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Electromagnetic Emissions Test Report Application for Grant of Equipment Authorization pursuant to FCC Part 15, Subpart E on the Xirrus, Inc. Transmitter Model: XN4

> UPN: 5428A-XN4 FCC ID: SK6XN4

GRANTEE: Xirrus, Inc. 2101 Corporate Center Dr. Newbury Park, CA 91320

TEST SITE(S): Elliott Laboratories 684 W. Maude Ave Sunnyvale, CA 94086 IC Site Registration #: IC 2845-1; IC 2845-2

REPORT DATE: January 21, 2009

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FINAL TEST DATE:

October 24, through November 11, 2008, January 7 and November 3 through November 13, 2009

AUTHORIZED SIGNATORY:

Mark Briggs Staff Engineer



Testing Cert #2016-01

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#### **REVISION HISTORY**

Rev #	Date	Comments	Modified By
1	Feb 6, 2009	First Release	Briggs
2	March 13, 2009	Added test data for the 5250-5350MHz and 5470-5725 MHz bands (original report only covered 5150-5250MHz operation.	Briggs
3	April 7, 2009	Corrected power detailed in table for 802.11n mode in the 5470-5725 MHz band for 5600MHz Chain C to reflect power detailed in the plot. This also affected the total power for that channel and the maximum power for 802.11n 20MHz mode in that band. Added comments about power plots showing the average signal level to be below -30dBm at the 5725 MHz band edge and, therefore, below -27dBm eirp. Updated the number of pages listed for the rf port test data to account for these new plots. Replaced the plots for output power for dual chain 802.11a modes for the 5250-5350 MHz and 5150-5250 MHz bands with the correct plots for the bighest output power	Briggs
4	December 15, 2009	Reissued after release of the FCC's interim policies for use of the 5470-5725 MHz band which required additional test data to support removal of operating on channels falling inside the 5600-5650 MHz sub-band. All results tables updated. Data for channels falling inside the 5600-5650Mhz ban was removed and replaced with data for a channel in the middle of the 5470-5725 MHz band but outside the 5600-5650 MHz band. Data showing compliance with -20dBc in the 5600 – 5650 MHz sub-band for the channels in each operating mode closest (above and below) to the sub-band. Removed receiver spurious emissions test data and removed RSS 210 from the scope of the test report.	Briggs

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#### SCOPE

An electromagnetic emissions test has been performed on the Xirrus, Inc. model XN4 pursuant to FCC Part 15, Subpart E requirements for UNII Devices (using FCC DA 02-2138, August 30, 2002), as modified by the FCC's interim policy detailed in the FCC Knowledge Database Publication Number 443999 released on 10/05/2009.

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.

The test results recorded herein are based on a single type test of the Xirrus, Inc. model XN4 and therefore apply only to the tested sample. The sample was selected and prepared by Steve Smith of Xirrus, Inc.

#### **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 XN4 complied with the requirements of FCC Part 15, Subpart E requirements for UNII Devices.

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

#### TEST RESULTS SUMMARY

#### 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	Device shall be designed for indoor use only	Complies
15.407 (a) (1)	A9.2(1)	Output Power	Single radio     a: 16.2 dBm     a2x: 16.1dBm     n20: 16.6dBm     n40: 16.3dBm     4x radio     a2x: 16.6dBm     a2x: 16.6dBm     0.047 Watts	17dBm	Complies
15.407 (a) (1)	-		a: 3.7 dBm/MHz	4 dBm/MHz	Complies
-	A9.5 (2)	Power Spectral Density	a2x: 3.6dBm/MHz n20: 3.9 dBm/MHz n40: 0.6 dBm/MHz	5 dBm/MHz	Complies

Output power is detailed for a single radio operating in the 5150-5250 MHz band and also for multiple radios operating in the band. A maximum of four radios using 20MHz channels or two radios using 40MHz channels can operate in the band (the device does not allow two radios to operate on overlapping channels). When multiple radios are operational in the band the maximum output power per radio is reduced by 10log(n) where n is the number of radios in the band.

The maximum power is detailed for a single radio for each mode (802.11a, 802.11a 2x2 MIMO, 802.11n 20MHz and 802.11n 40 MHz. The maximum output power across the band for 40MHz and 20MHz channels is also provided.

#### **Operation in the 5.25 – 5.35 GHz Band**

FCC	RSS	Description	Measured Value /	Limit /	Result		
Rule Part	Rule Part	Description	Comments	Requirement	(margin)		
15.407(a) (2)	A9.2(2)	Output Power	<u>Single radio</u> a: 18.3 dBm a2x: 21.3 Bm n20: 20.9 dBm n40: 22.8 dBm <u>4x radio</u> a2x: 23.9 dBm 0.245 Watts	24 dBm / 250mW (eirp < 30dBm)	Complies		
15.407(a) (2))			a: 5.7 dBm/MHz	11 dBm/MHz	Complies		
	A9.2(2) /	Power Spectral Density	a2x: 8.8 dBm/MHz n20: 8.2 dBm/MHz	11 dBm / MHz (Shall not exceed	Complies		
	A9.5 (2)		n40: 4.4 dBm/MHz	the average value by more than 3dB)	Complies		

Output power is detailed for a single radio operating in the 5250-5350 MHz band and also for multiple radios operating in the band. A maximum of four radios using 20MHz channels or two radios using 40MHz channels can operate in the band (the device does not allow two radios to operate on overlapping channels). When multiple radios are operational in the band the maximum output power per radio is reduced by 10log(n) where n is the number of radios in the band.

The maximum power is detailed for a single radio for each mode (802.11a, 802.11a 2x2 MIMO, 802.11n 20MHz and 802.11n 40 MHz. The maximum output power across the band for 40MHz and 20MMz channels is also provided.

Operation in the 5.47 – 5.725 GHz Band						
FCC	RSS	Description	Measured Value /	Limit /	Result	
Rule Part	Rule Part	Description	Comments	Requirement	(margin)	
15.407(a) (2)	A9.2(2)	Output Power	Single radio     a: 19.0 dBm     a2x: 20.9 dBm     n20: 21.0 dBm     n40: 21.1 dBm     4x radio     A 2x: 24.0 dBm     0.25 Watts	24 dBm / 250mW (eirp < 30dBm)	Complies	
15.407(a) (2))			a: 7.8 dBm/MHz	11 dBm/MHz	Complies	
	A9.2(2) /	Power Spectral Density	a2x: 8.3dBm/MHz n20: 8.3 dBm/MHz	11 dBm / MHz (Shall not exceed	Complies	
	A9.5 (2)	) n40: 7.9 dBm/MHz		the average value by more than 3dB)	Complies	
KDB 443999		Non-operation in 5600 – 5650 MHz sub band	Device cannot operate in the 5600 - 5650 MHz band. 20dB bandwidth of any channels shall not fall inside the 5600-5650 MHz sub-band.	Refer to manufacturer's attestation. 20dB bandwidth below 5591.3 MHz and above 5650.16 MHz	Complies	
KDB 443999Indoor use onlyDevice is not designed to be installed outdoors. User's manual has been updated to explicitly require indoor installation.Complies						
Output power is detailed for a single radio operating in the 5470-5725 MHz band and also for multiple radios operating in the band. All four radios can operate in the band using either 20MHz or 40MHz channels (the device does not allow two radios to operate on the same/overlapping channels). When multiple radios are operational in the band the maximum output power per radio is reduced by 10log(n) where n is the number of radios in the band. The maximum power is detailed for a single radio for each mode (802.11a, 802.11a 2x2 MIMO, 802.11n 20MHz and 802.11n 40 MHz. The maximum output power across the band for 40MHz and 20MHz channels is also provided						

General Requirements for all NII bands					
FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.401	A9.5a	Modulation	Digital Modulation is used (OFDM)	Digital modulation is required	Complies
15.407(a) (1)	-	26dB Bandwidth (minimum)	a: 21.4 MHz a2x: 21.2 MHz n20: 22.1MHz n40: 40.3MHz	N/A – limits output power if < 20MHz	N/A
15.407(b) (5) / 15.209	A9.3	Spurious Emissions below 1GHz	No emissions related 1GHz. Digital device Class B limits	to transmitter/receiver e tested against FCC / I	below CES 003
15.407(b) (2)	A9.3	Spurious Emissions above 1GHz	53.9dBμV/m (495.5μV/m) @ 5350.0MHz	Refer to SPURIOUS LIMITS –UNII and LELAN DEVICES	Complies (-0.1dB)
15.407(a)(6)	-	Peak Excursion Ratio	12.97 dB N40, 5310 MHz	< 13dB	Complies
15.407 (c)	A9.5(4)	Operation in the absence of information to transmit	Operation is discontinued in the absence of information (Operational Description p16)	Device shall automatically discontinue operation in the absence of information to transmit	Complies
15.407 (g)	A9.5 (5)	Frequency Stability	Frequency stability is better than 10ppm Operational Description p 16)		Complies
15.407 (h1)	A9.4	Transmit Power Control	Transmit power control is available and can be set manually and through the 802.11h protocol. Refer to operational description	The U-NII device shall have the capability to operate with a mean EIRP value lower than 24dBm (250mW)	Complies
15.407 (h2)	A9.4	Dynamic frequency Selection (device with radar detection)	Refer to Elliott Test r	eport R74742	

#### GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Internal antennas are integral to the device. External antenna connects using reverse TNC	Unique connector or integral antenna	Complies
15.207	RSS GEN Table 2	AC Conducted Emissions	41.3dBµV @ 2.972MHz	Refer to standard	Complies (- 4.7 dB)
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to MPE calculations in Exhibit 11 and User Manual statements (page 434).	Refer to OET 65, FCC Part 1 and RSS 102	Complies

#### MEASUREMENT UNCERTAINTIES

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

Measurement Type	Frequency Range (MHz)	Calculated Uncertainty (dB)
Conducted Emissions	0.15 to 30	± 2.4
Radiated Emissions	0.015 to 30	$\pm 3.0$
Radiated Emissions	30 to 1000	$\pm 3.6$
Radiated Emissions	1000 10 40000	$\pm 0.0$

#### EQUIPMENT UNDER TEST (EUT) DETAILS

#### GENERAL

The Xirrus, Inc. model XN4 is a multi-radio 802.11abgn Access Point radio which is designed to act as a hub for a wireless local area network (WLAN). The device contains 4 individual 802.11abgn radios supporting legacy mode and 3x3n modes in the 2.4GHz band and legacy and 2x2n modes in the 5 GHz bands. All four radios use internal antennas, with one radio also having the option to use an external antenna (the external antenna only supports legacy mode operation, no MIMO modes). The XN4 is powered via a proprietary PoE connection.

Normally, the EUT's would be ceiling mounted during operation. Preliminary measurements were made with the EUT tested as table-top equipment and also at a height of 1.5m above the ground plane. No significant difference in emissions was observed so formal tests were performed as table-top equipment

The sample was received on October 23, 2008 and tested on October 24, November 3, November 4, November 5, November 6, November 7, November 10 and November 11, 2008. Conducted emissions measurements were made on January 7, 2009. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Xirrus	XN4	802.11abgn access point	Prototype	SK6XN4
PhiHong	P73800202A1	PoE Injector	POE60U- 560(G)-SS-R	N/A

The sample was returned on October 30, 2009 and tested between November 3, and November 13, 2009. The purpose of these tests was to evaluate the compliance with the FCC's interim policy for devices operating in the 5470-5725 MHz band.

#### ANTENNA SYSTEM

Each of the radios connects to an internal antenna set configured for 3x3 MIMO operation in 2.4GHz bands and 2x2 MIMO operation in the 5GHz bands. Each internal antenna has a maximum gain of between 0 and 1dBi in the 2.4GHz band and 6dBi in the 5GHz bands.

One radio also has provision for connecting to a single external antenna to operate (typically) as a single-chain, receive-only radio. The external antenna connects to the EUT via a non-standard reverse TNC antenna connector, thereby meeting the requirements of FCC 15.203. The external antenna's maximum gain is 2.5dBi for all bands.

#### ENCLOSURE

The EUT enclosure is primarily constructed of plastic. It measures approximately 32 cm in diameter by 6 cm high.

#### MODIFICATIONS

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

#### SUPPORT EQUIPMENT

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

Company	Model	Description	Serial Number	FCC ID
IBM	Thinkpad R51	Laptop	-	-

No remote support equipment was used during testing.

#### EUT INTERFACE PORTS

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

Dort	Connected To	Cable(s)			
FOIL	Connected 10	Description	Shielded or Unshielded	Length(m)	
PoE IN	Switch	Cat 5	Unshielded	10.0	
PoE Out	Data& Power IN	Cat 5	Unshielded	1.0	
AC Power	PoE	3 wire	Unshielded	1.5	

Note: The service port was not connected during testing. The manufacturer stated that this is for setup purposes and therefore would not normally be connected.

#### EUT OPERATION

During testing the EUT was configured in either a transmit or a receive mode using ART software.

For transmit mode one or more of the four radios was configured to continuously transmit on a specific channel on one or more chains. Each radio could be configured for a single chain operation (legacy 802.11b, g or a modes) or for multi-chain (MIMO) operation (all modes). In receive mode one or more radios was configured in a receive only mode with all chains active.

When evaluating the external antenna only one radio was operating during testing. When evaluating the internal antennas the rf port and radiated band edge measurements were made with a single radio operational. Radiated spurious measurements were made with multiple radios active to allow for evaluating spurious emissions with radios active on top, bottom and center channels. This also allowed for evaluation of any intermodulation products from the system (none were observed).

#### 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.

Sito	Registratio	Location	
Site	FCC	Canada	
SVOATS #1	90592	IC 2845-1	684 West Maude Ave,
SVOATS #2	90593	IC 2845-2	CA 94085-3518

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

#### CONDUCTED EMISSIONS CONSIDERATIONS

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

#### RADIATED EMISSIONS CONSIDERATIONS

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

#### MEASUREMENT INSTRUMENTATION

#### RECEIVER SYSTEM

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

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

#### INSTRUMENT CONTROL COMPUTER

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

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

#### LINE IMPEDANCE STABILIZATION NETWORK (LISN)

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

#### FILTERS/ATTENUATORS

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

#### ANTENNAS

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

#### ANTENNA MAST AND EQUIPMENT TURNTABLE

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

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

#### INSTRUMENT CALIBRATION

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

#### **TEST PROCEDURES**

#### EUT AND CABLE PLACEMENT

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

#### CONDUCTED EMISSIONS

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



#### RADIATED EMISSIONS

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

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

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

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



Typical Test Configuration for Radiated Field Strength Measurements



The ground plane extends beyond the ellipse defined in CISPR 16 / CISPR 22 / ANSI C63.4 and is large enough to accommodate test distances (d) of 3m and 10m. Refer to the test data tables for the actual measurement distance.



<u>Test Configuration for Radiated Field Strength Measurements</u> <u>OATS- Plan and Side Views</u>

#### CONDUCTED EMISSIONS FROM ANTENNA PORT

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



#### Test Configuration for Antenna Port Measurements

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

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

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

#### BANDWIDTH MEASUREMENTS

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

#### SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

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

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

#### GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands<sup>1</sup> (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 <sub>KHz</sub> @ 300m	67.6-20*log <sub>10</sub> (F <sub>KHz</sub> ) @ 300m
0.490-1.705	24000/F <sub>KHz</sub> @ 30m	87.6-20*log <sub>10</sub> (F <sub>KHz</sub> ) @ 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

#### 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		

<sup>&</sup>lt;sup>1</sup> The restricted bands are detailed in FCC 15.203, RSS 210 Table 1 and RSS 310 Table 2

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

The peak excursion envelope is limited to 13dB.

#### **OUTPUT POWER LIMITS –LELAN DEVICES**

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

Operating Frequency	Output Power	Power Spectral
(MHz)		Density
5150 - 5250	200mW (23 dBm) eirp	10 dBm/MHz eirp
5250 - 5350	$250 \text{ mW} (24 \text{ dBm})^1$ 1W (30dBm) eirp	11 dBm/MHz
5470 - 5725	$250 \text{ mW} (24 \text{ dBm})^2$ 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.

#### SPURIOUS LIMITS – UNII and LELAN DEVICES

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

<sup>&</sup>lt;sup>1</sup> If EIRP exceeds 500mW the device must employ TPC

<sup>&</sup>lt;sup>2</sup> If EIRP exceeds 500mW the device must employ TPC

#### 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:

 $\begin{array}{lll} F_d &=& \text{Distance Factor in dB} \\ D_m &=& \text{Measurement Distance in meters} \\ D_s &=& \text{Specification Distance in meters} \end{array}$ 

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

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

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

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

$$R_c = R_r + F_d$$

and

 $M = R_c - L_s$ 

where:

- $R_r$  = Receiver Reading in dBuV/m
- $F_d$  = Distance Factor in dB
- $R_c$  = Corrected Reading in dBuV/m
- $L_S$  = Specification Limit in dBuV/m
- M = Margin in dB Relative to Spec

## EXHIBIT 1: Test Equipment Calibration Data

2 Pages

Radiated Emissions, 30 - 40 Engineer: Mehran Birgani	,000 MHz, 24-Oct-08					
Manufacturer	Description	Model #	Asset #	Cal Due		
Hewlett Packard	ewlett Packard Microwave Preamplifier, 1-26.5GHz					
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	10-Jun-10		
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40)	8564E	CH5273	24-Oct-08		
Dedicted Emissions 20 19	000 MHz 20 Oct 09 (Beasiver Spurious)					
Radiated Emissions, 30 - 16	,000 MHZ, 30-Oct-08 (Receiver Spurious)					
Engineer: Menran Birgani	Description	Madal #	A			
<u>Manufacturer</u>	Description		ASSet #			
	Antenna, Horn, 1-18 GHZ	3115	487	15-Jul-10		
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	06-Jun-09		
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-N0V-08		
Radiated Emissions, 1,000 -	• 40,000 MHz, 03-Nov-08					
Engineer: Mehran Birgani						
Manufacturer	Description	Model #	Asset #	Cal Due		
EMCO	Antenna, Horn, 1-18 GHz	3115	487	15-Jul-10		
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	06-Jun-09		
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Nov-08		
Radiated Emissions, 1000 -	40,000 MHz, 05-Nov-08					
Manufacturer	Description	Model #	∆sset #	Cal Due		
EMCO	Antenna Horn 1-18 GHz	3115	<u>487</u>	15- Jul-10		
Howlett Packard	Microwaya Proamplifier 1 26 5CHz	9110 9110 8	795			
Howlett Packard	Speeds 20 Hz 40 GHz SV (SA40) Ped	9564E (94125C)	11/0	24 Nov 08		
Tiewiell Fackaru	Speckii 30 Hz -40 GHz, 37 (3A40) Keu	8304L (84123C)	1140	24-1100-00		
Receiver Spurious Emission	ns, 14-Nov-08					
Engineer. Sunalia Khushza	u Decerintian	Model #	Accet #			
<u>Manufacturer</u>	Antonno Llorn 1 19 Cluz		<u>ASSEL #</u>			
EMCO	Microwaya Draamplifier 4 26 FOUr	3113	407	15-Jul-10		
Hewlett Deckard			1110	00-Jun-09		
	Specan 30 Hz -40 GHz, SV (SA40) Red	0004E (04120C)	1140	24-IN0V-06		
Conducted Emissions - AC	Power and Telecommunications Ports, 07-Jan-09					
Engineer: Joseph Cadigal				<b>.</b>		
<u>Manufacturer</u>	Description	<u>Model #</u>	Asset #	<u>Cal Due</u>		
Hewlett Packard	SpecAn 9 KHz-26.5 GHz, Non-Program	8563E	284	29-Dec-09		
Elliott Laboratories	LISN, FCC / CISPR	LISN-4, OATS	362	31-Jul-09		
Fischer Custom Comm.	150-50 ohm adapter, 1/2, 0.15 to 80 MHz	FCC-801-150-50	873	03-Jun-09		
Rohde & Schwarz	Test Receiver, 9 kHz-2750 MHz	ESCS 30	1337	02-Oct-09		
Rohde& Schwarz	Pulse Limiter	ESH3 Z2	1398	12-Feb-09		
Radio Antenna Port (Power	and Spurious Emissions), 06-Nov-08 to 11-Nov-08	}				
Engineer: Mehran Birgani	,					
Manufacturer	Description	Model #	Asset #	Cal Due		
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Nov-08		

Radio Antenna Port (Powe Engineer: Mehran Birgani	r and Spurious Emissions), 06-Nov-08			
Manufacturer	Description	Model #	Asset #	Cal Due
Hewlett Packard	8564E (84125C)	1148	24-Nov-08	
Radio Antenna Port (Powe	r and Spurious Emissions), 10-Nov-08			
Engineer: Mehran Birgani	<b>—</b> • • •			
Manufacturer	Description	Model #	Asset #	Cal Due
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Nov-08
Radio Antenna Port (Powe	r and Spurious Emissions), 11-Nov-08			
Manufacturer	Description	Model #	Asset #	Cal Due
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Nov-08
Radio Antenna Port (Powe	r and Spurious Emissions), 03-Nov-09			
Engineer: Sunalla Knushza		Ma		
Manufacturer	Description	Model #	Asset #	<u>Cal Due</u>
Agilent	PSA, Spectrum Analyzer, (installed options, 111,	E4446A	2139	30-Dec-09
-	115, 123, 105, 673, HTX,			
Radiated Emissions, 30 - 1	8,000 MHz, 05-Nov-09			
Engineer: Rafael Varelas				
<u>Manufacturer</u>	Description	Model #	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	487	15-Jul-10
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	19-Aug-10
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	12-Mar-10
Micro-Tronics	Band Reject Filter, 5470-5725 MHz	BRC50704-02	1681	26-May-10
Radio Antenna Port (Powe	r and Spurious Emissions), 10-Nov-09			
Engineer: Suhaila Khushza	ad			
Manufacturer	Description	Model #	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	487	15-Jul-10
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	19-Aug-10
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	12-Mar-10
Micro-Tronics	Band Reject Filter, 5470-5725 MHz	BRC50704-02	1681	26-May-10

## EXHIBIT 2: Test Measurement Data

T73388 (RF Port measurements)	104 pages
T73389 (Transmitter radiated measurements)	38 pages
T77249 Radiated spurious and rf port measurements, center channels for each operating mode in the 5470- 5725 MHz band	30 pages
T73385 (AC Conducted emissions measurements)	6 pages



# EMC Test Data

	company		
Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73388
		Account Manager:	Susan Pelzl
Contact:	Steve Smith		Mark Briggs
Emissions Standard(s):	FCC 15 E, RSS 210	Class:	NII
Immunity Standard(s):	-	Environment:	Wireless

## **NII RF Port Test Data**

For The

## Xirrus

Model

XN4

Date of Last Test: 11/11/2008

#### Temperature: 15-35 °C Rel. Humidity: 10-60 % Summary of Results Run # Test Performed Limit Result / Margin Pass / Fail Single radio: 16.2 dBm 15.407(a) (1), (2) 1 Power, 5150 - 5250MHz Pass 4x radio: 16.3 dBm 15.407(a) (1), (2) 3.7 dBm/MHz PSD, 5150 - 5250MHz Pass 1 1 26dB Bandwidth 15.407 23.4 MHz -1 99% Bandwidth **RSS 210** 17.2 MHz 2 Peak Excursion Envelope 15.407(a) (6) Pass 11.9 dB Antenna Conducted All emissions below the 3 15.407(b) Pass Out of Band Spurious -27dBm/MHz limit Modifications Made During Testing No modifications were made to the EUT during testing Deviations From The Standard No deviations were made from the requirements of the standard.

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

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

Date of Test: 11/6/2008 Test Engineer: Mehran Birgani Test Location: SV OATS #2

Config. Used: -Config Change: Direct connection EUT Voltage: 120V/60Hz

#### General Test Configuration

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

Δ	mhiont	Conditions	

## Ambient Conditions:

# EMC Test Data

Elliott Client: Xirrus Model: XN4

Contact: Steve Smith Standard: FCC 15 E, RSS 210

Test Specific Details

Class: N/A

Job Number: J71484 T-Log Number: T73388

Account Manager: Susan Pelzl

# Elliott

# EMC Test Data

	An ZALZO company		
Client:	Xirrus	Job Number:	J71484
Model:	VN/	T-Log Number:	T73388
	×1N4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

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

Antenna gain used is for the internal antenna. The external antenna gain is lower (2.5dBi) and not used for MIMO modes. Antenna Gain (dBi): 3.0

Dowor cotti	nac for a cir	aglo radio o	porating in t	bo band	7	a can (abi)	0.0			
Frequency	Software	Band	width	Output Po	wer <sup>1</sup> dBm	Power	Р	SD <sup>2</sup> dBm/Mł	Ηz	Decult
(MHz)	Setting	26dB	<b>99</b> % <sup>4</sup>	Measured	Limit	(Watts)	Measured	FCC Limit	RSS Limit <sup>3</sup>	Result
5180	18.5	23.4	17.2	16.2	17.0	0.042	3.7	4.0	7.0	Pass
5200	18.0	21.5	17.2	15.9	17.0	0.039	3.5	4.0	7.0	Pass
5240	18.5	21.5	17.2	16.1	17.0	0.041	3.6	4.0	7.0	Pass

#### Power settings for all four channels being used in the band

Output power measured on the centre channel to demonstrate power control is available to set the power to a level low enough to comply with limits when all four radios are operational in the band. Only power was measured - aggregation of PSD is not applicable as the device cannot have more than one radio operating on a channel.

Frequency	Software	Band	width	Measure	d Power <sup>1</sup>		
(MHz)	Setting	26dB	<b>99%</b> <sup>4</sup>	dBm	mW		
5200	11.0	19.1	17.2	10.3	10.7	Limit	
	Total	Power Acros	ss The Band	16.3	42.9	17 dBm	
Note 1:	Output po RBW=1M over 40 N	wer measure Hz, VB=3 MH IHz	ed using a sp Hz, sample d	ectrum analy etector, powe	/zer (see plot er averaging	ts below): on (transmitt	ed signal was continuous) and power integration
Note 2:	Measured	l using the sa	ime analyzer	settings use	ed for output	power.	
Note 3:	For RSS- 10dBm/M average F amount th	210 the limit f Hz. The limits PSD (calculat pat the measu	for the 5150 s are also co ed from the r ured value ex	- 5250 MHz I rrected for in measured po acceeds the av	band accoun stances whe wer divided l verage by mo	ts for the ante re the highes by the measu ore than 3dB.	enna gain as the maximum eirp allowed is t measured value of the PSD exceeds the red 99% bandwidth) by more than 3dB by the
Note 4:	99% Band	dwidth measu	ured in accore	dance with R	SS GEN - R	B > 1% of spa	an and VB >=3xRB







# EMC Test Data

Æ	Elliott An DEA' company	EMO	C Test Data
Client:	Xirrus	Job Number:	J71484
Madalı	VN/A	T-Log Number:	T73388
woden	∧1\4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

#### Run #2: Peak Excursion Measurement

Device meets the requirement for the peak excursion

Freq	Peak Excursion(dB)		Freq	Peak Excursion(dB)		Freq	Peak Excursion(dB)	
(MHz)	Value	Limit	(MHz)	Value	Limit	(MHz)	Value	Limit
5180	11.9	13.0	5260		13.0	5500		13.0
5200	11.9	13.0	5300		13.0	5600		13.0
5240	11.8	13.0	5320		13.0	5700		13.0



Trace A: RBW = VBW = 3MHz, Peak hold Trace B: RBW = 1 MHz, VBW = 3MHz, Integrated average power







	Elliott			EM	C Test Data					
Client	Xirrus			Job Number:	J71484					
		T-Log Number:	T73388							
Model	XN4	Account Manager:	Susan Pelzl							
Contact	Steve Smith									
Standard	FCC 15 E, RSS 210	Class:	N/A							
Run #3: O MIMO Devi for out of ba	ut Of Band Spurious Emissions - Anten ices: As the output power setting for the si and spurious emissions to account for dual Number of transmit chains: Maximum Antenna Gain: Spurious Limit: Adjustment for 2 chains: Limit Used On Plots <sup>Note 1</sup> :	na Conducted ngle chain mode is h chain operation, the 2 6.0 dBi -27.0 dBm/MHz e -6.0 dB adjustm -39.0 dBm/MHz -19.0 dBm/MHz	higher than the plots below c (adjusted to eirp ent for multipl Average Lim Peak Limit (	e setting for dual chain, a over both single- and dua assume two coherent da le chains and coherency l hit (RB=1MHz, VB=10Hz) RB=VB=1MHz)	nd by adjusting the limit al chain operation. ta streams) between chains.					
Note 1: Note 2:	consideration the maximum antenna ga signals more than 50MHz from the band gain is not known at these frequencies. All spurious signals below 1GHz are mo	in (limit = -27dBm - ds and that are close easured during digita	antenna gain) e to the limit a al device radia	). Radiated field strength re made to determine cor	measurements for npliance as the antenna					
Note 3:	Signals within 10MHz of the 5.725 or 5.	Signals within 10MHz of the 5.725 or 5.825 Band edge are subject to a limit of -17dBm EIRP								
Note 4:	If the device is for outdoor use then the Signals that fall in the restricted hands (	-270Bm eirp limit al	so applies in t	ne 5150 - 5250 MHZ Dan f 15 200	d.					




## EMC Test Data

	An <u>B</u>		
Client:	Xirrus	Job Number:	J71484
Model:	VNA	T-Log Number:	T73388
	×1v4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

#### High channel, 5150 - 5250 MHz Band, Chains A and C

Note; Initial approval for FCC will only allow operation in the 5150 - 5250 MHz NII band so a plot showing -20dBc at 5250 MHz and above is included.



#### Ambient Conditions: Temperature: 15-36 °C Rel. Humidity: 10-60 % Run # Test Performed Limit Result / Margin Pass / Fail Single radio: 16.1 dBm 15.407(a) (1), (2) 1 Power, 5150 - 5250MHz Pass 4x radio: 16.6 dBm 15.407(a) (1), (2) 3.6 dBm/MHz PSD, 5150 - 5250MHz Pass 1 1 26dB Bandwidth 15.407 21.9 MHz -1 99% Bandwidth **RSS 210** 17.2 MHz 2 Peak Excursion Envelope 15.407(a) (6) Pass 12.6 dB Antenna Conducted Covered by single-chain 3 15.407(b) Out of Band Spurious mode measurements 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.

Date of Test: 11/7/2008 Test Engineer: Rafael Varelas Test Location: OATS #1

specification listed above.

