

*Electromagnetic Emissions Test Report
Application for Grant of Equipment Authorization
pursuant to
Industry Canada RSS-Gen Issue 2 / RSS 210 Issue 7
FCC Part 15 Subpart C
on the
Xirrus, Inc.
Transmitter
Model: XN4*

UPN: 5428A-XN4
FCC ID: SK6XN4

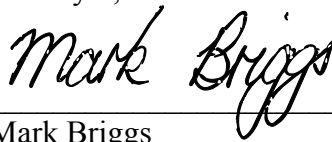
GRANTEE: Xirrus, Inc.
2101 Corporate Center Dr.
Newbury Park, CA 91320

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

FINAL TEST DATE: October 23 thorough November 14, 2008
January 7, 2009

AUTHORIZED SIGNATORY:



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Testing Cert #2016-01

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REVISION HISTORY

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SCOPE

An electromagnetic emissions test has been performed on the Xirrus, Inc. model XN4 pursuant to the following rules:

Industry Canada RSS-Gen Issue 2
RSS 210 Issue 7 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15 Subpart C

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

ANSI C63.4:2003
FCC DTS Measurement Procedure KDB558074, March 2005

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 the following regulations:

Industry Canada RSS-Gen Issue 2
RSS 210 Issue 7 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15 Subpart C

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

TEST RESULTS SUMMARY**DIGITAL TRANSMISSION SYSTEMS (2400 – 2483.5MHz)**

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247(a)	RSS 210 A8.2	Digital Modulation	Systems uses both OFDM and DSSS techniques	-	Complies
15.247 (a) (2)	RSS 210 A8.2 (1)	6dB Bandwidth	b: 10.1 MHz g: 16.5 MHz n20: 16.8 MHz n40: 34.8 MHz	>500kHz	Complies
	RSP100	99% Bandwidth	b: 16.1 MHz g: 17.6 MHz n20: 17.8 MHz n40: 37.1 MHz	Information only	Complies
15.247 (b) (3)	RSS 210 A8.2 (4)	Output Power (multipoint systems, single radio)	Single Radio b: 21.3 dBm g: 19.7 dBm b MIMO: 25.1 dBm g MIMO: 24.2 dBm n20: 24.2 dBm n40: 24.5 dBm 3 Radios in Band b MIMO: 29.8dBm EIRP = 35.6dBm ¹ n20: 29.0 dBm EIRP = 30.0dBm	1 Watt (30dBm) EIRP limited to 4 Watts (36dBm)	Complies
15.247(d)	RSS 210 A8.2 (2)	Power Spectral Density	b: 3.1 dBm/3kHz g: 2.8 dBm/3kHz n20 6.3 dBm/3kHz n40 5.8 dBm/3kHz	8dBm/3kHz	Complies
15.247(c)	RSS 210 A8.5	Antenna Port Spurious Emissions 30MHz – 25 GHz	All signal were more than 30dB below the fundamental	< -30dBc ^{Note 2}	Complies
15.247(c) / 15.209	RSS 210 A8.5	Radiated Spurious Emissions 30MHz – 25 GHz	53.5dBμV/m (473.2μV/m) @ 2487.9MHz (-0.5dB)	15.207 in restricted bands, all others <-30dBc ^{Note 2}	Complies

Note 1: EIRP calculated using antenna gain of 1.0dBi for MIMO modes and 2.5dBi for legacy modes (as they can use the higher gain external antenna). For MIMO modes using legacy modulations (802.11b and g) the antenna gains are added together based on the data on individual chains being coherent to give a total gain of 5.8dBi for three chains. For the n-modes the data on the individual chains is considered incoherent so the individual eirps for each chain are added.

Note 2: Limit of -30dBc used because the power was measured using the UNII test procedure (maximum power averaged over a transmission burst) / RMS averaging over a time interval, as permitted under RSS 210 section A8.4(4).

Note 3: The output power for 3 radios in the band assumes all three non-overlapping channels in the 2.4Ghz band are being used by the system and represents the total power across the band.

DIGITAL TRANSMISSION SYSTEMS (5725 –5850 MHz)

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247(a)	RSS 210 A8.2	Digital Modulation	Systems uses OFDM techniques	System must utilize a digital transmission technology	Complies
15.247 (a) (2)	RSS 210 A8.2 (1)	6dB Bandwidth	a: 16.3 MHz n20: 17.7MHz n40: 36.5 MHz	>500kHz	Complies
	RSP100	99% Bandwidth	a: 17.4 MHz n20: 18.2 MHz n40: 36.8 MHz	Information only	Complies
15.247 (b)	RSS 210 A8.2 (4)	Output Power (multipoint systems)	Single Radio a: 15.4 dBm a MIMO: 18.0 dBm n20: 18.6 dBm n40: 18.5 dBm 4 Radios in Band a: 24.0dBm EIRP = 1.0 W ^{Note 1} n20: 24.7dBm EIRP = 0.73 W ^{Note 1}	1 Watt, EIRP limited to 4 Watts.	Complies
15.247(d)	RSS 210 A8.2 (2)	Power Spectral Density	a: -4.9 dBm/3kHz n20: -5.4 dBm/3kHz n40: -7.2 dBm/3kHz	Maximum permitted is 8dBm/3kHz	Complies
15.247(c)	RSS 210 A8.5	Antenna Port Spurious Emissions – 30MHz – 40 GHz	All spurious emissions < -20dBc	< -30dBc ^{Note 2}	Complies
15.247(c) / 15.209	RSS 210 A8.5 Table 2, 3	Radiated Spurious Emissions 30MHz – 40 GHz Internal antenna	47.5dBμV/m (237.1μV/m) @ 7660.1MHz (-6.5dB)	15.207 in restricted bands, all others <-30dBc ^{Note 2}	Complies

Note 1: EIRP calculated using antenna gain of 3.0dBi. For MIMO modes using legacy modulations (802.11a) the antenna gains are added together based on the data on individual chains being coherent to give a total gain of 6.0dBi for two chains. For the n-modes the data on the individual chains is considered incoherent so the individual eirps for each chain are added.

Note 2: Limit of -30dBc used because the power was measured using the UNII test procedure (maximum power averaged over a transmission burst) / RMS averaging over a time interval, as permitted under RSS 210 section A8.4(4).

Note 3: The output power for 4 radios in the band assumes all four radios are operating in the 5.7GHz band are being used by the system and represents the total power across the band.

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector			Complies
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	44.2dB μ V/m (162.2 μ V/m) @ 1320.1MHz	Refer to LIMITS FOR RECEIVER RADIATED SPURIOUS EMISSIONS	Complies (- 9.8 dB)
15.207	RSS GEN Table 2	AC Conducted Emissions	41.3dB μ V @ 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, RSS 102 declaration and User Manual statements (page 434).	Refer to OET 65, FCC Part 1 and RSS 102	Complies
	RSP 100 RSS GEN 7.1.5	User Manual	Refer to pages 434 and 435 of the user manual	Statement required regarding non-interference	
	RSP 100 RSS GEN 7.1.5	User Manual	Refer to pages 434 and 435 of the user manual	Statement required regarding detachable antenna	

MEASUREMENT UNCERTAINTIES

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

Measurement Type	Frequency Range (MHz)	Calculated Uncertainty (dB)
Conducted Emissions	0.15 to 30	± 2.4
Radiated Emissions	0.015 to 30	± 3.0
Radiated Emissions	30 to 1000	± 3.6
Radiated Emissions	1000 to 40000	± 6.0

EQUIPMENT UNDER TEST (EUT) DETAILS**GENERAL**

The 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 23, October 24, October 30, November 3, November 5, November 6, November 7, November 11, November 12, November 13 and November 14, 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

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:

Port	Connected To	Cable(s)		
		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 inter-modulation products from the system (none were observed).

TEST SITE**GENERAL INFORMATION**

Final test measurements were taken on October 23, October 24, October 30, November 3, November 5, November 6, November 7, November 11, November 12, November 13 and November 14, 2008 at the test sites listed below. Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission and with industry Canada.

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

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

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

INSTRUMENT CALIBRATION

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

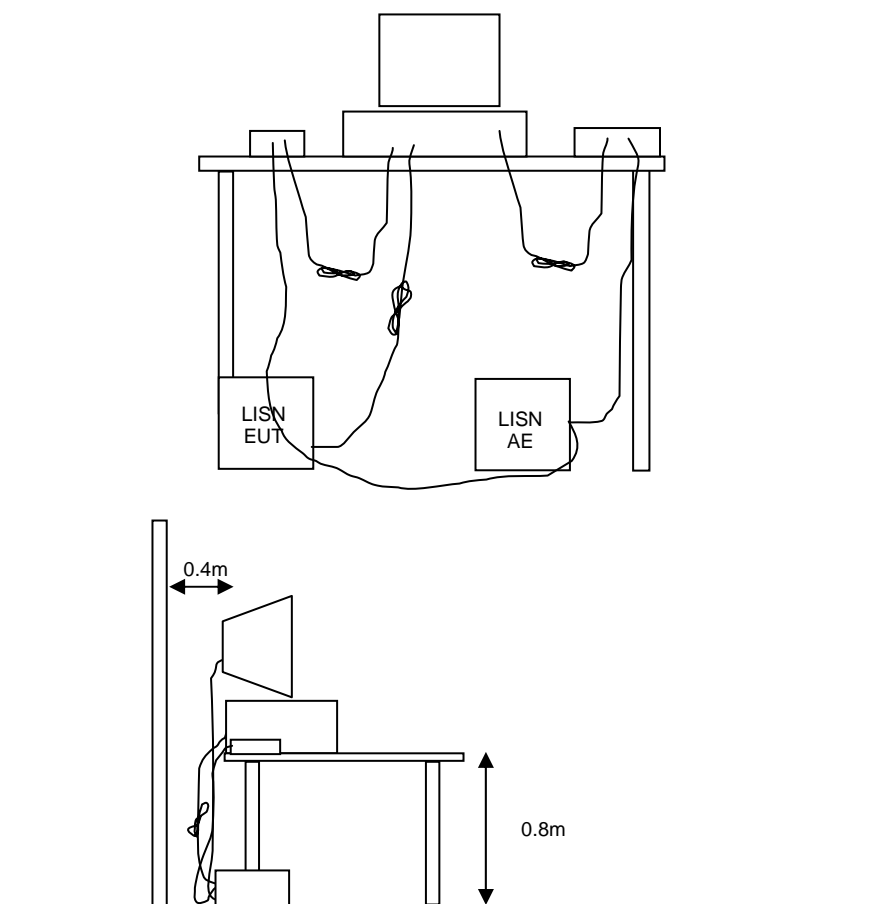
TEST PROCEDURES

EUT AND CABLE PLACEMENT

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

CONDUCTED EMISSIONS

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



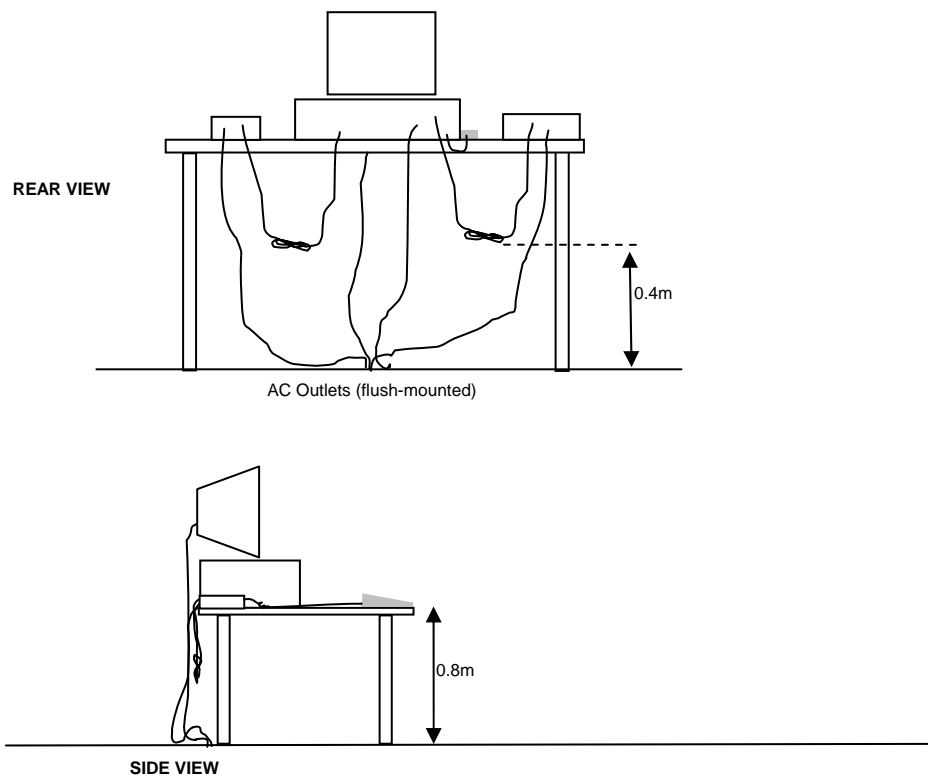
RADIATED EMISSIONS

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

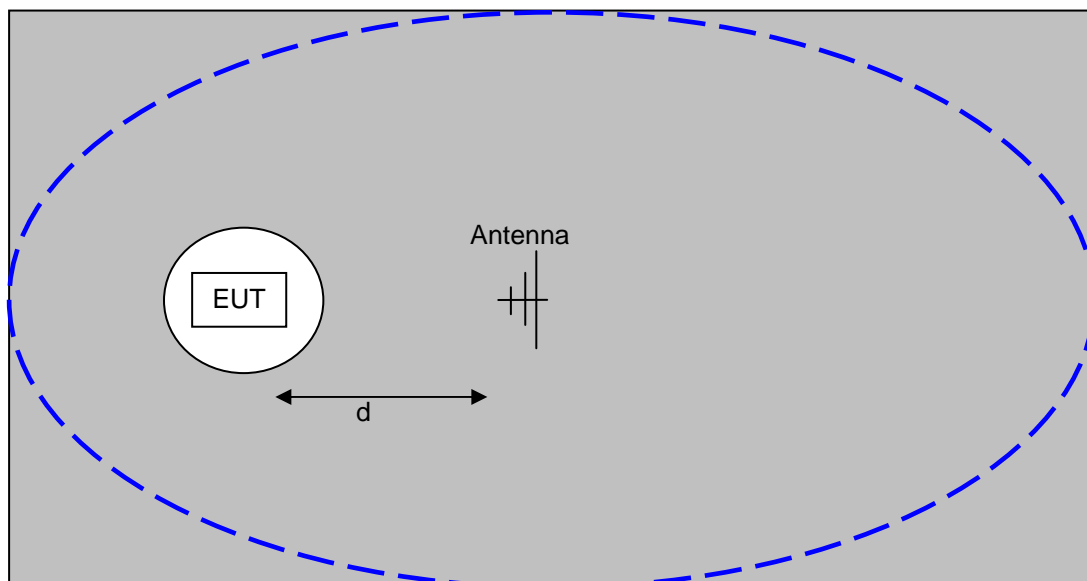
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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

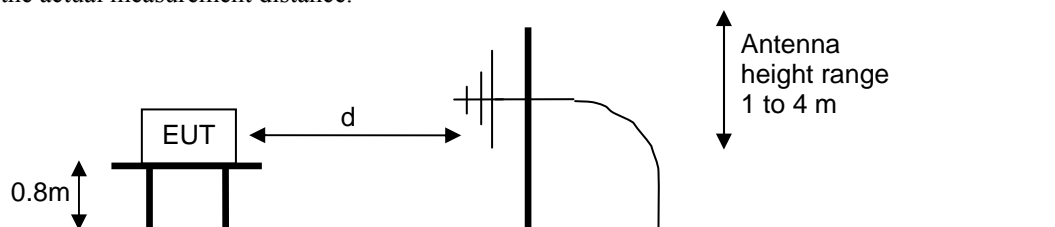
When testing above 18 GHz, the receive antenna is located at 1 meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.



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.



Test Configuration for Radiated Field Strength Measurements
OATS- Plan and Side Views

BANDWIDTH MEASUREMENTS

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

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

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

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

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

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

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

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

LIMITS FOR RECEIVER RADIATED SPURIOUS EMISSIONS

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

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

OUTPUT POWER LIMITS – DIGITAL TRANSMISSION SYSTEMS

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

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

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

TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS and DTS SYSTEMS

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

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

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

$$R_r - S = M$$

where:

R_r = Receiver Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

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

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

$$F_d = 20 * \text{LOG}_{10} (D_m/D_s)$$

where:

F_d = Distance Factor in dB

D_m = Measurement Distance in meters

D_s = Specification Distance in meters

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

$$F_d = 40 * \text{LOG}_{10} (D_m/D_s)$$

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

1 Page

Radiated Emissions, 30 - 40,000 MHz, 24-Oct-08**Engineer: Mehran Birgani**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	09-Oct-09
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	10-Jun-10
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40)	8564E	CH5273	24-Oct-08

Radiated Emissions, 30 - 18,000 MHz, 30-Oct-08**Engineer: Mehran Birgani**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
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, 1,000 - 40,000 MHz, 03-Nov-08**Engineer: Mehran Birgani**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
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

Radio (Spurious Emissions), 05-Nov-08**Engineer: Suhaila Khushzad**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz	3115	487	15-Jul-10
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Nov-08

Radiated Emissions, 1,000 - 40,000 MHz, 06-Nov-08**Engineer: Mehran Birgani**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
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
Hewlett Packard	High Pass filter, 8.2 GHz (Red System)	P/N 84300-80039 (84125C)	1152	13-Oct-09
Hewlett Packard	High Pass filter, 3.5 GHz (Red System)	P/N 84300-80038 (84125C)	1403	28-Aug-09

Radio (Power and Spurious Emissions), 14-Nov-08**Engineer: Suhaila Khushzad**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
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

Conducted Emissions - AC Power and Telecommunications Ports, 07-Jan-09**Engineer: Joseph Cadigal**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<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**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Nov-08

EXHIBIT 2: Test Measurement Data

162 Pages

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73386
		Account Manager:	Susan Pelzl
Contact:	Steve Smith		Mark Briggs
Emissions Standard(s):	FCC 15.247 / RSS 210	Class:	DTS
Immunity Standard(s):	-	Environment:	Wireless

DTS RF Port Test Data

For The

Xirrus

Model

XN4

Date of Last Test: 11/13/2008

Client: Xirrus

Job Number: J71484

Model: XN4

T-Log Number: T73386

Account Manager: Susan Pelzi

RSS 210 and FCC 15.247 Power Measurement Summary

2.4GHz Band

There are three non-overlapping 20MHz channels and no 40MHz non-overlapping channels. The power measurements below cover the cases where there is only one radio operational in the 2.4GHz band and where there are the maximum number of radios (3x20MHz channel or 1x40MHz channel) operating in the band. For the 802.11b mode the output power per radio has to be reduced from the maximum single-radio power. For all other modes the single radio power level can be used regardless of the number of radios operational in the band.

802.11b - single chain

Power Setting ²	Frequency (MHz)	Output Power		Antenna Gain (dBi)	EIRP ^{Note 2}	
		(dBm) ¹	mW		dBm	W
19.0	2412	19.1	80.9	2.5	21.6	0.144
20.0	2437	21.3	134.0	2.5	23.8	0.238
19.0	2462	19.7	92.5	2.5	22.2	0.164

3 radios in 802.11b single-chain mode:

Radio 1	21.3	134.9	2.5	23.8	0.240
Radio 2	21.3	134.9	1.0	22.3	0.170
Radio 3	21.3	134.9	1.0	22.3	0.170
Total:	26.1	404.7	-	27.6	0.580

802.11b - triple chain (EIRP assumes coherency between chains, effective antenna gain is x3)

Frequency (MHz)	Software Setting	Output Power (dBm)				Antenna Gain (dBi)	EIRP ^{Note 2}	
		A	B	C	Total		dBm	W
2412 MHz	18.0	18.05	17.3	18.19	22.6	5.80	28.4	0.697
2437 MHz	20.0	20.79	19.9	20.18	25.1	5.80	30.9	1.224
2462 MHz	19.0	19.12	17.95	18.17	23.2	5.80	29.0	0.797

Highest power setting with three channels in use, MIMO Mode:

Output power with three radios operating in 802.11b MIMO mode:	29.8	5.80	35.6	3.672
----------------------------------------------------------------	------	------	------	-------

802.11g - single chain

Power Setting ²	Frequency (MHz)	Output Power		Antenna Gain (dBi)	EIRP ^{Note 2}	
		(dBm) ¹	mW		dBm	W
17.0	2412	16.3	42.4	2.5	18.8	0.075
20.0	2437	19.7	92.7	2.5	22.2	0.165
17.0	2462	16.2	41.6	2.5	18.7	0.074
3 radios in 802.11g mode:		24.4	278.0	4.0	28.4	0.698

3 radios in 802.11g single-chain mode:

Radio 1	19.7	92.7	2.5	22.2	0.165
Radio 2	19.7	92.7	1.0	20.7	0.117
Radio 3	19.7	92.7	1.0	20.7	0.117
Total:	24.4	278.0	-	26.0	0.398

802.11g - triple chain (EIRP assumes coherency between chains, effective antenna gain is x3)

Frequency (MHz)	Software Setting	Output Power (dBm)				Antenna Gain (dBi)	EIRP ^{Note 2}	
		A	B	C	Total		dBm	W
2412 MHz	17.0	16.55	15.62	16.54	21.0	5.80	26.8	0.482
2437 MHz	20.0	20.08	18.9	19.36	24.2	5.80	30.0	1.010
2462 MHz	17.0	16.52	15.47	15.73	20.7	5.80	26.5	0.447
Output power with three radios operating in 802.11g MIMO mode:					29.02	5.80	34.8	3.031

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
	Account Manager: Susan Pelzi

802.11n 20MHz - triple chain (EIRP assumes no coherency between chains, effective antenna gain is x1)

Frequency (MHz)	Software Setting	Output Power (dBm)				Antenna Gain (dBi)	EIRP ^{Note 2}	
		A	B	C	Total		dBm	W
2412 MHz	17.0	16.64	15.56	16.73	21.1	1.0	22.1	0.163
2437 MHz	20.0	19.89	18.98	19.33	24.2	1.0	25.2	0.330
2462 MHz	17.0	16.46	15.49	15.67	20.7	1.0	21.7	0.147
Output power with three radios operating in 802.11n20 MIMO mode:					29.0	1.0	30.0	0.991

802.11n 40MHz - triple chain (EIRP assumes no coherency between chains, effective antenna gain is x1)

Frequency (MHz)	Software Setting	Output Power (dBm)				Antenna Gain (dBi)	EIRP ^{Note 2}	
		A	B	C	Total		dBm	W
2422 MHz	15.0	14.04	13.6	14.36	18.8	1.0	19.8	0.095
2437 MHz	20.0	20.08	19.64	19.34	24.5	1.0	25.5	0.352
2452 MHz	14.0	13.22	12.62	12.79	17.7	1.0	18.7	0.073

5.7GHz Band

There are five non-overlapping 20MHz channels and three non-overlapping 40MHz channels in this band. The power measurements below cover the cases where there is only one radio operational in the 5.7GHz band and where there are the maximum number of radios (5x20MHz channel or 3x40MHz channel) operating in the band. For all modes the single radio power level can be used regardless of the number of radios operational in the band.

802.11a - single chain

Power Setting ²	Frequency (MHz)	Output Power		Antenna Gain (dBi)	EIRP ^{Note 2}	
		(dBm) ¹	mW		dBm	W
17	5745	14.6	29.0	3.0	17.6	0.058
17	5785	15.1	32.4	3.0	18.1	0.065
17	5825	15.4	34.7	3.0	18.4	0.069
4 radios in 802.11a mode:		21.4	138.7	3.0	24.4	0.277

802.11a - dual chain (EIRP assumes coherency between chains, effective antenna gain is x2)

Frequency (MHz)	Software Setting	Output Power (dBm)				Antenna Gain (dBi)	EIRP ^{Note 2}	
		A	B	C	Total		dBm	W
5745 MHz	17.0	14.91		14.97	18.0	6.0	24.0	0.248
5785 MHz	17.0	15.02		14.99	18.0	6.0	24.0	0.252
5825 MHz	17.0	14.45		14.68	17.6	6.0	23.6	0.228
Output power with four radios operating in 802.11a MIMO mode:					24.0	6.0	30.0	1.008

802.11n 20MHz - triple chain (EIRP assumes no coherency between chains, effective antenna gain is x1)

Frequency (MHz)	Software Setting	Output Power (dBm)				Antenna Gain (dBi)	EIRP ^{Note 2}	
		A	B	C	Total		dBm	W
5745 MHz	17.0	15.89		15.31	18.62	3.0	21.6	0.145
5785 MHz	17.0	15.76		15.49	18.64	3.0	21.6	0.146
5825 MHz	17.0	15.39		14.94	18.18	3.0	21.2	0.131
Output power with four radios operating in 802.11n20 MIMO mode:					24.7	3.0	28.6	0.729

802.11n 40MHz - triple chain (EIRP assumes no coherency between chains, effective antenna gain is x1)

Frequency (MHz)	Software Setting	Output Power (dBm)				Antenna Gain (dBi)	EIRP ^{Note 2}	
		A	B	C	Total		dBm	W
5755 MHz	17.0	15.6		15.3	18.5	3.0	21.5	0.140
5795 MHz	17.0	15.8		15.2	18.5	3.0	21.5	0.142
Output power with two radios operating in 802.11n40 MIMO mode:					21.5	3.0	24.5	0.283

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73386
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

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

Test Specific Details

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

Date of Test: 11/6 and 11/2008
Test Engineer: R. Varelas and M. Birgani
Test Location: SV OATS #2

Config. Used: -
Config Change: -
EUT Voltage: POE

General Test Configuration

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

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

Ambient Conditions:

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

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power	15.247(b)	Pass	802.11b: 21.3 dBm 802.11g: 19.7 dBm
2	PSD	15.247(d)	Pass	802.11b: -1.8 dBm/3kHz 802.11g: -5.0 dBm/3kHz
3	Minimum 6dB Bandwidth	15.247(a)	Pass	802.11b: 10.1 MHz 802.11g: 16.5 MHz
3	Maximum 99% Bandwidth	RSS GEN	Pass	802.11b: 16.1 MHz 802.11g: 17.6 MHz
4	Spurious emissions	15.247(b)	Pass	All signal were more than 30dB below the fundamental

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73386
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #1: Output Power

Highest antenna gain is the external antenna gain of 2.5dBi (internal antenna gain is 1dBi).

802.11b - Single Radio In the Band

Power Setting ²	Frequency (MHz)	Output Power		Antenna Gain (dBi)	Result	EIRP ^{Note 2}	
		(dBm) ¹	mW			dBm	W
19.0	2412	19.1	80.9	2.5	Pass	21.6	0.144
20.0	2437	21.3	134.0	2.5	Pass	23.8	0.238
19.0	2462	19.7	92.5	2.5	Pass	22.2	0.164

802.11b - Three radios on non-overlapping channels - one external antenna and two internal antennas, note 3

Radio, Antenna	Output Power per radio		Antenna Gain (dBi)	EIRP ^{Note 2}	
	(dBm) ¹	mW		dBm	W
#1, Internal	21.3	134.0	1.0	22.3	0.169
#2, Internal	21.3	134.0	1.0	22.3	0.169
#4, External	21.3	134.0	2.5	23.8	0.238
TOTALS	26.0	401.9	-	27.6	0.6

802.11g - Single radio in the band

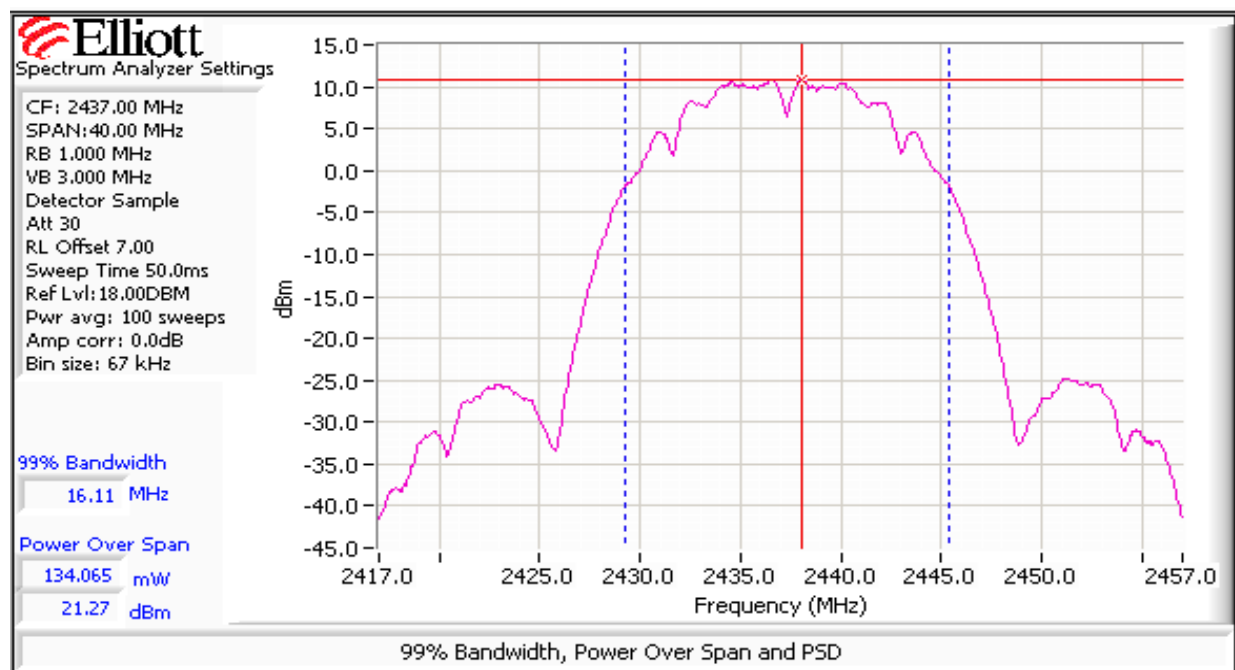
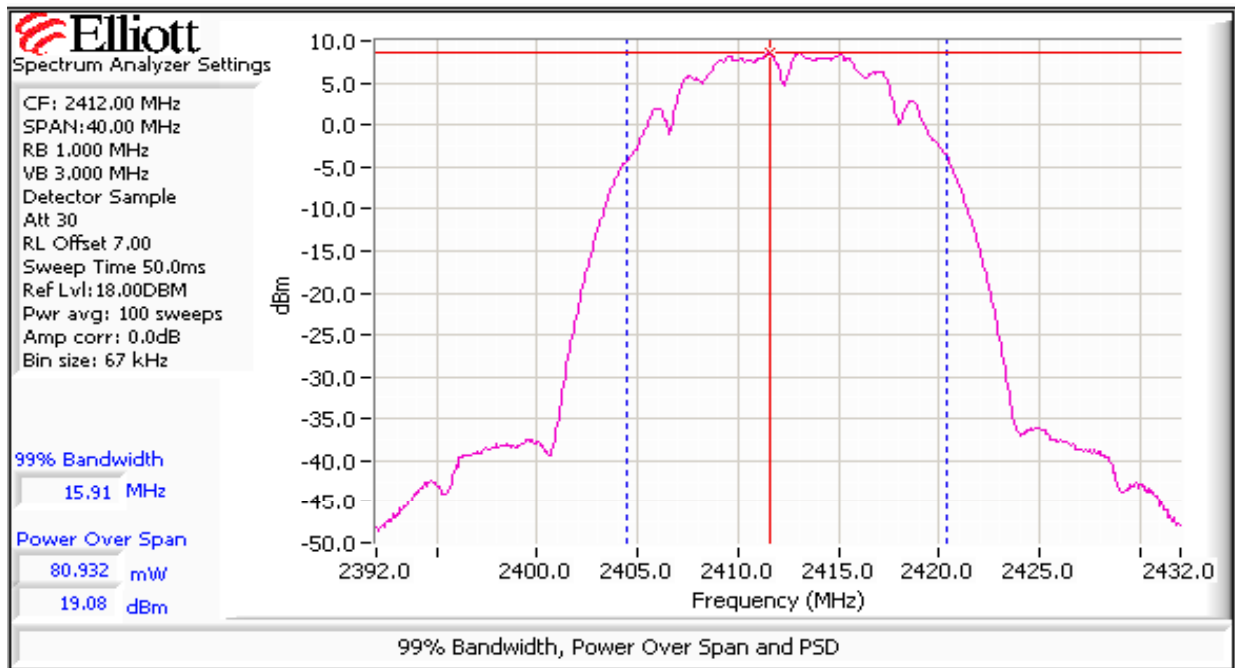
Power Setting ²	Frequency (MHz)	Output Power		Antenna Gain (dBi)	Result	EIRP ^{Note 2}	
		(dBm) ¹	mW			dBm	W
17.0	2412	16.3	42.4	2.5	Pass	18.8	0.075
20.0	2437	19.7	92.7	2.5	Pass	22.2	0.165
17.0	2462	16.2	41.6	2.5	Pass	18.7	0.074

802.11g - Three radios on non-overlapping channels, note 3

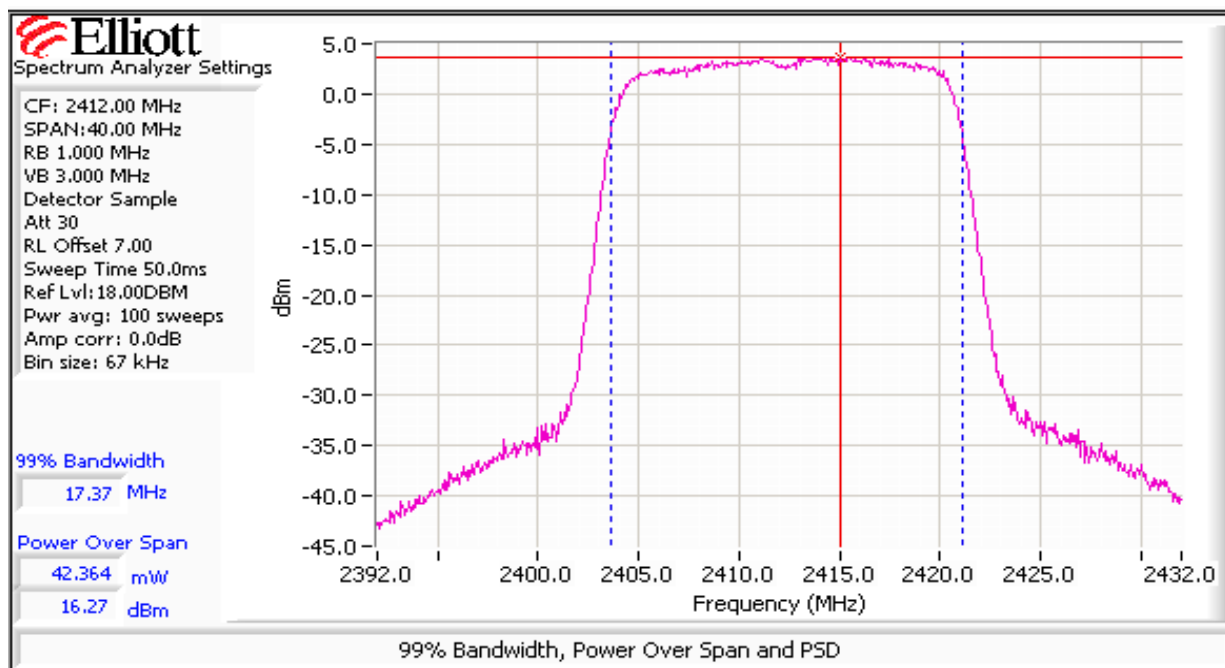
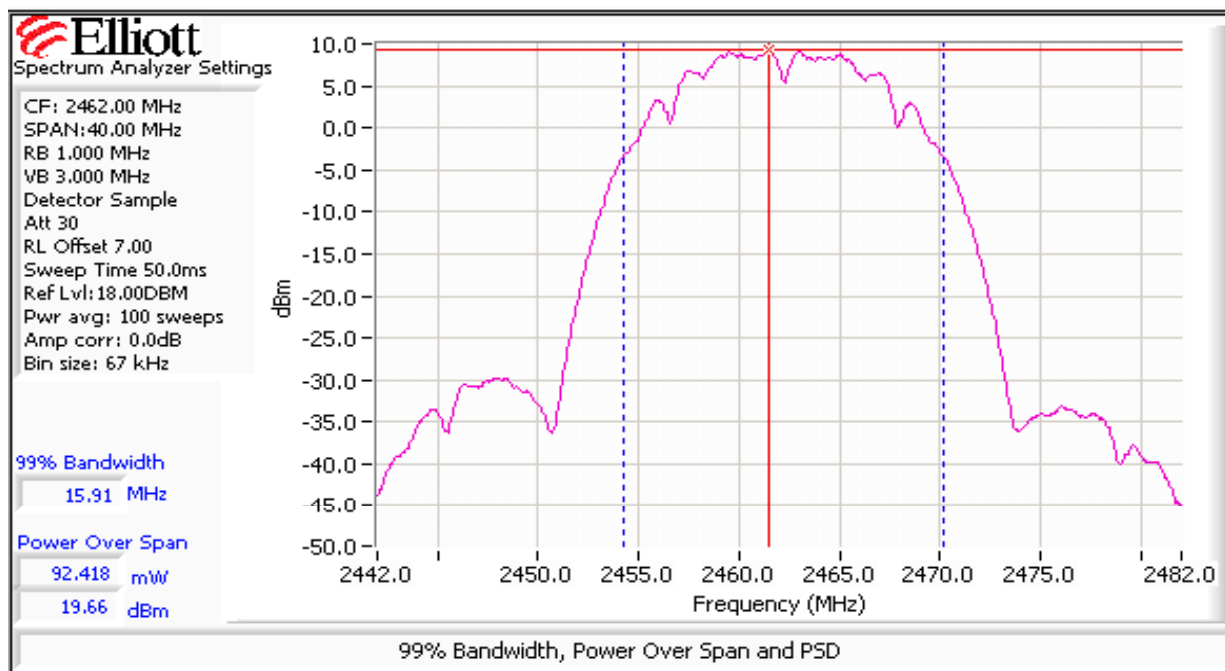
Radio, Antenna	Output Power per radio		Antenna Gain (dBi)	EIRP ^{Note 2}	
	(dBm) ¹	mW		dBm	W
#1, Internal	19.7	92.7	1.0	20.7	0.117
#2, Internal	19.7	92.7	1.0	20.7	0.117
#4, External	19.7	92.7	2.5	22.2	0.165
TOTALS	24.4	278.0	-	26.0	0.4

Note 1:	Output power measured using a spectrum analyzer (see plots below): RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz. Spurious limit is -30dBc because this method was used. The output power limit is 30dBm.
Note 2:	Power setting - the software power setting used during testing, included for reference only.
Note 3:	The device has multiple radios, but the software limits operation in any band to ensure only non-overlapping channels are used (no two radios can operate on the same channel or on overlapping channels). In the 2412 - 2462 MHz band there can be a maximum of 3 radios active (e.g. on channels 2,6 and 10). The calculated total power (obtained by multiplying the output power on a single radio by the number of radios that can be operating in the band) demonstrates that, with 3 radios active, the total output power still complies with the limit. As there is only one external antenna, the gain used for radios #1 and #2 is the gain for the internal antenna.

