EMC Test Report

Application for Grant of Equipment Authorization
Class II Permissive Change/Reassessment

Industry Canada RSS-Gen Issue 3 / RSS 210 Issue 8
FCC Part 15, Subpart E

Model: XI-N450 in the XR1000 and XR2000

IC CERTIFICATION #:	5428A-XN450
FCC ID:	SK6XI-N450
APPLICANT:	Xirrus, Inc. 2101 Corporate Center Dr. Newbury Park, CA 91320
TEST SITE(S):	Elliott Laboratories 41039 Boyce Road. Fremont, CA. 94538-2435
IC SITE REGISTRATION #:	2845B-3; 2845B-4, 2845B-5, 2845B-7
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REVISION HISTORY

Rev#	Date	Comments	Modified By
-	06-01-2012	First release	

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SCOPE

An electromagnetic emissions test has been performed on the Xirrus, Inc. model XI-N450 in the XR1000 and XR2000, pursuant to the following rules:

Industry Canada RSS-Gen Issue 3
RSS 210 Issue 8 "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.

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

Certification is a procedure where the manufacturer submits test data and technical information to a certification body and receives a certificate or grant of equipment authorization upon successful completion of the certification body's review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

STATEMENT OF COMPLIANCE

The tested sample of Xirrus, Inc. model XI-N450 in the XR1000 and XR2000 complied with the requirements of the following regulations:

RSS 210 Issue 8 "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 Xirrus, Inc. model XI-N450 in the XR1000 and XR2000 and therefore apply only to the tested sample. The sample was selected and prepared by Steve Smith of Xirrus, Inc..

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) (2)		26dB Bandwidth	Testing not performed, no changes from the original filing. Output power of test sample confirmed to be with 0.5dB of the original filing. (note 1)		
15.407 (a) (1)	A9.2(1)	Output Power			
15.407 (a) (1)	-	Power Spectral Density			
-	A9.5 (2)				
Note 1: In some cases power had to be reduced from the level of the original certification to comply with the spurious emissions requirements. These are noted in the test data.					

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	Testing not performed, no changes from the original filing. Output power of test sample confirmed to be with 0.5dB of the original filing. (note 1)		
15.407(a) (2)	A9.2(2)	Output Power			
15.407(a) (2)	-	Power Spectral Density			
-	A9.2(2) / A9.5 (2)	Power Spectral Density			
Note 1: In some cases power had to be reduced from the level of the original certification to comply with the spurious emissions requirements. These are noted in the test data.					

Operation in the 5.47 – 5.725 GHz Band

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.407(a) (2)		26dB Bandwidth	Testing not performed, no changes from the original filing. Output power of test sample confirmed to be with 0.5dB of the original filing. (note 1)		
15.407(a) (2)	A9.2(2)	Output Power			
15.407(a) (2))		Power Spectral Density			
	A9.2(2) / A9.5 (2)	Power Spectral Density			
KDB 443999	A9	Non-operation in 5600 – 5650 MHz sub band	Device cannot operate in the 5600 – 5650 MHz band –refer to Operational Description		Complies
Note 1: In some cases power had to be reduced from the level of the original certification to comply with the spurious emissions requirements. These are noted in the test data.					

Requirements for all U-NII/LELAN bands

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.407	A9.5a	Modulation	Unchanged from original filing.		
15.407(b) (5) / 15.209	A9.3	Spurious Emissions	54.0 dBµV/m @ 10601.7 MHz (-0.0 dB)	Refer to page **Error! Bookmark not defined.**	Complies
15.407(a)(6)	-	Peak Excursion Ratio	Unchanged from original filing.		
	A9.5 (3)	Channel Selection	Spurious emissions tested at outermost channels in each band	Device was tested on the top, bottom and center channels in each band	N/A
15			Measurements on three channels in each band		
15.407 (c)	A9.5(4)	Operation in the absence of information to transmit	Unchanged from original filing.		
15.407 (g)	A9.5 (5)	Frequency Stability	Unchanged from original filing.		
15.407 (h1)	A9.4	Transmit Power Control	Unchanged from original filing.		
15.407 (h2)	A9.4	Dynamic frequency Selection (device with radar detection)	Refer to separate test report, reference R86855	Threshold -62dBm (-64dBm if eirp > 200mW) Channel Availability Check > 60s Channel closing transmission time < 260ms Channel move time < 10s Non occupancy period > 30minutes	Complies
	A9.9g	User Manual information	Unchanged from original filing.		

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Unchanged from original filing.		
15.207	RSS GEN Table 2	AC Conducted Emissions	57.4 dBµV @ 4.716 MHz (-2.6 dB)	Refer to page 19	Complies
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Unchanged from original filing.		
-	RSP 100 RSS GEN 7.1.5	User Manual	Unchanged from original filing.		
-	RSP 100 RSS GEN 7.1.5	User Manual	Unchanged from original filing.		
-	RSP 100 RSS GEN 4.4.1	99% Bandwidth	Unchanged from original filing.		

MEASUREMENT UNCERTAINTIES

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with UKAS document LAB 34.

Measurement Type	Measurement Unit	Frequency Range	Expanded Uncertainty
RF power, conducted (power meter)	dBm	25 to 7000 MHz	± 0.52 dB
RF power, conducted (Spectrum analyzer)	dBm	25 to 7000 MHz	± 0.7 dB
Conducted emission of transmitter	dBm	25 to 26500 MHz	± 0.7 dB
Conducted emission of receiver	dBm	25 to 26500 MHz	± 0.7 dB
Radiated emission (substitution method)	dBm	25 to 26500 MHz	± 2.5 dB
Radiated emission (field strength)	dBµV/m	25 to 1000 MHz	± 3.6 dB
		1000 to 40000 MHz	± 6.0 dB
Conducted Emissions (AC Power)	dBµV	0.15 to 30 MHz	± 2.4 dB

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Xirrus, Inc. model XI-N450 in the XR1000 and XR2000 is an 802.11abgn 3x3 module intended to be installed in Xirrus Wireless Access Points. The module supports 802.11bgn 3x3 in the 2400-2483.5MHz, 5725-5850MHz, 5150-5250MHz, 5250-5350MHz and 5470-5725MHz bands. It additionally supports 802.11a SISO mode in the 5150-5250MHz, 5250-5350MHz and 5470-5725MHz bands at a higher per chain power. SISO modes in the other bands operate at the same output power per chain as the equivalent MIMO mode. It can operate in both 20- and 40-MHz channels in 802.11n mode.

For testing purposes one sample of the XI-N300 2x2 module, and one sample of a 3x3 version of the module (model number XI-N450) were installed into a Xirrus XR1000 host system. Two samples of the XI-N300 2x2 module and two samples of a 3x3 version of the module (model number XI-N450) were installed into a Xirrus XR2000 host system. During normal operation, the host system would be limited to one variety of module.

The sample was received on February 7, 2012 and tested on February 21, 22, 27, 28 and 29 and March 13, 14, 15 and 27, and April 6, 2012. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Xirrus	N/A	3x3 Wifi module	Various	SK6XI-N450

ANTENNA SYSTEM

The antenna system is integrated into the module with two antennas per module (one for each transmit-receive chain). The nominal antenna gains are 1dBi in the 2.4GHz band and 4dBi in the 5GHz bands.

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 equipment was used as support equipment for testing:

Company	Model	Description	Serial Number	FCC ID
Xirrus	XR1000	2 radio Access Point	-	-
Xirrus	XR2000	4 radio Access Point	-	-

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

Company	Model	Description	Serial Number	FCC ID
HP	Compaq 6910P	PC Laptop	n/a	DoC
Xirrus	XP2-MSI-95M	Dual Port POE Injector	P12400043B1	N/A

EUT INTERFACE PORTS

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

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
POE1	Remote POE Injector	CAT5	Unshielded	10
Laptop Ethernet	PoE Injector	Cat 5	Unshielded	1

EUT OPERATION

The modules were installed into a host system for spurious emissions tests.

To evaluate the radiated spurious emissions related to the transmitter the module was evaluated in all operating modes (802.11b, 802.11g, 802.11a, 802.11n in both20- and 40-MHz channels) using ART software utility to place the module(s) under test in continuous transmit modes. Both transmit chains were active for the DTS tests, NII tests were repeated in 802.11a mode with a single chain active.

For measurements at the restricted band edges one module was operating on the channel closest to the band edge. The worse case operating mode from the original filing was tested for each band. For other spurious emissions measurements multiple radios were operating simultaneously. As the host system can also house additional modules, during radiated spurious emissions tests all radios were active simultaneously. When installed into host systems the host system firmware will not allow multiple radios to operate on the same or overlapping channels, so if signals were above the limit with multiple radios active, and those signals were related to harmonics of the transmitted signal, then the measurements were repeated with only one of radio or one mode active because these harmonic emissions would only be present form one radio at any specific time.

Measurements on the host system for the frequency range 30 – 1000 MHz demonstrated that all significant emissions were from the host system. Digital device emissions from the host system above 1GHz (occurring at 2.5GHz, 5.0GHz and 7.5GHz) were excluded from the scope of this test report and will be evaluated as a part of the host system digital device tests.

AC conducted emissions measurements were made on the AC input to the Power-Over-Ethernet (PoE) injector used to power the host system. For these measurements all both radios were in a transmit/receive mode with all chains active.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken at the test sites listed below. Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission and with industry Canada.

Site	Registration Numbers		Location
	FCC	Canada	
Chamber 3	769238	2845B-3	41039 Boyce Road Fremont, CA 94538-2435
Chamber 4	211948	2845B-4	
Chamber 5	211948	2845B-5	
Chamber 7	A2LA accreditation	2845B-7	

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

CONDUCTED EMISSIONS CONSIDERATIONS

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

RADIATED EMISSIONS CONSIDERATIONS

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

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

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

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

INSTRUMENT CONTROL COMPUTER

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

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

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

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

FILTERS/ATTENUATORS

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

ANTENNAS

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

ANTENNA MAST AND EQUIPMENT TURNTABLE

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

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

INSTRUMENT CALIBRATION

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

TEST PROCEDURES

EUT AND CABLE PLACEMENT

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

CONDUCTED EMISSIONS

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

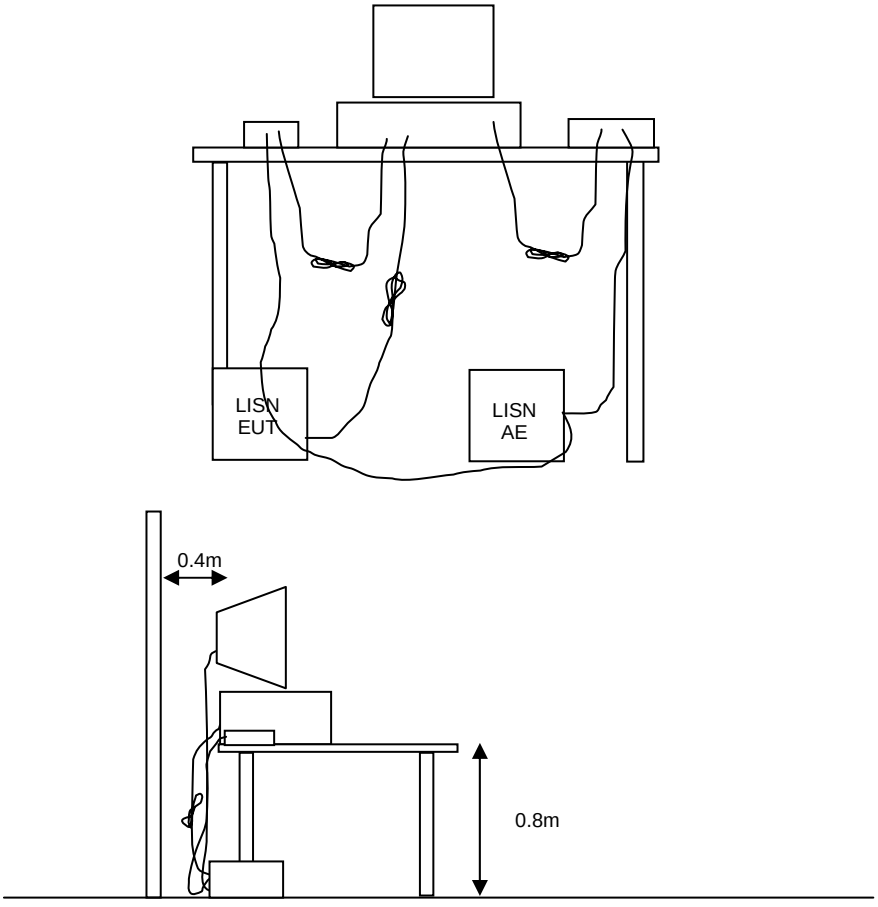


Figure 1 Typical Conducted Emissions Test Configuration

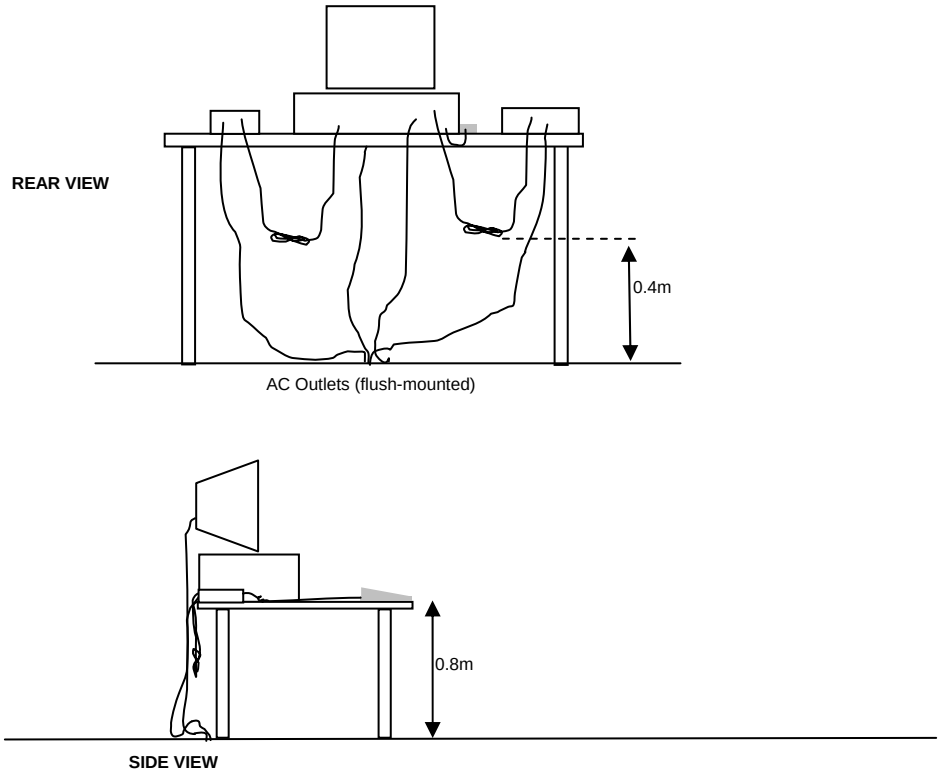
RADIATED EMISSIONS

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

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

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

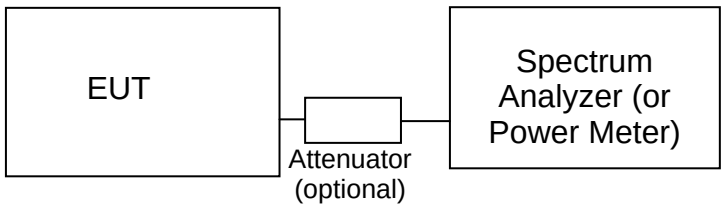
When testing above 18 GHz, the receive antenna is located at 1meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.



Typical Test Configuration for Radiated Field Strength Measurements

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:

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

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

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

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

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

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

RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS

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

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

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

FCC 15.407 (a) OUTPUT POWER LIMITS

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

Operating Frequency (MHz)	Output Power	Power Spectral Density
5150 – 5250	50mW (17 dBm)	4 dBm/MHz
5250 – 5350	250 mW (24 dBm)	11 dBm/MHz
5725 – 5825	1 Watts (30 dBm)	17 dBm/MHz

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

The peak excursion envelope is limited to 13dB.

OUTPUT POWER LIMITS –LELAN DEVICES

The table below shows the limits for output power and output power density defined by RSS 210. Where the signal bandwidth is less than 20 MHz the maximum output power is reduced to the power spectral density limit plus 10 times the log of the bandwidth (in MHz).

Operating Frequency (MHz)	Output Power	Power Spectral Density
5150 – 5250	200mW (23 dBm) eirp	10 dBm/MHz eirp
5250 – 5350	250 mW (24 dBm)[2] 1W (30dBm) eirp	11 dBm/MHz
5470 – 5725	250 mW (24 dBm)[3] 1W (30dBm) eirp	11 dBm/MHz
5725 – 5825	1 Watts (30 dBm) 4W eirp	17 dBm/MHz

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

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

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

SPURIOUS EMISSIONS 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 (88.3dBuV/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 d (meters) from the equipment under test:

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

where P is the eirp (Watts)

For a measurement at 3m the conversion from a logarithmic value for field strength (dBuV/m) to an eirp power (dBm) is -95.3dB.

Appendix A Test Equipment Calibration Data

Radiated Emissions, Bandedge, 22-Feb-12

Manufacturer	Description	Model	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/8/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-40 GHz	ESIB40 (1088.7490.40)	2493	12/9/2012

Radio Antenna Port (Power and Spurious Emissions), 15-Mar-12

Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	Power Meter, Single Channel	NRVS	1422	12/13/2012
Rohde & Schwarz	Power Sensor 100 uW - 2 Watts use with 20dB attenuator sn:100059 only	NRV-Z32	1423	9/1/2012
Agilent	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	2/23/2013

Appendix B Test Data

Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		-
Emissions Standard(s):	FCC 15.247/15.E/RSS-210	Class:	-
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Xirrus

Model

XI-N300 (2x2 radio module) in XR1000

Date of Last Test: 5/24/2012

Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

RSS 210 and FCC 15.407 (UNII) Radiated Spurious Emissions (5150-5250 MHz Band)

Test Specific Details

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

General Test Configuration

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

Ambient Conditions:

Temperature: 20-25 °C Rel. Humidity: 30-40 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Summary of Results

Spurious Radiated Emissions: 2x2 and 3x3 Modules for 802.11a; HT20; and HT40 modes

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1	802.11a	2x2: 5180 MHz 3x3: 5240 MHz	27 19		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.0 dBµV/m @ 4999.9 MHz (-1.0 dB)
2	802.11a	2x2: 5240 MHz 3x3: 5180 MHz	27 19		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.7 dBµV/m @ 5000.0 MHz (-0.3 dB)
3	802.11a	2x2: 5200 MHz 3x3: 5200 MHz	28 19		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.7 dBµV/m @ 5000.0 MHz (-0.3 dB)
4	802.11n20	2x2: 5180 MHz 3x3: 5240 MHz	26 19		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.5 dBµV/m @ 5000.0 MHz (-0.5 dB)
5	802.11n20	2x2: 5240 MHz 3x3: 5180 MHz	28 19		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.9 dBµV/m @ 5000.0 MHz (-1.1 dB)
6	802.11n20	2x2: 5200 MHz 3x3: 5200 MHz	28 19		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.2 dBµV/m @ 5000.1 MHz (-0.8 dB)
7	802.11n40	2x2: 5190 MHz 3x3: 5230 MHz	11 19		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	49.8 dBµV/m @ 5000.1 MHz (-4.2 dB)
8	802.11n40	2x2: 5230 MHz 3x3: 5190 MHz	28 8		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.7 dBµV/m @ 5000.1 MHz (-1.3 dB)

Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

System Configuration: Operating within 5150-5250 MHz

Radio #	Frequency	Module	Mode	Radio #	Frequency	Module	Mode
Run: 1				Run: 2			
1	5180	2x2	802.11a	1	5240	2x2	802.11a
0	5240	3x3	802.11a	0	5180	3x3	802.11a
Run: 3							
1	5200	2x2	802.11a				
0	5200	3x3	802.11a				
Run: 4				Run: 5			
1	5180	2x2	802.11HT20	1	5240	2x2	802.11HT20
0	5240	3x3	802.11HT20	0	5180	3x3	802.11HT20
Run: 6							
1	5200	2x2	802.11HT20				
0	5200	3x3	802.11HT20				
Run: 7				Run: 8			
1	5190	2x2	802.11HT40	1	5230	2x2	802.11HT40
0	5230	3x3	802.11HT40	0	5190	3x3	802.11HT40

Notes - Multiple radios operating at the same time as shown above. In all cases, power set to the maximum worse case single channel power, transmitting on all chains.

Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #1, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5150-5250 MHz Band

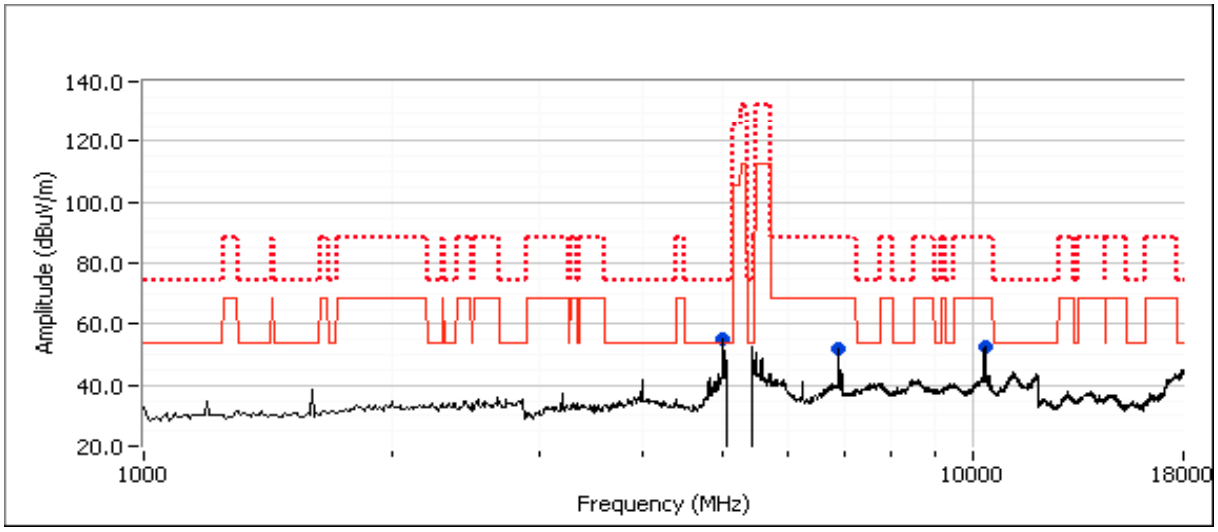
Date of Test: 2/27/2012 Test Location: FT7

Test Engineer: Rafael Varelas

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4999.860	53.0	V	54.0	-1.0	AVG	118	1.0	RB 1 MHz;VB 10 Hz;Pk
4999.960	58.1	V	74.0	-15.9	PK	118	1.0	RB 1 MHz;VB 3 MHz;Pk
6906.660	54.3	V	-	-	PK	74	1.2	RB 1 MHz;VB 3 MHz;Pk, note 2
10359.210	59.0	V	-	-	PK	247	1.0	RB 1 MHz;VB 3 MHz;Pk, note 2

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

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

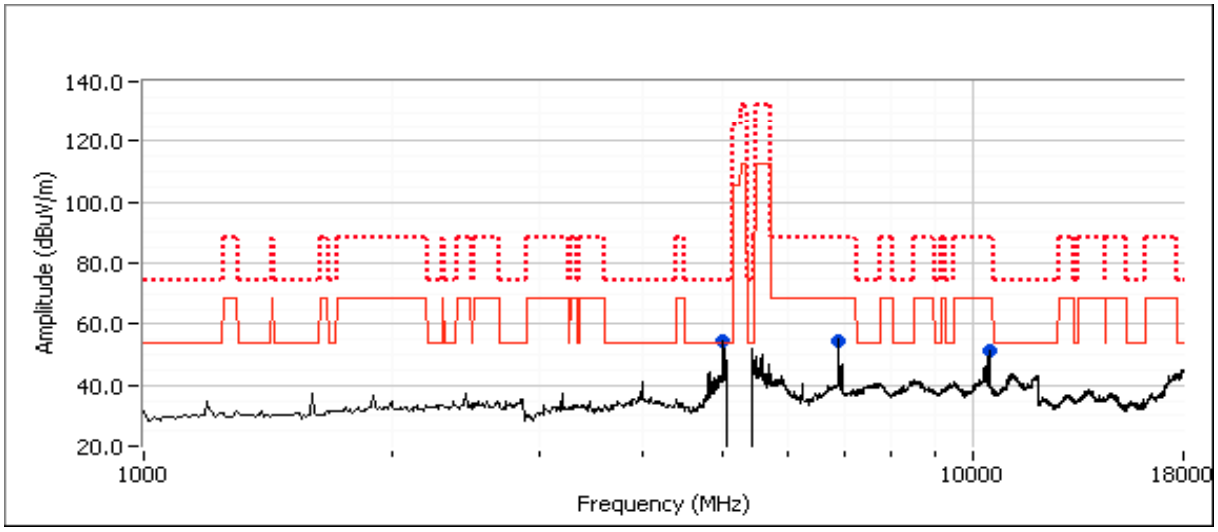
Date of Test: 2/27/2012 Test Location: FT7

Test Engineer: Rafael Varelas

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5000.030	53.7	V	54.0	-0.3	AVG	110	1.1	RB 1 MHz;VB 10 Hz;Pk
5000.000	58.5	V	74.0	-15.5	PK	110	1.1	RB 1 MHz;VB 3 MHz;Pk
6906.550	57.2	V	-	-	PK	280	1.3	RB 1 MHz;VB 3 MHz;Pk, note 2
10475.760	58.9	V	-	-	PK	99	1.0	RB 1 MHz;VB 3 MHz;Pk, note 2

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #3, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5150-5250 MHz Band

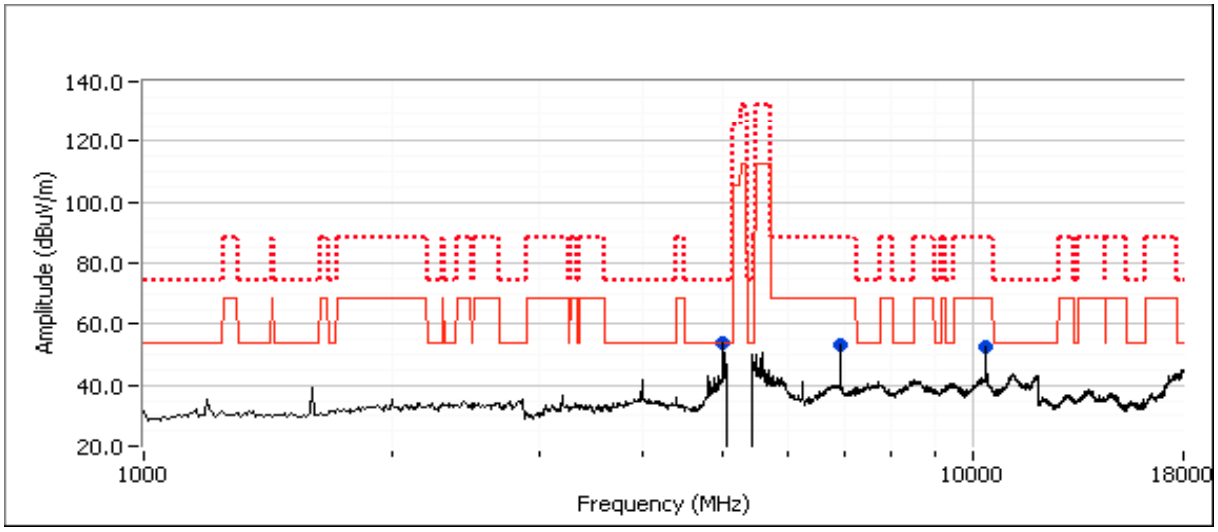
Date of Test: 2/27/2012 Test Location: FT7

Test Engineer: Rafael Varelas

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5000.020	53.7	V	54.0	-0.3	AVG	111	1.1	RB 1 MHz;VB 10 Hz;Pk
4999.910	58.5	V	74.0	-15.5	PK	111	1.1	RB 1 MHz;VB 3 MHz;Pk
6933.290	55.0	V	-	-	PK	282	1.1	RB 1 MHz;VB 3 MHz;Pk, note 2
10404.530	58.9	V	-	-	PK	294	1.0	RB 1 MHz;VB 3 MHz;Pk, note 2

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #4, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5150-5250 MHz Band