Config. Used: -Config Change: Direct connection EUT Voltage: PoE

#### General Test Configuration

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

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

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

Summary of Results

EMC Test Data

Job Number: J71484 T-Log Number: T73388

Account Manager: Susan Pelzl

Class: N/A

<b>CEII</b>	iott
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Client: Xirrus Model: XN4

Contact: Steve Smith Standard: FCC 15 E, RSS 210

Test Specific Details

### EMC Test Data

	An <u>D</u>										
Client:	Xirrus					J	Job Number:	J71484			
Madal	VNA					T-L	T73388				
wouer.	A1N4					Accou	int Manager:	Susan Pelzl			
Contact:	Steve Smith										
Standard:	FCC 15 E, RSS 210				Class:	N/A					
<b>Run #1: Ba</b> i Antenna gai	Run #1: Bandwidth, Output Power and Power spectral Density Antenna gain used is for the internal antenna. The external antenna gain is lower (2 5dBi) and not used for MIMO modes										
5		Chain 1	Chain 2	Chain 3	Coherent	Effective <sup>5</sup>					
	Antenna Gain (dBi):	3		3	Yes	6.0					

#### Power settings for a single radio operating in the band

rower settings for a single ratio operating in the band											
Frequency	Software	26dB BW	Measure	d Output Pov	ver <sup>1</sup> dBm	То	otal	Limit (dBm)	Max Power	Pass or	
(MHz)	Setting	(MHz)	Chain 1	Chain 2	Chain 3	mW	dBm		(W)	Fail	
5180	14.5	20.8	12.4		13.7	40.8	16.1	17.0		PASS	
5200	15.0	22.1	12.6		12.9	37.6	15.8	17.0	0.041	PASS	
5240	15.0	21.9	12.5		13.6	40.5	16.1	17.0		PASS	
Frequency	99% <sup>4</sup> Total		Р	SD <sup>2</sup> dBm/MH	Iz Total		PSD	Lii	mit	Pass or	
(MHz)	BW	Power	Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210 <sup>3</sup>	Fail	
5180	17.2	16.1	-0.1		1.2	2.3	3.6	4.0	4.0	PASS	
5200	17.2	15.8	0.0		0.5	2.1	3.3	4.0	4.0	PASS	
5240	17.2	16.1	-0.1		1.0	2.2	3.5	4.0	4.0	PASS	
Note 1:	Output power measured using a spectrum analyzer (see plots below for the high power measurements): Note 1: RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50MHz.										
Note 2:	Measured u	sing the sam	e analyzer se	ettings used f	for output po	wer.					
Noto 2:	For RSS-21 10dBm/MHz	0 the limit for z. The limits a	the 5150 - 5 are also corre	250 MHz bar ected for insta	nd accounts ances where	for the anten the highest r	ina gain as th measured va	ne maximum Ilue of the PS	eirp allowed SD exceeds th	is ne average	

Note 3: PSD (calculated from the measured power divided by the measured 99% bandwidth) by more than 3dB by the amount that the measured value exceeds the average by more than 3dB.

 Note 4:
 99% Bandwidth measured in accordance with RSS GEN - RB > 1% of span and VB >=3xRB

 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 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.

Model: XN4 Contact: Steve S							~	lob Number:	J71484	
Contact: Steve S							T-L	og Number:	T73388	
Contact: Steve Smith							Accou	int Manager:	Susan Pelz	
	nith	10						01	N1/A	
Standard: FCC 15	E, RSS 2	10			Ale e le eve el			Class:	N/A	
Dutput power measu vith limits when all fo levice cannot have r	red on the our radios nore than	e high ch are oper one radi	annel to de ational in th io operating	monstrate po le band. On on a channe	ower control ly power was el.	is available t measured -	o set the pov aggregation	ver to a level of PSD is no	low enough applicable	to comply as the
Frequency Softwa	re 26d	B BM	Measure	d Output Pov	ver'dBm	To	otal			
(MHz) Settin 5240 0 5	y (1VI	1 0	Chain 1	Chain 2	Chain 3	mW	dBm 10.6	Limit	D (\\/\	Docu
0.0	Z Tota	l power i	n the band	(four radios of	o, i operational):	45.4	10.0 16.6	17.0	0.045	PASS
Output p	ower mea	asured us	sing a spec	trum analyze	er (see plots l	pelow for the	high power	measuremer	nts):	togration
Note 1: RBW=1	vihz, vb= /iHz.	3 IVIHZ, S	sample dele	ector, power	averaging or	lansmilled	i signai was (	continuous) a	and power in	legration
SPAN: 40.00 MHz RB 1.000 MHz VB 3.000 MHz Detector Sampl Att 30 RL Offset 7.00 Sweep Time 50 Ref Lvl: 20.00DE Pwr avg: 100 sr Amp corr: 0.0d Bin size: 67 kHz Highest PSD -0.07 dBm 99% Bandwidth 17.17 MHz Power Over Sp 17.624 m/w 12.46 dBm	e Oms M veeps B /1.000 MH	-10, -15, -20, -20, -30, -35, -35, -40, -45, -50, 5	0- 0- 0- 0- 0- 0- 0- 5220.0 5	225.0 523	30.0 5235	0 5240.0 Frequency (	5245.0 MHz)	5250.0 5	255.0 526	
			99%	Bandwidth,	Power Over	Span and P	SD			















### EMC Test Data

(CE	Ellic	)tt		EMC Test Data						
Client:	Xirrus	Company		Jc	b Number:	J71484				
Madalı				T-Lo	g Number:	T73388				
Moder	XIN4			Accourt	t Manager:	Susan Pelzl				
Contact: Standard:	Steve Smith FCC 15 E, R	2SS 210			Class:	N/A				
	Powe	RSS-210 (LELAN Antenna Po F, PSD, Peak Excursion,	I) and FCC 15 ort Measurem , Bandwidth and	5.407(UN ents d Spuriou	II) s Emis:	sions				
Test Spec	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: 11/10 and 11/2008Config. Used: AC poweredTest Engineer: Mehran BirganiConfig Change: Direct connectionTest Location: SV OATS #1EUT Voltage: PoE										
General Test Configuration         When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators and cables used.         Ambient Conditions:       Temperature:       15-36 °C Rel. Humidity:       10-60 %         Summary of Results       Summary of Results       Summary of Results										
Run #	Mode	Test Performed	Limit	Pass / Fail		Result / Margin				
1	n20MHz	Power, 5150 - 5250MHz	15.407(a) (1), (2)	Pass	Singl	e radio: 16.6 dBm				
1	n20MHz	PSD 5150 - 5250MHz	15 407(a) (1) (2)	Pass	4X	radio: 16.5 dBm 3 0 dRm/MHz				
1	n20MHz	99% Bandwidth	RSS 210	-		18.4 MHz				
1	n40MHz	Power, 5150 - 5250MHz	15.407(a) (1), (2)	Pass	Singl 2x	e radio: 16.3 dBm radio: 16.7 dBm				
1	n40MHz	PSD, 5150 - 5250MHz	15.407(a) (1), (2)	Pass		0.6 dBm/MHz				
1	n40MHz	99% Bandwidth	RSS 210	-		36.7 MHz				
2	n20 & n40	Peak Excursion Envelope	15.407(a) (6)	Pass		12.9 dB				
3	n20 & n40	Antenna Conducted Spurious	15.407(b)	Pass	< -	27dBm/MHz eirp				
Modificat No modific Deviation No deviati	3       N2U & N4U       Antenna Conducted Spurious       15.407(b)       Pass       < -27dBm/MHz erp									

### EMC Test Data

Client:	Xirrus	Job Number:	J71484
Model:	VNA	T-Log Number:	T73388
	×1v4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

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

Antenna gain used is for the internal antenna. The external antenna gain is lower (2.5dBi) and not used for MIMO modes.

	Chain 1	Chain 2	Chain 3	Coherent	Effective <sup>5</sup>
Antenna Gain (dBi):	3		3	No	3.0

#### Power settings for a single radio operating in the band

	5	5	3									
Frequency	Software	26dB BW	Measure	d Output Pov	ver <sup>1</sup> dBm	То	ital	Limit (dDm)	Max Power	Pass or		
(MHz)	Setting	(MHz)	Chain 1	Chain 2	Chain 3	mW	dBm	сіпіц (арпі)	(W)	Fail		
5180	15.0	22.3	12.9	oridin' E	14.0	44.6	16.5	17.0		PASS		
5200	15.0	22.5	12.6		14.1	43.9	16.4	17.0	0.046	PASS		
5240	15.5	22.9	12.9		14.2	45.8	16.6	17.0		PASS		
5190	13.0	40.4	10.9		12.1	28.5	14.6	17.0	0.042	PASS		
5230	15.5	41.2	12.6		13.9	42.7	16.3	17.0	0.043	PASS		
Frequency	<b>99%</b> <sup>4</sup>	Total	Р	SD <sup>2</sup> dBm/MH	Iz	Total PSD		Lir	nit	Pass or		
(MHz)	BW	Power	Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210 <sup>3</sup>	Fail		
5180	18.4	16.5	0.3		1.2	2.4	3.8	4.0	7.0	PASS		
5200	18.3	16.4	-0.2		1.3	2.3	3.6	4.0	7.0	PASS		
5240	18.4	16.6	0.2		1.5	2.5	3.9	4.0	7.0	PASS		
5190	36.7	14.6	-5.2		-3.9	0.7	-1.5	4.0	7.0	PASS		
5230	36.6	16.3	-3.3		-1.7	1.1	0.6	4.0	7.0	PASS		
	Output power measured using a spectrum analyzer (see plots below for the high power measurements):											
Note 1:	Note 1: RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integratio								integration			
	over 40M	Hz (20MHz n	node) and 80	MHz (40MHz	z mode)							
Note 2:	Measured	l using the sa	ime analyzer	settings use	d for output	oower.						
	For RSS-2	210 the limit	for the 5150	- 5250 MHz k	band accoun	ts for the ant	enna gain as	s the maximu	m eirp allowe	ed is		
Note 3:	10dBm/MHz. The limits are also corrected for instances where the highest measured value of the PSD exceeds the											
11010 01	average PSD (calculated from the measured power divided by the measured 99% bandwidth) by more than 3dB by the											
	amount th	lat the measu	<u>ured value ex</u>	ceeds the av	verage by mo	ore than 3dB.						
Note 4:	99% Band	dwidth measu	ired in accord	dance with R	SS GEN - R	B > 1% of sp	an and VB >	=3xRB	6.1 I II I			
	For MIMC	) systems the	e total output	power and to	otal PSD are	calculated fo	orm the sum	of the powers	s of the indivi	dual chains		
	(in linear t	erms). The	antenna gain	used to dete	ermine the El	RP and limit	s for PSD/Ou	utput power d	lepends on th	ne operating		
Note 5:	mode of the	he MIMO dev	vice. If the si	gnals on the	non-coherer	it between th	e transmit ch	nains then th	e gain used	10		
	determine	e the limits is	the highest g	ain of the inc	dividual chair	is and the El	RP is the su	m of the prod	lucts of gain a	and power		
	on each c	hain. If the s	signals are co	herent then	the effective	antenna gair	n is the sum	(in linear tern	ns) of the gai	ns for each		
	chain and	the EIRP is	the product c	of the effectiv	e aain and to	otal power.						







### EMC Test Data

	An A	AS company								
Client:	Xirrus						J	ob Number:	J71484	
Madalı							T-L	og Number:	T73388	
woder:	XIN4						Accou	nt Manager:	Susan Pelzl	
Contact:	Steve Smith									
Standard:	FCC 15 E, F	RSS 210						Class:	N/A	
Power setti The lowest p 20MHz char Output powe with limits w device cann	ngs for all fo power level manel available er measured hen all four r ot have more	our n20 char equired per r e, with both ra on the cente adios are op e than one ra	nnels and be adio is 14dBi adios at 14dE r channel to erational in th dio operating	oth n40 char m for two rac 3m the total p demonstrate he band. On g on a channe	nnels being u dios operating power in the b power contro ly power was el.	used in the in n40MHz and is 17dE I is available measured -	band: (two 40 MHz Bm). e to set the po aggregation	or one 40M ower to a lev of PSD is no	Hz channel a el low enoug t applicable a	nd one h to comply as the
Frequency	Software	26dB BW	Measure	d Output Pov	wer <sup>1</sup> dBm	To	otal			
(MHz)	Setting	(MHz)	Chain 1	Chain 2	Chain 3	mW/	dBm			
5200	8.5	22.5	6.7	Ondin 2	8.2	11.3	10.5	Limit	P (W)	Result
Tota	al power in th	e band (four	radios opera	itional in n20	MHz mode):	45.1	16.5	17.0	0.045	PASS
Frequency	Software	26dB BW	Measure	d Output Pov	wer <sup>1</sup> dBm	To	otal			
(MHz)	Setting	(MHz)	Chain 1	Chain 2	Chain 3	mW	dBm			
5190	12.0	40.4	9.8		11.4	23.4	13.7			
5230	12.0	41.2	9.7		11.4	23.1	13.6	Limit	P (W)	Result
Tot	al power in th	ne band (two	radios opera	itional in n40	MHz mode):	46.5	16.7	17.0	0.046	PASS
Note 1: Note 2:	Output power measured using a spectrum analyzer (see plots below for the high power measurements):           Note 1:         RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 40MHz (20MHz mode) and 80MHz (40MHz mode)           Note 2:         Measured using the same analyzer settings used for output power.									
Note 3:	For RSS- 10dBm/M average F amount th	210 the limit i Hz. The limit: PSD (calculat <u>iat the measi</u>	for the 5150 s are also co ed from the r <u>ured value ex</u>	- 5250 MHz I rrected for in measured po <u>ceeds the av</u>	band account istances wher wer divided b verage by mo	s for the ant e the highes y the measu re than 3dB	tenna gain as st measured v ured 99% bar	the maximu value of the l idwidth) by n	m eirp allowe PSD exceeds nore than 3d	ed is s the B by the
Note 4:	99% Band	dwidth measu	ured in accord	dance with R	RSS GEN - RE	3 > 1% of sp	an and VB >=	=3xRB		
Note 5:	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 abelin and the EIRP is the sum (in linear terms) of the gains for each abelin and the EIRP is the sum (in linear terms) of the gains for each abelin and the EIRP is the sum (in linear terms) of the gains for each abelin and the EIRP is the sum (in linear terms) of the gains for each abelin and the EIRP is the sum (in linear terms) of the gains for each abelin and the EIRP is the sum (in linear terms) of the gains for each abelin and the EIRP is the sum (in linear terms) of the gains for each abelin and the EIRP is the sum (in linear terms) of the gains for each abelin and the EIRP is the sum (in linear terms) of the gains for each abelin and the EIRP is the sum (in linear terms) of the gains for each abelin and the EIRP is the sum (in linear terms) of the gains for each abelin and the EIRP is the sum (in linear terms) of the gains for each abelin and the EIRP is the sum (in linear terms) of the gains for each abelin and the EIRP is the sum (in linear terms) of the gains for each abelin and the EIRP is the sum (in linear terms) of the gains for each abelin and the EIRP is the sum (in linear terms) of the gains for each abelin and the EIRP is the sum (in linear terms) of the gains for each abelin and the EIRP is the sum (in linear terms) of the gains for each abelin and the EIRP is the sum (in linear terms) of the gains for each abelin and the EIRP is the sum (in linear terms) of the gains (in linear terms) of the g									

## EMC Test Data

C	An AZAS <sup>*</sup> company		
Client:	Xirrus	Job Number:	J71484
Model	YNA	T-Log Number:	T73388
Mouel.	AIN4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

#### Run #2: Peak Excursion Measurement

Elliott

Device meets the requirement for the peak excursion

Freq	Mode/	Peak Exc	ursion(dB) Mode/		Peak Exc	ursion(dB)
(MHz)	Chain	Value	Limit	Chain	Value	Limit
5180	n20 A	11.7	13.0	n20 C	11.1	13.0
5200	n20 A	11.4	13.0	n20 C	12.1	13.0
5240	n20 A	11.9	13.0	n20 C	11.6	13.0
5190	n40 A	12.9	13.0	n40 A	12.7	13.0
5230	n40 A	12.3	13.0	n40 C	12.6	13.0





(CE	Elliott	EMO	C Test Data
Client:	Xirrus	Job Number:	J71484
Model	YN4	T-Log Number:	T73388
	A114	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A
Run #3: Ou	t Of Band Spurious Emissions - Antenna Conducted		
MIMO Devic each chain i	ces: Antenna gain used is the effective gain calculated in the power section         ndividually and the limit was adjusted to account for all chains transmitting si         Number of transmit chains:       2         Maximum Antenna Gain:       3.0 dBi         Spurious Limit:       -27.0 dBm/MHz eirp         Adjustment for 2 chains:       -3.0 dB adjustment for multiple         Limit Used On Plots       -33.0 dBm/MHz	of this data sheet. The p imultaneously e chains. it (RB=1MHz, VB=10Hz)	lots were obtained for
	-13.0 dBm/MHz Peak Limit (I	RB=VB=1MHz)	eted to take into
Note 1:	consideration the maximum antenna gain (limit = -27dBm - antenna gain) signals more than 50MHz from the bands and that are close to the limit ar gain is not known at these frequencies.	<ul> <li>Radiated field strength</li> <li>re made to determine cor</li> </ul>	measurements for npliance as the antenna
Note 2:	All spurious signals below 1GHz are measured during digital device radia	ted emissions test.	
Note 3:	Signals within 10MHz of the 5.725 or 5.825 Band edge are subject to a lin	nit of -17dBm EIRP	d
Note 5:	Signals that fall in the restricted bands of 15 205 are subject to the limit of	110 5150 - 5250 MHZ Dahi f 15 209	u.

#### Elliott EMC Test Data Client: Xirrus Job Number: J71484 T-Log Number: T73388 Model: XN4 Account Manager: Susan Pelzl Contact: Steve Smith Standard: FCC 15 E, RSS 210 Class: N/A Plots Showing Out-Of-Band Emissions (RBW=VBW=1MHz) on Each Chain 802.11n - 20MHz, Low channel, 5150 - 5250 MHz Band (5180 MHz) with power setting of 17.0 dBm. Compliance with the radiated limits for the restricted band immediately below 5150MHz is demonstrated through the radiated emissions tests. 20dB attenuation pad at front of analyzer and 20dB attenuation at software level. Peak Measurment (RB = VB = 1MHz) with Average limit at 5180 MHz - 802.11n 20 mode 20.0 10.0 0.0 Amplitude (dBm) -10.0 -20.0 -30.0 -40.0 -50.0-30 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 Frequency (MHz)

20dB attenuation pad at front of analyzer and 0dB attenuation at software level to reduce the noise floor.





20dB attenuation pad at front of analyzer and 0dB attenuation at software level to reduce the noise floor.



### EMC Test Data

	An <u>B</u>		
Client:	Xirrus	Job Number:	J71484
Model	YNA	T-Log Number:	T73388
woder:	AN4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

#### 802.11n - 20MHz, High channel, 5150 - 5250 MHz Band (5240 MHz) with power setting of 17.0 dBm.

Note; Initial approval for FCC will only allow operation in the 5150 - 5250 MHz NII band so a plot showing -20dBc at 5250 MHz and above is included.

20dB attenuation pad at front of analyzer and 20dB attenuation at software level.



20dB attenuation pad at front of analyzer and 0dB attenuation at software level to reduce the noise floor.







#### 802.11n - 40MHz, High channel, 5150 - 5250 MHz Band (5230 MHz)

Note; Initial approval for FCC will only allow operation in the 5150 - 5250 MHz NII band so a plot showing -20dBc at 5250 MHz and above is included.

20dB attenuation pad at front of analyzer and 20dB attenuation at software level.





5235

-30.0-¦ | 5230

Frequency (MHz)

5240

5255

5250

5245

#### Elliott EMC Test Data Client: Xirrus Job Number: J71484 T-Log Number: T73388 Model: XN4 Account Manager: Susan Pelzl Contact: Steve Smith Standard: FCC 15 E, RSS 210 Class: N/A RSS-210 (LELAN) and FCC 15.407(UNII) **Antenna Port Measurements** Power, PSD, Peak Excursion, Bandwidth and Spurious Emissions Test Specific Details Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above. Date of Test: 11/6/2008 Config. Used: -Config Change: Direct connection Test Engineer: Mehran Birgani Test Location: SV OATS #2 EUT Voltage: 120V/60Hz General Test Configuration When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators and cables used. Ambient Conditions: Temperature: 15-35 °C Rel. Humidity: 10-60 % Summary of Results Run # Test Performed Limit Result / Margin Pass / Fail Single radio: 18.3 dBm 1 Power, 5250 - 5350MHz 15.407(a) (1), (2) Pass 3x radio: 23.1dBm 4x radio: 23.3 dBm 15.407(a) (1), (2) PSD, 5250 - 5350MHz 5.7 dBm/MHz Pass 1 1 26dB Bandwidth 15.407 24.0 MHz Pass 17.2 MHz 1 99% Bandwidth RSS 210

Antenna Conducted 15.407(b)		All omissions holow the
Out of Band Spurious	Pass	-27dBm/MHz limit

#### Modifications Made During Testing

No modifications were made to the EUT during testing

#### **Deviations From The Standard**

No deviations were made from the requirements of the standard.

## EMC Test Data

	An ZALES company		
Client:	Xirrus	Job Number:	J71484
Model:	YNA	T-Log Number:	T73388
	AIN4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

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

Antenna gain used is for the internal antenna. The external antenna gain is lower (2.5dBi) and not used for MIMO modes. Antenna Gain (dBi): 3.0

Antenna Gai	n (ani):	3.0

Power setti	Power settings for a single radio operating in the band										
Frequency	Software	Band	lwidth	Output Po	ower <sup>1</sup> dBm	Power	Р	SD <sup>2</sup> dBm/Mł	Ηz	Posult	
(MHz)	Setting	26dB	<b>99</b> % <sup>4</sup>	Measured	Limit	(Watts)	Measured	FCC Limit	RSS Limit <sup>3</sup>	Result	
5260	20.0	23.3	17.2	18.3	24.0	0.068	5.7	11.0	11.0	Pass	
5280	20.0	22.7	17.2	18.1	24.0	0.065	5.6	11.0	11.0	Pass	
5320	19.5	24.0	17.2	18.0	24.0	0.063	5.4	11.0	11.0	Pass	

#### Power settings for mutliple channels being used in the band

Output power measured on the centre channel to demonstrate power control is available to set the power to a level low enough to comply with limits when all four radios are operational in the band. Only power was measured - aggregation of PSD is not applicable as the device cannot have more than one radio operating on a channel.

						_	
Frequency	Software	Band	lwidth	Measure	ed Power <sup>1</sup>		
(MHz)	Setting	26dB	<b>99</b> % <sup>4</sup>	dBm	mW		
5260	20.0	23.3	17.2	18.3	67.6	Limit	
To	tal Power Ac	ross The Bai	nd - 3 radios	23.1	202.8	24 dBm	
						_	
Frequency	Software	Band	lwidth	Measure	ed Power <sup>1</sup>		
(MHz)	Setting	26dB	<b>99%</b> <sup>4</sup>	dBm	mW		
5280	19.0	21.9	17.2	17.3	53.7	Limit	
То	tal Power Ac	ross The Bai	nd - 4 radios	23.3	214.8	24 dBm	
Output power measured using a spectrum analyzer (see plots below): Note 1: RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 40 MHz							
Note 2:	Measured	using the sa	ame analyzer	settings use	ed for output	power.	
Note 3:	For RSS-2 10dBm/M average F amount th	210 the limit Hz. The limit 2SD (calculat at the measu	for the 5150 s are also co ed from the r ured value ex	- 5250 MHz rrected for ir measured po cceeds the a	band accoun istances whe ower divided l verage by mo	ts for the ant re the highes by the measu ore than 3dB.	enna gain as the maximum eirp allowed is st measured value of the PSD exceeds the ured 99% bandwidth) by more than 3dB by the
Note 4:	99% Band	lwidth measu	ured in accore	dance with F	RSS GEN - R	B > 1% of sp	an and VB $>=3xRB$







## EMC Test Data

Œ	Elliott An AZAS' company	EMO	C Test Data
Client:	Xirrus	Job Number:	J71484
Model:	YN 4	T-Log Number:	T73388
	AIN4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

#### Run #2: Peak Excursion Measurement

Device meets the requirement for the peak excursion

Freq	Peak Exc	ursion(dB)	Freq	Peak Excursion(dB)		Freq	Peak Exc	ursion(dB)
(MHz)	Value	Limit	(MHz)	Value	Limit	(MHz)	Value	Limit
5180		13.0	5260	11.5	13.0	5500		13.0
5200		13.0	5300	11.5	13.0	5600		13.0
5240		13.0	5320	11.8	13.0	5700		13.0

#### Plots Showing Peak Excursion

Trace A: RBW = VBW = 3MHz, Peak hold Trace B: RBW = 1 MHz, VBW = 3MHz, Integrated average power







<b>E</b>	Illiott			EM	C Test Data
Client	An AZES" company Xirrus			lob Number:	171484
Olichit.	741105			T-L og Number:	T73388
Model:	XN4			Account Manager:	Susan Pelzl
Contact:	Steve Smith				
Standard:	FCC 15 E, RSS 210			Class:	N/A
Run #3: Ou MIMO Devic for out of bai	t Of Band Spurious Emissions - Antenna Con ees: As the output power setting for the single ch and spurious emissions to account for dual chain of Number of transmit chains: Maximum Antenna Gain: 3.1	ducted ain mode is l pperation, the 2 0 dBi	higher than t plots below	the setting for dual chain, and cover both single- and dua	nd by adjusting the limit al chain operation.
	Spurious Limit: -27. Adjustment for 2 chains: -6. Limit Used On Plots <sup>Note 1</sup> : -36. -16.	) dBm/MHz ) dB adjustn ) dBm/MHz ) dBm/MHz	eirp hent for mult Average L Peak Limi	iple chains and coherency l imit (RB=1MHz, VB=10Hz) t (RB=VB=1MHz)	between chains.
Note 1:	The -27dBm/MHz limit is an eirp limit. The lim consideration the maximum antenna gain (limi signals more than 50MHz from the bands and gain is not known at these frequencies.	it for antenna t = -27dBm - that are close	i port condu antenna gai e to the limit	cted measurements is adjust in). Radiated field strength are made to determine cor	sted to take into measurements for npliance as the antenna
Note 2:	All spurious signals below 1GHz are measured	I during digita	al device rac	liated emissions test.	
Note 3:	Signals within 10MHz of the 5.725 or 5.825 Ba	nd edge are	subject to a	limit of -17dBm EIRP	
Note 4:	If the device is for outdoor use then the -27dBr	n eirp limit al	so applies in	n the 5150 - 5250 MHz ban	d.
Note 5:	Signals that fail in the restricted bands of 15.20	J5 are subjec	t to the limit	01 15.209.	






Æ				EMC Test Data							
Client:	Xirrus	2 company		J	ob Number:	J71484					
Model				T-L	og Number:	T73388					
would.	AN4			Accour	nt Manager:	Susan Pelzl					
Contact:	Steve Smith										
Standard:	FCC 15 E, F	RSS 210			Class:	N/A					
Test Spec Te Te General T When mea analyzer o allow for th	Antenna Port Measurements         Power, PSD, Peak Excursion, Bandwidth and Spurious Emissions         Test Specific Details         Objective:       The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.         Date of Test:       11/7/2008       Config. Used: AC powered         Test Engineer:       Rafeel Varelas       Config Change: Direct connection         Test Location:       OATS #1       EUT Voltage: PoE         General Test Configuration         When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators and cables used.										
Ambient ( Summary	Conditions	S: Temperature: Rel. Humidity:	: 15-36 °C : 10-60 %								
Ru	n #	Test Performed	Limit	Pass / Fail		Result					
1	l	Power, 5250 - 5350MHz	15.407(a) (1), (2)	Pass	Singl 4x	e radio: 21.3 dBm radio: 23.9 dBm					
1		PSD, 5250 - 5350MHz	15.407(a) (1), (2)	Pass	1	8.8 dBm/MHz					
1		26dB Bandwidth	15.407	-		25.8 MHz					
1		99% Bandwidth	RSS 210	-		17.3 MHz					
2	) -	Peak Excursion Envelope	15.407(a) (6)	Pass	Covered by	12.6 dB					
3	}	Out of Band Spurious	15.407(b)		mode mea	siriyie-criairi isurements					

## EMC Test Data

	An DLLL Company		
Client:	Xirrus	Job Number:	J71484
Model: X	YNA	T-Log Number:	T73388
	AIN4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

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

Antenna gain used is for the internal antenna. The external antenna gain is lower (2.5dBi) and not used for MIMO modes.

	Chain 1	Chain 2	Chain 3	Coherent	Effective <sup>5</sup>
Antenna Gain (dBi):	3		3	Yes	6.0

#### Power settings for a single radio operating in the band

<u> </u>	-								
Software	26dB BW	Measure	d Output Pov	ver <sup>1</sup> dBm	To	ital	Limit (dBm)	Max Power	Pass or
Setting	(MHz)	Chain 1	Chain 2	Chain 3	mW	dBm	Linin (abin)	(W)	Fail
20.0	24.9	17.9		18.3	128.7	21.1	24.0		PASS
20.0	25.8	18.7		17.8	134.3	21.3	24.0	0.134	PASS
19.0	25.3	17.6		16.5	102.2	20.1	24.0		PASS
<b>99%</b> <sup>4</sup>	Total	PSD <sup>2</sup> dBm/MHz		Total	PSD	Lir	mit	Pass or	
BW	Power	Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210 <sup>3</sup>	Fail
17.2	21.1	5.3		5.7	7.1	8.5	11.0	11.0	PASS
17.3	21.3	6.1		5.3	7.5	8.7	11.0	11.0	PASS
17.2	20.1	5.2		4.0	5.8	7.7	11.0	11.0	PASS
	Software Setting 20.0 19.0 99% <sup>4</sup> BW 17.2 17.3 17.2	Software         26dB BW           Setting         (MHz)           20.0         24.9           20.0         25.8           19.0         25.3           99% <sup>4</sup> Total           BW         Power           17.2         21.1           17.3         21.3           17.2         20.1	Software         26dB BW         Measurer           Setting         (MHz)         Chain 1           20.0         24.9         17.9           20.0         25.8         18.7           19.0         25.3         17.6           99% <sup>4</sup> Total         P?           BW         Power         Chain 1           17.2         21.1         5.3           17.3         21.3         6.1           17.2         20.1         5.2	Software         26dB BW (MHz)         Measured Output Pov Chain 1         Chain 2           20.0         24.9         17.9         17.9           20.0         25.8         18.7         100           19.0         25.3         17.6         17.9           99% <sup>4</sup> Total         PSD <sup>2</sup> dBm/MH           BW         Power         Chain 1         Chain 2           17.2         21.1         5.3         17.6           17.3         21.3         6.1         100           17.2         20.1         5.2         100	Software         26dB BW (MHz)         Measured Output Power <sup>1</sup> dBm Chain 1         Chain 2         Chain 3           20.0         24.9         17.9         18.3           20.0         25.8         18.7         17.8           19.0         25.3         17.6         16.5           99% <sup>4</sup> Total Power         PSD <sup>2</sup> dBm/MHz         Chain 3           17.2         21.1         5.3         5.7           17.3         21.3         6.1         5.3           17.2         20.1         5.2         4.0	Software         26dB BW         Measured Output Power <sup>1</sup> dBm         To           Setting         (MHz)         Chain 1         Chain 2         Chain 3         mW           20.0         24.9         17.9         18.3         128.7           20.0         25.8         18.7         17.8         134.3           19.0         25.3         17.6         16.5         102.2           99% <sup>4</sup> Total         PSD <sup>2</sup> dBm/MHz         Total           BW         Power         Chain 1         Chain 2         Chain 3         mW/MHz           17.2         21.1         5.3         5.7         7.1           17.3         21.3         6.1         5.3         7.5           17.2         20.1         5.2         4.0         5.8	Software Setting26dB BW (MHz)Measured Output Power1 dBmTotal20.024.917.9Chain 2Chain 3mWdBm20.024.917.918.3128.721.120.025.818.717.8134.321.319.025.317.616.5102.220.1PowerChain 1Chain 2Chain 3mW/MHz99%4TotalPSD <sup>2</sup> dBm/MHzTotal PSDBWPowerChain 1Chain 2Chain 3mW/MHzdBm/MHz17.221.15.35.77.18.517.321.36.15.37.58.717.220.15.24.05.87.7	Software         26dB BW         Measured Output Power <sup>1</sup> dBm         Total         Limit (dBm)           Setting         (MHz)         Chain 1         Chain 2         Chain 3         mW         dBm           20.0         24.9         17.9         18.3         128.7         21.1         24.0           20.0         25.8         18.7         17.8         134.3         21.3         24.0           19.0         25.3         17.6         16.5         102.2         20.1         24.0           99% <sup>4</sup> Total         PSD <sup>2</sup> dBm/MHz         Total         PSD         Lin           BW         Power         Chain 1         Chain 2         Chain 3         mW/MHz         dBm/MHz         FCC           17.2         21.1         5.3         5.7         7.1         8.5         11.0           17.3         21.3         6.1         5.3         7.5         8.7         11.0           17.2         20.1         5.2         4.0         5.8         7.7         11.0	Software Setting26dB BW (MHz)Measured Output Power <sup>1</sup> dBm Chain 1Total Chain 2Total MWMax Power (W)20.024.917.918.3128.721.124.020.025.818.717.8134.321.324.020.025.317.616.5102.220.124.099%4Total PowerPSD <sup>2</sup> dBm/MHzTotal PSDLimit MW/MHzFCCRSS 210 <sup>3</sup> 17.221.15.35.77.18.511.011.017.321.36.15.37.58.711.011.017.220.15.24.05.87.711.011.0

## EMC Test Data

	An DLLL Company		
Client:	Xirrus	Job Number:	J71484
Model:	YN4	T-Log Number:	T73388
	AIN4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

#### Power settings for all four 802.11a channels being used in the band:

Output power measured on the center channel to demonstrate power control is available to set the power to a level low enough to comply with limits when all four radios are operational in the band. Only power was measured - aggregation of PSD is not applicable as the device cannot have more than one radio operating on a channel.