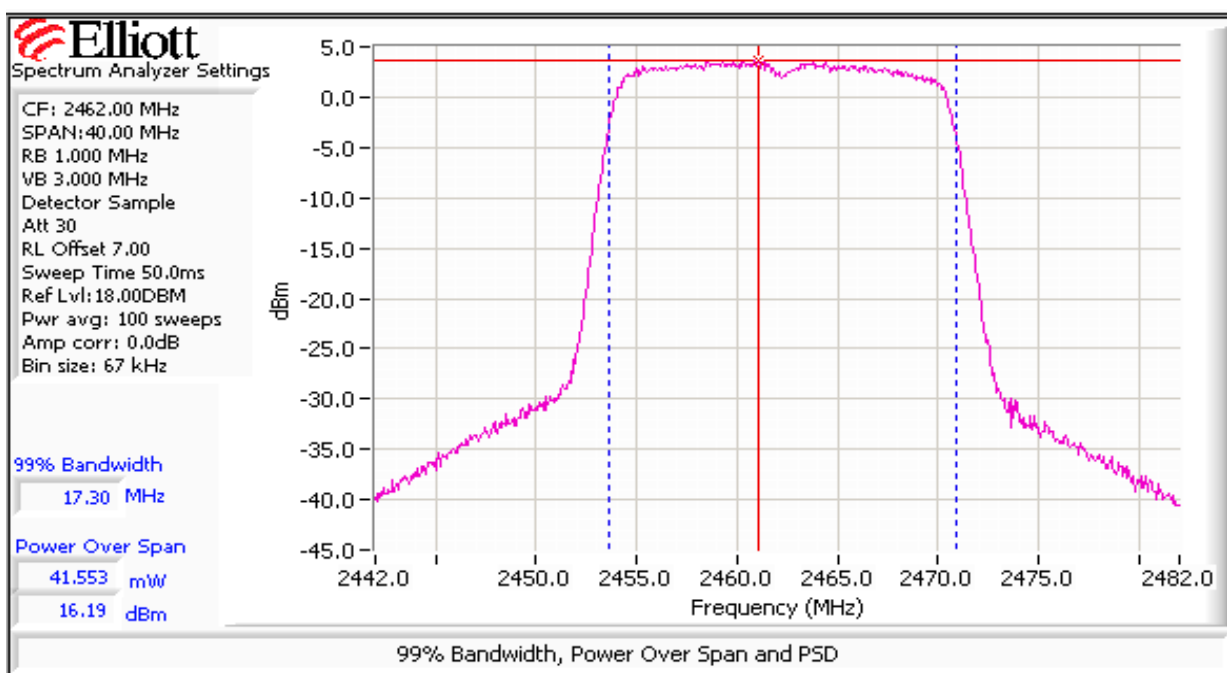
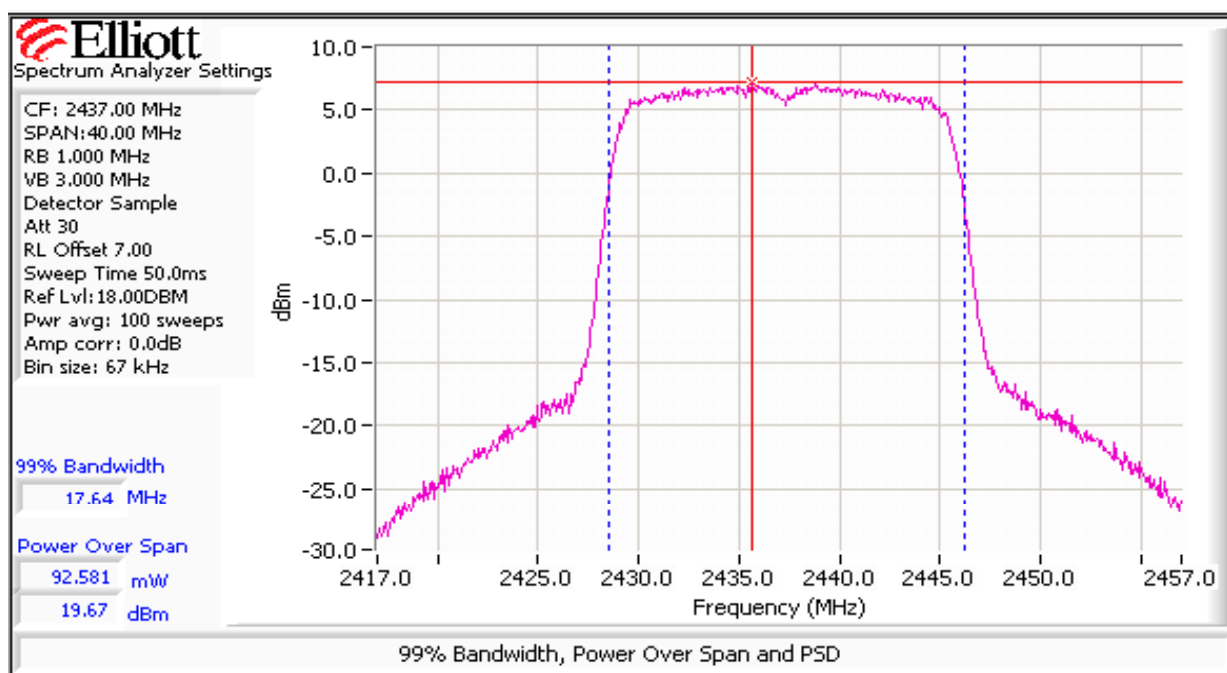
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
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Standard: FCC 15.247 / RSS 210	Class: N/A



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #2: Power spectral Density

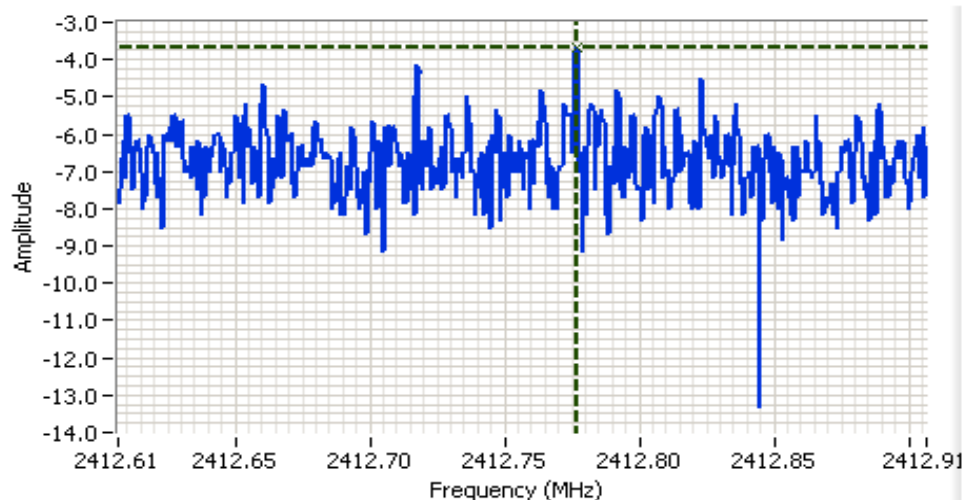
802.11b

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) <small>Note 1</small>	Limit dBm/3kHz	Result
19.0	2412	-3.7	8.0	Pass
20.0	2437	-1.8	8.0	Pass
19.0	2462	-3.5	8.0	Pass

802.11g

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) <small>Note 1</small>	Limit dBm/3kHz	Result
17.0	2412	-8.5	8.0	Pass
20.0	2437	-5.0	8.0	Pass
17.0	2462	-5.0	8.0	Pass

Note 1:	Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from preliminary scans using RB=3kHz using multiple sweeps at a faster rate over the 6dB bandwidth of the signal.
Note 2:	The operation of multiple radios in the band does not affect power spectral density as radios cannot operate on overlapping channels.



Analyzer Settings

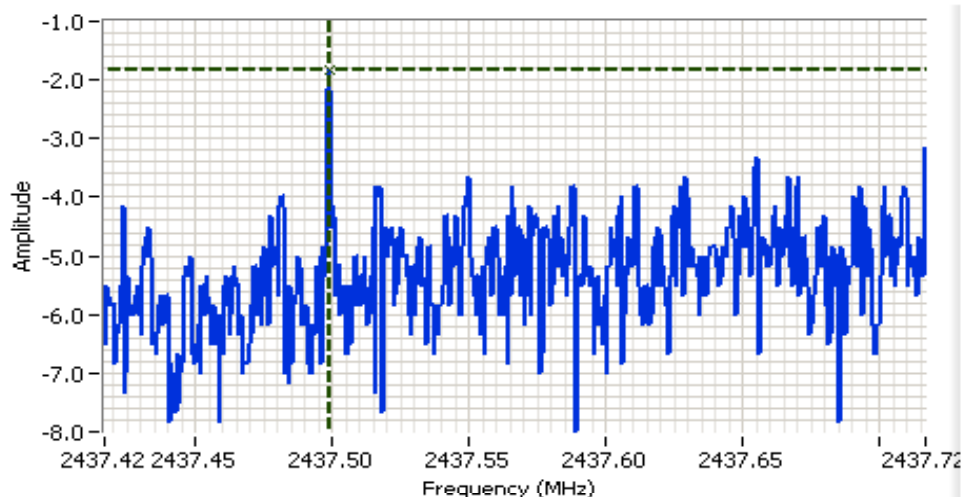
HP8564E
CF: 2412.757 MHz
SPAN: 300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector Sample
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl: 18.00 dBm

Comments

PSD = -3.67 dBm/3kHz
Setting: 19.0 dBm

Cursor 1	2412.7771	-3.67	+	-	↔
	0.0000	0.00	+	-	↔

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



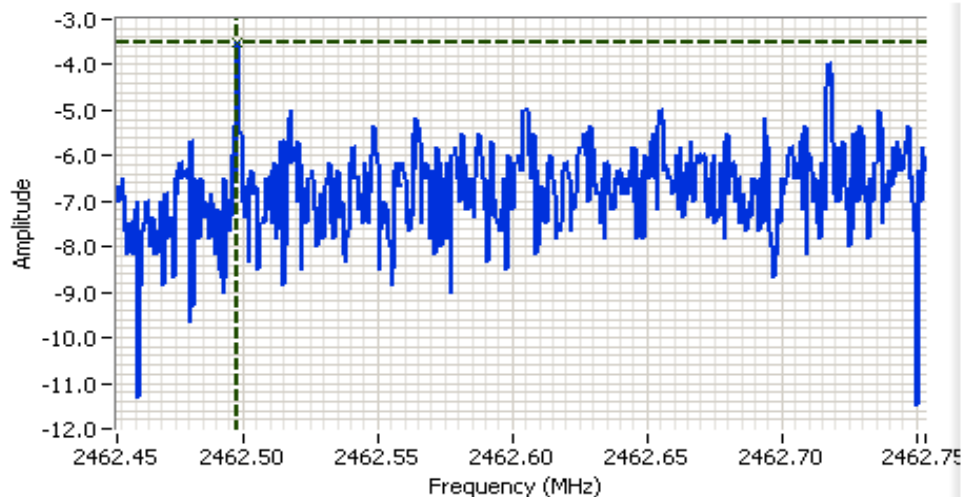
Analyzer Settings

HP8564E
CF: 2437.567 MHz
SPAN:300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector Sample
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl:18.00DBM

Comments

PSD = -1.83 dBm/3kHz
Setting: 20.0dBm

Cursor 1 2437.4987 -1.83
0.0000 0.00



Analyzer Settings

HP8564E
CF: 2462.603 MHz
SPAN:300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector Sample
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl:18.00DBM

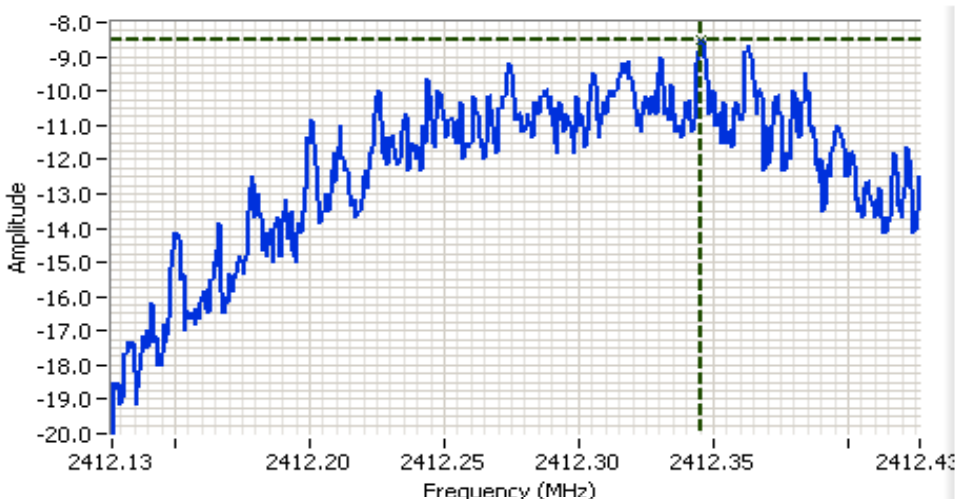
Comments

PSD = -3.50 dBm/3kHz
Setting: 19.0dBm

Cursor 1 2462.4978 -3.50
0.0000 0.00



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



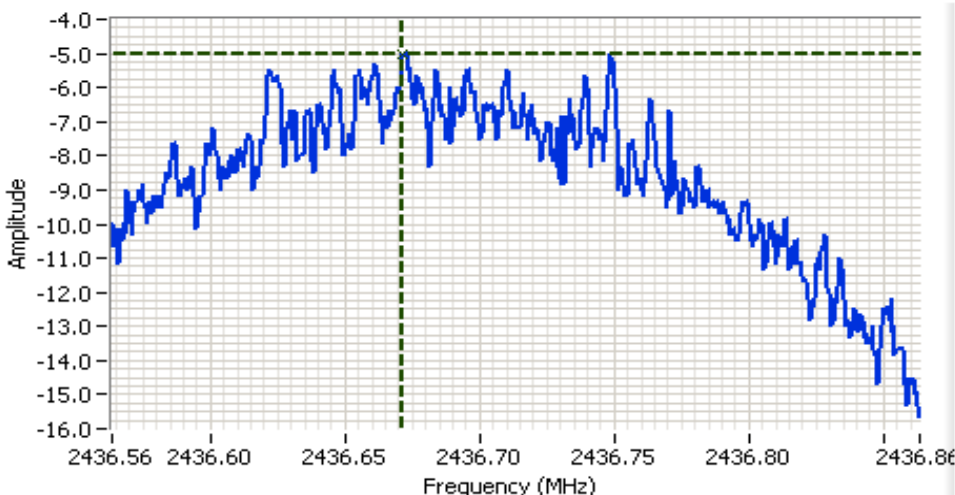
Analyzer Settings

HP8564E
CF: 2412.277 MHz
SPAN: 300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector Sample
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl: 18.00dBm

Comments

PSD = -8.5 dBm/3kHz
Setting: 17.0dBm

Cursor 1 2412.3451 -8.50



Analyzer Settings

HP8564E
CF: 2436.713 MHz
SPAN: 300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector Sample
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl: 18.00dBm

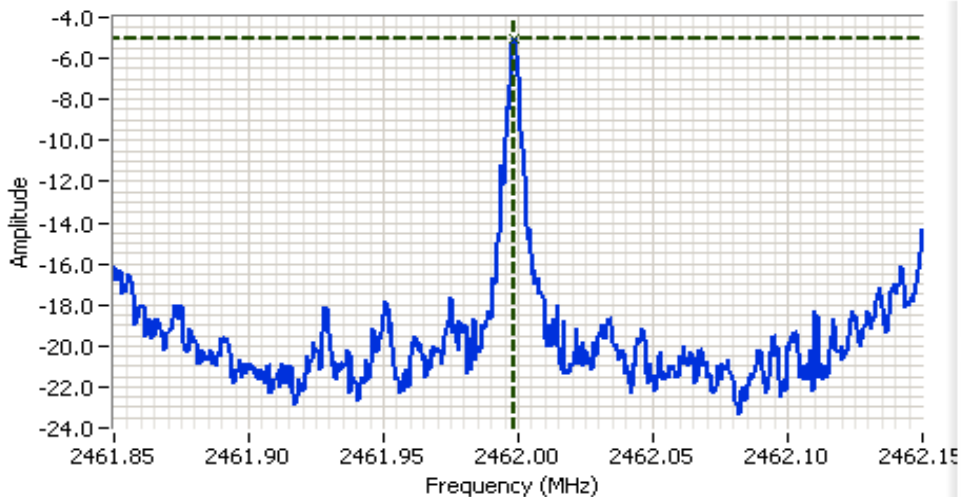
Comments

PSD = -5.0 dBm/3kHz
Setting: 20.0dBm

Cursor 1 2436.6714 -5.00



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Analyzer Settings

HP8564E
CF: 2462.000 MHz
SPAN: 300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector Sample
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl: 18.00dBm

Comments

PSD = -5.0 dBm/3kHz
Setting: 17.0dBm

Cursor 1 2461.9985 -5.00

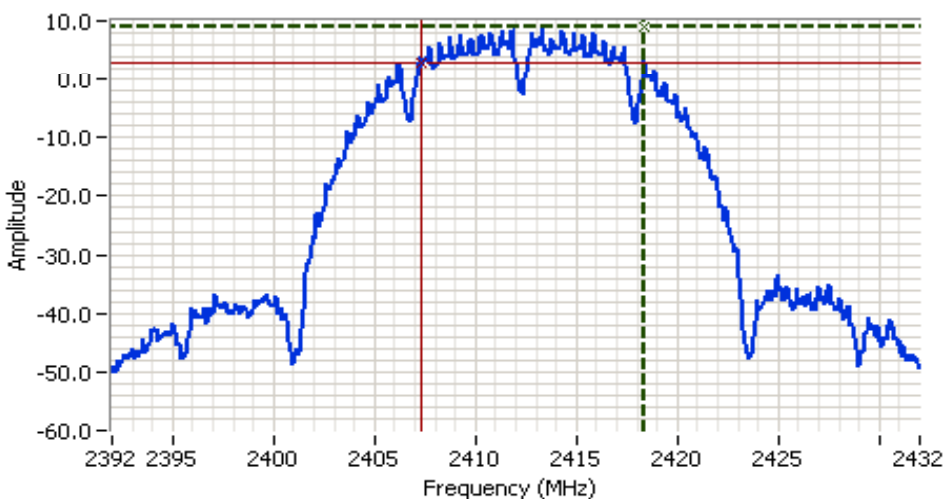
0.0000 0.00

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #3: Signal Bandwidth

Mode	Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz)	6dB	99%
802.11b	19.0	2412	100kHz	11.1	15.91	
802.11b	20.0	2437	100kHz	12.1	16.11	
802.11b	19.0	2462	100kHz	10.1	15.9	
802.11g	17.0	2412	100kHz	16.5	17.4	
802.11g	20.0	2437	100kHz	16.5	17.6	
802.11g	17.0	2462	100kHz	16.5	17.3	

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



Analyzer Settings

HP8564E
CF: 2412.000 MHz
SPAN: 40.000 MHz
RB 100 kHz
VB 100 kHz
Detector Sample
Att 30
RL Offset 7.00
Sweep Time 50.0ms
Ref Lvl: 18.00dBm

Comments

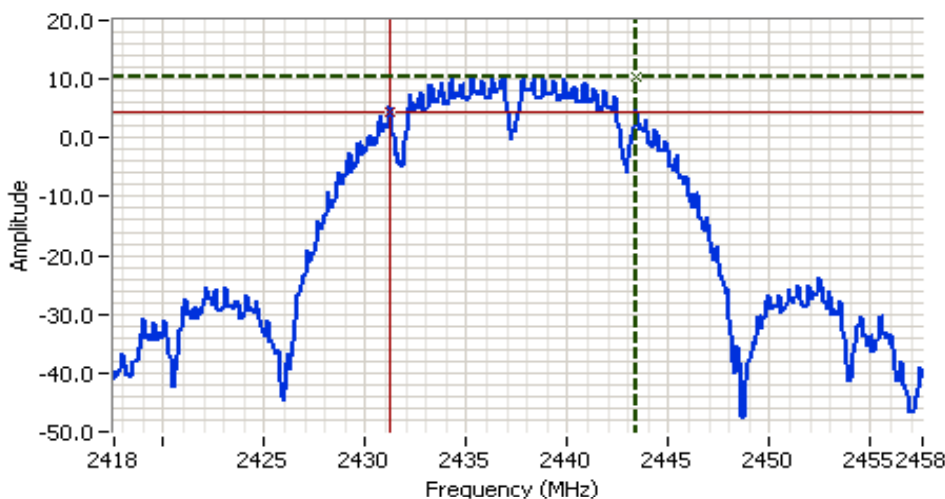
6dB BW: 11.133 MHz
Setting: 19.0dBm

Cursor 1	2418.4000	9.17	
Cursor 2	2407.2667	3.17	

Delta Freq. 11.133

Delta Amplitude 6.00

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Analyzer Settings

HP8564E
CF: 2437.567 MHz
SPAN:40.000 MHz
RB 100 kHz
VB 100 kHz
Detector Sample
Att 30
RL Offset 7.00
Sweep Time 50.0ms
Ref Lvl:18.00DBM

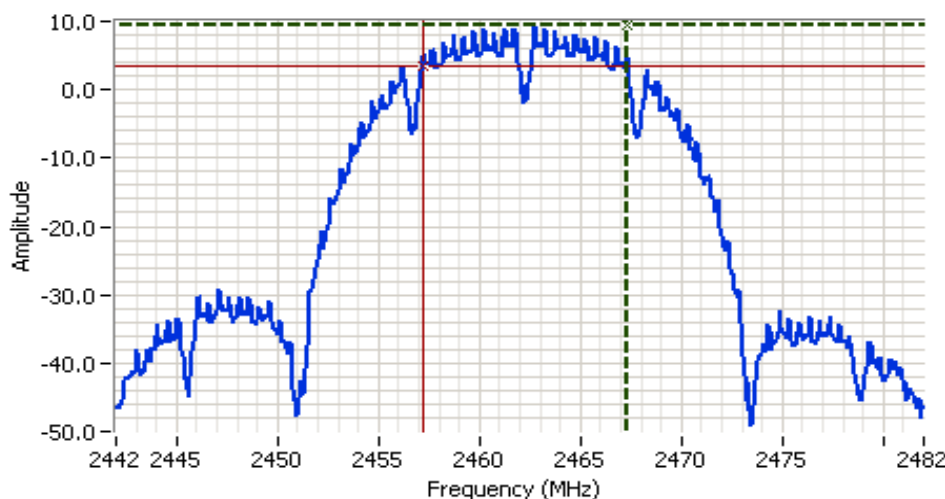
Comments

6dB BW: 12.133 MHz
Setting: 20.0dBm

Cursor 1 2443.3667 10.50
Cursor 2 2431.2333 4.50

Delta Freq. 12.133

Delta Amplitude 6.00



Analyzer Settings

HP8564E
CF: 2462.000 MHz
SPAN:40.000 MHz
RB 100 kHz
VB 100 kHz
Detector Sample
Att 30
RL Offset 7.00
Sweep Time 50.0ms
Ref Lvl:18.00DBM

Comments

6dB BW: 10.133 MHz
Setting: 19.0dBm

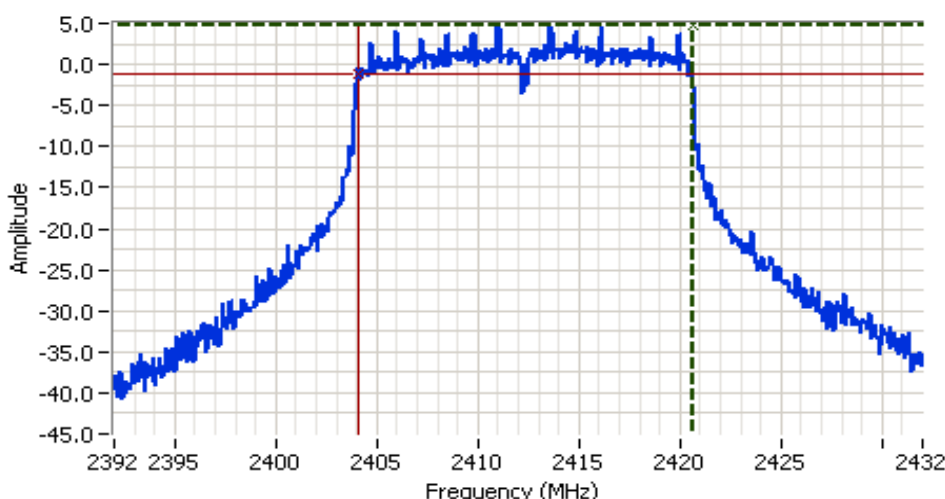
Cursor 1 2467.3333 9.33
Cursor 2 2457.2000 3.33

Delta Freq. 10.133

Delta Amplitude 6.00



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Analyzer Settings

HP8564E
CF: 2412.000 MHz
SPAN:40.000 MHz
RB 100 kHz
VB 100 kHz
Detector Sample
Att 30
RL Offset 7.00
Sweep Time 50.0ms
Ref Lvl:18.00DBM

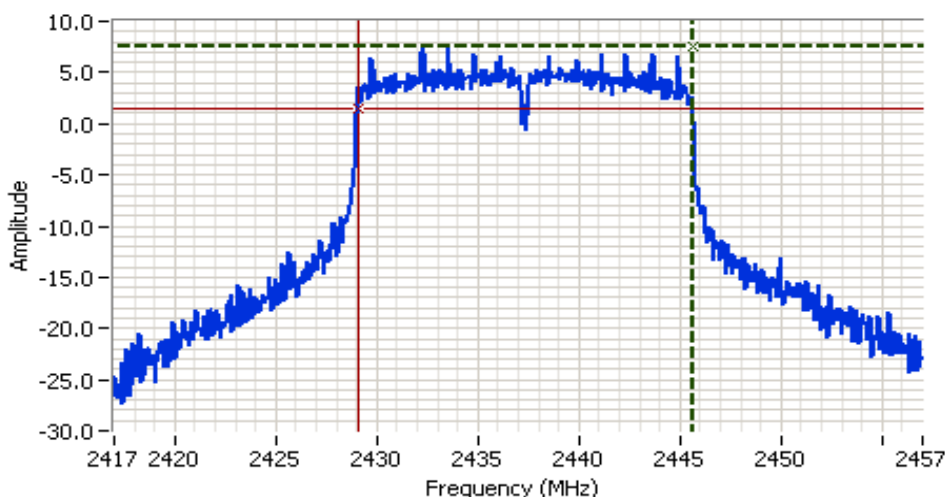
Comments

6dB BW: 16.533 MHz
Setting: 17.0dBm

Cursor 1 2420.6000 4.83
Cursor 2 2404.0667 -1.17

Delta Freq. 16.533

Delta Amplitude 6.00



Analyzer Settings

HP8564E
CF: 2437.000 MHz
SPAN:40.000 MHz
RB 100 kHz
VB 100 kHz
Detector Sample
Att 30
RL Offset 7.00
Sweep Time 50.0ms
Ref Lvl:18.00DBM

Comments

6dB BW: 16.533 MHz
Setting: 20.0dBm

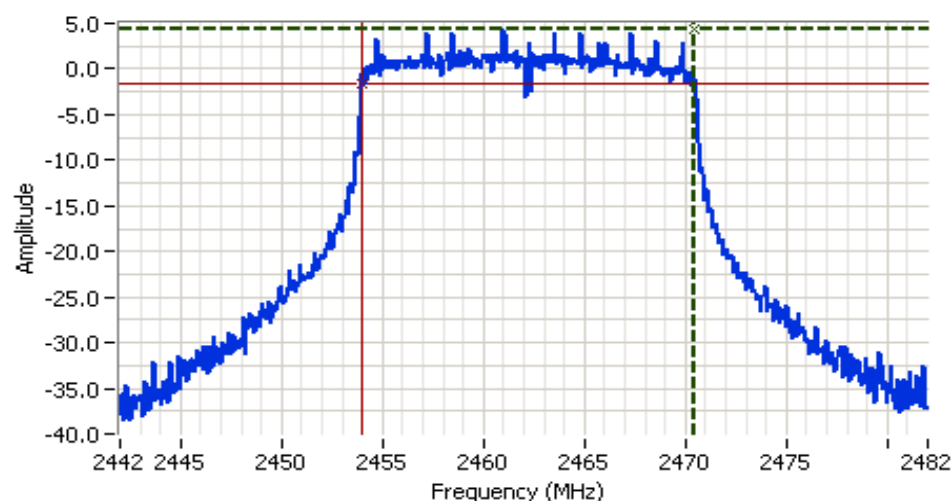
Cursor 1 2445.6000 7.50
Cursor 2 2429.0667 1.50

Delta Freq. 16.533

Delta Amplitude 6.00



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Analyzer Settings
HP8564E
CF: 2462.000 MHz
SPAN: 40.000 MHz
RB 100 kHz
VB 100 kHz
Detector Sample
Att 30
RL Offset 7.00
Sweep Time 50.0ms
Ref Lvl: 18.00dBm
Comments
6dB BW: 16.467 MHz
Setting: 17.0dBm

Cursor 1	2470.4667	4.33
Cursor 2	2454.0000	-1.67

Delta Freq.	16.467
Delta Amplitude	6.00



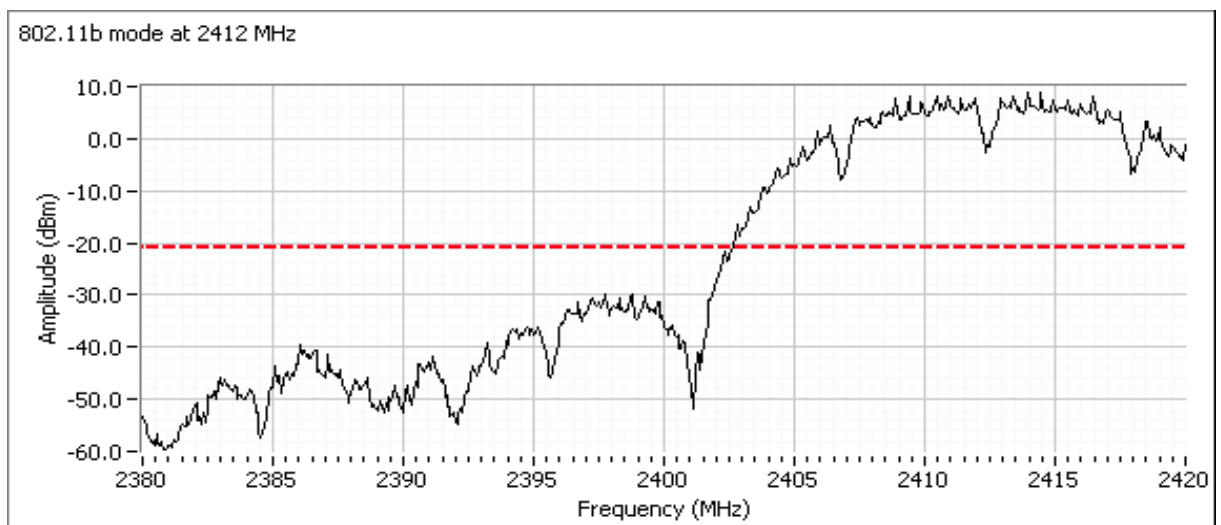
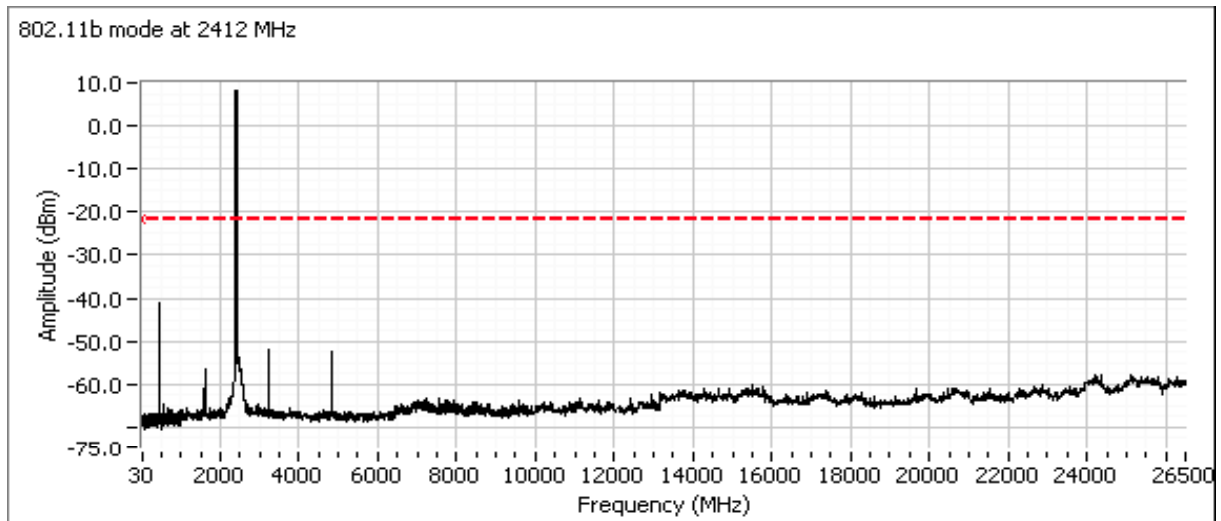
Run #4: Out of Band Spurious Emissions

Frequency (MHz)	Limit	Result
2412, 802.11b	-30dBc	Pass
2437, 802.11b	-30dBc	Pass
2462, 802.11b	-30dBc	Pass
2412, 802.11g	-30dBc	Pass
2437, 802.11g	-30dBc	Pass
2462, 802.11g	-30dBc	Pass

Note 1:	Measured using RB>=100kHz, VB>= RB
Note 2:	All measurements made at power setting of 20 on all three channels.