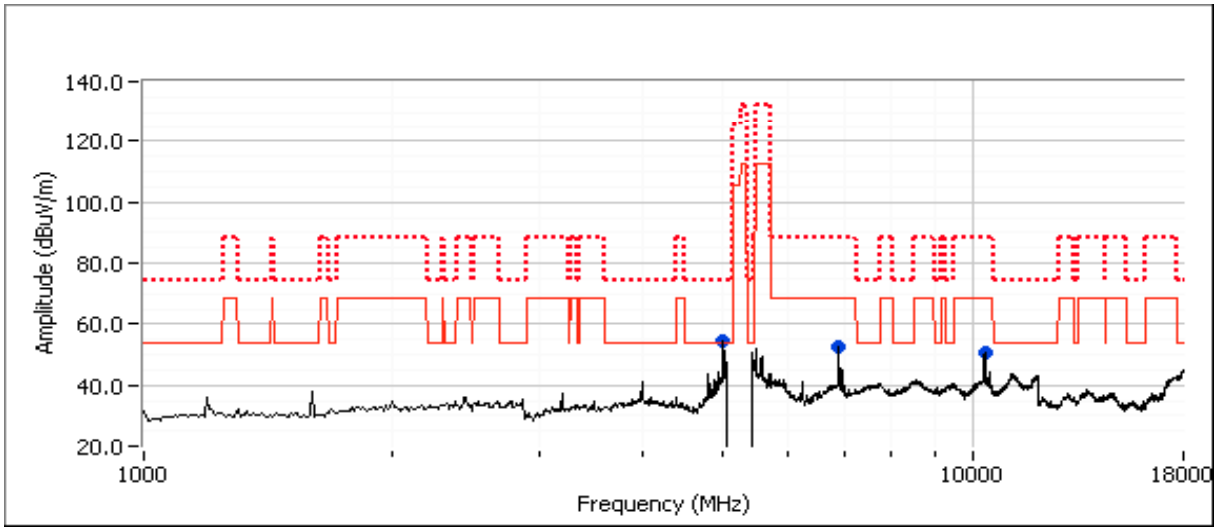
Date of Test: 2/27/2012 Test Location: FT7

Test Engineer: Rafael Varelas

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5000.010	53.5	V	54.0	-0.5	AVG	111	1.1	RB 1 MHz;VB 10 Hz;Pk
4999.890	58.6	V	74.0	-15.4	PK	111	1.1	RB 1 MHz;VB 3 MHz;Pk
10361.800	56.7	V	-	-	PK	298	1.0	RB 1 MHz;VB 3 MHz;Pk, note 2
6906.560	54.7	V	-	-	PK	78	1.3	RB 1 MHz;VB 3 MHz;Pk, note 2

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #5, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5150-5250 MHz Band

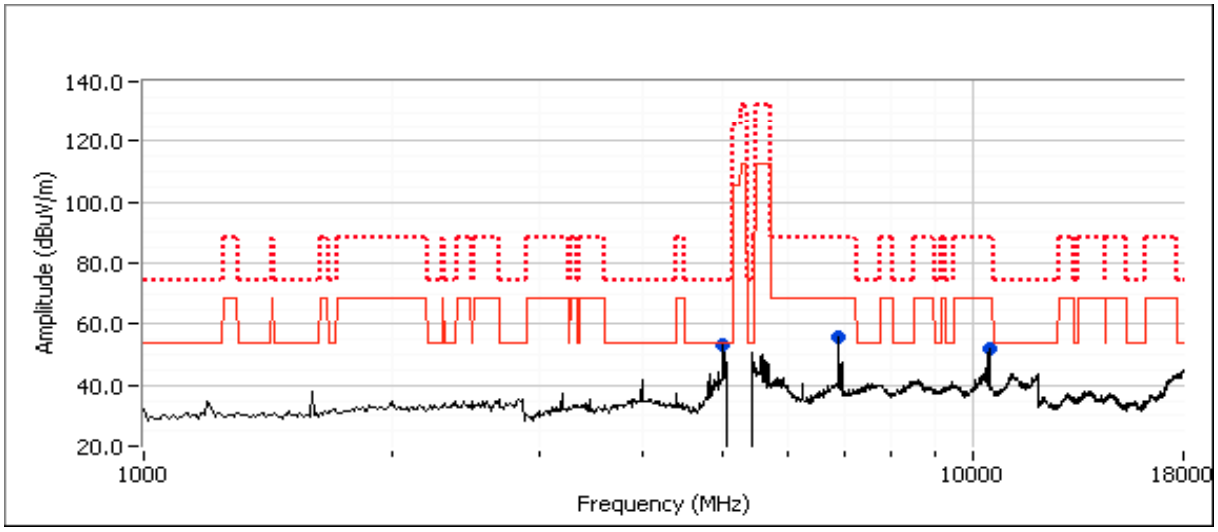
Date of Test: 2/27/2012 Test Location: FT7

Test Engineer: Rafael Varelas

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5000.020	52.9	V	54.0	-1.1	AVG	115	1.2	RB 1 MHz;VB 10 Hz;Pk
4999.980	58.0	V	74.0	-16.0	PK	115	1.2	RB 1 MHz;VB 3 MHz;Pk
10477.490	59.9	V	-	-	PK	138	1.0	RB 1 MHz;VB 3 MHz;Pk, note 2
6906.710	57.5	V	-	-	PK	280	1.3	RB 1 MHz;VB 3 MHz;Pk, note 2

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #6, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5150-5250 MHz Band

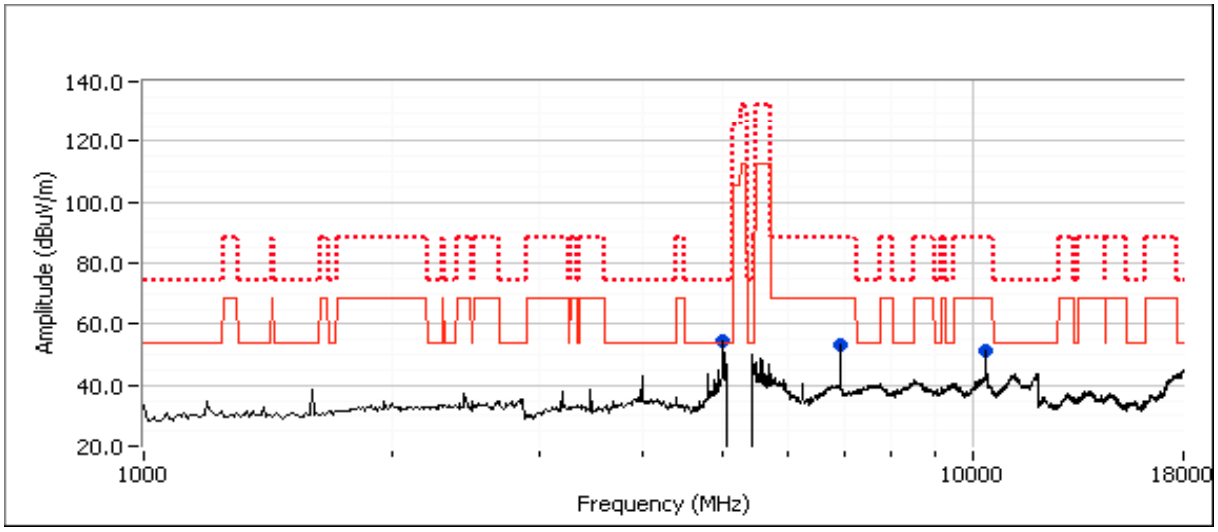
Date of Test: 2/27/2012 Test Location: FT7

Test Engineer: Rafael Varelas

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5000.050	53.2	V	54.0	-0.8	AVG	114	1.0	RB 1 MHz;VB 10 Hz;Pk
5000.150	58.4	V	74.0	-15.6	PK	114	1.0	RB 1 MHz;VB 3 MHz;Pk
6933.270	54.8	V	-	-	PK	281	1.3	RB 1 MHz;VB 3 MHz;Pk, note 2
10400.280	60.9	V	-	-	PK	138	1.0	RB 1 MHz;VB 3 MHz;Pk, note 2

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #7, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5150-5250 MHz Band

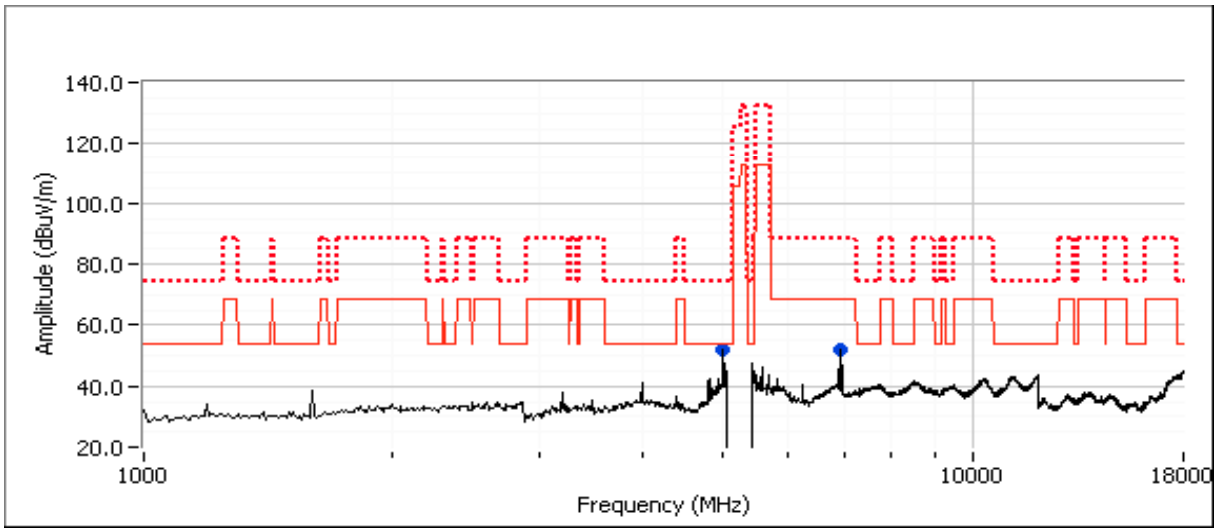
Date of Test: 2/27/2012 Test Location: FT7

Test Engineer: Rafael Varelas

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5000.060	49.8	V	54.0	-4.2	AVG	112	1.2	RB 1 MHz;VB 10 Hz;Pk
5000.000	54.7	V	74.0	-19.3	PK	112	1.2	RB 1 MHz;VB 3 MHz;Pk
6919.830	54.4	V	-	-	PK	83	1.3	RB 1 MHz;VB 3 MHz;Pk, note 2

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #8, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5150-5250 MHz Band

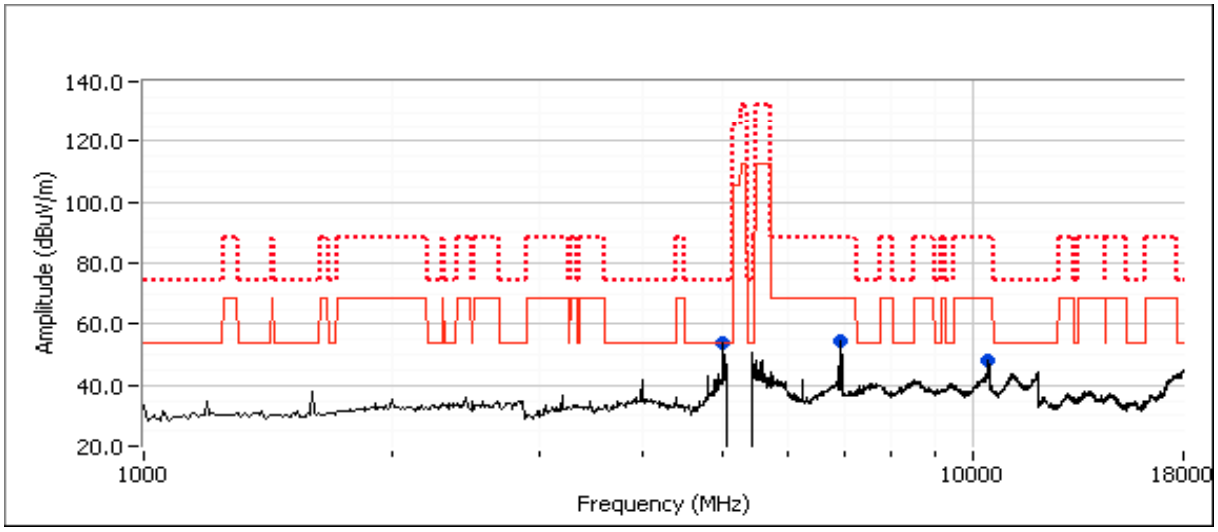
Date of Test: 2/27/2012 Test Location: FT7

Test Engineer: Rafael Varelas

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5000.050	52.7	V	54.0	-1.3	AVG	116	1.2	RB 1 MHz;VB 10 Hz;Pk
5000.100	57.5	V	74.0	-16.5	PK	116	1.2	RB 1 MHz;VB 3 MHz;Pk
10460.320	56.8	V	-	-	PK	99	1.2	RB 1 MHz;VB 3 MHz;Pk, note 2
6920.040	56.8	V	-	-	PK	280	1.3	RB 1 MHz;VB 3 MHz;Pk, note 2

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

RSS 210 and FCC 15.407 (UNII) Radiated Spurious Emissions (5250-5350 MHz Band)

Test Specific Details

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

General Test Configuration

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

Ambient Conditions:

Temperature: 20-25 °C Rel. Humidity: 30-40 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Summary of Results

Spurious Radiated Emissions: 2x2 and 3x3 Modules for 802.11a; HT20; and HT40 modes

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1	802.11a	2x2: 5260 MHz 3x3: 5320 MHz	35 28		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.8 dBµV/m @ 10642.8 MHz (-0.2 dB)
2	802.11a	2x2: 5320 MHz 3x3: 5260 MHz	29* 32		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	68.2 dBµV/m @ 10520.9 MHz (-0.1 dB)
3	802.11a	2x2: 5300 MHz 3x3: 5300 MHz	32* 32		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	54.0 dBµV/m @ 10601.7 MHz (-0.0 dB)
4	802.11n20	2x2: 5260 MHz 3x3: 5320 MHz	34 21		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	No significant non-restricted band emissions
5	802.11n20	2x2: 5320 MHz 3x3: 5260 MHz	27 33		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.7 dBµV/m @ 10638.2 MHz (-1.3 dB)
6	802.11n20	2x2: 5300 MHz 3x3: 5300 MHz	29* 33		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.9 dBµV/m @ 10600.0 MHz (-1.1 dB)
7	802.11n40	2x2: 5270 MHz 3x3: 5310 MHz	33 12		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	No significant non-restricted band emissions
8	802.11n40	2x2: 5310 MHz 3x3: 5270 MHz	14 34		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	No significant non-restricted band emissions

Note: * - indicates power reduced from original certification

Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

System Configuration: Operating within 5250-5350 MHz

Radio #	Frequency	Module	Mode	Radio #	Frequency	Module	Mode
Run: 1				Run: 2			
1	5260	2x2	802.11a	1	5320	2x2	802.11a
0	5320	3x3	802.11a	0	5260	3x3	802.11a
Run: 3							
1	5300	2x2	802.11a				
0	5300	3x3	802.11a				
Run: 4				Run: 5			
1	5260	2x2	802.11HT20	1	5320	2x2	802.11HT20
0	5320	3x3	802.11HT20	0	5260	3x3	802.11HT20
Run: 6							
1	5300	2x2	802.11HT20				
0	5300	3x3	802.11HT20				
Run: 7				Run: 8			
1	5270	2x2	802.11HT40	1	5310	2x2	802.11HT40
0	5310	3x3	802.11HT40	0	5270	3x3	802.11HT40

Notes - Multiple radios operating at the same time as shown above. In all cases, power set to the maximum worse case single channel power, transmitting on all chains.

Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #1, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5250-5350 MHz Band

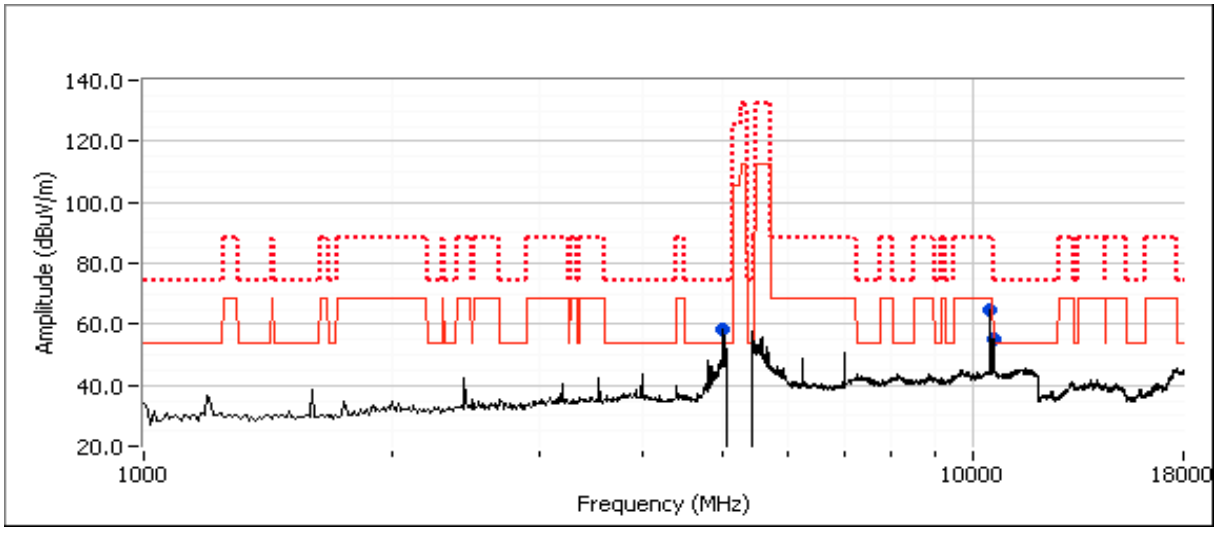
Date of Test: 2/28/2012 Test Location: FT3

Test Engineer: Rafael Varelas

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Power setting = 35 (2x2), Power setting = 28 (3x3)								
5000.010	61.7	V	74.0	-12.3	PK	111	1.0	RB 1 MHz;VB 3 MHz;Pk
10642.800	53.8	V	54.0	-0.2	AVG	77	1.0	RB 1 MHz;VB 10 Hz;Pk
10642.830	67.3	V	74.0	-6.7	PK	77	1.0	RB 1 MHz;VB 3 MHz;Pk
10522.790	71.4	V	-	-	PK	245	1.0	RB 1 MHz;VB 3 MHz;Pk, note 2
5000.060	56.8	V	-	-	AVG	111	1.0	Note 4

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

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

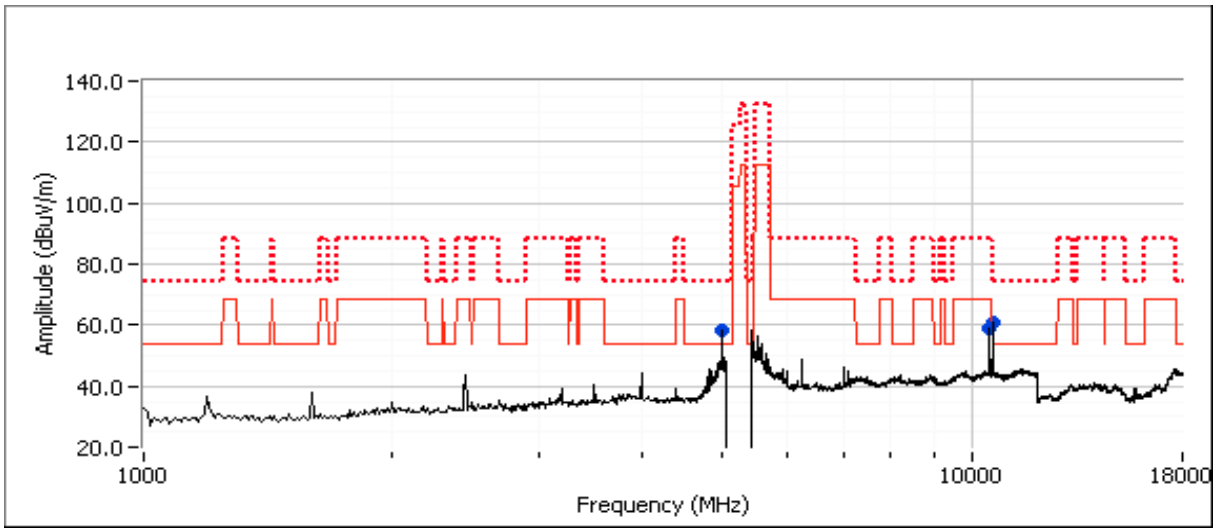
Date of Test: 2/28/2012 Test Location: FT3

Test Engineer: Rafael Varelas

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Power setting = 29 (2x2), Power setting = 32 (3x3)								
10520.890	68.2	V	68.3	-0.1	PK	84	1.0	RB 1 MHz;VB 3 MHz;Pk
5000.090	58.1	V	-	-	Peak	88	1.3	Note 4
10640.640	53.4	V	54.0	-0.6	AVG	254	1.1	
10640.840	67.5	V	74.0	-6.5	PK	254	1.1	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #3, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5250-5350 MHz Band

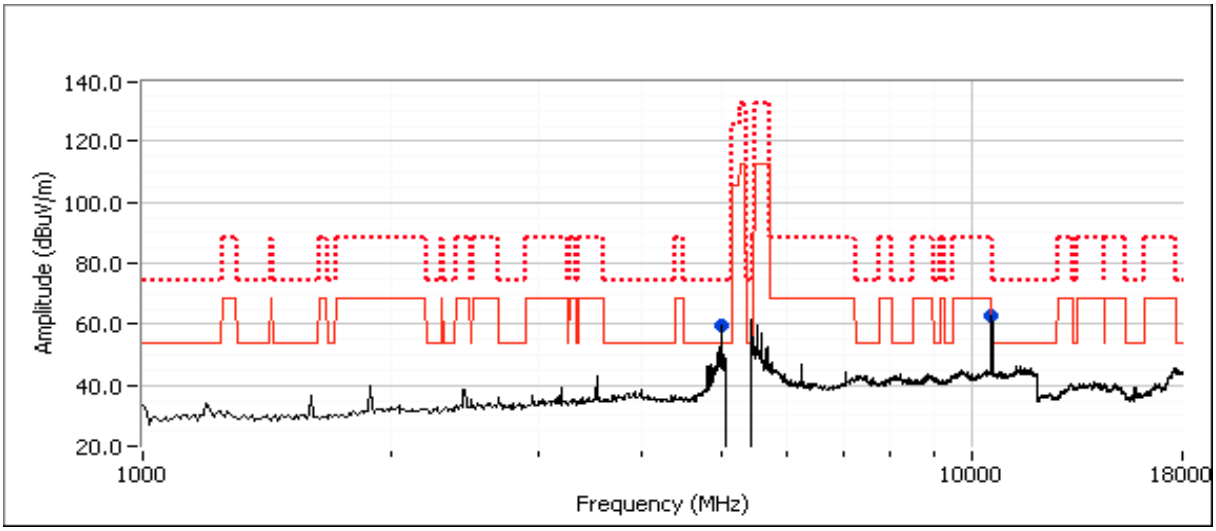
Date of Test: 2/28/2012 Test Location: FT3

Test Engineer: Rafael Varelas

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Power setting = 32 (2x2), Power setting = 32 (3x3)								
5000.090	59.6	V	-	-	Peak	105	1.3	Note 4
10601.740	54.0	V	54.0	0.0	AVG	245	1.0	
10601.920	67.2	V	74.0	-6.8	PK	245	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #4, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5250-5350 MHz Band

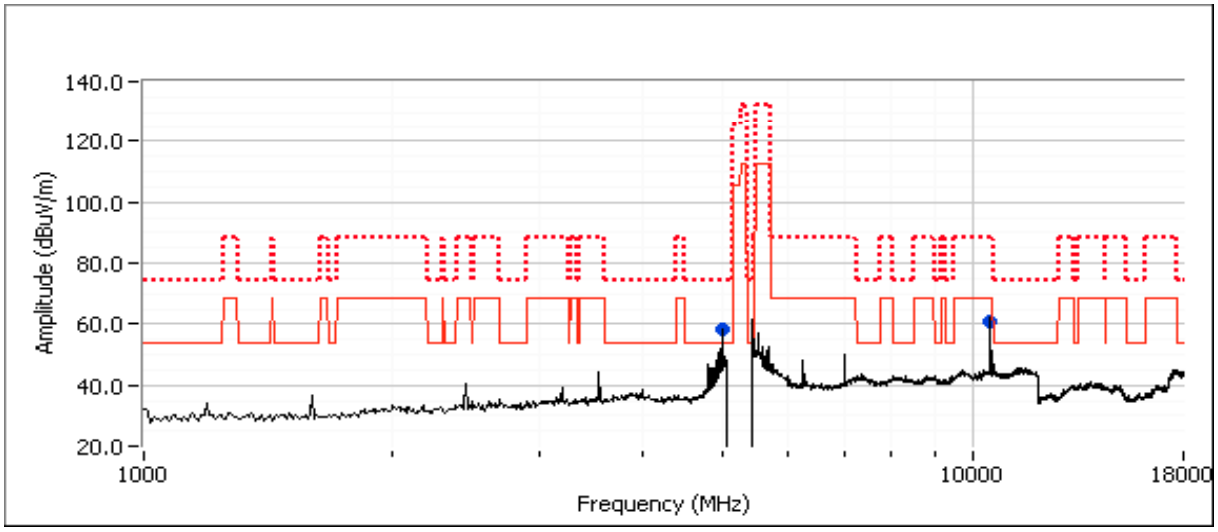
Date of Test: 2/28/2012 Test Location: FT3

Test Engineer: Rafael Varelas

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
10522.970	67.3	V	-	-	PK	251	1.0	RB 1 MHz;VB 3 MHz;Pk, note 2
5436.670	61.1	V	-	-	Peak	76	1.3	Note 4
5000.090	58.3	V	-	-	Peak	97	1.3	Note 4

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #5, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5250-5350 MHz Band

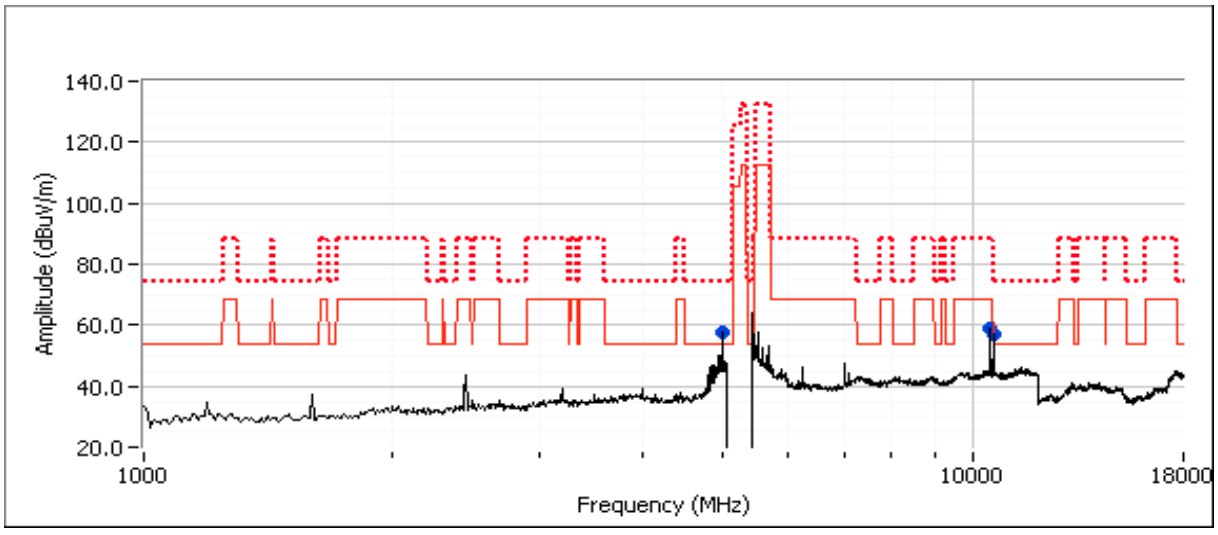
Date of Test: 2/28/2012 Test Location: FT3

Test Engineer: Rafael Varelas

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
10638.200	52.7	V	54.0	-1.3	AVG	103	1.3	RB 1 MHz;VB 10 Hz;Pk
10639.670	65.3	V	74.0	-8.7	PK	103	1.3	RB 1 MHz;VB 3 MHz;Pk
10516.340	66.3	V	-	-	PK	23	1.4	RB 1 MHz;VB 3 MHz;Pk, note 2
5436.670	61.1	V	-	-	Peak	76	1.3	Note 4
5000.090	57.8	V	-	-	Peak	105	1.0	Note 4

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #6, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5250-5350 MHz Band

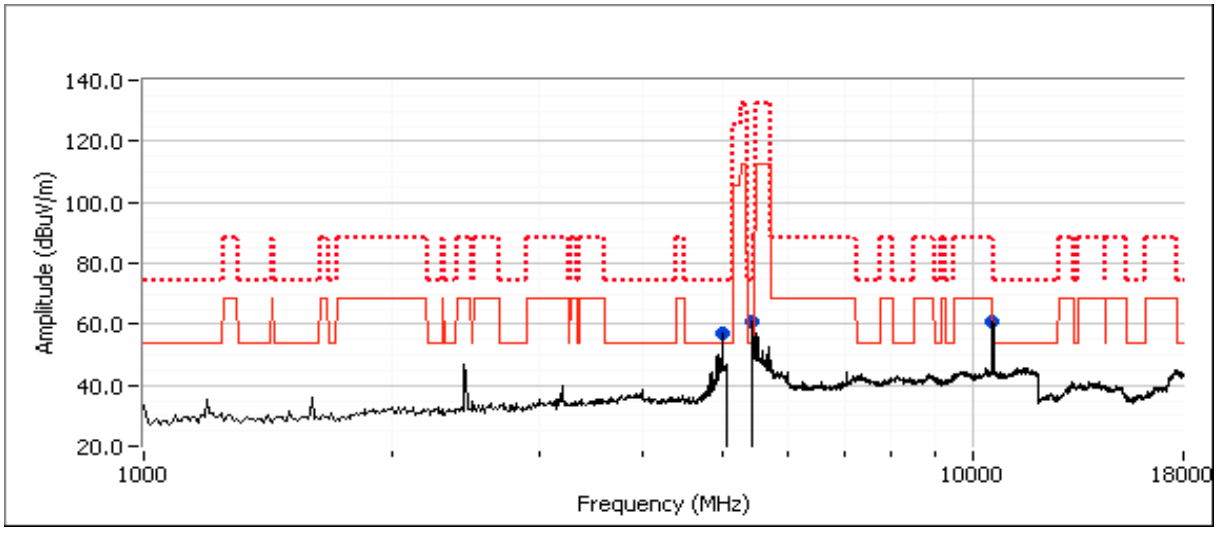
Date of Test: 2/28/2012 Test Location: FT3