Frequency	Software	26dB BW	Measure	d Output Pov	wer <sup>1</sup> dBm	To	tal	]		
(MHz)	Setting	(MHz)	Chain 1	Chain 2	Chain 3	mW	dBm			
5300	16.5	25.8	14.9		14.9	61.8	17.9	Limit	P (W)	Result
		Total power	r in the band	(four radios	operational):	247.2	23.9	24.0	0.247	PASS
Note 1:	Output powe RBW=1MHz over 50MHz	er measured z, VB=3 MHz	using a spec , sample dete	ctrum analyze ector, power	er (see plots k averaging on	pelow for the (transmitted	high power signal was	measuremer continuous) a	nts): and power in	egration
Note 2:	Measured u	sing the sam	e analyzer se	ettings used	for output pov	wer.				
Note 3:	For RSS-210 the limit for the 5150 - 5250 MHz band accounts for the antenna gain as the maximum eirp allowed is 10dBm/MHz. The limits are also corrected for instances where the highest measured value of the PSD exceeds the average PSD (calculated from the measured power divided by the measured 99% bandwidth) by more than 3dB by the amount that the measured value exceeds the average by more than 3dB.									
Note 4:	99% Bandw	idth measure	ed in accorda	nce with RS	S GEN - RB >	1% of span	and VB >=3	xRB		
Note 5:	(in linear ter mode of the the limits is chain. If the the FIRP is	with the first the former of t	tenna gain us e. If the sign ain of the inc coherent the	sed to deterr als on the no lividual chair n the effectiv e gain and to	nine the EIRF on-coherent b as and the EIF antenna ga otal power	P and limits for etween the t RP is the sum in is the sum	or PSD/Outp ransmit chai n of the prod n (in linear te	ut powers of ut power dep ns then the ucts of gain rms) of the g	pends on the gain used to and power or ains for each	operating determine each chain and



## EMC Test Data

	An Direction Company		
Client:	Xirrus	Job Number:	J71484
Model: XN	YNA	T-Log Number:	T73388
	×114	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

#### Run #2: Peak Excursion Measurement

Device meets the requirement for the peak excursion

Freq	Peak Exc	ursion(dB)	Freq	Peak Excursion(dB) Freq Peak Excursion		ursion(dB)		
(MHz)	Value	Limit	(MHz)	Value	Limit	(MHz)	Value	Limit
5180		13.0	5260	11.4	13.0	5500		13.0
5200		13.0	5300	11.7	13.0	5600		13.0
5240		13.0	5320	12.6	13.0	5700		13.0

## Plots Showing Peak Excursion

Trace A: RBW = VBW = 3MHz, Peak hold Trace B: RBW = 1 MHz, VBW = 3MHz, Integrated average power













<b>E</b>		)tt		EMC Test Data					
Client:	Xirrus	Company		Job	Number:	J71484			
Model				T-Log	Number:	T73388			
Wouer.	XIN4			Account	Manager:	Susan Pelzl			
Contact:	Steve Smith								
Standard:	FCC 15 E, R	210			Class:	N/A			
	Powe	RSS-210 (LELAN Antenna Pc er, PSD, Peak Excursion,	l) and FCC 15 ort Measurem , Bandwidth and	.407(UNI ents d Spurious	l) Emis:	sions			
Test Sper	cific Detail	S							
	Objective:	The objective of this test session is to specification listed above.	perform final qualificatio	n testing of the I	EUT with r	respect to the			
Date of Test: 11/10 and 11/2008Config. Used: AC poweredTest Engineer: Mehran BirganiConfig Change: Direct connectionTest Location: SV OATS #1EUT Voltage: PoE									
General I When mea analyzer o allow for t Ambient	General Test Configuration         When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators and cables used.         Ambient Conditions:       Temperature:       15-36 °C Rel. Humidity:       10-60 %         Summary of Results       Summary of Results								
Run #	Mode	Test Performed	Limit	Pass / Fail	F	Result / Margin			
1	n20MHz	Power, 5250-5350MHz	15,407(a) (1), (2)	Pass	Singl	e radio: 20.9 dBm			
1	= 201411-			Depe	4x	radio: 23.5 dBm			
1	n20MHz	PSD, 5250-5350IVIHZ	15.407(a) (1), (2) DSS 210	Pass		10 / MU7			
1	n40MHz	Power, 5250-5350MHz	15.407(a) (1), (2)	Pass	Single 2x	e radio: 20.4 dBm radio: 21.9 dBm			
1	n40MHz	PSD, 5250-5350MHz	15.407(a) (1), (2)	Pass		4.4 dBm/MHz			
1	n40MHz	99% Bandwidth	RSS 210	-		36.9 MHz			
2	n20 & n40	Peak Excursion Envelope	15.407(a) (6)	Pass		12.97 dB			
3	n20 & n40	Antenna Conducted Spurious	15.407(b)	Pass	< -2	27dBm/MHz eirp			
<b>Modificat</b> No modifica <b>Deviation</b> No deviatior	ions Made tions were ma Is From Th ns were made	ade to the EUT during testing <b>The Standard</b> <b>The Standard</b> <b>Standard</b> <b>Standard</b> <b>Standard</b> <b>Standard</b> <b>Standard</b> <b>Standard</b> <b>Standard</b> <b>Standard</b> <b>Standard</b> <b>Standard</b> <b>Standard</b> <b>Standard</b>	d.						

Client:	Xirrus							Job Number:	J71484	
Model	XNA						T-I	Log Number:	T73388	
mouch.							Αссоι	unt Manager:	Susan Pelzl	
Contact:	Steve Smith									
Standard:	FCC 15 E, F	RSS 210						Class:	N/A	
Run #1: Ba	ndwidth, Ou	tput Power	and Power s	spectral Der	isity					
Antenna gai	n used is for	the internal a	antenna. Th	e external an	itenna gain is	s lower (2.5d	Bi) and not u	sed for MIM	D modes.	
0			Chain 1	Chain 2	Chain 3	Coherent	Effective <sup>5</sup>	]		
	Antenna	a Gain (dBi):	3		3	No	3.0			
								-		
Power setti	ngs for a si	ngle radio o	perating in t	the band	1	1		1		_
Frequency	Software	26dB BW	Measure	d Output Po	wer'dBm	To	otal	Limit (dBm)	Max Power	Pass or
(MHz)	Setting	(MHZ)	Chain 1	Chain 2	Chain 3	mW	dBm	, ,	(VV)	Fail
5260	20.0	23.0	17.5		18.3	123.8	20.9	24.0	0.10.1	PASS
5300	20.0	24.3	18.0		1/.4	118.0	20.7	24.0	0.124	PASS
5320	18.5	22.1	16.4		15./	80.8	19.1	24.0		PASS
5270	20.0	44.0	17.1		17.0	108.8	20.4	24.0	0.109	PASS PASS
5510	10.5	41.0	13.0		13.5	40.4	10.7	24.0		1733
Frequency	<b>99</b> % <sup>4</sup>	Total	P	SD <sup>2</sup> dBm/MF	17	Tota	PSD	Li	mit	Pass or
(MHz)	BW	Power	Chain 1	Chain 2	Chain 3	m\////Hz	dBm/MHz	FCC	$DCC 210^3$	Fail
5260	18.4	20.9	4.9		5.5	6.6	8.2	11.0	11.0	PASS
5280	18.4	20.7	5.4		4.7	6.4	8.1	11.0	11.0	PASS
5320	18.4	19.1	3.8		3.0	4.4	6.4	11.0	11.0	PASS
5270	36.9	20.4	1.1		1.7	2.8	4.4	11.0	11.0	PASS
5310	36.9	16.7	-2.2		-2.4	1.2	0.7	11.0	11.0	PASS
	0.1.1.1.1.1					La la classa Cara I	0			
Noto 1		Wer measure	a using a sp da comple d	ectrum analy	zer (see pio	IS DEIOW IOF	ted signal we	er measuren	ienis):	intogration
NOLE T.	NOV AUM	ПZ, VD=3 №Г Ца (20МЦа м	nodo) and 80	етестог, ром мат (лома	ei averaying z modo)		teu signai wa		s) and power	Integration
Note 2:	Measured	using the sa	ame analyzer	r settinas use	ed for output	power.				
	For RSS-2	210 the limit f	for the 5250	- 5350 MHz	band accour	its for the ani	tenna gain as	s the maximu	m eirp allowe	ed is
Noto 2	11dBm/M	Hz. The limits	s are also co	rrected for in	stances whe	ere the highe	st measured	value of the	PSD exceeds	s the
NOLE 3.	average F	SD (calculat	ed from the i	measured po	wer divided	by the measure	ured 99% bai	ndwidth) by r	nore than 3d	3 by the
	amount th	at the measu	ured value ex	kceeds the av	verage by me	ore than 3dB				
Note 4:	99% Band	lwidth measu	ured in accor	dance with R	SS GEN - R	B > 1% of sp	an and VB >	=3xRB		
	For MIMC	systems the	e total output	power and to	otal PSD are	calculated for	orm the sum	of the power	s of the indivi	dual chains
	(in linear t	erms). The a	antenna gair	I USED to dete	ermine the E	IRP and limit	is for PSD/O	utput power (	lepends on tr	ne operating
	mode of the	ne ivilivio dev	/ICE. IF INE SI	ignais on the	non-conerer dividual abai	n beiween ir	ie transmit ci	nains inen ir	ie gain used i lucto of goin (	10 and nower
Note 5:	determine the limits is the highest gain of the individual chains and the EIRP is the sum of the products of gain and power									
Note 5:	on each c	hain If the c	cianale are er		me eneciive	anitenna yai			115101111001111001110011100111001100110	
Note 5:	on each c	hain. If the s	signals are co	of the effective	a nain and t	ntal nower		(	noy of the gain	







## EMC Test Data

	An ZAZZO company		
Client:	Xirrus	Job Number:	J71484
Model:	YNA	T-Log Number:	T73388
	AIN4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

## Power settings for all four n20 channels and both n40 channels being used in the band:

The device adjusts output power downwards if mutliple radios operate in the same band to maintain compliance with the total power limit for the band. Measuremetns were made at the lowest required power setting (i.e. all non-overlaping channels in the band occupied) to verify the device has the dynamic range to do this.

Frequency	Software	26dB BW	Measure	d Output Pov	wer <sup>1</sup> dBm	To	otal			
(MHz)	Setting	(MHz)	Chain 1	Chain 2	Chain 3	mW	dBm			
5300	17.0	24.3	14.6		14.4	56.4	17.5	Limit	P (W)	Result
Tota	I power in th	e band (four	radios opera	itional in n20	MHz mode):	225.5	23.5	24.0	0.226	PASS
Frequency	Software	26dB BW	Measure	d Output Pov	wer <sup>1</sup> dBm	То	otal			
(MHz)	Setting	(MHz)	Chain 1	Chain 2	Chain 3	mW	dBm			
5270	20.0	44.0	17.1		17.6	108.8	20.4			
5310	16.5	41.6	13.8		13.5	46.4	16.7	Limit	P (W)	Result
Tota	al power in th	ne band (two	radios opera	itional in n40	MHz mode):	155.2	21.9	24.0	0.155	PASS
	Output po	wer measure	ed using a sp	ectrum analy	yzer (see plot	s below for t	he high powe	er measurem	nents):	
Note 1:	RBW=1M	Hz, VB=3 Mł	Hz, sample d	etector, pow	er averaging	on (transmitt	ted signal wa	s continuous	s) and power	integration
	over 40M	Hz (20MHz n	node) and 80	MHz (40MH	z mode)					
Note 2:	Measured	l using the sa	ime analyzer	settings use	ed for output p	ower.				
	For RSS-2	210 the limit	for the 5250	- 5350 MHz	band account	ts for the ant	enna gain as	the maximu	m eirp allowe	ed is
Note 3	11dBm/M	Hz. The limit	s are also co	rrected for in	istances whei	re the highes	st measured v	value of the	PSD exceeds	s the
1010 0.	average F	PSD (calculat	ed from the r	measured po	ower divided b	by the measu	ured 99% bar	ndwidth) by r	nore than 3d	B by the
	amount th	nat the measu	ured value ex	ceeds the av	verage by mo	ore than 3dB				
Note 4:	99% Band	dwidth measu	ired in accor	dance with R	RSS GEN - RE	3 > 1% of sp	an and VB >:	=3xRB		
	For MIMC	) systems the	e total output	power and to	otal PSD are	calculated for	orm the sum of	of the power	s of the indivi	dual chains
	(in linear t	terms). The	antenna gain	used to dete	ermine the EI	RP and limit	s for PSD/Ou	itput power o	lepends on the	ne operating
Note 5:	mode of t	he MIMO dev	vice. If the si	gnals on the	non-coheren	t between th	ie transmit ch	ains then th	ne gain used	to
	determine	e the limits is	the highest g	jain of the ind	dividual chain	is and the El	RP is the sur	n of the proc	lucts of gain	and power
	on each c	hain. If the s	signals are co	pherent then	the effective	antenna gair	n is the sum (	in linear terr	ns) of the gai	ns for each
	chain and	the EIRP is	the product of	of the effective	e gain and to	ital power.				

<b>Elliott</b> EMC Tes			C Test Data
Client:	Xirrus	Job Number:	J71484
Model:	XN4 -	T-Log Number:	T73388
		Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

#### Run #2: Peak Excursion Measurement

Device meets the requirement for the peak excursion

Freq	Mode/	Peak Exc	ursion(dB)	Mode/	de/ Peak Excursion(dB)		
(MHz)	Chain	Value	Limit	Chain	Value	Limit	
5260	n20 A	11.2	13.0	n20 C	11.2	13.0	
5280	n20 A	11.3	13.0	n20 C	11.4	13.0	
5320	n20 A	11.9	13.0	n20 C	11.3	13.0	
5270	n40 A	12.6	13.0	n40 A	12.9	13.0	
5310	n40 A	12.8	13.0	n40 C	12.97	13.0	





Elliott	EMO	C Test Data
Client: Xirrus	Job Number:	J71484
Model: VNA	T-Log Number:	T73388
	Account Manager:	Susan Pelzl
Contact: Steve Smith Standard: FCC 15 E, RSS 210	Class:	N/A
Due #2. Out Of David Country Enviroinne Arthouse Country to d		
Run #3: Out Of Band Spurious Emissions - Antenna Conducted		
MIMO Devices: Antenna gain used is the effective gain calculated in the power section of	of this data sheet. The p	lots were obtained for
each chain individually and the limit was adjusted to account for all chains transmitting sin	multaneously	
Number of transmit chains: 2		
Maximum Antenna Gain: 3.0 dBi Spurious Limit: 27.0 dBm/MHz oirp		
Adjustment for 2 chains: -3.0 dB adjustment for multiple	chains	
	it (RB=1MHz, VB=10Hz)	
Limit Used On Plots in -13.0 dBm/MHz Peak Limit (R	RB=VB=1MHz)	
	,	
Note 1:       The -2/dBm//MHz limit is an erp limit. The limit for antenna port conducted n consideration the maximum antenna gain (limit = -27dBm - antenna gain). R more than 50MHz from the bands and that are close to the limit are made to known at these frequencies.         Note 2:       All spurious signals below 1GHz are measured during digital device radiated Note 3:         Signals within 10MHz of the 5.725 or 5.825 Band edge are subject to a limit of Note 4:       If the device is for outdoor use then the -27dBm eirp limit also applies in the 9 Note 5:         Signals that fall in the restricted bands of 15.205 are subject to the limit of 15	neasurements is adjuste Radiated field strength mo determine compliance a <u>l emissions test.</u> of -17dBm EIRP 5150 - 5250 MHz band. 5.209.	d to take into easurements for signals s the antenna gain is not







# Client: Xirrus Job Number: J71484 Model: XN4 T-Log Number: T73388 Contact: Steve Smith Account Manager: Susan Pelzl Standard: FCC 15 E, RSS 210 Class: N/A 802.11n 20MHz, 5320 MHz, High channel, 5250 - 5350 MHz Band with power setting of 20dBm. Compliance with the radiated limits for the restricted band immediately above 5350MHz is demonstrated through the radiated emissions tests.

20dB attenuation pad at front of analyzer and 20dB attenuation at software level.



20dB attenuation pad at front of analyzer and 0dB attenuation at software level to reduce the noise floor.







## EMC Test Data

	An DLass company		
Client:	Xirrus	Job Number:	J71484
Model:	VN/	T-Log Number:	T73388
	X1V4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

#### 802.11n 40MHz, 5310 MHz, High channel, 5250 - 5350 MHz Band with power setting of 20dBm.

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

20dB attenuation pad at front of analyzer and 20dB attenuation at software level.



20dB attenuation pad at front of analyzer and 0dB attenuation at software level to reduce the noise floor.



#### Client: Xirrus Job Number: J71484 T-Log Number: T73388 Model: XN4 Account Manager: Susan Pelzl Contact: Steve Smith Standard: FCC 15 E, RSS 210 Class: N/A RSS-210 (LELAN) and FCC 15.407(UNII) **Antenna Port Measurements** Power, PSD, Peak Excursion, Bandwidth and Spurious Emissions Test Specific Details Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above. Date of Test: 11/6/2008 Config. Used: -Test Engineer: Mehran Birgani Config Change: Direct connection Test Location: SV OATS #2 EUT Voltage: 120V/60Hz General Test Configuration When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators and cables used. Ambient Conditions: Temperature: 15-35 °C Rel. Humidity: 10-60 % Summary of Results Test Performed Pass / Fail Run # Limit Result / Margin 15.407(a) (1), (2) Power, 5470 - 5725MHz Pass Single radio: 19.0 dBm 1 1 PSD, 5470 - 5725MHz 15.407(a) (1), (2) Pass 7.8 dBm/MHz 1 26dB Bandwidth 15.407 Pass 23.1 MHz 99% Bandwidth **RSS 210** 1 17.4 MHz 11.9 dB 2 Peak Excursion Envelope 15.407(a) (6) Pass Antenna Conducted All emissions below the 3 15.407(b) Pass Out of Band Spurious -27dBm/MHz limit Modifications Made During Testing No modifications were made to the EUT during testing Deviations From The Standard No deviations were made from the requirements of the standard.

Elliott

EMC Test Data

## Ellight

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Client:	: Xirrus							lob Number:	J71484		
							T-L	og Number:	T73388		
Model:	XN4						Accou	nt Manager:	Susan Pelzl		
Contact:	t: Steve Smith										
Standard:	FCC 15 E, F	RSS 210						Class:	N/A		
un #1: Ba ntenna gai	ndwidth, Ou in used is for ings for a sir	tput Power a the internal a ngle radio op	and Powers antenna. The perating in t	spectral Den e external an he band	sity tenna gain is Antenn	s lower (2.5d a Gain (dBi):	Bi) and not us 3.0	sed for MIMC	) modes.		
requency	Software	Band	width	ith Output Power <sup>1</sup> dBm Powe		Power	er PSD <sup>2</sup> dBm/N		łz		
(MHz)	Setting	26dB	<b>99</b> % <sup>4</sup>	Measured	Limit	(Watts)	(Watts)	Measured	FCC Limit	RSS Limit <sup>3</sup>	Resu
5500	20.0	23.1	17.3	19.0	24.0	0.079	6.5	11.0	11.0	Pas	
5700	20.0	22.5	17.4	17.7	24.0	0.059	5.2	11.0	11.0	Pas	
ower setti valuation c	ngs for all fo of total output Output po RBW=1M over 40 M	power with a power with a wer measure Hz, VB=3 MH Hz	perating in all fiour radio ed using a sp Iz, sample d	the band: s operating in pectrum analy etector, powe	n the band is vzer (see plo er averaging	covered by ts below): on (transmit	test data log ted signal wa	T77249. s continuous	) and power i	ntegrati	
Note 1:	Measured using the same analyzer settings used for output power.										
Note 1: Note 2:	Measured	using the sa	For RSS-210 the limit for the 5150 - 5250 MHz band accounts for the antenna gain as the maximum eirp allowed is 10dBm/MHz. The limits are also corrected for instances where the highest measured value of the PSD exceeds the average PSD (calculated from the measured power divided by the measured 99% bandwidth) by more than 3dB by the amount that the measured value exceeds the average by more than 3dB.								
Note 1: Note 2: Note 3:	Measured For RSS-2 10dBm/M average P amount th	210 the limit f Hz. The limits SD (calculat at the measu	for the 5150 s are also co ed from the i <u>ired value</u> ex	rrected for in measured po <u>(ceeds the</u> a)	stances whe wer divided <u>verage by mo</u>	re the highe by the measi ore than 3dB	st measured v ured 99% bar	ndwidth) by n	PSD exceeds nore than 3dE	3 by the	







T73388 (RF Port Measurements).xls



(CE	Elliott			EMO	C Test Data	
Client:	Xirrus			Job Number:	J71484	
				T-Log Number:	T73388	
Model:	XN4		F	Account Manager:	Susan Pelzl	
Contact:	Contact: Steve Smith					
Standard:	FCC 15 E, RSS 210	Class:	N/A			
Contact: Standard: Run #3: Ou MIMO Devid for out of ba Note 1: Note 2: Note 3:	Steve Smith FCC 15 E, RSS 210 At Of Band Spurious Emissions - Antenices: As the output power setting for the sind spurious emissions to account for dual Number of transmit chains: Maximum Antenna Gain: Spurious Limit: Adjustment for 2 chains: Limit Used On Plots <sup>Note 1</sup> : The -27dBm/MHz limit is an eirp limit. The consideration the maximum antenna gasignals more than 50MHz from the band gain is not known at these frequencies. All spurious signals below 1GHz are mean signals that fall in the restricted bands of the signals that fall in the restricted bands of the signals that fall in the restricted bands of the signals that fall in the restricted bands of the signals that fall in the restricted bands of the signals that fall in the restricted bands of the signals that fall in the restricted bands of the signals that fall in the restricted bands of the signals that fall in the restricted bands of the signals that fall in the restricted bands of the signals that fall in the restricted bands of the signals that fall in the restricted bands of the signals that fall in the restricted bands of the signals that fall in the restricted bands of the signals that fall in the restricted bands of the signals that fall in the restricted bands of the signals that fall in the restricted bands of the signals that fall in the restricted bands of the signals the signal term signals the signal term signals the signal term signals the signal term signals term sis term signals term signals term sig	na Conducted ngle chain mode is f chain operation, the 2 3.0 dBi -27.0 dBm/MHz -6.0 dB adjustm -36.0 dBm/MHz -16.0 dBm/MHz The limit for antenna in (limit = -27dBm - ds and that are close easured during digita of 15.205 are subject	higher than the plots below co eirp hent for multiple Average Limi Peak Limit (R port conducted antenna gain). e to the limit are al device radiate t to the limit of	Class: setting for dual chain, an over both single- and dua e chains and coherency to t (RB=1MHz, VB=10Hz) RB=VB=1MHz) d measurements is adjust Radiated field strength e made to determine cor ed emissions test. 15.209.	N/A  hd by adjusting the limit l chain operation.  between chains.  sted to take into measurements for npliance as the antenna	



	An AZAS* company		
Client:	Xirrus	Job Number:	J71484
Model:	YN4	T-Log Number:	T73388
	AN4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

#### High channel, 5470 - 5725 MHz Band with Power Setting of 20, Chain A and Chain C

The 26dB bandiwtdh data shows that the 26dB signal bandiwdth (and, therefore, the 20dB signal bandwidth) remains within the allocated band. The power plot shows the signal level at 5725 MHz as falling below the -27dBm eirp limit (level is below -30dBm/MHz)



Elliott
	An LAZ	合 company				
Client:	Xirrus			Job	Number:	J71484
Model				T-Log	Number:	T73388
wouer.	7114			Account	Manager:	Susan Pelzl
Contact:	Steve Smith					
Standard:	FCC 15 E, F	RSS 210			Class:	N/A
Test Spe	Powe cific Detail Objective:	RSS-210 (LELAN Antenna Po er, PSD, Peak Excursion, Is The objective of this test session is to specification listed above.	and FCC 15 ort Measurem Bandwidth and	.407(UNI ents I Spurious n testing of the I	<b>I)</b> Emise	sions respect to the
l Te Te	Date of Test: st Engineer: est Location:	11/10/2008 Mehran Birgani SV OATS #1	Config. Used: Config Change: EUT Voltage:	AC powered Direct connecti PoE	on	
General Test Configuration         When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators and cables used.         Ambient Conditions:       Temperature:       15-36 °C Rel. Humidity:       10-60 %						ected to the spectrum ements are corrected to
Run #	Mode	Test Performed	Limit	Pass / Fail	F	Result / Margin
1	а	Power, 5470 - 5725MHz	15.407(a) (1), (2)	Pass	Single	e radio: 20.8 dBm
1	а	PSD, 5470 - 5725MHz	15.407(a) (1), (2)	Pass		3.3 dBm/MHz
1	а	99% Bandwidth	RSS 210	-		17.4 MHz
2	а	Peak Excursion Envelope	15.407(a) (6)	Pass		11.9 dB
	3 Antenna Conducted - Out of Band Spurious 15.407(b) Covered by single-chain mode measurements					single-chain surements
Modificat No modifi Deviation No deviat	ions Made cations were s From Th ons were ma	e During Testing made to the EUT during testing ne Standard ade from the requirements of the stand	ard.			

## EMC Test Data

## EMC Test Data

	An A	Company								
Client:	Xirrus							Job Number:	J71484	
Model <sup>.</sup>	XN4						T-I	Log Number:	T73388	
Modeli						Αссоι	unt Manager:	Susan Pelzl		
Contact:	Steve Smith	1								
Standard:	FCC 15 E, F	RSS 210						Class:	N/A	
D #1 D.a.					- <b>!!</b>					
Antenna gai	nawlath, Ou n used is for	the internal :	and Power s	spectral Den e external an	ISITY Itenna dain is	: lower (2 5dl	Ri) and not u	sed for MIM(	modes	
Antenna gai	11 0300 13 101		Chain 1	Chain 2	Chain 3	Coherent	Effective <sup>5</sup>		5 moues.	
	Antenna	a Gain (dBi):	3		3	Yes	6.0			
Power setti	ngs for a si	ngle radio o	perating in t	he band				4		
Frequency	Software	26dB BW	Measure	d Output Pov	wer <sup>1</sup> dBm	To	otal	Limit (dBm)	Max Power	Pass or
(MHz)	Setting	(MHz)	Chain 1	Chain 2	Chain 3	mW	dBm	Liniit (ubiii)	(W)	Fail
5500	20.0	21.2	18.2		17.2	118.6	20.7	24.0	0.121	PASS
5700	20.0	26.7	17.8		17.8	120.5	20.8	24.0	0.121	PASS
Frequency	<b>99</b> % <sup>4</sup>	Total	Р	SD <sup>2</sup> dBm/MH	łz	Total	PSD	Li	mit	Pass or
(MHz)	BW	Power	Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210 <sup>3</sup>	Fail
5500	17.3	20.7	5.8		4.6	6.7	8.3	11.0	11.0	PASS
5700	17.4	20.8	5.3		5.2	6.7	8.3	11.0	11.0	PASS
Note 1:	Output po RBW=1M over 40M	ower measure Hz, VB=3 MH Hz (20MHz n	ed using a sp Hz, sample d node) and 10	ectrum analy etector, powe DOMHz (40MI	yzer (see pio er averaging Hz mode)	on (transmit	ted signal wa	er measurem as continuous	s) and power	integration
Note 2:	Measured	d using the sa	ame analyzer	settings use	ed for output	power.				
Note 3:	For RSS- 10dBm/M average F	210 the limit Hz. The limit PSD (calculat	for the 5150 s are also co ed from the r	- 5250 MHz I rrected for in measured po	band accoun stances whe wer divided I	ts for the ant re the highes by the measu	enna gain as st measured ured 99% ba	s the maximu value of the ndwidth) by r	m eirp allowe PSD exceeds nore than 3dE	ed is 5 the 3 by the
Note 4:	99% Band	dwidth measu	ured in accor	dance with R	SS GEN - R	B > 1% of sp	an and VB >	=3xRB		
	For MIMC	) systems the	e total output	power and to	otal PSD are	calculated for	orm the sum	of the power	s of the indivi	dual chains
	(in linear i	terms). The	antenna gain	used to dete	ermine the El	IRP and limit	s for PSD/O	utput power c	lepends on th	ne operating
Note 5:	dotorming	ne MIMO de\ the limite is	/ICe. If the si the highest c	gnais on the	non-conerer dividual chair	it between the	PD is the su	nains then tr	le gain used i	0 and nowor
	on each c	hain. If the s	signals are co	pherent then	the effective	antenna gair	n is the sum	(in linear terr	ns) of the gain	ns for each
	chain and	the EIRP is	the product of	of the effectiv	e gain and to	otal power.			noy or the gui	













## EMC Test Data

<b>Elliott</b> EMC Test Date							
Client:	Xirrus	Company		J	ob Number:	J71484	
				T-L	og Number:	T73388	
Model:	XN4			Accou	nt Manager:	Susan Pelzl	
Contact:	Steve Smith						
Standard:	FCC 15 E, R	RSS 210			Class:	N/A	
RSS-210 (LELAN) and FCC 15.407(UNII) Antenna Port Measurements Power, PSD, Peak Excursion, Bandwidth and Spurious Emissions							
Test Spec	ific Detail	S					
	Objective:	The objective of this test session is to specification listed above.	perform final qualification	n testing of th	e EUT with r	respect to the	
I Te Te	Date of Test: 11/10 and 11/2008Config. Used: AC poweredTest Engineer: Mehran BirganiConfig Change: Direct connectionTest Location: SV OATS #1EUT Voltage: PoE						
General T When me analyzer o allow for t Ambient o Summary	General Test Configuration         When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators and cables used.         Ambient Conditions:       Temperature:       15-36 °C Rel. Humidity:         Summary of Results       Summary of Results						
Run #	Mode	Test Performed	Limit	Pass / Fail	F	Result / Margin	
1	n20MHz	Power, 5470-5725MHz	15.407(a) (1), (2)	Pass	Single	e radio: 21.0 dBm	
1	n20MHz	PSD, 5470-5725MHz	15.407(a) (1), (2)	Pass	8	B.3 dBm/MHz	
1	n20MHz	99% Bandwidin	RSS 210	- Dace	Single	18.0 MHZ	
1	n/0MHz	PSD 5470-5725MHz	15.407(a)(1), (2) 15.407(a)(1)(2)	Pass	Siriyi	5 1 dBm/MHz	
1	n40MHz	99% Bandwidth	RSS 210	-		37 1 MHz	
2	n20 & n40	Peak Excursion Envelope	15.407(a) (6)	Pass		12.9 dB	
3	n20 & n40	Antenna Conducted Spurious	15.407(b)	Pass	< -2	27dBm/MHz eirp	
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.							