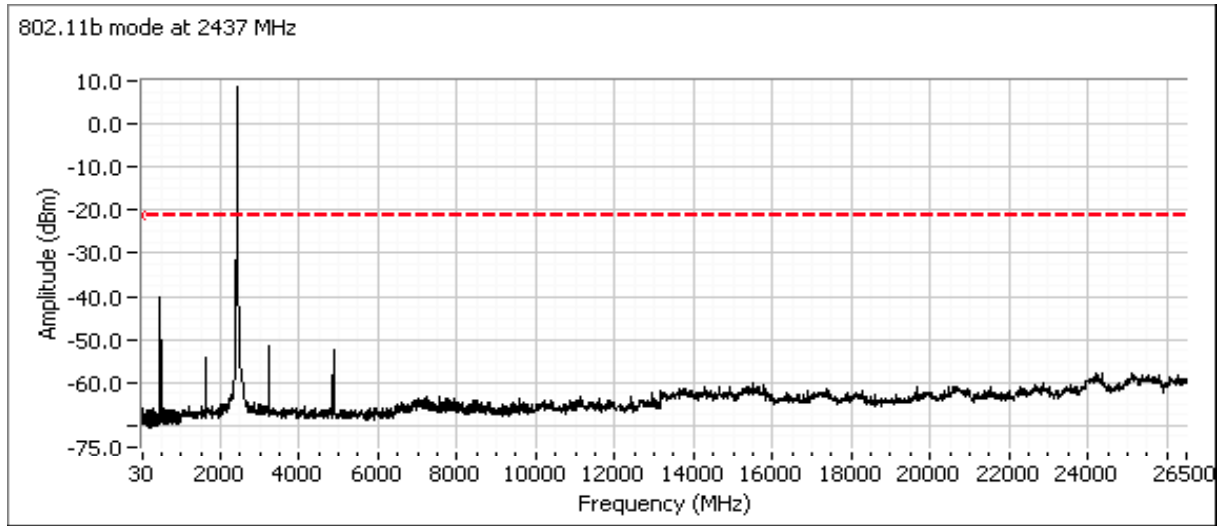
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Plots for low channel - 802.11b - , power setting(s) = 20

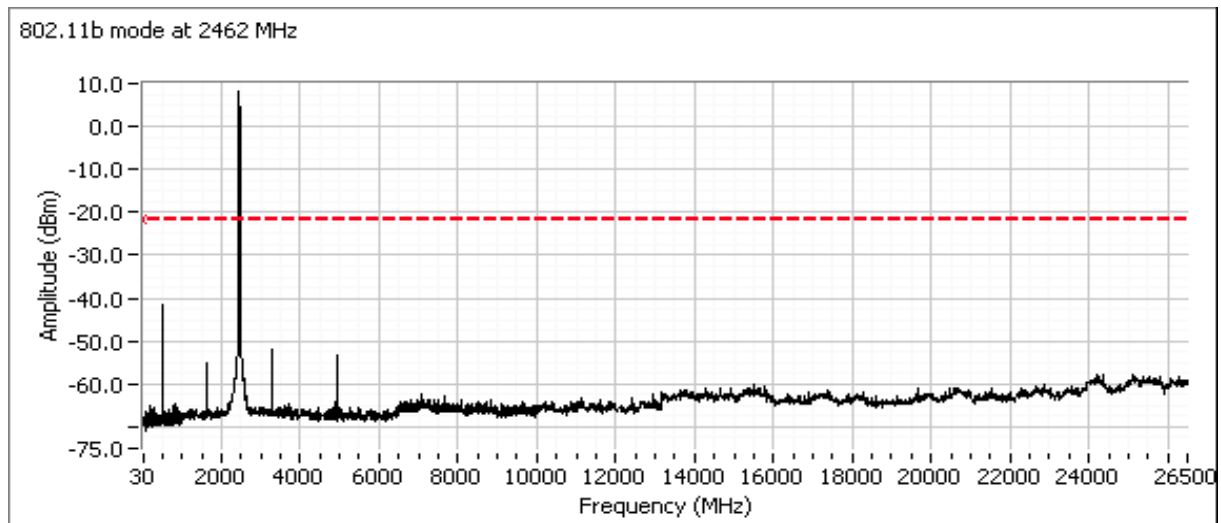


Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Plots for center channel - 802.11b - , power setting(s) = 20.0

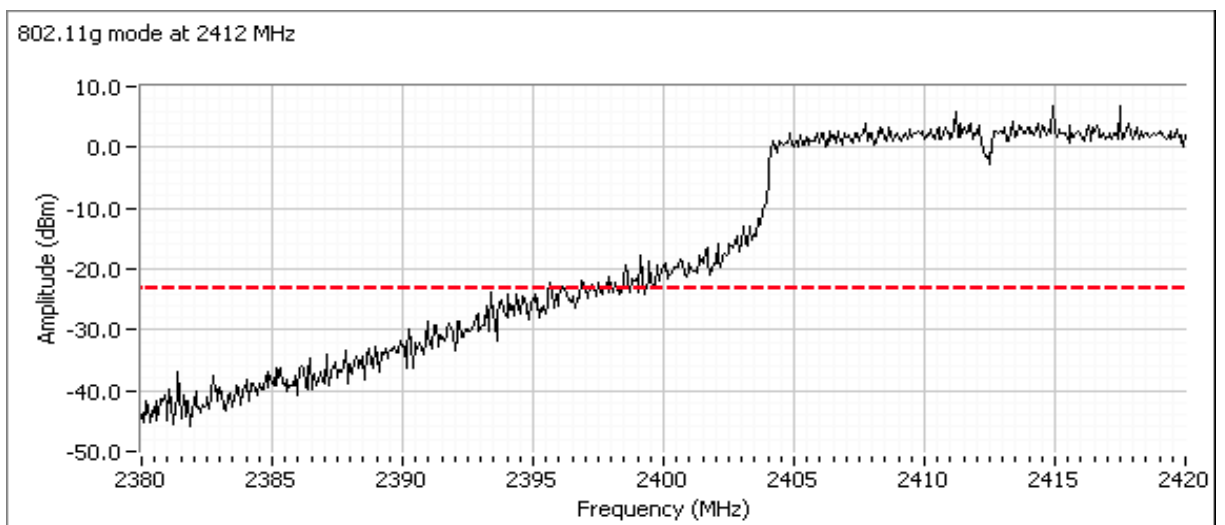
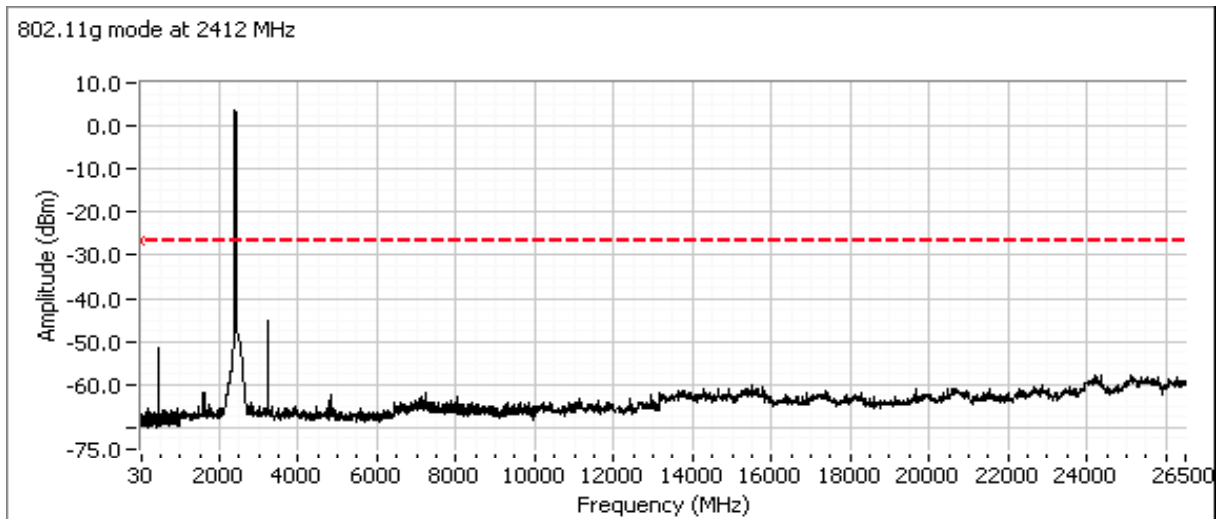


Plots for high channel - 802.11b - , power setting(s) = 20.0



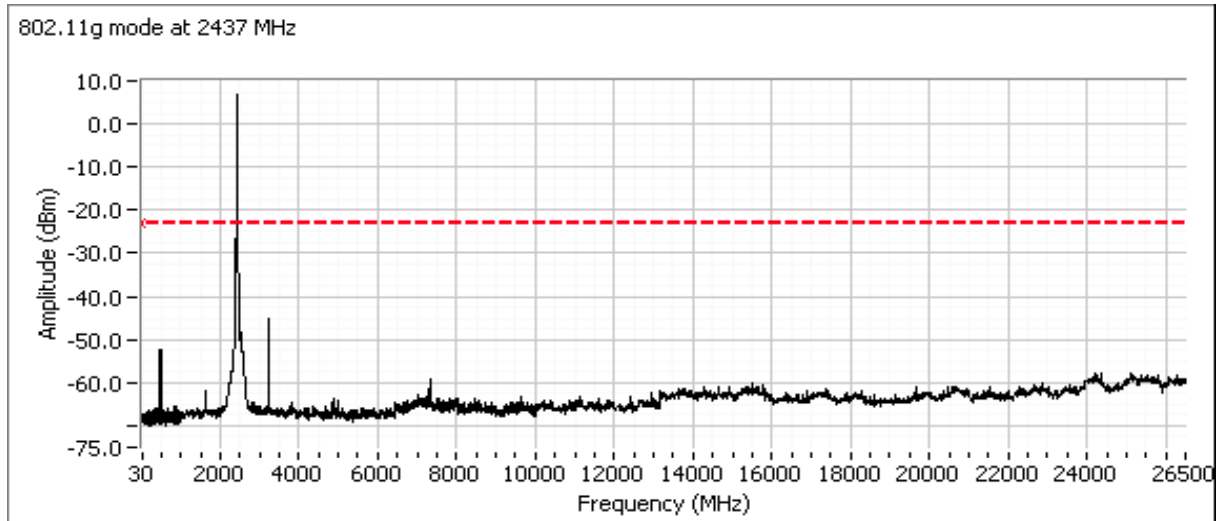
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Plots for low channel - 802.11g - , power setting(s) = 20

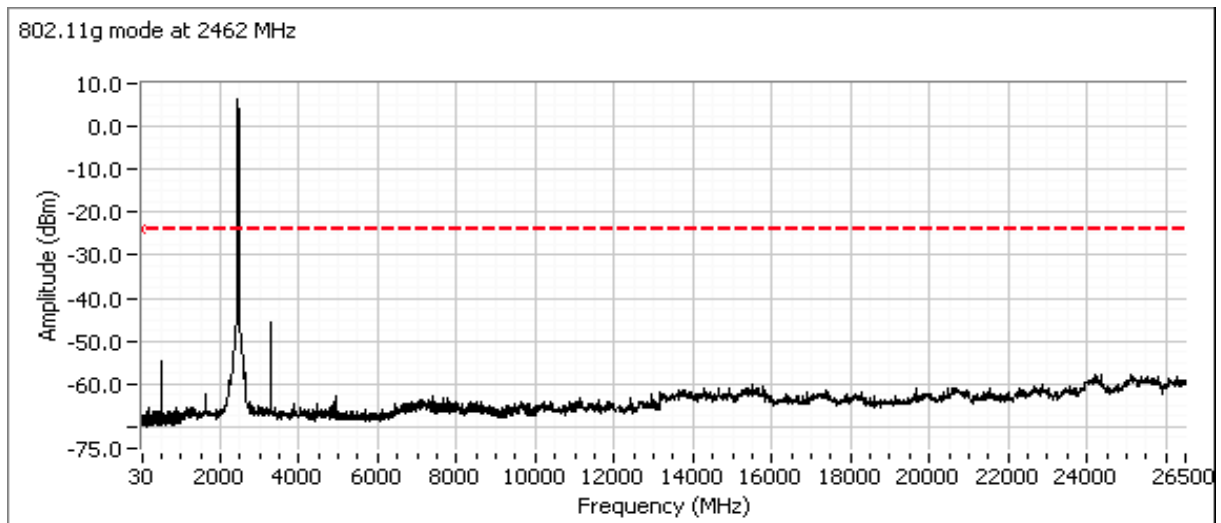


Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Plots for center channel - 802.11g - , power setting(s) = 20.0



Plots for high channel - 802.11g - , power setting(s) = 20.0



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73386
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

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

Test Specific Details

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

Date of Test: 11/7 and 11/2008
Test Engineer: S. Khushzad/M. Birgani/R. Varelas
Test Location: SV OATS # 2

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

General Test Configuration

The EUT was connected to the spectrum analyzer or power meter via a suitable attenuator.

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

Ambient Conditions:

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

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power	15.247(b)	Pass	802.11b: 25.1 dBm 802.11g: 24.2 dBm 3 radios: 29.8 dBm
2	PSD	15.247(d)	Pass	802.11b: 3.1 dBm/3kHz 802.11g: 2.8 dBm/3kHz
3	Minimum 6dB Bandwidth	15.247(a)	Pass	802.11b: 9.6 MHz 802.11g: 15.3 MHz
3	Maximum 99% Bandwidth	RSS GEN	Pass	802.11b: 15.8 MHz 802.11g: 23.4 MHz
4	Spurious emissions	15.247(b)	Pass	All signals were more than 30dB below the fundamental

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73386
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

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

Transmitted signal on chain is coherent ? Yes

Highest antenna gain for MIMO mode is the internal antenna gain of 1dBi (external antenna does not support MIMO modes).

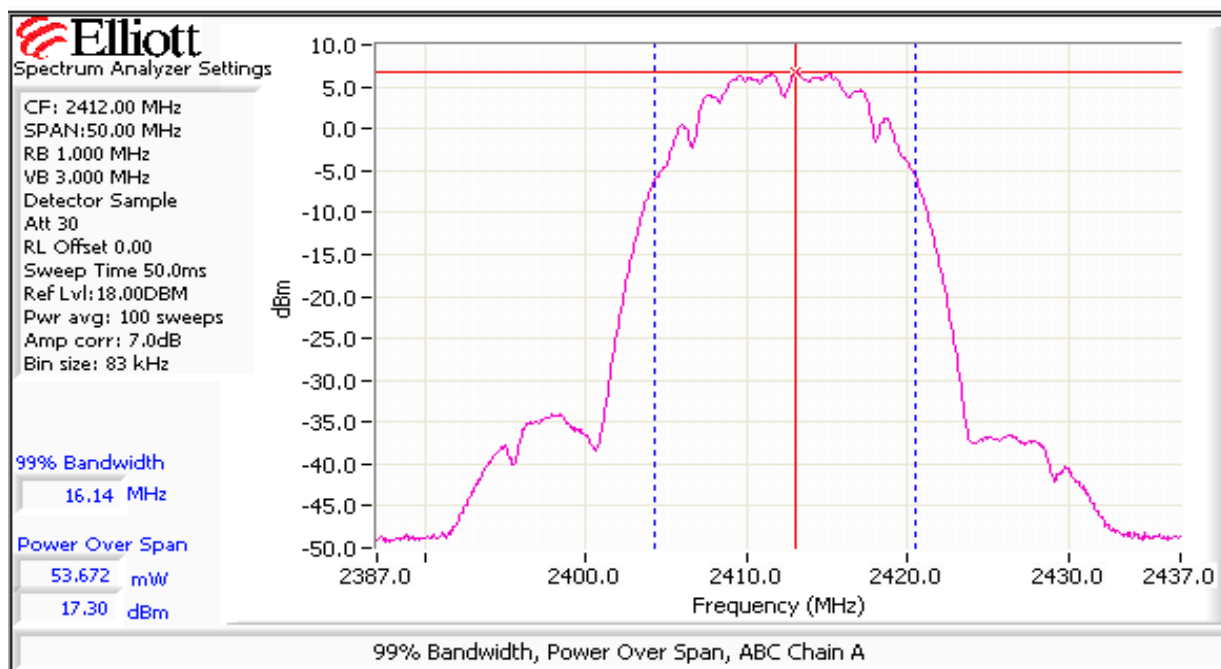
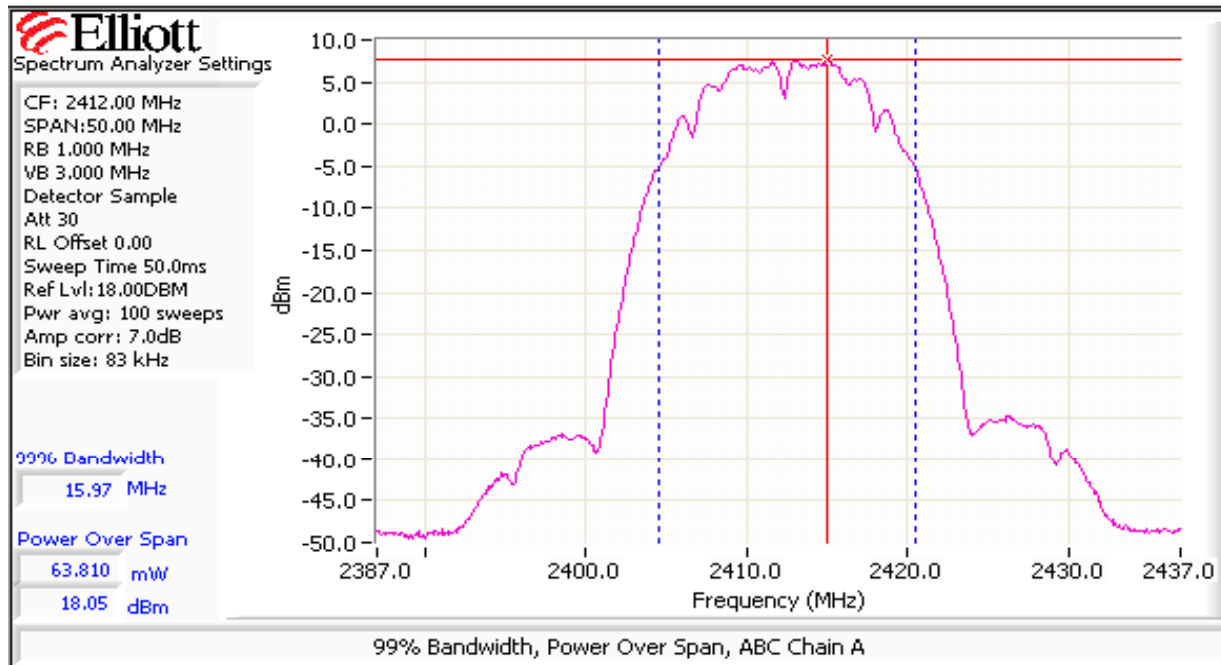
Single radio Operating in the Band

2412 MHz - 802.11b	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	18.0	18.0	18.0					
Output Power (dBm) ^{Note 1}	18.05	17.3	18.19		22.6 dBm	0.183 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	1.0	1.0	1.0		5.8 dBi		Pass	
eirp (dBm) ^{Note 2}	19.05	18.3	19.19		28.4 dBm	0.693 W		
2437 MHz - 802.11b	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	20.0	20.0	20.0					
Output Power (dBm) ^{Note 1}	20.79	19.9	20.18		25.1 dBm	0.322 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	1.0	1.0	1.0		5.8 dBi		Pass	
eirp (dBm) ^{Note 2}	21.79	20.9	21.18		30.8 dBm	1.216 W		
2462 MHz - 802.11b	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	19.0	19.0	19.0					
Output Power (dBm) ^{Note 1}	19.12	17.95	18.17		23.2 dBm	0.210 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	1.0	1.0	1.0		5.8 dBi		Pass	
eirp (dBm) ^{Note 2}	20.12	18.95	19.17		29.0 dBm	0.792 W		
2412 MHz - 802.11g	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	17.0	17.0	17.0					
Output Power (dBm) ^{Note 1}	16.55	15.62	16.54		21.0 dBm	0.127 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	1.0	1.0	1.0		5.8 dBi		Pass	
eirp (dBm) ^{Note 2}	17.55	16.62	17.54		26.8 dBm	0.479 W		
2437 MHz - 802.11g	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	20.0	20.0	20.0					
Output Power (dBm) ^{Note 1}	20.08	18.9	19.36		24.2 dBm	0.266 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	1.0	1.0	1.0		5.8 dBi		Pass	
eirp (dBm) ^{Note 2}	21.08	19.9	20.36		30.0 dBm	1.004 W		
2462 MHz - 802.11g	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	17.0	17.0	17.0					
Output Power (dBm) ^{Note 1}	16.52	15.47	15.73		20.7 dBm	0.118 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	1.0	1.0	1.0		5.8 dBi		Pass	
eirp (dBm) ^{Note 2}	17.52	16.47	16.73		26.5 dBm	0.444 W		

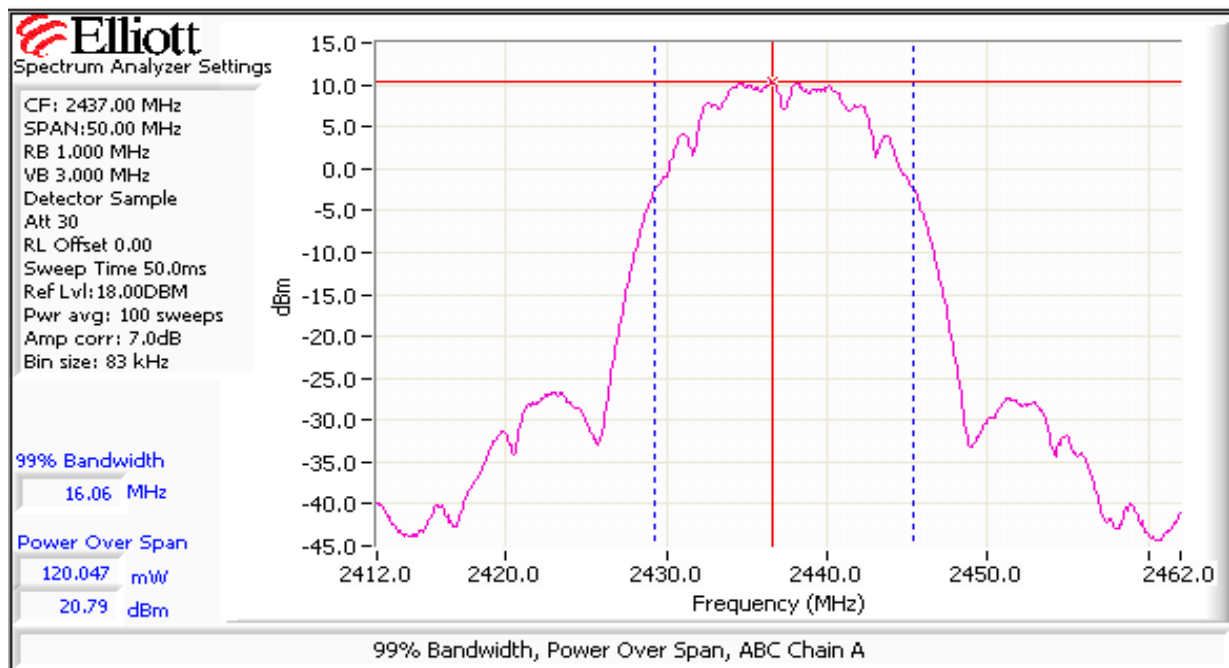
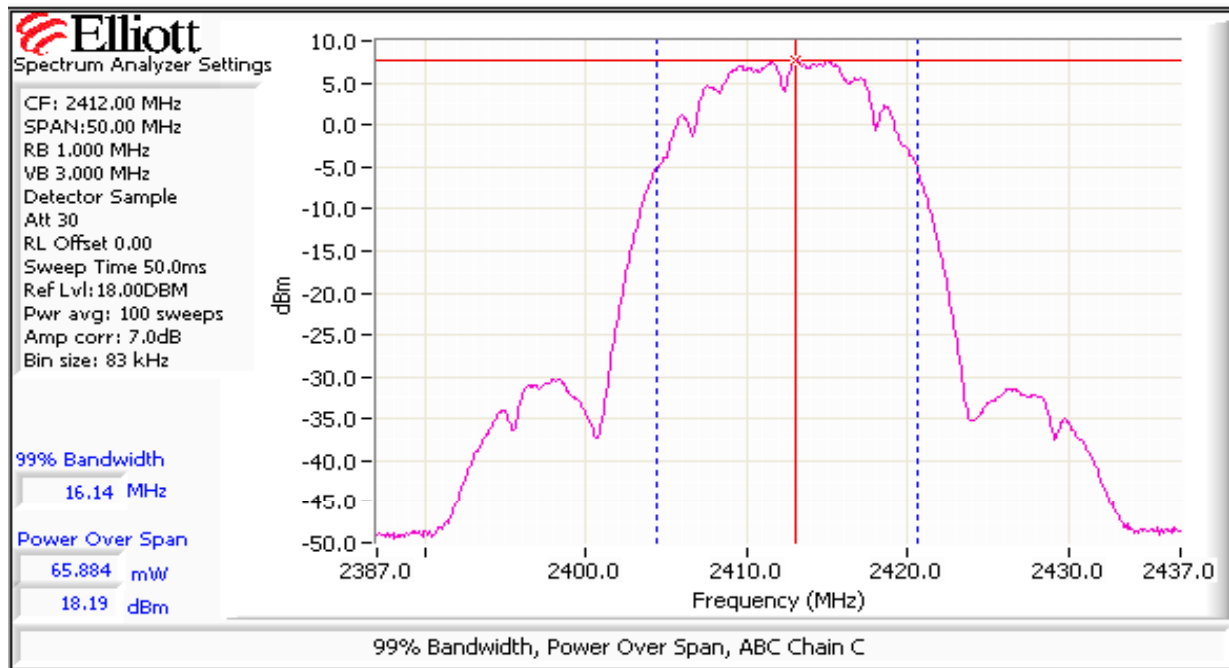
Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz (reference method 1 of FCC DA 02-2138 for U-NII devices, August 30, 2002). Spurious limit becomes -30dBc.
Note 2:	As there is coherency between chains the effective antenna gain is the sum of the individual antenna gains and the eirp is the product of the total power and the effective antenna gain

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

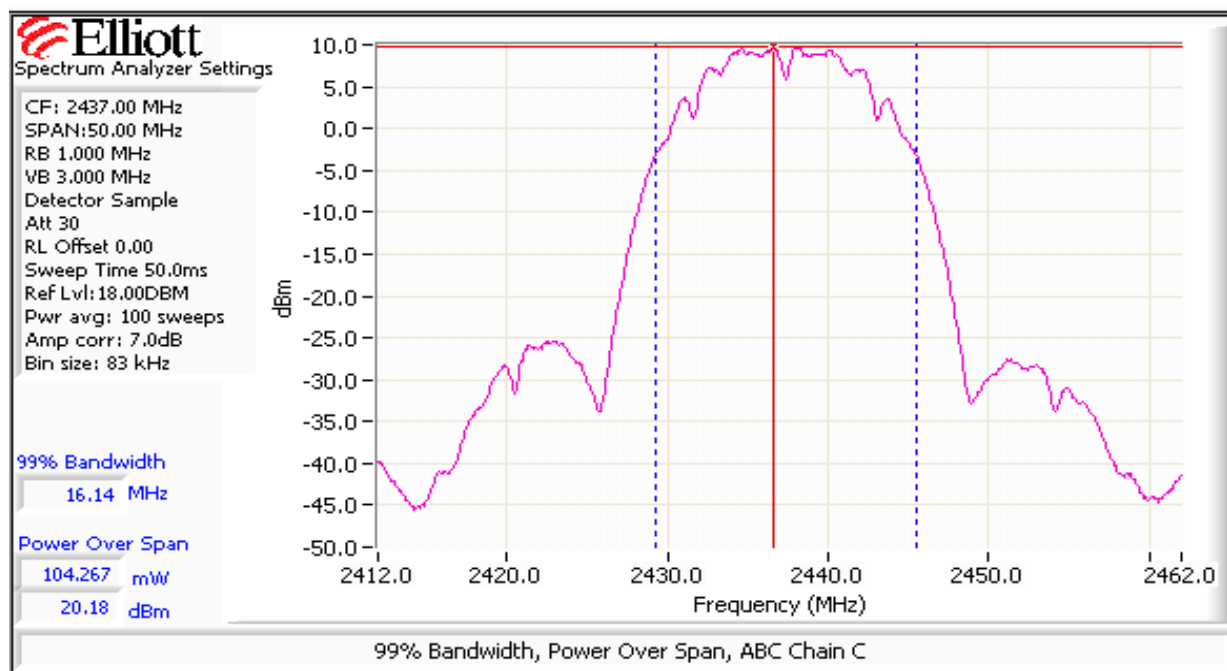
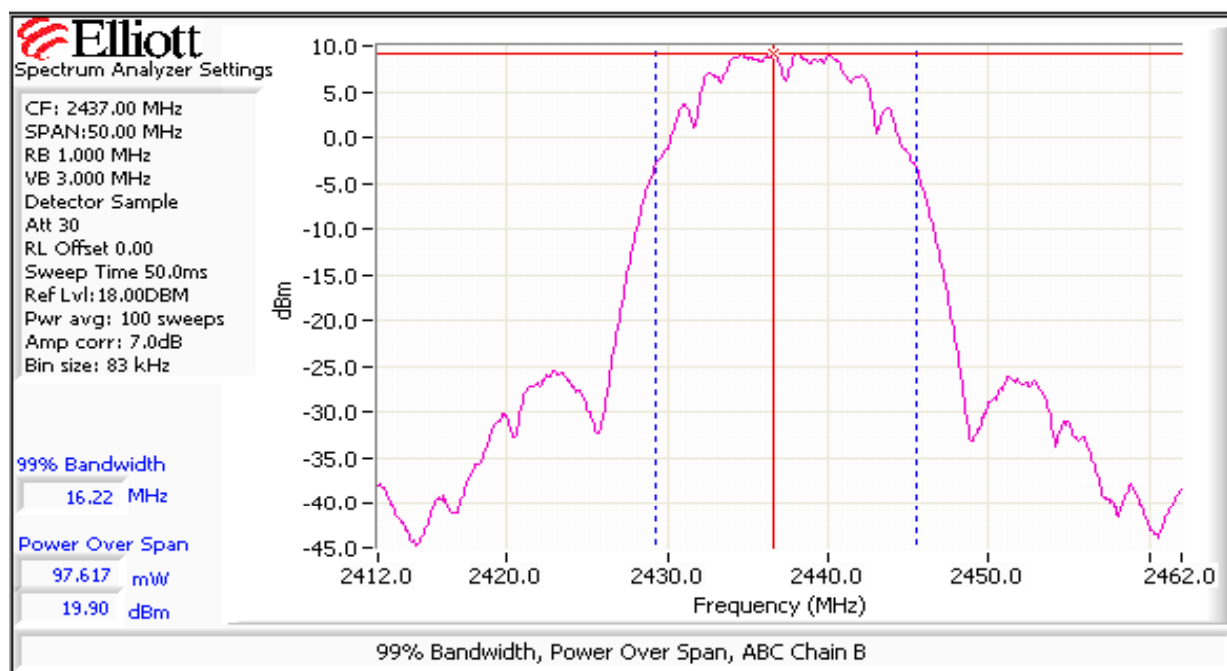
Run #1: Output Power - Chain A + B + C



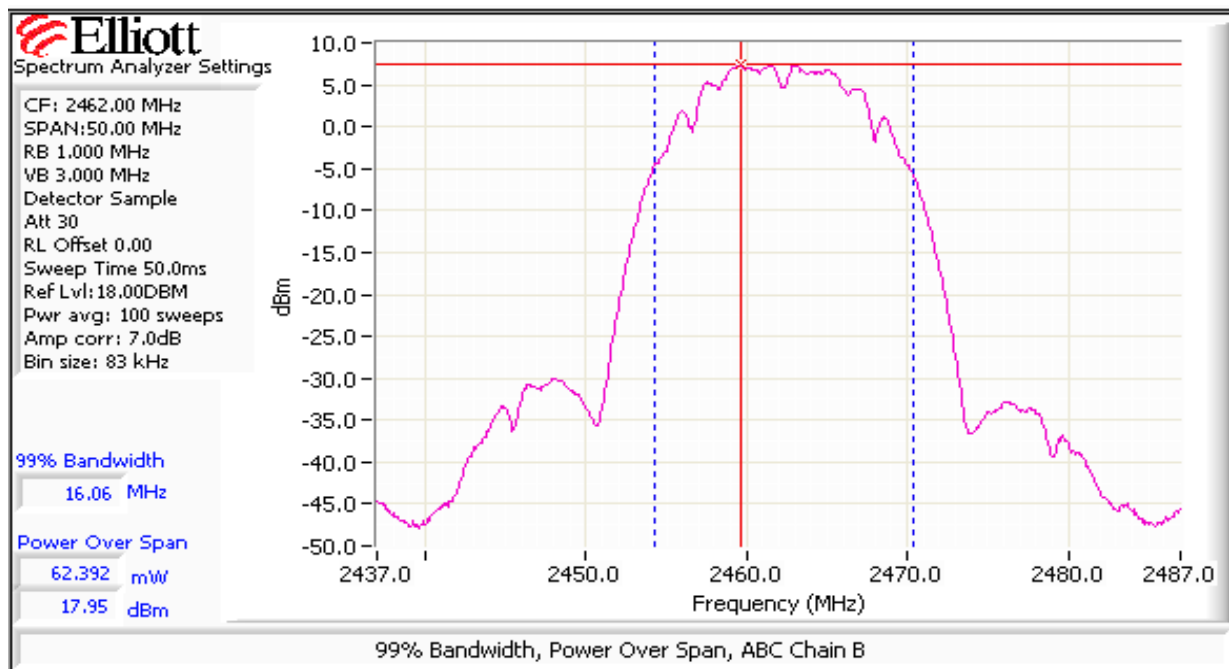
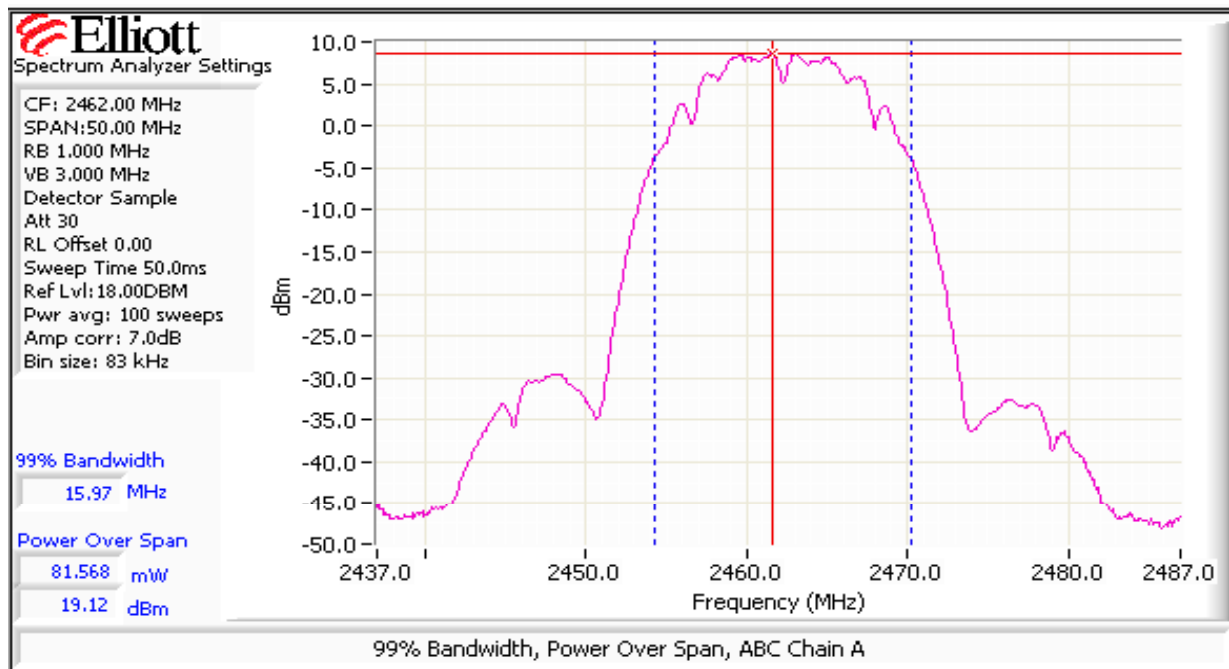
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



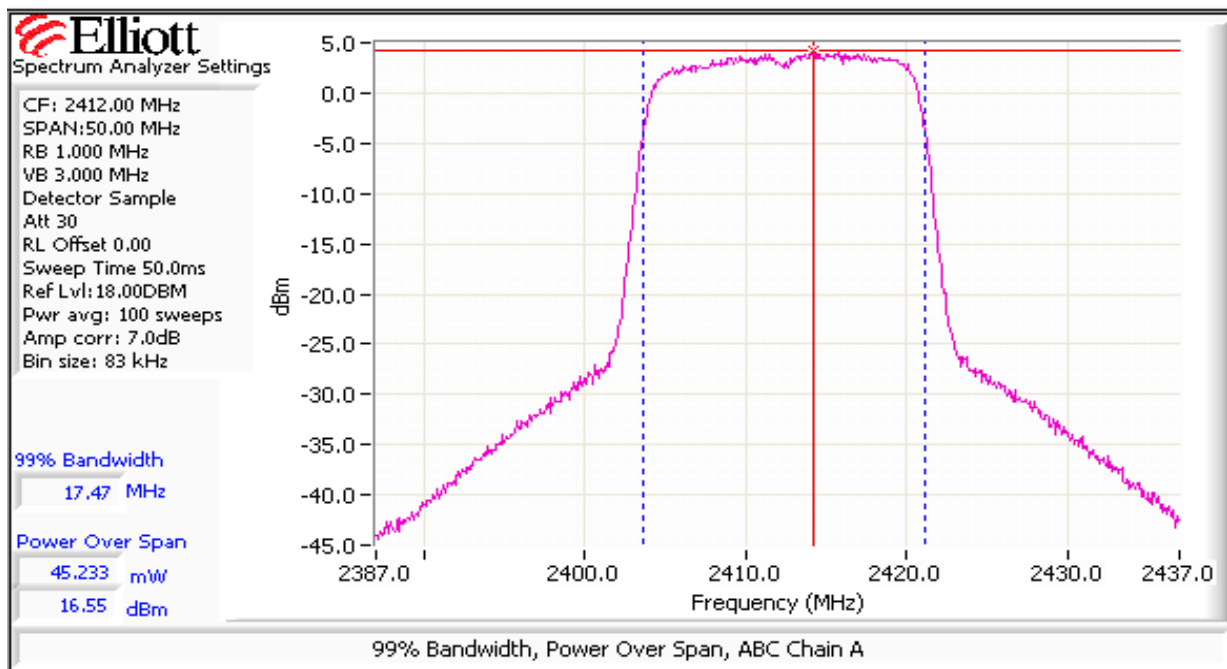
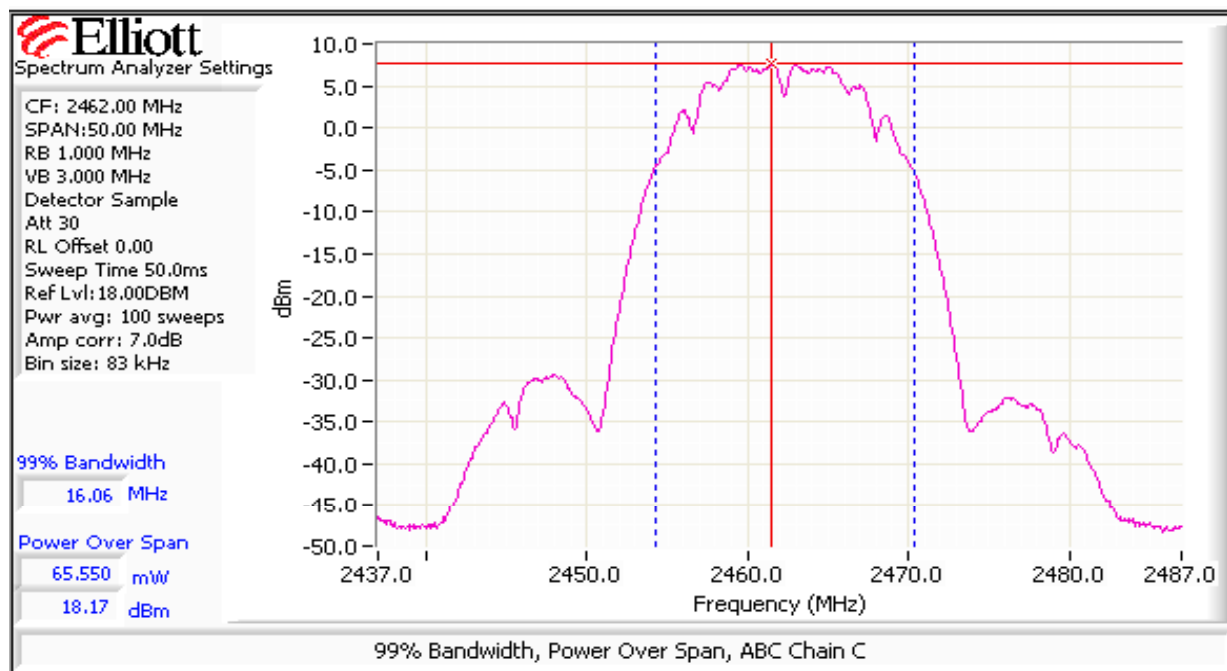
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