Test Engineer: Rafael Varelas

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Power setting = 34 (2x2), Power setting = 33 (3x3)								
5436.670	61.1	V	-	-	Peak	76	1.3	Note 4
5000.090	57.3	V	-	-	Peak	94	1.3	Note 4
10600.000	52.9	V	54.0	-1.1	AVG	266	1.1	RB 1 MHz;VB 10 Hz;Pk
10601.410	64.8	V	74.0	-9.2	PK	266	1.1	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #7, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5250-5350 MHz Band

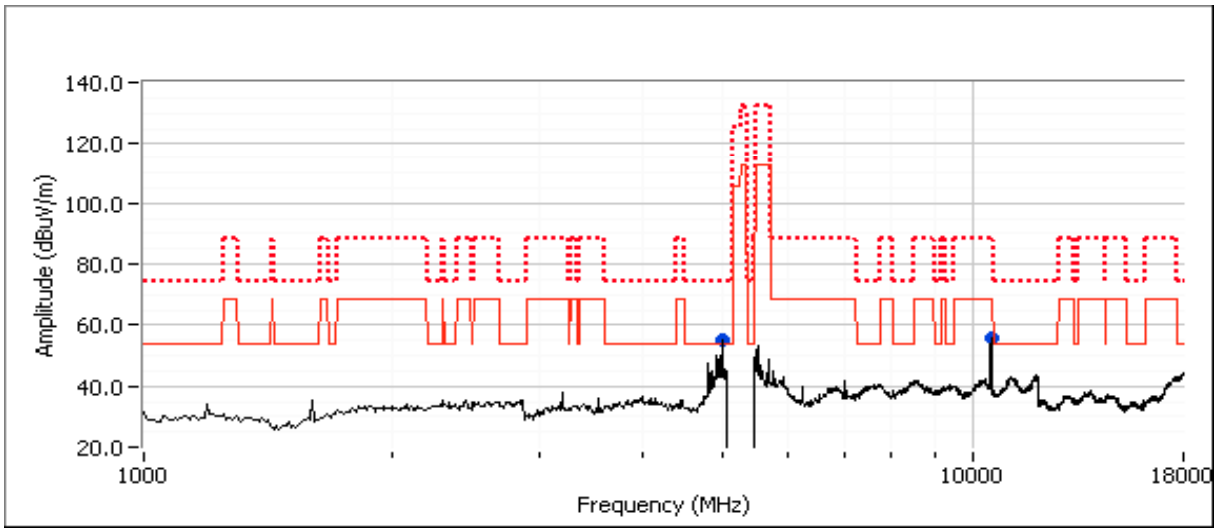
Date of Test: 2/29/2012 Test Location: FT7

Test Engineer: Rafael Varelas

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
10537.020	54.6	V	-	-	PK	86	1.7	RB 1 MHz;VB 3 MHz;Pk, note 2
4999.960	55.4	V	-	-	Peak	116	1.0	Note 4

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #8, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5250-5350 MHz Band

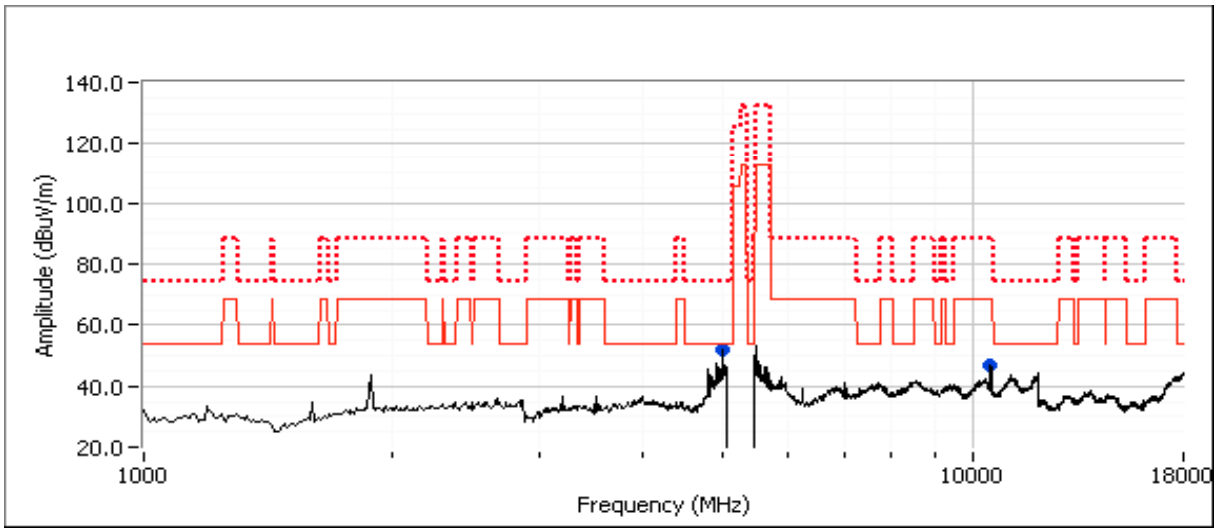
Date of Test: 2/29/2012 Test Location: FT7

Test Engineer: Rafael Varelas

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
10533.040	53.3	V	-	-	PK	78	1.1	RB 1 MHz;VB 3 MHz;Pk, note 2
4996.670	52.2	V	-	-	Peak	353	1.0	Note 4

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

RSS 210 and FCC 15.407 (UNII) Radiated Spurious Emissions (5470-5725 MHz Band)

Test Specific Details

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

General Test Configuration

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

Ambient Conditions:

Temperature: 20-25 °C Rel. Humidity: 30-40 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Summary of Results

Spurious Radiated Emissions: 2x2 and 3x3 Modules for 802.11a; HT20; and HT40 modes

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1	802.11a	2x2: 5500 MHz 3x3: 5700 MHz	35 33		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	47.3dBµV/m @ 11000.1MHz (-6.7dB)
2	802.11a	2x2: 5700 MHz 3x3: 5500 MHz	32 33		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	49.0dBµV/m @ 11399.5MHz (-5.0dB)
3	802.11a	2x2: 5580 MHz 3x3: 5580 MHz	32* 30*		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.4dBµV/m @ 11158.76MHz (-1.6dB)
4	802.11n20	2x2: 5500 MHz 3x3: 5700 MHz	32* 33		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.9dBµV/m @ 5080.03MHz (-0.1dB)
5	802.11n20	2x2: 5700 MHz 3x3: 5500 MHz	31* 30		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.9dBµV/m @ 11398.89MHz (-0.1dB)
6	802.11n20	2x2: 5580 MHz 3x3: 5580 MHz	32 30		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.5dBµV/m @ 11158.45MHz (-1.5dB)
7	802.11n40	2x2: 5510 MHz 3x3: 5670 MHz	20 34		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	51.8dBµV/m @ 5119.99MHz (-2.2dB)
8	802.11n40	2x2: 5670 MHz 3x3: 5510 MHz	27 13		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	51.1dBµV/m @ 5080.06MHz (-2.9dB)

Note: * - indicates power reduced from original certification

Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

System Configuration: Operating within 5470-5725 MHz

Radio #	Frequency	Module	Mode	Radio #	Frequency	Module	Mode
Run: 1				Run: 2			
1	5500	2x2	802.11a	1	5700	2x2	802.11a
0	5700	3x3	802.11a	0	5500	3x3	802.11a
Run: 3							
1	5580	2x2	802.11a				
0	5580	3x3	802.11a				
Run: 4				Run: 5			
1	5500	2x2	802.11HT20	1	5700	2x2	802.11HT20
0	5700	3x3	802.11HT20	0	5500	3x3	802.11HT20
Run: 6							
1	5580	2x2	802.11HT20				
0	5580	3x3	802.11HT20				
Run: 7				Run: 8			
1	5510	2x2	802.11HT40	1	5670	2x2	802.11HT40
0	5670	3x3	802.11HT40	0	5510	3x3	802.11HT40

Notes - Multiple radios operating at the same time as shown above. In all cases, power set to the maximum worse case single channel power, transmitting on all chains.

Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #1, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5470-5725 MHz Band

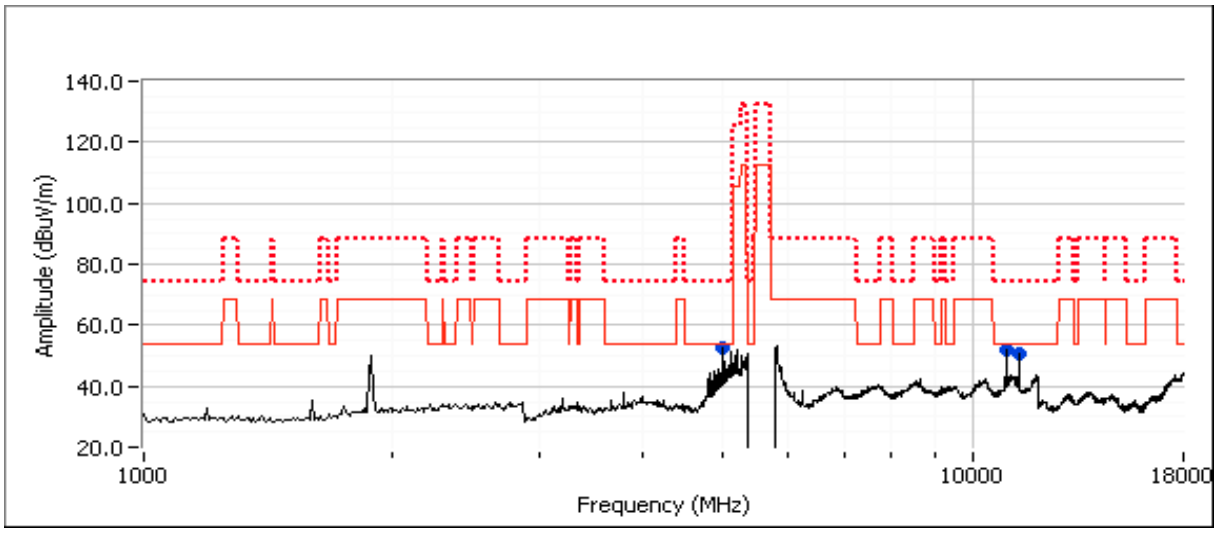
Date of Test: 2/29/2012 Test Location: FT7

Test Engineer: Rafael Varelas

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11000.070	47.3	V	54.0	-6.7	AVG	208	1.3	RB 1 MHz;VB 10 Hz;Pk
11005.200	59.6	V	74.0	-14.4	PK	208	1.3	RB 1 MHz;VB 3 MHz;Pk
11399.640	45.9	V	54.0	-8.1	AVG	88	1.1	RB 1 MHz;VB 10 Hz;Pk
11394.970	56.7	V	74.0	-17.3	PK	88	1.1	RB 1 MHz;VB 3 MHz;Pk
5000.060	52.3	V	-	-	Peak	104	1.0	Note 4

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 12-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #2, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5470-5725 MHz Band

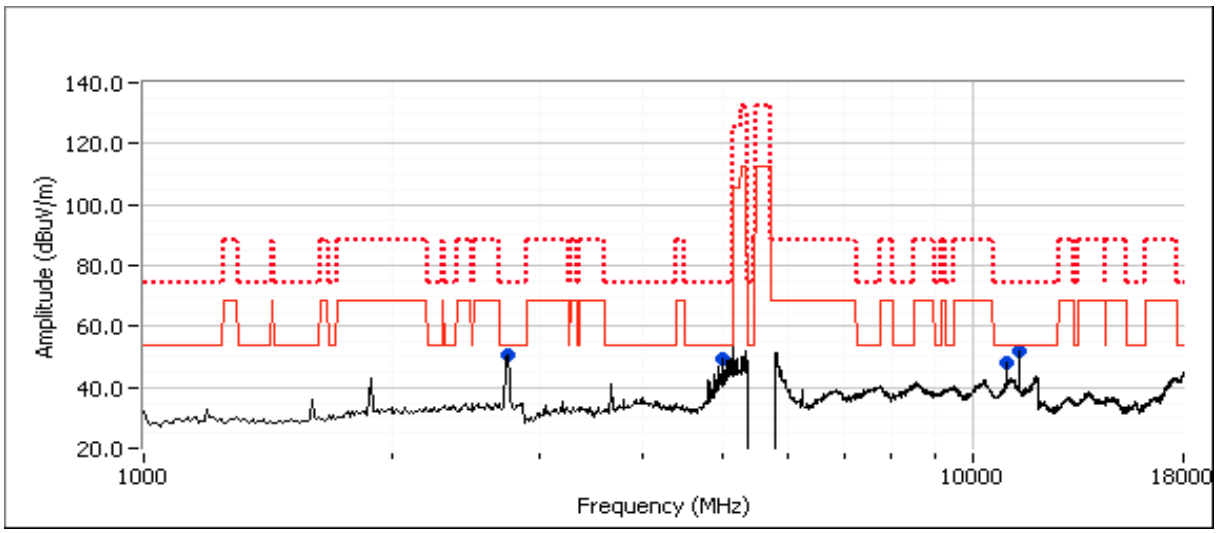
Date of Test: 2/29/2012 Test Location: FT7

Test Engineer: Rafael Varelas

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11399.470	49.0	V	54.0	-5.0	AVG	201	1.1	RB 1 MHz;VB 10 Hz;Pk
11399.540	59.3	V	74.0	-14.7	PK	201	1.1	RB 1 MHz;VB 3 MHz;Pk
2750.270	48.1	H	54.0	-5.9	AVG	130	1.0	RB 1 MHz;VB 10 Hz;Pk
2749.540	60.5	H	74.0	-13.5	PK	130	1.0	RB 1 MHz;VB 3 MHz;Pk
11004.760	43.4	V	54.0	-10.6	AVG	81	1.0	RB 1 MHz;VB 10 Hz;Pk
10996.090	54.9	V	74.0	-19.1	PK	81	1.0	RB 1 MHz;VB 3 MHz;Pk
5000.060	49.6	V	-	-	Peak	100	1.0	Note 4

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 12-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

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

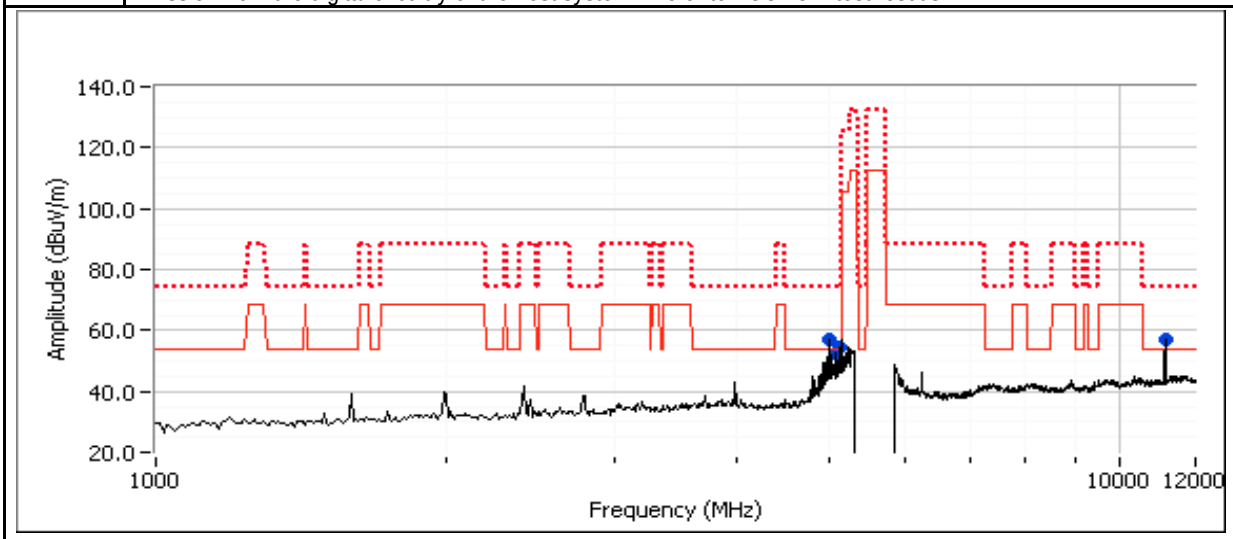
Date of Test: 3/14/2012 Test Location: Fremont Chamber #3

Test Engineer: Peter Sales

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11158.760	52.4	V	54.0	-1.6	AVG	316	1.0	RB 1 MHz;VB 10 Hz;Pk
11158.700	64.8	V	74.0	-9.2	PK	316	1.0	RB 1 MHz;VB 3 MHz;Pk
5080.020	51.6	V	54.0	-2.4	AVG	281	1.1	RB 1 MHz;VB 10 Hz;Pk
5080.190	57.8	V	74.0	-16.2	PK	281	1.1	RB 1 MHz;VB 3 MHz;Pk
5000.070	55.3	V	54.0	1.3	AVG	247	1.0	RB 1 MHz;VB 10 Hz;Pk
5000.170	60.9	V	74.0	-13.1	PK	247	1.0	RB 1 MHz;VB 3 MHz;Pk
5120.090	51.5	V	54.0	-2.5	AVG	281	1.1	2x2 5580
5119.930	57.9	V	74.0	-16.1	PK	281	1.1	2x2 5580
5119.940	39.9	V	54.0	-14.1	AVG	310	1.0	3x3 5580
5120.060	48.4	V	74.0	-25.6	PK	310	1.0	3x3 5580

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 12-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

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

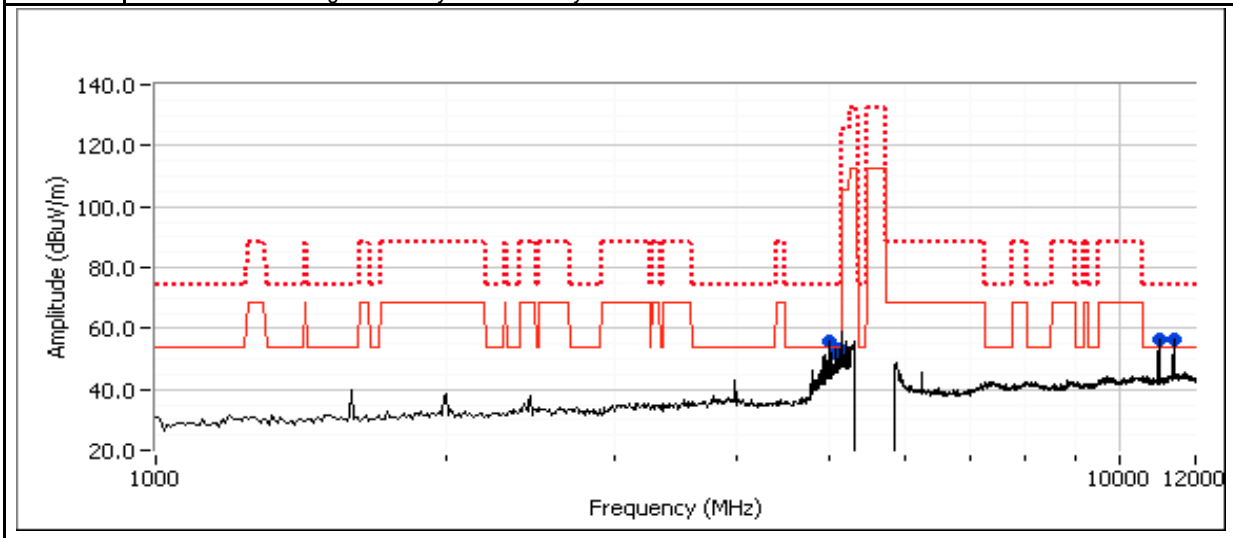
Date of Test: 3/14/2012 Test Location: Fremont Chamber #3

Test Engineer: Peter Sales

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5080.030	53.9	V	54.0	-0.1	AVG	260	1.0	RB 1 MHz;VB 10 Hz;Pk
5079.880	59.0	V	74.0	-15.0	PK	260	1.0	RB 1 MHz;VB 3 MHz;Pk
5000.060	54.9	V	-	-	AVG	247	1.1	Note 4
5000.190	59.5	V	-	-	PK	247	1.1	Note 4
11000.670	53.9	V	54.0	-0.1	AVG	176	1.0	2x2 5500
10998.710	66.2	V	74.0	-7.8	PK	176	1.0	2x2 5500
11395.670	53.7	V	54.0	-0.3	AVG	340	1.0	RB 1 MHz;VB 10 Hz;Pk
11395.800	67.2	V	74.0	-6.8	PK	340	1.0	RB 1 MHz;VB 3 MHz;Pk
5119.970	48.3	V	54.0	-5.7	AVG	288	1.3	2x2 5500
5120.110	56.6	V	74.0	-17.4	PK	288	1.3	2x2 5500
5120.130	48.3	V	54.0	-5.7	AVG	81	1.0	3x3 5700
5120.000	56.7	V	74.0	-17.3	PK	81	1.0	3x3 5700

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 12-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #5, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5470-5725 MHz Band

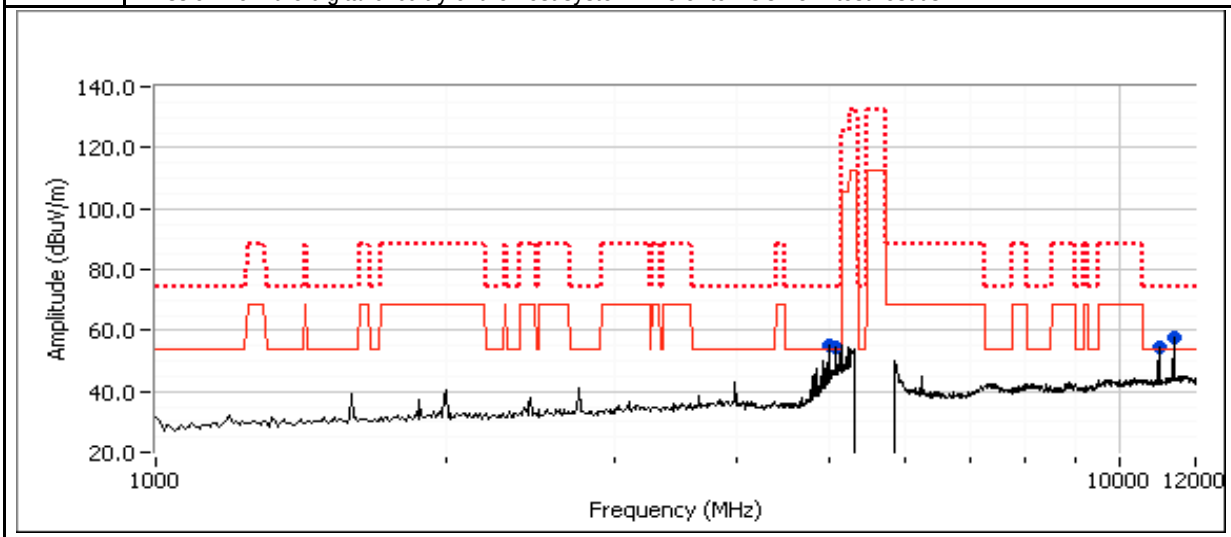
Date of Test: 3/14/2012 Test Location: Fremont Chamber #3

Test Engineer: Peter Sales

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11398.390	53.9	V	54.0	-0.1	AVG	360	1.0	2x2 5700
11398.190	66.0	V	74.0	-8.0	PK	360	1.0	2x2 5700
11000.280	50.0	V	54.0	-4.0	AVG	352	1.2	RB 1 MHz;VB 10 Hz;Pk
11000.870	62.7	V	74.0	-11.3	PK	352	1.2	RB 1 MHz;VB 3 MHz;Pk
5000.080	54.2	V	-	-	AVG	250	1.1	Note 4
5000.200	59.7	V	-	-	PK	250	1.1	Note 4
5080.120	53.5	V	54.0	-0.5	AVG	263	1.0	RB 1 MHz;VB 10 Hz;Pk
5079.830	59.0	V	74.0	-15.0	PK	263	1.0	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 12-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #6, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5470-5725 MHz Band

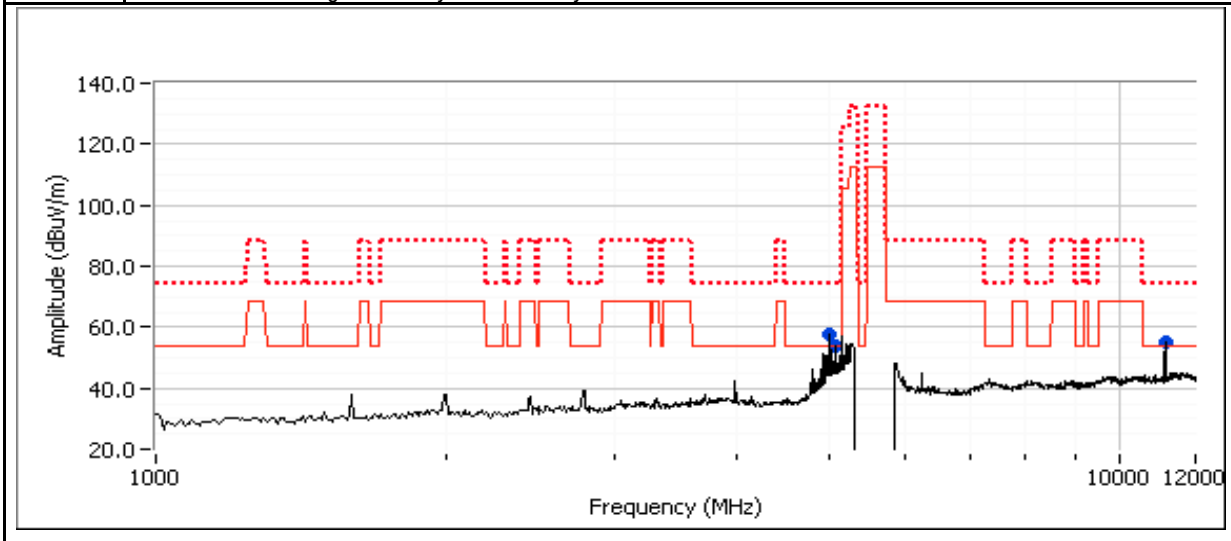
Date of Test: 3/14/2012 Test Location: Fremont Chamber #3

Test Engineer: Peter Sales

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11158.450	52.5	V	54.0	-1.5	AVG	321	1.0	RB 1 MHz;VB 10 Hz;Pk
11158.040	65.2	V	74.0	-8.8	PK	321	1.0	RB 1 MHz;VB 3 MHz;Pk
5080.010	51.7	V	54.0	-2.3	AVG	281	1.1	RB 1 MHz;VB 10 Hz;Pk
5080.100	57.0	V	74.0	-17.0	PK	281	1.1	RB 1 MHz;VB 3 MHz;Pk
5000.060	55.6	V	-	-	AVG	252	1.1	Note 4
5000.120	61.1	V	-	-	PK	252	1.1	Note 4

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 12-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #7, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5470-5725 MHz Band

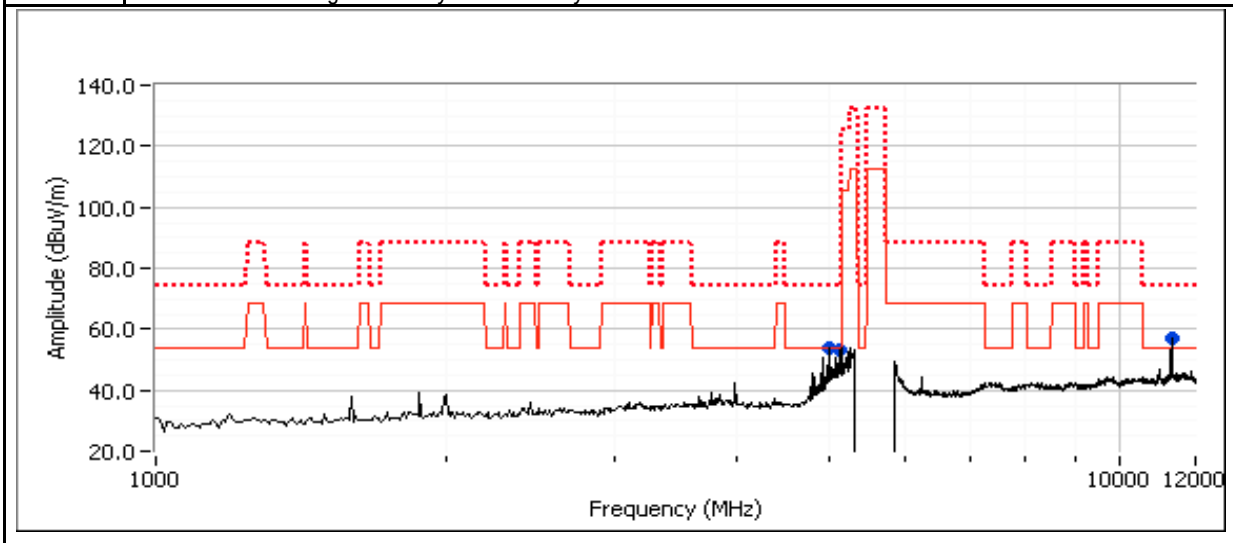
Date of Test: 3/15/2012 Test Location: Fremont Chamber #3