## EMC Test Data

	AII 24									
Client:	Xirrus							Job Number:	J71484	
Madali VNA			T-l	_og Number:	T73388					
woder:	X114						Accou	Int Manager:	Susan Pelzl	
Contact:	Steve Smith									
Standard:	FCC 15 E, F	RSS 210						Class:	N/A	
Run #1: Bai Antenna gai	ndwidth, Ou n used is for Antenna	tput Power a the internal a a Gain (dBi):	and Power s antenna. The Chain 1 3	e external Den chain 2	sity tenna gain is Chain 3 3	lower (2.5d Coherent No	Bi) and not u Effective <sup>5</sup> 3.0	sed for MIMC	) modes.	
Power setti	ngs for a sir	ngle radio op	perating in t	he band						
Frequency	Software	26dB BW	Measure	d Output Pov	ver <sup>1</sup> dBm	Тс	otal	Limit (dBm)	Max Power	Pass or
(MHz)	Setting	(MHz)	Chain 1	Chain 2	Chain 3	mW	dBm		(W)	Fail

	5	. ,		Ghailt Z		11177	uDIII		. /	
5500	20.0	23.9	18.6		17.1	123.7	20.9	24.0	0 1 2 4	PASS
5700	20.0	27.1	18.3		17.7	126.5	21.0	24.0	0.120	PASS
5510	17.5	40.7	15.4		14.5	62.9	18.0	24.0	0 1 2 0	PASS
5670	20.0	71.6	18.8		17.2	128.3	21.1	24.0	0.128	PASS
Frequency	<b>99</b> % <sup>4</sup>	Total	Р	SD <sup>2</sup> dBm/MF	lz	Total	PSD	Li	mit	Pass or
(MHz)	BW	Power	Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210 <sup>3</sup>	Fail
5500	18.4	20.9	6.0		4.3	6.7	8.2	11.0	11.0	PASS
5700	18.6	21.0	5.6		4.9	6.7	8.3	11.0	11.0	PASS
5510	36.9	18.0	-0.6		-1.4	1.6	2.0	11.0	11.0	PASS
5670	37.1	21.1	2.7		1.3	3.2	5.1	11.0	11.0	PASS
	Output po	wer measure	ed using a sp	ectrum analy	zer (see plot	ts below for t	he high powe	er measurem	nents):	
Note 1:	RBW=1M	Hz, VB=3 MI	Hz, sample d	etector, powe	er averaging	on (transmitt	ted signal wa	s continuous	s) and power	integration
	over 40M	Hz (20MHz n	node) and 80	MHz (40MHz	z mode)					
Note 2:	Measured	l using the sa	ame analyzer	settings use	d for output	power.				
	For RSS-2	210 the limit	for the 5470	- 5725 MHz k	band accoun	ts for the ant	enna gain as	the maximu	m eirp allowe	ed is
Note 3:	11dBm/M	Hz. The limit	s are also co	rrected for in	stances whe	re the highes	st measured	value of the l	PSD exceeds	s the
	average F	SD (calculat	ed from the r	neasured po	wer divided I	by the measu	ured 99% bar	ndwidth) by n	nore than 3dl	B by the
	amount th	at the measu	ured value ex	ceeds the av	verage by mo	ore than 3dB				
Note 4:	99% Band	dwidth measu	ured in accord	dance with R	SS GEN - R	B > 1% of sp	an and VB >	=3xRB		
	For MIMC	) systems the	e total output	power and to	otal PSD are	calculated for	orm the sum	of the powers	s of the indivi	dual chains
	(in linear t	erms). The	antenna gain	used to dete	ermine the E	IRP and limit	s for PSD/OL	itput power c	lepends on th	ne operating
Note 5	mode of the	he MIMO dev	vice. If the si	gnals on the	non-coherer	nt between th	ie transmit ch	ains then th	ne gain used i	to
11010 01	determine	the limits is	the highest g	ain of the inc	dividual chair	ns and the El	RP is the sur	n of the prod	lucts of gain	and power
	on each c	hain. If the s	signals are co	herent then	the effective	antenna gair	n is the sum (	(in linear tern	ns) of the gai	ns for each
	chain and	the EIRP is	the product c	of the effectiv	e aain and to	otal power.				

Power settings for all four radios operating in the band:

Evaluation of total output power with all fiour radios operating in the band is covered by test data log T77249.











<b>C</b> E	Elliott	EM	C Test Data
Client:	Xirrus	Job Number:	J71484
		T-Log Number:	T73388
Model:	XN4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A
Run #3: Ou MIMO Devid	t Of Band Spurious Emissions - Antenna Conducted es: Antenna gain used is the effective gain calculated in the power section	of this data sheet. The p	lots were obtained for
each chain i	ndividually and the limit was adjusted to account for all chains transmitting si Number of transmit chains: 2 Maximum Antenna Gain: 3.0 dBi Spurious Limit: -27.0 dBm/MHz eirp Adjustment for 2 chains: -3.0 dB adjustment for multiple Limit Used On Plots Note 1: -33.0 dBm/MHz Average Lim -13.0 dBm/MHz Peak Limit (F	e chains. it (RB=1MHz, VB=10Hz) RB=VB=1MHz)	
Note 1:	The -27dBm/MHz limit is an eirp limit. The limit for antenna port conducted consideration the maximum antenna gain (limit = -27dBm - antenna gain). If more than 50MHz from the bands and that are close to the limit are made to known at these frequencies.	measurements is adjuste Radiated field strength m determine compliance a	d to take into easurements for signals s the antenna gain is not
Note 2:	All spurious signals below 1GHz are measured during digital device radiated	d emissions test.	
Note 3:	Signals within 10MHz of the 5.725 or 5.825 Band edge are subject to a limit	of -17dBm EIRP	
Note 4:	If the device is for outdoor use then the -27dBm eirp limit also applies in the	5150 - 5250 MHz band.	
Note 5:	Signals that fall in the restricted bands of 15.205 are subject to the limit of 15	5.209.	



## EMC Test Data

	An DLLED company		
Client:	Xirrus	Job Number:	J71484
Madal	YNA	T-Log Number:	T73388
would.	AIN4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

#### 802.11n 20MHz, High channel (5700 MHz), 5470 - 5725 MHz Band with power setting of 20dBm.

The 26dB bandwidth data shows that the 26dB signal bandwidth (and, therefore, the 20dB signal bandwidth) remains within the allocated band - see plots on the following page.

The 26dB bandiwtdh data shows that the 26dB signal bandiwdth (and, therefore, the 20dB signal bandwidth) remains within the allocated band. The power plot shows the signal level at 5725 MHz as falling below the -27dBm eirp limit (level is below -30dBm/MHz) 20dB attenuation pad at front of analyzer and 20dB attenuation at software level.



20dB attenuation pad at front of analyzer and 0dB attenuation at software level to reduce the noise floor.





## EMC Test Data

	An <u>B</u>		
Client:	Xirrus	Job Number:	J71484
Model	VNA	T-Log Number:	T73388
MOUEI.	XIN4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

#### 802.11n 40MHz, Low channel (5510 MHz), 5470 - 5725 MHz Band with power setting of 20dBm.

Compliance with the radiated limits for the restricted band immediately below 5460 MHz and the band edge at 5470MHz are demonstrated through the radiated emissions tests.

20dB attenuation pad at front of analyzer and 20dB attenuation at software level.



20dB attenuation pad at front of analyzer and 0dB attenuation at software level to reduce the noise floor.



## EMC Test Data

	An DLLED company		
Client:	Xirrus	Job Number:	J71484
Madal	YNA	T-Log Number:	T73388
would.	AIN4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

#### 802.11n 40MHz, High channel (5670 MHz), 5470 - 5725 MHz Band with power setting of 20dBm.

The 26dB bandwidth data shows that the 26dB signal bandwidth (and, therefore, the 20dB signal bandwidth) remains within the allocated band - see plots on the following page.

The 26dB bandiwtdh data shows that the 26dB signal bandiwdth (and, therefore, the 20dB signal bandwidth) remains within the allocated band. The power plot shows the signal level at 5725 MHz as falling below the -27dBm eirp limit (level is below -30dBm/MHz) 20dB attenuation pad at front of analyzer and 0dB attenuation at analyzer input level to reduce the noise floor.





20dB attenuation pad at front of analyzer and 0dB attenuation at analyzer input level to reduce the noise floor.





## EMC Test Data

	company		
Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73389
		Account Manager:	Susan Pelzl
Contact:	Steve Smith		Mark Briggs
Emissions Standard(s):	FCC 15.247 / RSS 210	Class:	UNII
Immunity Standard(s):	-	Environment:	Wireless

## **EMC** Test Data

For The

## Xirrus

Model

XN4

Date of Last Test: 11/6/2008

## EMC Test Data

	An ZALES company		
Client:	Xirrus	Job Number:	J71484
Madal	YNA	T-Log Number:	T73389
MOUEI.	AIN4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15.247 / RSS 210	Class:	N/A

## RSS 210 and FCC 15.407 (UNII - 5150 - 5250 MHz) Radiated Spurious Emissions, Band Edges - Internal Antenna

#### Test Specific Details

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

#### General Test Configuration

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

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

Ambient Conditions:	Temperature:	15-35 °C
	Rel. Humidity:	10-60 %

#### Summary of Results

Run #	Mode	Channel	Power Setting	Test Performed	Limit	Result / Margin
1a	802.11a	5180 MHz	20.0dBm	Restricted Band Edge	15.209	51.8dBµV/m (389.0µV/m) @
	Chain A		al 5150 MHZ			5149.91VIHZ (-Z.ZUB)
1h	1b 802.11a	5100 MUz 10 5dDm	Restricted Band Edge	15 209	53.2dBµV/m (457.1µV/m) @	
ID.	Chain A+C		TO.SUDIT	at 5150 MHz	15.207	5149.9MHz (-0.8dB)
10	802.11n20		180 MHz 17.0dBm	Restricted Band Edge	15 200	53.7dBµV/m (484.2µV/m) @
ΤC	Chain A+C			at 5150 MHz	10.209	5149.9MHz (-0.3dB)
1.d	802.11n40	E100 MUL	13.0dBm	Restricted Band Edge	15 200	52.4dBµV/m (416.9µV/m) @
ld	Chain A+C			at 5150 MHz	10.209	5148.3MHz (-1.6dB)

#### Modifications Made During Testing

No modifications were made to the EUT during testing

#### **Deviations From The Standard**









#### Elliott EMC Test Data Client: Xirrus Job Number: J71484 T-Log Number: T73389 Model: XN4 Account Manager: Susan Pelzl Contact: Steve Smith Standard: FCC 15.247 / RSS 210 Class: N/A RSS 210 and FCC 15.407 (UNII - 5150 - 5250 MHz) **Radiated Spurious Emissions, Internal Antenna** Test Specific Details Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above. Config. Used: 1 Date of Test: 11/3/2008 Config Change: None Test Engineer: Mehran Birgani EUT Voltage: POE Test Location: SV OATS #1 General Test Configuration The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane. For radiated emissions testing the measurement antenna was located 3 meters from the EUT. Ambient Conditions: Temperature: 15-35 °C Rel. Humidity: 10-60 % Summary of Results Power Limit **Test Performed** Result / Margin Run # Mode Channel Setting 802.11a, 5180 MHz 39.9dBµV/m (98.9µV/m) @ n20, n40 5190 MHz 10357.7MHz (-14.1dB) 20 per Radiated Emissions, 40.4dBµV/m (104.7µV/m) @ 802.11a, 1 FCC 15.209 / 15 E 5200 MHz n20 chain 1 - 40 GHz 10398.8MHz (-13.6dB) 38.9dBµV/m (88.1µV/m) @ 802.11a, 5240 MHz 10476.4MHz (-15.1dB) n20, n40 5230 MHz Modifications Made During Testing No modifications were made to the EUT during testing **Deviations From The Standard**

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

6								EM	C Test Da
Client:	Xirrus							Job Number:	J71484
Model: XN4							T-	Log Number:	T73389
								unt Manager:	Susan Pelzl
Contact:	Steve Smith								
Standard:	FCC 15.247	/ RSS 210						Class:	N/A
Rauiu	(MHz)	woue	Chain A	Chain C			COII	IIIIGHII2	
Raulo	(MHz)	wode	Chain A	Chain C			COIL	Iments	
1	5180	а	20	20					
2	5180	n20	20	20					
3	5190	n40	20	20					
4	-	-							
Scan made Spurious R	in anechoic o adiated Emi	chamber, me ssions:	asurements	in tables bel	low taken on (	DATS.			
Frequency	Level	Pol	15.20	9/15E	Detector	Azimuth	Height	Comments	
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
6902.620	33.9	Н	54.0	-20.1	AVG	58	1.0	Note 2, RB	1 MHz; VB: 10 Hz

Trequeriej	ECTO	1 01	101201	11.02	Dotootoi	7 termatin	Hoight	Commonto
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
6902.620	33.9	Н	54.0	-20.1	AVG	58	1.0	Note 2, RB 1 MHz; VB: 10 Hz
6906.880	33.9	V	54.0	-20.1	AVG	21	1.0	Note 2, RB 1 MHz; VB: 10 Hz
6919.930	34.4	V	54.0	-19.6	AVG	349	1.0	Note 2, RB 1 MHz; VB: 10 Hz
6922.720	34.2	Н	54.0	-19.8	AVG	253	1.0	Note 2, RB 1 MHz; VB: 10 Hz
10355.230	39.3	Н	54.0	-14.7	AVG	27	1.0	Note 2, RB 1 MHz; VB: 10 Hz
10357.720	39.9	V	54.0	-14.1	AVG	233	1.0	Note 2, RB 1 MHz; VB: 10 Hz
10381.820	39.5	V	54.0	-14.5	AVG	258	1.4	Note 2, RB 1 MHz; VB: 10 Hz
10381.820	39.4	Н	54.0	-14.6	AVG	177	1.0	Note 2, RB 1 MHz; VB: 10 Hz
6904.370	45.3	V	74.0	-28.7	PK	21	1.0	Note 2, RB 1 MHz; VB: 1 MHz
6908.000	44.7	Н	74.0	-29.3	PK	58	1.0	Note 2, RB 1 MHz; VB: 1 MHz
6914.730	45.3	V	74.0	-28.7	PK	349	1.0	Note 2, RB 1 MHz; VB: 1 MHz
6917.270	45.6	Н	74.0	-28.4	PK	253	1.0	Note 2, RB 1 MHz; VB: 1 MHz
10359.200	51.1	V	74.0	-22.9	PK	233	1.0	Note 2, RB 1 MHz; VB: 1 MHz
10359.580	50.4	H	74.0	-23.6	PK	27	1.0	Note 2, RB 1 MHz; VB: 1 MHz
10376.800	50.3	H	74.0	-23.7	PK	177	1.0	Note 2, RB 1 MHz; VB: 1 MHz
10380.750	50.6	V	74.0	-23.4	PK	258	1.4	Note 2, RB 1 MHz; VB: 1 MHz
	For emiss	ions in restrie	cted bands, t	he limit of 15	5.209 was use	ed. For all ot	her emissior	ns outside the 5150 - 5250MHz band
Note 1:	the avera	ge limit was	set to -27dBr	n/MHz (~68.	3 dBuV/m) ar	nd peak limit	set to 20dB	higher than the average limit (88.3
	dBuV/m).					-		
Note 2:	Not in a re	estricted ban	d					

		DTT Arcompany						EM	C Test Da
Client:	Xirrus							Job Number:	J71484
Model							T-	Log Number:	T73389
wouer.	AN4						Ассо	unt Manager:	Susan Pelzl
Contact:	Steve Smith								
Standard:	FCC 15.247	/ RSS 210						Class:	N/A
	00 MU- 00	0 1 1 0 0 0 1	1m20 Comtor	Channel					
un #10: 52	Channel	2.118, 802.1	Power	Setting					
Radio	(MHz)	Mode	Chain A	Chain C			Corr	nments	
1	5200	а	20	20					
2	5200	n20	20	20					
purious R	adiated Emi	SSIONS:	15 20	0/15F	Dotoctor	Azimuth	Hoight	Commonte	
MHz		rui v/h	l imit	Margin	$Pk/OP/\Delta_{V}$	dearees	meters	COMMENTS	
6933 170	34 5	Н	54.0	-19 5	AVG	253	1.0	Note 2 RB	1 MHz <sup>,</sup> VB <sup>,</sup> 10 Hz
6933.300	35.6	V	54.0	-18.4	AVG	310	1.0	Note 2, RB	1 MHz: VB: 10 Hz
0398.500	40.3	H	54.0	-13.7	AVG	315	1.0	Note 2, RB	1 MHz: VB: 10 Hz
0398.820	40.4	V	54.0	-13.6	AVG	18	1.6	Note 2, RB	1 MHz; VB: 10 Hz
5931.500	46.1	V	74.0	-27.9	PK	310	1.0	Note 2, RB	1 MHz; VB: 1 MHz
6935.450	45.8	Н	74.0	-28.2	PK	253	1.0	Note 2, RB	1 MHz; VB: 1 MHz
0398.620	51.6	Н	74.0	-22.4	PK	315	1.0	Note 2, RB	1 MHz; VB: 1 MHz
0402.000	51.7	V	74.0	-22.3	PK	18	1.6	Note 2, RB	1 MHz; VB: 1 MHz
	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions outside the 5150 - 5250MHz the <b>average</b> limit was set to -27dBm/MHz (~68.3 dBuV/m) and peak limit set to 20dB higher than the average limit (84 dBuV/m)								e 5150 - 5250MHz b he average limit (88
Note 1:	dBuV/m).	dBuV/m).							
Note 1: Note 2:	dBuV/m). Not in a re	estricted ban	d						
Note 1: Note 2:	dBuV/m). Not in a re	estricted ban	d						
Note 1: Note 2:	dBuV/m). Not in a re	estricted ban	d						
Note 1: Note 2:	dBuV/m). Not in a re	estricted ban	<u>d</u>						
Note 1: Note 2:	dBuV/m). Not in a re	estricted ban	d						
Note 1: Note 2:	dBuV/m). Not in a re	estricted ban	<u>d</u>						
Note 1: Note 2:	dBuV/m). Not in a re	estricted ban	<u>d</u>						
Note 1: Note 2:	<u>dBuV/m).</u> Not in a re	estricted ban	<u>d</u>						
Note 1: Note 2:	<u>dBuV/m).</u> Not in a re	estricted ban	<u>d</u>						
Note 1: Note 2:	<u>dBuV/m).</u> Not in a re	estricted ban	<u>d</u>						
Note 1: Note 2:	<u>dBuV/m).</u> Not in a re	estricted ban	<u>d</u>						
Note 1: Note 2:	<u>dBuV/m).</u> Not in a re	estricted ban	<u>d</u>						
Note 1: Note 2:	<u>dBuV/m).</u> Not in a re	estricted ban	<u>d</u>						
Note 1: Note 2:	<u>dBuV/m).</u> Not in a re	estricted ban	<u>d</u>						
Note 1: Note 2:	<u>dBuV/m).</u> Not in a re	estricted ban	<u>d</u>						
Note 1: Note 2:	<u>dBuV/m).</u> Not in a re	estricted ban	<u>d</u>						
Note 1: Note 2:	<u>dBuV/m).</u> Not in a re	estricted ban	<u>d</u>						

								EM	C Test Da
Client:	Xirrus							Job Number:	J71484
Madal							T-	Log Number:	T73389
wouer.	A114						Ассо	unt Manager:	Susan Pelzl
Contact:	Steve Smith								
Standard:	FCC 15.247	/ RSS 210						Class:	N/A
<mark>≀un</mark> #1c: 80	02.11a, 802.1	1n20 and 8	02.11n40, Hi	gh Channe					
Radio	Channel	Mode	Power	Setting			Comments		
	(MHz)		Chain A	Chain C					
1	5240	a	20	20					
2	5240	n20	20	20					
3	5230	n40	20	20					
ourious R	adiated Fmi	ssions:							
Frequency	Level	Pol	15.209	9/15E	Detector	Azimuth	Heiaht	Comments	
MHz	dBuV/m	v/h	Limit	Margin	Pk/OP/Ava	degrees	meters	e en interne	
6966.600	34.0	Н	54.0	-20.0	AVG	76	1.0	Note 2, RB	1 MHz; VB: 10 Hz
6986.350	34.0	Н	54.0	-20.0	AVG	10	1.0	Note 2, RB	1 MHz; VB: 10 Hz
0460.280	38.9	V	54.0	-15.1	AVG	53	1.0	Note 2, RB	1 MHz; VB: 10 Hz
0463.780	38.7	Н	54.0	-15.3	AVG	355	1.0	Note 2, RB	1 MHz; VB: 10 Hz
0475.170	38.8	Н	54.0	-15.2	AVG	0	1.0	Note 2, RB	1 MHz; VB: 10 Hz
0476.380	38.9	V	54.0	-15.1	AVG	246	1.0	Note 2, RB	1 MHz; VB: 10 Hz
6976.020	45.1	Н	74.0	-28.9	PK	76	1.0	Note 2, RB	1 MHz; VB: 1 MHz
6982.680	45.1	Н	74.0	-28.9	PK	10	1.0	Note 2, RB	1 MHz; VB: 1 MHz
0457.720	50.5	V	74.0	-23.5	PK	53	1.0	Note 2, RB	1 MHz; VB: 1 MHz
10461.730	49.7	Н	74.0	-24.3	PK	355	1.0	Note 2, RB	1 MHz; VB: 1 MHz
10476.120	51.0	V	74.0	-23.0	PK	246	1.0	Note 2, RB	1 MHz; VB: 1 MHz
0476.230	49.9	Н	74.0	-24.1	PK	0	1.0	Note 2, RB	1 MHz; VB: 1 MHz
Note 1:	For emiss the <b>avera</b> dBuV/m).	ions in restri <b>ge</b> limit was	cted bands, t set to -27dBr	he limit of 15 n/MHz (~68.	5.209 was use .3 dBuV/m) ar	ed. For all of nd peak limit	her emissio set to 20dB	ons outside the higher than t	e 5150 - 5250MHz b he average limit (88

# Client: Xirrus Job Number: J71484 Model: XN4 T-Log Number: T73389 Contact: Steve Smith Susan Pelzl

Standard: FCC 15.247 / RSS 210

Class: N/A

## RSS 210 and FCC 15.407 (UNII - 5150 - 5250 MHz) Radiated Spurious Emissions, Band Edges - External Antenna

## Test Specific Details

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

Date of Test: 11/5/2008 Test Engineer: Rafael Varelas Test Location: OATS #1 Config. Used: 1 Config Change: None EUT Voltage: POE

## General Test Configuration

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

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

Ambient	Conditions:
---------	-------------

Temperature:	15-35 °C
Rel. Humidity:	10-60 %

## Summary of Results

Run #	Mode	Channel	Power Setting	Test Performed	Limit	Result / Margin
1	802.11a Chain B	5180 MHz	20.0	Restricted Band Edge at 5150 MHz	15.209	51.5dBµV/m @ 5149.9MHz (-2.5dB)

## Modifications Made During Testing

No modifications were made to the EUT during testing

## Deviations From The Standard

6								EM	C Test Dat
Client	Xirrus							Job Number:	J71484
Madal							T-	Log Number:	T73389
Wodel	XN4					-	Acco	unt Manager:	Susan Pelzl
Contact	Steve Smith								
Standard	FCC 15.247	/ RSS 210						Class:	N/A
ın #1, Ra 80 MHz,	diated Spuri 802.11a, Cha	ous Emissio in B with po	ons, 30 - 40, ower setting	000 MH. Op of 20dBm	eration in the	e 5150-5250	MHz Band		
50 MHz I	Band Edge Si	gnal Radiate	ed Field Stren	15 200	Datastar	A <del>,</del> inoth	Llaight	Commonto	
equency			FUU	15.209 Margin	Detector	Azimuth	Height	Comments	
	0ΒμV/M 515	<u></u>	54.0	-2.5	PK/QP/AVg	aegrees	1 0	DB 1 MHz· \	/B· 10 Hz
147 440	66.6	V	74.0	-2.3	PK	303	1.7	RB 1 MHz <sup>.</sup>	/B: 1 MHz
149.810	49.5	<u> </u>	54.0	-4.5	Ανα	347	1.0	RB 1 MHz;	/B: 10 Hz
149.210	62.0	H	74.0	-12.0	PK	347	1.0	RB 1 MHz; V	/B: 1 MHz
			<b>.</b>	<u></u>	11				
Note 1:	For emiss	ions in restri	cted band im	mediately be	elow 5150MH:	z, the limit of	15.209 was	s used.	
Amplitude (dBuV/m) 9.00	5.0 - 9.0 5.0 0.0 5.0	vh.,.H.s.jhHovdo	n de la constante de la consta	lipudolisedase Antonio	haandhoonnadhooradha	Madhungh-lad	and the second s	ner an	

#### Elliott EMC Test Data Client: Xirrus Job Number: J71484 T-Log Number: T73389 Model: XN4 Account Manager: Susan Pelzl Contact: Steve Smith Standard: FCC 15.247 / RSS 210 Class: N/A RSS 210 and FCC 15.407 (UNII - 5150 - 5250 MHz) **Radiated Spurious Emissions, External Antenna** Test Specific Details Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above. Config. Used: 1 Date of Test: 11/5/2008 Test Engineer: Rafael Varelas Config Change: None Test Location: OATS #1 EUT Voltage: POE General Test Configuration The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane. For radiated emissions testing the measurement antenna was located 3 meters from the EUT. Ambient Conditions: Temperature: 15-35 °C Rel. Humidity: 10-60 % Summary of Results Power Limit Radio **Test Performed** Run # Mode Channel Result / Margin Setting 40.5dBµV/m @ 802.11a 5180 MHz 4 10359.7MHz (-13.5dB) 41.6dBµV/m@ Radiated Emissions, 1 802.11a 5200 MHz 20 4 FCC 15.209 / 15 E 1 - 40 GHz 10398MHz (-12.4dB) 40.9dBµV/m @ 802.11a 5240 MHz 4 10479.0MHz (-13.1dB) Modifications Made During Testing No modifications were made to the EUT during testing Deviations From The Standard

<b>C</b> E		Dtt Art company						EMO	C Test Data	
Client:	Xirrus							Job Number:	J71484	
							T-	Log Number:	T73389	
Model:	XN4						Acco	Account Manager: Susan Pelzl		
Contact	Stova Smith						7,000	ant Manager		
Standard:		/ DSS 210						Class	NI/Λ	
Stariuaru.	FCC 15.247	7 K33 210	20 40							
Run #1, Rac Run #1a: 51	lated Spuri 180 MHz, 802	ous Emissio 2.11a, Low (	ons, 30 - 40, Channel, Wit	h External <i>I</i>	Antenna	9 5 150-5250	MHZ Band,	, 802.118 100	de, external Ant.	
	Er	auoney Dar	000	Tost D	istanco	Limit D	istanco	Extrapolat	ion Eactor	
	100	10 - 18000 M	IYE IHz	TESUL	2		2		Extrapolation Factor 0.0 Comments RB 1 MHz; VB: 10 Hz RB 1 MHz; VB: 1 MHz RB 1 MHz; VB: 10 Hz RB 1 MHz; VB: 10 Hz	
	100	JU - 10000 IV	II IZ		5		5	0	.0	
Spurious R	adiated Fmi	ssions:								
Frequency	Level	Pol	15.209	9/15E	Detector	Azimuth	Height	Comments		
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
10359.660	40.5	V	54.0	-13.5	AVG	360	1.0	RB 1 MHz; V	/B: 10 Hz	
10359.760	51.9	V	74.0	-22.1	PK	360	1.0	RB 1 MHz; V	/B: 1 MHz	
6906.680	39.0	V	54.0	-15.0	AVG	0	1.0	RB 1 MHz; V	/B: 10 Hz	
6906.230	48.6	V	74.0	-25.4	PK	0	1.0	RB 1 MHz; V	/B: 1 MHz	
6906.520	34.4	Н	54.0	-19.6	AVG	233	1.0	RB 1 MHz; V	/B: 10 Hz	
6905.270	45.8	Н	74.0	-28.2	PK	233	1.0	RB 1 MHz; V	/B: 1 MHz	
10359.680	39.8	Н	54.0	-14.2	AVG	298	1.0	RB 1 MHz; V	/B: 10 Hz	
10360.380	51.1	Н	74.0	-22.9	PK	298	1.0	RB 1 MHz; \	/B: 1 MHz	
Run #1b: 52	200 MHz, 802 Padiatod Emi	2.11a, Cente	r Channel, \	Nith Extern	al Antenna					
Frequency		Pol	15 200	9/15F	Detector	∆zimuth	Height	Comments		
MHz	dBuV/m	v/h	l imit	Margin		dearees	meters	Comments		
10398 520	41.6	Н	54.0	-12 4	AVG	n 0	21	RB 1 MHz <sup>.</sup> \	/B <sup>.</sup> 10 Hz	
10400 070	52.6	H	74.0	-21.4	PK	0	2.1	RB 1 MHz <sup>,</sup>	/B: 10112 /B <sup>:</sup> 1 MHz	
6933 080	35.9	H	54.0	-18.1	AVG	360	2.1	RB 1 MHz <sup>,</sup>	/B: 10 Hz	
6931 920	46.6	H	74.0	-27.4	PK	360	2.0	RB 1 MHz <sup>,</sup>	/B: 10/12 /B <sup>:</sup> 1 MHz	
10398 670	41.1	V	54.0	-12.9	AVG	5	11	RB 1 MHz <sup>,</sup>	/B: 10 Hz	
10400 080	52.2	V	74.0	-21.8	PK	5	11	RB 1 MHz <sup>,</sup>	/B: 10112 /B <sup>:</sup> 1 MHz	
6933 390	37.9	V	54.0	-16.1	AVG	253	1.0	RB 1 MHz <sup>,</sup>	/B: 10 Hz	
6933,330	47.9	V	74.0	-26.1	PK	253	1.0	RB 1 MHz <sup>,</sup>	/B: 10112 /B <sup>:</sup> 1 MHz	
Run #1c: 52	240 MHz, 802	2.11a, High (	Channel, Wi	th External	Antenna	200				
Frequency	Level	Pol	15.209	9/15E	Detector	Azimuth	Height	Comments		
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
10478.990	40.9	V	54.0	-13.1	AVG	351	1.0	MHz; VB: 1	0 Hz	

51.8

34.5

45.5

40.1

54.9

34.5

46.0

V

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V

Η

Η

Η

Η

74.0

54.0

74.0

54.0

74.0

54.0

74.0

-22.2

-19.5

-28.5

-13.9

-19.1

-19.5

-28.0

10479.360

6972.750

6970.150

10478.530

10481.310

6970.120

6971.690

РΚ

AVG

РΚ

AVG

РΚ

AVG

РΚ

351

244

244

360

360

50

50

1.0

1.0

1.0

1.0

1.0

1.0

1.0

MHz; VB: 1 MHz

MHz; VB: 10 Hz

MHz; VB: 1 MHz

MHz; VB: 10 Hz

MHz; VB: 1 MHz

MHz; VB: 10 Hz

MHz; VB: 1 MHz
## EMC Test Data

	An DLED company		
Client:	Xirrus	Job Number:	J71484
Model	VN/	T-Log Number:	T73389
MOUCI.	X1N4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15.247 / RSS 210	Class:	N/A

#### RSS 210 and FCC 15.407 (UNII - 5250 - 5350 MHz and 5470-5725MHz) Radiated Spurious Emissions, Band Edges, Internal Antenna