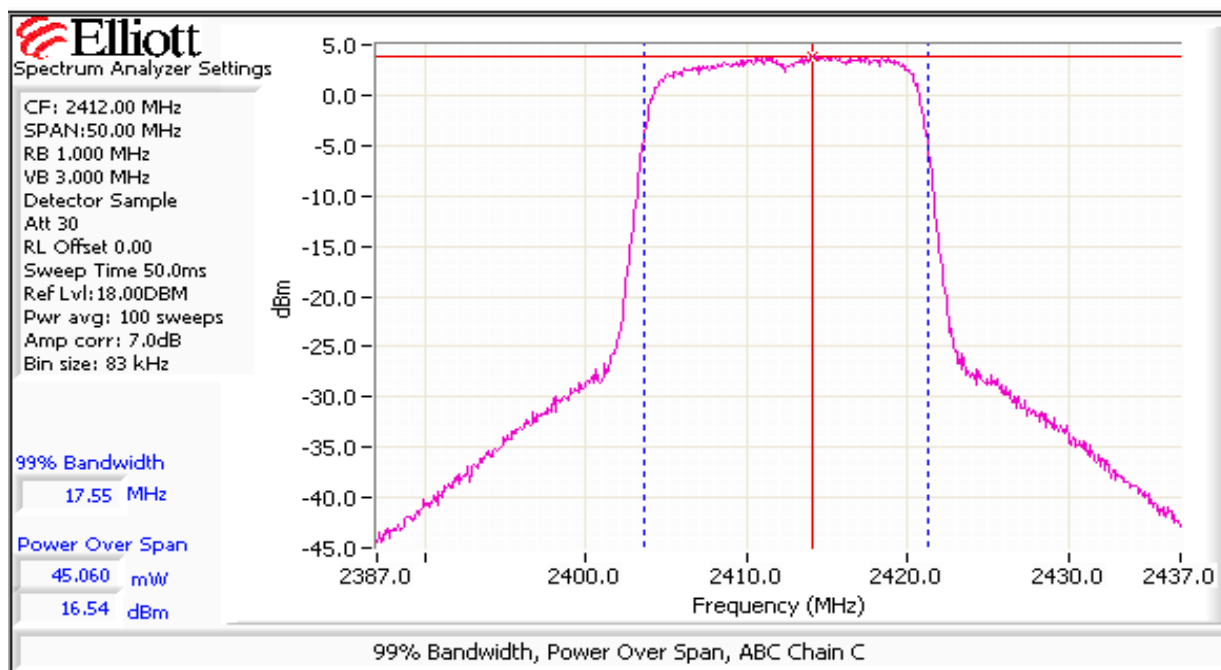
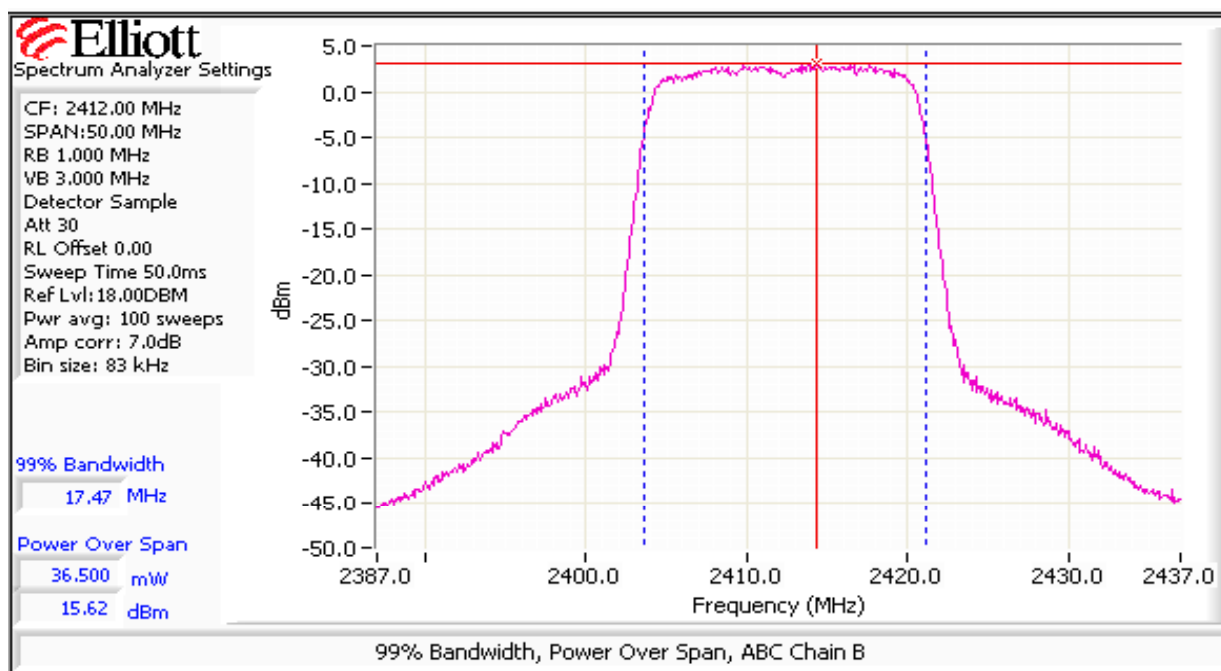
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



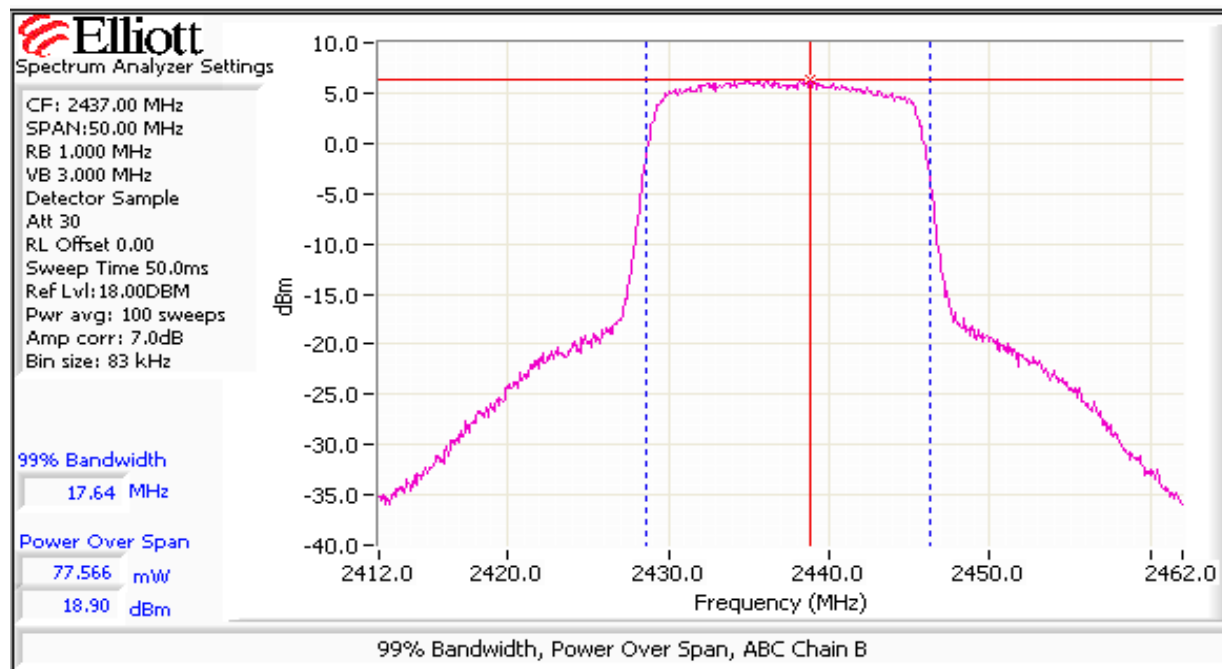
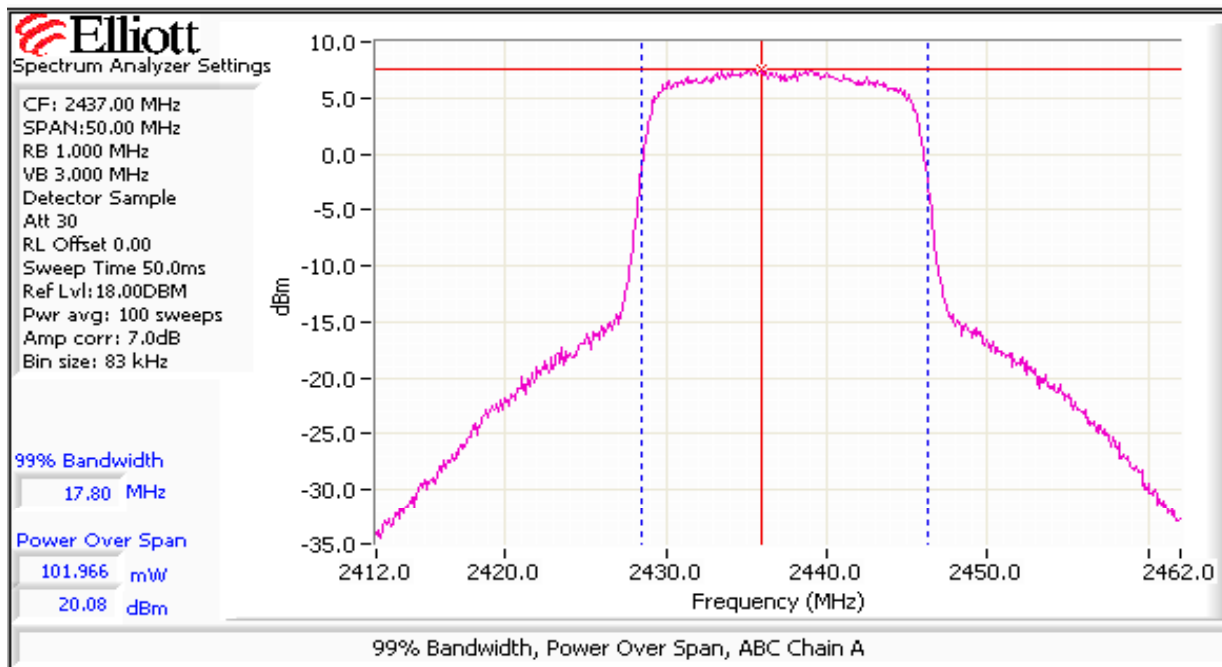
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



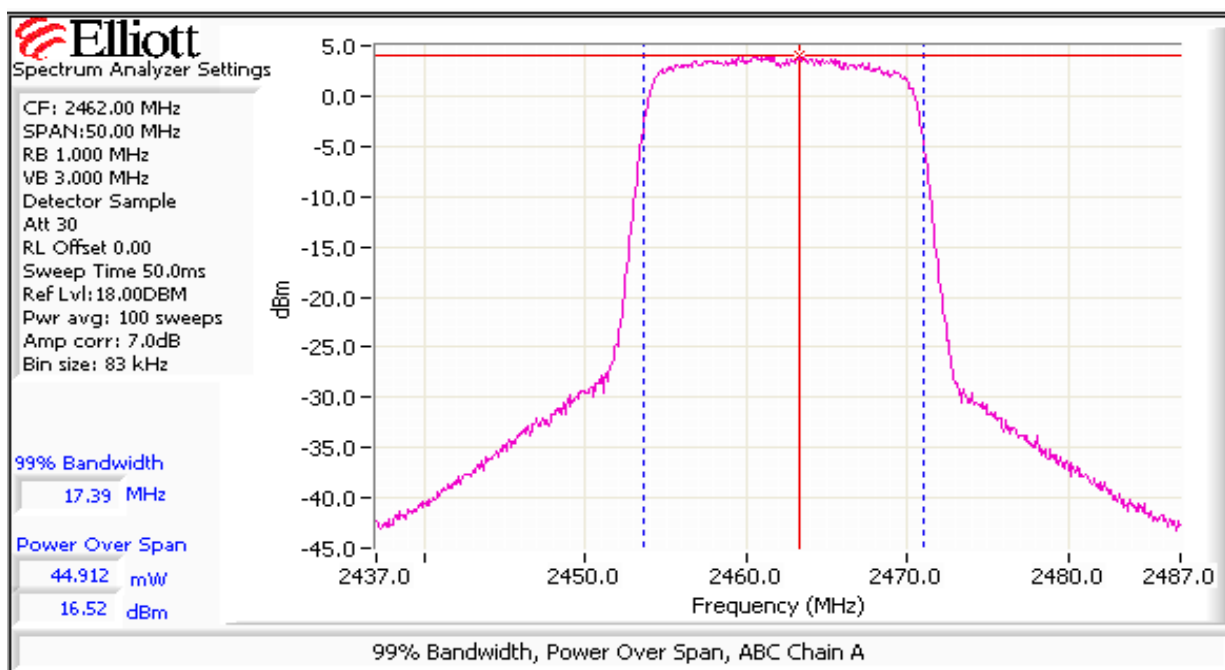
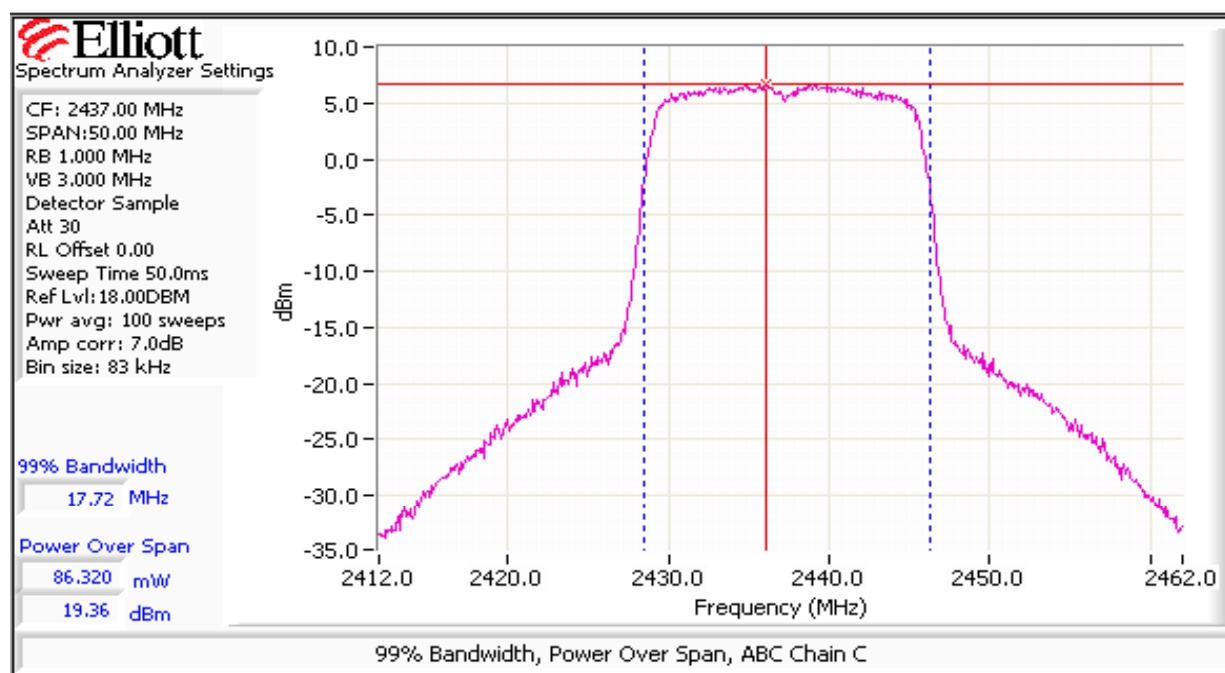
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



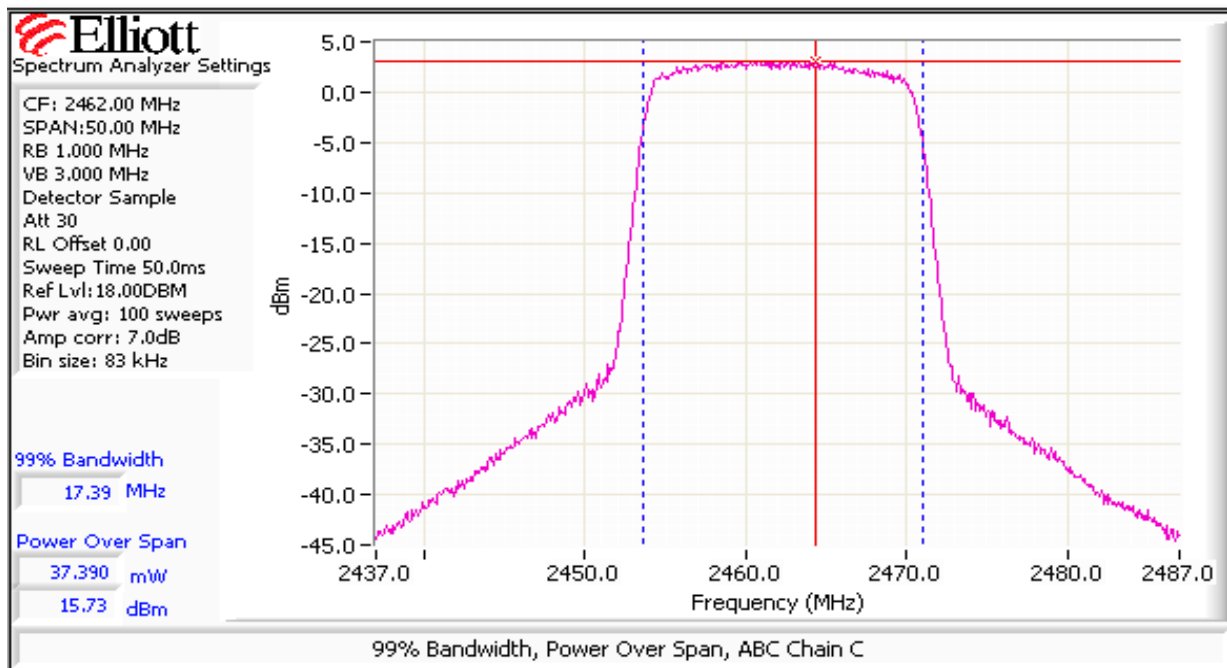
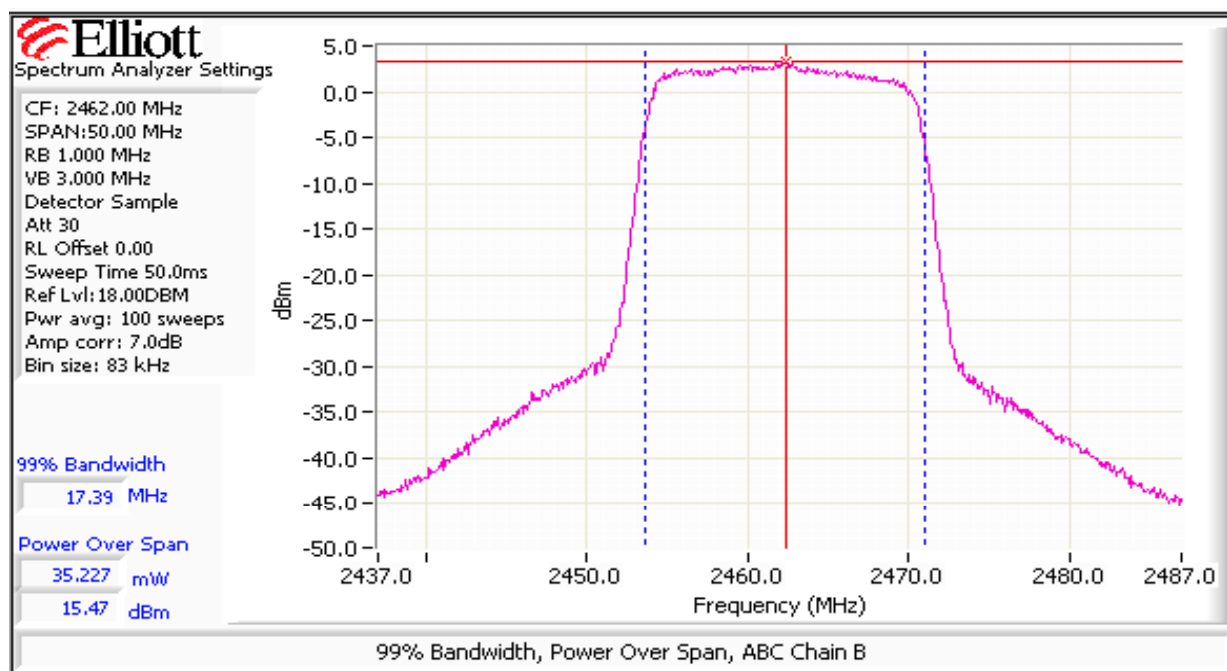
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73386
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Two radios on non-overlapping channels, note 3

802.11b	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	20.0	20.0	20.0					
Output Power (dBm) ^{Note 1}	20.79	19.9	20.18		28.1 dBm	0.644 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	1.0	1.0	1.0		5.8 dBi		Pass	
eirp (dBm) ^{Note 2}	21.79	20.9	21.18		33.9 dBm	2.432 W		
802.11g	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	20.0	20.0	20.0					
Output Power (dBm) ^{Note 1}	20.08	18.9	19.36		27.3 dBm	0.532 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	1.0	1.0	1.0		5.8 dBi		Pass	
eirp (dBm) ^{Note 2}	21.08	19.9	20.36		33.0 dBm	2.008 W		

Three radios on non-overlapping channels, note 3

802.11b	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	20.0	20.0	20.0					
Output Power (dBm) ^{Note 1}	20.79	19.9	20.18		29.8 dBm	0.966 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	1.0	1.0	1.0		5.8 dBi		Pass	
eirp (dBm) ^{Note 2}	21.79	20.9	21.18		35.6 dBm	3.647 W		
802.11g	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	20.0	20.0	20.0					
Output Power (dBm) ^{Note 1}	20.08	18.9	19.36		29.0 dBm	0.797 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	1.0	1.0	1.0		5.8 dBi		Pass	
eirp (dBm) ^{Note 2}	21.08	19.9	20.36		34.8 dBm	3.011 W		

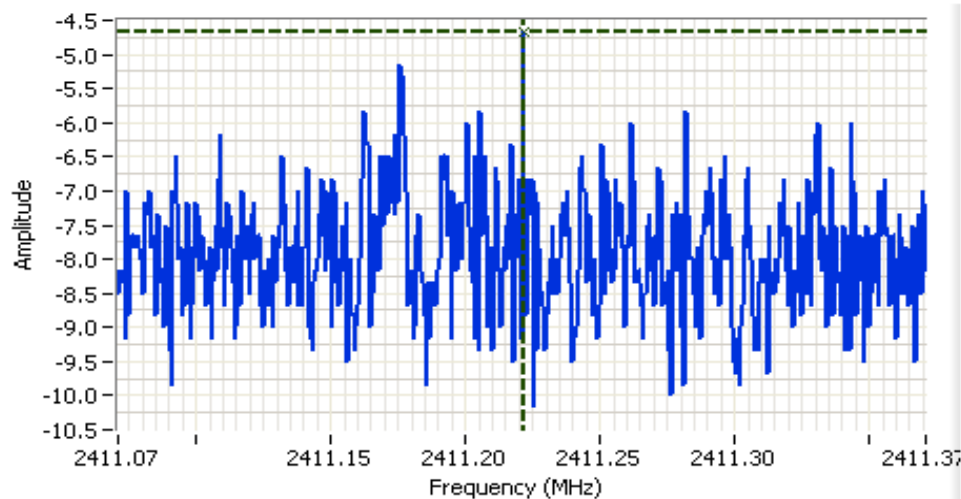
Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz (reference method 1 of FCC DA 02-2138 for U-NII devices, August 30, 2002). Spurious limit becomes -30dBc.
Note 2:	As there is coherency between chains the effective antenna gain is the sum of the individual antenna gains and the eirp is the product of the total power and the effective antenna gain
Note 3:	The device has multiple radios, but the software limits operation in any band to ensure only non-overlapping channels are used (no two radios can operate on the same channel or on overlapping channels). In the 2412 - 2462 MHz band there can be a maximum of 3 radios active. The calculated total power (obtained by multiplying the output power on a single radio by the number of radios that can be operating in the band) demonstrates that, with 2 or 3 radios active, the total output power still complies with the limit. (The external antenna does not support MIMO modes so the internal antenna gain represents the highest gain).

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) ^{Note 1}				Total	Limit dBm/3kHz	Result
		Chain 1	Chain 2	Chain 3	Chain 4			
18.0	2412 802.11b	-4.7	-4.0	-5.5		0.1	8.0	Pass
20.0	2437 802.11b	-1.7	-1.3	-2.2		3.1	8.0	Pass
19.0	2462 802.11b	-3.3	-3.5	-4.0		1.2	8.0	Pass
17.0	2412 802.11g	-6.7	-6.8	-3.5		-0.6	8.0	Pass
20.0	2437 802.11g	-3.7	-3.5	-5.2		0.7	8.0	Pass
17.0	2462 802.11g	-7.3	2.0	-8.3		2.8	8.0	Pass

Note 1:	Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from preliminary scans using RB=3kHz using multiple sweeps at a faster rate over the 6dB bandwidth of the signal.
Note 2:	The operation of multiple radios in the band does not affect power spectral density as radios cannot operate on overlapping channels.



Analyzer Settings

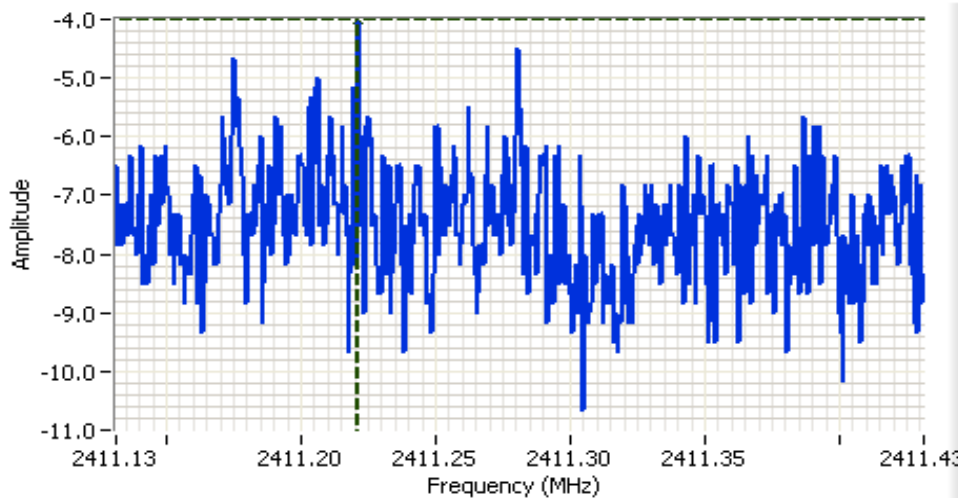
HP8564E
CF: 2411.221 MHz
SPAN: 300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl: 25.00 DBM

Comments

PSD = -4.67 dBm/3kHz
Setting 18dBm
ABC, Chain A

Cursor 1	2411.2214	-4.67	
	0.0000	0.00	

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



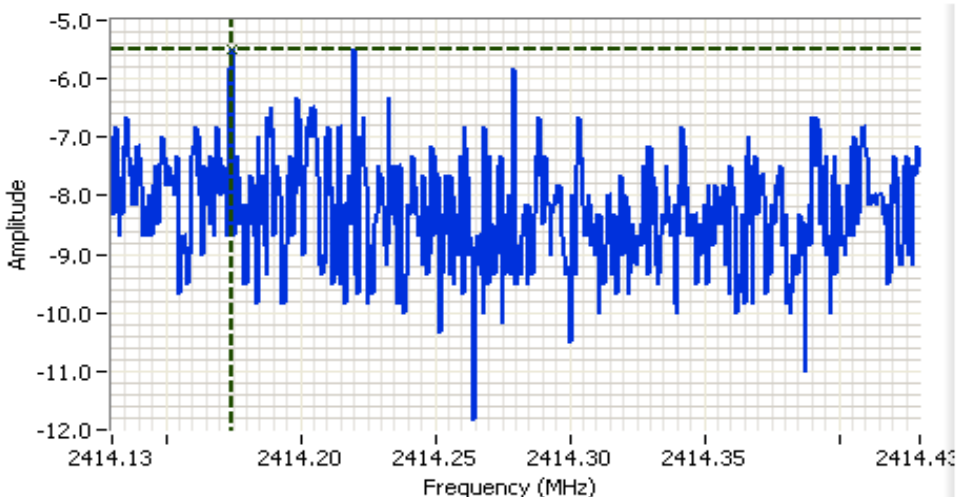
Analyzer Settings

HP8564E
CF: 2411.281 MHz
SPAN:300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl:25.00DBM

Comments

PSD = -4.0 dBm/3kHz
Setting : 18dBm
ABC, Chain B

Cursor 1 2411.2207 -4.00
0.0000 0.00



Analyzer Settings

HP8564E
CF: 2414.280 MHz
SPAN:300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl:25.00DBM

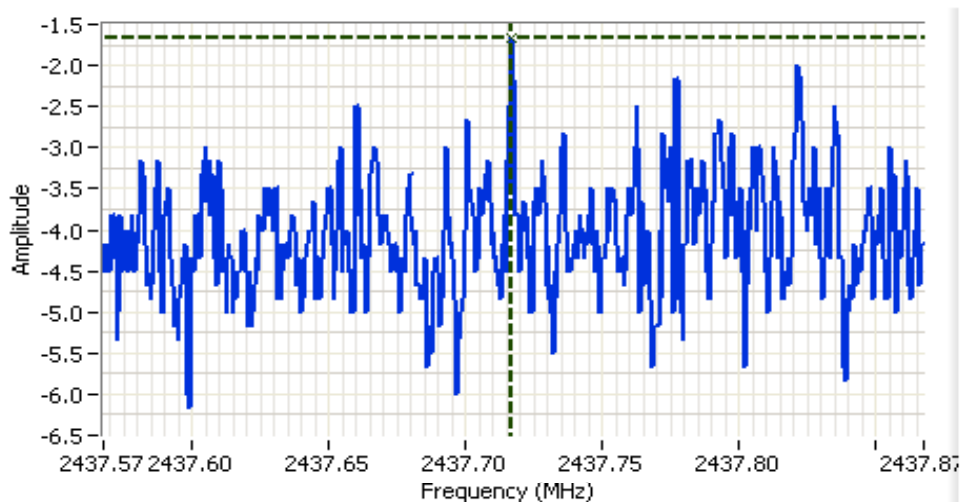
Comments

PSD = -5.50 dBm/3kHz
Setting : 18dBm
ABC, Chain C

Cursor 1 2414.1745 -5.50
0.0000 0.00



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Analyzer Settings

HP8564E
CF: 2437.718 MHz
SPAN:300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl:25.00DBM

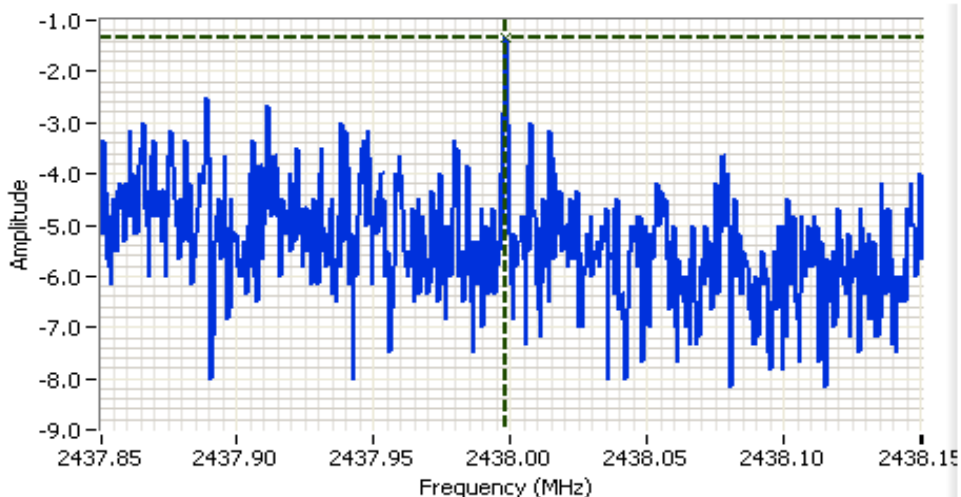
Comments

PSD = -1.67 dBm/3kHz
Setting : 20dBm
2437 MHz,
ABC, Chain A

Cursor 1 2437.7170 -1.67

0.0000

0.00



Analyzer Settings

HP8564E
CF: 2438.001 MHz
SPAN:300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl:25.00DBM

Comments

PSD = -1.33 dBm/3kHz
Setting : 20dBm
2437 MHz,
ABC, Chain B

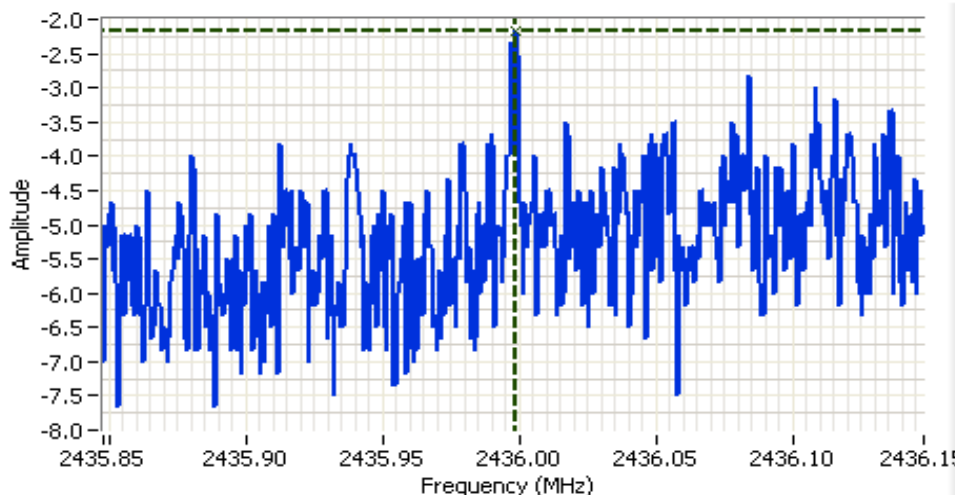
Cursor 1 2437.9987 -1.33

0.0000

0.00



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

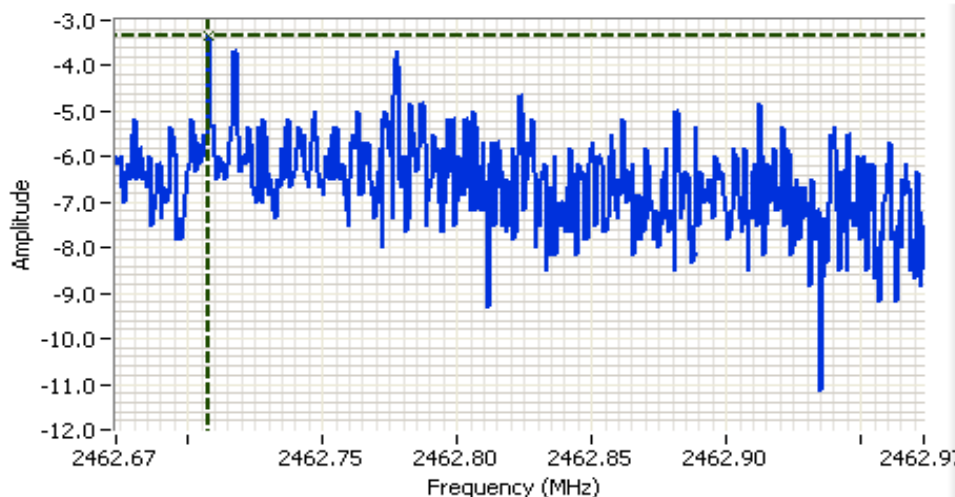
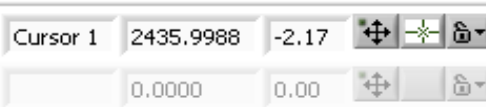


Analyzer Settings

HP8564E
CF: 2435.998 MHz
SPAN:300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl:25.00DBM

Comments

PSD = -2.17 dBm/3kHz
Setting : 20dBm
2437 MHz,
ABC, Chain C

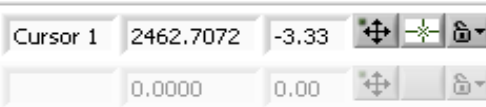


Analyzer Settings

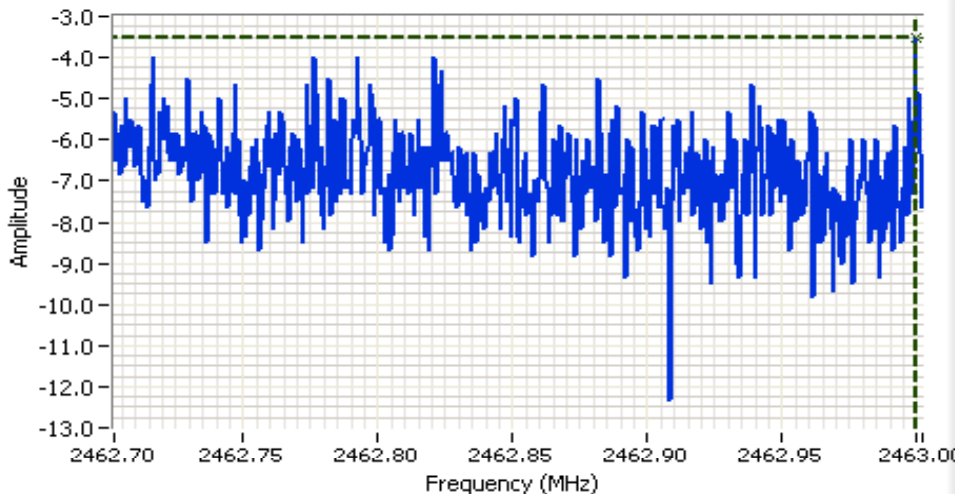
HP8564E
CF: 2462.823 MHz
SPAN:300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl:25.00DBM

Comments

PSD = -3.33 dBm/3kHz
Setting : 19dBm
2462 MHz,
ABC, Chain A



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



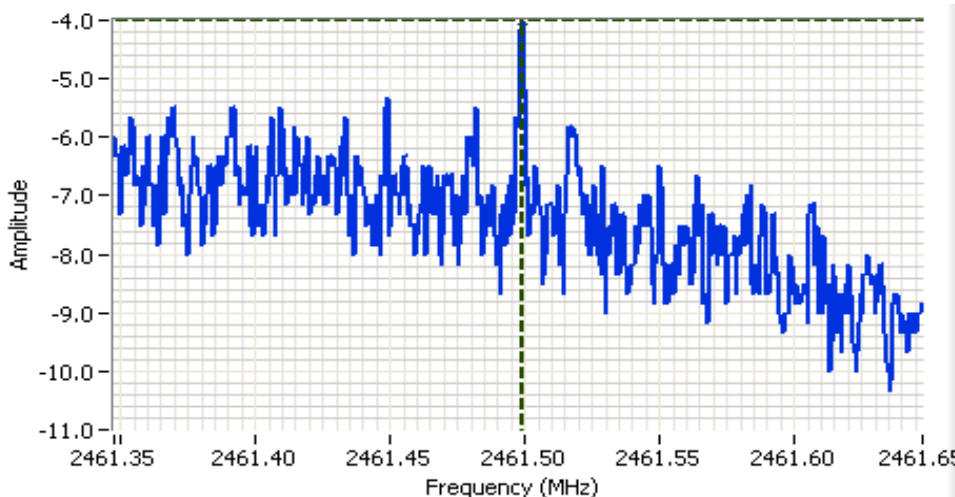
Analyzer Settings

HP8564E
CF: 2462.852 MHz
SPAN:300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl:25.00DBM

Comments

PSD = -3.50 dBm/3kHz
Setting : 19dBm
2462 MHz,
ABC, Chain B

Cursor 1 2462.9996 -3.50
0.0000 0.00



Analyzer Settings

HP8564E
CF: 2461.498 MHz
SPAN:300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 84.0ms
Ref Lvl:25.00DBM

Comments

PSD = -4.0 dBm/3kHz
Setting : 19dBm
2462 MHz,
ABC, Chain C

Cursor 1 2461.4991 -4.00
0.0000 0.00



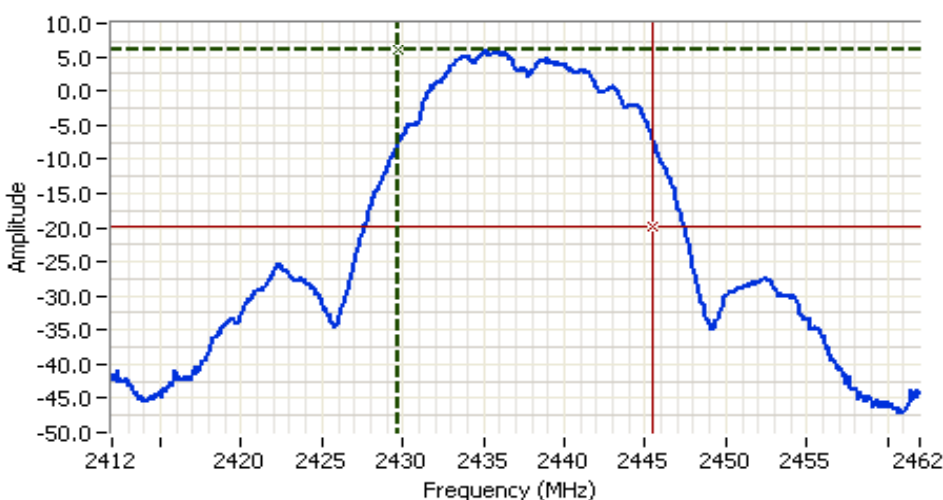
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz)	
			6dB	99%
18.0	2412 802.11b	100kHz	11.6	15.7
20.0	2437 802.11b	100kHz	9.6	15.8
19.0	2462 802.11b	100kHz	10.4	15.6
17.0	2412 802.11g	100kHz	15.8	18.8
20.0	2437 802.11g	100kHz	15.9	23.4
17.0	2462 802.11g	100kHz	15.3	18.9

Note 1: Measured with all chains connected together through a combiner, unused ports on the combiner terminated in 50ohms.