Test Engineer: Peter Sales

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11336.620	50.9	V	54.0	-3.1	AVG	346	1.0	RB 1 MHz;VB 10 Hz;Pk
11336.430	63.9	V	74.0	-10.1	PK	346	1.0	RB 1 MHz;VB 3 MHz;Pk
5000.050	52.1	V	-	-	AVG	252	1.3	Note 4
4999.950	56.5	V	-	-	PK	252	1.3	Note 4
5119.990	51.8	V	54.0	-2.2	AVG	100	1.1	RB 1 MHz;VB 10 Hz;Pk
5119.730	58.0	V	74.0	-16.0	PK	100	1.1	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 12-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86254
Model:	XI-N300 (2x2 radio module) in XR1000	T-Log Number:	T86381
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #8, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5470-5725 MHz Band

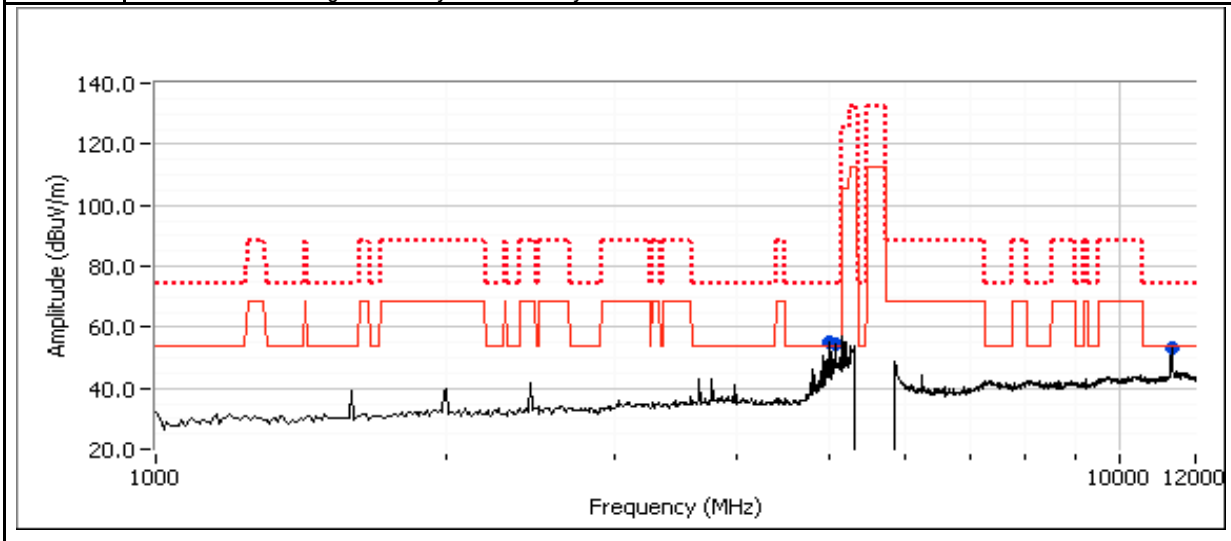
Date of Test: 3/15/2012 Test Location: Fremont Chamber #3

Test Engineer: Peter Sales

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11358.590	47.9	V	54.0	-6.1	AVG	13	1.3	RB 1 MHz;VB 10 Hz;Pk
11361.040	62.4	V	74.0	-11.6	PK	13	1.3	RB 1 MHz;VB 3 MHz;Pk
5000.050	54.7	V	-	-	AVG	250	1.1	Note 4
4999.970	60.1	V	-	-	PK	250	1.1	Note 4
5080.060	51.1	V	54.0	-2.9	AVG	269	1.0	RB 1 MHz;VB 10 Hz;Pk
5080.280	57.4	V	74.0	-16.6	PK	269	1.0	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 12-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		-
Emissions Standard(s):	FCC 15.247/15.E/RSS-210	Class:	-
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Xirrus

Model

XI-N450 (3x3 radio module) in XR1000

Date of Last Test: 5/24/2012

Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions
802.11bg, HT20 Band Edge and Spurious, HT40 Band Edge

Test Specific Details

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

General Test Configuration

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

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

Ambient Conditions:

Temperature: 20-25 °C
Rel. Humidity: 30-40 %

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.

Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Run #	Mode	Channel	Power Setting		Test Performed	Limit	Result / Margin
1a Low Channel	HT20	2412 MHz	22*		Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	53.8 V/m @ 2389.9 MHz (-0.2 dB)
1b High Channel		2462 MHz	22*		Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	53.2 V/m @ 2483.5 MHz (-0.8 dB)

Note: * - indicates power reduced from original certification

Testing was performed on the worse case mode from the original filing.
Power was set to be within 0.5dB of the original filing power.

Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #1: Radiated Spurious Emissions, 30 - 26500 MHz. Operating Mode: 802.11n 20 MHz, 3x3

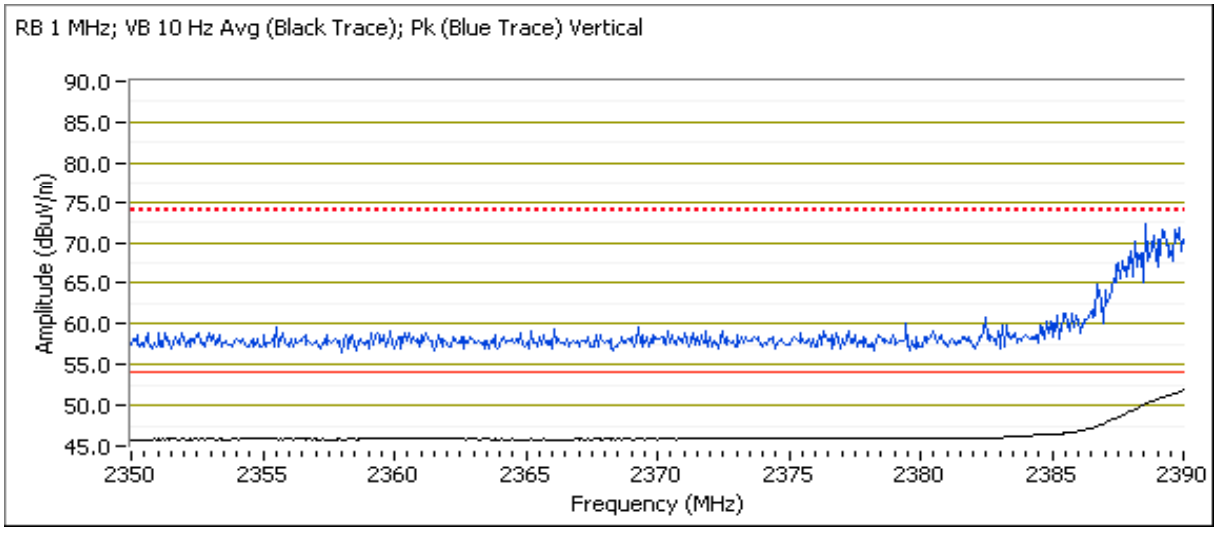
Date of Test: 2/21/2012 Test Location: FT Chamber #3

Test Engineer: Rafael Varelas

Run #1a: Channel 1@ 2412 MHz, Radio #12

Band Edge Signal Field Strength - Direct measurement of field strength

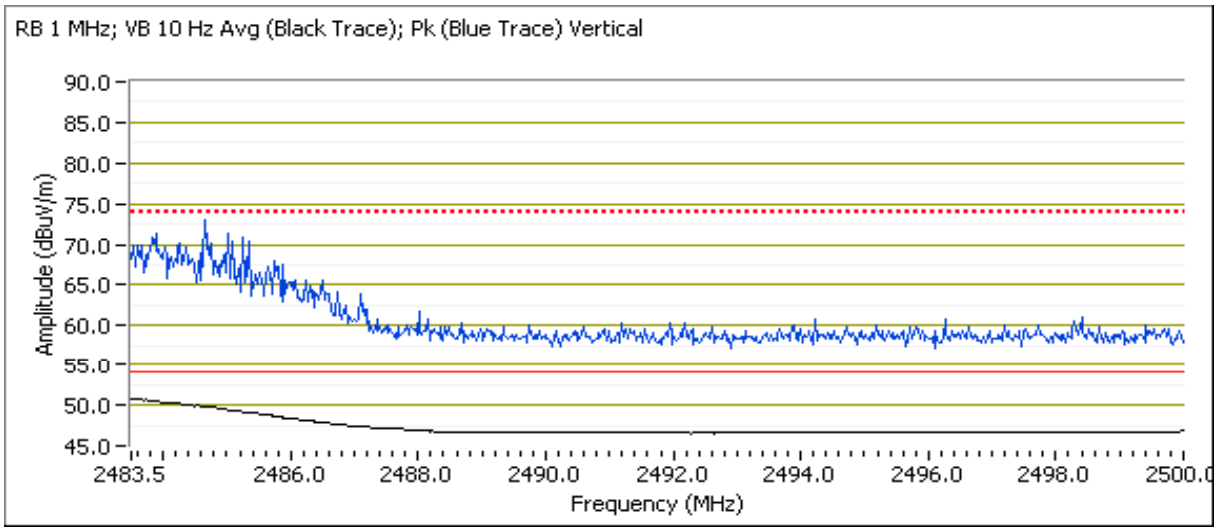
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Power setting 22								
2389.870	53.8	V	54.0	-0.2	AVG	304	1.2	RB 1 MHz;VB 10 Hz;Pk, 11.0
2389.450	71.5	V	74.0	-2.5	PK	304	1.2	RB 1 MHz;VB 3 MHz;Pk, 11.0
2389.820	51.1	H	54.0	-2.9	AVG	322	1.1	RB 1 MHz;VB 10 Hz;Pk, 11.0
2388.880	65.4	H	74.0	-8.6	PK	322	1.1	RB 1 MHz;VB 3 MHz;Pk, 11.0



Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #1b: High Channel @ 2462 MHz, Radio #12
Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Power setting 22								
2483.530	53.2	V	54.0	-0.8	AVG	218	1.0	RB 1 MHz;VB 10 Hz;Pk, 11.0
2483.820	70.0	V	74.0	-4.0	PK	218	1.0	RB 1 MHz;VB 3 MHz;Pk, 11.0
2483.520	50.9	H	54.0	-3.1	AVG	282	1.0	RB 1 MHz;VB 10 Hz;Pk
2484.710	66.7	H	74.0	-7.3	PK	282	1.0	RB 1 MHz;VB 3 MHz;Pk



Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	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.

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT.

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

Ambient Conditions:

Temperature: 20-25 °C
Rel. Humidity: 30-40 %

Summary of Results

Run #	Mode	Channel	Power Setting		Test Performed	Limit	Result / Margin
1	HT20 Chain 012	5150-5250 #36 (low)	19		Restricted Band Edge at 5150 MHz	15.209	47.2 dBµV/m @ 5149.8 MHz (-6.8 dB)
		5150-5250 #40	15*		Restricted Band Edge at 5150 MHz		53.8 dBµV/m @ 5000.0 MHz (-0.2 dB)
2	HT20 Chain 012	5250-5350 #64 (High)	21		Restricted Band Edge at 5350 MHz	15.209	53.4 dBµV/m @ 5359.9 MHz (-0.6 dB)
		5150-5250 #60	33		Restricted Band Edge at 5350 MHz		47.5 dBµV/m @ 5360.0 MHz (-6.5 dB)
3	HT20 Chain 012	5470-5725 Low	30		Restricted Band Edge at 5460 MHz	15.209	53.2 dBµV/m @ 5440.0 MHz (-0.8 dB)

Note: * - indicates power reduced from original certification

Testing was performed on the worse case mode from the original filing.
Power was set to be within 0.5dB of the original filing power.

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

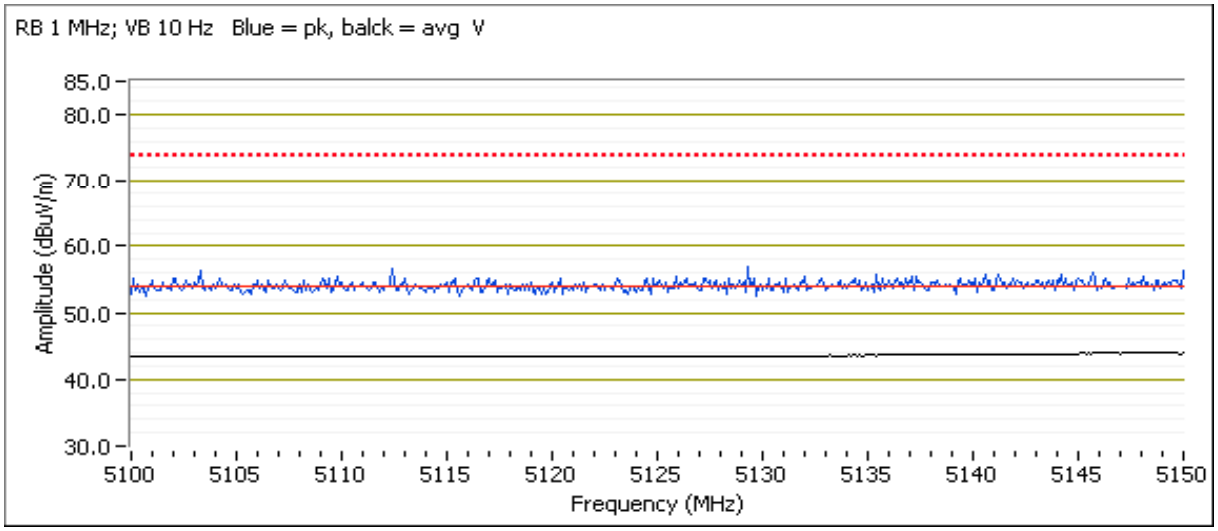
Run #1, Radiated Spurious Emissions at Band Edges. Operation in the 5150-5250 MHz Band

Run #1a: Low Channel, 5180 MHz

Date of Test: 2/22/2012
Test Engineer: John Caizzi
Test Location: FT5

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments	Chains
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
5149.800	47.2	V	54.0	-6.8	AVG	109	1.05		
5148.770	61.6	V	74.0	-12.4	PK	109	1.05		



Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

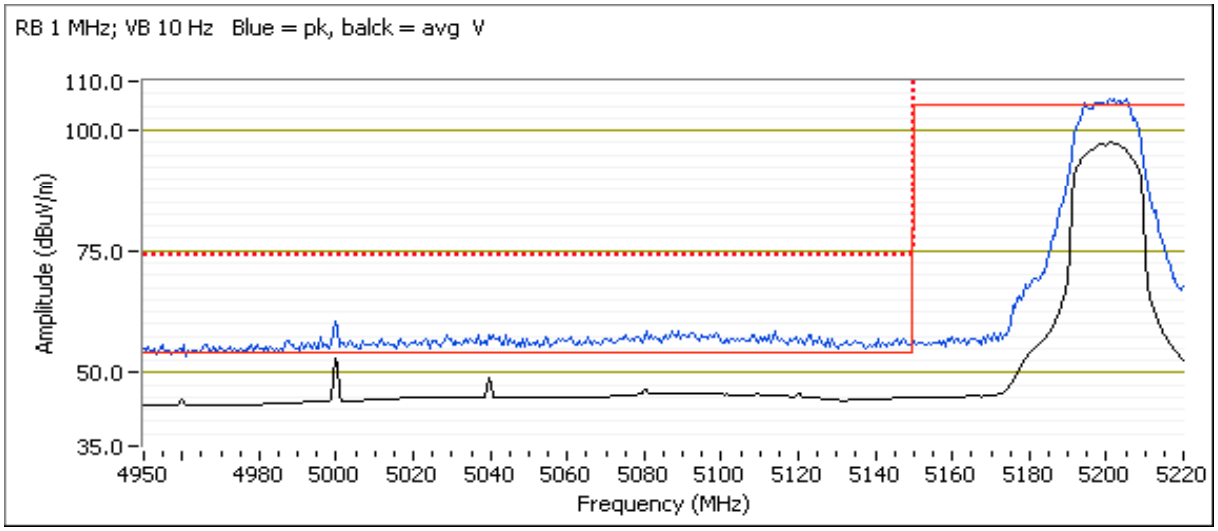
Run #1b: Channel 40, 5200 MHz

Date of Test: 2/22/2012
Test Engineer: John Caizzi
Test Location: FT5

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments	Chains
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
5000.000	53.8	V	54.0	-0.2	AVG	118	1.07		
4999.810	61.1	V	74.0	-12.9	PK	118	1.07		

Note 1	The H polarization was checked, & the 5 GHz signal observed, but at a much lower level than V polarization.



Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

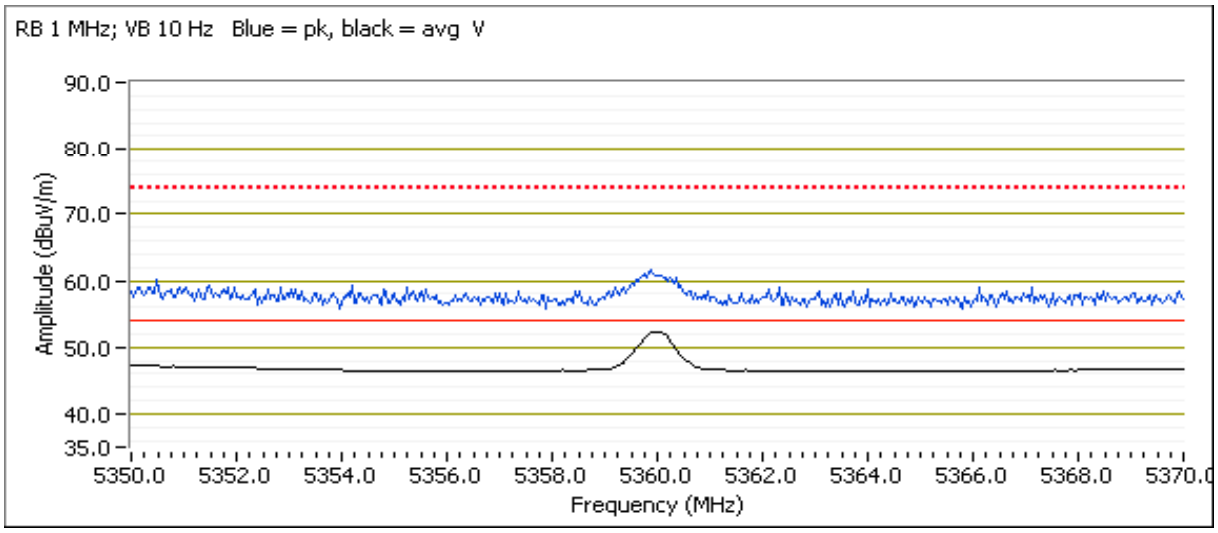
Run #2, Radiated Spurious Emissions at Band Edges. Operation in the 5250-5350 MHz Band
Run #2a High Channel

Date of Test: 2/22/2012
Test Engineer: John Caizzi
Test Location: FT5

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments	Chains
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
5359.910	53.4	V	54.0	-0.6	AVG	66	1.02		
5359.800	61.9	V	74.0	-12.1	PK	66	1.02		

Note 1	The H polarization was checked, but the signal was absent.



Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

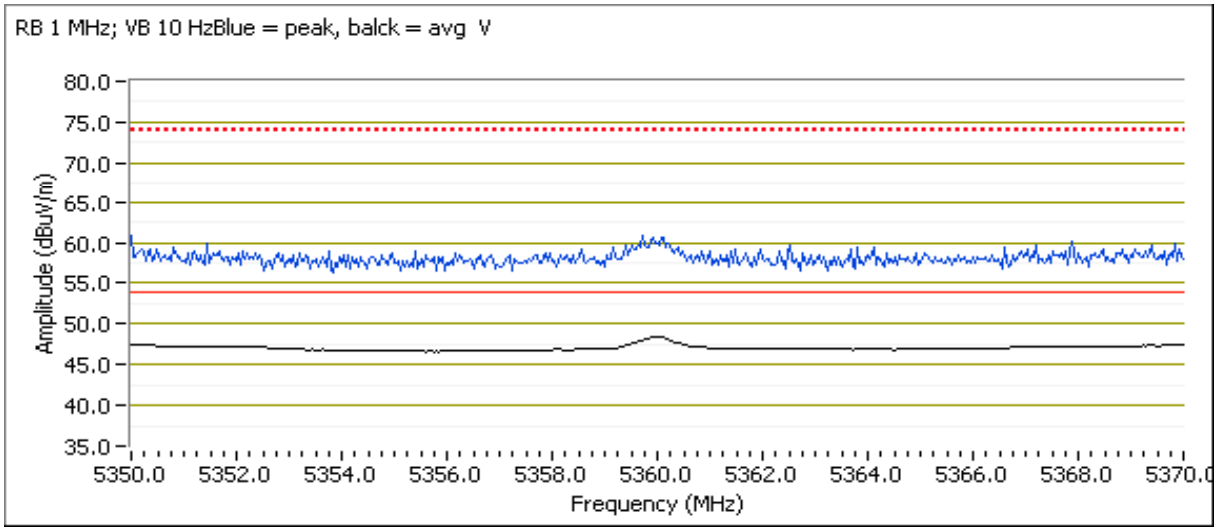
Run #2b Channel 60, 5300 MHz

Date of Test: 2/22/2012
Test Engineer: John Caizzi
Test Location: FT5

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments	Chains
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
5360.020	47.5	V	54.0	-6.5	AVG	139	1.00		
5361.420	59.9	V	74.0	-14.1	PK	139	1.00		

Note 1	The H polarization was checked, but the signal was absent.



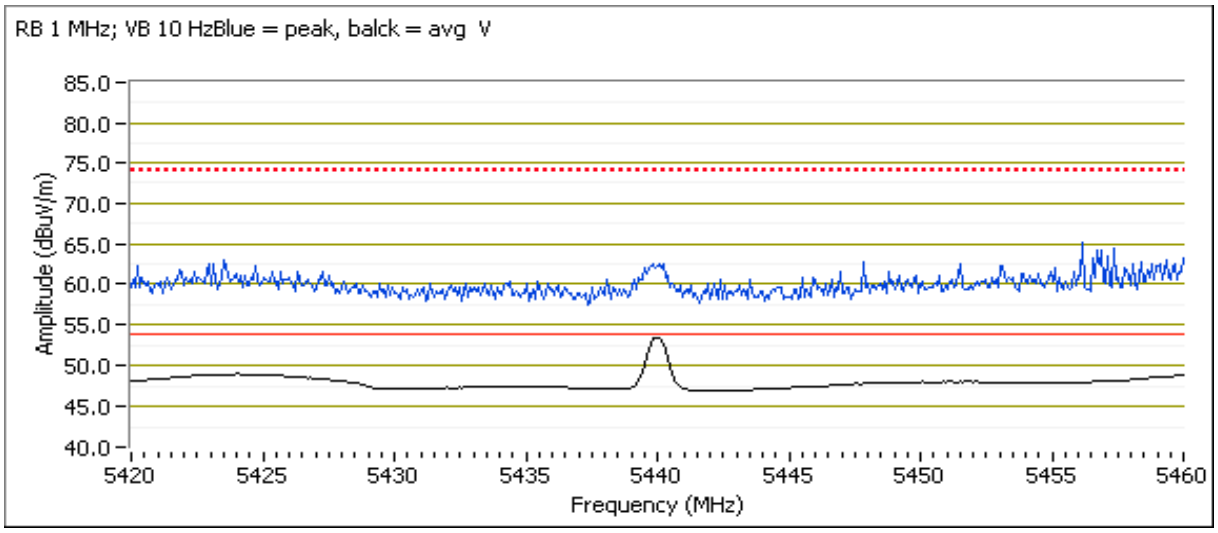
Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #3, Radiated Spurious Emissions at Band Edges. Operation in the 5470-5725 MHz Band
Run #3a: Low Channel, Radio #12

Date of Test: 2/22/2012
Test Engineer: Rafael Varelas
Test Location: FT Chamber #5

5350-5460 MHz Restricted Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments	Chains
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
5439.960	53.2	V	54.0	-0.8	AVG	273	1.0	POS; RB 1 MHz; VB: 10 Hz	
5455.270	63.2	V	74.0	-10.8	PK	273	1.0	POS; RB 1 MHz; VB: 10 MHz	
5439.960	44.6	H	54.0	-9.4	AVG	326	1.0	POS; RB 1 MHz; VB: 10 Hz	
5447.740	57.5	H	74.0	-16.5	PK	326	1.0	POS; RB 1 MHz; VB: 10 MHz	



Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

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

Test Specific Details

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

Date of Test: 3/27/2012
Test Engineer: Rafael Varelas
Test Location: FT Lab #4

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

General Test Configuration

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

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

Power measured on radio #10 with XR2000 unit

Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

XR1000 -

Operating Mode: 802.11n20

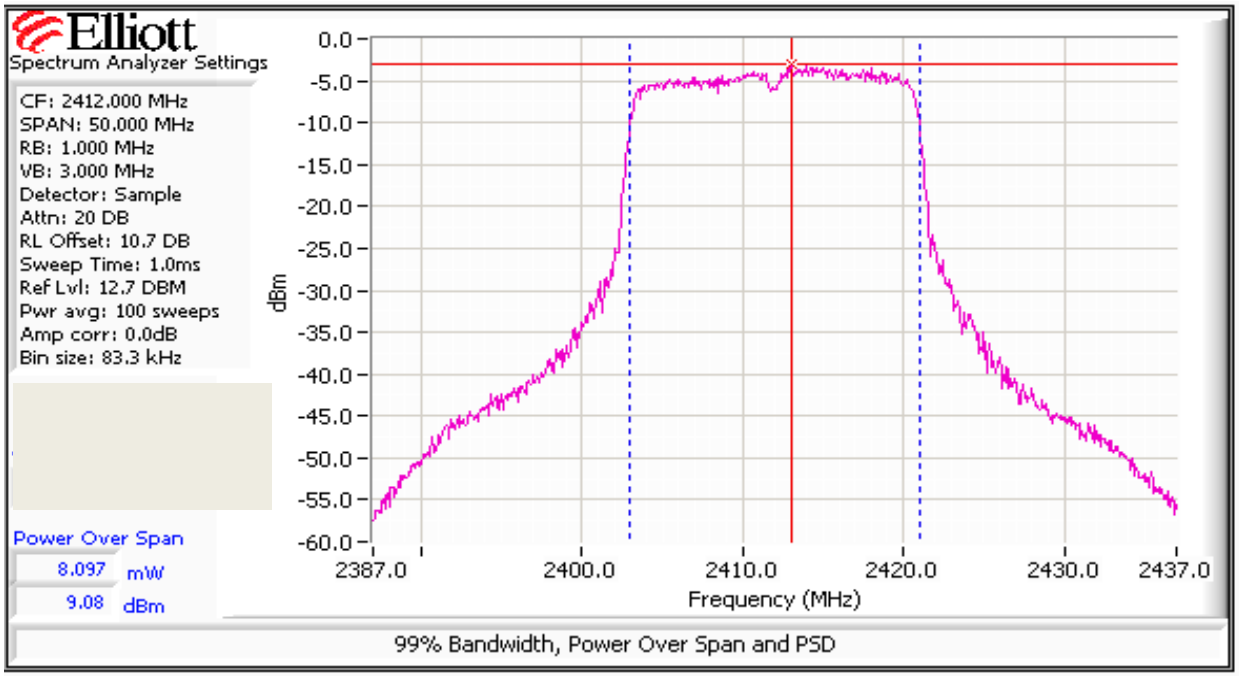
Transmitted signal on chain is coherent ? yes

2412 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting Note 3	22.0	22.0	22.0					
Output Power (dBm) Note 1	8.6	9.0	9.1		13.7 dBm	0.023 W	29.2 dBm	0.837 W
Antenna Gain (dBi) Note 2	2.0	2.0	2.0		6.8 dBi	6.8 dBi	Pass	
eirp (dBm) Note 2	10.6	11	11.1		20.4 dBm	0.111 W		

2462 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting Note 3	22.0	22.0	22.0					
Output Power (dBm) Note 1	8.6	8.4	8.8		13.4 dBm	0.022 W	29.2 dBm	0.837 W
Antenna Gain (dBi) Note 2	2.0	2.0	2.0		6.8 dBi	6.8 dBi	Pass	
eirp (dBm) Note 2	10.6	10.4	10.8		20.1 dBm	0.103 W		

Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz (option #2, method 1 in KDB 558074, equivalent to method 1 of DA-02-2138A1 for U-NII devices). Spurious limit becomes -30dBc.
Note 2:	As there is coherency between chains the effective antenna gain is the sum of the individual antenna gains and the eirp is the product of the total power and the effective antenna gain
Note 3:	Power setting - if a single number the same power setting was used for each chain. If multiple numbers the power setting for each chain is separated by a comma (e.g. x,y would indicate power setting x for chain 1, power setting y for chain 2.

Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A



Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

XR2000 -

Run #1: Output Power - Chain A + B + C

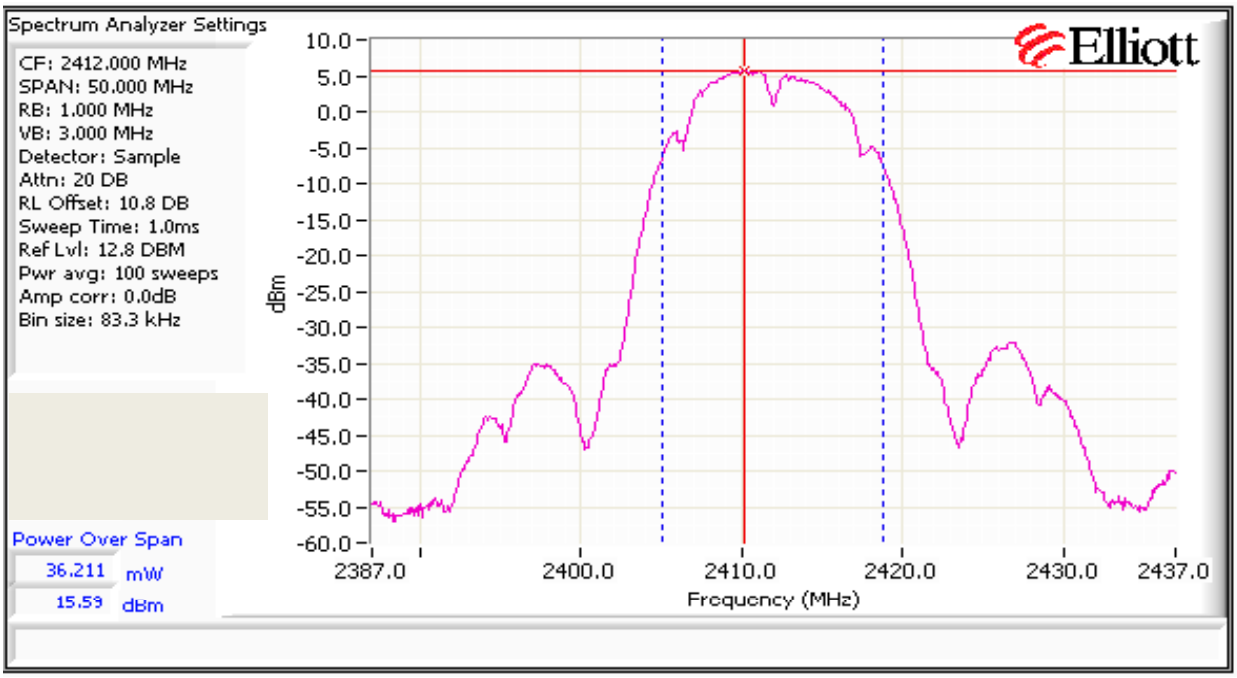
Operating Mode: 802.11b

Transmitted signal on chain is coherent ? yes

2412 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting Note 3	34.0	34.0	34.0					
Output Power (dBm) Note 1	15.6	14.2	15.0		19.8 dBm	0.094 W	29.2 dBm	0.837 W
Antenna Gain (dBi) Note 2	2.0	2.0	2.0		6.8 dBi	6.8 dBi	Pass	
eirp (dBm) Note 2	17.6	16.23	17		26.5 dBm	0.449 W		

Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz (option #2, method 1 in KDB 558074, equivalent to method 1 of DA-02-2138A1 for U-NII devices). Spurious limit becomes -30dBc.
Note 2:	As there is coherency between chains the effective antenna gain is the sum of the individual antenna gains and the eirp is the product of the total power and the effective antenna gain
Note 3:	Power setting - if a single number the same power setting was used for each chain. If multiple numbers the power setting for each chain is separated by a comma (e.g. x,y would indicate power setting x for chain 1, power setting y for chain 2.

Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A



Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements
MIMO and Smart Antenna Systems
Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

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

Date of Test: 3/27/2012
Test Engineer: Rafael Varelas
Test Location: FT Lab #4

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

General Test Configuration

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

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

Power measured on radio #10 with XR2000 unit

Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

XR1000 -

Run #1: Output Power - Chain A + B

Operating Mode: 802.11a

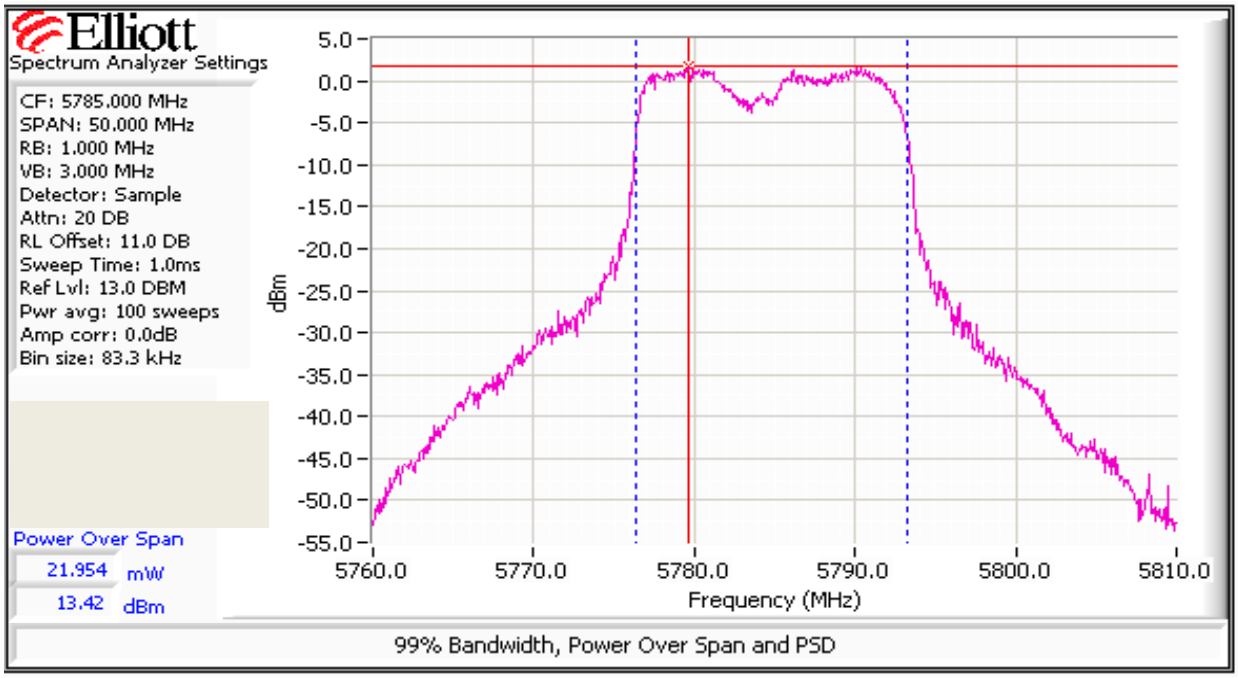
Transmitted signal on chain is coherent ? Yes

5785 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting Note 3	35.0	35.0	35.0					
Output Power (dBm) Note 1	12.9	13.4	12.8		17.8 dBm	0.061 W	27.2 dBm	0.528 W
Antenna Gain (dBi) Note 2	4.0	4.0	4.0		8.8 dBi		Pass	
eirp (dBm) Note 2	16.94	17.4	16.8		26.6 dBm	0.457 W		

5825 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting Note 3	32.0	32.0	32.0					
Output Power (dBm) Note 1	10.8	12.3	11.1		16.2 dBm	0.042 W	27.2 dBm	0.528 W
Antenna Gain (dBi) Note 2	4.0	4.0	4.0		8.8 dBi		Pass	
eirp (dBm) Note 2	14.8	16.3	15.1		25.0 dBm	0.316 W		

Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz (option #2, method 1 in KDB 558074, equivalent to method 1 of DA-02-2138A1 for U-NII devices). Spurious limit becomes -30dBc.
Note 2:	As there is coherency between chains the effective antenna gain is the sum of the individual antenna gains and the eirp is the product of the total power and the effective antenna gain
Note 3:	Power setting - if a single number the same power setting was used for each chain. If multiple numbers the power setting for each chain is separated by a comma (e.g. x,y would indicate power setting x for chain 1, power setting y for chain 2.

Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A



Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

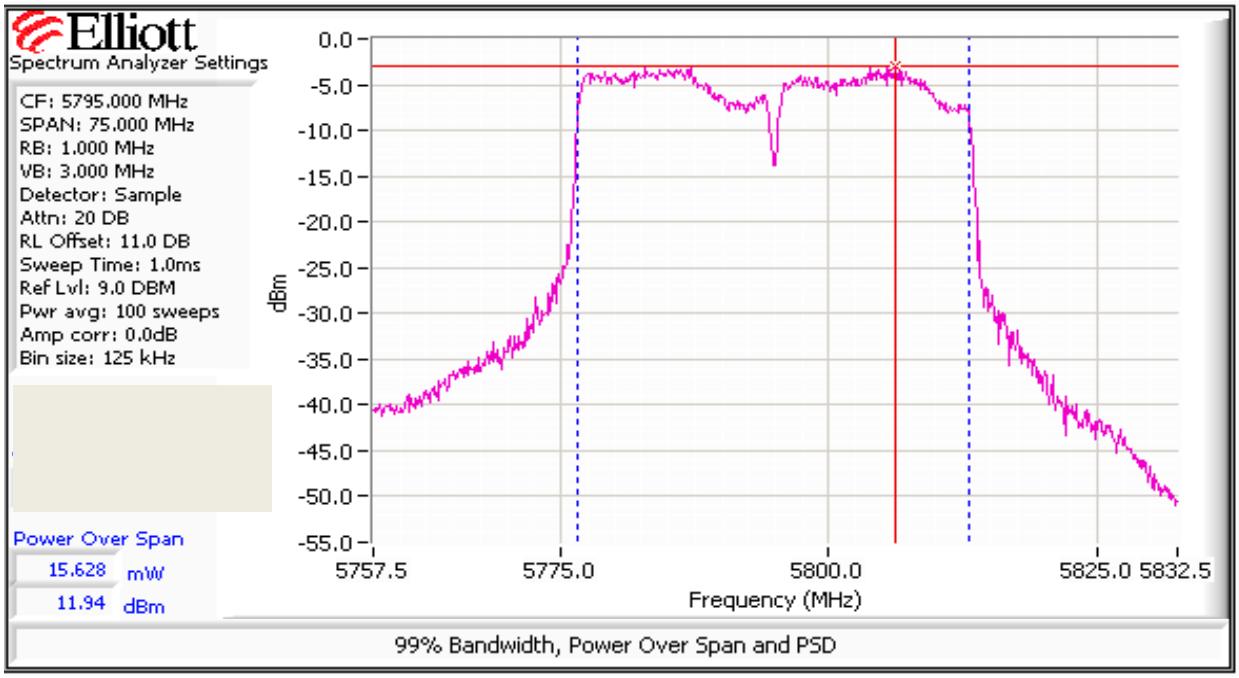
Operating Mode: 802.11n40
Transmitted signal on chain is coherent ? Yes
701.0

5755 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting Note 3	29.0	29.0	29.0					
Output Power (dBm) Note 1	10.3	9.9	8.5		14.4 dBm	0.028 W	27.2 dBm	0.528 W
Antenna Gain (dBi) Note 2	4.0	4.0	4.0		8.8 dBi		Pass	
eirp (dBm) Note 2	14.3	13.9	12.5		23.2 dBm	0.208 W		

5795 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting Note 3	32.0	32.0	32.0					
Output Power (dBm) Note 1	11.4	11.9	11.1		16.3 dBm	0.042 W	27.2 dBm	0.528 W
Antenna Gain (dBi) Note 2	4.0	4.0	4.0		8.8 dBi		Pass	
eirp (dBm) Note 2	15.4	15.9	15.1		25.0 dBm	0.318 W		

Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 75 MHz (option #2, method 1 in KDB 558074, equivalent to method 1 of DA-02-2138A1 for U-NII devices). Spurious limit becomes -30dBc.
Note 2:	As there is coherency between chains the effective antenna gain is the sum of the individual antenna gains and the eirp is the product of the total power and the effective antenna gain
Note 3:	Power setting - if a single number the same power setting was used for each chain. If multiple numbers the power setting for each chain is separated by a comma (e.g. x,y would indicate power setting x for chain 1, power setting y for chain 2.

Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A



Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

XR2000 -

Run #1: Output Power - Chain A + B + C

Operating Mode: 802.11a

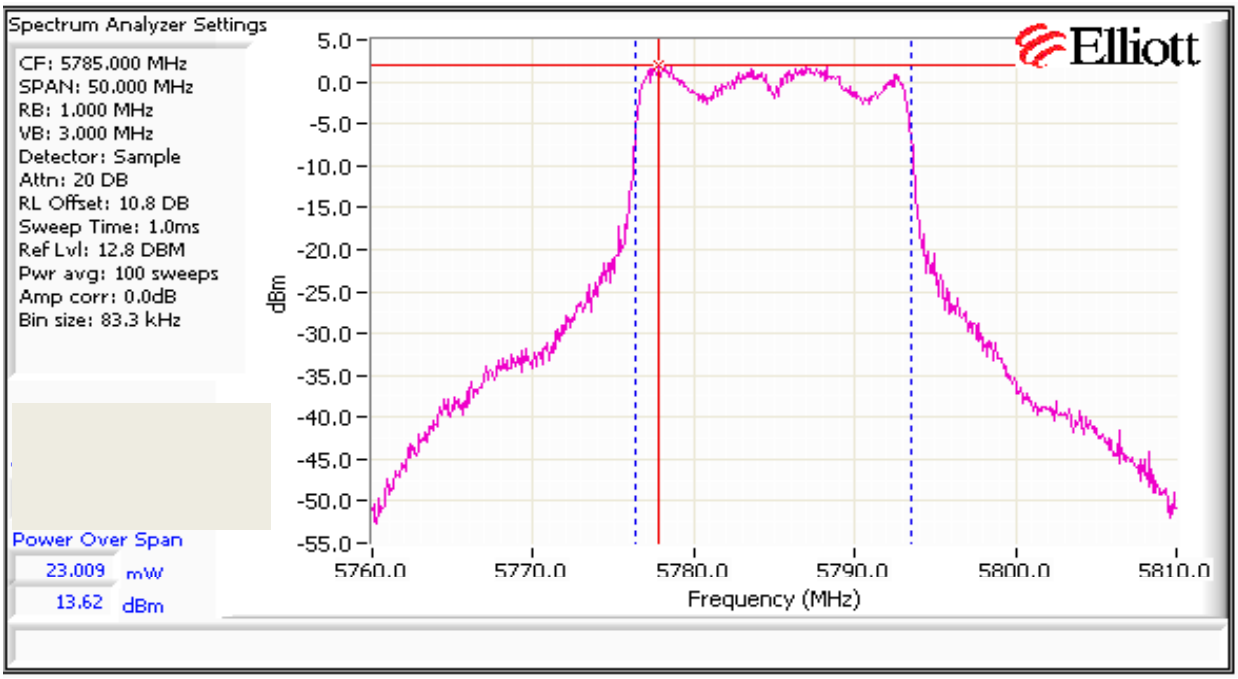
Transmitted signal on chain is coherent ? Yes

5745 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting Note 3	32.0	32.0	32.0					
Output Power (dBm) Note 1	12.2	12.8	12.6		17.3 dBm	0.054 W	27.2 dBm	0.528 W
Antenna Gain (dBi) Note 2	4.0	4.0	4.0		8.8 dBi		Pass	
eirp (dBm) Note 2	16.2	16.82	16.64		26.1 dBm	0.408 W		

5785 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting Note 3	34.0	34.0	34.0					
Output Power (dBm) Note 1	13.0	13.6	12.8		17.9 dBm	0.062 W	27.2 dBm	0.528 W
Antenna Gain (dBi) Note 2	4.0	4.0	4.0		8.8 dBi		Pass	
eirp (dBm) Note 2	17.03	17.62	16.8		26.7 dBm	0.468 W		

Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz (option #2, method 1 in KDB 558074, equivalent to method 1 of DA-02-2138A1 for U-NII devices). Spurious limit becomes -30dBc.
Note 2:	As there is coherency between chains the effective antenna gain is the sum of the individual antenna gains and the eirp is the product of the total power and the effective antenna gain
Note 3:	Power setting - if a single number the same power setting was used for each chain. If multiple numbers the power setting for each chain is separated by a comma (e.g. x,y would indicate power setting x for chain 1, power setting y for chain 2.

Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A



Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Operating Mode: 802.11n20

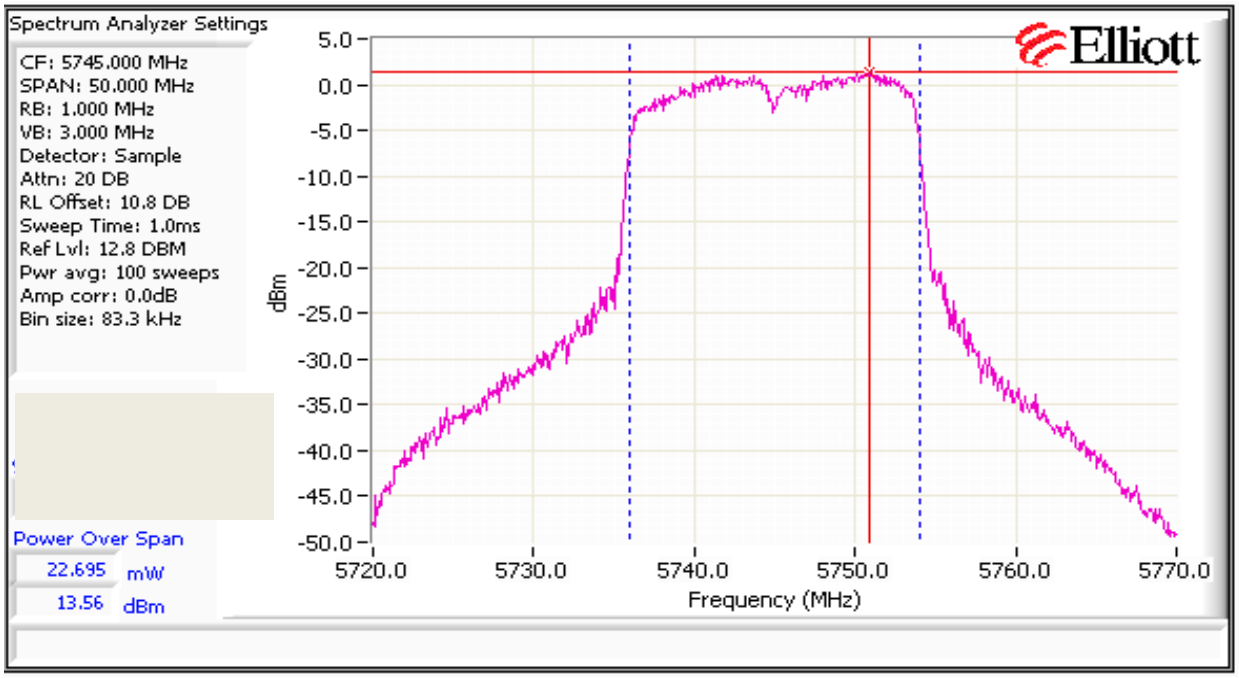
Transmitted signal on chain is coherent ? Yes

5745 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting Note 3	33.0	33.0	33.0					
Output Power (dBm) Note 1	12.3	13.6	12.9		17.7 dBm	0.059 W	27.2 dBm	0.528 W
Antenna Gain (dBi) Note 2	4.0	4.0	4.0		8.8 dBi		Pass	
eirp (dBm) Note 2	16.3	17.6	16.9		26.5 dBm	0.448 W		

5785 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting Note 3	31.0	31.0	31.0					
Output Power (dBm) Note 1	11.0	12.3	11.5		16.4 dBm	0.044 W	27.2 dBm	0.528 W
Antenna Gain (dBi) Note 2	4.0	4.0	4.0		8.8 dBi		Pass	
eirp (dBm) Note 2	15	16.31	15.5		25.2 dBm	0.330 W		

Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz (option #2, method 1 in KDB 558074, equivalent to method 1 of DA-02-2138A1 for U-NII devices). Spurious limit becomes -30dBc.
Note 2:	As there is coherency between chains the effective antenna gain is the sum of the individual antenna gains and the eirp is the product of the total power and the effective antenna gain
Note 3:	Power setting - if a single number the same power setting was used for each chain. If multiple numbers the power setting for each chain is separated by a comma (e.g. x,y would indicate power setting x for chain 1, power setting y for chain 2.

Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A



Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Operating Mode: 802.11n40

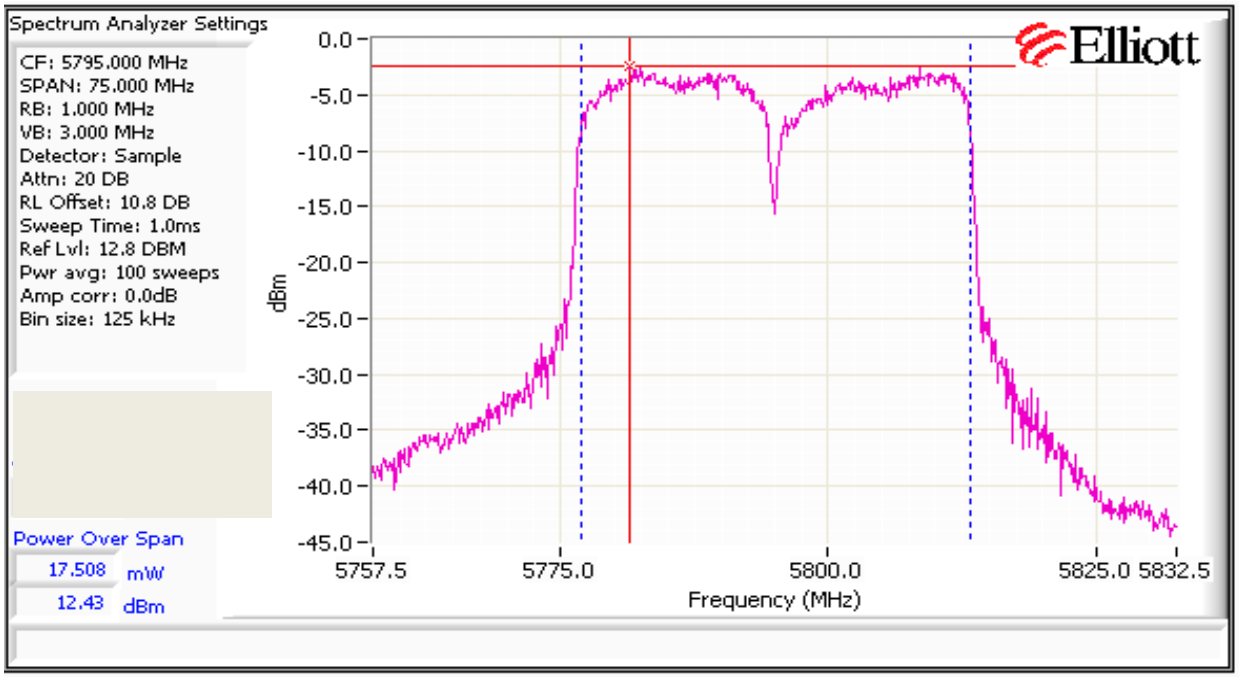
Transmitted signal on chain is coherent ? Yes

5755 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting Note 3	29.0	29.0	29.0					
Output Power (dBm) Note 1	9.3	10.6	10.1		14.8 dBm	0.030 W	27.2 dBm	0.528 W
Antenna Gain (dBi) Note 2	4.0	4.0	4.0		8.8 dBi		Pass	
eirp (dBm) Note 2	13.3	14.6	14.1		23.6 dBm	0.228 W		

5795 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting Note 3	32.0	32.0	32.0					
Output Power (dBm) Note 1	10.9	12.4	10.8		16.2 dBm	0.042 W	27.2 dBm	0.528 W
Antenna Gain (dBi) Note 2	4.0	4.0	4.0		8.8 dBi		Pass	
eirp (dBm) Note 2	14.94	16.43	14.84		25.0 dBm	0.317 W		

Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 75 MHz (option #2, method 1 in KDB 558074, equivalent to method 1 of DA-02-2138A1 for U-NII devices). Spurious limit becomes -30dBc.
Note 2:	As there is coherency between chains the effective antenna gain is the sum of the individual antenna gains and the eirp is the product of the total power and the effective antenna gain
Note 3:	Power setting - if a single number the same power setting was used for each chain. If multiple numbers the power setting for each chain is separated by a comma (e.g. x,y would indicate power setting x for chain 1, power setting y for chain 2.

Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A



Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

RSS-210 (LELAN) and FCC 15.407(UNII)
Antenna Port Measurements
Power

Test Specific Details

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

Date of Test: 3/27/2012
Test Engineer: Rafael Varelas
Test Location: FT Lab #4

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

Run #1: Bandwidth, Output Power and Power Spectral Density - MIMO Systems

Note 1:	Output power measured using a spectrum analyzer (see plots below). RBW=1MHz, VB=3 MHz, # of points in sweep ≥ 2*span/RBW, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50MHz for 802.11a, 802.11n 20MHz and 75MHz for 802.11n 40 MHz (method SA-1 of KDB 789033).
Note 5:	For MIMO systems the total output power and total PSD are calculated form the sum of the powers of the individual chains (in linear terms). The antenna gain used to determine the EIRP and limits for PSD/Output power depends on the operating mode of the MIMO device. If the signals on the non-coherent between the transmit chains then the gain used to determine the limits is the highest gain of the individual chains and the EIRP is the sum of the products of gain and power on each chain. If the signals are coherent then the effective antenna gain is the sum (in linear terms) of the gains for each chain and the EIRP is the product of the effective gain and total power.

Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

XR 1000 -

MIMO Device - 5150-5250 MHz Band

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	4.0	4.0	4.0	Yes	8.8	47.3	16.7

Power

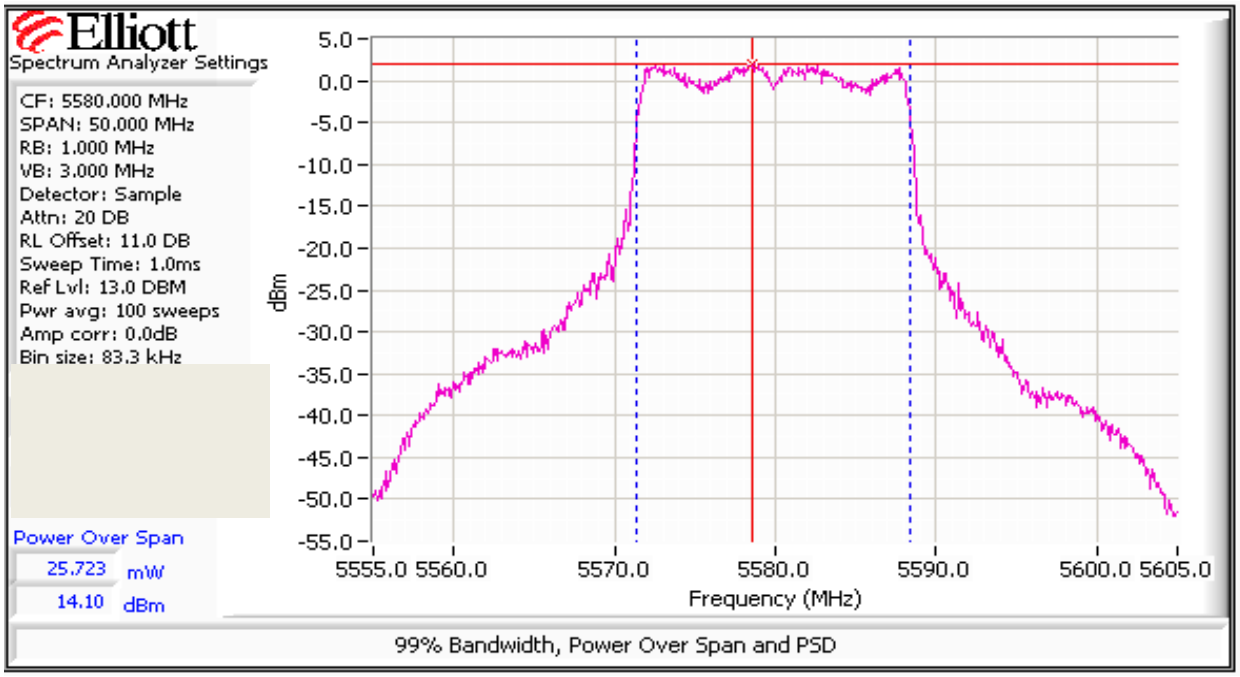
Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
802.11n 20MHz MIMO Mode										
5200	15.0	20.0	3.2	3.5	2.9	6.3	8.0	14.2	0.006	PASS

MIMO Device - 5470-5725 MHz Band

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	4.0	4.0	4.0	Yes	8.8	485.9	26.9

Power

Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
802.11a MIMO Mode										
5580	30.0	20.0	11.7	13.8	14.1	64.5	18.1	21.2	0.064	PASS



Client:	Xirrus	Job Number:	J86254
Model:	XI-N450 (3x3 radio module) in XR1000	T-Log Number:	T86382
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

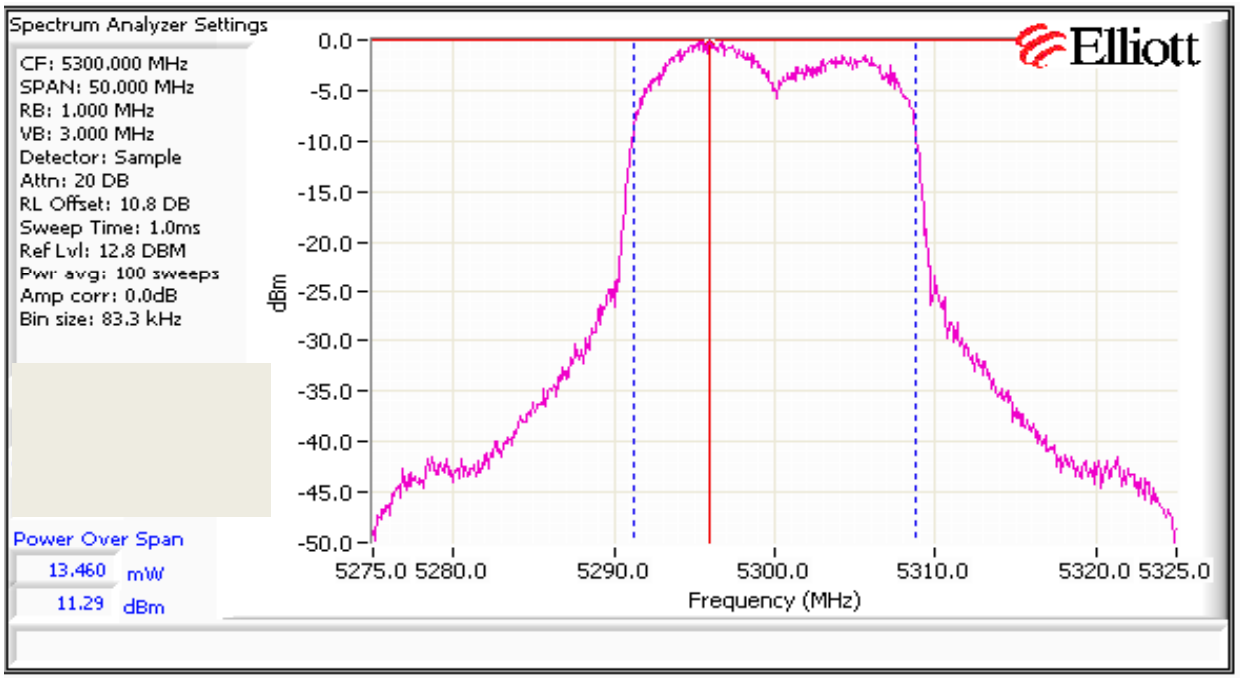
XR 2000 -

MIMO Device - 5250-5350 MHz Band

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	4.0	4.0	4.0	Yes	8.8	302.6	24.8

Power

Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm Chain 1	Chain 2	Chain 3	Total mW	dBm	Limit (dBm)	Max Power (W)	Pass or Fail
802.11n 20MHz MIMO Mode										
5300	32.0	20.0	11.2	11.3	11.3	40.2	16.0	21.2	0.040	PASS



Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		-
Emissions Standard(s):	FCC 15.247/15.E/RSS-210	Class:	-
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Xirrus

Model

XI-N300 (2x2 radio module) in XR2000

Date of Last Test: 5/24/2012

Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

RSS 210 and FCC 15.407 (UNII) Radiated Spurious Emissions (5150-5250 MHz Band)

Test Specific Details

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

General Test Configuration

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

Ambient Conditions:

Temperature: 20-25 °C Rel. Humidity: 30-40 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Summary of Results

Spurious Radiated Emissions: 2x2 and 3x3 Modules for 802.11a; HT20; and HT40 modes

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1	802.11a	See Below	See Below		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.1 dBµV/m @ 5440.04 MHz (-0.9 dB)
2	802.11a	See Below	See Below		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	54.0 dBµV/m @ 5440.00 MHz (0.0 dB)
3	802.11n20	See Below	See Below		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.2 dBµV/m @ 5439.98 MHz (-1.8 dB)
4	802.11n20	See Below	See Below		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.6 dBµV/m @ 5440.17 MHz (-0.4 dB)
5	802.11n40	See Below	See Below		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.3 dBµV/m @ 5440.03 MHz (-0.7 dB)

Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

System Configuration: Operating within 5150-5250 MHz

Radio #	Frequency	Module	Mode	Pwr	Radio #
Run: 1					
1	5180	2x2	802.11a	27	2
0	5240	3x3	802.11a	19	10
2	5240	2x2	802.11a	27	6
3	5180	3x3	802.11a	19	14
Run: 2					
1	5200	2x2	802.11a	26 (28)	2
0	5200	3x3	802.11a	19	10
2	5200	2x2	802.11n20	28	6
3	5200	3x3	802.11n20	19	14
Run: 3					
1	5180	2x2	802.11n20	26	2
0	5240	3x3	802.11n20	19	10
2	5240	2x2	802.11n20	28	6
3	5180	3x3	802.11n20	19	14
Run: 4					
1	5200	2x2	802.11n20	27 (28)	2
0	5200	3x3	802.11n20	19	10
2	5200	2x2	802.11n20	27 (28)	6
3	5200	3x3	802.11n20	19	14
Run: 5					
1	5190	2x2	802.11HT40	11	2
0	5230	3x3	802.11HT40	19	10
2	5230	2x2	802.11HT40	26 (28)	6
3	5190	3x3	802.11HT40	8	14

Notes - Multiple radios operating at the same time as shown above. In all cases, power set to the maximum worse case single channel power, transmitting on all chains.

Highlights indicate that power was lowered from the original level. Notation - XX (YY), XX = passing power setting, YY = power setting for original power levels.

Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #1, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5150-5250 MHz Band

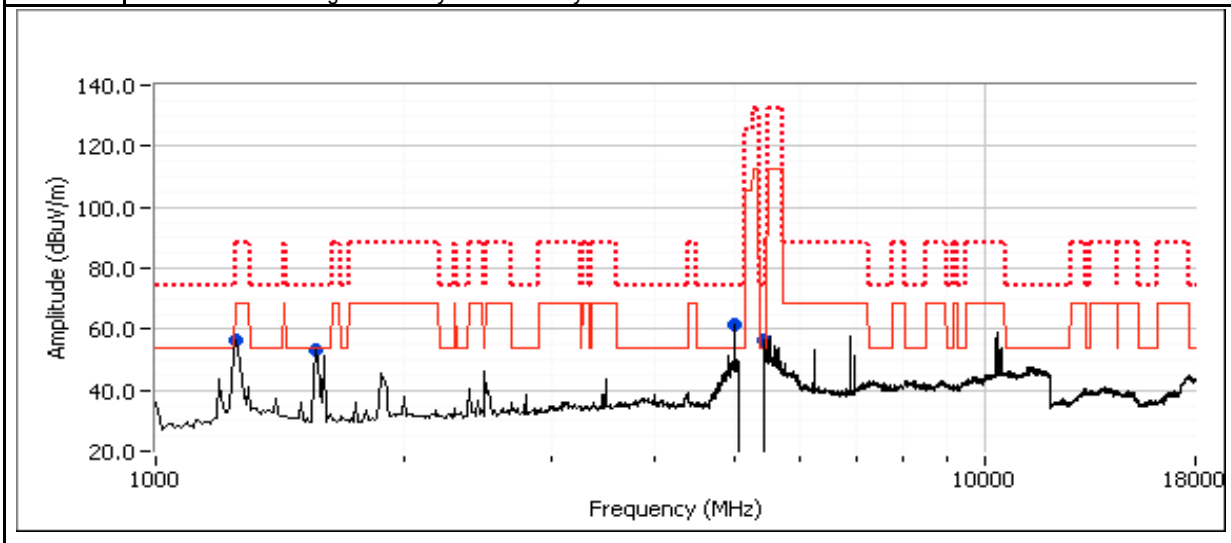
Date of Test: 3/13/2012 Test Location: Fremont Chamber #3

Test Engineer: Peter Sales

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5000.090	58.5	V	-	-	AVG	181	1.0	Note 4
5440.040	53.1	V	54.0	-0.9	AVG	95	1.0	RB 1 MHz;VB 10 Hz;Pk
1554.520	43.7	V	54.0	-10.3	AVG	185	1.1	RB 1 MHz;VB 10 Hz;Pk
5000.030	63.3	V	-	-	PK	181	1.0	Note 4
5439.790	62.0	V	74.0	-12.0	PK	95	1.0	RB 1 MHz;VB 3 MHz;Pk
1554.400	53.5	V	74.0	-20.5	PK	185	1.1	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

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

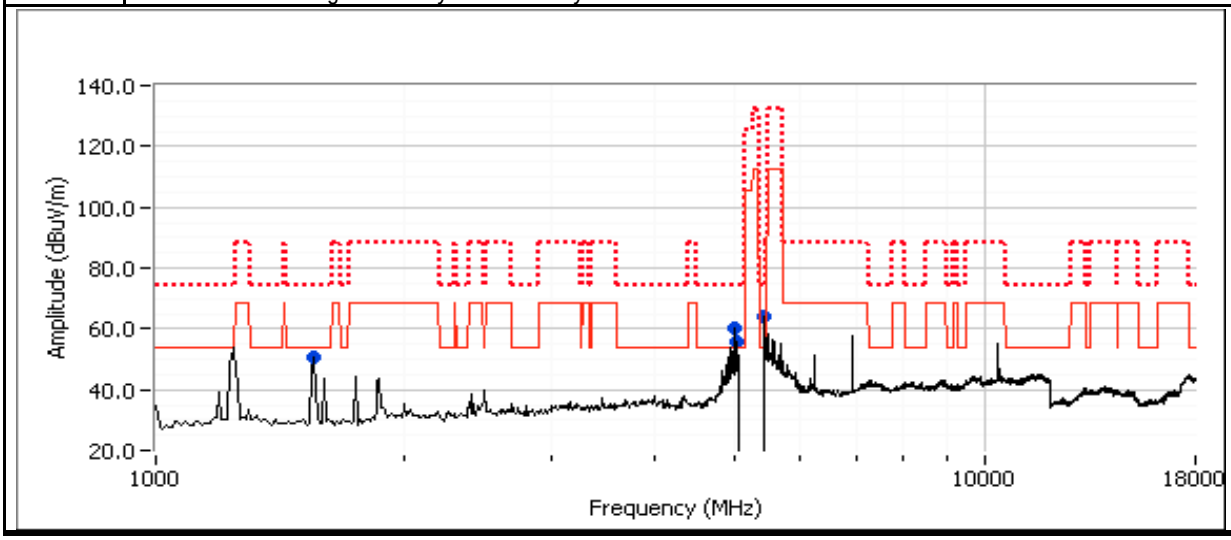
Date of Test: 3/13/2012 Test Location: Fremont Chamber #3

Test Engineer: Peter Sales

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5039.870	45.8	V	54.0	-8.2	AVG	14	1.1	RB 1 MHz;VB 10 Hz;Pk
5040.340	56.9	V	74.0	-17.1	PK	14	1.1	RB 1 MHz;VB 3 MHz;Pk
1552.710	46.9	V	54.0	-7.1	AVG	204	1.0	RB 1 MHz;VB 10 Hz;Pk
1553.010	56.0	V	74.0	-18.0	PK	204	1.0	RB 1 MHz;VB 3 MHz;Pk
5000.050	58.9	V	-	-	AVG	248	1.0	Note 4
5000.070	63.4	V	-	-	PK	248	1.0	Note 4
5440.000	54.0	V	54.0	0.0	AVG	297	1.2	2x2 aMode, Power 26
5440.560	64.0	V	74.0	-10.0	PK	297	1.2	2x2 aMode, Power 26
5439.980	50.3	V	54.0	-3.7	AVG	323	1.2	2x2 HT20, Power 28
5439.870	59.5	V	74.0	-14.5	PK	323	1.2	2x2 HT20, Power 28
5439.990	52.5	V	54.0	-1.5	AVG	106	1.2	3x3 aMode, Power 19
5439.990	62.1	V	74.0	-11.9	PK	106	1.2	3x3 aMode, Power 19
5439.980	53.8	V	54.0	-0.2	AVG	111	1.1	3x3 HT20, Power 19
5440.130	63.1	V	74.0	-10.9	PK	111	1.1	3x3 HT20, Power 19

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #3, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5150-5250 MHz Band

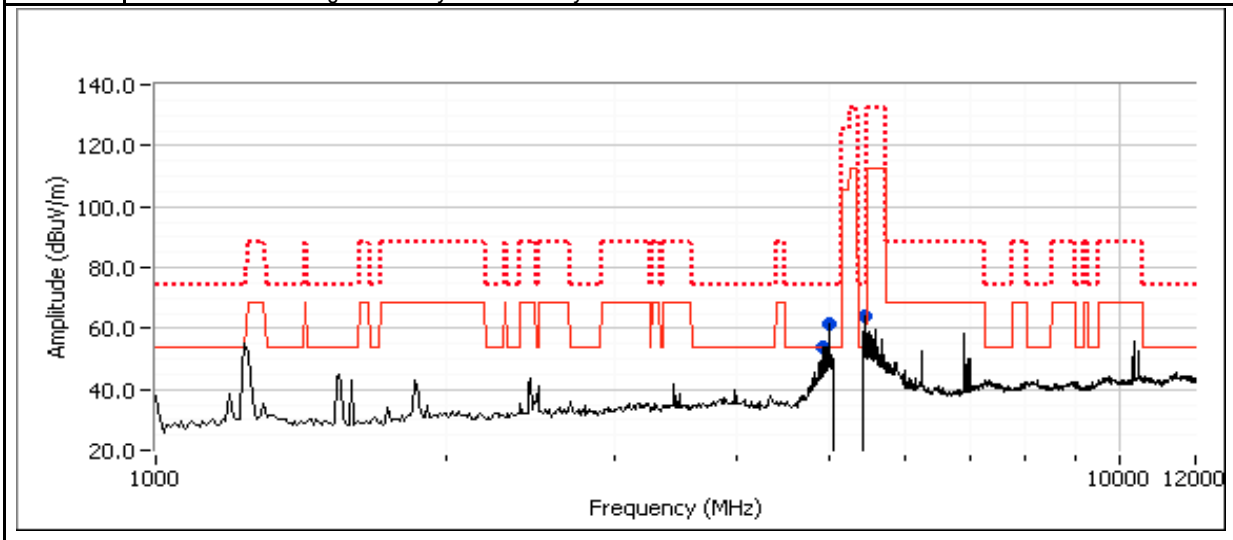
Date of Test: 3/13/2012 Test Location: Fremont Chamber #3

Test Engineer: Peter Sales

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4919.990	50.3	V	54.0	-3.7	AVG	292	1.2	RB 1 MHz;VB 10 Hz;Pk
4920.160	57.3	V	74.0	-16.7	PK	292	1.2	RB 1 MHz;VB 3 MHz;Pk
5000.040	56.4	V	-	-	AVG	293	1.3	Note 4
5000.140	63.7	V	-	-	PK	293	1.3	Note 4
5439.980	52.2	V	54.0	-1.8	AVG	229	1.3	2x2 5180, Power 28
5439.880	62.0	V	74.0	-12.0	PK	229	1.3	2x2 5180, Power 28
5440.010	52.1	V	54.0	-1.9	AVG	229	1.3	2x2 5240, Power 28
5439.730	62.2	V	74.0	-11.8	PK	229	1.3	2x2 5240, Power 28
5439.940	50.7	V	54.0	-3.3	AVG	28	1.1	3x3 5240, Power 19
5440.200	59.9	V	74.0	-14.1	PK	28	1.1	3x3 5240, Power 19
5439.950	52.2	V	54.0	-1.8	AVG	12	1.3	3x3 5180, Power 19
5439.790	62.5	V	74.0	-11.5	PK	12	1.3	3x3 5180, Power 19

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 12-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #4, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5150-5250 MHz Band

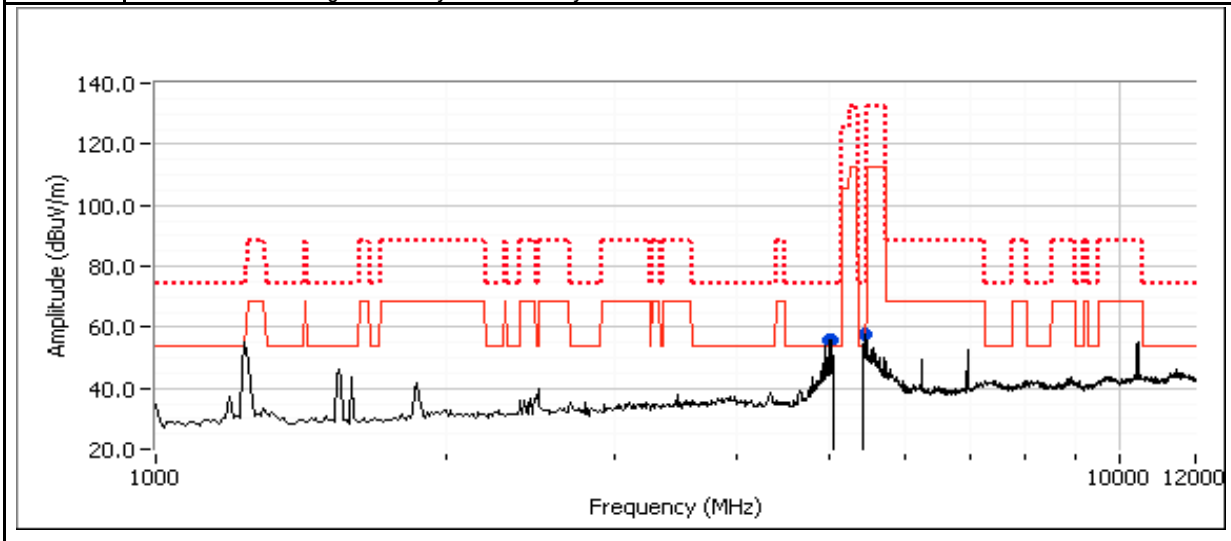
Date of Test: 3/13/2012 Test Location: Fremont Chamber #3

Test Engineer: Peter Sales

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5440.170	53.6	V	54.0	-0.4	AVG	218	1.1	2x2 5200, Power 27
5439.910	62.4	V	74.0	-11.6	PK	218	1.1	2x2 5200, Power 27
5440.080	49.6	V	54.0	-4.4	AVG	23	1.3	3x3 5200, Power 19
5440.230	60.6	V	74.0	-13.4	PK	23	1.3	3x3 5200, Power 19
5000.040	52.4	V	-	-	AVG	31	1.0	Note 4
4999.990	59.9	V	-	-	PK	31	1.0	Note 4

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 12-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #5, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5150-5250 MHz Band

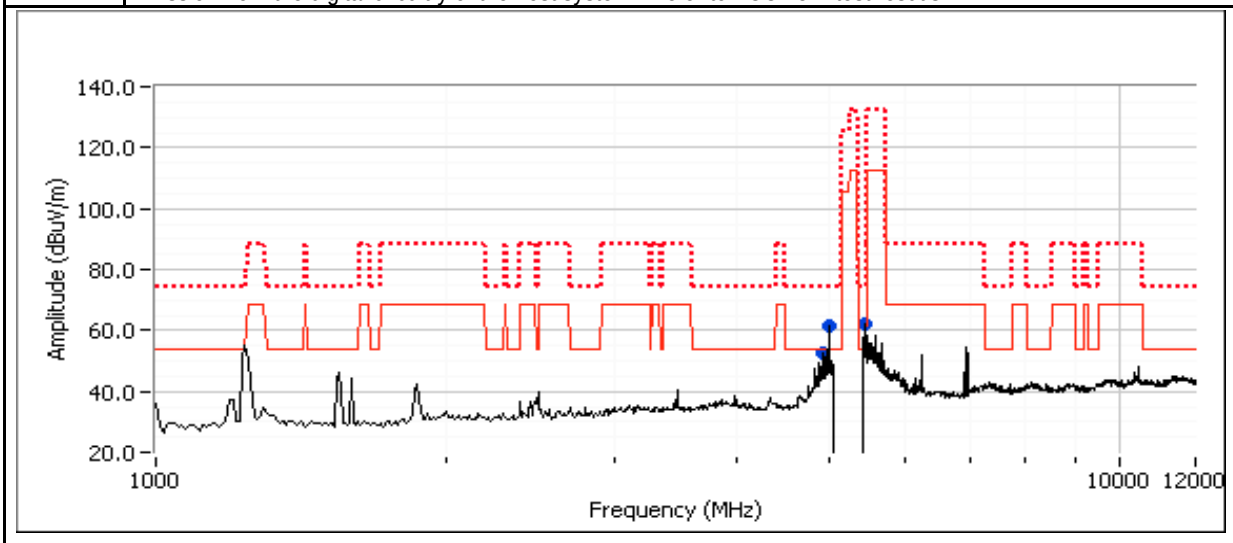
Date of Test: 3/13/2012 Test Location: Fremont Chamber #3

Test Engineer: Peter Sales

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4920.020	45.8	V	54.0	-8.2	AVG	35	1.1	RB 1 MHz;VB 10 Hz;Pk
4920.150	55.1	V	74.0	-18.9	PK	35	1.1	RB 1 MHz;VB 3 MHz;Pk
5440.030	53.3	V	54.0	-0.7	AVG	229	1.1	2x2 5230, Power 26
5439.850	62.7	V	74.0	-11.3	PK	229	1.1	2x2 5230, Power 26
5439.960	52.9	V	54.0	-1.1	AVG	229	1.1	2x2 5190, Power 11
5439.880	60.6	V	74.0	-13.4	PK	229	1.1	2x2 5190, Power 11
5440.010	48.1	V	54.0	-5.9	AVG	311	1.2	3x3 5190, Power 8
5439.850	58.0	V	74.0	-16.0	PK	311	1.2	3x3 5190, Power 8
5439.960	48.2	V	54.0	-5.8	AVG	297	1.1	3x3 5230, Power 13
5440.060	58.2	V	74.0	-15.8	PK	297	1.1	3x3 5230, Power 13

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

RSS 210 and FCC 15.407 (UNII) Radiated Spurious Emissions (5250-5350 MHz Band)

Test Specific Details

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

General Test Configuration

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

Ambient Conditions:

Temperature: 20-25 °C Rel. Humidity: 30-40 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Summary of Results

Spurious Radiated Emissions: 2x2 and 3x3 Modules for 802.11a; HT20; and HT40 modes

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1	802.11a	See Below	See Below		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.9 dBµV/m @ 5439.98 MHz (-0.1 dB)
2	802.11a	See Below	See Below		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.9 dBµV/m @ 5440.06 MHz (-0.1 dB)
3	802.11n20	See Below	See Below		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	54.0 dBµV/m @ 5440.11 MHz (0.0 dB)
5	802.11n40	See Below	See Below		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	48.4 dBµV/m @ 5440.10 MHz (-5.6 dB)

Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

System Configuration: Operating within 5250-5350 MHz

Radio #	Frequency	Module	Mode	Pwr
Run: 1				
1	5260	2x2	802.11a	34 (35)
0	5320	3x3	802.11a	28
2	5320	2x2	802.11a	31
3	5260	3x3	802.11a	32
Run: 2				
1	5300	2x2	802.11a	34
0	5300	3x3	802.11a	32
2	5300	2x2	802.11n20	31 (34)
3	5300	3x3	802.11n20	32 (33)
Run: 3				
1	5260	2x2	802.11n20	34
0	5320	3x3	802.11n20	21
2	5320	2x2	802.11n20	27
3	5260	3x3	802.11n20	33
Run: 5				
1	5270	2x2	802.11HT40	33
0	5310	3x3	802.11HT40	12
2	5310	2x2	802.11HT40	14
3	5270	3x3	802.11HT40	34

Notes - Multiple radios operating at the same time as shown above. In all cases, power set to the maximum worse case single channel power, transmitting on all chains.

Highlights indicate that power was lowered from the original level. Notation - XX (YY), XX = passing power setting, YY = power setting for original power levels.

Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #1, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5250-5350 MHz Band

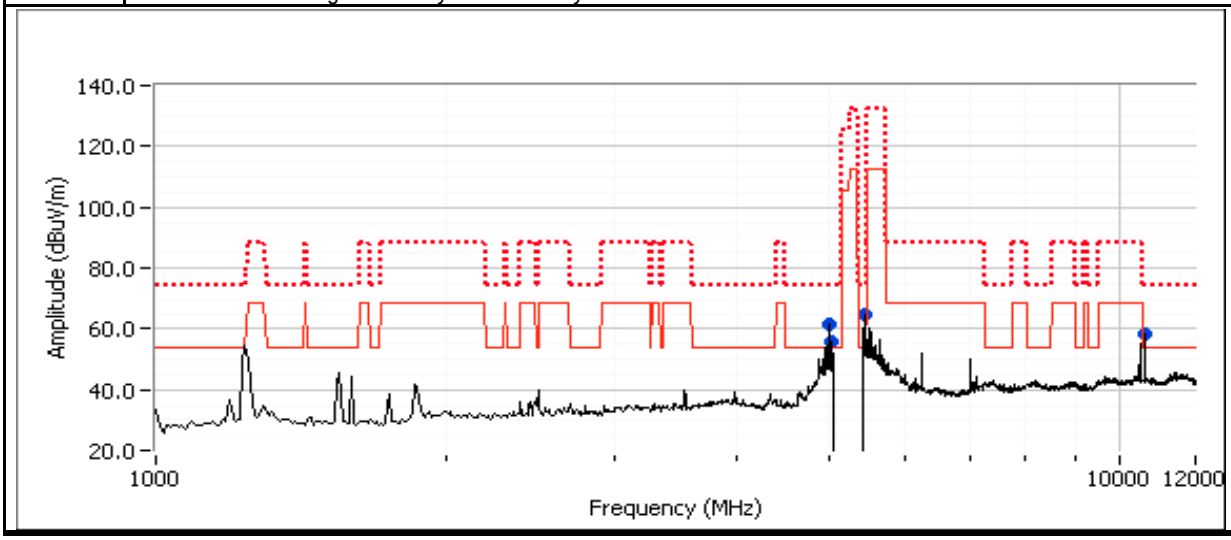
Date of Test: 3/14/2012 Test Location: Fremont Chamber #3

Test Engineer: Peter Sales

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5000.050	58.7	V	-	-	AVG	239	1.0	Note 4
5000.010	61.8	V	-	-	PK	239	1.0	Note 4
5039.960	52.2	V	54.0	-1.8	AVG	140	1.0	RB 1 MHz;VB 10 Hz;Pk
5040.130	60.7	V	74.0	-13.3	PK	140	1.0	RB 1 MHz;VB 3 MHz;Pk
5439.980	53.9	V	54.0	-0.1	AVG	58	1.3	2x2 5320, Power 31
5439.790	61.1	V	74.0	-12.9	PK	58	1.3	2x2 5320, Power 31
5440.000	49.4	V	54.0	-4.6	AVG	69	1.1	2x2 5260, Power 34
5439.560	59.0	V	74.0	-15.0	PK	69	1.1	2x2 5260, Power 34
5440.100	52.5	V	54.0	-1.5	AVG	47	1.3	3x3 5320, Power 28
5440.210	63.3	V	74.0	-10.7	PK	47	1.3	3x3 5320, Power 28
5440.040	52.9	V	54.0	-1.1	AVG	28	1.2	3x3 5260, Power 32
5439.850	63.7	V	74.0	-10.3	PK	28	1.2	3x3 5260, Power 32
10640.230	52.4	V	54.0	-1.6	AVG	353	1.1	RB 1 MHz;VB 10 Hz;Pk
10640.620	65.6	V	74.0	-8.4	PK	353	1.1	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 12-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

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

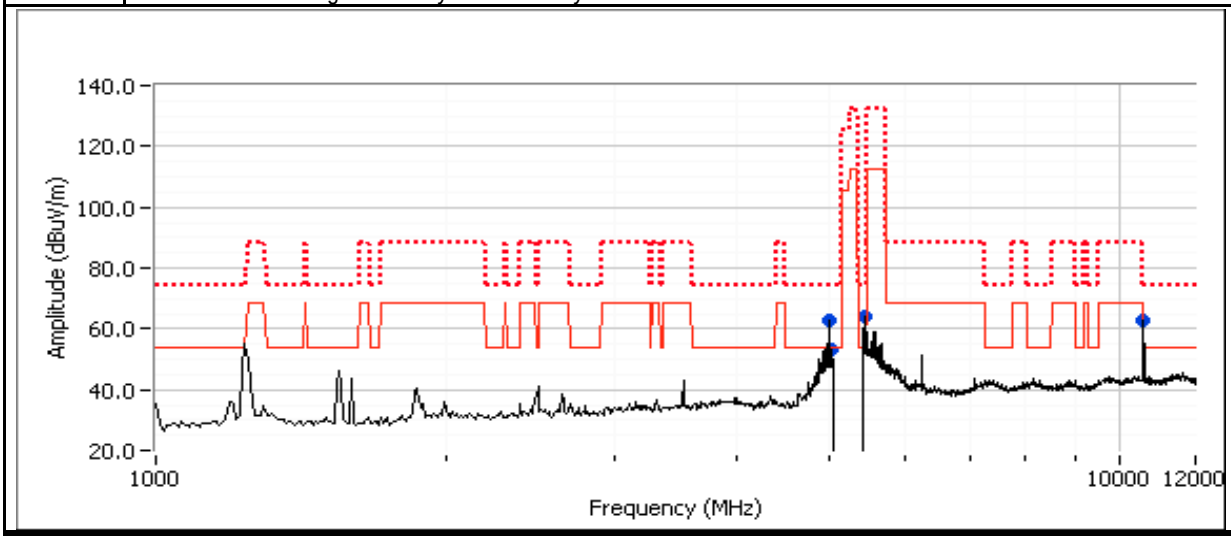
Date of Test: 3/14/2012 Test Location: Fremont Chamber #3