#### Test Specific Details

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

#### General Test Configuration

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

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

Ambient Conditions:	Temperature:	15-35 °C
	Rel. Humidity:	10-60 %

#### Modifications Made During Testing

No modifications were made to the EUT during testing

#### **Deviations From The Standard**

							<i>EIVI</i> (	C Test Data
Client:	Xirrus						Job Number:	J71484
Madalı						T-l	_og Number:	T73389
Model:	XN4				1	Accou	Int Manager:	Susan Pelzl
Contact:	Steve Smith							
Standard:	FCC 15.247	/ RSS 210					Class:	N/A
Summary of Results								
Run #	Mode	Channel	Power Setting	Test Performed	Lir	nit	F	Result / Margin
1a	802.11a Chain A	5320 MHz	19.5dBm	Restricted Band Edge at 5350 MHz	FCC 15.2	209 / 15 E	53.9dBµ 535	uV/m (495.5µV/m) @ 0.0MHz (-0.1dB)
1h	802.11a	5500 MH7	20.0dBm	Restricted Band Edge at 5460 MHz	FCC 15.2	209 / 15 E	48.3dBµ 545	uV/m (260.0µV/m) @ 59.2MHz (-5.7dB)
10	Chain A	3300 WHZ	20.0dBm	Band Edge 5460 - 5470 MHz	15E (68.3 d 88.3dBu\	BuV/m avg, //m pe <u>ak)</u>	54.3dBµ 546'	uV/m (518.8µV/m) @ 9.9MHz (-14. <u>0dB)</u>
2a	802.11a Chain A+C	5320 MHz	19.0dBm	Restricted Band Edge at 5350 MHz	FCC 15.2	209 / 15 E	53.9dBµ 535	uV/m (495.5µV/m) @ 0.0MHz (-0.1dB)
	802.11a		20.0dBm	Restricted Band Edge at 5460 MHz	FCC 15.2	209 / 15 E	45.5dBµ 545	JV/m (188.4µV/m) @ 59.5MHz (-8.5dB)
20	Chain A+C	5500 MHz	20.0dBm	Band Edge 5460 - 5470 MHz	15E (68.3 d 88.3dBu\	.BuV/m avg, //m peak)	50.1dBµ 546'	uV/m (319.9µV/m) @ 9.8MHz (-18.2dB)
3a	802.11n20 Chain A+C	5320 MHz	18.5dBm	Restricted Band Edge at 5350 MHz	FCC 15.2	209 / 15 E	50.9dBµ 535	uV/m (350.8µV/m) @ 50.0MHz (-3.1dB)
26	802.11n20		20.0dBm	Restricted Band Edge at 5460 MHz	FCC 15.2	209 / 15 E	46.7dBµ 546	uV/m (216.3µV/m) @ 50.0MHz (-7.3dB)
30	Chain A+C	5500 Minz	20.0dBm	Band Edge         15E (68.3 c           5460 - 5470 MHz         88.3dBu		BuV/m avg, //m peak <u>)</u>	52.6dBµ 546'	uV/m (426.6µV/m) @ 9.8MHz (-15.7dB)
4a	802.11n40 Chain A+C	5310 MHz	17.0dBm	Restricted Band Edge at 5350 MHz FCC 15.2		209 / 15 E	52.2dBµ 535	JV/m (407.4µV/m) @ 50.0MHz (-1.8dB)
4b	802.11n40		17.5dBm	Restricted Band Edge at 5460 MHz	FCC 15.2	209 / 15 E	53.6dBµ 545	JV/m (478.6µV/m) @ 9.8MHz (-0.4dB)
40	Chain A+C	2210 10112	17.5dBm	Band Edge 5460 - 5470 MHz	15E (68.3 d 88.3dBu\	BuV/m avg, //m peak)	57.7dBµ 546'	JV/m (767.4µV/m) @ 9.7MHz (-10.6dB)

#### Elliott EMC Test Data Client: Xirrus Job Number: J71484 T-Log Number: T73389 Model: XN4 Account Manager: Susan Pelzl Contact: Steve Smith Standard: FCC 15.247 / RSS 210 Class: N/A Run #1: Radiated Emissions at Band Edges, Operation in the 5250-5350MHz and 5460 - 5725MHz Bands, 802.11a mode Date of Test: 10/24/2008 Config. Used: 1 Config Change: None Test Engineer: Mehran Birgani Test Location: SV OATS #1 EUT Voltage: POE Run #1a: 5320 MHz, 802.11a (Chain A) with power setting of 19.5 dBm 5350 MHz Band Edge Signal Radiated Field Strength Level Pol FCC 15.209 Detector Frequency Azimuth Height Comments Pk/QP/Avg MHz dBµV/m V/H Limit Margin degrees meters -7.0 5350.000 47.0 Η 54.0 AVG 8 1.1 RB 1 MHz; VB: 10 Hz 53.9 279 5350.030 ٧ 54.0 -0.1 AVG 1.9 RB 1 MHz; VB: 10 Hz 5352.500 63.7 Н 74.0 -10.3 РΚ 8 1.1 RB 1 MHz; VB: 1 MHz RB 1 MHz; VB: 1 MHz 5353.500 70.0 V 74.0 ΡK 279 1.9 -4.0 Note 1: For emissions in restricted band immediately above 5350MHz, the limit of 15.209 was used RB 1 MHz; VB 10 Hz Average (Black trace), RB=VB=1MHz Peak (Blue trace), Vertical 80.0 75.0-70.0 white we have a second state of the second sta when the full and the start of Amplitude (dBuV/m) 65.0 60.0 55.0 50.0 45.0 40.0 35.0-........ 5350.0 5352.0 5354.0 5356.0 5358.0 5360.0 5362.0 5364.0 5366.0 5368.0 5370.0 Frequency (MHz)







#### Elliott EMC Test Data Client: Xirrus Job Number: J71484 T-Log Number: T73389 Model: XN4 Account Manager: Susan Pelzl Contact: Steve Smith Standard: FCC 15.247 / RSS 210 Class: N/A Run #3: Radiated Emissions, Band Edges, Operation in the 5250-5350MHz and 5460 - 5725MHz Bands, 802.11n 20MHz Date of Test: 10/24/2008 Config. Used: 1 Config Change: None Test Engineer: Mehran Birgani Test Location: SV OATS #1 EUT Voltage: POE Run #3a: 5320 MHz, 802.11n 20MHz (Chain A+C) with power setting of 18.5 dBm 5350 MHz Band Edge Signal Radiated Field Strength Level Pol FCC 15.209 Detector Frequency Azimuth Height Comments Pk/QP/Avg MHz dBµV/m V/H Limit Margin degrees meters ٧ 2.0 5350.000 50.9 54.0 -3.1 AVG 271 RB 1 MHz; VB: 10 Hz 5350.000 49.3 Н 54.0 -4.7 AVG 30 1.0 RB 1 MHz; VB: 10 Hz 5353.500 63.3 Н 74.0 -10.7 ΡK 30 1.0 RB 1 MHz; VB: 1 MHz 5354.770 V ΡK 271 2.0 RB 1 MHz; VB: 1 MHz 69.1 74.0 -4.9 Note 1: For emissions in restricted band immediately above 5350MHz, the limit of 15.209 was used. RB 1 MHz; VB 10 Hz Average (Black trace), RB=VB=1MHz Peak (Blue trace), Vertical 80.0 75.0manter and the second of the second 70.0 Amplitude (dBuV/m) 65.0 60.0 55.0 50.0 45.0 40.0 35.0-1,..... ........ 5350.0 5352.0 5354.0 5356.0 5358.0 5360.0 5362.0 5368.0 5364.0 5366.0 5370.0 Frequency (MHz)



#### Elliott EMC Test Data Client: Xirrus Job Number: J71484 T-Log Number: T73389 Model: XN4 Account Manager: Susan Pelzl Contact: Steve Smith Standard: FCC 15.247 / RSS 210 Class: N/A Run #4: Radiated Emissions, Band Edges, Operation in the 5250-5350MHz and 5460 - 5725MHz Bands, 802.11n 40MHz Date of Test: 10/24/2008 Config. Used: 1 Config Change: None Test Engineer: Mehran Birgani Test Location: SV OATS #1 EUT Voltage: POE Run #4a: 5310 MHz, 802.11n 40MHz (Chain A+C) with power setting of 17.0 dBm 5350 MHz Band Edge Signal Radiated Field Strength Level Pol FCC 15.209 Detector Frequency Azimuth Height Comments Pk/QP/Avg MHz dBµV/m V/H Limit Margin degrees meters ٧ AVG 5350.030 52.2 54.0 -1.8 313 1.9 RB 1 MHz; VB: 10 Hz 5350.030 49.3 Н 54.0 -4.7 AVG 0 1.2 RB 1 MHz; VB: 10 Hz 5350.200 66.4 Н 74.0 -7.6 ΡK 0 1.2 RB 1 MHz; VB: 1 MHz RB 1 MHz; VB: 1 MHz 5350.230 71.2 V 74.0 -2.8 ΡK 1.9 313 Note 1: For emissions in the restricted band starting at 5350 MHz the limit of 15.209 was used. RB 1 MHz; VB 10 Hz Average (Black trace), RB=VB=1MHz Peak (Blue trace), Vertical 80.0 75.0-70.0 Amplitude (dBuV/m) 65.0 When of the most have a specific the 60.0 55.0 50.0 45.0 40.0 5350.0 5352.0 5354.0 5356.0 5358.0 5360.0 5362.0 5364.0 5366.0 5368.0 5370.0 Frequency (MHz)



### EMC Test Data

Client:	Xirrus	Job Number:	J71484
Model	YNA	T-Log Number:	T73389
WOUCI.	AIN4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15.247 / RSS 210	Class:	N/A
Model: Contact: Standard:	XN4 Steve Smith FCC 15.247 / RSS 210	T-Log Number: Account Manager: Class:	T73389 Susan Pelzl N/A

#### RSS 210 and FCC 15.407 (UNII - 5250 - 5350 MHz and 5470-5725MHz) Radiated Spurious Emissions, 1 - 40 GHz, Internal Antenna

#### Test Specific Details

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

Config. Used: 1

Config Change: None

EUT Voltage: POE

Date of Test: 11/3 & 11/4/2008 Test Engineer: Mehran Birgani/Rafael Varelas Test Location: SV OATS #1

#### General Test Configuration

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

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

Ambient Conditions:	Temperature:
	Del Ilumiditu

 Temperature:
 15-35 °C

 Rel. Humidity:
 10-60 %

#### Summary of Results

Run #	Mode	Channel	Power Setting	Test Performed	Limit	Result / Margin
1a	802.11a,	5260 MHz				41.7dBµV/m (121.6µV/m) @
Tu	n20,n40	5270 MHz				7026.7MHz (-12.3dB)
1h	802.11a,					38.1dBµV/m (80.4µV/m) @
U U	n20		<sup>2</sup> 20 on oach	10597.1MHz (-15.9dB)		
10	802.11a,	5320 MHz	20 Uli Eduli chain	Radiated Emissions,		39.9dBµV/m @ 10638.8MHz
ιι	n20,n40	5310 MHz	(highost		ECC 15 200 / 15 E	(-14.1dB)
1d	802.11a,	5500 MHz	nowor	1 - 40 GHz	FGG 10.2097 10 E	46.0dBµV/m @ 7333.4MHz
Tu	n20,n40	5510 MHz	power	ng)		(-8.0dB)
10	802.11a,		setting)			Refer to test data log T77249 for
Te	n20,n40	-				radiated emissions, center channel
1f	802.11a,	5700 MHz				50.3dBµV/m @ 7600.1MHz
- 11	n20,n40	5670 MHz				(-3.7dB)

#### Modifications Made During Testing

No modifications were made to the EUT during testing

#### Deviations From The Standard

#### Elliott EMC Test Data Client: Xirrus Job Number: J71484 T-Log Number: T73389 Model: XN4 Account Manager: Susan Pelzl Contact: Steve Smith Standard: FCC 15.247 / RSS 210 Class: N/A **Frequency Range** Test Distance Limit Distance **Extrapolation Factor** 1000 - 18000 MHz 3 0.0 3 Run #1, Radiated Spurious Emissions, 1,000 - 40,000 MHz. Operation in the 5250-5350 MHz and 5470 - 5725 MHz Bands Scan made in anechoic chamber, measurements in tables below taken on OATS. Run #1a: Low Channel (5250-5350 MHz) 802.11a, 802.11n20 and 802.11n40 Power Setting Channel Radio Mode Comments Chain C Chain A (MHz) 1 5260 а 20 20 2 n20 20 20 5260 20 3 5270 n40 20 4 Spurious Radiated Emissions: Frequency Level Pol 15.209 / 15E Detector Azimuth Height Comments Mode MHz dBµV/m v/h Margin Pk/QP/Avg degrees Limit meters 7013.410 36.8 V 54.0 -17.2 AVG 1.0 RB 1 MHz; VB: 10 Hz all 8 7026.660 41.7 V 54.0 -12.3 AVG 88 2.2 RB 1 MHz; VB: 10 Hz all RB 1 MHz; VB: 10 Hz AVG 10518.260 38.4 Н 54.0 -15.6 65 1.7 all V 54.0 AVG 96 1.0 RB 1 MHz; VB: 10 Hz 10520.870 37.8 -16.2 all 10536.770 37.8 Η 54.0 -16.2 AVG 0 1.0 RB 1 MHz; VB: 10 Hz all V 54.0 AVG 54 10544.050 38.1 -15.9 1.0 RB 1 MHz; VB: 10 Hz all 7013.440 V 74.0 -27.1 ΡK 8 46.9 1.0 RB 1 MHz; VB: 1 MHz all 7026.680 49.1 V 74.0 -24.9 ΡK 88 2.2 RB 1 MHz; VB: 1 MHz all 10518.600 59.7 74.0 -14.3 ΡK RB 1 MHz; VB: 1 MHz Н 65 1.7 all -19.7 ΡK 10524.980 V 74.0 96 1.0 RB 1 MHz; VB: 1 MHz 54.3 all 10536.450 49.6 Н 74.0 -24.4 ΡK 0 1.0 RB 1 MHz; VB: 1 MHz all 10541.100 48.9 V 74.0 -25.1 ΡK 54 RB 1 MHz; VB: 1 MHz 1.0 all For emissions in restricted bands, the limit of 15.209 was used. For all other emissions the average limit was set to Note 1: -27dBm/MHz (~68.3 dBuV/m) and peak limit set to 20dB higher than the average limit (88.3 dBuV/m).

Client: Xi Model: XI	An AT							EM	C Test	Data
Model: XI	irrus	company						Job Number:	J71484	
Model: XI							T-	Log Number:	T73389	
	N4						Accou	unt Manager:	Susan Pelzl	
Contact: St	teve Smith									
Standard: F(	CC 15.247	/ RSS 210						Class:	N/A	
Dum #1h. Com	tor Chann			11 000 11	1-20					
Run # ID: Cen	Channel	el (5250-535	D330 WHZ) 802.118, 802.11120		<u>n20</u>					
Radio	(MHz)	Mode	Chain A	Chain C	-		Com	ments		
1	5300	a	20	20						
2	5300	n20	20	20						
3	-	-	-	-						
4	-	-	_	-						
					-4					
Spurious Rad	liated Emis	ssions:								
Frequency	Level	Pol	15.209	₹/15E	Detector	Azimuth	Height	Comments		Mode
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
7066.600	35.4	H	54.0	-18.6	AVG	101	1.8	RB 1 MHz; V	/B: 10 Hz	a, n20
7066.630	38.1	V	54.0	-15.9	AVG	360	1.0	RB 1 MHz; V	/B: 10 Hz	a, n20
10595.080	37.5	<u> </u>	54.0	-16.5	AVG	81	2.3	RB 1 MHz; V	/B: 10 Hz	a, n20
10597.130	38.1	<u> </u>	54.0	-15.9	AVG	0	2.2	RB 1 MHz; V	/B: 10 Hz	a, n20
7066.620	47.2	V	74.0	-26.8	PK	360	1.0	RB 1 MHz; V	VB: 1 MHz	a, n20
7066.720	45.6	<u> </u>	74.0	-28.4	PK	101	1.8	RB 1 MHz; V	VB: 1 MHz	a, n20
10597.580	49.3	V	74.0	-24.7	PK	0	2.2	RB 1 MHz; V	/B: 1 MHz	a, n20
10600.150	49.1	H	/4.0	-24.9	РК	81	2.3	RB 1 MHZ; V	/B: 1 MHz	a, n20
	For amicai		-tod hondo t	La limit of 1		- For all at	- ar amicolo	the overee		.1.1.0
Note 1:					5.209 Was use	0. FOI all ui			e iimit was se	etio
	-2/0Bm/iv	/IHZ (~08.3 U	iBuv/m) anu	peak limit se	et to 20aB nig	her than the	average im	it (88.3 abuv	/m).	
Dun #1c· Hiał	h Channel	(5250-5350	MH2) 802 11	۱ <u>م</u> ۵۵۷ 11n	20 and 802 1°	In/10				
Kull # IC. Higi	Channel	(3230-3330	Power	Setting		11140				
Radio	(MHz)	Mode	Chain A	Chain C	-		Com	ments		
1	5320	а	20	20	-					
2	5320	n20	20	20						
3	5310	n40	20	20						
-	-	-	_	_	+					

Æ		) tt ar*company						EMC Test	Data
Client:	Xirrus							Job Number: J71484	
Model	XN4						T-	Log Number: T73389	
							Αссоι	unt Manager: Susan Pelzl	
Contact:	Steve Smith								
Standard:	FCC 15.247	/ RSS 210				 		Class: N/A	
Crowslavia D	liatad Emi								
Spurious R		SSIONS: Pol	15,209	) / 15F	Detector	∆zimuth	Height	Comments	Mode
MHz	dBuV/m	v/h	Limit	Margin	Pk/OP/Ava	dearees	meters	Comments	MOGC
10638.780	39.9	V	54.0	-14.1	AVG	360	1.8	RB 1 MHz: VB: 10 Hz	all
10638.530	39.5	H	54.0	-14,5	AVG	0	1.5	RB 1 MHz: VB: 10 Hz	all
10618.540	39.2	H	54.0	-14.8	AVG	305	1.0	RB 1 MHz: VB: 10 Hz	all
10618.500	39.0	V	54.0	-15,0	AVG	34	1.0	RB 1 MHz: VB: 10 Hz	all
7093,390	38.6	V	54.0	-15.4	AVG	19	1.6	RB 1 MHz: VB: 10 Hz	all
7093.260	36.7	H	54.0	-17.3	AVG	280	1.3	RB 1 MHz: VB: 10 Hz	all
7080,240	36.4	H	54.0	-17.6	AVG	28	1.3	RB 1 MHz: VB: 10 Hz	all
7080.390	36.2	V	54.0	-17,8	AVG	240	1.0	RB 1 MHz: VB: 10 Hz	all
10638.740	51.3	V	74.0	-22,7	PK	360	1.8	RB 1 MHz: VB: 1 MHz	all
10621.420	50.4	H	74.0	-23.6	PK	305	1.0	RB 1 MH7: VB: 1 MHz	all
10638.580	50.3	H	74.0	-23.7	PK	0	1.5	RB 1 MH7: VB: 1 MHz	all
10620.230	50.1	V	74.0	-23,9	PK	34	1.0	RB 1 MH7: VB: 1 MHz	all
7093.370	49.2	V	74.0	-24,8	PK	19	1.6	RB 1 MH7: VB: 1 MHz	all
7093,940	48.7	H	74.0	-25.3	PK	280	1.3	RB 1 MH7: VB: 1 MHz	all
7081.310	47.9	H	74.0	-26,1	PK	28	1.3	RB 1 MHz: VB: 1 MHz	all
7078.970	47.6	V	74.0	-26,4	PK	240	1.0	RB 1 MHz: VB: 1 MHz	all
, , , , , , , , , , , , , , , , , , , ,		`			<u> </u>				<u>u</u>
	For emiss	ions in restri	cted bands, t	he limit of 1	5.209 was use	ed. For all of	ther emissio	ns the average limit was se	et to
Note 1:	-27dBm/N	ЛНz (~68.3 с	IBuV/m) and	neak limit se	et to 20dB hig	her than the	average lim	iit (88.3 dBuV/m).	
		, /EATO 5725	م ۱۹۱۱-۱ ۵۵۵ 11	o 000 11pt					
	Channel	(0470-0720		Cottina		1140			
Radio		Mode	Chain A	Chain (	1		Com	iments	
1	(IVITZ) 5500	а			╂────				
2	5500	n20	20	20	├───				
2	5510	n40	20	20	├───				
4	-	-	- 20	-	<del> </del>				
	I		LI		<u> </u>				

<b>C</b> E								EM	C Test	Data
Client:	Xirrus							Job Number:	J71484	
							T-	Log Number:	T73389	
Model:	XN4						Acco	unt Manager:	Susan Pelzl	
Contact <sup>.</sup>	Steve Smith	1						antinanagon		
Standard	FCC 15 247	/ RSS 210						Class	N/A	
Stanuaru.	10013.247	1103210						01033.		
Spurious R	adiated Emi	ssions:								
Frequency	Level	Pol	15.209	9/15E	Detector	Azimuth	Height	Comments		Mode
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
7333.420	46.0	V	54.0	-8.0	AVG	330	1.0	RB 1 MHz; V	VB: 10 Hz	all
7346.710	43.7	V	54.0	-10.3	AVG	27	1.0	RB 1 MHz; V	VB: 10 Hz	all
11000.910	41.8	V	54.0	-12.2	AVG	334	1.0	RB 1 MHz; V	VB: 10 Hz	all
11018.530	41.2	V	54.0	-12.8	AVG	153	1.0	RB 1 MHz; V	VB: 10 Hz	all
10999.650	40.5	Н	54.0	-13.5	AVG	265	1.0	RB 1 MHz; V	VB: 10 Hz	all
11020.270	40.4	Н	54.0	-13.6	AVG	93	1.0	RB 1 MHz; V	VB: 10 Hz	all
7333.630	39.3	Н	54.0	-14.7	AVG	21	1.0	RB 1 MHz; V	VB: 10 Hz	all
7346.730	38.2	Н	54.0	-15.8	AVG	123	1.1	RB 1 MHz; \	VB: 10 Hz	all
11000.450	52.9	V	74.0	-21.1	PK	334	1.0	RB 1 MHz; \	VB: 1 MHz	all
11019.290	52.8	V	74.0	-21.2	PK	153	1.0	RB 1 MHz;	VB: 1 MHz	all
11001.040	52.4	H	74.0	-21.6	PK	265	1.0	RB 1 MHz;	VB: 1 MHz	all
/333.0/0	52.3	V	/4.0	-21./	PK	330	1.0	RB 1 MHz;	VB: 1 MHz	all
11020.080	51.7	H	74.0	-22.3	PK	93	1.0	RB 1 MHZ; V	VB: 1 MHz	all
7346.650	50.4	V	74.0	-23.6	PK	27	1.0	RB 1 MHZ;	VB: 1 MHZ	all
7332.810	48.0	H	74.0	-25.4	PK	21 100	1.0	RB I MHZ;		all
7340.390	48.Z	Н	74.0	-25.8	PK	123	1.1	RB I IVIHZ;	AR: I MHZ	all
	Eor omice	ione in roetri	ctod bands t	ha limit of 1	5 200 was use	d For all at	hor omissio	ne the average	no limit was so	t to
Note 1:	-27dBm/	MHz (~68.3 d	IRuV/m) and	ne innit of 13 neak limit si	ot to 20dR high	bor than the	averane lin	hit (88 3 dBul)	Je iii iii was se //m)	1 10
	-z/uDIII/I	VITZ (~00.3 U	ibuv/iii) aliu	peak infin si	et to zoub hig		average in	III (00.3 UDUV	/111).	