Note 2: 99% bandwidth measured in accordance with RSS GEN, with RB > 1% of the span and VB > 3xRB





Analyzer Settings

HP8564E
CF: 2437.000 MHz
SPAN: 50.000 MHz
RB 1.000 MHz
VB 3.000 MHz
Detector POS
Att 20
RL Offset 0.00
Sweep Time 100.0ms
Ref Lvl: 7.80DBM

Comments

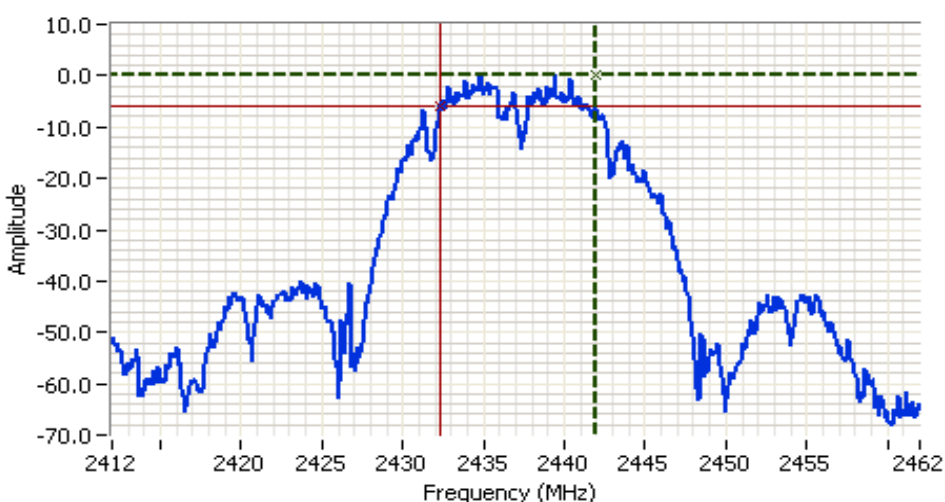
99% BW: 15.8 MHz
802.11b MIMO
chains A+B+C

Cursor 1	2429.7205	6.13	
Cursor 2	2445.5275	-19.87	

Delta Freq. 15.807

Delta Amplitude 26.00

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Analyzer Settings

HP8564E
CF: 2437.000 MHz
SPAN: 50.000 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 20
RL Offset 0.00
Sweep Time 100.0ms
Ref Lvl: 7.80DBM

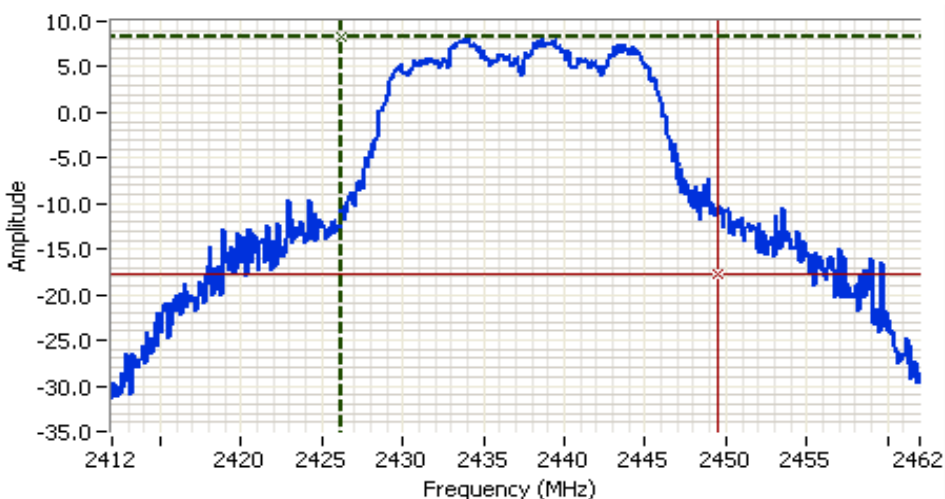
Comments

6dB BW: 9.583 MHz
802.11b MIMO
chains A+B+C

Cursor 1 2441.9167 0.13
Cursor 2 2432.3333 -5.87

Delta Freq. 9.583

Delta Amplitude 6.00



Analyzer Settings

HP8564E
CF: 2437.000 MHz
SPAN: 50.000 MHz
RB 1.000 MHz
VB 3.000 MHz
Detector POS
Att 20
RL Offset 0.00
Sweep Time 100.0ms
Ref Lvl: 7.80DBM

Comments

99% BW: 23.4 MHz
802.11g MIMO
chains A+B+C

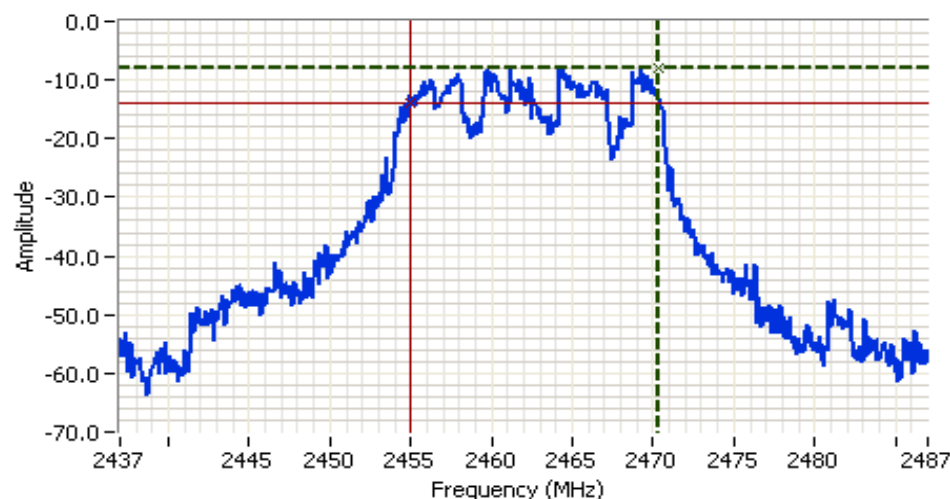
Cursor 1 2426.1431 8.30
Cursor 2 2449.5208 -17.70

Delta Freq. 23.378

Delta Amplitude 26.00



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Analyzer Settings

HP8564E
CF: 2462.000 MHz
SPAN:50.000 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 20
RL Offset 0.00
Sweep Time 100.0ms
Ref Lvl:7.80DBM

Comments

6dB BW: 15.333 MHz
802.11g MIMO
chains A+B+C

Cursor 1	2470.3333	-7.87	+	-	↔
Cursor 2	2455.0000	-13.87	+	-	↔

Delta Freq. 15.333
Delta Amplitude 6.00



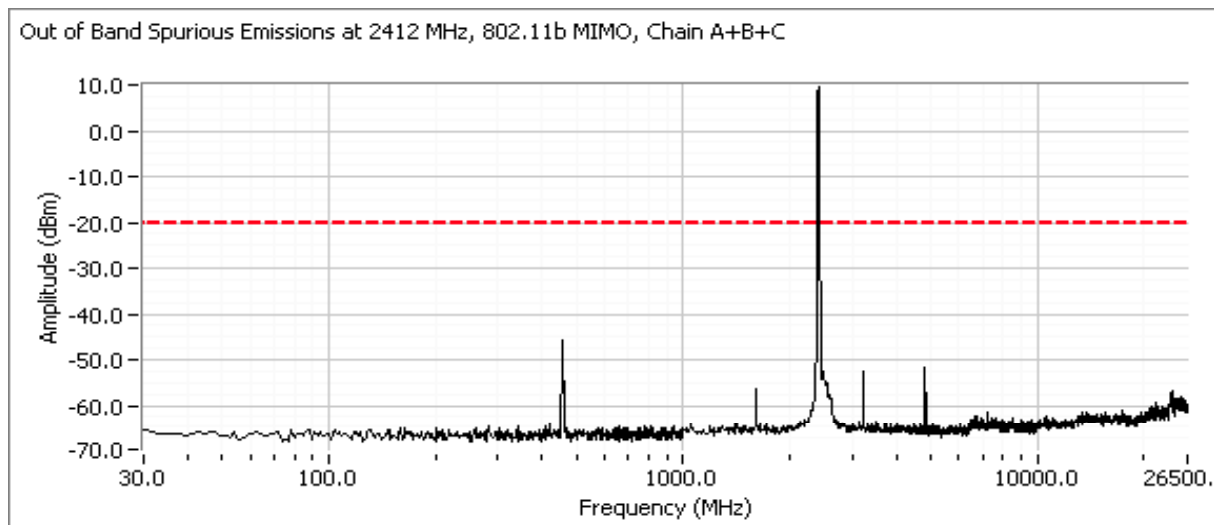
Run #4: Out of Band Spurious Emissions

Power Setting Per Chain				Frequency (MHz)	Limit	Result
#1	#2	#3	#4			
20.0	20.0	20.0		2412 802.11b	-30dBc	Pass
20.0	20.0	20.0		2437 802.11b	-30dBc	Pass
20.0	20.0	20.0		2462 802.11b	-30dBc	Pass
20.0	20.0	20.0		2412 802.11g	-30dBc	Pass
20.0	20.0	20.0		2437 802.11g	-30dBc	Pass
20.0	20.0	20.0		2462 802.11g	-30dBc	Pass

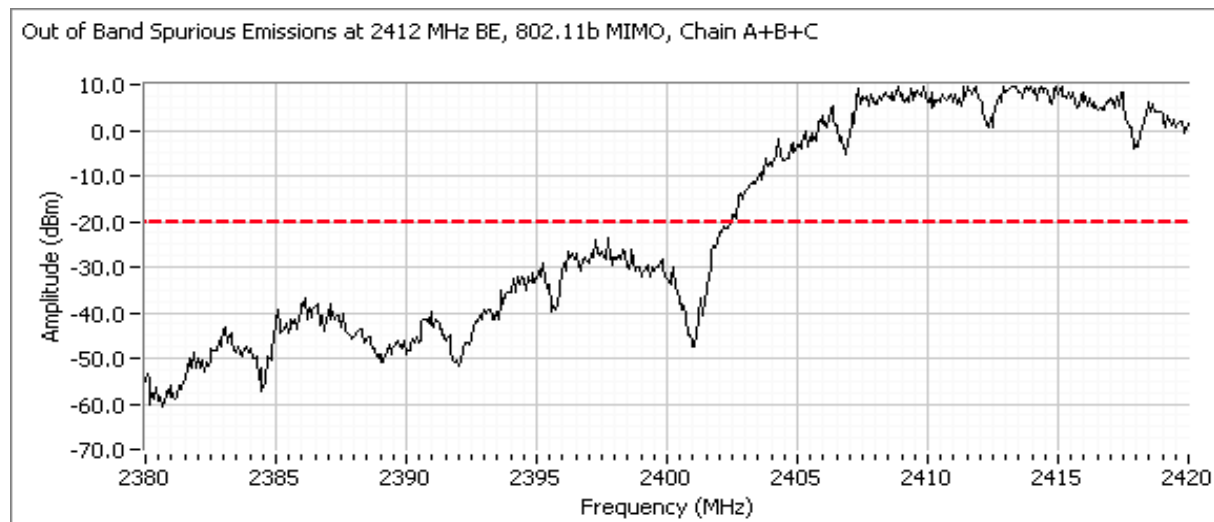
- Note 1: Measured with all chains connected together through a combiner, unused ports on the combiner terminated in 50ohms for the frequency range 30 - 18000 MHz. Outside this frequency range measurements made on each channel individually.
- Note 2: Measured using RB>=100kHz, VB>= RB
- Note 3: All measurements made at power setting of 20 on all three channels.

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Plots for low channel - 802.11b - , power setting(s) = 20

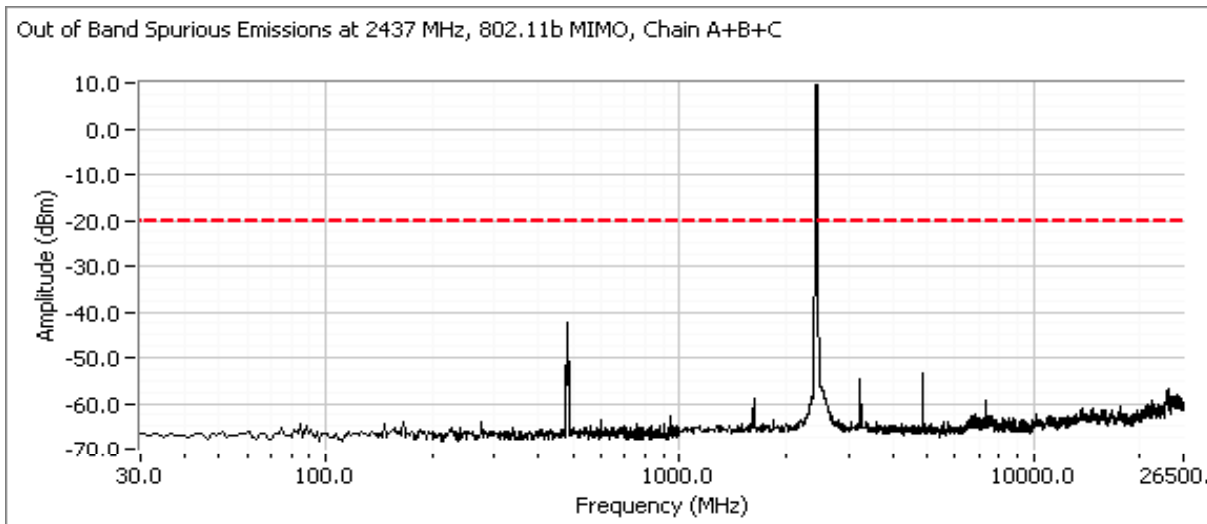


include a plot from 2380 - 2420 MHz showing -30dBc at 2400 MHz

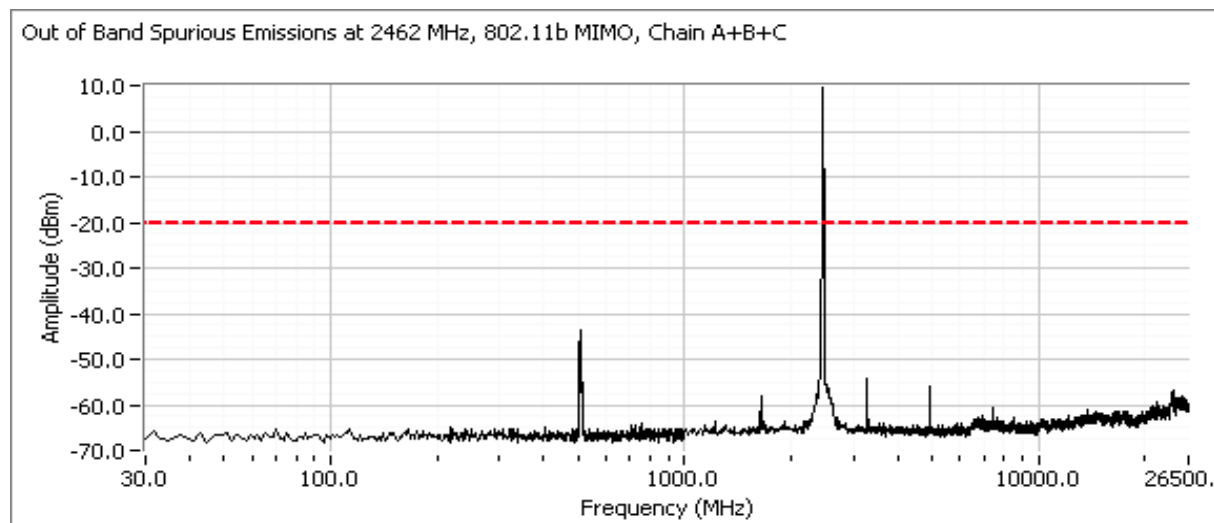


Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Plots for center channel - 802.11b - , power setting(s) = 20.0



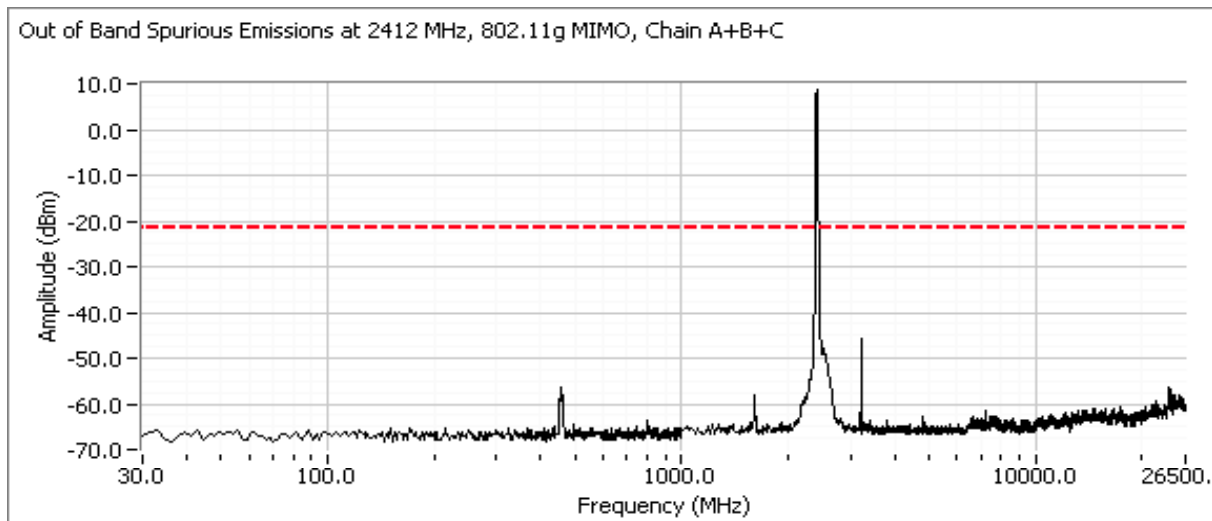
Plots for high channel - 802.11b - , power setting(s) = 20.0



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

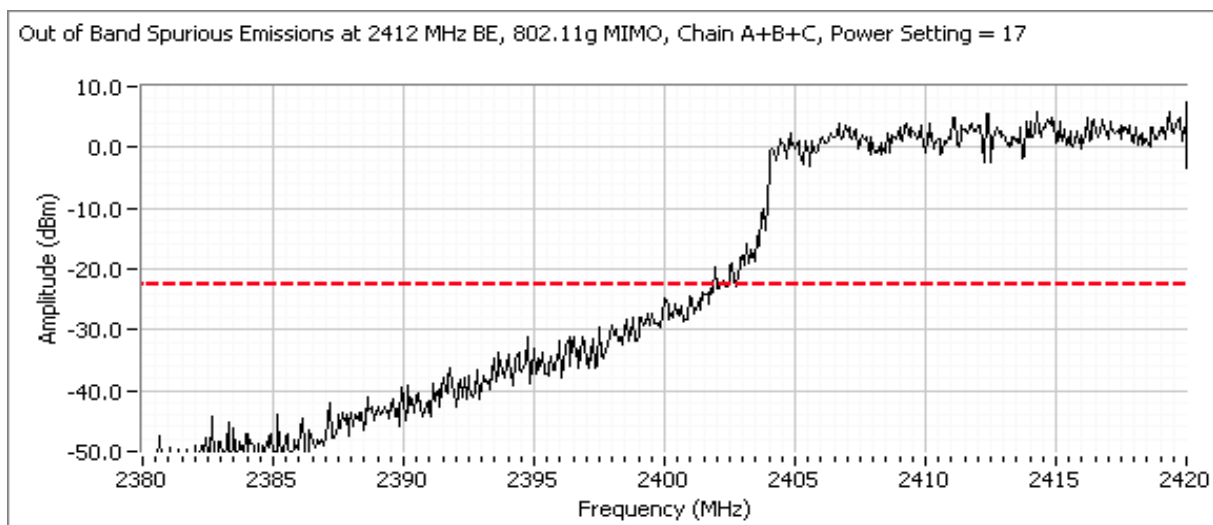
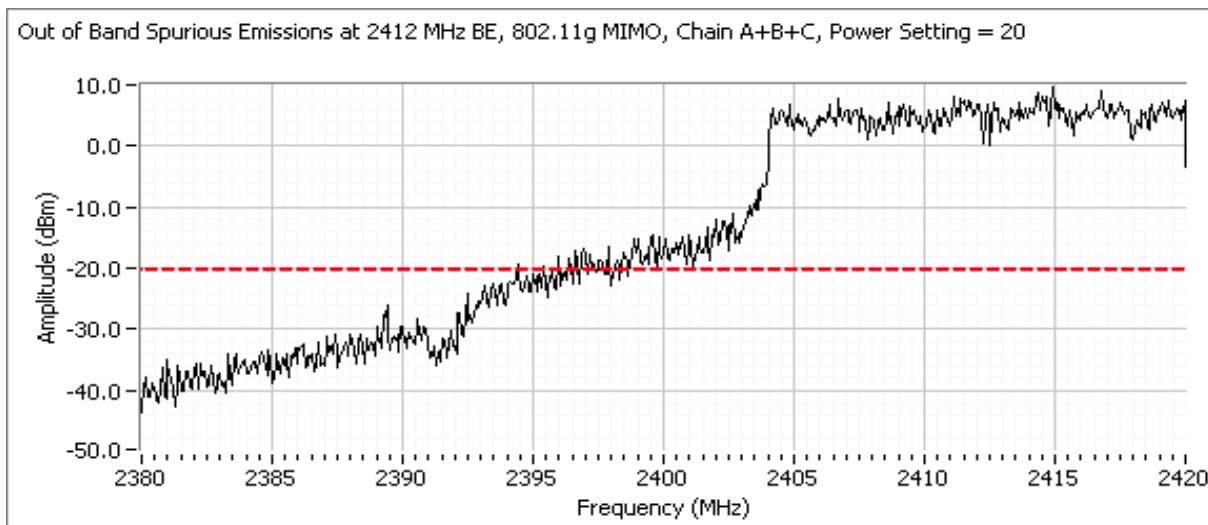
Plots for low channel - 802.11g -, power setting(s) = 20

Out of Band Spurious Emissions at 2412 MHz, 802.11g MIMO, Chain A+B+C



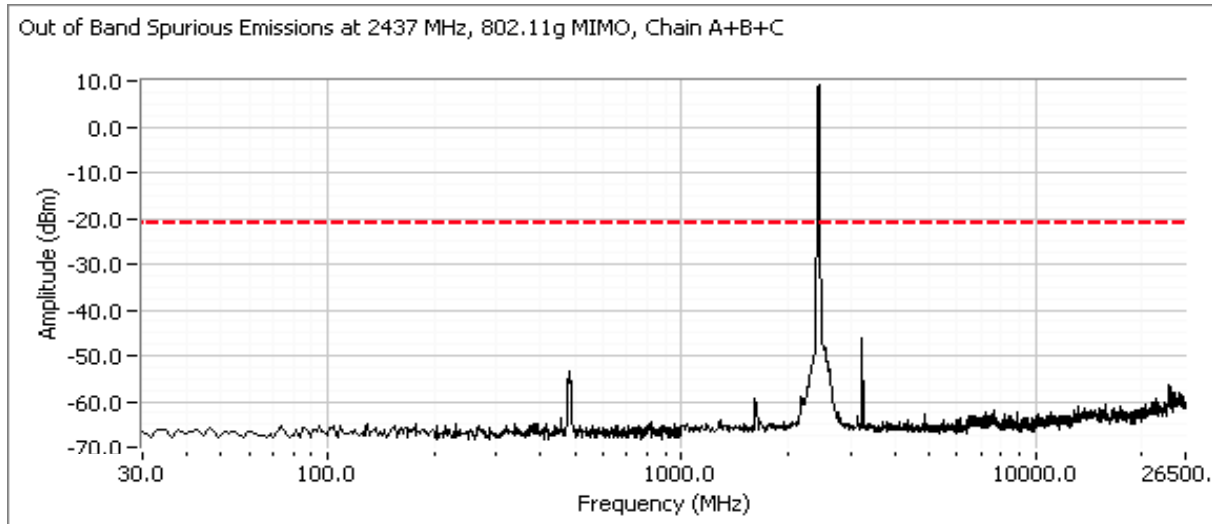
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

include a plot from 2380 - 2420 MHz showing -30dBc at 2400 MHz

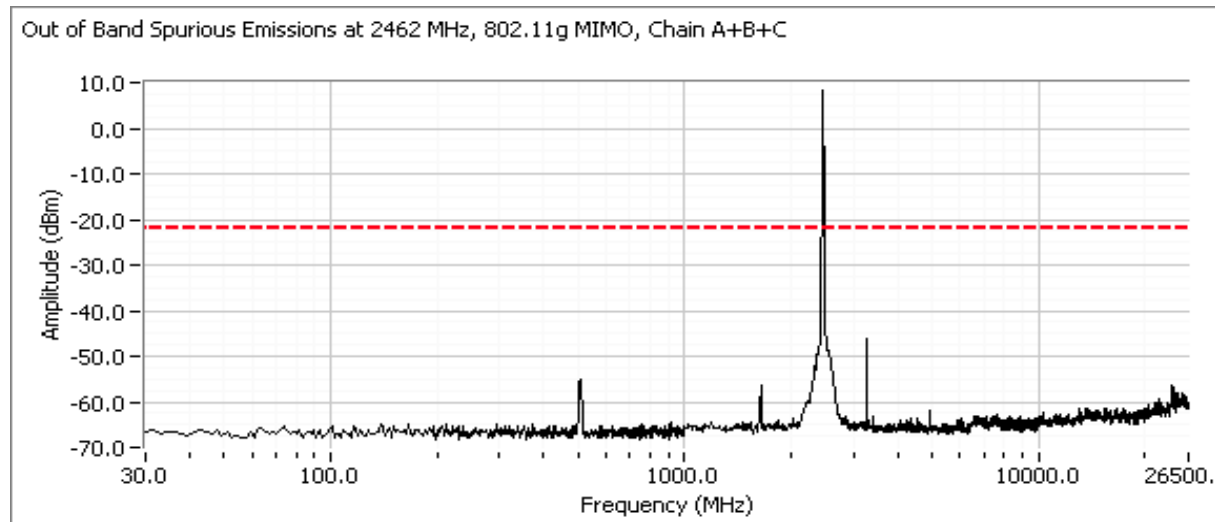


Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Plots for center channel - 802.11g - , power setting(s) = 20.0



Plots for high channel - 802.11g - , power setting(s) = 20.0



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73386
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

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

Test Specific Details

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

Date of Test: 11/12/2008
Test Engineer: Rafael Varelas
Test Location: SVOATS #1

Config. Used: -
Config Change: -
EUT Voltage: POE

General Test Configuration

The EUT was connected to the spectrum analyzer or power meter via a suitable attenuator.

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

Ambient Conditions:
Temperature: 13 °C
Rel. Humidity: 100 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power Chain A+B+C	15.247(b)	Pass	802.11n20: 24.2 dBm 802.11n40: 24.5 dBm
2	PSD Chain A+B+C	15.247(d)	Pass	n20: 6.3 dBm/3kHz n40: 5.8 dBm/3kHz
3	Minimum 6dB Bandwidth	15.247(a)	Pass	802.11n20: 16.83 MHz 802.11n40: 34.82 MHz
3	99% Bandwidth	RSS GEN	Pass	802.11n20: 17.8 MHz 802.11n40: 37.1 MHz
4	Spurious emissions	15.247(b)	Pass	All signals were more than 30dB below the fundamental

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73386
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

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

Transmitted signal on chain is coherent ? No

Highest antenna gain for MIMO mode is the internal antenna gain of 1dBi (external antenna does not support MIMO modes).

Single radio Operating in the Band

2412 MHz - 802.11n20	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	17.0	17.0	17.0					
Output Power (dBm) ^{Note 1}	16.64	15.56	16.73		21.1 dBm	0.129 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	1.0	1.0	1.0			1.0 dBi	Pass	
eirp (dBm) ^{Note 2}	17.64	16.56	17.73		22.1 dBm	0.163 W		
2437 MHz - 802.11n20	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	20.0	20.0	20.0					
Output Power (dBm) ^{Note 1}	19.89	18.98	19.33		24.2 dBm	0.262 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	1.0	1.0	1.0			1.0 dBi	Pass	
eirp (dBm) ^{Note 2}	20.89	19.98	20.33		25.2 dBm	0.330 W		
2462 MHz - 802.11n20	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	17.0	17.0	17.0					
Output Power (dBm) ^{Note 1}	16.46	15.49	15.67		20.7 dBm	0.117 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	1.0	1.0	1.0			1.0 dBi	Pass	
eirp (dBm) ^{Note 2}	17.46	16.49	16.67		21.7 dBm	0.147 W		
2422 MHz - 802.11n40	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	15.0	15.0	15.0					
Output Power (dBm) ^{Note 1}	14.04	13.6	14.36		18.8 dBm	0.076 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	1.0	1.0	1.0			1.0 dBi	Pass	
eirp (dBm) ^{Note 2}	15.04	14.6	15.36		19.8 dBm	0.095 W		
2437 MHz - 802.11n40	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	20.0	20.0	20.0					
Output Power (dBm) ^{Note 1}	20.08	19.64	19.34		24.5 dBm	0.280 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	1.0	1.0	1.0			1.0 dBi	Pass	
eirp (dBm) ^{Note 2}	21.08	20.64	20.34		25.5 dBm	0.352 W		
2452 MHz - 802.11n40	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	14.0	14.0	14.0					
Output Power (dBm) ^{Note 1}	13.22	12.62	12.79		17.7 dBm	0.058 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	1.0	1.0	1.0			1.0 dBi	Pass	
eirp (dBm) ^{Note 2}	14.22	13.62	13.79		18.7 dBm	0.073 W		

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73386
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Three radios on non-overlapping channels, note 3

802.11n20	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	20.0	20.0	20.0					
Output Power (dBm) ^{Note 1}	19.89	18.98	19.33		29.0 dBm	0.787 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	1.0	1.0	1.0			-3.8 dBi	Pass	
eirp (dBm) ^{Note 2}	20.9	20.0	20.3		25.2 dBm	0.330 W		

Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz for 802.11n 20MHz and 80 MHz for 802.11n 40 MHz (reference method 1 of FCC DA 02-2138 for U-NII devices, August 30, 2002). Spurious limit becomes -30dBc.
Note 2:	As there is no coherency between chains the total EIRP is the sum of the individual EIRPs and effective antenna gain equals the eirp divide by the sum of the power on each chain.
Note 3:	The device has multiple radios, but the software limits operation in any band to ensure only non-overlapping channels are used (no two radios can operate on the same channel or on overlapping channels). In the 2412 - 2462 MHz band there can be a maximum of 3 radios active with all 3 using 20MHz channels (in 40MHz mode there can be only one 40MHz and one 20MHz channel used). The calculated total power (obtained by multiplying the output power on a single radio by the number of radios that can be operating in the band) demonstrates that the total output power still complies with the limit. The total power with one radio operating on a 20MHz channel and one on a 40MHz channel is lower than the power with three radios operating on 20MHz channels and is, therefore, not calculated.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73386
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) ^{Note 1}				Total	Limit dBm/3kHz	Result
		Chain 1	Chain 2	Chain 3	Chain 4			
17.0	2412 802.11n20	-6.8	0.2	-7.7		1.5	8.0	Pass
20.0	2437 802.11n20	2.2	-2.0	3.0		6.3	8.0	Pass
17.0	2462 802.11n20	-1.5	-5.2	-2.0		2.2	8.0	Pass
15.0	2422 802.11n40	-2.0	-3.7	-3.5		1.8	8.0	Pass
20.0	2437 802.11n40	-3.0	4.7	-4.3		5.8	8.0	Pass
14.0	2452 802.11n40	-5.7	-9.0	-12.5		-3.4	8.0	Pass

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

Note 2: The operation of multiple radios in the band does not affect power spectral density as radios cannot operate on overlapping channels.

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz)	
			6dB	99%
17.0	2412 802.11n20	100kHz	17.58	18.7
20.0	2437 802.11n20	100kHz	17.75	17.8
17.0	2462 802.11n20	100kHz	16.83	18.6
15.0	2422 802.11n40	100kHz	34.2	37.2
20.0	2437 802.11n40	100kHz	36.8	37.6
14.0	2452 802.11n40	100kHz	36.6	37.1

Note 1: Measured with all chains connected together through a combiner, unused ports on the combiner terminated in 50ohms.

Note 2: 99% bandwidth measured in accordance with RSS GEN, with RB > 1% of the span and VB > 3xRB

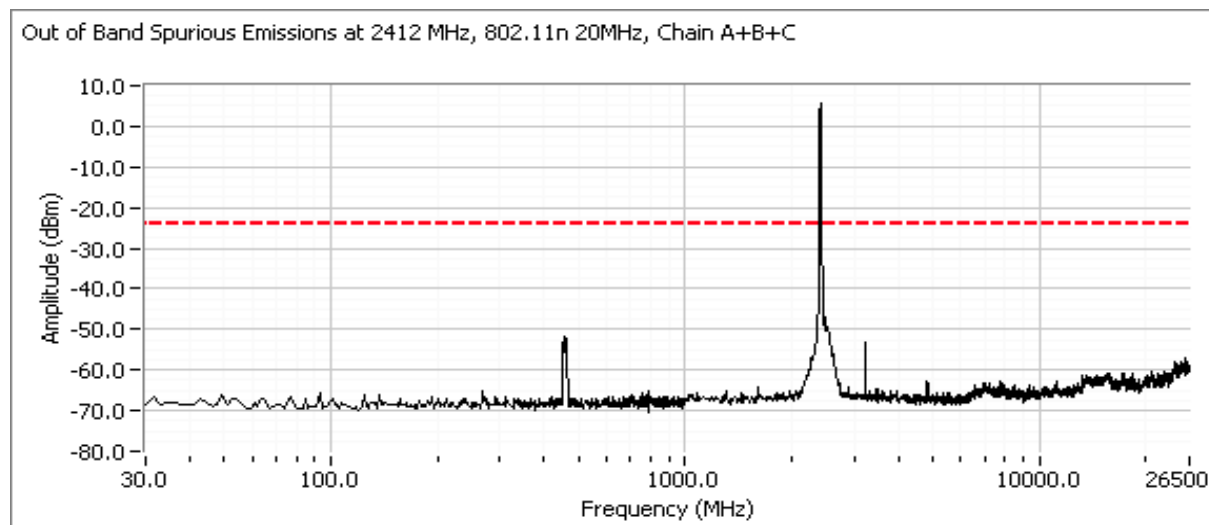
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #4: Out of Band Spurious Emissions

Power Setting Per Chain				Frequency (MHz)	Limit	Result
#1	#2	#3	#4			
17.0	17.0	17.0		2412 802.11n20	-30dBc	Pass
20.0	20.0	20.0		2437 802.11n20	-30dBc	Pass
17.0	17.0	17.0		2462 802.11n20	-30dBc	Pass
15.0	15.0	15.0		2422 802.11n40	-30dBc	Pass
20.0	20.0	20.0		2437 802.11n40	-30dBc	Pass
14.0	14.0	14.0		2452 802.11n40	-30dBc	Pass

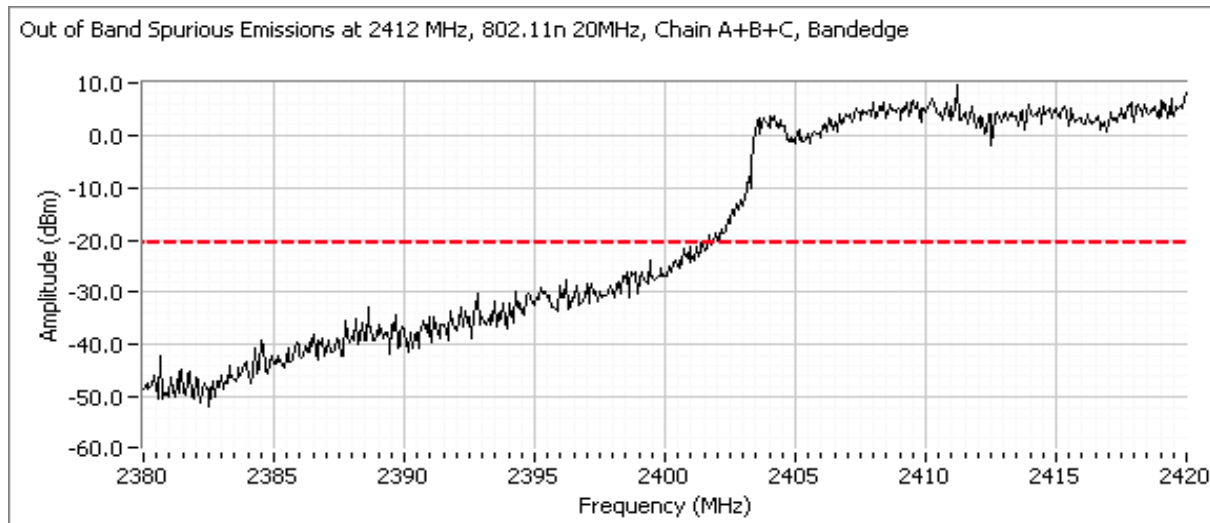
Note 1:	Measured with all chains connected together through a combiner, unused ports on the combiner terminated in 50ohms for the frequency range 30 - 26500 MHz. Outside this frequency range measurements made on each channel individually.
Note 2:	Measured using RB>=100kHz, VB>= RB