Test Engineer: Peter Sales

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5000.030	55.9	V	-	-	AVG	206	1.1	Note 4
5000.000	62.1	V	-	-	PK	206	1.1	Note 4
5040.000	53.4	V	54.0	-0.6	AVG	143	1.1	RB 1 MHz;VB 10 Hz;Pk
5039.990	60.7	V	74.0	-13.3	PK	143	1.1	RB 1 MHz;VB 3 MHz;Pk
5439.770	53.9	V	54.0	-0.1	AVG	240	1.2	2x2 aMode, Power 34
5439.980	63.6	V	74.0	-10.4	PK	240	1.2	2x2 aMode, Power 34
5440.060	53.9	V	54.0	-0.1	AVG	243	1.2	2x2 HT20, Power 31
5440.340	63.6	V	74.0	-10.4	PK	243	1.2	2x2 HT20, Power 31
5439.910	48.9	V	54.0	-5.1	AVG	360	1.0	3x3 aMode, Power 32
5440.570	59.9	V	74.0	-14.1	PK	360	1.0	3x3 aMode, Power 32
5439.980	52.4	V	54.0	-1.6	AVG	38	1.1	3x3 HT20, Power 32
5441.570	62.9	V	74.0	-11.1	PK	38	1.1	3x3 HT20, Power 32
10600.340	53.8	V	54.0	-0.2	AVG	10	1.2	RB 1 MHz;VB 10 Hz;Pk
10600.190	66.2	V	74.0	-7.8	PK	10	1.2	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #3, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5250-5350 MHz Band

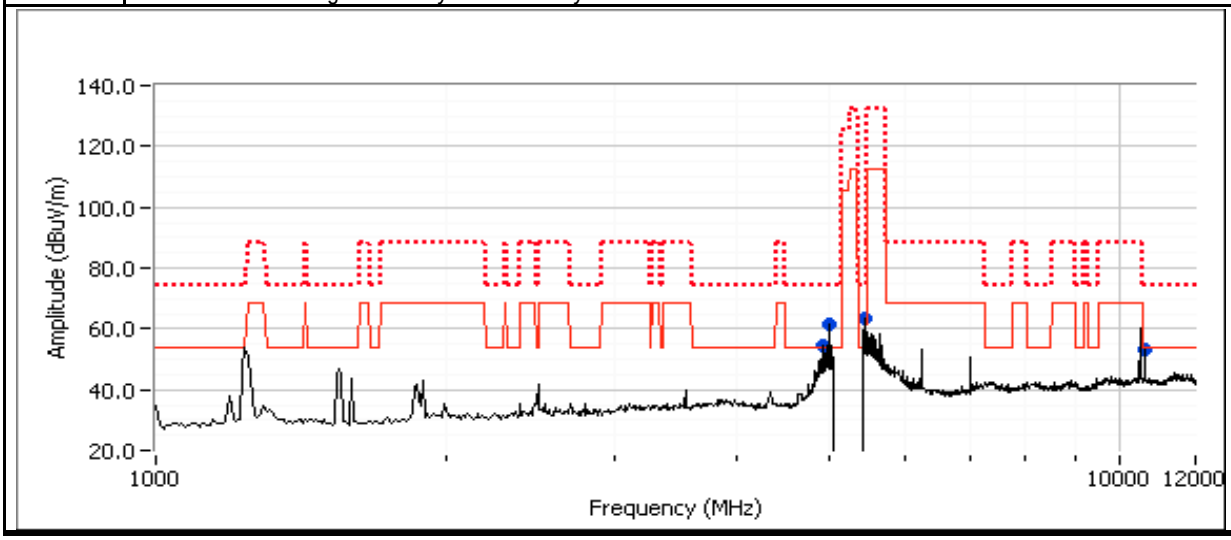
Date of Test: 3/14/2012 Test Location: Fremont Chamber #3

Test Engineer: Peter Sales

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5000.120	56.2	V	-	-	AVG	207	1.0	Note 4
4999.970	63.0	V	-	-	PK	207	1.0	Note 4
4919.880	46.2	V	54.0	-7.8	AVG	243	1.0	RB 1 MHz;VB 10 Hz;Pk
4919.870	56.0	V	74.0	-18.0	PK	243	1.0	RB 1 MHz;VB 3 MHz;Pk
5439.950	53.8	V	54.0	-0.2	AVG	222	1.0	2x2 5320, Power 27
5439.930	63.6	V	74.0	-10.4	PK	222	1.0	2x2 5320, Power 27
5440.010	53.4	V	54.0	-0.6	AVG	222	1.0	2x2 5260, Power 34
5440.010	63.8	V	74.0	-10.2	PK	222	1.0	2x2 5260, Power 34
5439.980	52.4	V	54.0	-1.6	AVG	310	1.1	3x3 5260, Power 33
5440.290	63.2	V	74.0	-10.8	PK	310	1.1	3x3 5260, Power 33
5440.110	54.0	V	54.0	0.0	AVG	300	1.1	3x3 5320, Power 32
5441.040	65.2	V	74.0	-8.8	PK	300	1.1	3x3 5320, Power 32
10640.460	50.5	V	54.0	-3.5	AVG	360	1.1	RB 1 MHz;VB 10 Hz;Pk
10642.020	64.0	V	74.0	-10.0	PK	360	1.1	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #5, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5250-5350 MHz Band

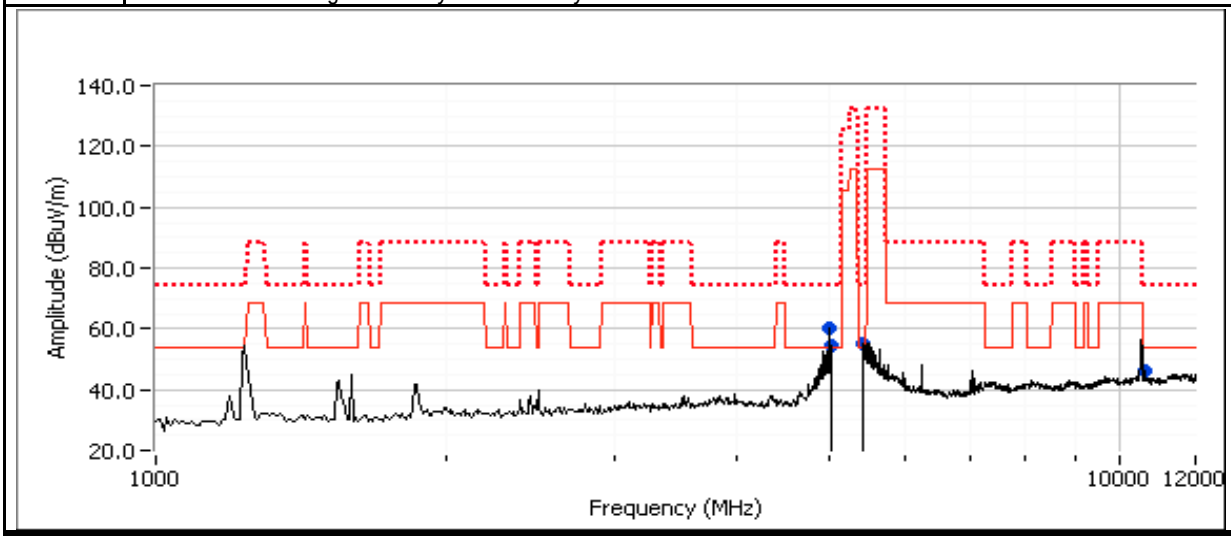
Date of Test: 3/14/2012 Test Location: Fremont Chamber #3

Test Engineer: Peter Sales

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
10604.410	41.3	V	54.0	-12.7	AVG	131	1.1	RB 1 MHz;VB 10 Hz;Pk
10605.670	53.1	V	74.0	-20.9	PK	131	1.1	RB 1 MHz;VB 3 MHz;Pk
5033.470	45.4	V	54.0	-8.6	AVG	334	1.1	RB 1 MHz;VB 10 Hz;Pk
5033.880	56.6	V	74.0	-17.4	PK	334	1.1	RB 1 MHz;VB 3 MHz;Pk
5440.100	48.4	V	54.0	-5.6	AVG	313	1.2	2x2 5270, Power 33
5440.480	60.1	V	74.0	-13.9	PK	313	1.2	2x2 5270, Power 33
5439.940	44.9	V	54.0	-9.1	AVG	315	1.2	2x2 5310, Power 14
5441.460	56.9	V	74.0	-17.1	PK	315	1.2	2x2 5310, Power 14
5440.040	49.1	V	54.0	-4.9	AVG	138	1.0	3x3 5270, Power 34
5439.360	59.0	V	74.0	-15.0	PK	138	1.0	3x3 5270, Power 34
5439.970	47.7	V	54.0	-6.3	AVG	139	1.0	3x3 5310, Power 12
5439.960	57.1	V	74.0	-16.9	PK	139	1.0	3x3 5310, Power 12
5000.130	60.1	V	-	-	AVG	146	1.1	Note 4
5000.150	64.2	V	-	-	PK	146	1.1	Note 4

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 18-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

RSS 210 and FCC 15.407 (UNII) Radiated Spurious Emissions (5470-5725 MHz Band)

Test Specific Details

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

General Test Configuration

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

Ambient Conditions:

Temperature: 20-25 °C Rel. Humidity: 30-40 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Summary of Results

Spurious Radiated Emissions: 2x2 and 3x3 Modules for 802.11a; HT20; and HT40 modes

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1	802.11a	See Below	See Below		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.2 dBµV/m @ 11400.20 MHz (-0.8 dB)
2	802.11a	See Below	See Below		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	51.9 dBµV/m @ 5039.93 MHz (-2.1 dB)
3	802.11n20	See Below	See Below		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	54.0 dBµV/m @ 11397.33 MHz (0.0 dB)
5	802.11n40	See Below	See Below		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	51.8 dBµV/m @ 5040.04 MHz (-2.2 dB)

Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

System Configuration: Operating within 5470-5725 MHz

Radio #	Frequency	Module	Mode	Pwr
Run: 1				
1	5500	2x2	802.11a	35
0	5700	3x3	802.11a	33
2	5700	2x2	802.11a	32
3	5500	3x3	802.11a	33
Run: 2				
1	5580	2x2	802.11a	35
0	5580	3x3	802.11a	33
2	5580	2x2	802.11n20	32
3	5580	3x3	802.11n20	30
Run: 3				
1	5500	2x2	802.11HT2(	33
0	5700	3x3	802.11HT2(	33
2	5700	2x2	802.11HT2(	32
3	5500	3x3	802.11HT2(	30
Run: 5				
1	5510	2x2	802.11HT4(	20
0	5670	3x3	802.11HT4(	34
2	5670	2x2	802.11HT4(	27
3	5510	3x3	802.11HT4(	13

Notes - Multiple radios operating at the same time as shown above. In all cases, power set to the maximum worse case single channel power, transmitting on all chains.

Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #1, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5470-5725 MHz Band

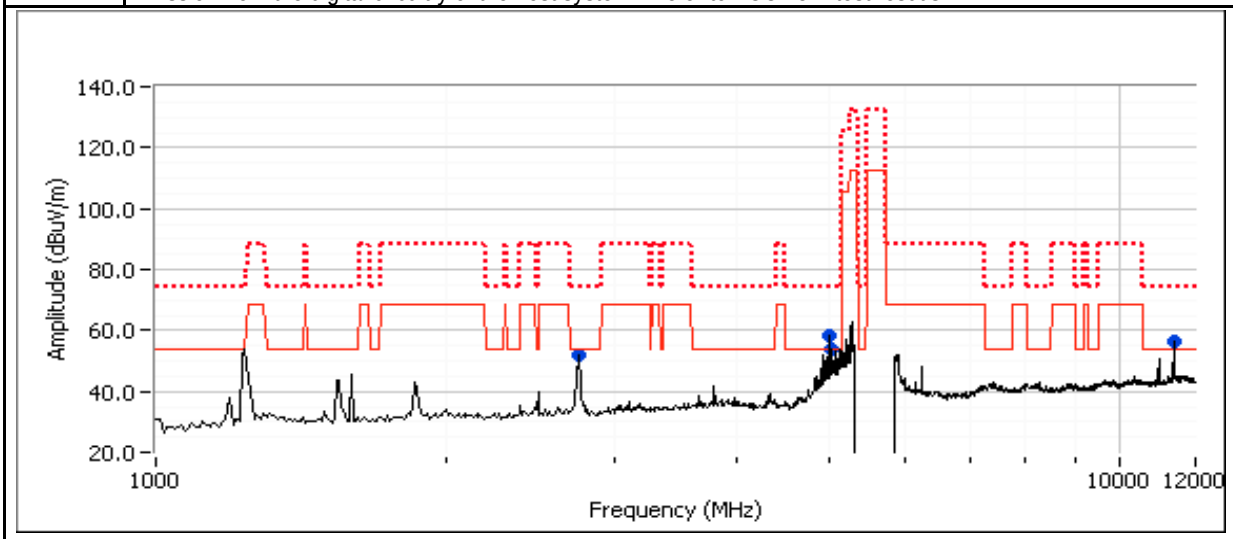
Date of Test: 3/14/2012 Test Location: Fremont Chamber #3

Test Engineer: Peter Sales

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11400.200	53.2	V	54.0	-0.8	AVG	212	1.1	2x2 5700, Power 32
11400.800	66.9	V	74.0	-7.1	PK	212	1.1	2x2 5700, Power 32
11401.240	52.0	V	54.0	-2.0	AVG	209	1.1	3x3 5700, Power 33
11401.290	65.3	V	74.0	-8.7	PK	209	1.1	3x3 5700, Power 33
2749.890	48.8	V	54.0	-5.2	AVG	138	1.0	RB 1 MHz;VB 10 Hz;Pk
2749.230	63.5	V	74.0	-10.5	PK	138	1.0	RB 1 MHz;VB 3 MHz;Pk
5039.990	45.7	V	54.0	-8.3	AVG	336	1.1	RB 1 MHz;VB 10 Hz;Pk
5040.420	54.7	V	74.0	-19.3	PK	336	1.1	RB 1 MHz;VB 3 MHz;Pk
5000.200	56.5	V	-	-	AVG	318	1.1	Note 4
5000.080	62.2	V	-	-	PK	318	1.1	Note 4

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 12-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #2, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5470-5725 MHz Band

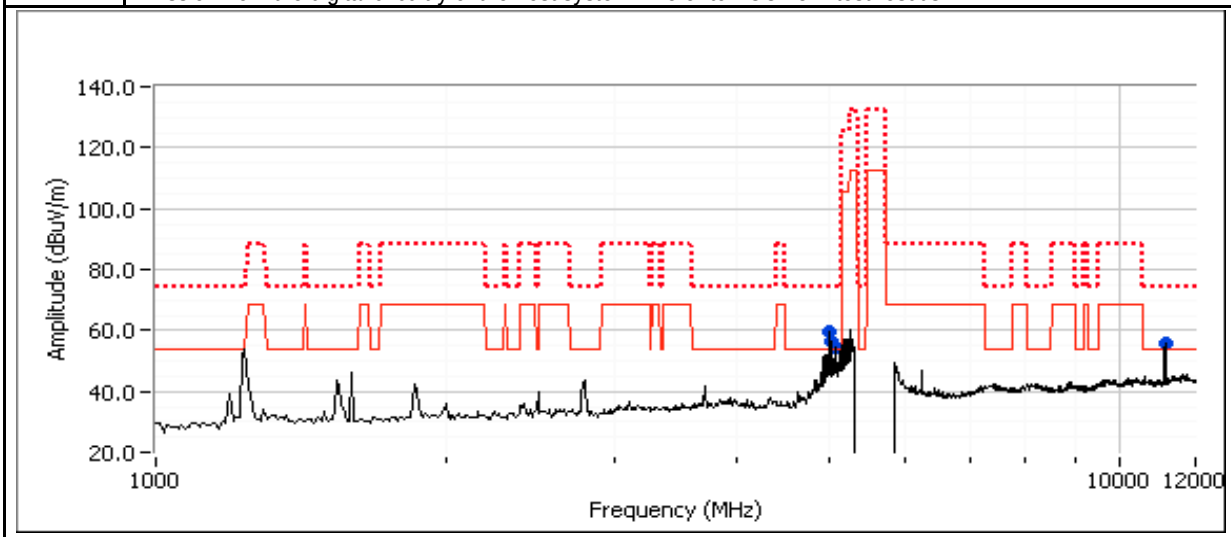
Date of Test: 3/14/2012 Test Location: Fremont Chamber #3

Test Engineer: Peter Sales

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5039.930	51.9	V	54.0	-2.1	AVG	336	1.3	RB 1 MHz;VB 10 Hz;Pk
5040.190	58.2	V	74.0	-15.8	PK	336	1.3	RB 1 MHz;VB 3 MHz;Pk
5080.050	50.6	V	54.0	-3.4	AVG	318	1.1	RB 1 MHz;VB 10 Hz;Pk
5079.750	58.1	V	74.0	-15.9	PK	318	1.1	RB 1 MHz;VB 3 MHz;Pk
11169.360	49.8	V	54.0	-4.2	AVG	327	1.0	RB 1 MHz;VB 10 Hz;Pk
11170.170	62.9	V	74.0	-11.1	PK	327	1.0	RB 1 MHz;VB 3 MHz;Pk
5000.220	55.2	V	-	-	AVG	117	1.0	Note 4
5000.090	59.7	V	-	-	PK	117	1.0	Note 4

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 12-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

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

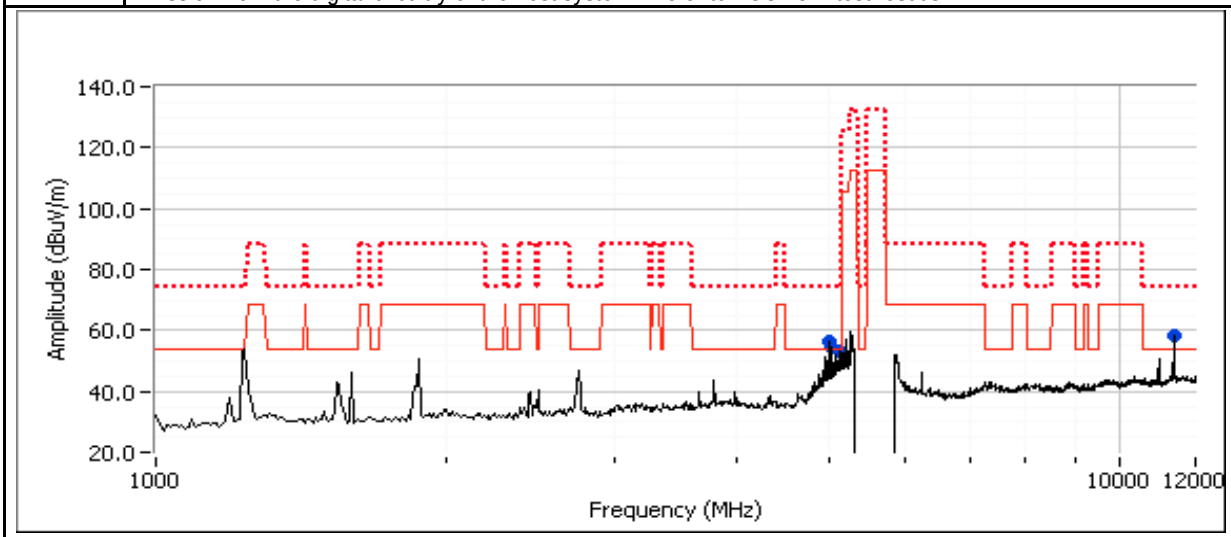
Date of Test: 3/14/2012 Test Location: Fremont Chamber #3

Test Engineer: Peter Sales

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11397.330	54.0	V	54.0	0.0	AVG	94	1.1	RB 1 MHz;VB 10 Hz;Pk
11396.710	66.2	V	74.0	-7.8	PK	94	1.1	RB 1 MHz;VB 3 MHz;Pk
5120.210	49.0	V	54.0	-5.0	AVG	151	1.3	RB 1 MHz;VB 10 Hz;Pk
5119.980	58.0	V	74.0	-16.0	PK	151	1.3	RB 1 MHz;VB 3 MHz;Pk
5000.200	54.3	V	-	-	AVG	143	1.0	Note 4
5000.180	59.7	V	-	-	PK	143	1.0	Note 4
5039.980	45.8	V	54.0	-8.2	AVG	334	1.1	RB 1 MHz;VB 10 Hz;Pk
5039.990	55.9	V	74.0	-18.1	PK	334	1.1	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 12-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86256
Model:	XI-N300 (2x2 radio module) in XR2000	T-Log Number:	T86500
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #5, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5470-5725 MHz Band

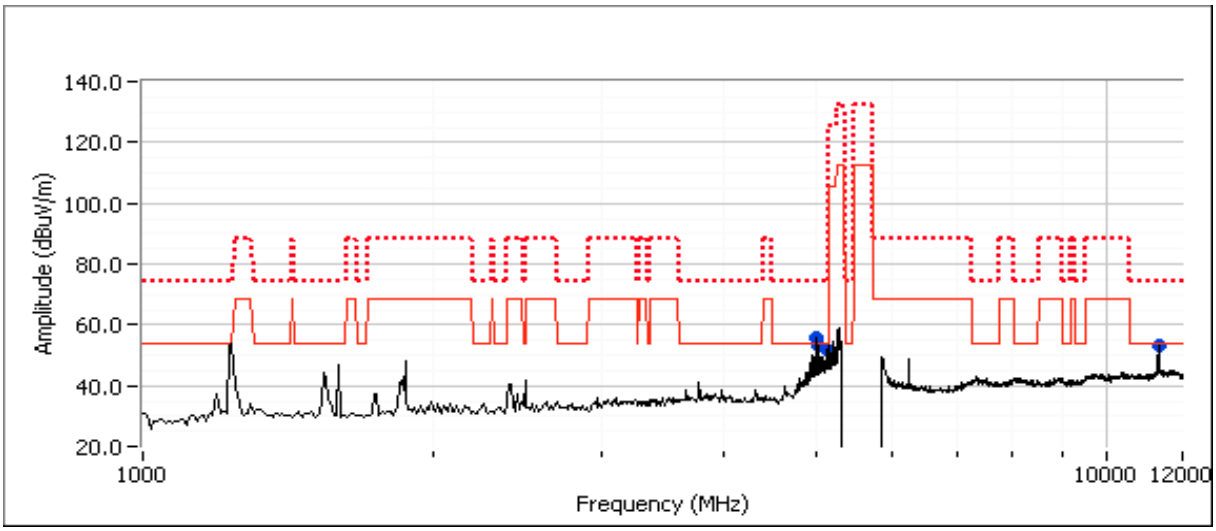
Date of Test: 3/14/2012 Test Location: Fremont Chamber #3

Test Engineer: Peter Sales

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11334.320	49.7	V	54.0	-4.3	AVG	140	1.1	RB 1 MHz;VB 10 Hz;Pk
11333.090	62.2	V	74.0	-11.8	PK	140	1.1	RB 1 MHz;VB 3 MHz;Pk
5000.220	54.2	V	-	-	AVG	142	1.2	Note 4
5000.210	60.2	V	-	-	PK	142	1.2	Note 4
5120.020	48.0	V	54.0	-6.0	AVG	147	1.0	RB 1 MHz;VB 10 Hz;Pk
5120.080	57.6	V	74.0	-16.4	PK	147	1.0	RB 1 MHz;VB 3 MHz;Pk
5040.040	51.8	V	54.0	-2.2	AVG	335	1.3	RB 1 MHz;VB 10 Hz;Pk
5039.910	57.8	V	74.0	-16.2	PK	335	1.3	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). Compliance demonstrated via a conducted measurement during the original filing.
Note 3:	No significant emissions were observed for 12-40GHz
Note 4:	Emission from the digital circuitry of the host system. Refer to FCC 15.B test resutls.



Client:	Xirrus	Job Number:	J86256
Model:	XI-N450 (3x3 radio module) in XR2000	T-Log Number:	T86501
		Account Manager:	Michelle Kim
Contact:	Steve Smith		-
Emissions Standard(s):	FCC 15.247/15.E/RSS-210	Class:	-
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Xirrus

Model

XI-N450 (3x3 radio module) in XR2000

Date of Last Test: 5/24/2012

Client:	Xirrus	Job Number:	J86256
Model:	XI-N450 (3x3 radio module) in XR2000	T-Log Number:	T86501
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions
802.11bg, HT20 Band Edge and Spurious, HT40 Band Edge

Test Specific Details

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

Date of Test: 2/21/2012 Test Location: FT7

Test Engineer: Jack Liu

General Test Configuration

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

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

Ambient Conditions:

Temperature: 20-25 °C

Rel. Humidity: 30-40 %

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.

Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Run #	Mode	Channel	Power Setting		Test Performed	Limit	Result / Margin
1a Low	HT20	2412 MHz	28.0	-	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	54.0 V/m @ 2390.0 MHz (0.0 dB)
1b High		2462 MHz	25.0	-	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	53.9 V/m @ 2483.5 MHz (-0.1 dB)

Testing was performed on the worse case mode from the original filing.
Power was set to be within 0.5dB of the original filing power.