Client: Xirus         Job Number: J71484           Tog Number: J71484           Tog Number: J71484           Contact: Steve Smith           Client: Site of Standard: FCC 15.247 / RSS 210           Client: Site of Standard: FCC 15.247 / RSS 210           Client: Name           Radio Channel (S470-5725 MHz) 802.11a, 802.11n20 and 802.11n40           Radio Channel (Mode Chann A Chain C Chain A Chain C           1         5700         a         20         20         20         20         20         20         20         2         20         20         20         20         2         2         5700         n40         20         20         20         20         2         2         2         5700         n40         20         20         2         2         2         5700         n40         20         20         2         2         4         -			Dtt						EM	C Test	Data
Model:         XN4         T-Log Number:         T73389           Contact:         Steve Smith	Client:	Xirrus	2 company						Job Number:	J71484	
Model:         XM4         Account Manage:         Susan Pelzl           Contact:         Sleve Smith         Standard:         FCC 15.247 / RSS 210         Class:         N/A           Run #1f: high Channel (5470-5725 MHz) 802.11a, 802.11n20 and 802.11n40         Class:         N/A           Radio         Channel (MHz)         Mode         Power Setting         Comments           1         5700         a         20         33         5670         n40         20         20         R21         M4z         481         Wdelt         20         RB1 MHz; WB: 10 Hz         all         20         RB1 MHz; WB: 10 Hz         all         20         RB1 MHz; WB: 10 Hz         all         20         RB1 MHz;								T-	Log Number:	T73389	
Contact:         Steve Smith           Standard:         FCC 15.247 / RSS 210           Class:         N/A           Radio         Class:         N/A           Radio         Class:         N/A           Radio         Class:         N/A           Radio         Class:         N/A           Class:         N/A           Class:         N/A           Class:         N/A           Class:         Class:         N/A           Class:         N/A           Structure         Comments         Comments         Mode           M/A         A         C         -           Structure         Power Setting         Comments         Mode           M/A         Comments         Mode           MHz         Miterial         Comments         Mode	Model:	XN4						Accou	unt Manager:	Susan Pelzl	
Standard: FCC 15.247 / RSS 210         Class: N/A           Ran #1f: high Channel (5470-5725 MHz) 802.11a, 802.11n20 and 802.11n40           Radio         Channel (MHz)         Mode Channel (MHz)         Comments           1         5700         a         20         20         Comments           2         5700         n20         20         Comments           4         -         -         -           5670         n40         20         20         Comments           4         -         -         -         Comments           Frequency         Level         Pol         15.209 / 15E         Detector         Azimuth         Height         Comments         Mode           MHZ         MBµU/m         Wh         Limit         Margin         PK0P/Arg degrees         meters           7600.080         50.3         V         54.0         -8.3         AVG         327         1.0         RB 1 MHz, VB: 10 Hz         all           7560.040         45.7         V         54.0         -9.7         AVG         239         1.0         RB 1 MHz, VB: 10 Hz         all           7560	Contact:	Steve Smith									
Run #1f: high Channel (5470-5725 MHz) 802.11a, 802.11n20 and 802.11n40           Radio         Channel (MHz)         Power Setting Chain A         Comments           1         5700         a         20         20           2         5700         n20         20         20           3         5670         n40         20         20           4         -         -         -         -           Spurious Radiated Emissions: Frequency         Level         Pol         15.209 / 15E         Detector         Azimuth         Height         Comments         Mode           7600.080         50.3         V         54.0         -3.7         AVG         319         2.0         RB 1 MHz; VB: 10 Hz         all           1399.460         47.2         V         54.0         -8.3         AVG         327         1.0         RB 1 MHz; VB: 10 Hz         all           1399.920         44.3         H         54.0         -9.7         AVG         239         1.0         RB 1 MHz; VB: 10 Hz         all           1339.500         42.4         V         54.0         -10.3         AVG         72         1.0         RB 1 MHz; VB: 10 Hz         all           113	Standard:	FCC 15.247	/ RSS 210						Class:	N/A	
Run #1f: high Channel         Mode         Power Setting         Comments           Radio         Channel         Mode         Power Setting         Comments           1         5700         a         20         20           2         5700         n20         20         20           3         5670         n40         20         20           4         -         -         -         -           Frequency         Level         Pol         15209/15E         Detector         Azimuth         Height         Comments         Mode           7600.080         50.3         V         54.0         -3.7         AVG         319         2.0         RB 1 MHz; VB: 10 Hz         all           11399.460         47.2         V         54.0         -6.8         AVG         327         1.0         RB 1 MHz; VB: 10 Hz         all           11399.920         44.3         H         54.0         -9.7         AVG         239         1.0         RB 1 MHz; VB: 10 Hz         all           11339.930         42.4         V         54.0         -10.3         AVG         72         2.0         RB 1 MHz; VB: 10 Hz         all           11339.910		L.								1	
Radio         Channel (MHz)         Mode         Power Setting Chain A         Comments           1         5700         a         20         20           2         5700         n20         20         20           3         5670         n40         20         20           4         -         -         -         -           Spurious Radiated Emissions:         Frequency         Level         Pol         15.209 / 15E         Detector         Azimuth         Height         Comments         Mode           7600.080         50.3         V         54.0         -3.7         AVG         319         2.0         RB 1 MHz; VB: 10 Hz         all           11399.460         47.2         V         54.0         -8.3         AVG         327         1.0         RB 1 MHz; VB: 10 Hz         all           11399.400         45.7         V         54.0         -9.7         AVG         239         1.0         RB 1 MHz; VB: 10 Hz         all           11399.920         44.3         H         54.0         -10.3         AVG         237         1.0         RB 1 MHz; VB: 10 Hz         all           1139.910         41.2         H         54.0         -1	Run #1f: hi	gh Channel	(5470-5725	MHz) 802.11	a, 802.11n2	0 and 802.11	n40				
Industry         Industry         Chain A         Chain C         Description           1         5700         a         20         20         20           3         5670         n40         20         20         20           3         5670         n40         20         20         20           4         -         -         -         -         -           Spurious Radiated Emissions:         Erequency         Level         Pol         15.209 / 15E         Detector         Azimuth         Height         Comments         Mode           MHz         dBµV/m         Vh         Limit         Margin         PK/OP/Avg         degrees         meters         -           7600.080         50.3         V         54.0         -6.8         AVG         327         1.0         RB 1 MHz; VB: 10 Hz         all           11399.460         47.2         V         54.0         -8.3         AVG         72         2.0         RB 1 MHz; VB: 10 Hz         all           11399.50         44.3         H         54.0         -10.3         AVG         318         2.0         RB 1 MHz; VB: 10 Hz         all           11339.50         42.4         V<	Radio	Channel	Mode	Power	Setting			Com	ments		
1         5700         a         20         20           2         5700         n20         20         20           3         5670         n40         20         20           4         -         -         -         -           Frequency         Level         Pol         15.209 / 15E         Detector         Azimuth         Height         Comments         Mode           MHz         dBµV/m         v/h         Limit         Margin         Pk/OP/Avg         degrees         meters           7600.080         50.3         V         54.0         -3.7         AVG         319         2.0         RB 1 MHz; VB: 10 Hz         all           11399.460         47.2         V         54.0         -6.8         AVG         327         1.0         RB 1 MHz; VB: 10 Hz         all           760.040         45.7         V         54.0         -8.3         AVG         72         2.0         RB 1 MHz; VB: 10 Hz         all           11399.920         44.3         H         54.0         -10.3         AVG         318         2.0         RB 1 MHz; VB: 10 Hz         all           11399.920         45.5         H         74.0         -1	Rudio	(MHz)	Mode	Chain A	Chain C			Com	inicitto		
2         5700         n20         20         20           3         5670         n40         20         20           4         -         -         -         -           Spurious Radiated Emissions:         Frequency         Level         Pol         15.209 / 15E         Detector         Azimuth         Height         Comments         Mode           MHz         dBµV/m         v/h         Limit         Margin         Pk/OP/Avg         degrees         meters         -           7600.080         50.3         V         54.0         -3.7         AVG         319         2.0         RB 1 MHz; VB: 10 Hz         all           11399.400         47.2         V         54.0         -8.3         AVG         72         2.0         RB 1 MHz; VB: 10 Hz         all           11399.920         44.3         H         54.0         -9.7         AVG         239         1.0         RB 1 MHz; VB: 10 Hz         all           11339.530         42.4         V         54.0         -11.6         AVG         74         1.0         RB 1 MHz; VB: 10 Hz         all           11339.530         42.4         V         54.0         -12.8         AVG         74	1	5700	а	20	20						
3         5670         n40         20         20           4         -         -         -         -         -           Spurious Radiated Emissions:         Frequency         Level         Pol         15.209 / 15E         Detector         Azimuth         Height         Comments         Mode           MHz         dB <sub>µ</sub> V/m         v/h         Limit         Margin         PK/OP/Avg         degrees         meters           7600.080         50.3         V         54.0         -3.7         AVG         319         2.0         RB 1 MHz; VB: 10 Hz         all           1399.460         47.2         V         54.0         -6.8         AVG         327         1.0         RB 1 MHz; VB: 10 Hz         all           1399.920         44.3         H         54.0         -9.7         AVG         239         1.0         RB 1 MHz; VB: 10 Hz         all           11339.930         42.4         V         54.0         -10.3         AVG         237         1.0         RB 1 MHz; VB: 10 Hz         all           11339.910         41.2         H         54.0         -12.8         AVG         74         1.0         RB 1 MHz; VB: 10 Hz         all           11339.910 <td>2</td> <td>5700</td> <td>n20</td> <td>20</td> <td>20</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	2	5700	n20	20	20						
4         -         -         -           Spurious Radiated Emissions:           Frequency         Level         Pol         15.209 / 15E         Detector         Azimuth         Height         Comments         Mode           7600.080         50.3         V         54.0         -3.7         AVG         319         2.0         RB 1 MHz; VB: 10 Hz         all           11399.460         47.2         V         54.0         -6.8         AVG         327         1.0         RB 1 MHz; VB: 10 Hz         all           7600.060         45.7         V         54.0         -8.3         AVG         72         2.0         RB 1 MHz; VB: 10 Hz         all           11399.920         44.3         H         54.0         -9.7         AVG         239         1.0         RB 1 MHz; VB: 10 Hz         all           11399.920         44.3         H         54.0         -10.3         AVG         237         1.0         RB 1 MHz; VB: 10 Hz         all           11399.920         44.3         H         54.0         -12.8         AVG         74         1.0         RB 1 MHz; VB: 10 Hz         all           11399.120         56.5         H         74.0         -17.5         <	3	5670	n40	20	20						
Spurious Radiated Emissions:           Frequency         Level         Pol         15.209 / 15E         Detector         Azimuth         Height         Comments         Mode           MHz         dBµU/m         v/h         Limit         Margin         Pk/OP/Avg         degrees         meters           7600.080         50.3         V         54.0         -3.7         AVG         319         2.0         RB 1 MHz; VB: 10 Hz         all           11399.460         47.2         V         54.0         -6.8         AVG         327         1.0         RB 1 MHz; VB: 10 Hz         all           7500.040         45.7         V         54.0         -9.7         AVG         239         1.0         RB 1 MHz; VB: 10 Hz         all           11399.920         44.3         H         54.0         -9.7         AVG         239         1.0         RB 1 MHz; VB: 10 Hz         all           11399.920         44.3         H         54.0         -11.6         AVG         237         1.0         RB 1 MHz; VB: 10 Hz         all           11339.530         42.4         V         54.0         -11.6         AVG         237         1.0         RB 1 MHz; VB: 10 Hz         all	4	-	-	-	-						
Spurious Radiated Emissions:         Frequency         Level         Pol         15.209 / 15E         Detector         Azimuth         Height         Comments         Mode           MHz         dB <sub>µ</sub> U/m         v/h         Limit         Margin         Pk/QP/Avg         degrees         meters         —           7600.080         50.3         V         54.0         -3.7         AVG         319         2.0         RB 1 MHz; VB: 10 Hz         all           11399.460         47.2         V         54.0         -6.8         AVG         327         1.0         RB 1 MHz; VB: 10 Hz         all           11399.920         44.3         H         54.0         -9.7         AVG         239         1.0         RB 1 MHz; VB: 10 Hz         all           11399.920         44.3         H         54.0         -10.3         AVG         237         1.0         RB 1 MHz; VB: 10 Hz         all           11339.910         41.2         H         54.0         -11.6         AVG         74         1.0         RB 1 MHz; VB: 10 Hz         all           11339.910         41.2         H         54.0         -15.2         AVG         74         1.0         RB 1 MHz; VB: 10 Hz         all											
Integrate         Level         Poil         13.207 / 132         Detection         Azimuth         Height         Comments         Midde           MHz         dBµV/m         w/h         Limit         Margin         Pk/OP/Avg         degrees         meters	Spurious R	adiated Emi	SSIONS:	15 200	) / 155	Dotostor	Azimuth	Holaht	Commonto		Mada
MHZ         dBµ/m         Vin         Limit         Margin         PROPAvg         degrees         meters           7600.080         50.3         V         54.0         -3.7         AVG         319         2.0         RB 1 MHz; VB: 10 Hz         all           11399.460         47.2         V         54.0         -6.8         AVG         327         1.0         RB 1 MHz; VB: 10 Hz         all           7500.040         45.7         V         54.0         -8.3         AVG         72         2.0         RB 1 MHz; VB: 10 Hz         all           11399.920         44.3         H         54.0         -9.7         AVG         239         1.0         RB 1 MHz; VB: 10 Hz         all           11399.920         44.3         H         54.0         -10.3         AVG         318         2.0         RB 1 MHz; VB: 10 Hz         all           11339.530         42.4         V         54.0         -11.6         AVG         237         1.0         RB 1 MHz; VB: 10 Hz         all           11339.910         41.2         H         54.0         -12.8         AVG         74         1.0         RB 1 MHz; VB: 10 Hz         all           1140.0420         59.5         V	Frequency	Level	P01	15.205	7/IDE	Delector	Azimuin	Height	Comments		Mode
7600.080         50.3         V         54.0         -3.7         AVG         319         2.0         RB 1 MHz; VB: 10 Hz         all           11399.460         47.2         V         54.0         -6.8         AVG         327         1.0         RB 1 MHz; VB: 10 Hz         all           7560.040         45.7         V         54.0         -8.3         AVG         72         2.0         RB 1 MHz; VB: 10 Hz         all           11399.920         44.3         H         54.0         -9.7         AVG         239         1.0         RB 1 MHz; VB: 10 Hz         all           7600.060         43.7         H         54.0         -10.3         AVG         318         2.0         RB 1 MHz; VB: 10 Hz         all           11339.530         42.4         V         54.0         -11.6         AVG         237         1.0         RB 1 MHz; VB: 10 Hz         all           11399.10         41.2         H         54.0         -12.8         AVG         74         1.0         RB 1 MHz; VB: 10 Hz         all           1400.420         59.5         V         74.0         -14.5         PK         327         1.0         RB 1 MHz; VB: 10 Hz         all           1399.120 <td></td> <td>dBµV/m</td> <td>V/N</td> <td>LIMIL</td> <td>iviargin</td> <td>PK/QP/AVg</td> <td>degrees</td> <td>meters</td> <td></td> <td></td> <td></td>		dBµV/m	V/N	LIMIL	iviargin	PK/QP/AVg	degrees	meters			
11399.400       47.2       V       54.0       -6.8       AVG       327       1.0       RB 1 MHz; VB: 10 Hz       all         7560.040       45.7       V       54.0       -8.3       AVG       72       2.0       RB 1 MHz; VB: 10 Hz       all         11399.920       44.3       H       54.0       -9.7       AVG       239       1.0       RB 1 MHz; VB: 10 Hz       all         7600.060       43.7       H       54.0       -10.3       AVG       318       2.0       RB 1 MHz; VB: 10 Hz       all         11339.530       42.4       V       54.0       -11.6       AVG       237       1.0       RB 1 MHz; VB: 10 Hz       all         11339.910       41.2       H       54.0       -12.8       AVG       74       1.0       RB 1 MHz; VB: 10 Hz       all         11400.420       59.5       V       74.0       -14.5       PK       327       1.0       RB 1 MHz; VB: 10 Hz       all         1399.120       56.5       H       74.0       -17.5       PK       239       1.0       RB 1 MHz; VB: 1 MHz       all         1339.760       53.9       H       74.0       -20.1       PK       74       1.0       RB 1	/600.080	50.3	V	54.0	-3.7	AVG	319	2.0	RB I MHZ;	VB: 10 HZ	all
7560.040         45.7         V         54.0         -8.3         AVG         72         2.0         RB 1 MHz; VB: 10 Hz         all           11399.920         44.3         H         54.0         -9.7         AVG         239         1.0         RB 1 MHz; VB: 10 Hz         all           7600.060         43.7         H         54.0         -10.3         AVG         318         2.0         RB 1 MHz; VB: 10 Hz         all           11339.530         42.4         V         54.0         -11.6         AVG         237         1.0         RB 1 MHz; VB: 10 Hz         all           11339.530         42.4         V         54.0         -12.8         AVG         74         1.0         RB 1 MHz; VB: 10 Hz         all           11339.910         41.2         H         54.0         -12.8         AVG         74         1.0         RB 1 MHz; VB: 10 Hz         all           11400.420         59.5         V         74.0         -14.5         PK         327         1.0         RB 1 MHz; VB: 10 Hz         all           7560.060         38.8         H         54.0         -17.5         PK         239         1.0         RB 1 MHz; VB: 1 MHz         all           1399.120<	11399.460	47.2	V	54.0	-6.8	AVG	327	1.0	RB I MHZ;	VB: 10 HZ	all
11399.920       44.3       H       54.0       -9.7       AVG       239       1.0       RB 1 MHz; VB: 10 Hz       all         7600.060       43.7       H       54.0       -10.3       AVG       318       2.0       RB 1 MHz; VB: 10 Hz       all         11339.530       42.4       V       54.0       -11.6       AVG       237       1.0       RB 1 MHz; VB: 10 Hz       all         11339.910       41.2       H       54.0       -12.8       AVG       74       1.0       RB 1 MHz; VB: 10 Hz       all         11400.420       59.5       V       74.0       -14.5       PK       327       1.0       RB 1 MHz; VB: 10 Hz       all         7560.060       38.8       H       54.0       -15.2       AVG       123       1.0       RB 1 MHz; VB: 10 Hz       all         11399.120       56.5       H       74.0       -17.5       PK       239       1.0       RB 1 MHz; VB: 10 Hz       all         11399.120       56.5       H       74.0       -17.5       PK       239       1.0       RB 1 MHz; VB: 1 MHz       all         1139.120       55.5       V       74.0       -20.1       PK       74       1.0       R	/560.040	45.7	V	54.0	-8.3	AVG	/2	2.0	RB 1 MHZ;	VB: 10 Hz	all
7600.060       43.7       H       54.0       -10.3       AVG       318       2.0       RB 1 MHz; VB: 10 Hz       all         11339.530       42.4       V       54.0       -11.6       AVG       237       1.0       RB 1 MHz; VB: 10 Hz       all         11339.910       41.2       H       54.0       -12.8       AVG       74       1.0       RB 1 MHz; VB: 10 Hz       all         11400.420       59.5       V       74.0       -14.5       PK       327       1.0       RB 1 MHz; VB: 10 Hz       all         7560.060       38.8       H       54.0       -15.2       AVG       123       1.0       RB 1 MHz; VB: 10 Hz       all         11399.120       56.5       H       74.0       -17.5       PK       239       1.0       RB 1 MHz; VB: 1 MHz       all         7600.150       55.0       V       74.0       -19.0       PK       319       2.0       RB 1 MHz; VB: 1 MHz       all         11339.760       53.9       H       74.0       -20.1       PK       74       1.0       RB 1 MHz; VB: 1 MHz       all         7559.840       51.6       V       74.0       -22.2       PK       72       2.0       RB	11399.920	44.3	H	54.0	-9.7	AVG	239	1.0	RB 1 MHZ;	VB: 10 Hz	all
11339.530       42.4       V       54.0       -11.6       AVG       237       1.0       RB 1 MHz; VB: 10 Hz       all         11339.910       41.2       H       54.0       -12.8       AVG       74       1.0       RB 1 MHz; VB: 10 Hz       all         11400.420       59.5       V       74.0       -14.5       PK       327       1.0       RB 1 MHz; VB: 10 Hz       all         7560.060       38.8       H       54.0       -15.2       AVG       123       1.0       RB 1 MHz; VB: 10 Hz       all         11399.120       56.5       H       74.0       -17.5       PK       239       1.0       RB 1 MHz; VB: 1 MHz       all         7600.150       55.0       V       74.0       -19.0       PK       319       2.0       RB 1 MHz; VB: 1 MHz       all         11339.760       53.9       H       74.0       -20.1       PK       74       1.0       RB 1 MHz; VB: 1 MHz       all         1340.130       53.8       V       74.0       -20.2       PK       237       1.0       RB 1 MHz; VB: 1 MHz       all         7559.840       51.6       V       74.0       -22.5       PK       318       2.0       RB	/600.060	43.7	H	54.0	-10.3	AVG	318	2.0	RB 1 MHZ;	VB: 10 Hz	all
11339.910       41.2       H       54.0       -12.8       AVG       74       1.0       RB 1 MHz; VB: 10 Hz       all         11400.420       59.5       V       74.0       -14.5       PK       327       1.0       RB 1 MHz; VB: 1 MHz       all         7560.060       38.8       H       54.0       -15.2       AVG       123       1.0       RB 1 MHz; VB: 10 Hz       all         11399.120       56.5       H       74.0       -17.5       PK       239       1.0       RB 1 MHz; VB: 1 MHz       all         7600.150       55.0       V       74.0       -19.0       PK       319       2.0       RB 1 MHz; VB: 1 MHz       all         11339.760       53.9       H       74.0       -20.1       PK       74       1.0       RB 1 MHz; VB: 1 MHz       all         11340.130       53.8       V       74.0       -20.2       PK       237       1.0       RB 1 MHz; VB: 1 MHz       all         7600.260       51.5       H       74.0       -22.5       PK       318       2.0       RB 1 MHz; VB: 1 MHz       all         760.260       51.5       H       74.0       -25.1       PK       123       1.0       RB 1	11339.530	42.4	V	54.0	-11.6	AVG	237	1.0	RB 1 MHZ;	VB: 10 Hz	all
11400.420       59.5       V       74.0       -14.5       PK       327       1.0       RB 1 MHz; VB: 1 MHz       all         7560.060       38.8       H       54.0       -15.2       AVG       123       1.0       RB 1 MHz; VB: 10 Hz       all         11399.120       56.5       H       74.0       -17.5       PK       239       1.0       RB 1 MHz; VB: 1 MHz       all         7600.150       55.0       V       74.0       -19.0       PK       319       2.0       RB 1 MHz; VB: 1 MHz       all         11339.760       53.9       H       74.0       -20.1       PK       74       1.0       RB 1 MHz; VB: 1 MHz       all         11340.130       53.8       V       74.0       -20.2       PK       237       1.0       RB 1 MHz; VB: 1 MHz       all         7559.840       51.6       V       74.0       -22.4       PK       72       2.0       RB 1 MHz; VB: 1 MHz       all         7600.260       51.5       H       74.0       -22.5       PK       318       2.0       RB 1 MHz; VB: 1 MHz       all         760.270       48.9       H       74.0       -25.1       PK       123       1.0       RB 1 MH	11339.910	41.2	H	54.0	-12.8	AVG	/4	1.0	RB 1 MHz;	VB: 10 Hz	all
7560.060       38.8       H       54.0       -15.2       AVG       123       1.0       RB 1 MHz; VB: 10 Hz       all         11399.120       56.5       H       74.0       -17.5       PK       239       1.0       RB 1 MHz; VB: 1 MHz       all         7600.150       55.0       V       74.0       -19.0       PK       319       2.0       RB 1 MHz; VB: 1 MHz       all         11339.760       53.9       H       74.0       -20.1       PK       74       1.0       RB 1 MHz; VB: 1 MHz       all         11340.130       53.8       V       74.0       -20.2       PK       237       1.0       RB 1 MHz; VB: 1 MHz       all         7559.840       51.6       V       74.0       -22.4       PK       72       2.0       RB 1 MHz; VB: 1 MHz       all         7600.260       51.5       H       74.0       -22.5       PK       318       2.0       RB 1 MHz; VB: 1 MHz       all         760.270       48.9       H       74.0       -25.1       PK       123       1.0       RB 1 MHz; VB: 1 MHz       all         Note 1:       For emissions in restricted bands, the limit of 15.209 was used. For all other emissions the average limit was set to <td>11400.420</td> <td>59.5</td> <td>V</td> <td>/4.0</td> <td>-14.5</td> <td>PK</td> <td>327</td> <td>1.0</td> <td>RB 1 MHZ;</td> <td>VB: 1 MHz</td> <td>all</td>	11400.420	59.5	V	/4.0	-14.5	PK	327	1.0	RB 1 MHZ;	VB: 1 MHz	all
11399.120       56.5       H       74.0       -17.5       PK       239       1.0       RB 1 MHz; VB: 1 MHz       all         7600.150       55.0       V       74.0       -19.0       PK       319       2.0       RB 1 MHz; VB: 1 MHz       all         11339.760       53.9       H       74.0       -20.1       PK       74       1.0       RB 1 MHz; VB: 1 MHz       all         11340.130       53.8       V       74.0       -20.2       PK       237       1.0       RB 1 MHz; VB: 1 MHz       all         7559.840       51.6       V       74.0       -22.4       PK       72       2.0       RB 1 MHz; VB: 1 MHz       all         7600.260       51.5       H       74.0       -22.5       PK       318       2.0       RB 1 MHz; VB: 1 MHz       all         7600.270       48.9       H       74.0       -25.1       PK       123       1.0       RB 1 MHz; VB: 1 MHz       all         7560.270       48.9       H       74.0       -25.1       PK       123       1.0       RB 1 MHz; VB: 1 MHz       all         Note 1:       For emissions in restricted bands, the limit of 15.209 was used. For all other emissions the average limit was set to -27dBm/MHz (-	/560.060	38.8	H	54.0	-15.2	AVG	123	1.0	RB 1 MHZ;	VB: 10 Hz	all
7600.150         55.0         V         74.0         -19.0         PK         319         2.0         RB 1 MHz; VB: 1 MHz         all           11339.760         53.9         H         74.0         -20.1         PK         74         1.0         RB 1 MHz; VB: 1 MHz         all           11340.130         53.8         V         74.0         -20.2         PK         237         1.0         RB 1 MHz; VB: 1 MHz         all           7559.840         51.6         V         74.0         -22.4         PK         72         2.0         RB 1 MHz; VB: 1 MHz         all           7600.260         51.5         H         74.0         -22.5         PK         318         2.0         RB 1 MHz; VB: 1 MHz         all           7600.260         51.5         H         74.0         -25.1         PK         123         1.0         RB 1 MHz; VB: 1 MHz         all           7560.270         48.9         H         74.0         -25.1         PK         123         1.0         RB 1 MHz; VB: 1 MHz         all           Note 1:         For emissions in restricted bands, the limit of 15.209 was used. For all other emissions the average limit was set to           -27dBm/MHz (~68.3 dBuV/m) and peak limit set to 20dB higher than the averag	11399.120	56.5	H	/4.0	-17.5	PK	239	1.0	RB 1 MHz;	VB: 1 MHz	all
11339.760       53.9       H       74.0       -20.1       PK       74       1.0       RB 1 MHz; VB: 1 MHz       all         11340.130       53.8       V       74.0       -20.2       PK       237       1.0       RB 1 MHz; VB: 1 MHz       all         7559.840       51.6       V       74.0       -22.4       PK       72       2.0       RB 1 MHz; VB: 1 MHz       all         7600.260       51.5       H       74.0       -22.5       PK       318       2.0       RB 1 MHz; VB: 1 MHz       all         7560.270       48.9       H       74.0       -25.1       PK       123       1.0       RB 1 MHz; VB: 1 MHz       all         7560.270       48.9       H       74.0       -25.1       PK       123       1.0       RB 1 MHz; VB: 1 MHz       all         Note 1:         For emissions in restricted bands, the limit of 15.209 was used. For all other emissions the average limit was set to         -27dBm/MHz (~68.3 dBuV/m) and peak limit set to 20dB higher than the average limit (88.3 dBuV/m).	/600.150	55.0	V	/4.0	-19.0	PK	319	2.0	RB 1 MHz;	VB: 1 MHz	all
11340.130       53.8       V       74.0       -20.2       PK       237       1.0       RB 1 MHz; VB: 1 MHz       all         7559.840       51.6       V       74.0       -22.4       PK       72       2.0       RB 1 MHz; VB: 1 MHz       all         7600.260       51.5       H       74.0       -22.5       PK       318       2.0       RB 1 MHz; VB: 1 MHz       all         7560.270       48.9       H       74.0       -25.1       PK       123       1.0       RB 1 MHz; VB: 1 MHz       all         7560.270       48.9       H       74.0       -25.1       PK       123       1.0       RB 1 MHz; VB: 1 MHz       all         Note 1:         For emissions in restricted bands, the limit of 15.209 was used. For all other emissions the average limit was set to         -27dBm/MHz (~68.3 dBuV/m) and peak limit set to 20dB higher than the average limit (88.3 dBuV/m).	11339.760	53.9	H	/4.0	-20.1	PK	/4	1.0	RB 1 MHz;	VB: 1 MHz	all
7559.840       51.6       V       74.0       -22.4       PK       72       2.0       RB 1 MHz; VB: 1 MHz       all         7600.260       51.5       H       74.0       -22.5       PK       318       2.0       RB 1 MHz; VB: 1 MHz       all         7560.270       48.9       H       74.0       -25.1       PK       123       1.0       RB 1 MHz; VB: 1 MHz       all         Note 1:       For emissions in restricted bands, the limit of 15.209 was used. For all other emissions the average limit was set to -27dBm/MHz (~68.3 dBuV/m) and peak limit set to 20dB higher than the average limit (88.3 dBuV/m).       RB 1 MHz; VB: 1 MHz       Image: Colored col	11340.130	53.8	V	74.0	-20.2	PK	237	1.0	RB 1 MHz;	VB: 1 MHz	all
7600.260       51.5       H       74.0       -22.5       PK       318       2.0       RB 1 MHz; VB: 1 MHz       all         7560.270       48.9       H       74.0       -25.1       PK       123       1.0       RB 1 MHz; VB: 1 MHz       all         Note 1:         For emissions in restricted bands, the limit of 15.209 was used. For all other emissions the average limit was set to -27dBm/MHz (~68.3 dBuV/m) and peak limit set to 20dB higher than the average limit (88.3 dBuV/m).	7559.840	51.6	V	74.0	-22.4	PK	72	2.0	RB 1 MHz;	VB: 1 MHz	all
7560.270       48.9       H       74.0       -25.1       PK       123       1.0       RB 1 MHz; VB: 1 MHz       all         Note 1:       For emissions in restricted bands, the limit of 15.209 was used. For all other emissions the average limit was set to -27dBm/MHz (~68.3 dBuV/m) and peak limit set to 20dB higher than the average limit (88.3 dBuV/m).	7600.260	51.5	H	74.0	-22.5	PK	318	2.0	RB 1 MHz;	VB: 1 MHz	all
Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions the average limit was set to -27dBm/MHz (~68.3 dBuV/m) and peak limit set to 20dB higher than the average limit (88.3 dBuV/m).	/560.270	48.9	Н	/4.0	-25.1	PK	123	1.0	RB 1 MHZ;	VB: 1 MHz	all
	Note 1:	For emiss -27dBm/N	ions in restri MHz (~68.3 d	cted bands, t dBuV/m) and	he limit of 1 peak limit se	5.209 was use et to 20dB hig	ed. For all ot her than the	her emissio average lim	ns the averac it (88.3 dBuV	ge limit was se //m).	et to

### EMC Test Data

Client:	Xirrus	Job Number:	J71484
Model	YNA	T-Log Number:	T73389
MOUCI.	AIN4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15.247 / RSS 210	Class:	N/A

#### RSS 210 and FCC 15.407 (UNII - 5250 - 5350 MHz and 5470-5725MHz) Radiated Spurious Emissions, Band Edges - External Antenna

#### Test Specific Details

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

Date of Test: 11/5/2008 Test Engineer: Rafael Varelas Test Location: OATS #1 Config. Used: 1 Config Change: None EUT Voltage: POE

#### General Test Configuration

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

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

Ambient	Conditions:
	oonanions.

Temperature:	15-35 °C
Rel. Humidity:	10-60 %

#### 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

Run #	Mode	Channel	Power Setting	Test Performed	Limit	Result / Margin
15	802.11a	5220 MHz	10 5	Restricted Band Edge	ECC 15 200 / 15 E	49.6dBµV/m @ 5350.0MHz
Ia	Chain B	5520 IVII IZ	17.5	at 5350 MHz	1 CC 13.2077 13 L	(-4.4dB)
			20.0	Restricted Band Edge		49.5dBµV/m @ 5457.0MHz
1h	802.11a		20.0	at 5460 MHz	FGG 10.2097 10 E	(-4.5dB)
U	Chain B	5500 MITZ	20.0	Band Edge 5460 - 5470	15E (68.3 dBuV/m avg,	49.8dBµV/m @ 5469.7MHz
			20.0	MHz	88.3dBuV/m peak)	(-18.5dB)

C E		Ditt Ar company						EMO	C Test Data
Client:	Xirrus							Job Number:	J71484
							T-	Log Number:	T73389
Model:	XN4						Accou	unt Manager:	Susan Pelzl
Contact:	Steve Smith							5	
Standard	ECC 15 247	/ RSS 210						Class	N/A
Dup #1, Do	diated Emice	rions at Par	d Edgag O	noration in	the 5250 525	0MUz and E	140 57251	/Uz Dande (	002 11a modo
кин #1. ка Run #1a: 5	220 MHz 802	) 11a (Chain	B) with nov	ver setting	nf 19 5	UNITIZ ALIU D	400 - 37230	IITZ Dahus, o	
	520 MI 12, 002		b) with pot	wer setting	01 17.5				
5350 MHz E	Band Edge Sig	onal Radiate	d Field Strer	nath					
Frequency	Level	Pol	FCC 1	15.209	Detector	Azimuth	Height	Comments	
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
5350.000	49.6	V	54.0	-4.4	Avg	101	1.9	RB 1 MHz; V	VB: 10 Hz
5352.420	61.9	V	74.0	-12.1	PK	101	1.9	RB 1 MHz; V	VB: 1 MHz
5350.030	49.4	Н	54.0	-4.6	Avg	183	2.3	RB 1 MHz; V	VB: 10 Hz
5350.880	62.1	Н	74.0	-11.9	PK	183	2.3	RB 1 MHz; V	VB: 1 MHz
	1								
Note 1:	For emissi	ions in restri	cted band im	mediately al	pove 5350MH	z, the limit of	15.209 was	s used.	
RB 1 MH	Hz; VB 10 Hz	Average (Bl	ack Trace), I	RB=VB=1M	Hz Peak (Blue	Trace) Vert	ical		
80	0								
/5	.0-								
2 20	.0-								
_ \	.0-	h.							
960	.0 - <sup>Maryada</sup> yikasaa	Multi-Multi-Market	the mark the second	VAN Armyon	had the second where	Harran and M	haddenaldenia	and an and a state of the	notherappeters
<sup>B</sup> 55	.0								
/ 분 50	.0								
45	0-								
	.0								
40	.0-								
35	.0 - ,								
	5350.0 53	52.0 535	4.0 5356	.U 5358.U	J 5360.0 Frequency (M	5362.U Hə)	5364.0 5	5366.U 53t	58.0 5370.0
				1	requercy (in	112)			

	An AZ	ح <sup>*</sup> company							
Client:	Xirrus							Job Number:	J71484
Madal							T-	Log Number:	T73389
Moder	XN4					ľ	Acco	unt Manager:	Susan Pelzl
Contact:	Steve Smith								
Standard:	FCC 15.247	/ RSS 210						Class:	N/A
8un #1b: 55 460 MHz R	600 MHz, 802	2.11a (Chair	n B) with pow	ver setting	of 20 jth				
Frequency	Level	Pol	FCC 1	15.209 Marain	Detector	Azimuth	Height	Comments	
WIHZ	dBµV/m	<u>V/H</u>	LIMIT	Iviargin	PK/QP/AVg	degrees	meters		VD: 10 Uz
5457.020	49.5 62.0	V	54.0 74.0	-4.5	AVY	313	1.8	RB 1 MHZ;	VB: 10 HZ VB: 1 MHz
5457.110	49.4	 H	54.0	-4.6	Ανα	5	1.0	RB 1 MHz;	VB: 10 Hz
5458.370	61.7	H	74.0	-12.3	PK	5	1.1	RB 1 MHz;	VB: 1 MHz
80. 75. 70. ( <sup>(1)</sup> /265. ( <sup>1)</sup> /29) 60.	0	Average (Bl	ack Trace), F	RB=VB=1MF	Hz Peak (Blue	Trace) Verti	ical Material	www.www.www.	Mohadoward
80. 75. (w/\ngp) aprillowy (w/\ngp) aprillowy 45. 40. 35.	0	Average (Bl	ack Trace), F	RB=VB=1MH	Hz Peak (Blue	Trace) Verti	саl ////////////////////////////////////	,,, <b>1</b> , <b></b> ,,.,.,.,.,.,.,.,.,.,.,.,.,.,	
80. 75. (W) 65. (W) 99,55. 99,110 99,110 99,110 45. 40. 35. 5470 MHz B Frequency	0	Average (Bl	ack Trace), F	RB=VB=1MF	Hz Peak (Blue	Azimuth	cal	5 5465.0 5	
80. 75. 70. (w) 65. 90 60. 90 55. 45. 40. 35. 5470 MHz B Frequency MHz	0	Average (Bl	ack Trace), F	RB=VB=1MF	Hz Peak (Blue	Azimuth degrees	And	5 5465.0 5	<u>Altitude And</u> 467.5 5470.0
80. 75. 70. (Ju) 65. 90. 90. 55. 45. 40. 35. 50. 45. 40. 35. 50. 45. 40. 35. 50. 45. 40. 35. 50. 45. 40. 35. 50. 50. 45. 45. 40. 50. 50. 45. 50. 50. 50. 50. 50. 50. 50. 50. 50. 5	0	Average (Bl	ack Trace), F	RB=VB=1MH	Hz Peak (Blue	Trace) Verti	cal	5 5465.0 5	whether and a second se
80. 75. 70. (W) 65. 90.55. 90.55. 40. 35. 40. 35. 5470 MHz B Frequency MHz 5469.670 5469.490	0	Average (Bl	ack Trace), F	RB=VB=1MH 	Iz Peak (Blue	Azimuth degrees 313 313	Leight 1.8 1.8	Comments RB 1 MHz;	VB: 10 Hz VB: 1 MHz
80. 75. 70. (W) 65. 90, 90, 55. 40. 35. 40. 35. 54. 70 MHz B Frequency MHz 5469.670 5469.490 5468.130	$\begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 $	Average (Bl	ack Trace), F	RB=VB=1MF	Tz Peak (Blue	Azimuth degrees 313 5	Height Height 1.8 1.1	Comments RB 1 MHz; RB 1 MHz;	VB: 10 Hz VB: 1 MHz VB: 10 Hz
80. 75. 70. (W) 65. 90.55. 90.55. 40. 35. 54.70 MHz B Frequency MHz 5469.670 5468.130 5467.160	$\begin{array}{c} 0 \\ - \\$	Average (Bl	ack Trace), F	RB=VB=1MH	Iz Peak (Blue	Trace) Verti	Height Height 1.8 1.1 1.1	Comments RB 1 MHz; RB 1 MHz; RB 1 MHz; RB 1 MHz;	VB: 10 Hz VB: 1 MHz VB: 1 MHz VB: 1 MHz
80. 75. 70. 99. 99. 10. 99. 10. 99. 10. 10. 10. 10. 10. 10. 10. 10. 10. 10	0	Average (Bl	ack Trace), F	RB=VB=1MH	Detector PK/QP/Avg PK Avg PK	Azimuth degrees 313 55 5 5 5 5 5	Height Height 1.8 1.1 1.1 15 200 wee	Comments RB 1 MHz; RB 1 MHz; RB 1 MHz;	VB: 10 Hz VB: 1 MHz VB: 1 MHz VB: 1 MHz
80. 75. 70. 90. 90. 55. 90. 50. 45. 40. 35. 54. 40. 35. 54. 54. 54. 54. 54. 54. 54. 54. 54. 5	0	Average (Bl	ack Trace), F	RB=VB=1MH	Hz Peak (Blue	Azimuth degrees 313 313 5 5 5 7, the limit of et to -27dBm	Height Height Height 1.8 1.1 1.1 1.1 15.209 was ////////////////////////////////////	Comments RB 1 MHz; RB 1 MHz; RB 1 MHz; RB 1 MHz; RB 1 MHz; RB 1 MHz;	VB: 10 Hz VB: 1 MHz VB: 1 MHz VB: 1 MHz

# 

### EMC Test Data

Client:	Xirrus	Job Number:	J71484
Model	YNA	T-Log Number:	T73389
wouer.	AIN4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15.247 / RSS 210	Class:	N/A

#### RSS 210 and FCC 15.407 (UNII - 5250 - 5350 MHz and 5470-5725MHz) Radiated Spurious Emissions, 1 - 40 GHz, External Antenna

#### Test Specific Details

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

Date of Test: 11/4/2008 Test Engineer: Rafael Varelas Test Location: SVOATS #1 Config. Used: 1 Config Change: None EUT Voltage: POE

#### General Test Configuration

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

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

Ambient Conditions:	Temperature:	15-35 °C
	Rel. Humidity:	10-60 %

#### Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
	802.11a	5260 MHz MHz					63.7dBµV/m @ 10520.8MHz (-10.3dB)
1	802.11a	5300 MHz	20				41.3dBµV/m @ 7066.8MHz (-12.7dB)
	802.11a	5320 MHz			Dadiated Emissions		40.3dBµV/m @ 7093.4MHz (-13.7dB)
	802.11a	5500 MHz			1 - 40 GHz	FCC 15.209 / 15 E	42.9dBµV/m @ 7333.5MHz (-11.1dB)
2	802.11a	-	20				Refer to T77249 for radiated emissions, center channel
	802.11a	5700 MHz					52.3dBµV/m @ 7600.1MHz (-1.7dB)

#### Modifications Made During Testing

No modifications were made to the EUT during testing

## EMC Test Data

	An DLLL Company		
Client:	Xirrus	Job Number:	J71484
Model	YNA	T-Log Number:	T73389
MOUEI.	AIN4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15.247 / RSS 210	Class:	N/A

#### Deviations From The Standard

No deviations were made from the requirements of the standard.