Plots for low channel - 802.11n (20MHz) - , power setting(s) = 17.0

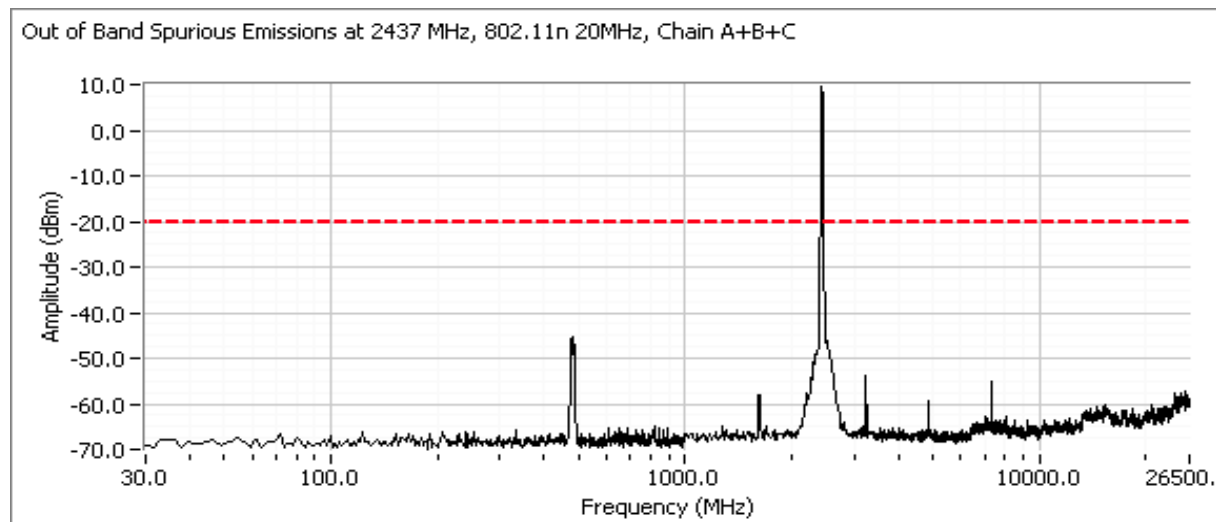


Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

include a plot from 2380 - 2420 MHz showing -30dBc at 2400 MHz

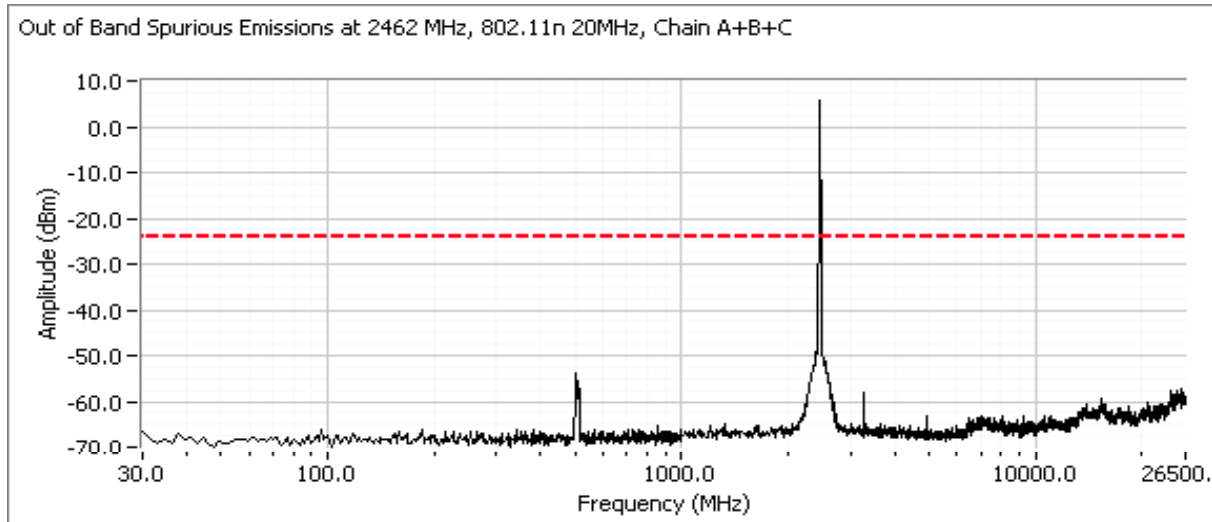


Plots for center channel - 802.11n (20MHz) - , power setting(s) = 20.0

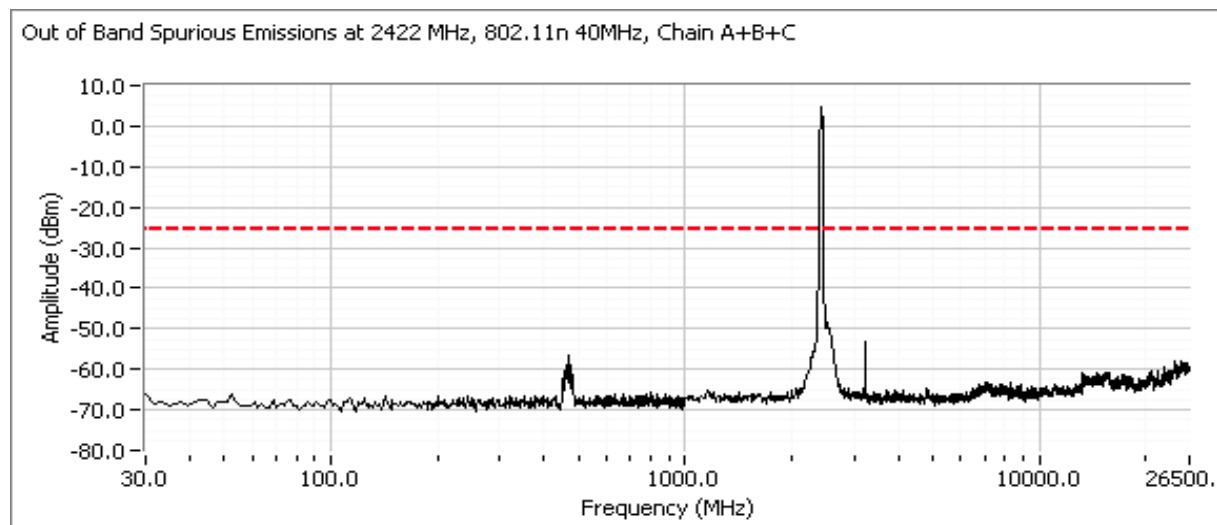


Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Plots for high channel - 802.11n (20MHz) - , power setting(s) = 17.0

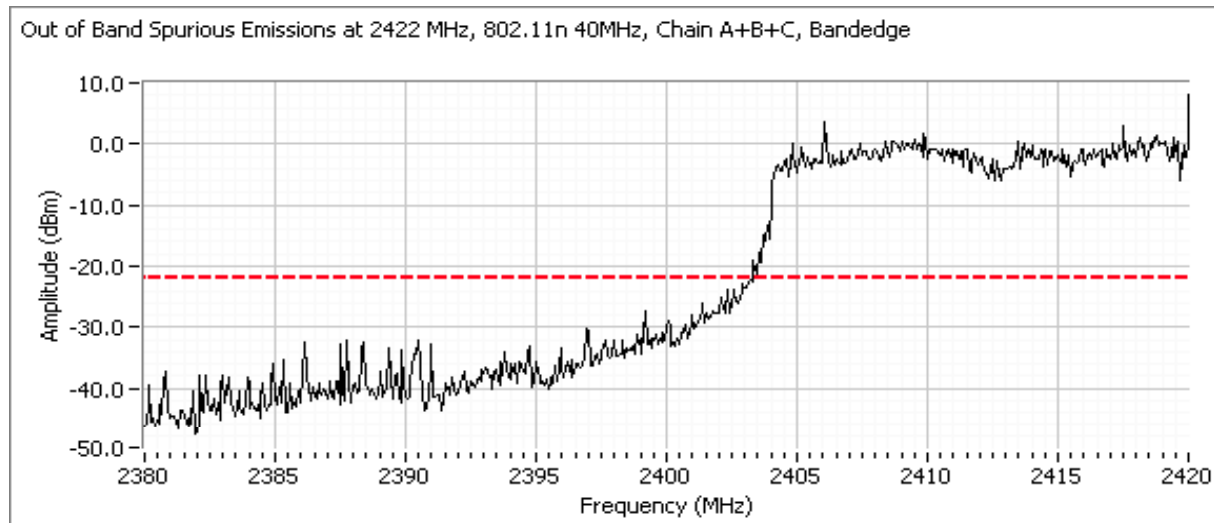


Plots for low channel - 802.11n (40MHz) - , power setting(s) = 15

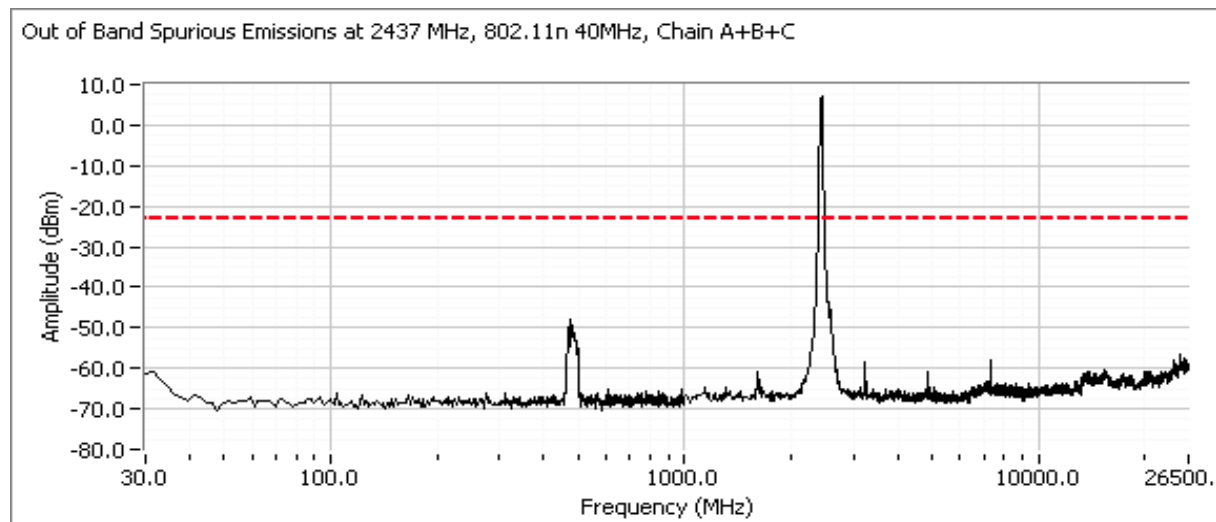


Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

include a plot from 2380 - 2420 MHz showing -30dBc at 2400 MHz

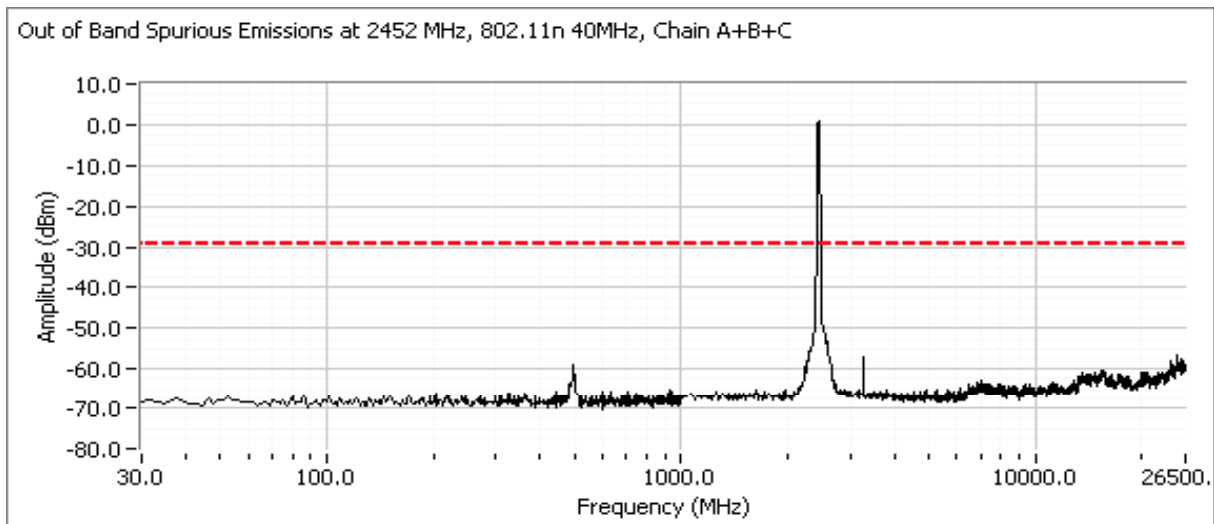


Plots for center channel - 802.11n (40MHz) - , power setting(s) = 20.0



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73386
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Plots for high channel - 802.11n (40MHz) - , power setting(s) = 14.0



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73386
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

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

Test Specific Details

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

Date of Test: 11/6 and 11/2008
Test Engineer: R. Varelas and M. Birgani
Test Location: SV OATS #2

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

General Test Configuration

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

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

Ambient Conditions:

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

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power	15.247(b)	Pass	Single Radio: 15.4 dBm 4x Radios: 21.4dBm (0.138W)
2	PSD	15.247(d)	Pass	802.11a: -5.5 dBm/3kHz
3	Minimum 6dB Bandwidth	15.247(a)	Pass	802.11a: 16.3 MHz
3	Maximum 99% Bandwidth	RSS GEN	-	802.11a: 17.4 MHz
4	Spurious emissions	15.247(b)	Pass	All signal were more than 30dB below the fundamental

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #1: Output Power

Highest antenna gain for the internal antenna is 3dBi (external antenna, 2.5dBi gain, does not support MIMO modes).

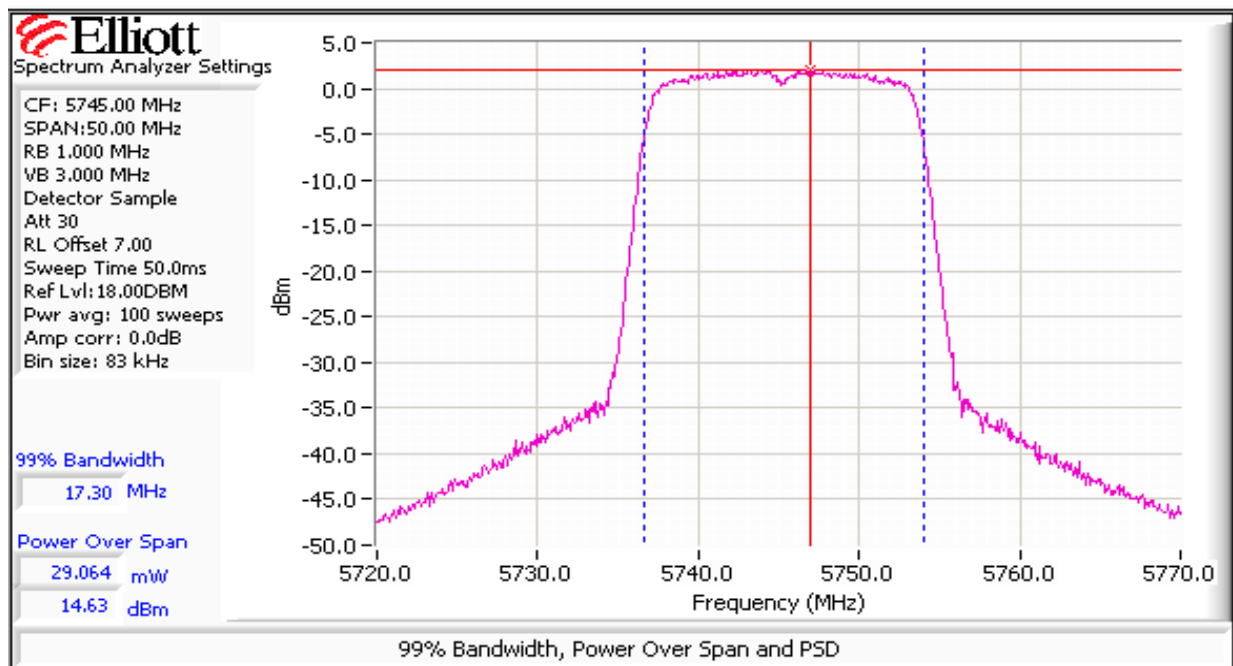
802.11a - Single Radio In the Band

Power Setting ²	Frequency (MHz)	Output Power		Antenna Gain (dBi)	Result	EIRP ^{Note 2}	
		(dBm) ¹	mW			dBm	W
17	5745	14.6	29.0	3.0	Pass	17.6	0.058
17	5785	15.1	32.4	3.0	Pass	18.1	0.065
17	5825	15.4	34.7	3.0	Pass	18.4	0.069

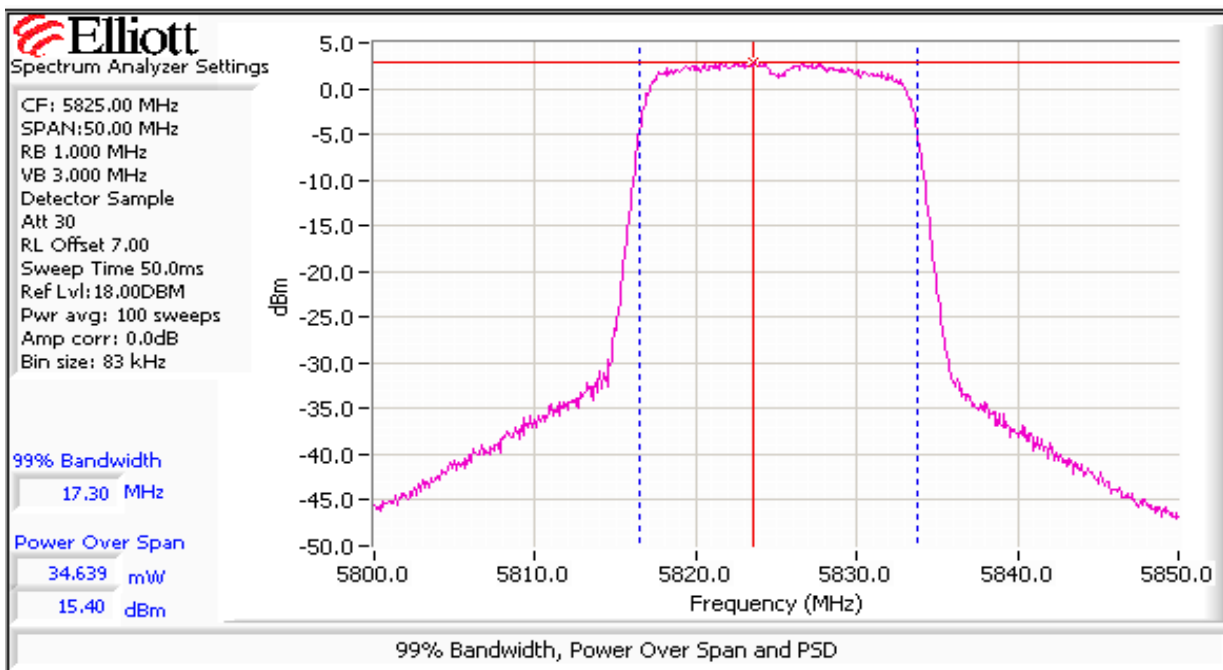
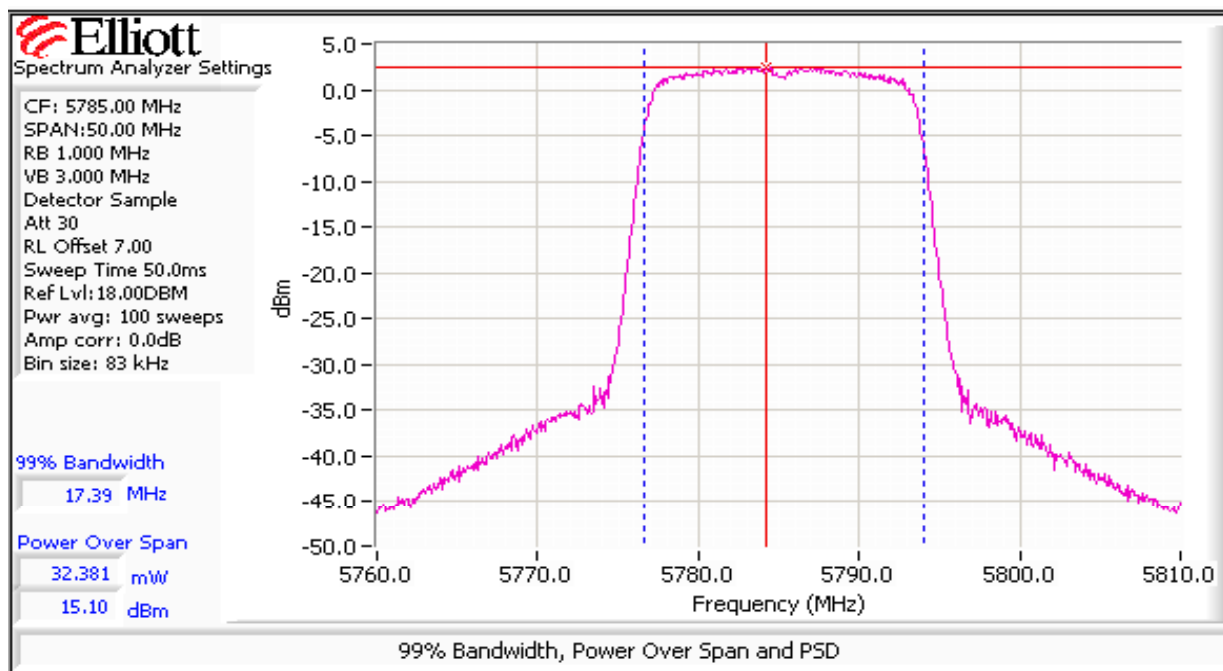
802.11a - Four radios on non-overlapping channels, note 3

Power Setting ²	Frequency (MHz)	Output Power per radio		Total Power		Antenna Gain (dBi)	Result	EIRP ^{Note 2}	
		(dBm) ¹	mW	dBm	mW			dBm	W
17	-	15.4	34.7	21.4	138.7	3.0	Pass	24.4	0.277

Note 1:	Output power measured using a spectrum analyzer (see plots below): RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz. Spurious limit is -30dBc because this method was used. The output power limit is 30dBm.
Note 2:	Power setting - the software power setting used during testing, included for reference only.
Note 3:	The device has multiple radios, but the software limits operation in any band to ensure only non-overlapping channels are used (no two radios can operate on the same channel or on overlapping channels). In the 5745 - 5785 MHz band there can be a maximum of 4 radios active (5, non-overlapping 802.11a channels, 4 radaios that can operate in the band). The calculated total power (obtained by mutliplying the output power on a single radio by the number of radios that can be operating in the band) demonstrates that, with 4 radios active, the total output power still complies with the limit.



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

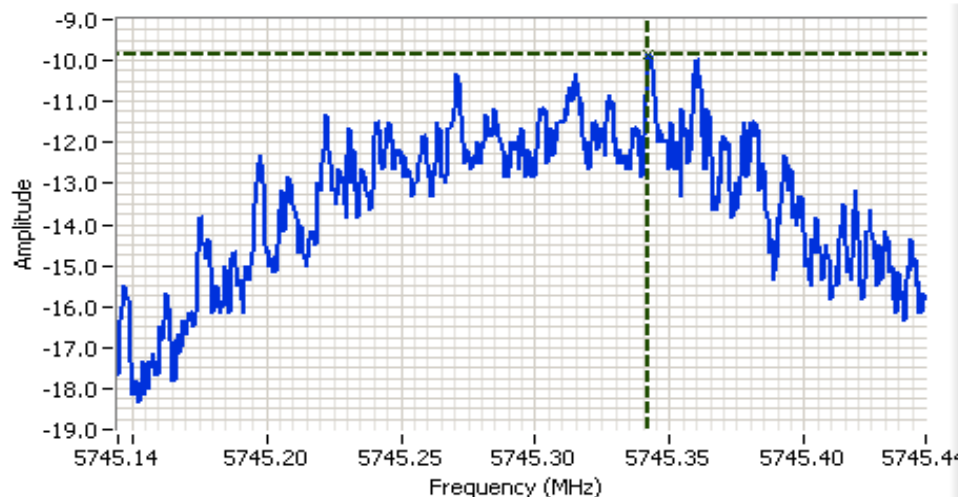


Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A







Run #2: Power spectral Density 802.11a

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) ^{Note 1}	Limit dBm/3kHz	Result
17	5745	-9.8	8.0	Pass
17	5785	-5.5	8.0	Pass
17	5825	-8.8	8.0	Pass

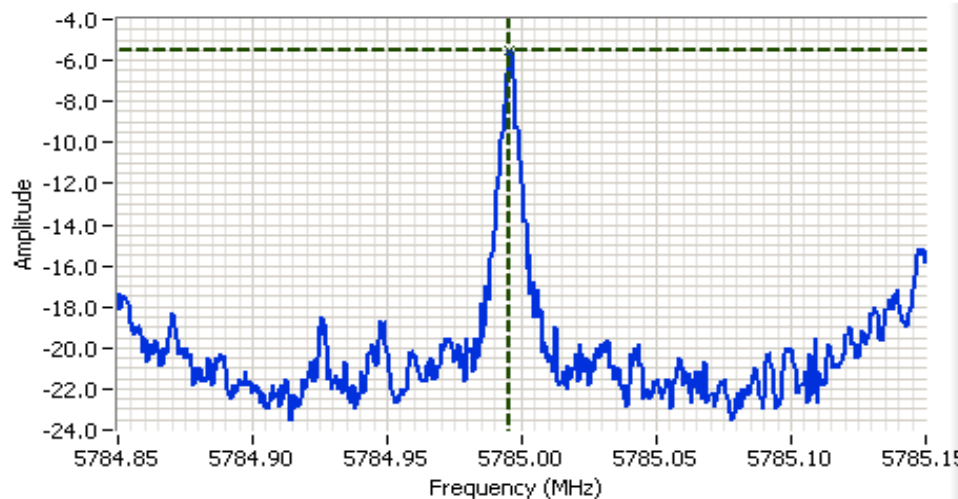
Note 1:	Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from preliminary scans using RB=3kHz using multiple sweeps at a faster rate over the 6dB bandwidth of the signal.
Note 2:	The operation of multiple radios in the band does not affect power spectral density as radios cannot operate on overlapping channels.



Analyzer Settings
HP8564E
CF: 5745.295 MHz
SPAN: 300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector Sample
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl: 18.00dBm
Comments
PSD = -9.83 dBm/3kHz
Setting: 17.0dBm

Cursor 1	5745.3419	-9.83			
	0.0000	0.00			

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

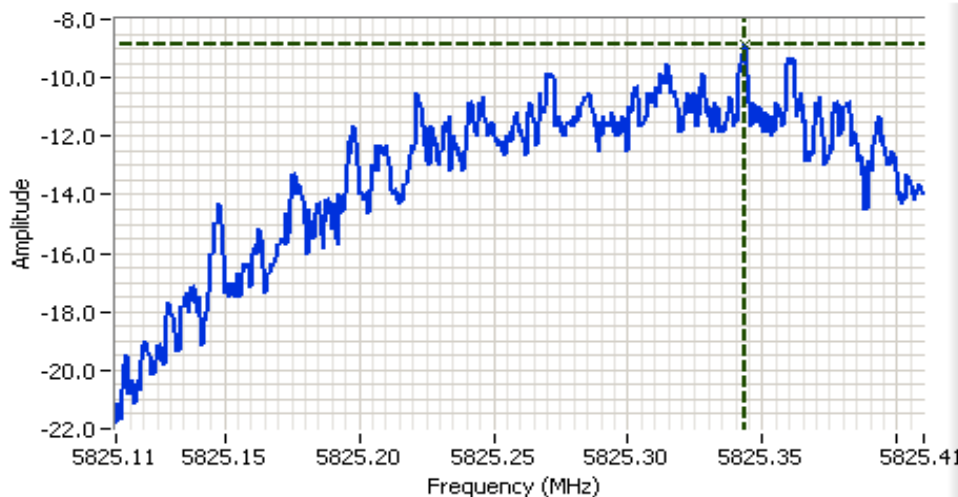
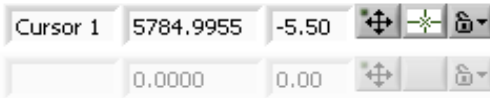


Analyzer Settings

HP8564E
CF: 5785.000 MHz
SPAN:300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector Sample
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl:18.00dBm

Comments

PSD = -5.50 dBm/3kHz
Setting: 17.0dBm

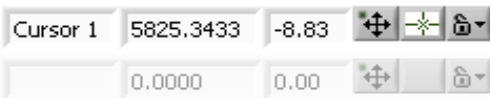


Analyzer Settings

HP8564E
CF: 5825.260 MHz
SPAN:300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector Sample
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl:18.00dBm

Comments

PSD = -8.83 dBm/3kHz
Setting: 17.0dBm

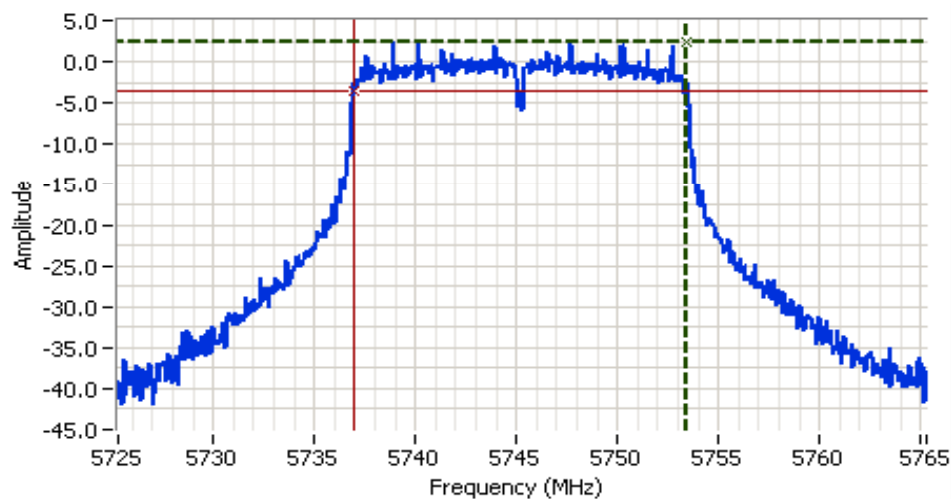


Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #3: Signal Bandwidth

Mode	Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz)	
				6dB	99%
802.11a	17	5745	100k	16.4	17.3
802.11a	17	5785	100k	16.4	17.4
802.11a	17	5825	100k	16.3	17.3

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




Analyzer Settings

HP8564E
CF: 5745.295 MHz
SPAN: 40.000 MHz
RB 100 kHz
VB 100 kHz
Detector Sample
Att 30
RL Offset 7.00
Sweep Time 50.0ms
Ref Lvl: 18.00DBM

Comments

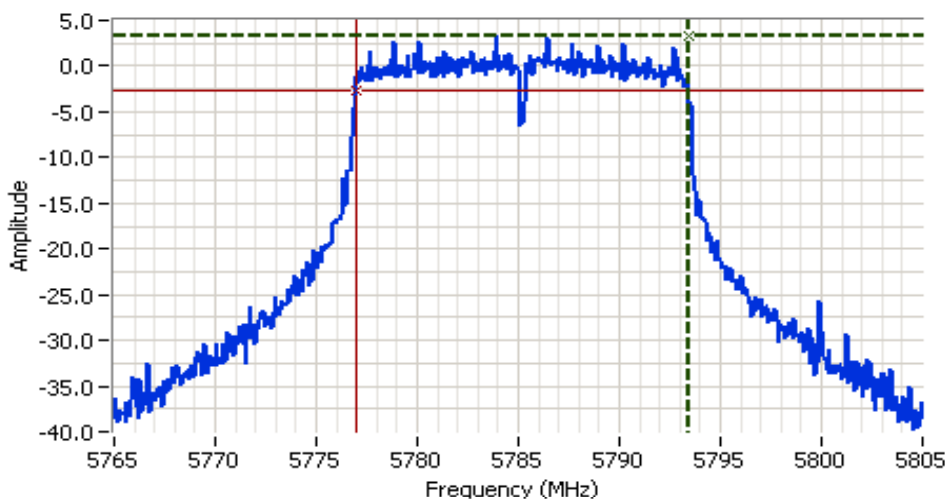
6dB BW: 16.467 MHz
Setting: 17.0dBm

Cursor 1	5753.4283	2.50			
Cursor 2	5736.9616	-3.50			

Delta Freq. 16.467

Delta Amplitude 6.00

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Analyzer Settings

HP8564E
CF: 5785.000 MHz
SPAN:40.000 MHz
RB 100 kHz
VB 100 kHz
Detector Sample
Att 30
RL Offset 7.00
Sweep Time 50.0ms
Ref Lvl:18.00dBm

Comments

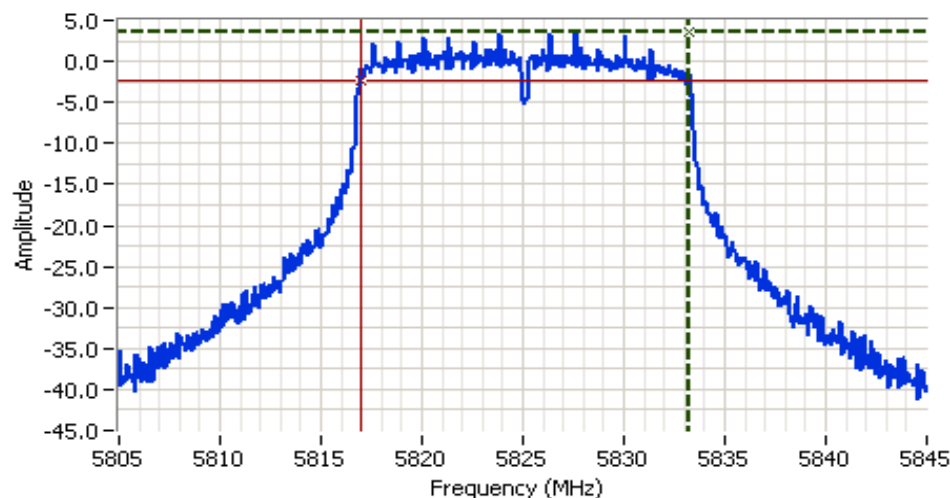
6dB BW: 16.400 MHz
Setting: 17.0dBm

Cursor 1 5793.4000 3.33

Cursor 2 5777.0000 -2.67

Delta Freq. 16.400

Delta Amplitude 6.00



Analyzer Settings

HP8564E
CF: 5825.000 MHz
SPAN:40.000 MHz
RB 100 kHz
VB 100 kHz
Detector Sample
Att 30
RL Offset 7.00
Sweep Time 50.0ms
Ref Lvl:18.00dBm

Comments

6dB BW: 16.333 MHz
Setting: 17.0dBm

Cursor 1 5833.2667 3.67

Cursor 2 5816.9333 -2.33

Delta Freq. 16.333

Delta Amplitude 6.00



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

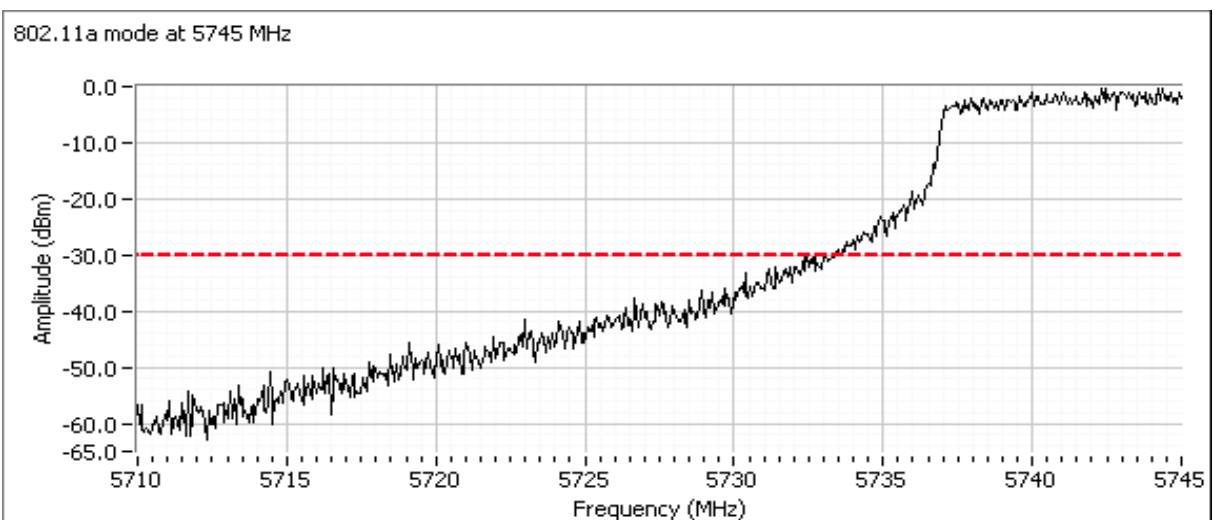
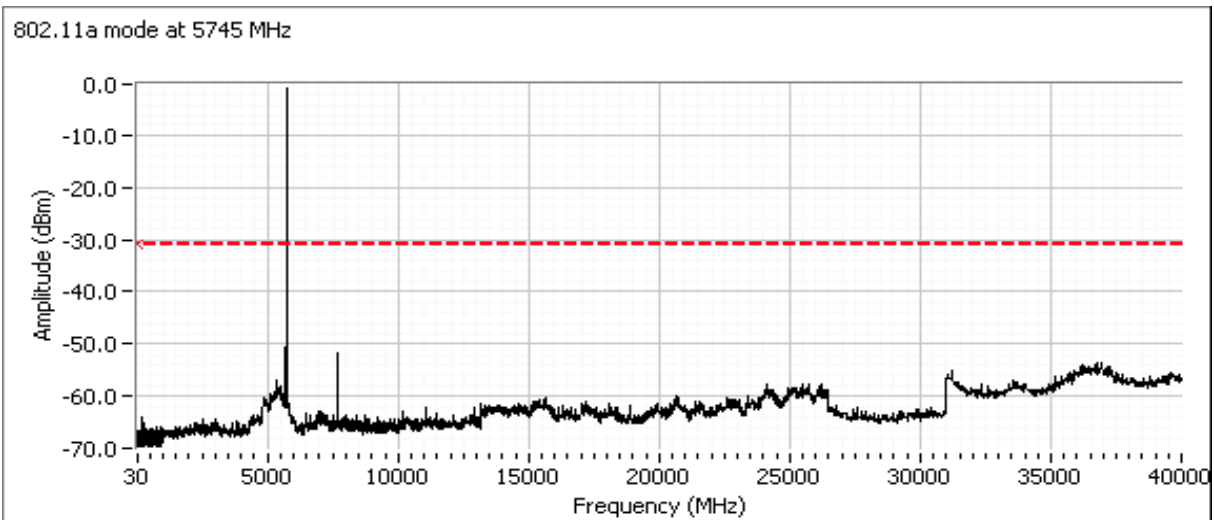
Run #4: Out of Band Spurious Emissions