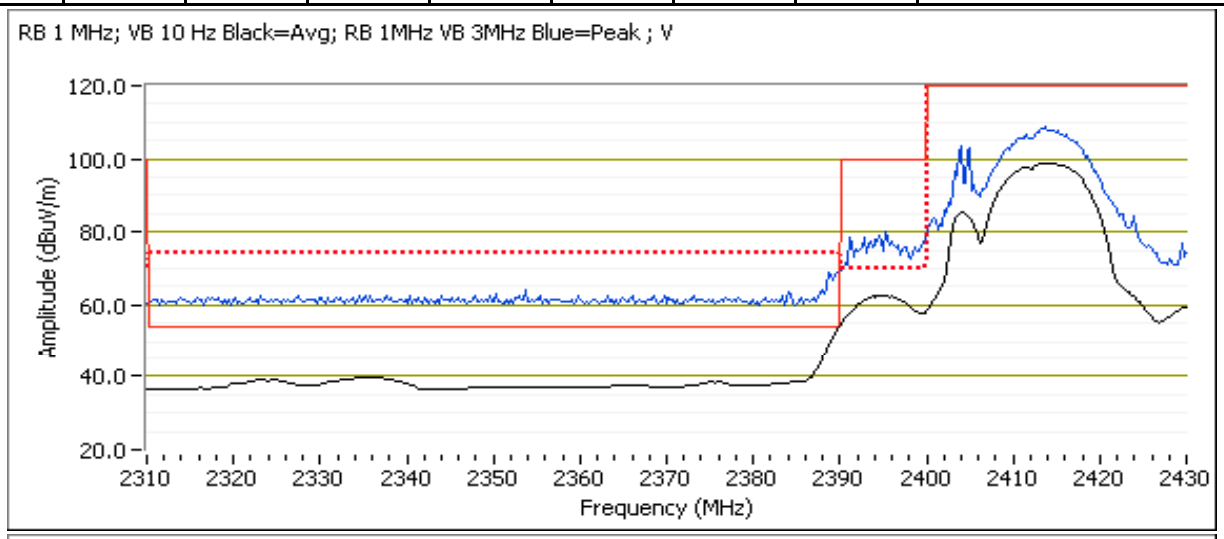
Client:	Xirrus	Job Number:	J86256
Model:	XI-N450 (3x3 radio module) in XR2000	T-Log Number:	T86501
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

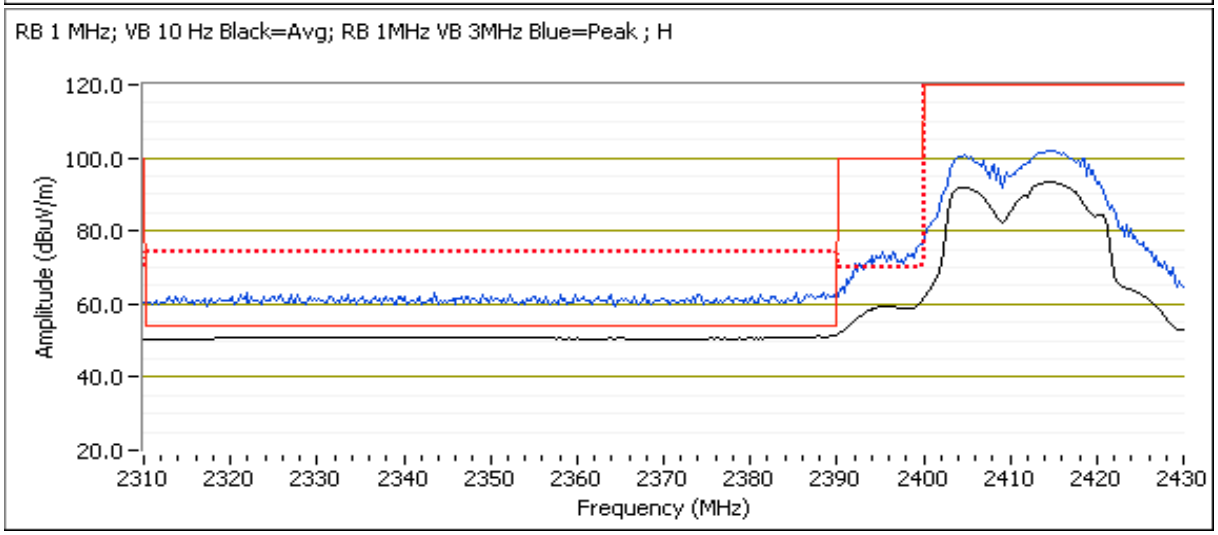
Run #1: Radiated Spurious Emissions, 30 - 26500 MHz. Operating Mode: 802.11n 20 MHz, 3x3

Run #1a: Channel 1@ 2412 MHz, Radio #10

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	54.0	V	54.0	0.0	AVG	160	1.0	
2389.680	67.5	V	74.0	-6.5	PK	160	1.0	
2390.000	51.4	H	54.0	-2.6	AVG	146	1.0	
2324.910	62.3	H	74.0	-11.7	PK	146	1.0	



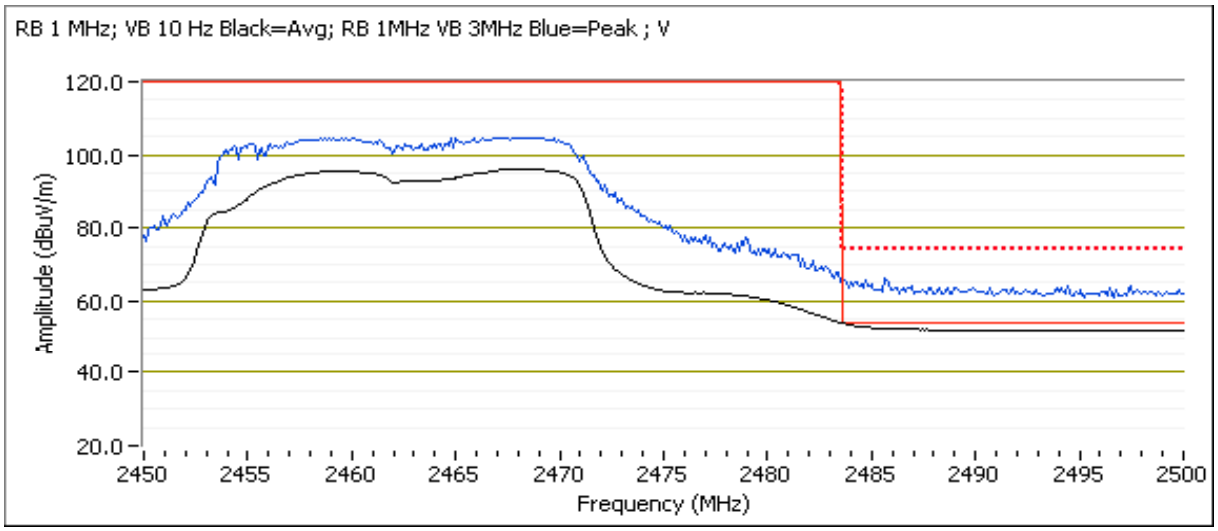


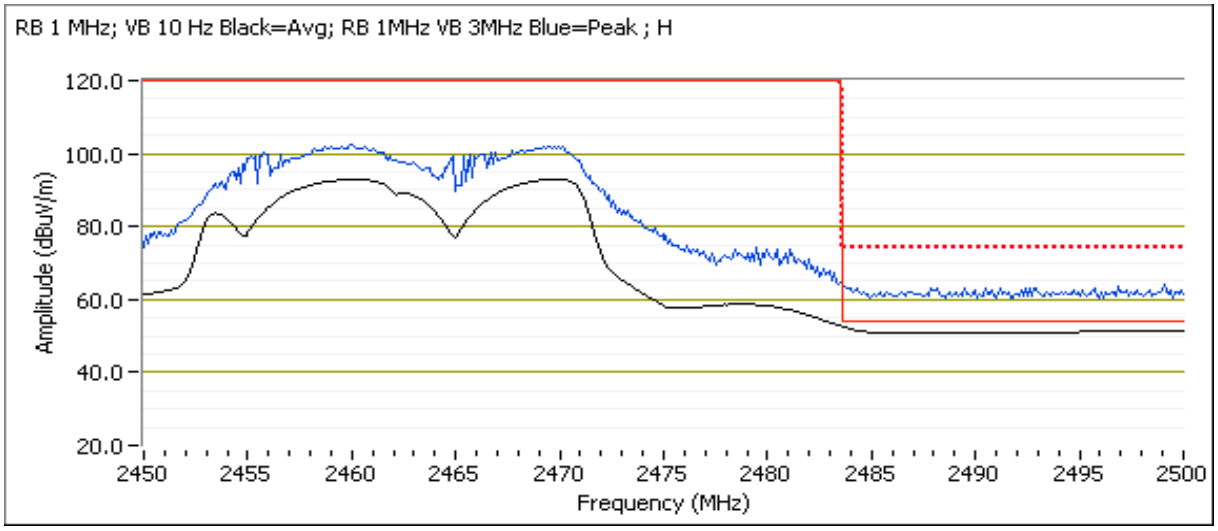
Client:	Xirrus	Job Number:	J86256
Model:	XI-N450 (3x3 radio module) in XR2000	T-Log Number:	T86501
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #1b: High Channel @ 2462 MHz, Radio #10

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.500	53.9	V	54.0	-0.1	AVG	163	1.2	
2484.360	66.7	V	74.0	-7.3	PK	163	1.2	
2483.500	52.6	H	54.0	-1.4	AVG	140	1.0	
2483.500	63.3	H	74.0	-10.7	PK	140	1.0	





Client:	Xirrus	Job Number:	J86256
Model:	XI-N450 (3x3 radio module) in XR2000	T-Log Number:	T86501
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	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.

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT.

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

Ambient Conditions:

Temperature: 20-25 °C
Rel. Humidity: 30-40 %

Summary of Results

Run #	Mode	Channel	Power Setting		Test Performed	Limit	Result / Margin
1	HT20 Chain 012	5150-5250 #36 (low)	9.5		Restricted Band Edge at 5150 MHz	15.209	45.7 dBµV/m @ 5149.8 MHz (-8.3 dB)
		5150-5250 #40	9.5		Restricted Band Edge at 5150 MHz		44.0 dBµV/m @ 5132.7 MHz (-10.0 dB)
2	HT20 Chain 012	5250-5350 #64 (High)	10.5		Restricted Band Edge at 5350 MHz	15.209	46.5 dBµV/m @ 5359.9 MHz (-7.5 dB)
		5150-5250 #60	16.5		Restricted Band Edge at 5350 MHz		46.9 dBµV/m @ 5360.0 MHz (-7.1 dB)
3	HT20 Chain 012	5470-5725 #100 Low	15.0		Restricted Band Edge at 5460 MHz	15.209	49.5 dBµV/m @ 5440.0 MHz (-4.5 dB)

Testing was performed on the worse case mode from the original filing.
Power was set to be within 0.5dB of the original filing power.

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xirrus	Job Number:	J86256
Model:	XI-N450 (3x3 radio module) in XR2000	T-Log Number:	T86501
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

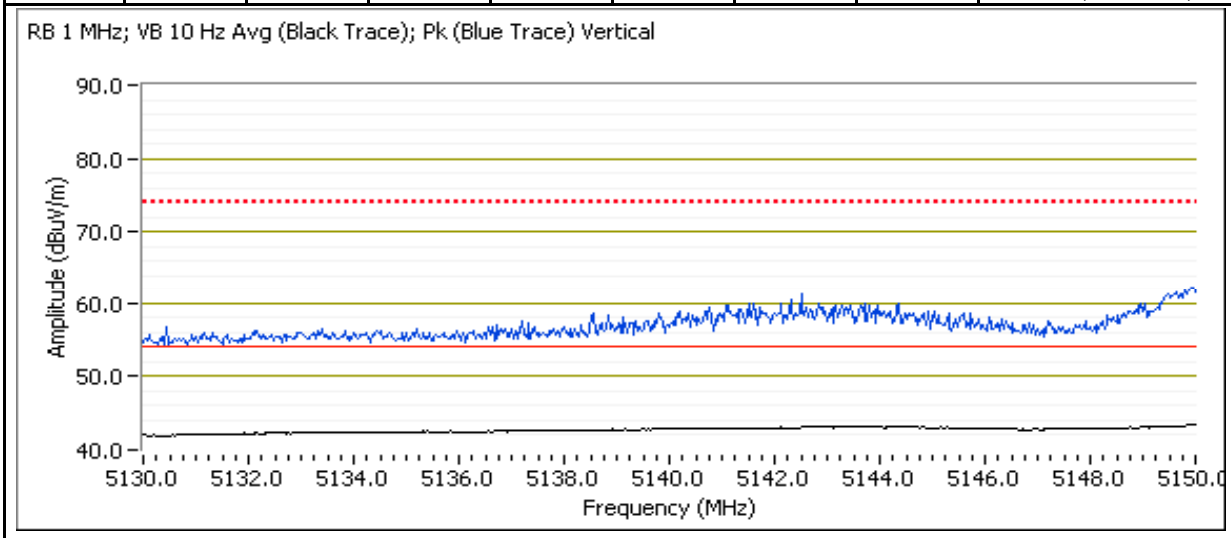
Run #1, Radiated Spurious Emissions at Band Edges. Operation in the 5150-5250 MHz Band

Date of Test: 2/22/2012
Test Engineer: Peter Sales
Test Location: FT Chamber #7

Run #1a: Low Channel, 5180 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments	Chains
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
5149.800	45.7	V	54.0	-8.3	AVG	222	1.21	RB 1 MHz;VB 10 Hz;Pk	
5149.830	59.7	V	74.0	-14.3	PK	222	1.21	RB 1 MHz;VB 3 MHz;Pk	
5148.970	43.1	H	54.0	-10.9	AVG	206	1.16	RB 1 MHz;VB 10 Hz;Pk	
5147.200	56.1	H	74.0	-17.9	PK	206	1.16	RB 1 MHz;VB 3 MHz;Pk	



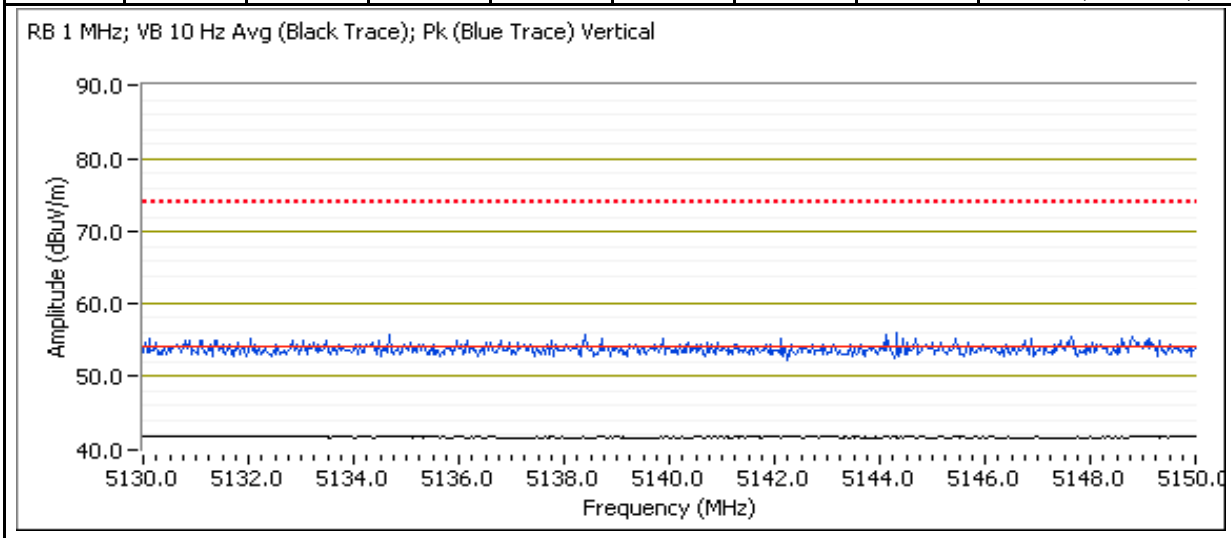
Client:	Xirrus	Job Number:	J86256
Model:	XI-N450 (3x3 radio module) in XR2000	T-Log Number:	T86501
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #1b: Channel 40, 5200 MHz

Date of Test: 2/22/2012
Test Engineer: Peter Sales
Test Location: FT Chamber #7

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments	Chains
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
5132.670	44.0	V	54.0	-10.0	AVG	214	1.0	RB 1 MHz;VB 10 Hz;Pk	
5132.400	42.2	H	54.0	-11.8	AVG	252	1.0	RB 1 MHz;VB 10 Hz;Pk	
5134.170	55.0	V	74.0	-19.0	PK	214	1.0	RB 1 MHz;VB 3 MHz;Pk	
5147.330	53.7	H	74.0	-20.3	PK	252	1.0	RB 1 MHz;VB 3 MHz;Pk	



Client:	Xirrus	Job Number:	J86256
Model:	XI-N450 (3x3 radio module) in XR2000	T-Log Number:	T86501
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

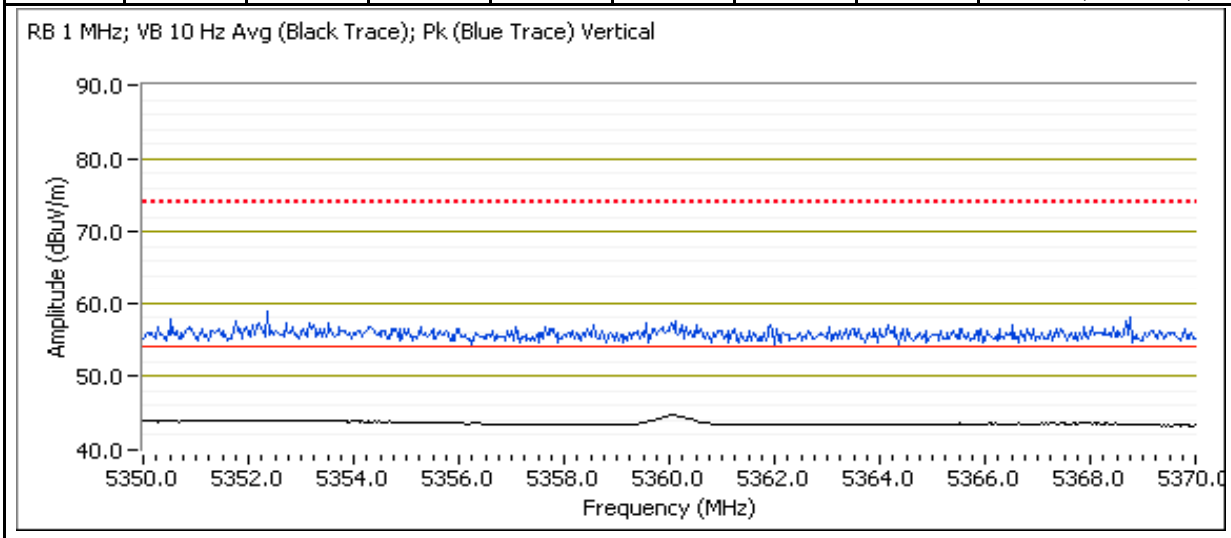
Run #2, Radiated Spurious Emissions at Band Edges. Operation in the 5250-5350 MHz Band

Date of Test: 2/22/2012
Test Engineer: Peter Sales
Test Location: FT Chamber #7

Run #2a High Channel

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments	Chains
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
5359.900	46.5	V	54.0	-7.5	AVG	233	1.1	RB 1 MHz;VB 10 Hz;Pk	
5359.770	43.0	H	54.0	-11.0	AVG	190	1.0	RB 1 MHz;VB 10 Hz;Pk	
5360.400	57.3	V	74.0	-16.7	PK	233	1.1	RB 1 MHz;VB 3 MHz;Pk	
5362.370	53.7	H	74.0	-20.3	PK	190	1.0	RB 1 MHz;VB 3 MHz;Pk	



Client:	Xirrus	Job Number:	J86256
Model:	XI-N450 (3x3 radio module) in XR2000	T-Log Number:	T86501
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

Run #2a Channel 60, 5300 MHz

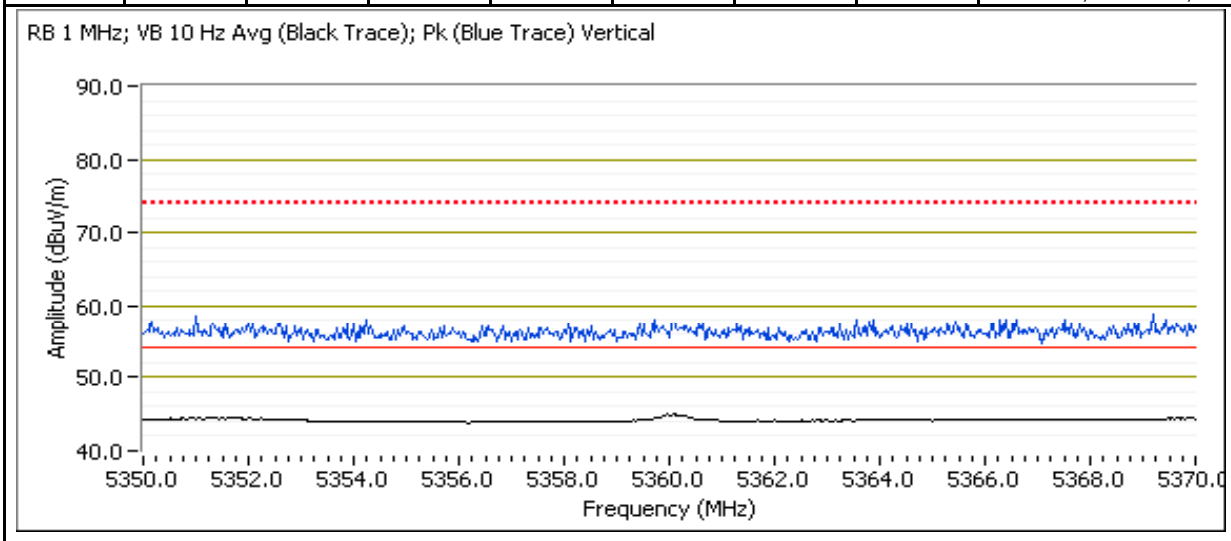
Date of Test: 2/22/2012

Test Engineer: Peter Sales

Test Location: FT Chamber #7

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments	Chains
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
5360.030	46.9	V	54.0	-7.1	AVG	242	1.3	RB 1 MHz;VB 10 Hz;Pk	
5366.970	43.0	H	54.0	-11.0	AVG	190	2.0	RB 1 MHz;VB 10 Hz;Pk	
5350.170	58.2	V	74.0	-15.8	PK	242	1.3	RB 1 MHz;VB 3 MHz;Pk	
5360.870	54.5	H	74.0	-19.5	PK	190	2.0	RB 1 MHz;VB 3 MHz;Pk	



Client:	Xirrus	Job Number:	J86256
Model:	XI-N450 (3x3 radio module) in XR2000	T-Log Number:	T86501
		Account Manager:	Michelle Kim
Contact:	Steve Smith		
Standard:	FCC 15.247/15.E/RSS-210	Class:	N/A

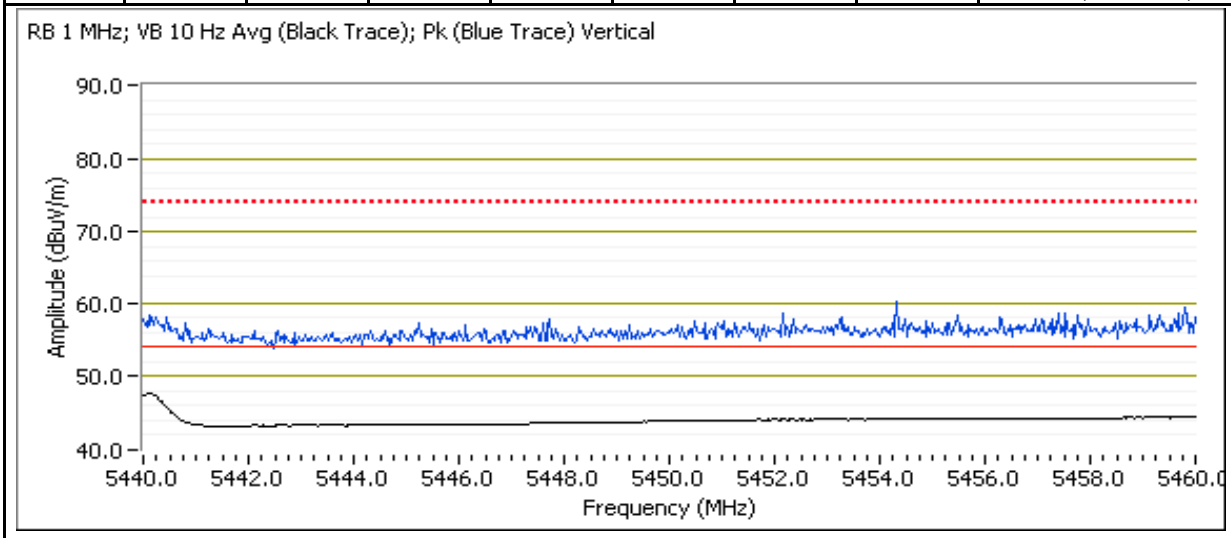
Run #3, Radiated Spurious Emissions at Band Edges. Operation in the 5470-5725 MHz Band

Date of Test: 2/22/2012
Test Engineer: Peter Sales
Test Location: FT Chamber #7

Run #3a: Low Channel

5350-5460 MHz Restricted Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments	Chains
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
5440.000	49.5	V	54.0	-4.5	AVG	232	1.0	RB 1 MHz;VB 10 Hz;Pk	
5459.770	57.5	V	74.0	-16.5	PK	232	1.0	RB 1 MHz;VB 3 MHz;Pk	
5458.070	43.1	H	54.0	-10.9	AVG	298	1.0	RB 1 MHz;VB 10 Hz;Pk	
5448.800	53.9	H	74.0	-20.1	PK	298	1.0	RB 1 MHz;VB 3 MHz;Pk	



Client:	Xirrus	Job Number:	J86254
Model:	XR1000	T-Log Number:	T86343
		Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Emissions Standard(s):	EN55022, FCC	Class:	B
Immunity Standard(s):	EN 301 489-1 V1.8.1	Environment:	-

EMC Test Data

For The

Xirrus

Model

XR1000

Date of Last Test: 4/17/2012

Client:	Xirrus	Job Number:	J86254
Model:	XR1000	T-Log Number:	T86343
		Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	EN55022, FCC	Class:	A

Conducted Emissions

(Elliott Laboratories Fremont Facility, Semi-Anechoic Chamber)

Test Specific Details

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

Date of Test: 4/6/2012
Test Engineer: Chris Groat
Test Location: Fremont Chamber #3

Config. Used: 1
Config Change: none
EUT Voltage: POE

General Test Configuration

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

Ambient Conditions:

Temperature: 21 °C
Rel. Humidity: 34 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power, 120V/60Hz	Class A	Pass	57.4 dBµV @ 4.716 MHz (-2.6 dB)

Modifications Made During Testing

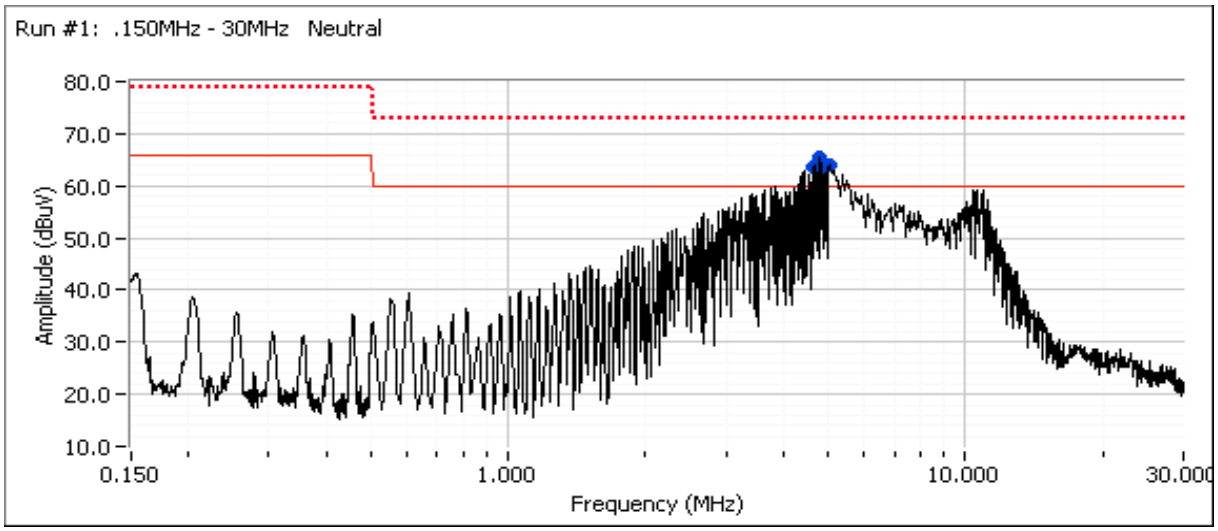
No modifications were made to the EUT during testing

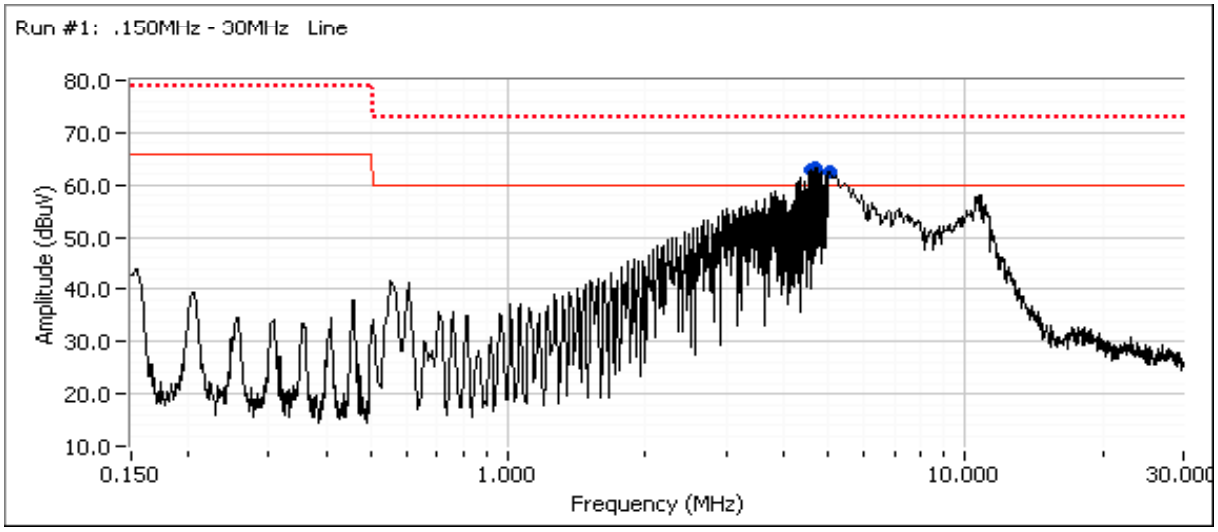
Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xirrus	Job Number:	J86254
Model:	XR1000	T-Log Number:	T86343
		Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	EN55022, FCC	Class:	A

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz
Radios in Transmit Mode: 1 3x3 and 1 2x2





Client:	Xirrus	Job Number:	J86254
Model:	XR1000	T-Log Number:	T86343
		Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	EN55022, FCC	Class:	A

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz
Radios in Transmit Mode: 1 3x3 and 1 2x2

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

Frequency	Level	AC	Class A		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
4.819	65.4	Neutral	60.0	5.4	Peak	
4.716	64.1	Neutral	60.0	4.1	Peak	
5.020	63.9	Neutral	60.0	3.9	Peak	
4.666	63.6	Neutral	60.0	3.6	Peak	
4.869	63.6	Neutral	60.0	3.6	Peak	
4.720	63.3	Line 1	60.0	3.3	Peak	
4.669	63.2	Line 1	60.0	3.2	Peak	
4.618	62.8	Line 1	60.0	2.8	Peak	
5.075	62.6	Line 1	60.0	2.6	Peak	

Final quasi-peak and average readings

Frequency	Level	AC	Class A		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
4.716	57.4	Neutral	60.0	-2.6	AVG	AVG (0.10s)
4.819	56.1	Neutral	60.0	-3.9	AVG	AVG (0.10s)
4.720	55.8	Line 1	60.0	-4.2	AVG	AVG (0.10s)
4.666	55.6	Neutral	60.0	-4.4	AVG	AVG (0.10s)
5.020	55.5	Neutral	60.0	-4.5	AVG	AVG (0.10s)
5.075	55.3	Line 1	60.0	-4.7	AVG	AVG (0.10s)
4.869	54.7	Neutral	60.0	-5.3	AVG	AVG (0.10s)
4.669	54.5	Line 1	60.0	-5.5	AVG	AVG (0.10s)
4.618	52.8	Line 1	60.0	-7.2	AVG	AVG (0.10s)
4.716	64.4	Neutral	73.0	-8.6	QP	QP (1.00s)
4.819	64.2	Neutral	73.0	-8.8	QP	QP (1.00s)
4.666	63.9	Neutral	73.0	-9.1	QP	QP (1.00s)
5.020	63.4	Neutral	73.0	-9.6	QP	QP (1.00s)
4.869	63.4	Neutral	73.0	-9.6	QP	QP (1.00s)
4.720	63.0	Line 1	73.0	-10.0	QP	QP (1.00s)
4.669	62.7	Line 1	73.0	-10.3	QP	QP (1.00s)
4.618	62.1	Line 1	73.0	-10.9	QP	QP (1.00s)
5.075	61.7	Line 1	73.0	-11.3	QP	QP (1.00s)

End of Report

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