#### Run #1, Radiated Spurious Emissions, 1,000 - 40,000 MHz. Operation in the 5250-5350 MHz and 5470 - 5725 MHz Bands

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

#### Run #1a: 802.11a, Low Channel @ 5260

Dadio	Channel	Modo	Power Setting	Commonts
Raulu	(MHz)	woue	Chain A	Comments
4	5260	а	20	

#### Spurious Radiated Emissions:

Frequency	Level	Pol	15.209	9/15E	Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
10520.790	63.7	Н	74.0	-10.3	PK	349	1.0	RB 1 MHz; VB: 1 MHz
10518.830	40.4	Н	54.0	-13.6	AVG	349	1.0	RB 1 MHz; VB: 10 Hz
10519.860	39.8	V	54.0	-14.2	AVG	163	1.0	RB 1 MHz; VB: 10 Hz
7013.340	39.0	V	54.0	-15.0	AVG	345	1.1	RB 1 MHz; VB: 10 Hz
7013.400	37.9	Н	54.0	-16.1	AVG	238	1.7	RB 1 MHz; VB: 10 Hz
10521.280	52.0	V	74.0	-22.0	PK	163	1.0	RB 1 MHz; VB: 1 MHz
7013.380	48.2	V	74.0	-25.8	PK	345	1.1	RB 1 MHz; VB: 1 MHz
7013.680	48.1	Н	74.0	-25.9	PK	238	1.7	RB 1 MHz; VB: 1 MHz
		Cha	ain B on 11/5	5/08				
10518.660	39.5	V	54.0	-14.5	AVG	360	1.8	RB 1 MHz; VB: 10 Hz
10518.990	50.5	V	74.0	-23.5	PK	360	1.8	RB 1 MHz; VB: 1 MHz
7013.410	40.2	V	54.0	-13.8	AVG	287	1.0	RB 1 MHz; VB: 10 Hz
7013.480	48.8	V	74.0	-25.2	PK	287	1.0	RB 1 MHz; VB: 1 MHz
10518.760	40.4	Н	54.0	-13.6	AVG	253	1.8	RB 1 MHz; VB: 10 Hz
10519.120	61.7	Н	74.0	-12.3	PK	253	1.8	RB 1 MHz; VB: 1 MHz

	Xirrus							Job Number:	J71484
							T-	Log Number:	T73389
Model:	XN4						Ассо	unt Manager:	Susan Pelzl
Contact:	Steve Smith								
Standard:	FCC 15.247	/ RSS 210						Class:	N/A
)up #1h, 00	211a Cont	or Channal	@ 5200						
.un # nb. ou	Channel		Power	Setting					
Radio	(MHz)	Mode	Cha	ain A			Con	iments	
4	5300	а	2	0					
purious Ra	adiated Emis	ssions:	15 200	) / 15E	Dotostor	Azimuth	Lloight	Commonto	
MH <sub>7</sub>		101 v/b	Limit	Margin		AZIIIIUUII	metors	Comments	
7066 750	ubμv/III 41 3	V	54 0	-12 7	AVG	349	20	RB 1 MH7· V	/B <sup>.</sup> 10 H <sub>7</sub>
10598.500	39.6	— <u> </u>	54.0	-14.4	AVG	()	1.0	RB 1 MHz <sup>.</sup>	/B: 10 Hz
10598.500	39.6	V	54.0	-14.4	AVG	268	1.0	RB 1 MHz: V	/B: 10 Hz
7066.310	36.1	H	54.0	-17.9	AVG	314	1.4	RB 1 MHz; V	/B: 10 Hz
0598.840	51.4	Н	74.0	-22.6	PK	0	1.0	RB 1 MHz;	/B: 1 MHz
0599.570	51.1	V	74.0	-22.9	PK	268	1.0	RB 1 MHz;	/B: 1 MHz
7066.750	49.7	V	74.0	-24.3	PK	349	2.0	RB 1 MHz; V	/B: 1 MHz
7066.130	47.1	Н	74.0	-26.9	PK	314	1.4	RB 1 MHz; V	/B: 1 MHz
		Ch	ain B on 11/5	5/08					
0598.540	39.0	Н	54.0	-15.0	AVG	17	1.0	RB 1 MHz; V	/B: 10 Hz
0599.470	50.4	H	74.0	-23.6	PK	17	1.0	RB 1 MHz;	VB: 1 MHz
7066.690	38.2	V	54.0	-15.8	AVG	23	1.0	RB 1 MHz;	/B: 10 Hz
7067.100	47.6	V	74.0	-26.4	PK	23	1.0	RB 1 MHz;	/B: 1 MHz
ote 1:	For emission 27dBm/MHz	s in restricte (~68.3 dBu)	ed bands, the V/m) and pea	e limit of 15.2 ak limit set to	209 was used. 5 20dB higher	For all othe than the ave	r emissions rage limit (8	the average 88.3 dBuV/m).	limit was set

<b>C</b> E	Ellic	ott						EM	C Test	Data
Client:	Xirrus	company						Job Number:	J71484	
							T-I	Log Number:	T73389	
Model:	XN4						Αссоι	unt Manager:	Susan Pelzl	
Contact:	Steve Smith									
Standard:	FCC 15.247	/ RSS 210						Class:	N/A	
Run #1, Rao Run #1c: 80	diated Spuri )2.11a, High	ous Emissio Channel @	ons, 1,000 5320	40,000 MHz.	Operation in	n the 5250-5	5350 MHz ar	nd 5470 - 572	25 MHz Bands	
Dadio	Channel	Modo	Power	Setting			Com	monte		
Raulu	(MHz)	woue	Cha	in A			COIII	IIIEIIIS		
4	5320	а	2	0						
-			15.00			A 1 11				
Frequency		Pol	15.209	/ I5E	Detector	Azimuth	Height	Comments		
IVIHZ	dBμV/m 40.2	V/f1	54.0	12 7	PK/QP/AVg	uegrees			VD- 10 日 <sub>7</sub>	
1093.370	40.3 20 /	V	54.0	-13.7	AVG	300 252	1.0	RB 1 MHZ;	VB: 10 HZ VB: 10 Hz	
10638 530	39.4	H	54.0	-14.0	AVG	5	1.0	RB 1 MHz <sup>,</sup>	VB: 10 Hz	
7093,290	37.6	H	54.0	-16.4	AVG	180	1.0	RB 1 MHz: '	VB: 10 Hz	
10640.940	51.1	V	74.0	-22.9	PK	252	1.0	RB 1 MHz: '	VB: 1 MHz	
10638.570	50.6	H	74.0	-23.4	PK	5	1.0	RB 1 MHz; '	VB: 1 MHz	
7093.140	49.2	V	74.0	-24.8	РК	360	1.0	RB 1 MHz; '	VB: 1 MHz	
7093.500	48.1	Н	74.0	-25.9	PK	180	1.1	RB 1 MHz; Y	VB: 1 MHz	
	Chain B on 11/5/08									
7093.530	41.1	V	54.0	-12.9	AVG	181	1.0	RB 1 MHz;	VB: 10 Hz	
7093.270	49.5	V	74.0	-24.5	PK	181	1.0	RB 1 MHz; '	VB: 1 MHz	
10638.510	39.0	V	54.0	-15.0	AVG	360	1.0	RB 1 MHz; '	VB: 10 Hz	
10639.460	51.0	V	74.0	-23.0	PK	360	1.0	RB 1 MHz; '	VB: 1 MHz	
	For emission	ns in restricte	ed bands, the	limit of 15.2	09 was used.	For all othe	er emissions	the average	limit was set to	) -
Note 1:	27dBm/MHz	z (~68.3 dBu)	V/m) and pea	ik limit set to	20dB higher	than the ave	erage limit (8	8.3 dBuV/m)		
		(							-	
Run #2, Rad	diated Spuri	ous Emissio	ons, 1,000 -	40,000 MHz.	Operation in	n the 5250-5	350 MHz ar	nd 5470 - 572	25 MHz Bands	5
Run #2a: 80	)2.11a, Low	Channel @	5500							
Padio	Channel	Mode	Power	Setting			Com	mants		
Raulo	(MHz)	woue	Cha	in A			Com	mento		
4	5500	а	2	0						
Spurious R	adiated Emi	ssions:								
Frequency	Level	Pol	15.209	9/15E	Detector	Azimuth	Height	Comments		Mode
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
7333.450	42.9	V	54.0	-11.1	AVG	227	1.0	RB 1 MHz; '	VB: 10 Hz	а
11000.830	40.1	V	54.0	-13.9	AVG	14	1.0	RB 1 MHz; '	VB: 10 Hz	а
11000.750	40.0	Н	54.0	-14.0	AVG	360	1.0	RB 1 MHz; '	VB: 10 Hz	а
7333.400	39.1	Н	54.0	-14.9	AVG	250	1.0	RB 1 MHz; Y	VB: 10 Hz	а
10999.820	51.1	V	74.0	-22.9	PK	14	1.0	RB 1 MHz; Y	VB: 1 MHz	а
11001.360	51.1	Н	74.0	-22.9	PK	360	1.0	RB 1 MHz; Y	VB: 1 MHz	а
7333.370	50.0	V	74.0	-24.0	PK	227	1.0	RB 1 MHz; '	VB: 1 MHz	а
7333.290	48.6	Н	74.0	-25.4	PK	250	1.0	RB 1 MHz; '	VB: 1 MHz	а
7000 5=-	Chain B on 11/5/08							10.40.11		
/333.370	39.4	V	54.0	-14.6	AVG	280	1.0	RB 1 MHz;	VB: 10 Hz	
/333.280	49.1	V	/4.0	-24.9	PK	280	1.0	RB 1 MHz; '	VB: 1 MHz	

(7 E		<b>ott</b>						EM	C Test	Data
Client:	Xirrus	,						Job Number:	J71484	
							T-Log Number: T73389			
Model:	XN4						Acco	unt Manager:	Susan Pelzl	
Contact:	Steve Smith									
Standard:	FCC 15.247	/ RSS 210					Class:	N/A		
olanda.a.	10010121	1100 211						0.0.11		
Run #2c: 80	)2.11a, High	Channel @	5700							
Dadia	Channel	Mada	Power	Setting			Com	monte		
Radio	(MHz)	wode	Cha	iin A			Com	iments		
4	5700	а	2	0						
Spurious R	adiated Emi	ssions:								
Frequency	Level	Pol	15.209	9/15E	Detector	Azimuth	Height	Comments		Mode
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
7600.050	52.3	V	54.0	-1.7	AVG	230	2.0	RB 1 MHz;	VB: 10 Hz	а
11398.500	42.8	V	54.0	-11.2	AVG	217	1.9	RB 1 MHz;	VB: 10 Hz	а
7600.040	42.8	Н	54.0	-11.2	AVG	234	1.0	RB 1 MHz;	VB: 10 Hz	а
11399.060	41.9	Н	54.0	-12.1	AVG	263	1.0	RB 1 MHz;	VB: 10 Hz	а
7600.140	55.7	V	74.0	-18.3	PK	230	2.0	RB 1 MHz;	VB: 1 MHz	а
11399.220	54.5	V	74.0	-19.5	PK	217	1.9	RB 1 MHz;	VB: 1 MHz	а
11400.570	53.3	Н	74.0	-20.7	PK	263	1.0	RB 1 MHz;	VB: 1 MHz	а
7600.020	50.2	Н	74.0	-23.8	PK	234	1.0	RB 1 MHz;	VB: 1 MHz	а
		Ch	ain B on 11/5	5/08						
7600.020	44.1	V	54.0	-9.9	AVG	352	1.1	RB 1 MHz;	VB: 10 Hz	а
7600.250	50.5	V	74.0	-23.5	PK	352	1.1	RB 1 MHz;	VB: 1 MHz	а



## EMC Test Data

	, company		
Client:	Xirrus	Job Number:	J77228
Model:	XN4	T-Log Number:	T77249
		Account Manager:	Susan Pelzl
Contact:	Steve Smith		Mark Briggs
Emissions Standard(s):	FCC 15 E, RSS 210	Class:	NII
Immunity Standard(s):	-	Environment:	Wireless
Model: Contact: Emissions Standard(s): Immunity Standard(s):	XN4 Steve Smith FCC 15 E, RSS 210 -	I-Log Number: Account Manager: Class: Environment:	I //249 Susan Pelzl Mark Briggs NII Wireless

### **NII RF Port Test Data**

For The

### Xirrus

Model

XN4

Date of Last Test: 11/23/2009

#### Elliott EMC Test Data Client: Xirrus Job Number: J77228 T-Log Number: T77249 Model: XN4 Account Manager: Susan Pelzl Contact: Steve Smith Standard: FCC 15 E, RSS 210 Class: N/A RSS-210 (LELAN) and FCC 15.407(UNII) **Antenna Port Measurements** Power, PSD, Peak Excursion, Bandwidth and Spurious Emissions Test Specific Details Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above. Date of Test: 11/23/2009 Config. Used: -Config Change: Direct connection Test Engineer: Rafael Varelas EUT Voltage: 120V/60Hz Test Location: OATS #2 General Test Configuration When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators and cables used. Ambient Conditions: Temperature: 15-35 °C Rel. Humidity: 10-60 % Summary of Results Run # Test Performed Limit Result / Margin Pass / Fail Single radio: 18.5 dBm 1 Power, 5470 - 5725MHz 15.407(a) (1), (2) Pass 4x radio: 23.5 dBm

1	PSD, 5470 - 5725MHz	15.407(a) (1), (2)	Pass	6.0 dBm/MHz
1	26dB Bandwidth	15.407	Pass	37.9 MHz
1	99% Bandwidth	RSS 210	-	17.4 MHz
2	Peak Excursion Envelope	15.407(a) (6)	Pass	11.98 dB
3	Antenna Conducted	15 /07(b)	Dass	All emissions below the
J	Out of Band Spurious	13.407(b)	F 033	-27dBm/MHz limit
Λ	20dB bapdwidth	15 /07/b)	Dace	20dB bandwidth below 5589.3 MHz
4		13.407(b)	газэ	and above 5650.2 MHz

#### Modifications Made During Testing

No modifications were made to the EUT during testing

#### Deviations From The Standard

		JTC						EM	C Test	Da
Client:	An 2472 Xirrus	ළ company						Job Number:	J77228	
Model							T-l	_og Number:	T77249	
wouer.	A114						Αссоι	int Manager:	Susan Pelzl	
Contact:	Steve Smith									
Standard:	FCC 15 E, R	SS 210						Class:	N/A	
<b>in #1: Ba</b> itenna gai	ndwidth, Out in used is for i	tput Power the internal	and Powe antenna. T	r spectral Der he external ar	nsity htenna gain is Antenn	s lower (2.5d a Gain (dBi):	Bi) and not u 3.0	sed for MIM(	O modes.	
	Softwaro	Ran	dwidth		owor <sup>1</sup> dBm	Dowor	D		47	
	Setting	24 dD		Maggurad		(Watts)	Maggurad			Res
(IVIHZ)	20.0	200B	99% 17 /	19 5	24.0	0.071	k O		RSS LIMIL	Da
0000	20.0	07.7	17.1	10.0	21.0	0.071	0.0	11.0	11.0	10
SPAN: RB 1.0 VB 3.0 Detect Att 20 RL Off Sweep Ref Lv Pwr 2 Bin siz Highes 5 99% Ba 17 Power 71.4 18	50.00 MHz 00 MHz 00 MHz 00 Sample set 0.00 0 Time 50.0ms 1:7.00DBM vg: 100 sweep corr: 11.0dB e: 83 kHz t PSD .99 dBm/1.00 andwidth .39 MHz Over Span 427 mW .54 dBm	-1 -1 -2 -2 00 MHz -3 -3 -4	0.0 - 5.0 - 5.0 - 0.0 - 5.0 - 0.0 - 5.0 - 0.0 - 5.555.0 5 99°	560.0 % Bandwidth,	5570.0 Power Over	5580.0 Frequency of Span and P	(MHz)	0.0	5600.0 5605	5.0
Note 1: Note 2: Note 3:	Output pov RBW=1MI over 40 MI Measured For RSS-2 10dBm/MI average P amount th	wer measur Hz, VB=3 M Hz using the s 210 the limit Hz. The limit SD (calcula at the moss	ed using a Hz, sample ame analyz for the 515 ts are also of ted from the ured value	spectrum analydetector, pow er settings use 0 - 5250 MHz corrected for ir e measured po exceeds the a	yzer (see plo er averaging ed for output band accour istances whe ower divided	ts below): on (transmit power. its for the an ere the highe by the meas	ted signal wa tenna gain as st measured ured 99% bai	the maximu value of the ndwidth) by r	s) and power i um eirp allowe PSD exceeds nore than 3dB	ntegra d is the 3 by th

### EMC Test Data

	An Direction Company		
Client:	Xirrus	Job Number:	J77228
Model:	YNA	T-Log Number:	T77249
wouer.	×114	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

#### Power settings for all four radios operating in the 5470 - 5725 MHz band

Output power measured on the centre channel to demonstrate power control is available to set the power to a level low enough to comply with limits when all four radios are operational in the band. Only power was measured - aggregation of PSD is not applicable as the device cannot have more than one radio operating on a channel.

Frequency	Software	Band	lwidth	Measure		
(MHz)	Setting	26dB	<b>99</b> % <sup>4</sup>	dBm	mW	
5580	19.5	37.9	-	17.5	56.5	Limit
	Total	Power Acros	23.5	226.0	24 dBm	

#### Run #2: Peak Excursion Measurement

Device meets the requirement for the peak excursion

Freq	Peak Exc	ursion(dB)	Freq	Peak Excursion(dB)		Freq	Peak Excursion(dB)	
(MHz)	Value	Limit	(MHz)	Value	Limit	(MHz)	Value	Limit
5180		13.0	5260		13.0	5500	11.1	13.0
5200		13.0	5300		13.0	5580	12.0	13.0
5240		13.0	5320		13.0	5700	11.0	13.0



		tt		EMO	C Test Da
Client:	An 2225 co Xirrus	ompany		Job Number:	J77228
Madal				T-Log Number:	T77249
wodel:	XIN4			Account Manager:	Susan Pelzl
Contact:	Steve Smith				
Standard:	FCC 15 E, RSS	210		Class:	N/A
n #3: Ou	t Of Band Spuri	ious Emissions - Ant	enna Conducted		
D Tes	st Engineer: Sub	3/2009 Jaila Khushzad	Config. Used:	- Direct connection	
Te	st Location: Cha	mber #2	EUT Voltage:	120V/60Hz	
			Ű		
MO Devic	es: As the output	ut power setting for the	e single chain mode is higher than the	setting for dual chain, a	nd by adjusting the I
out of bar	nd spurious emis	sions to account for du	ual chain operation, the plots below co	over both single- and dua	al chain operation.
	Numbe	er of transmit chains:	2		
	Max	Imum Antenna Gain: Spurious Limit:	3.0 GBI -27.0 dBm/MHz eirn		
	Adju	ustment for 2 chains:	-6.0 dB adjustment for multiple	e chains and coherency I	between chains.
	Limit	Llood On Dioto Note 1.	-36.0 dBm/MHz Average Lim	it (RB=1MHz, VB=10Hz)	
	LIIIII	USEU UIT PIOLS	-16.0 dBm/MHz Peak Limit (F	RB=VB=1MHz)	
		Alla limitic on oim limi	t. The limit for entenne next conducte	d magaziramanta la adiu	atad ta taka inta
	i ne -27aBm/iv	/iHz limit is an eirp limi	t. The limit for antenna port conducte	a measurements is adjust	sted to take into
	consideration	the maximum antenna	agin (limit – "27dRm "antenna gain)	Radiated field strength	magguramants for
Note 1:	consideration signals more t	the maximum antenna han 50MHz from the b	a gain (limit = -27dBm - antenna gain). bands and that are close to the limit ar	Radiated field strength e made to determine cor	measurements for npliance as the ante
Note 1:	consideration signals more t gain is not kno	the maximum antenna han 50MHz from the b own at these frequenci	a gain (limit = -27dBm - antenna gain). bands and that are close to the limit ar es.	Radiated field strength e made to determine cor	measurements for npliance as the ante
Note 1: Note 2:	consideration signals more t gain is not kno All spurious sig	the maximum antenna han 50MHz from the b own at these frequenci gnals below 1GHz are	a gain (limit = -27dBm - antenna gain). pands and that are close to the limit ar es. measured during digital device radiat	Radiated field strength e made to determine cor red emissions test.	measurements for npliance as the ante
Note 1: Note 2: Note 3:	consideration signals more t gain is not kno All spurious signals that fa	the maximum antenna han 50MHz from the b own at these frequenci gnals below 1GHz are Il in the restricted band	a gain (limit = -27dBm - antenna gain). bands and that are close to the limit ar es. measured during digital device radiat ds of 15.205 are subject to the limit of	Radiated field strength e made to determine cor ted emissions test. 15.209.	measurements for npliance as the ante
Note 1: Note 2: Note 3:	consideration signals more ti gain is not kno All spurious sig Signals that fa	the maximum antenna han 50MHz from the b own at these frequenci gnals below 1GHz are Il in the restricted band Plots Showir	a gain (limit = -27dBm - antenna gain). ands and that are close to the limit ar es. measured during digital device radiat ds of 15.205 are subject to the limit of ng Out-Of-Band Emissions (RBW=V	Radiated field strength e made to determine cor ed emissions test. 15.209.	measurements for npliance as the ante
Note 1: Note 2: Note 3:	consideration signals more t gain is not kno All spurious sig Signals that fa	the maximum antenna han 50MHz from the b own at these frequenci gnals below 1GHz are Il in the restricted band Plots Showir	a gain (limit = -27dBm - antenna gain). bands and that are close to the limit ar es. measured during digital device radiat ds of 15.205 are subject to the limit of ng Out-Of-Band Emissions (RBW=V	Radiated field strength e made to determine cor ed emissions test. 15.209. /BW=1MHz)	measurements for npliance as the ante
Note 1: Note 2: Note 3:	consideration signals more t gain is not kno All spurious sig Signals that fa	the maximum antenna han 50MHz from the b <u>own at these frequenci</u> gnals below 1GHz are Il in the restricted band <u>Plots Showir</u>	a gain (limit = -27dBm - antenna gain). bands and that are close to the limit ar es. measured during digital device radiat ds of 15.205 are subject to the limit of ng Out-Of-Band Emissions (RBW=V	Radiated field strength e made to determine cor ted emissions test. 15.209. /BW=1MHz)	measurements for npliance as the ante
Note 1: Note 2: Note 3:	consideration signals more t gain is not kno All spurious sig Signals that fa	the maximum antenna han 50MHz from the b <u>own at these frequenci</u> gnals below 1GHz are Il in the restricted band <u>Plots Showir</u> Middle channel, 5580	a gain (limit = -27dBm - antenna gain). bands and that are close to the limit ar es. measured during digital device radiat ds of 15.205 are subject to the limit of ng Out-Of-Band Emissions (RBW=V O MHz with Power Setting of 22.0, C	Radiated field strength e made to determine cor ted emissions test. 15.209. (BW=1MHz) hain A and Chain C	measurements for npliance as the ante
Note 1: Note 2: Note 3:	consideration signals more t gain is not kno All spurious sig Signals that fa	the maximum antenna han 50MHz from the b own at these frequenci gnals below 1GHz are Il in the restricted band <u>Plots Showir</u> Middle channel, 5580	a gain (limit = -27dBm - antenna gain). pands and that are close to the limit ar es. measured during digital device radiat ds of 15.205 are subject to the limit of ng Out-Of-Band Emissions (RBW=V MHz with Power Setting of 22.0, C	Radiated field strength e made to determine cor ted emissions test. 15.209. /BW=1MHz) hain A and Chain C	measurements for npliance as the ante
Note 1: Note 2: Note 3:	consideration signals more ti gain is not kno All spurious sig Signals that fa Signals that fa	the maximum antenna han 50MHz from the b <u>own at these frequenci</u> gnals below 1GHz are <u>Il in the restricted band</u> <u>Plots Showir</u> Middle channel, 5580	a gain (limit = -27dBm - antenna gain). bands and that are close to the limit ar es. measured during digital device radiat ds of 15.205 are subject to the limit of ng Out-Of-Band Emissions (RBW=V O MHz with Power Setting of 22.0, C	Radiated field strength e made to determine cor ted emissions test. 15.209. /BW=1MHz) hain A and Chain C	measurements for npliance as the ante
Note 1: Note 2: Note 3:	consideration signals more t gain is not kno All spurious sig Signals that fa Signals that fa	the maximum antenna han 50MHz from the b <u>own at these frequenci</u> gnals below 1GHz are Il in the restricted band <u>Plots Showir</u> Middle channel, 5580 ns, ⊂hain 0	a gain (limit = -27dBm - antenna gain). ands and that are close to the limit ar es. measured during digital device radiat ds of 15.205 are subject to the limit of ng Out-Of-Band Emissions (RBW=V D MHz with Power Setting of 22.0, C	Radiated field strength e made to determine cor ted emissions test. 15.209. /BW=1MHz) hain A and Chain C	measurements for npliance as the ante
Note 1: Note 2: Note 3:	consideration signals more ti gain is not kno All spurious sig Signals that fa Df-Band Emissio	the maximum antenna han 50MHz from the b <u>own at these frequenci</u> gnals below 1GHz are <u>Il in the restricted band</u> <u>Plots Showir</u> Middle channel, 5580 ns, Chain 0	a gain (limit = -27dBm - antenna gain). bands and that are close to the limit ar es. measured during digital device radiat ds of 15.205 are subject to the limit of ng Out-Of-Band Emissions (RBW=V O MHz with Power Setting of 22.0, C	Radiated field strength e made to determine cor ted emissions test. 15.209. /BW=1MHz) hain A and Chain C	measurements for npliance as the ante
Note 1: Note 2: Note 3:	consideration signals more ti gain is not kno All spurious sig Signals that fa Df-Band Emissio	the maximum antenna han 50MHz from the b <u>own at these frequenci</u> gnals below 1GHz are <u>Il in the restricted band</u> <u>Plots Showir</u> Middle channel, 5580 ns, Chain 0	a gain (limit = -27dBm - antenna gain). bands and that are close to the limit ar es. measured during digital device radiat ds of 15.205 are subject to the limit of ng Out-Of-Band Emissions (RBW=V 0 MHz with Power Setting of 22.0, C	Radiated field strength e made to determine cor ted emissions test. 15.209. /BW=1MHz) hain A and Chain C	measurements for npliance as the ante
Vote 1: Vote 2: Note 3: Out-0 - -	consideration signals more ti gain is not kno All spurious sig Signals that fa Df-Band Emissio	the maximum antenna han 50MHz from the b <u>own at these frequenci</u> gnals below 1GHz are Il in the restricted band <u>Plots Showir</u> Middle channel, 5580 ns, ⊂hain 0	a gain (limit = -27dBm - antenna gain). pands and that are close to the limit ar es. measured during digital device radiat ds of 15.205 are subject to the limit of ng Out-Of-Band Emissions (RBW=V 0 MHz with Power Setting of 22.0, C	Radiated field strength e made to determine cor ted emissions test. 15.209. /BW=1MHz) hain A and Chain C	measurements for npliance as the ante
Note 1: Note 2: Note 3: Out-(	consideration signals more ti gain is not kno All spurious sig Signals that fa Df-Band Emissio 10.0 - 0.0 - 10.0 - 20.0 - 30.0 -	the maximum antenna han 50MHz from the b <u>own at these frequenci</u> gnals below 1GHz are <u>Il in the restricted band</u> <u>Plots Showir</u> Middle channel, 5580 ns, Chain 0	a gain (limit = -27dBm - antenna gain). pands and that are close to the limit ar es. measured during digital device radiat ds of 15.205 are subject to the limit of ng Out-Of-Band Emissions (RBW=V O MHz with Power Setting of 22.0, C	Radiated field strength e made to determine cor ted emissions test. 15.209. /BW=1MHz) hain A and Chain C	measurements for npliance as the ante
Note 1: Note 2: Note 3: Out-0	consideration signals more ti gain is not kno All spurious sig Signals that fa Df-Band Emissio 10.0 - 0.0 - 10.0 - 20.0 - 30.0 - 40.0 -	the maximum antenna han 50MHz from the b <u>own at these frequenci</u> gnals below 1GHz are <u>Il in the restricted band</u> <u>Plots Showir</u> Middle channel, 5580 ns, Chain 0	a gain (limit = -27dBm - antenna gain). bands and that are close to the limit ar es. measured during digital device radiat ds of 15.205 are subject to the limit of ng Out-Of-Band Emissions (RBW=V 0 MHz with Power Setting of 22.0, C	Radiated field strength e made to determine cor ted emissions test. 15.209. /BW=1MHz) hain A and Chain C	measurements for npliance as the ante
Vote 1: Vote 2: Vote 3: Vote 3: Out-0 (mgp) - - - - - - - - - - - - - -	consideration signals more ti gain is not kno All spurious sig Signals that fa Df-Band Emissio 10.0 - 0.0 - 10.0 - 20.0 - 30.0 - 40.0 - 50.0 -	the maximum antenna han 50MHz from the b <u>own at these frequenci</u> gnals below 1GHz are <u>Il in the restricted band</u> <u>Plots Showir</u> Middle channel, 5580 ns, Chain 0	a gain (limit = -27dBm - antenna gain). bands and that are close to the limit ar es. measured during digital device radiat ds of 15.205 are subject to the limit of ng Out-Of-Band Emissions (RBW=V 0 MHz with Power Setting of 22.0, C	Radiated field strength e made to determine cor ted emissions test. 15.209. /BW=1MHz) hain A and Chain C	measurements for npliance as the ante
Vote 1: Vote 2: Note 3: Out-0 - - - - - - - - - - - -	consideration signals more ti gain is not kno All spurious sig Signals that fa Signals that fa 0.0 - 10.0 - 20.0 - 30.0 - 40.0 - 50.0 - 60.0 -	the maximum antenna han 50MHz from the b <u>own at these frequenci</u> gnals below 1GHz are Il in the restricted band <u>Plots Showir</u> Middle channel, 5580 ns, ⊂hain 0	a gain (limit = -27dBm - antenna gain). ands and that are close to the limit ar es. measured during digital device radiat ds of 15.205 are subject to the limit of ng Out-Of-Band Emissions (RBW=V 0 MHz with Power Setting of 22.0, C	<ul> <li>Radiated field strength e made to determine cor</li> <li>ted emissions test.</li> <li>15.209.</li> <li>/BW=1MHz)</li> <li>hain A and Chain C</li> </ul>	measurements for npliance as the ante
Vote 1: Vote 2: Vote 3: Out-0 - - - - - - - - - - - - -	consideration signals more ti gain is not kno All spurious sig Signals that fa Df-Band Emissio 10.0 - 0.0 - 10.0 - 20.0 - 30.0 - 30.0 - 50.0 - 60.0 -	the maximum antenna han 50MHz from the b own at these frequenci gnals below 1GHz are il in the restricted band <u>Plots Showir</u> Middle channel, 5580 ns, Chain 0	a gain (limit = -27dBm - antenna gain). ands and that are close to the limit ar es. measured during digital device radiat ds of 15.205 are subject to the limit of ng Out-Of-Band Emissions (RBW=V O MHz with Power Setting of 22.0, C	Radiated field strength e made to determine cor ted emissions test. 15.209. /BW=1MHz) hain A and Chain C	measurements for npliance as the ante
Vote 1: Vote 2: Vote 3: Vote 3: Out-C (mgp) Pop Pop - - - - - - - - - - - - -	consideration signals more ti gain is not kno All spurious sig Signals that fa Signals that fa 0.0 - 10.0 - 20.0 - 30.0 - 40.0 - 50.0 - 80.0 - 70.0 - 80.0 -	the maximum antenna han 50MHz from the b <u>own at these frequenci</u> gnals below 1GHz are <u>Il in the restricted band</u> <u>Plots Showir</u> Middle channel, 5580 ns, ⊂hain 0	a gain (limit = -27dBm - antenna gain). ands and that are close to the limit ar es. measured during digital device radiat ds of 15.205 are subject to the limit of ng Out-Of-Band Emissions (RBW=V 0 MHz with Power Setting of 22.0, C	Radiated field strength e made to determine cor ted emissions test. 15.209. /BW=1MHz) hain A and Chain C	measurements for npliance as the ante
Vote 1: Vote 2: Vote 3: Out-0 - - - - - - - - - - - - -	consideration signals more ti gain is not kno All spurious sig Signals that fa Signals that fa Of-Band Emissio 10.0 - 20.0 - 10.0 - 20.0 - 30.0 - 40.0 - 50.0 - 80.0 - 90.0 - 30.0 -	the maximum antenna han 50MHz from the b <u>own at these frequenci</u> gnals below 1GHz are <u>Il in the restricted band</u> <u>Plots Showir</u> Middle channel, 5580 ns, ⊂hain 0	a gain (limit = -27dBm - antenna gain). aands and that are close to the limit ar es. measured during digital device radiat ds of 15.205 are subject to the limit of ng Out-Of-Band Emissions (RBW=V 0 MHz with Power Setting of 22.0, C 0 MHz with Power Setting of 22.0, C 1000.0	Radiated field strength e made to determine cor ted emissions test. 15.209. /BW=1MHz) hain A and Chain C	measurements for npliance as the ante