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

Note 1: Measured on Chain A

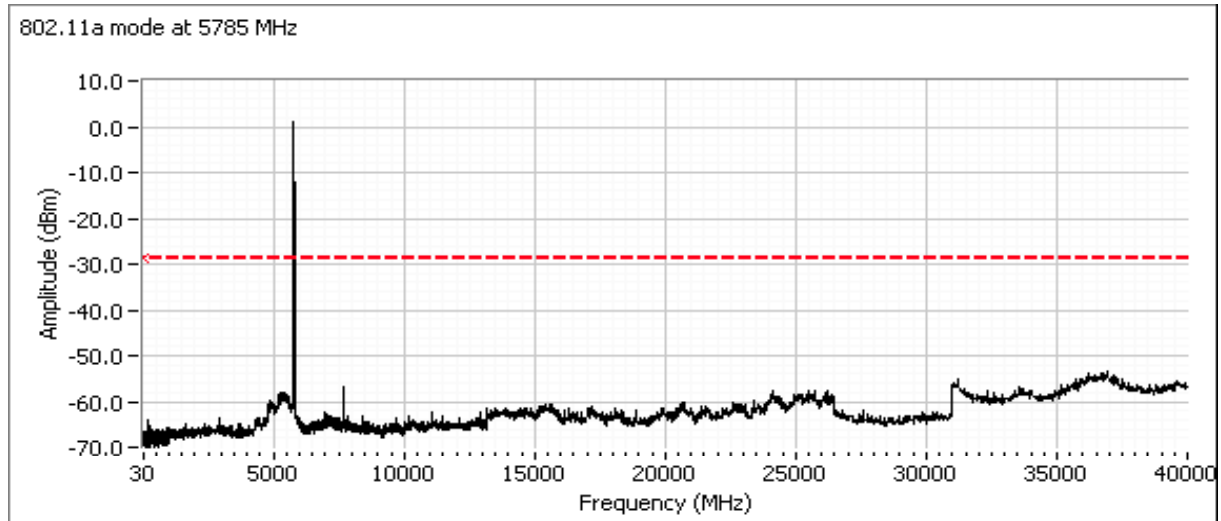
Note 2: Measured using RB>=100kHz, VB>= RB

Plots for low channel - 802.11a - , power setting(s) = 17



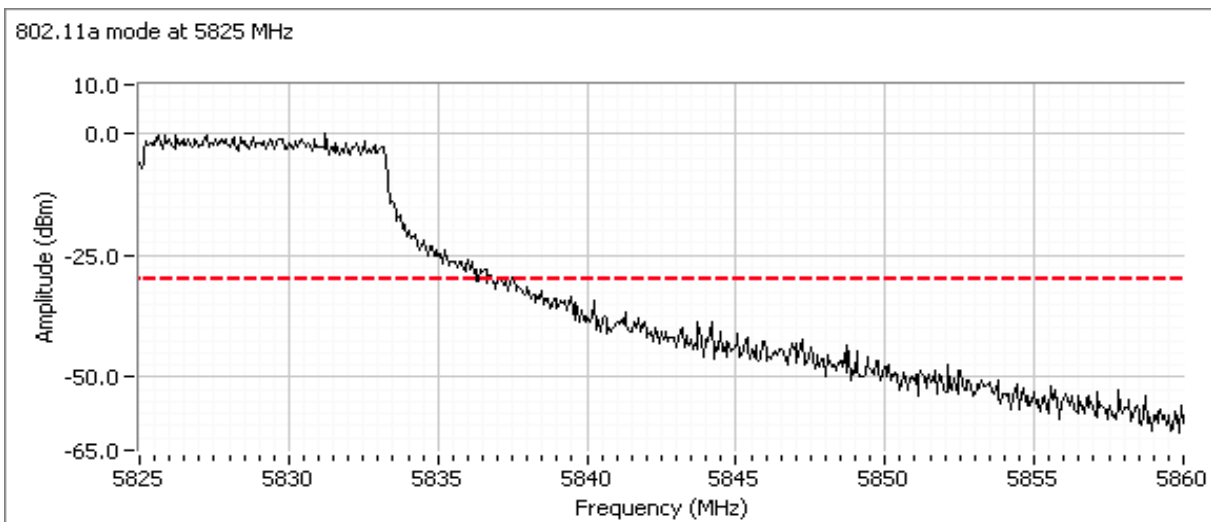
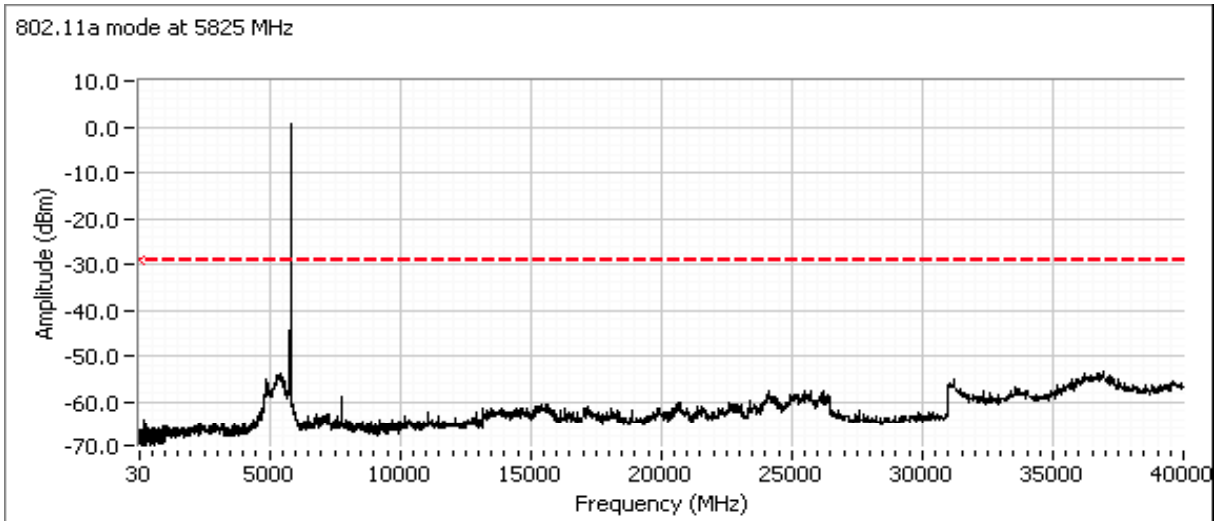
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Plots for center channel - 802.11a - , power setting(s) = 17



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Plots for high channel - 802.11a - , power setting(s) = 17



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73386
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

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

Test Specific Details

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

Date of Test: 11/13/2008
Test Engineer: Suhaila Khushzad
Test Location: OATS # 1

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

General Test Configuration

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

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

Ambient Conditions:
Temperature: 20 °C
Rel. Humidity: 50 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power Chain A+C	15.247(b)	Pass	802.11a: 23.9 dBm
2	PSD Chain A+C	15.247(d)	Pass	802.11a: -4.9 dBm/3kHz
3	Minimum 6dB Bandwidth	15.247(a)	Pass	802.11a: 16.4 MHz
3	99% Bandwidth	RSS GEN	Pass	802.11a: 17 MHz
4	Spurious emissions	15.247(b)	Pass	All signal were more than 30dB below the fundamental

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73386
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #1: Output Power - Chain A + C

Transmitted signal on chain is coherent ? Yes

Highest antenna gain for the internal antenna is 3dBi (external antenna, 2.5dBi gain, does not support MIMO modes).

Single radio Operating in the Band

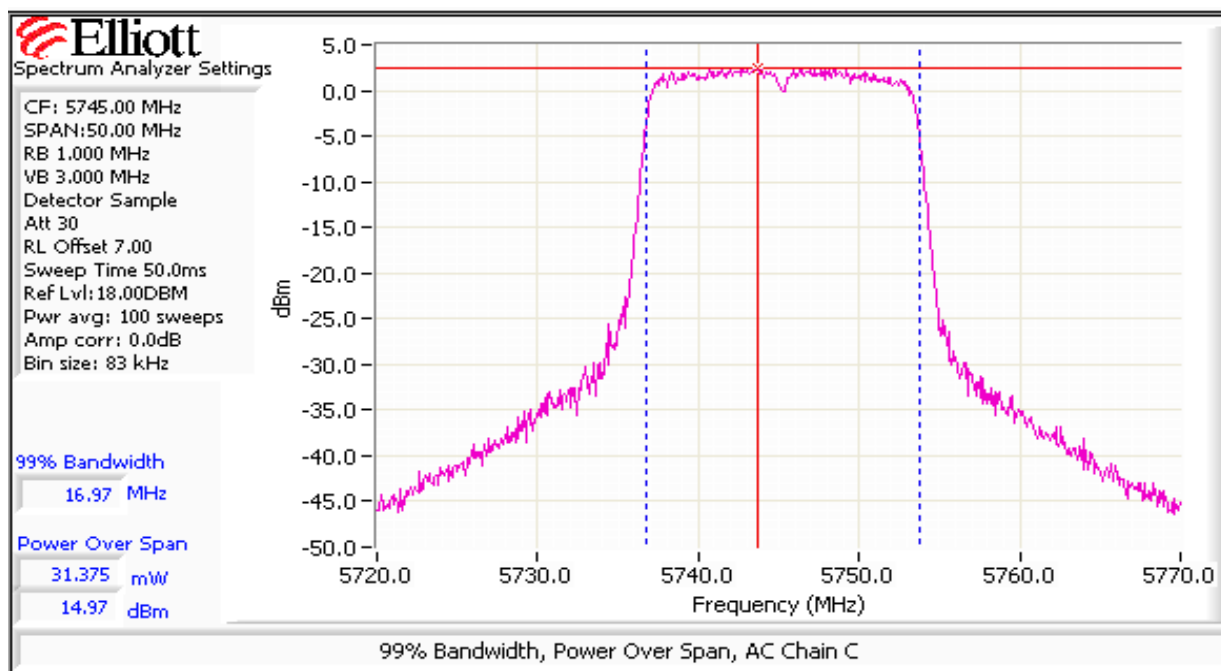
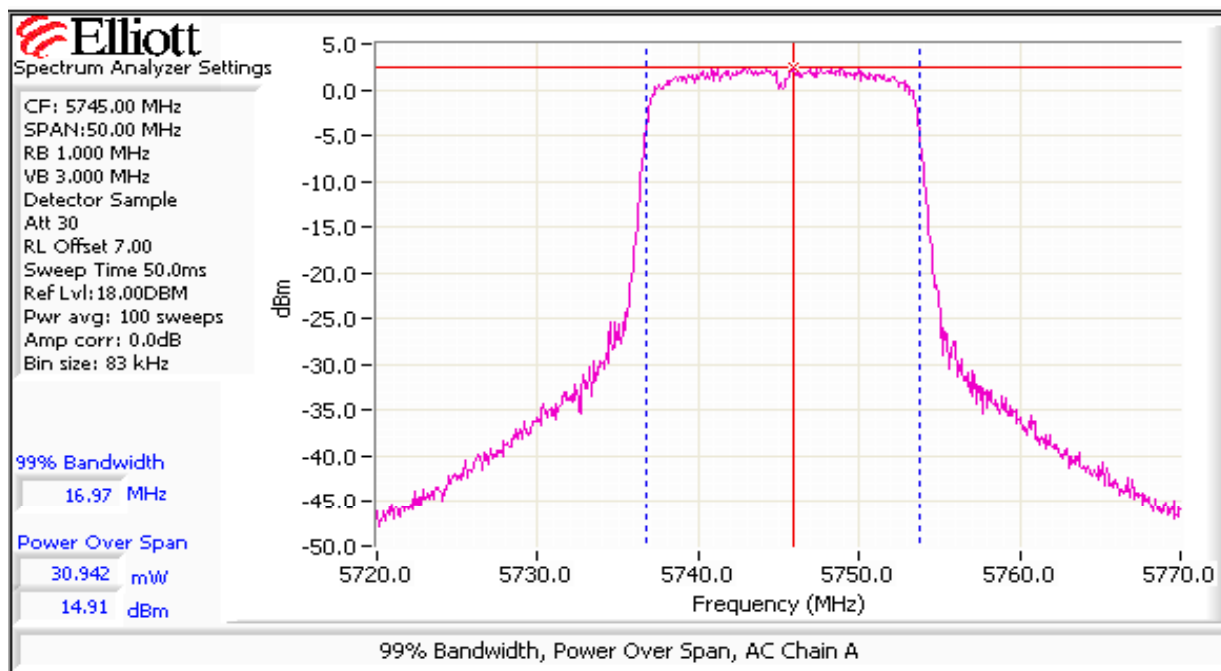
5745	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	17.0		17.0					
Output Power (dBm) ^{Note 1}	14.91		14.97		18.0 dBm	0.062 W	30.0 dBm	0.998 W
Antenna Gain (dBi) ^{Note 2}	3		3		6.0 dBi		Pass	
eirp (dBm) ^{Note 2}	17.91		17.97		24.0 dBm	0.249 W		
5785	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	17.0		17.0					
Output Power (dBm) ^{Note 1}	15.02		14.99		18.0 dBm	0.063 W	30.0 dBm	0.998 W
Antenna Gain (dBi) ^{Note 2}	3		3		6.0 dBi		Pass	
eirp (dBm) ^{Note 2}	18.02		17.99		24.0 dBm	0.253 W		
5825	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	17.0		17.0					
Output Power (dBm) ^{Note 1}	14.45		14.68		17.6 dBm	0.057 W	30.0 dBm	0.998 W
Antenna Gain (dBi) ^{Note 2}	3		3		6.0 dBi		Pass	
eirp (dBm) ^{Note 2}	17.45		17.68		23.6 dBm	0.228 W		

Four radios on non-overlapping channels, note 3

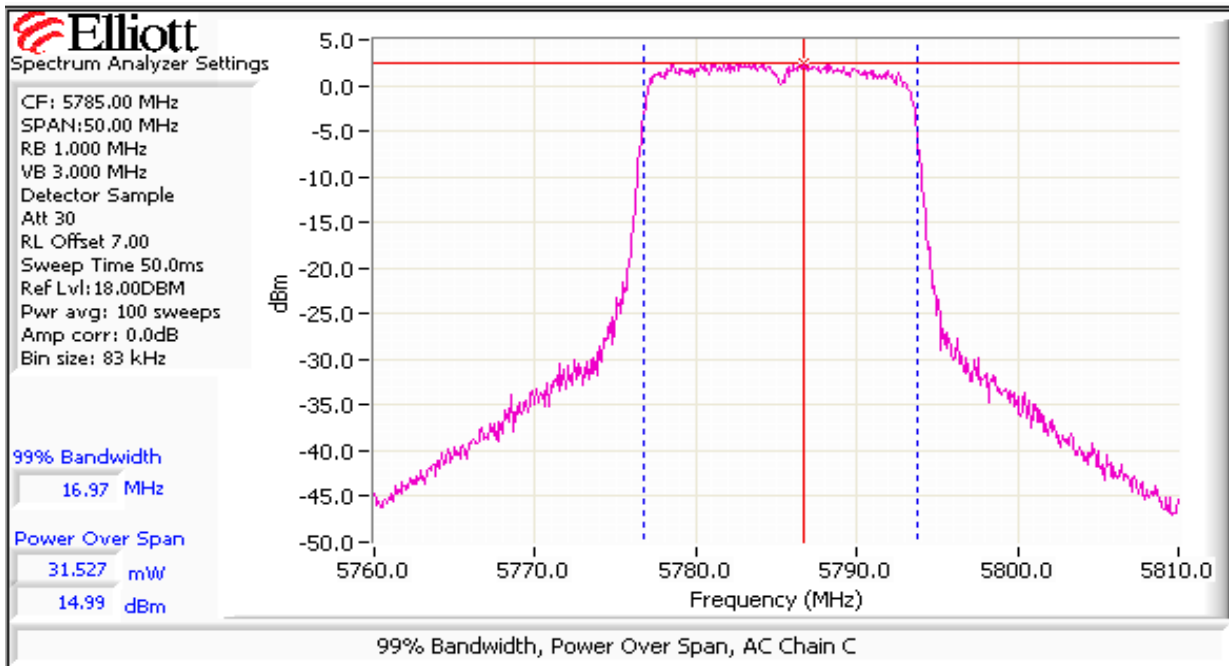
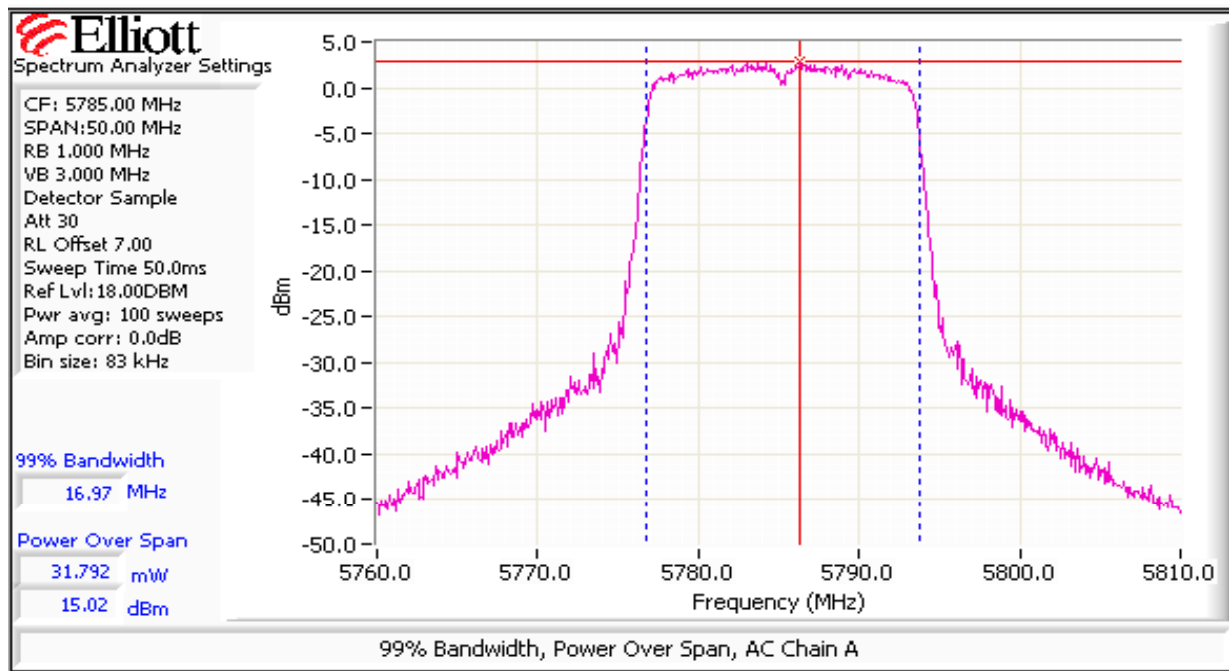
-	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	17.0		17.0					
Output Power (dBm) ^{Note 1}	14.97		14.68		23.9 dBm	0.243 W	30.0 dBm	0.998 W
Antenna Gain (dBi) ^{Note 2}	3		3		6.0 dBi		Pass	
eirp (dBm) ^{Note 2}	17.97		17.68		29.9 dBm	0.970 W		

Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz (reference method 1 of FCC DA 02-2138 for U-NII devices, August 30, 2002). Spurious limit becomes -30dBc.
Note 2:	As there is coherency between chains the effective antenna gain is the sum of the individual antenna gains and the eirp is the product of the total power and the effective antenna gain
Note 3:	The device has multiple radios, but the software limits operation in any band to ensure only non-overlapping channels are used (no two radios can operate on the same channel or on overlapping channels). In the 5745 - 5785 MHz band there can be a maximum of 4 radios active (5, non-overlapping 802.11a channels, 4 radaios that can operate in the band). The calculated total power (obtained by mutliplying the output power on a single radio by the number of radios that can be operating in the band) demonstrates that, with 4 radios active, the total output power still complies with the limit.

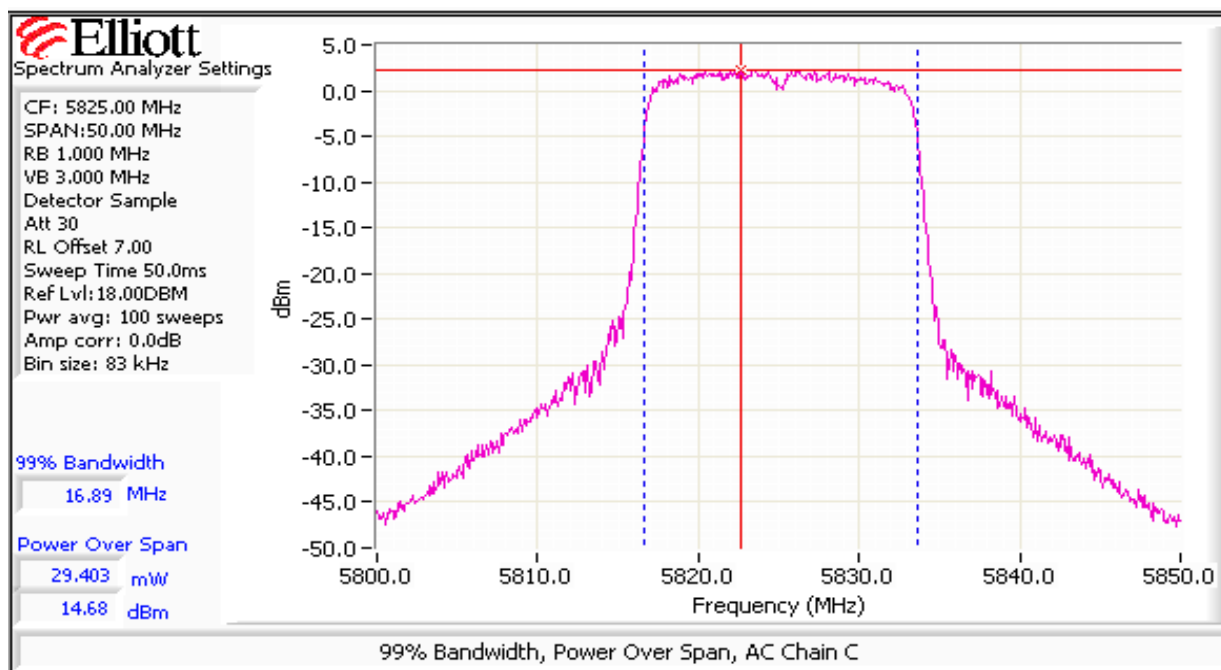
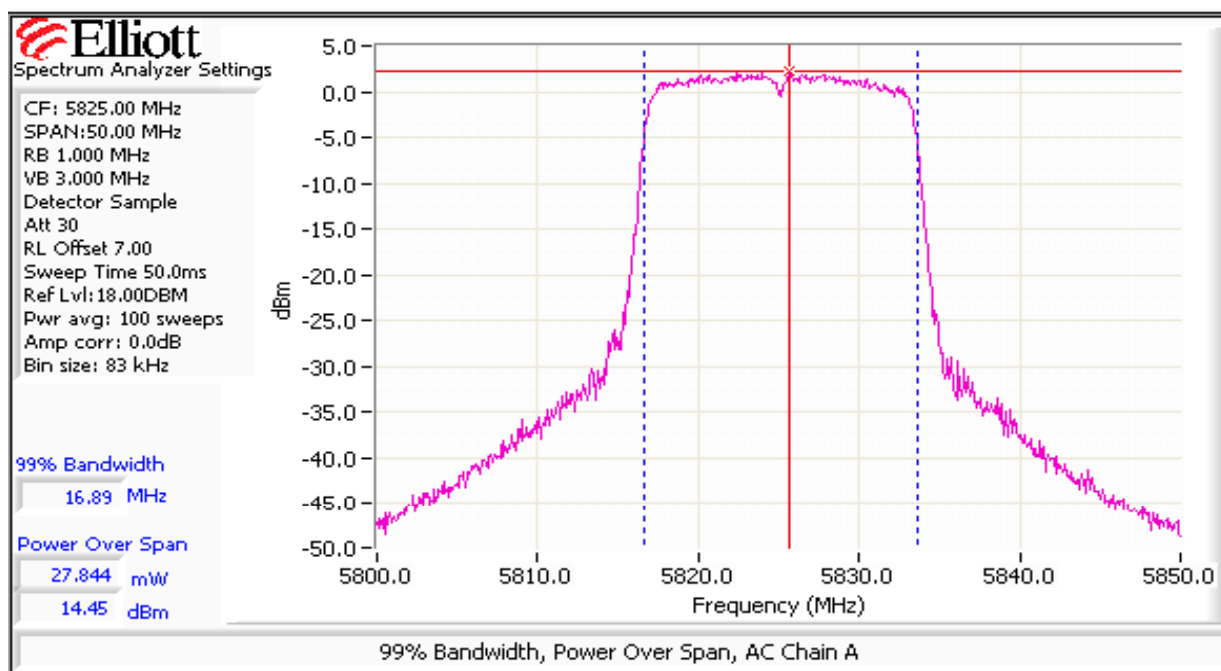
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

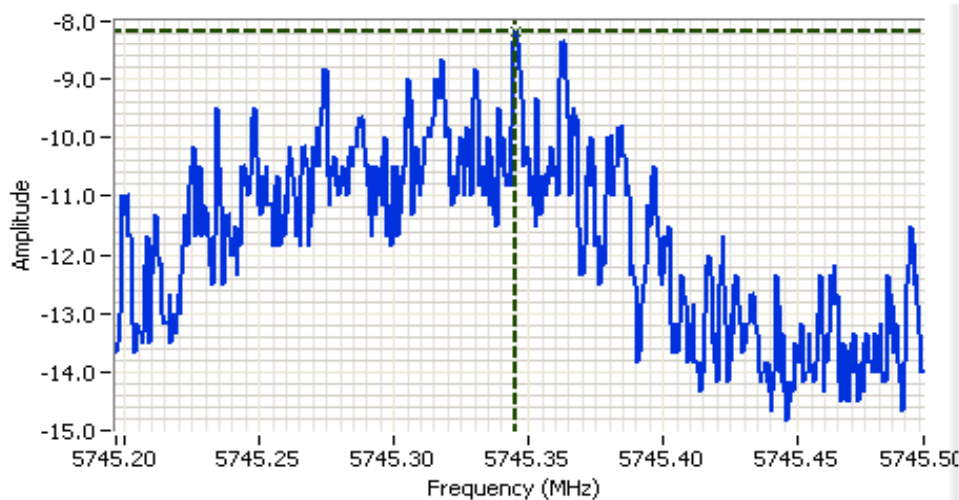


Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) ^{Note 1}				Total	Limit dBm/3kHz	Result
		Chain 1	Chain 2	Chain 3	Chain 4			
17.0	5745	-8.2		-7.7		-4.9	8.0	Pass
17.0	5785	-8.0		-8.8		-5.4	8.0	Pass
17.0	5825	-8.2		-8.3		-5.2	8.0	Pass

Note 1:	Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from preliminary scans using RB=3kHz using multiple sweeps at a faster rate over the 6dB bandwidth of the signal.
Note 2:	The operation of multiple radios in the band does not affect power spectral density as radios cannot operate on overlapping channels.



Analyzer Settings

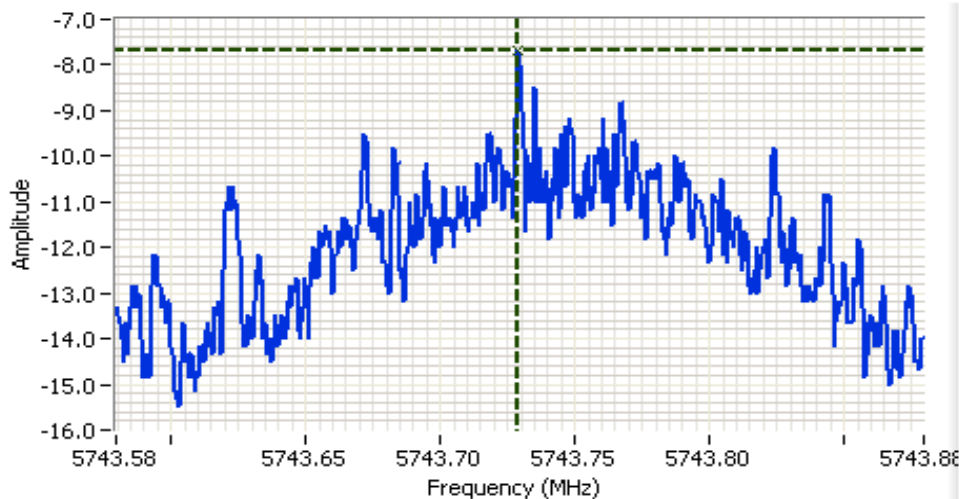
HP8564E, EMI
CF: 5745.347 MHz
SPAN: 300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl: 18.00DBM

Comments

PSD = -8.17 dBm/3kHz
Setting: 17 dBm
a-mode, AC Chain A

Cursor 1	5745.3452	-8.17	
	0.0000	0.00	

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



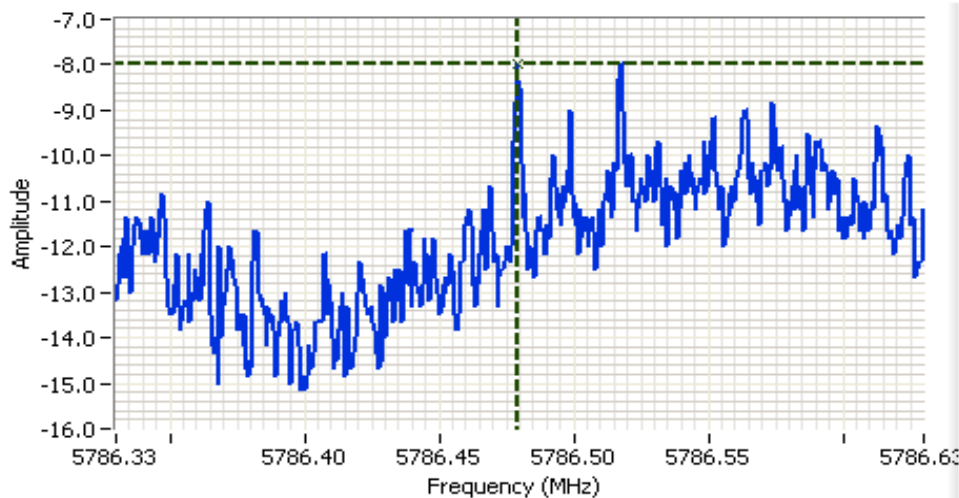
Analyzer Settings

HP8564E,EMI
CF: 5743.729 MHz
SPAN:300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl:18.00DBM

Comments

PSD = -7.67 dBm/3kHz
Setting: 17 dBm
a-mode, AC Chain C

Cursor 1 5743.7290 -7.67
0.0000 0.00



Analyzer Settings

HP8564E,EMI
CF: 5786.480 MHz
SPAN:300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl:18.00DBM

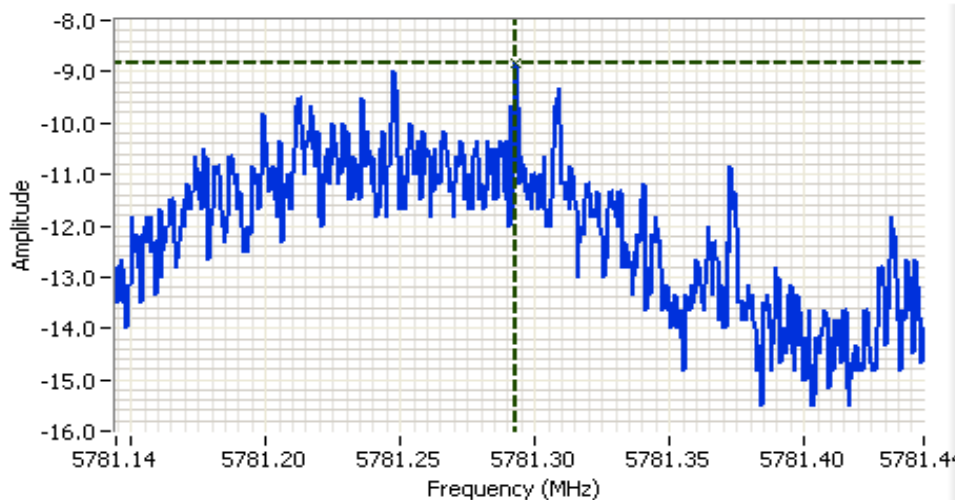
Comments

PSD = -8.0 dBm/3kHz
Setting: 17 dBm
a-mode, AC Chain A

Cursor 1 5786.4790 -8.00
0.0000 0.00



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



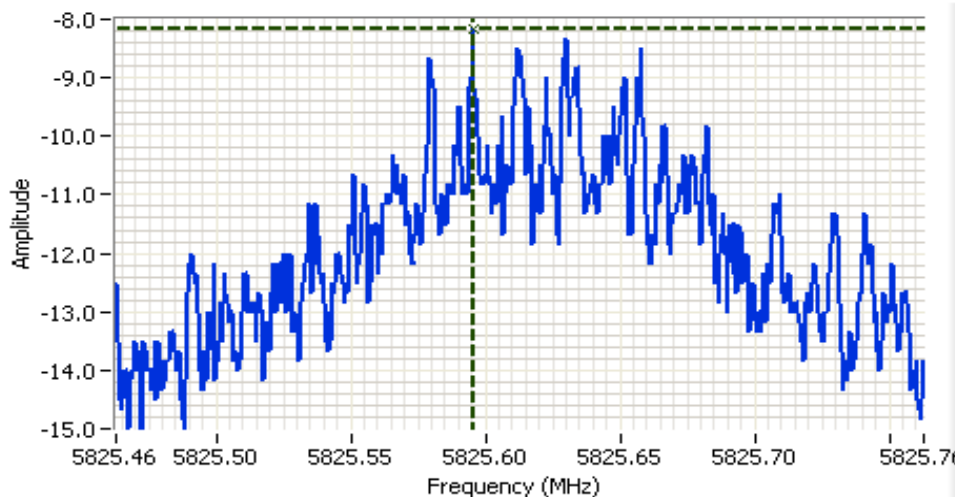
Analyzer Settings

HP8564E,EMI
CF: 5781.294 MHz
SPAN:300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl:18.00DBM

Comments

PSD = -8.83 dBm/3kHz
Setting: 17 dBm
a-mode, AC Chain C

Cursor 1 5781.2929 -8.83
0.0000 0.00



Analyzer Settings

HP8564E,EMI
CF: 5825.613 MHz
SPAN:300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl:18.00DBM

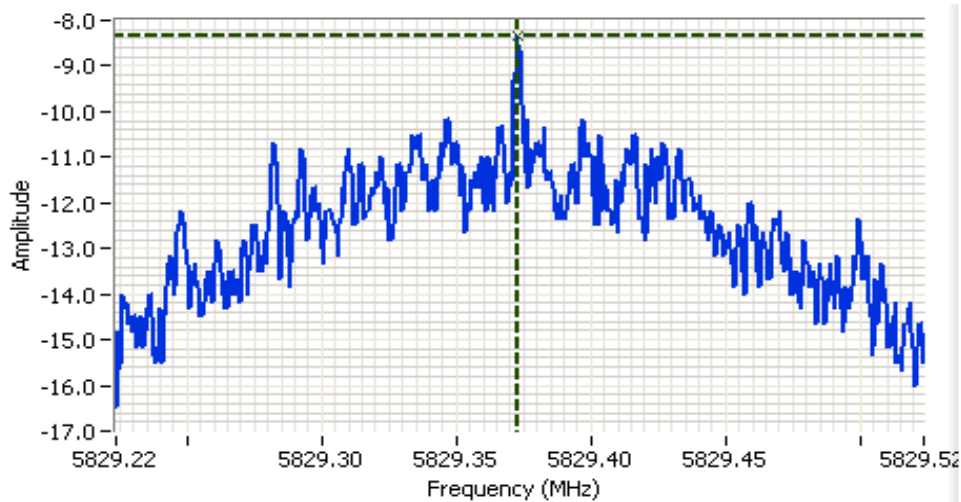
Comments

PSD = -8.17 dBm/3kHz
Setting: 17 dBm
a-mode, AC Chain A

Cursor 1 5825.5953 -8.17
0.0000 0.00



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Analyzer Settings

HP8564E,EMI
CF: 5829.374 MHz
SPAN:300 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 100.0s
Ref Lvl:18.00DBM

Comments

PSD = -8.33 dBm/3kHz
Setting: 17 dBm
a-mode, AC Chain C

Cursor 1 5829.3725 -8.33
0.0000 0.00



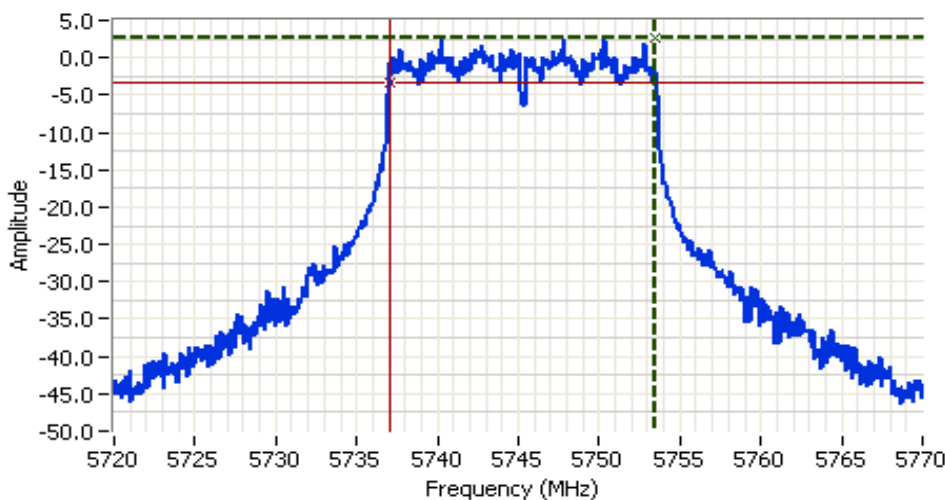
Run #3: Signal Bandwidth

Mode	Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz)	
				6dB	99%
802.11a	17	5745	100k	16.4	17.0
802.11a	17	5785	100k	16.5	17.0
802.11a	17	5825	100k	16.5	16.9

Note 1: Measured with all chains connected together through a combiner, unused ports on the combiner terminated in 50ohms.