#### Elliott EMC Test Data Job Number: J77228 T-Log Number: T77249 Account Manager: Susan Pelzl

Model: XN4 Contact: Steve Smith Standard: FCC 15 E, RSS 210

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

Power, PSD, Peak Excursion, Bandwidth and Spurious Emissions

#### Test Specific Details

Client: Xirrus

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: 11/3/2009 & 11/23/09 Test Engineer: Suhaila Khushzad/Rafael Varelas Test Location: OATS #2

Config. Used: AC powered Config Change: Direct connection EUT Voltage: PoE

Class: N/A

#### General Test Configuration

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

Ambient Conditions:

Temperature: 15-36 °C Rel. Humidity: 10-60 %

#### Summary of Results

Mode	Test Performed	Limit	Pass / Fail	Result / Margin
0	Dowor 5470 5725MHz	15 407(2) (1) (2)	Dace	Single radio: 20.9 dBm
d	Fower, 3470 - 372310112	15.407(d) (1), (Z)	Pd55	4x radio: 24.0 dBm
а	PSD, 5470 - 5725MHz	15.407(a) (1), (2)	Pass	8.4 dBm/MHz
а	99% Bandwidth	RSS 210	-	17.4 MHz
а	Peak Excursion Envelope	15.407(a) (6)	Pass	12.4 dB
2	Antenna Conducted - Out of Band	15 /07(b)		Covered by single-chain
)	Spurious	15.407(b)		mode measurements
1	20dB bandwidth	15 407(b)	Dace	20dB bandwidth below 5591.0 MHz
t		15.407(D)	rd55	and above 5650.3 MHz
	Mode a a a 3	ModeTest PerformedaPower, 5470 - 5725MHzaPSD, 5470 - 5725MHza99% BandwidthaPeak Excursion EnvelopeAntenna Conducted - Out of Band Spurious420dB bandwidth	Mode         Test Performed         Limit           a         Power, 5470 - 5725MHz         15.407(a) (1), (2)           a         PSD, 5470 - 5725MHz         15.407(a) (1), (2)           a         P9% Bandwidth         RSS 210           a         Peak Excursion Envelope         15.407(a) (6)           3         Antenna Conducted - Out of Band Spurious         15.407(b)           4         20dB bandwidth         15.407(b)	ModeTest PerformedLimitPass / FailaPower, 5470 - 5725MHz15.407(a) (1), (2)PassaPSD, 5470 - 5725MHz15.407(a) (1), (2)PassaPSD, 5470 - 5725MHz15.407(a) (1), (2)Passa99% BandwidthRSS 210-aPeak Excursion Envelope15.407(a) (6)Pass3Antenna Conducted - Out of Band Spurious15.407(b)15.407(b)420dB bandwidth15.407(b)Pass

#### Modifications Made During Testing

No modifications were made to the EUT during testing

#### Deviations From The Standard

## EMC Test Data

Client:	Xirrus	Job Number:	J77228
Model <sup>.</sup>	YNA	T-Log Number:	T77249
wouer.	AN4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

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

Antenna gain used is for the internal antenna. The external antenna gain is lower (2.5dBi) and not used for MIMO modes.

			Chain 1	Chain 2	Chain 3	Coherent	Effective <sup>5</sup>			
	Antenna	a Gain (dBi):	3		3	Yes	6.0			
Power settings for a single radio operating in the band										
Frequency	Software	26dB BW	Measured Output Power <sup>1</sup> dBm			Тс	otal	Limit (dBm)	Max Power	Pass or
(MHz)	Setting	(MHz)	Chain 1	Chain 2	Chain 3	mW	dBm		(W)	Fail
5580	20.0	38.2	17.3		18.4	122.9	20.9	24.0	0.123	PASS
Frequency	<b>99</b> % <sup>4</sup>	Total	Р	PSD <sup>2</sup> dBm/MHz		Total PSD		Limit		Pass or
(MHz)	BW	Power	Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210 <sup>3</sup>	Fail
5580	17.4	20.9	4.7		6.0	6.9	8.4	11.0	11.0	PASS

#### Power settings for all four 802.11a channels being used in the band:

Output power measured on the center channel to demonstrate power control is available to set the power to a level low enough to comply with limits when all four radios are operational in the band. Only power was measured - aggregation of PSD is not applicable as the device cannot have more than one radio operating on a channel.

Frequency	Software	26dB BW	Measured Output Power <sup>1</sup> dBm			Total					
(MHz)	Setting	(MHz)	Chain 1	Chain 2	Chain 3	mW	dBm				
5580	16.5	38.2	14.5		15.3	62.3	17.9	Limit	P (W)	Result	
Total power in the band (four radios operational):							24.0	24.0	0.249	PASS	
Note 1:	Output power measured using a spectrum analyzer (see plots below for the high power measurements): RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 40MHz (20MHz mode) and 100MHz (40MHz mode)										
Note 2:	Measured using the same analyzer settings used for output power.										
Note 3:	For RSS-210 the limit for the 5150 - 5250 MHz band accounts for the antenna gain as the maximum eirp allowed is 10dBm/MHz. The limits are also corrected for instances where the highest measured value of the PSD exceeds the average PSD (calculated from the measured power divided by the measured 99% bandwidth) by more than 3dB by the amount that the measured value exceeds the average by more than 3dB.										
Note 4:	99% Bandwidth measured in accordance with RSS GEN - RB > 1% of span and VB >=3xRB										
Note 5:	For MIMO systems the total output power and total PSD are calculated form the sum of the powers of the individual chains (in linear terms). The antenna gain used to determine the EIRP and limits for PSD/Output power depends on the operating mode of the MIMO device. If the signals on the non-coherent between the transmit chains then the gain used to determine the limits is the highest gain of the individual chains and the EIRP is the sum of the products of gain and power on each chain. If the signals are coherent then the effective antenna gain is the sum (in linear terms) of the gains for each chain and the EIRP is the product of the effective gain and total power.										








#### Elliott EMC Test Data Client: Xirrus Job Number: J77228 T-Log Number: T77249 Model: XN4 Account Manager: Susan Pelzl Contact: Steve Smith Standard: FCC 15 E, RSS 210 Class: N/A RSS-210 (LELAN) and FCC 15.407(UNII) **Antenna Port Measurements** Power, PSD, Peak Excursion, Bandwidth and Spurious Emissions Test Specific Details Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above. Date of Test: 11/23/2009 Config. Used: AC powered Test Engineer: Rafael Varelas Config Change: Direct connection Test Location: OATS #2 EUT Voltage: PoE General Test Configuration When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators and cables used. Ambient Conditions: Temperature: 15-36 °C Rel. Humidity: 10-60 % Summary of Results Test Performed Limit Pass / Fail Result / Margin Run # Mode Single radio: 20.9 dBm 1 n20MHz Power, 5470-5725MHz 15.407(a) (1), (2) Pass 4x radio: 23.8 dBm 15.407(a) (1), (2) n20MHz PSD, 5470-5725MHz Pass 1 8.1 dBm/MHz 1 n20MHz 99% Bandwidth **RSS 210** 18.5 MHz Single radio: 20.6 dBm n40MHz 15.407(a) (1), (2) 1 Power, 5470-5725MHz Pass 3x radio: 22.5 dBm 7.9 dBm/MHz n40MHz PSD, 5470-5725MHz 15.407(a) (1), (2) Pass 1 1 n40MHz 99% Bandwidth RSS 210 36.7 MHz n20 & n40 Peak Excursion Envelope 15.407(a) (6) Pass 12.3 dB 2 < -27dBm/MHz eirp 3 n20 & n40 Antenna Conducted Spurious 15.407(b) Pass 20dB bandwidth below 5591.3 MHz 4 20dB bandwidth 15.407(b) n20MHz Pass and above 5650.16 MHz 20dB bandwidth below 5569.7 MHz n40MHz 20dB bandwidth 15.407(b) 4 Pass and above 5650.3 MHz Modifications Made During Testing No modifications were made to the EUT during testing **Deviations From The Standard** No deviations were made from the requirements of the standard.

# Elliott

## EMC Test Data

4	An A	A company								Data
Client:	Xirrus						~	Job Number:	J77228	
Madalı							T-L	_og Number:	T77249	
wouer.	A114						Accou	int Manager:	Susan Pelzl	
Contact:	Steve Smith									
Standard:	FCC 15 E, F	RSS 210						Class:	N/A	
Run #1: Ba	ndwidth, Ou	tput Power	and Power s	spectral Den	isity					
Antenna gai	n used is for	the internal a	antenna. The	e external an	tenna gain is	s lower (2.5dl	Bi) and not u	sed for MIMC	) modes.	
	Antonn	o Coin (dDi)	Chain 1	Chain 2	Chain 3	Coherent	Effective <sup>3</sup>			
	nt: Xirrus Job Number: [J77228   nt: Xirrus I-Log Number: T77249   et: XN4 I-Log Number: T77249   et: Steve Smith Intervention   d: FCC 15 E, RSS 210 Class: [N/A   Sandwidth, Output Power and Power spectral Density Intervention   gain used is for the internal antenna. The external antenna gain is lower (2.5dBi) and not used for MIMO modes.   Chain 1 Chain 2 Chain 3 Oherent Effective?   Antenna Gain (dBi): 3 3 No 3.0   sttings for a single radio operating in the band Software 26dB BW Measured Output Power dBm Total   20.0 36.3 17.3 18.4 122.3 20.9 24.0 0.122 PASS   20.0 36.3 17.3 18.4 122.3 20.9 24.0 0.1114 PASS   20.0 39.2 16.8 18.2 113.9 20.6 24.0 0.1114 PASS   20.9 99% <sup>4</sup> Total Chain 3 mW/MHz dBm/MHz Erect PASS   20.0 39.2 16.8 18.2 113.9 20.6 24.0 0.112									
Power setti	ngs for a sir	ngle radio or	perating in t	he band						
Frequency	Software	26dB BW	Measure	d Output Pov	wer <sup>1</sup> dBm	To	otal		Max Power	Pass or
(MHz)	Setting	(MHz)	Chain 1	Chain 2	Chain 3	mW	dBm	Limit (dBm)	(W)	Fail
5580	20.0	36.3	17.3	Ondin 2	18.4	122.3	20.9	24.0	0.122	PASS
5550	20.0	39.2	16.8		18.2	113.9	20.6	24.0	0.114	PASS
Frequency	<b>99</b> % <sup>4</sup>	Total	Р	SD <sup>2</sup> dBm/MH	łz	Total	PSD	Lir	nit	Pass or
(MHz)	BW	Power	Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210 <sup>3</sup>	Fail
5580	18.5	20.9	4.4		5.6	6.4	8.1	11.0	11.0	PASS
5550	18.5	20.6	4.2		5.4	6.1	7.9	11.0	11.0	PASS
Note 1: Note 2:	Output po RBW=1M over 40M Measured For RSS-2 11dBm/M	wer measure Hz, VB=3 MH <u>Hz (20MHz n I using the sa</u> 210 the limit f Hz. The limits	ed using a sp Iz, sample d node) and 80 me analyzer for the 5470 s are also co	ectrum analy etector, powe MHz (40MH settings use - 5725 MHz I rrected for in	vzer (see plo er averaging z mode) ed for output band accoun stances whe	ts below for t on (transmitt power. ts for the ant re the highes	he high powe ted signal wa enna gain as st measured	er measurem is continuous the maximu value of the l	ents): and power m eirp allowe PSD exceeds	integration ed is
Note 5.	average F	SD (calculat	ed from the i	neasured po	wer divided	by the measu	ured 99% bar	ndwidth) by n	nore than 3dl	3 by the
Note 1:	amount th	lat the measu	<u>ired value ex</u> ired in accor	<u>(ceeds the al</u>	Verage by mo	<u>pre than 3dB</u> B < 1% of sp	an and VR >	-3vDB		
NOIC 4.	For MIMC	) systems the	total output	power and to	otal PSD are	calculated fo	orm the sum	of the powers	s of the indivi	dual chains
Note 5:	(in linear t mode of tl determine on each c chain and	erms). The a he MIMO deve the limits is hain. If the s the FIRP is t	antenna gain rice. If the si the highest g ignals are co the product o	used to dete gnals on the jain of the incoherent then of the effective	ermine the E non-coherer dividual chair the effective re gain and to	IRP and limit nt between th ns and the EI antenna gain ptal power.	s for PSD/Ou transmit ch RP is the sum n is the sum	utput power d nains then th m of the prod (in linear tern	lepends on the gain used flucts of gain and here gain and	ne operating to and power ns for each





Elliott	EMO	C Test Data
Client: Xirrus	Job Number:	J77228
	T-Log Number:	T77249
Model: XN4	Account Manager:	Susan Pelzl
Contact: Steve Smith		
Standard: FCC 15 E, RSS 210	Class:	N/A
EURCE Transmitter   Clent: Xirus Job Number: 1/7228   Addet: XI4 Account Manager Susan Pelzi   Addet: XI4 Account Manager Susan Pelzi   Clent: Xirus Job Number: 1/7229   Addet: XI4 Account Manager Susan Pelzi   Addet: XIA Account Manager Susan Pelzi   Config Used: AC powered   Extendeme: Sunala Khushzad Config Used: AC powered   Test Enginee: Sunala Khushzad Config Change: Direct connection   Test Enginee: Sunala Khushzad Config Change: Direct connection   Config Change: Direct connection   Surative regin calculated in the power section of this data sheet. The plots were obtained for other individually and the limit was adjusted to account for all chains transmitting simultaneously   Number of transmit chans: 2   Adjustment for 2 chains: 2   Adjustment for 2 chains: 2   Config Change: Direct connection   Surative distribution of the data sectors for adjustment for adjustment for adjustment for adjustment for adjustmen		
Number of transmit chains: 2   Maximum Antenna Gain: 3.0 dBi   Spurious Limit: -27.0 dBm/MHz eirp   Adjustment for 2 chains: -3.0 dB adjustment for multiple   Limit Used On Plots Note 1:   -33.0 dBm/MHz Average Lim   -13.0 dBm/MHz Peak Limit (F	e chains. it (RB=1MHz, VB=10Hz) RB=VB=1MHz)	
Note 1: The -27dBm/MHz limit is an eirp limit. The limit for antenna port conducted consideration the maximum antenna gain (limit = -27dBm - antenna gain). If more than 50MHz from the bands and that are close to the limit are made to known at these frequencies.   Note 2: All spurious signals below 1GHz are measured during digital device radiated	measurements is adjuste Radiated field strength m o determine compliance a d emissions test.	ed to take into easurements for signals is the antenna gain is not
Note 3: Signals within 10MHz of the 5.725 or 5.825 Band edge are subject to a limit	of -17dBm EIRP	
Note 4: If the device is for outdoor use then the -27dBm eirp limit also applies in the	5150 - 5250 MHz band.	













	An 2022 Company		
Client:	Xirrus	Job Number:	J77228
Model	VNA	T-Log Number:	T77249
wouer.	×1×4	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

## RSS 210 and FCC 15.407 (UNII - 5250 - 5350 MHz and 5470-5725MHz) Radiated Spurious Emissions, 1 - 40 GHz, Internal Antenna

## **Test Specific Details**

**Elliott** 

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

### General Test Configuration

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

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

Ambient Conditions:	Temperature:	12 °C
	Rel. Humidity:	84 %

## Summary of Results

Run #	Mode	Channel	Power Setting	Test Performed	Limit	Result / Margin
1	802.11a, n20,n40	5580 MHz 5550 MHz	20 on each chain	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.9dBµV/m @ 7400.1MHz (-0.1dB)

### Modifications Made During Testing

No modifications were made to the EUT during testing

### Deviations From The Standard

No deviations were made from the requirements of the standard.

(CE		<b>ک</b> <sup>*</sup> company						EMO	C Test	Data
Client:	Xirrus							Job Number:	J77228	
							T-	Loa Number:	T77249	
Model:	XN4						Αςτοι	unt Manager	Susan Pelzl	
Contact <sup>.</sup>	Steve Smith						710001	ant managon	ousuitt oizi	
Standard		010 220						Class	N/A	
Stanuaru.	1 CC 13 L, I	33210						Ciass.	IWA	
	Fre	equency Rar	nae	Test D	istance	Limit D	istance	Extranola	tion Factor	
	100	18000  Mar	I <u>gc</u> IHz	1030 0	3	2			0	
Run #1, Ra	diated Spuri	ous Emissio	ons, 1,000 -	40,000 MHz.	Operation in	n the 5470 -	5725 MHz I	Band, center	channel	
Radio	Channel	Mode	Power	Setting	Comments					
	(MHz)		Chain A	Chain C						
1	5580	a	20	20						
2	5580	n20	20	20						
3	5550	n40	20	20						
4	-	-	-	-						
Run 2c:Spu	irious Radia	ted Emissic	ons:(Consol	e Port disco	nnected)					
Radio	Channel	Mode	Power	Setting			Com	ments		
	(MHz)		Chain A	Chain C			00111			
1	5580	а	20	20						
2	5580	n20	20	20						
3	5550	n40	20	20						
4	-	-	-	-						
Frequency	امىرم ا	Pol	15 200	)/15F	Detector	Azimuth	Hoight	Commonts		Mode
MH7	dBu\//m	v/h	l imit	Margin	$Pk/OP/\Delta va$	dearees	meters	Comments		Mode
7400 070	52 <b>9</b>	V	54.0	-0 1		65 65	1 /			all
7400.070	15 A		54.0	-8.6	AVG	107	1.4			all
7440.040	49.4	V	54.0	-5.5	AVG	22	1.4			all
7400.000	57.2	V	74.0	-16.8	PK	65	1.7			all
7400.020	52.9	Н	74.0	-21.1	PK	197	1.4			all
7440 090	54.1	V	74.0	_10.0	PK	33	1.4			all
Note -the se	cond harmor	nics were me	easured with	power set to	setting 22	00	1.7			un
11168.030	52.5	V	54.0	-1.5	AVG	17	1.2	RB 1 MHz: '	VB: 10 Hz	all
11162.270	46.7	H	54.0	-7.3	AVG	129	1.0	RB 1 MHz: '	VB: 10 Hz	all
11100.780	46.1	V	54.0	-7.9	AVG	97	1.0	RB 1 MHz: '	VB: 10 Hz	all
11168.970	64.0	V	74.0	-10.0	PK	17	1.2	RB 1 MHz: '	VB: 1 MHz	all
11101.190	44.0	H	54.0	-10.0	AVG	139	1.8	RB 1 MHz; '	VB: 10 Hz	all
11166.030	58.3	Н	74.0	-15.7	PK	129	1.0	RB 1 MHz: '	VB: 1 MHz	all
11100.390	58.1	V	74.0	-15.9	РК	97	1.0	RB 1 MHz: '	VB: 1 MHz	all
11101.390	55.1	H	74.0	-18.9	PK	139	1.8	RB 1 MHz: '	VB: 1 MHz	all
										-
Note 1:	For emissior -27dBm/MH	ns in restricte Iz (~68.3 dBi	ed bands, the uV/m) and pe	e limit of 15.2 eak limit set t	09 was used. o 20dB highe	For all othe r than the av	r emissions verage limit (	the average (88.3 dBuV/m	limit was set t ı).	0

	An <u>Bur</u> company		
Client:	Xirrus	Job Number:	J77228
Model	YN4	T-Log Number:	T77249
wouer.	×114	Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	FCC 15 E, RSS 210	Class:	N/A

## RSS 210 and FCC 15.407 (UNII - 5250 - 5350 MHz and 5470-5725MHz) Radiated Spurious Emissions, 1 - 40 GHz, External Antenna

## Test Specific Details

© Elliott

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

### General Test Configuration

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

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

Ambient Conditions:	Temperature:	12 °C
	Rel. Humidity:	84 %

### Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
2	802.11a	5580 MHz	22		Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	46.7dBµV/m @ 7440.1MHz (-7.3dB)

#### Modifications Made During Testing

No modifications were made to the EUT during testing

### **Deviations From The Standard**

No deviations were made from the requirements of the standard.

		Dtt Ar company						EMC	C Test	Data
Client.	AITUS						Т.	Log Number	T772/0	
Model:	XN4						-1	Log Nullibel.	1//249 Sucan Dolzl	
Contoot	Stove Smith			ALLU	uni manayer.	Susaii Peizi				
Contact:		000 010						Class	N1/A	
Standard:	FUC 15 E, F	(55 2 10	4		<u> </u>		050 141	Class:	IN/A	
Run # I, Rac [ Te Te	Date of Test: St Engineer: St Location:	ous emissio 11/10/2009 Suhaila Khu SVOATS #2	shzad	40,000 MHZ	. Operation II C Cor E	n the 5250-5 onfig. Used: ifig Change: UT Voltage:	1 None POE	10 5470 - 572	25 MHZ Band	S
Radio	Channel (MHz)	Mode	Power Cha	Setting in B	-		Com	ments		
4	5580	а	2	1						
Spurious R	adiated Emi	ssions:						-		
Frequency	Level	Pol	15.209	9/15E	Detector	Azimuth	Height	Comments		Mode
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
7440.090	46.7	V	54.0	-7.3	AVG	184	1.2	Power settir	ng 21	а
11160.200	42.9	H	54.0	-11.1	AVG	186	1.1	RB 1 MHz;	VB: 10 Hz	а
11160.500	43.5	V	54.0	-10.5	AVG	296	1.0	RB 1 MHz;	VB: 10 Hz	а
7439.960	58.2	H	/4.0	-15.8	РК	145	1.3	RB 1 MHz; Y	VB: 1 MHz	а
7440.220	52.5	V	74.0	-21.5	PK	184	1.2	Power settin		a
7440.250	60.4	V	74.0	-13.6	PK	317	1.3	RB I MHZ;	VB: I MHZ	a
11150.100	54.0	V	74.0	-20.0	PK	296	1.0	RB I MHZ;		a



All LLLE	company		
Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73385 (EMC)
		Account Manager:	Susan Pelzl
Contact:	Steve Smith		Mark Briggs
Emissions Standard(s):	EN 301 489-17, FCC 15B	Class:	FCC Class B
Immunity Standard(s):	EN 301 489-17	Environment:	-

## **EMC** Test Data

For The

## Xirrus

Model

XN4

Date of Last Test: 1/21/2009





6	Ellig	ott					EM	C Test Da
Client:	Xirrus	(A) company					Job Number:	J71484
Madal							T-Log Number:	T73385 (EMC)
wodel:	XIN4						Account Manager:	Susan Pelzl
Contact:	Steve Smith	۱						
Standard:	EN 301 489	-17, FCC 15E	3				Class:	FCC Class B
Frequency	Level	AC	Cla	ss B	Detector	Comments		
MHz	dBµV	Line	Limit	Margin	QP/Ave			
2.972	41.3	Line 1	46.0	-4.7	AVG	AVG (0.100s)		
0.594	41.0	Line 1	46.0	-5.0	AVG	AVG (0.100s)		
2.634	40.7	Neutral	46.0	-5.3	AVG	AVG (0.100s)		
2.981	40.5	Neutral	46.0	-5.5	AVG	AVG (0.100s)		
2.921	40.1	Line 1	46.0	-5.9	AVG	AVG (0.100s)		
3.318	40.0	Line 1	46.0	-6.0	AVG	AVG (0.100s)		
3.378	39.5	Neutral	46.0	-6.5	AVG	AVG (0.100s)		
3.466	39.4	Line 1	46.0	-6.6	AVG	AVG (0.100s)		
2.236	39.1	Neutral	46.0	-6.9	AVG	AVG (0.100s)		
0.594	38.7	Neutral	46.0	-/.3	AVG	AVG (0.100s)		
3.677	34.8	Neutral	46.0	-11.Z	AVG	AVG (0.100S)		
2.034	42.7	Neutral	0.0 <u></u>	-13.3		QP(1.000s)		
2 466	40.0		56.0	-13.4		QP(1.000s)		
3.400	42.0	Line 1	56.0	-13.0		OP(1.000s)		
0.50/	42.0	Line 1	56.0	-13.3		OP(1.000s)		
2 921	42.3	Line 1	56.0	-13.7		OP(1.000s)		
3 318	42.0	Line 1	56.0	-14.0		OP(1.000s)		
2 981	41.9	Neutral	56.0	-14 1	OP	OP(1.000s)		
16 098	45.7	Line 1	60.0	-14.3	OP	OP(1.000s)		
2.236	41.2	Neutral	56.0	-14.8	OP	OP (1.000s)		
3.378	40.9	Neutral	56.0	-15.1	OP	OP (1.000s)		
15.905	34.8	Neutral	50.0	-15.2	AVG	AVG (0.100s)		
4.970	30.2	Neutral	46.0	-15.8	AVG	AVG (0.100s)		
16.098	34.1	Line 1	50.0	-15.9	AVG	AVG (0.100s)		
0.444	30.9	Line 1	47.0	-16.1	AVG	AVG (0.100s)		
0.594	39.9	Neutral	56.0	-16.1	QP	QP (1.000s)		
0.447	30.4	Neutral	46.9	-16.5	AVG	AVG (0.100s)		
0.198	36.7	Line 1	53.7	-17.0	AVG	AVG (0.100s)		
3.677	37.5	Neutral	56.0	-18.5	QP	QP (1.000s)		
9.146	30.6	Neutral	50.0	-19.4	AVG	AVG (0.100s)		
8.966	29.0	Line 1	50.0	-21.0	AVG	AVG (0.100s)		
4.970	33.9	Neutral	56.0	-22.1	QP	QP (1.000s)		
9.146	37.1	Neutral	60.0	-22.9	QP	UP (1.000s)		
0.444	33.2	Line 1	57.0	-23.8	QP	UP (1.000s)		
0.114	26.0		50.0	-24.0	AVG	AVG (U. 100S)		
0.198	39.4 25 5	Line I	03.7	-24.3		UP (1.000s)		
0.900	35.5 20.1	LINE I	0U.U	-24.5		QP(1.000S)		
U.44/	3Z. I	iveutfal	20.9	-24.8		UP (1.000S)		



Elliott
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	An ZCZAO company		
Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73385 (EMC)
		Account Manager:	Susan Pelzl
Contact:	Steve Smith		
Standard:	EN 301 489-17, FCC 15B	Class:	FCC Class B

Frequency	Level	AC	EN55	022 A	Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.555	42.1	Neutral	60.0	-17.9	AVG	AVG (0.100s)
0.556	40.5	Line 1	60.0	-19.5	AVG	AVG (0.100s)
1.916	44.4	Neutral	60.0	-15.6	AVG	AVG (0.100s)
1.927	45.0	Line 1	60.0	-15.0	AVG	AVG (0.100s)
2.637	47.3	Line 1	60.0	-12.7	AVG	AVG (0.100s)
2.671	46.6	Neutral	60.0	-13.4	AVG	AVG (0.100s)
3.377	44.0	Neutral	60.0	-16.0	AVG	AVG (0.100s)
3.397	48.3	Line 1	60.0	-11.7	AVG	AVG (0.100s)
4.209	43.9	Line 1	60.0	-16.1	AVG	AVG (0.100s)
4.981	42.7	Line 1	60.0	-17.3	AVG	AVG (0.100s)

EXHIBIT 3: Photographs of Test Configurations