Note 2: 99% bandwidth measured in accordance with RSS GEN, with RB > 1% of the span and VB > 3xRB

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Analyzer Settings

HP8564E,EMI
CF: 5745.000 MHz
SPAN:50.000 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 50.0ms
Ref Lvl:18.00DBM

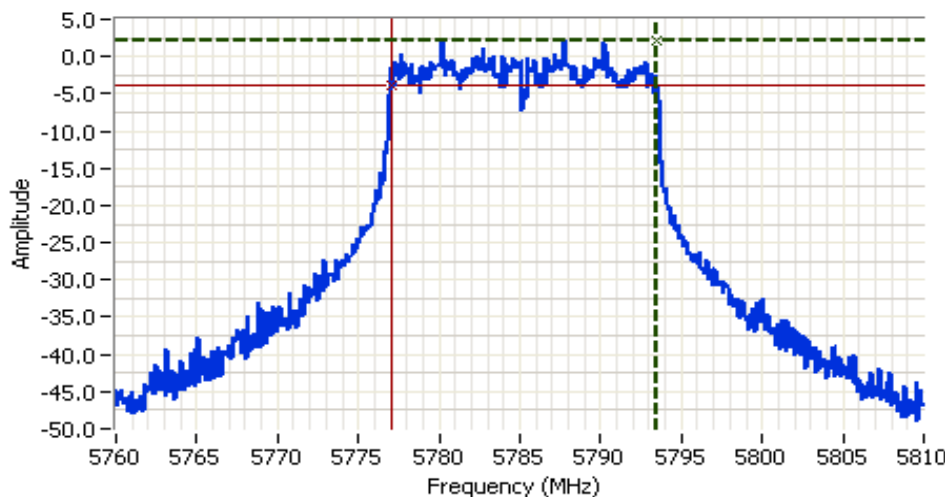
Comments

6dB BW: 16.417 MHz
Setting: 17dBm
a-mode, Chain AC

Cursor 1 5753.5000 2.67
Cursor 2 5737.0833 -3.33

Delta Freq. 16.417

Delta Amplitude 6.00



Analyzer Settings

HP8564E,EMI
CF: 5785.000 MHz
SPAN:50.000 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 50.0ms
Ref Lvl:18.00DBM

Comments

6dB BW: 16.500 MHz
Setting: 17dBm
a-mode, Chain AC

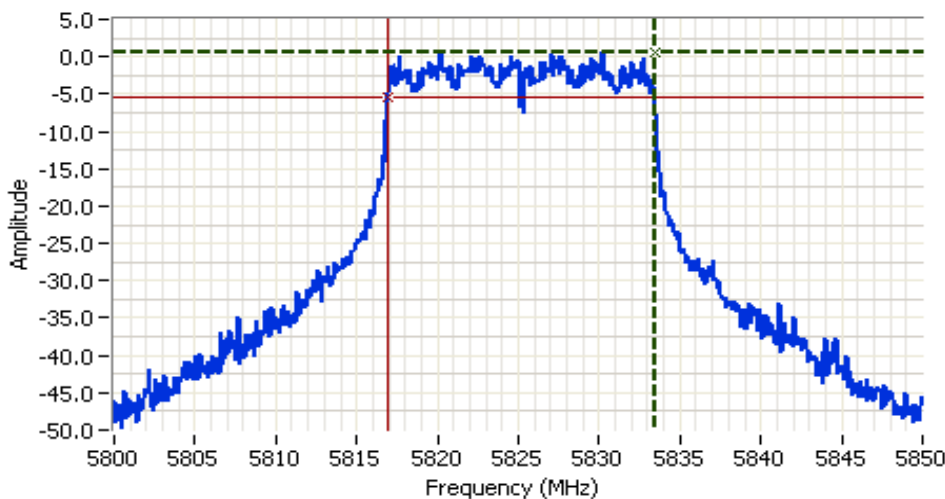
Cursor 1 5793.5000 2.17
Cursor 2 5777.0000 -3.83

Delta Freq. 16.500

Delta Amplitude 6.00



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Analyzer Settings

HP8564E,EMI
CF: 5825.000 MHz
SPAN:50.000 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 50.0ms
Ref Lvl:18.00DBM

Comments

6dB BW: 16.500 MHz
Setting: 17dBm
a-mode, Chain AC

Cursor 1	5833.4167	0.67			
Cursor 2	5816.9167	-5.33			

Delta Freq. 16.500

Delta Amplitude 6.00



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

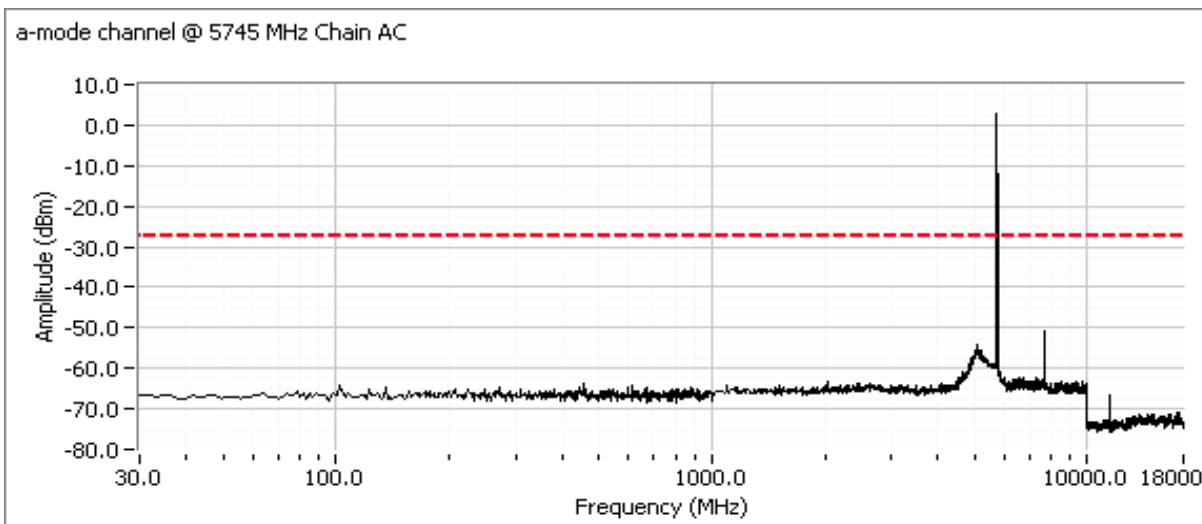
Run #4: Out of Band Spurious Emissions

Measured using RB>=100kHz, VB>= RB

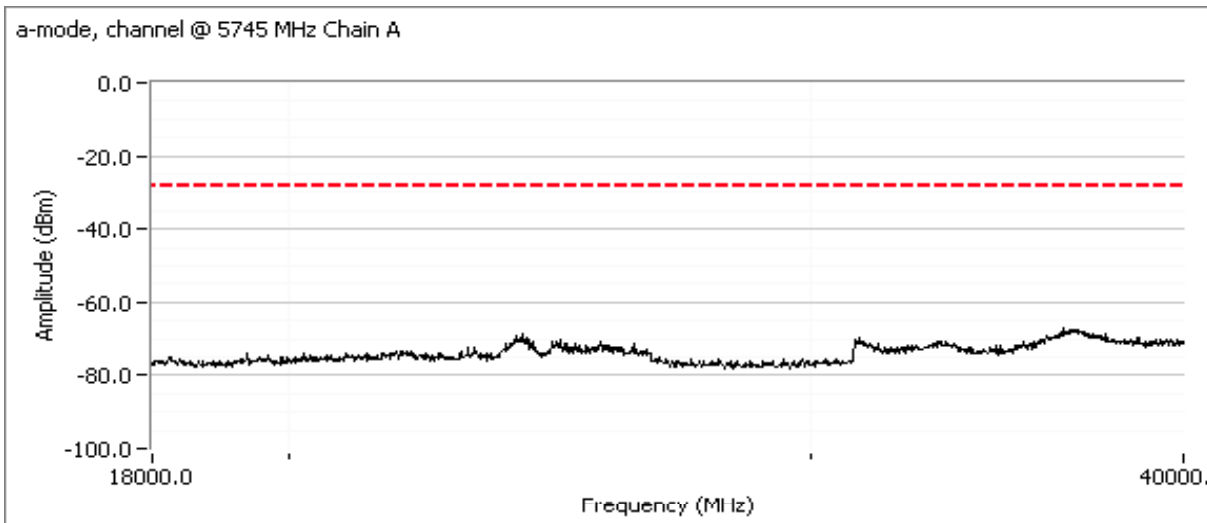
Frequency (MHz)	Limit	Result
5745	-30dBc	Pass
5785	-30dBc	Pass
5825	-30dBc	Pass

Note 1:	Measured with all chains connected together through a combiner, unused ports on the combiner terminated in 50ohms for the frequency range 30 - 18000 MHz. Outside this frequency range measurements made on each channel individually.
Note 2:	Measured using RB>=100kHz, VB>= RB

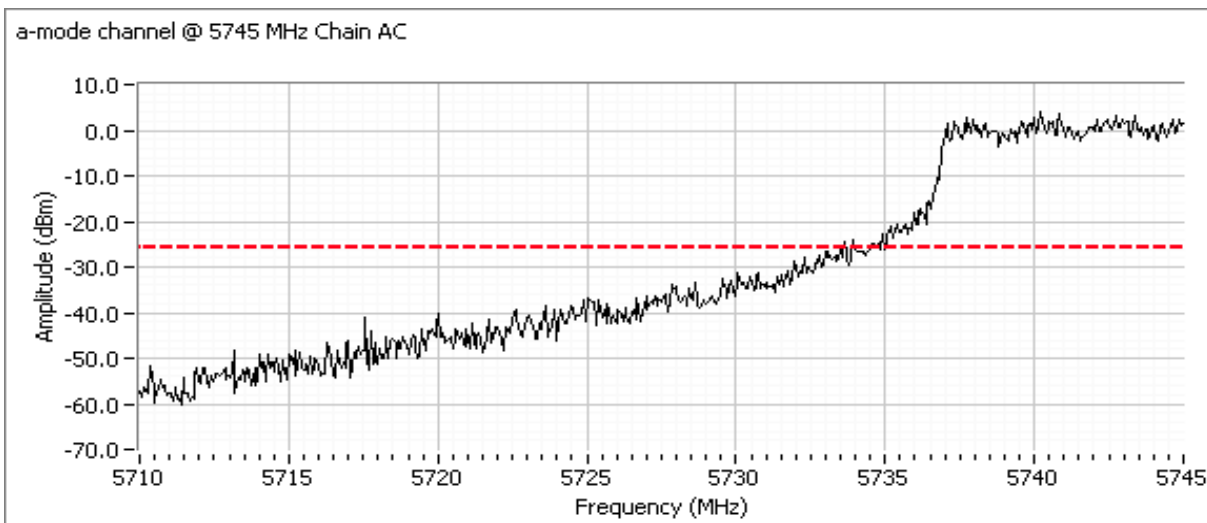
Plots for low channel - 802.11a - , power setting(s) = 17



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

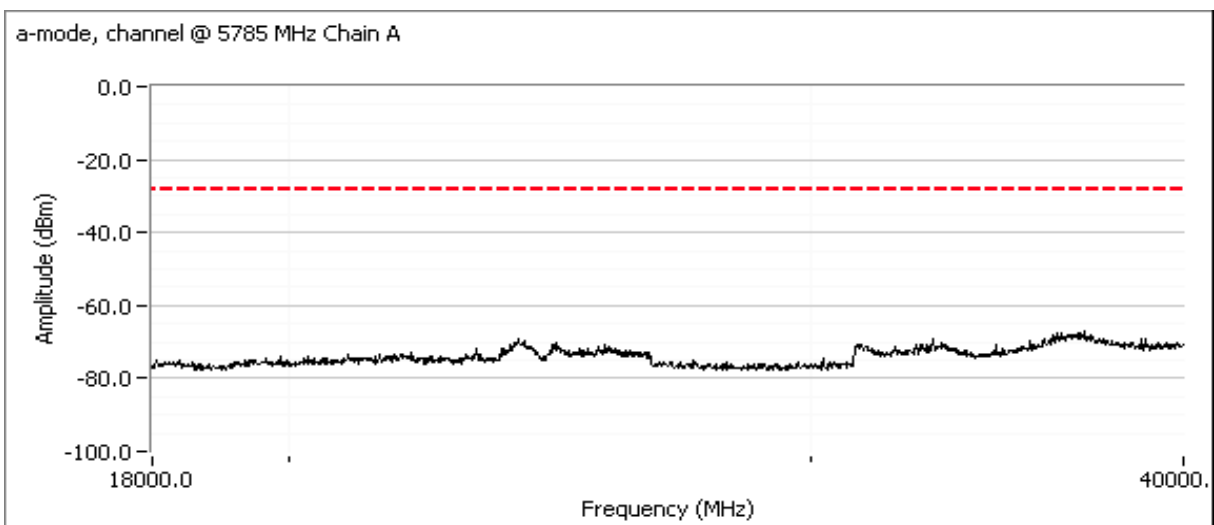
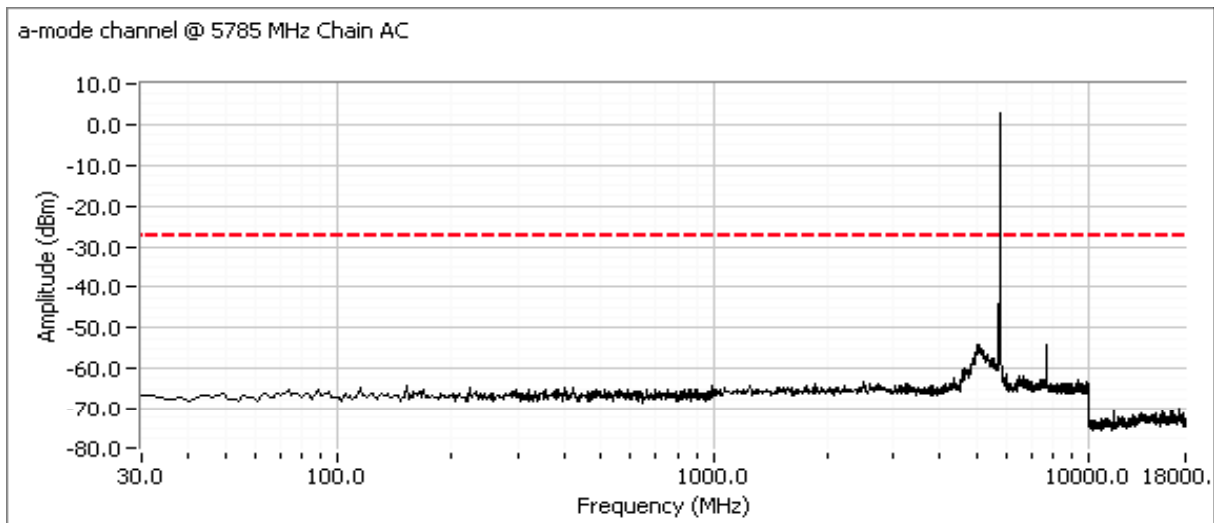


Additional plot showing compliance with -30dBc limit at 5725 MHz



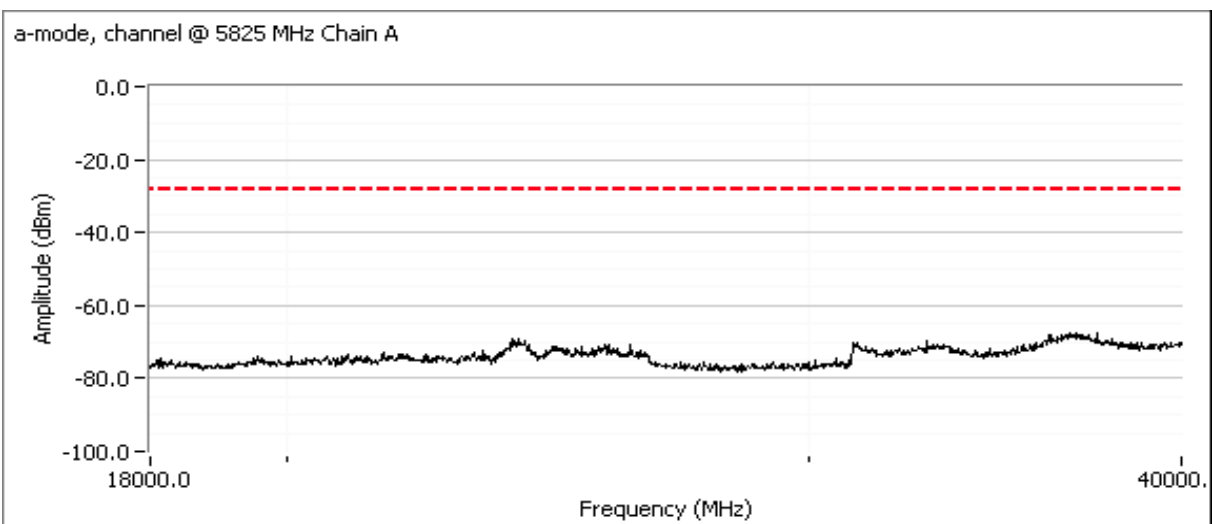
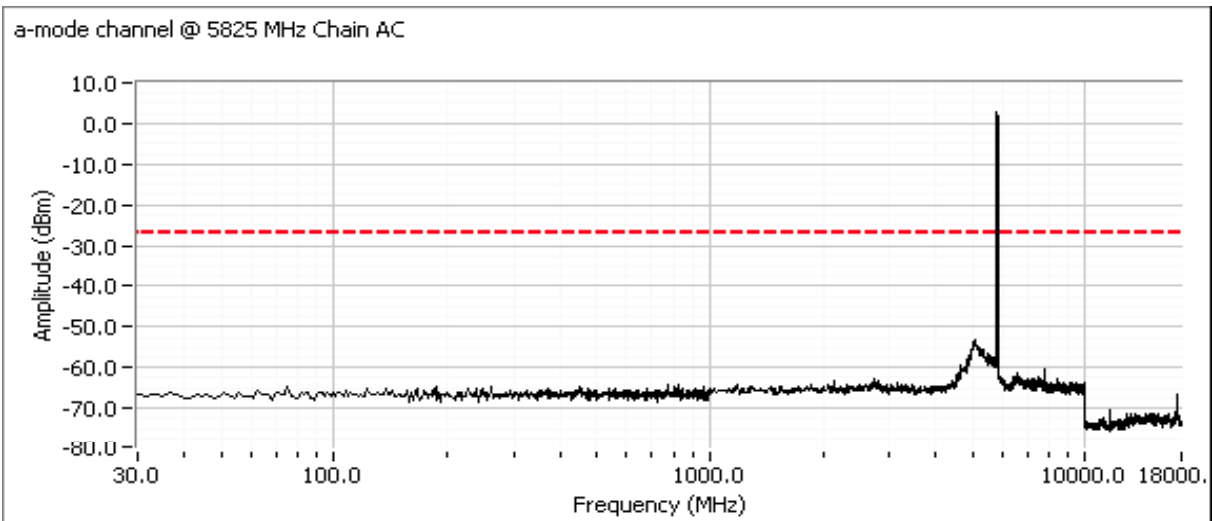
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Plots for center channel - 802.11a - , power setting(s) = 17



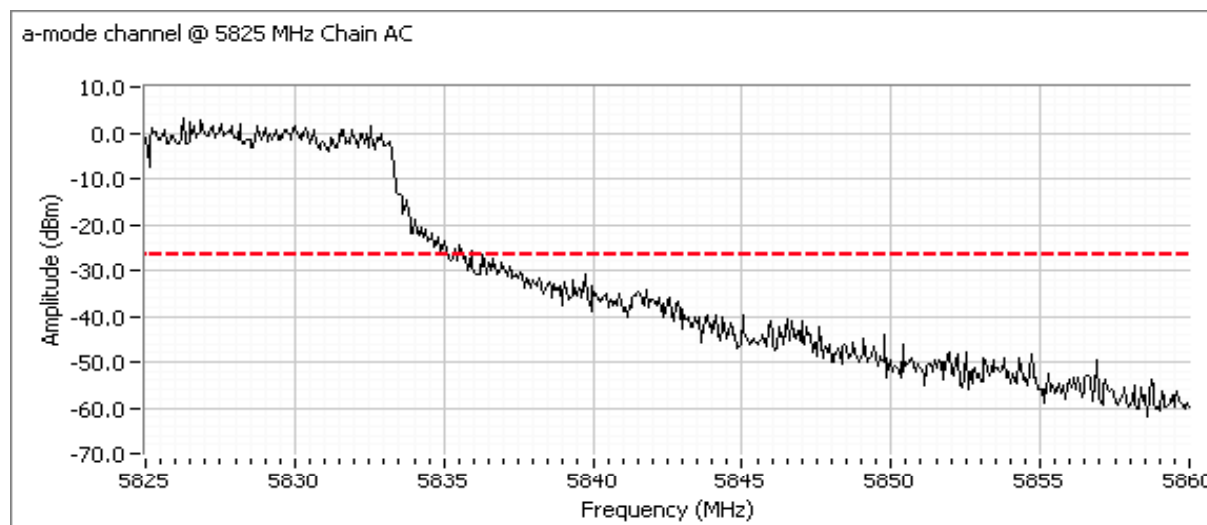
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Plots for high channel - 802.11a - , power setting(s) = 17



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Additional plot showing compliance with -30dBc limit at 5850 MHz



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73386
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

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

Test Specific Details

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

Date of Test: 11/13/2008
Test Engineer: S. Khushzad / R. Varelas
Test Location: OATS # 1

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

General Test Configuration

The EUT was connected to the spectrum analyzer or power meter via a suitable attenuator.

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

Ambient Conditions:
Temperature: 20 °C
Rel. Humidity: 50 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power Chain A+C	15.247(b)	Pass	802.11n20: 18.6 dBm 802.11n40: 18.5 dBm
2	PSD Chain A+C	15.247(d)	Pass	n20: -5.4 dBm/3kHz n40: -7.2 dBm/3kHz
3	Minimum 6dB Bandwidth	15.247(a)	Pass	802.11n20: 17.66 MHz 802.11n40: 36.5 MHz
3	99% Bandwidth	RSS GEN	Pass	802.11n20: 18.2 MHz 802.11n40: 36.8 MHz
4	Spurious emissions	15.247(b)	Pass	All signal were more than 30dB below the fundamental

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73386
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #1: Output Power - Chain A + C

Transmitted signal on chain is coherent ? No

Highest antenna gain for the internal antenna is 3dBi (external antenna, 2.5dBi gain, does not support MIMO modes).

Single radio Operating in the Band

5745 802.11n 20MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	17.0		17.0					
Output Power (dBm) ^{Note 1}	15.9		15.3		18.6 dBm	0.073 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	3		3			3.0 dBi	Pass	
eirp (dBm) ^{Note 2}	18.9		18.3		21.6 dBm	0.145 W		
5785 802.11n 20MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	17.0		17.0					
Output Power (dBm) ^{Note 1}	15.8		15.5		18.6 dBm	0.073 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	3		3			3.0 dBi	Pass	
eirp (dBm) ^{Note 2}	18.8		18.5		21.6 dBm	0.146 W		
5825 802.11n 20MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	17.0		17.0					
Output Power (dBm) ^{Note 1}	15.4		14.9		18.2 dBm	0.066 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	3		3			3.0 dBi	Pass	
eirp (dBm) ^{Note 2}	18.4		17.9		21.2 dBm	0.131 W		
5755 802.11n 40MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	17.0		17.0					
Output Power (dBm) ^{Note 1}	15.6		15.3		18.5 dBm	0.070 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	3		3			3.0 dBi	Pass	
eirp (dBm) ^{Note 2}	18.6		18.3		21.5 dBm	0.140 W		
5795 802.11n 40MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	17.0		17.0					
Output Power (dBm) ^{Note 1}	15.8		15.2		18.5 dBm	0.071 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	3		3			3.0 dBi	Pass	
eirp (dBm) ^{Note 2}	18.8		18.2		21.5 dBm	0.142 W		

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73386
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Four radios on non-overlapping channels, note 3

802.11n 20MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	17.0		17.0					
Output Power (dBm) ^{Note 1}	15.8		15.5		24.7 dBm	0.292 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	3		3			-3.0 dBi	Pass	
eirp (dBm) ^{Note 2}	18.8		18.5		21.6 dBm	0.146 W		

Two radios on 40 MHz non-overlapping channels, note 3

802.11n 40MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
Power Setting ^{Note 3}	17.0		17.0					
Output Power (dBm) ^{Note 1}	15.8		15.2		21.5 dBm	0.142 W	30.0 dBm	1.000 W
Antenna Gain (dBi) ^{Note 2}	3		3			0.0 dBi	Pass	
eirp (dBm) ^{Note 2}	18.8		18.2		21.5 dBm	0.142 W		

Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz for 802.11n 20MHz mode and 80 MHz for 802.11n 40MHz mode (reference method 1 of FCC DA 02-2138 for U-NII devices, August 30, 2002). Spurious limit becomes -30dBc.
Note 2:	As there is no coherency between chains the total EIRP is the sum of the individual EIRPs and effective antenna gain equals the eirp divide by the sum of the power on each chain.
Note 3:	The device has multiple radios, but the software limits operation in any band to ensure only non-overlapping channels are used (no two radios can operate on the same channel or on overlapping channels). In the 5745 - 5785 MHz band there can be a maximum of 4 radios active (5, non-overlapping 20MHz channels, 4 radios available) or 2 40 Mhz channels. The calculated total power (obtained by multiplying the output power on a single radio by the number of radios that can be operating in the band) demonstrates that, with 4 radios active (2 for n40 mode), the total output power complies with the limit.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73386
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) ^{Note 1}				Total	Limit dBm/3kHz	Result
		Chain 1	Chain 2	Chain 3	Chain 4			
17.0	5745	-8.8		-8.2		-5.5	8.0	Pass
17.0	5785	-8.2		-8.7		-5.4	8.0	Pass
17.0	5825	-8.3		-9.3		-5.8	8.0	Pass
17.0	5755	-11.8		-10.3		-8.0	8.0	Pass
17.0	5795	-9.8		-10.7		-7.2	8.0	Pass

Note 1:	Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from preliminary scans using RB=3kHz using multiple sweeps at a faster rate over the 6dB bandwidth of the signal.
Note 2:	The operation of multiple radios in the band does not affect power spectral density as radios cannot operate on overlapping channels.

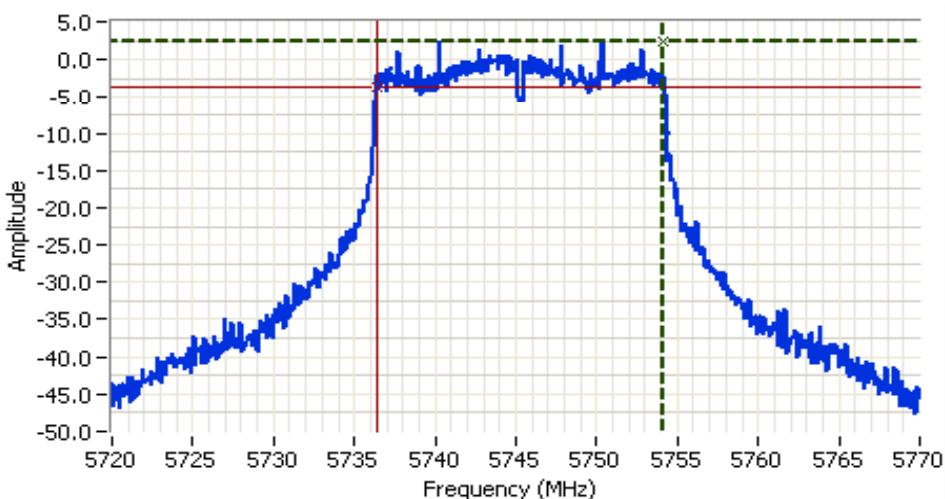
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #3: Signal Bandwidth

Mode	Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz)	
				6dB	99%
802.11n20	17	5745	100kHz	17.75	18.2
802.11n20	17	5785	100kHz	17.66	18.2
802.11n20	17	5825	100kHz	17.66	18.1
802.11n40	17	5755	100kHz	36.6	36.8
802.11n40	17	5795	100kHz	36.5	36.7

Note 1: Measured with all chains connected together through a combiner, unused ports on the combiner terminated in 50ohms.

Note 2: 99% bandwidth measured in accordance with RSS GEN, with RB > 1% of the span and VB > 3xRB





Analyzer Settings

HP8564E,EMI
CF: 5745.000 MHz
SPAN:50.000 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 50.0ms
Ref Lvl:18.00DBM

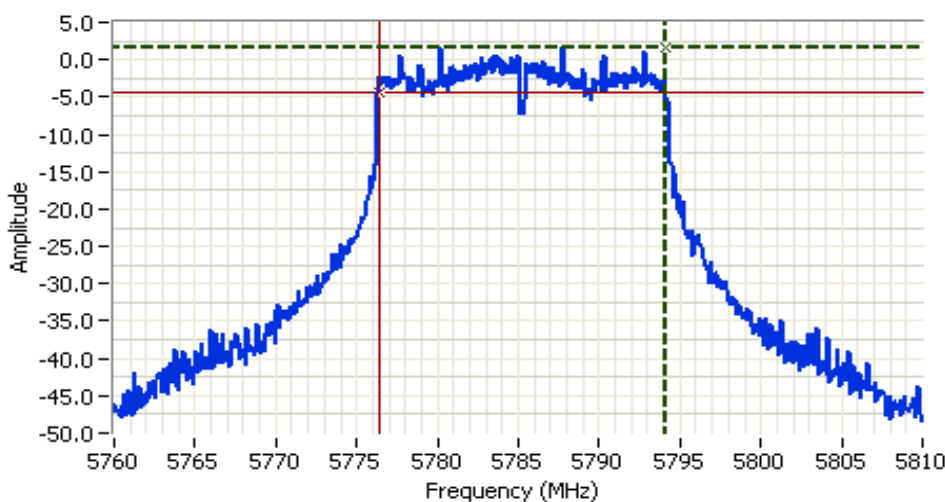
Comments

6dB BW: 17.750 MHz
Setting: 17dBm
n20MHz, Chain AC

Cursor 1	5754.1667	2.50	
Cursor 2	5736.4167	-3.50	

Delta Freq. 17.750
Delta Amplitude 6.00

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Analyzer Settings

HP8564E,EMI
CF: 5785.000 MHz
SPAN:50.000 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 50.0ms
Ref Lvl:18.00DBM

Comments

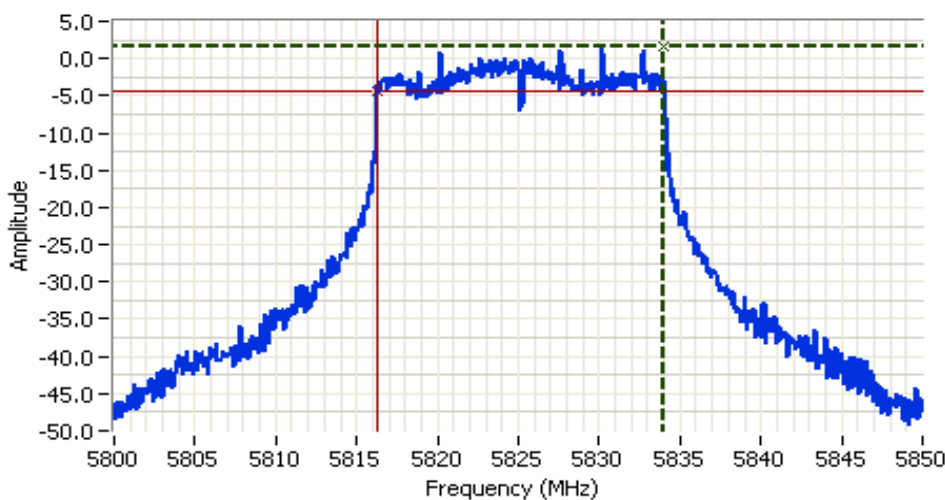
6dB BW: 17.667 MHz
Setting: 17dBm
n20MHz, Chain AC

Cursor 1 5794.0833 1.50

Cursor 2 5776.4167 -4.50

Delta Freq. 17.667

Delta Amplitude 6.00



Analyzer Settings

HP8564E,EMI
CF: 5825.000 MHz
SPAN:50.000 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 50.0ms
Ref Lvl:18.00DBM

Comments

6dB BW: 17.667 MHz
Setting: 17dBm
n20MHz, Chain AC

Cursor 1 5834.0000 1.50

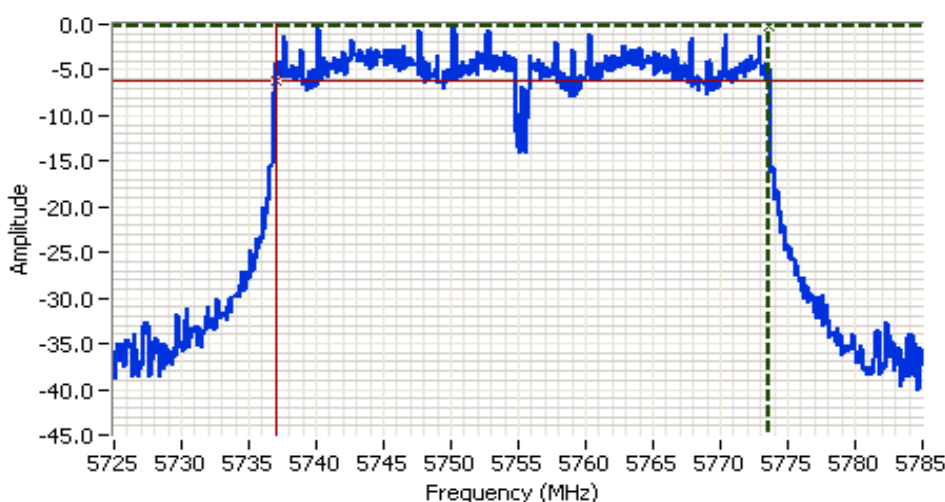
Cursor 2 5816.3333 -4.50

Delta Freq. 17.667

Delta Amplitude 6.00



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Analyzer Settings

HP8564E,EMI
CF: 5755.000 MHz
SPAN:60.000 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 50.0ms
Ref Lvl:18.00DBM

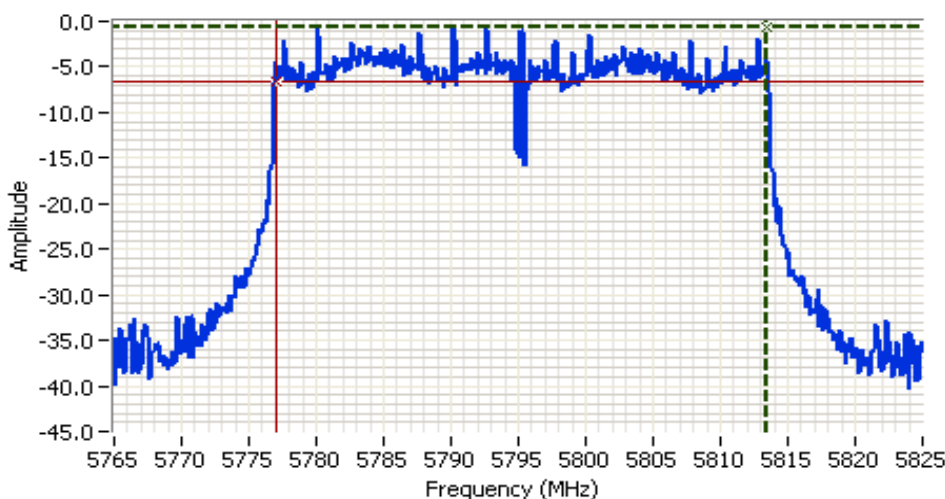
Comments

6dB BW: 36.600 MHz
Setting: 17dBm
n40MHz, Chain AC

Cursor 1 5773.6000 -0.17
Cursor 2 5737.0000 -6.17

Delta Freq. 36.600

Delta Amplitude 6.00



Analyzer Settings

HP8564E,EMI
CF: 5795.000 MHz
SPAN:60.000 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 30
RL Offset 7.00
Sweep Time 50.0ms
Ref Lvl:18.00DBM

Comments

6dB BW: 36.500 MHz
Setting: 17dBm
n40MHz, Chain AC

Cursor 1 5813.5000 -0.67
Cursor 2 5777.0000 -6.67

Delta Freq. 36.500

Delta Amplitude 6.00



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73386
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

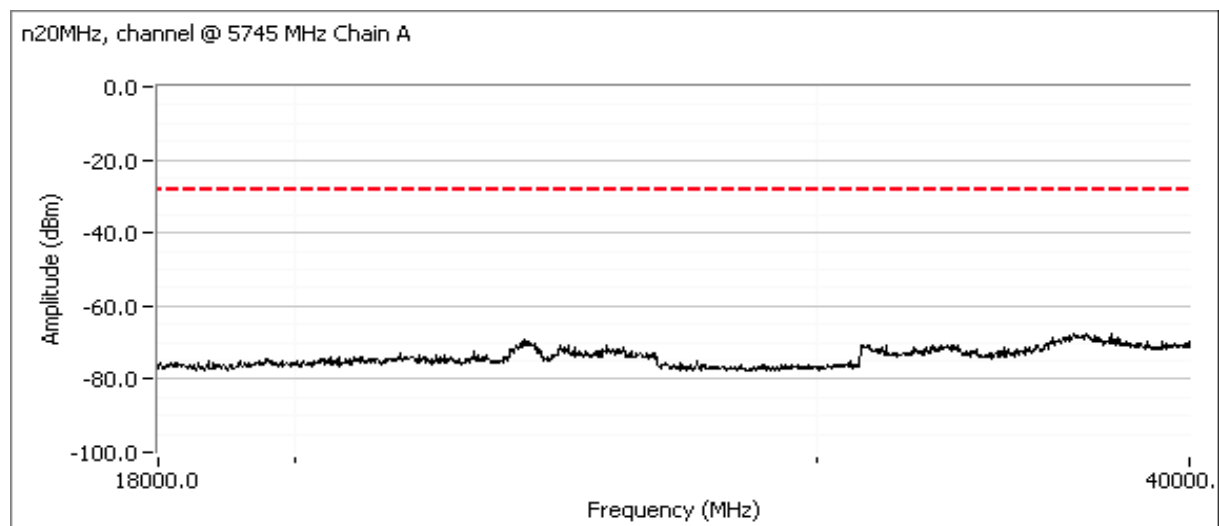
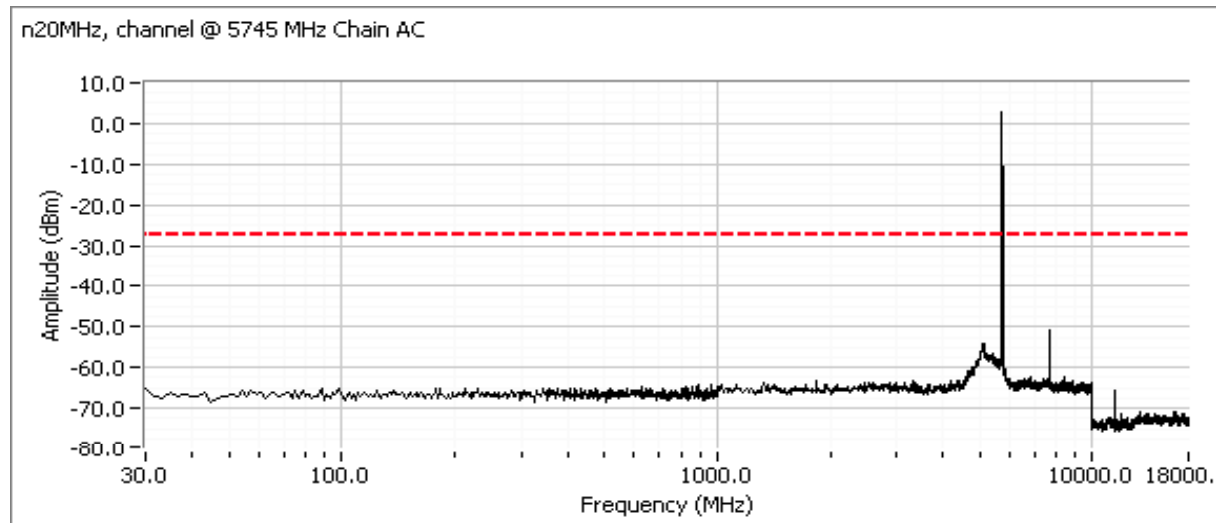
Run #4: Out of Band Spurious Emissions

Frequency (MHz)	Limit	Result
5745	-30dBc	Pass
5785	-30dBc	Pass
5825	-30dBc	Pass
5755	-30dBc	Pass
5795	-30dBc	Pass

Note 1:	Measured with all chains connected together through a combiner, unused ports on the combiner terminated in 50ohms for the frequency range 30 - 18000 MHz. Outside this frequency range measurements made on each channel individually.
Note 2:	Measured using RB>=100kHz, VB>= RB

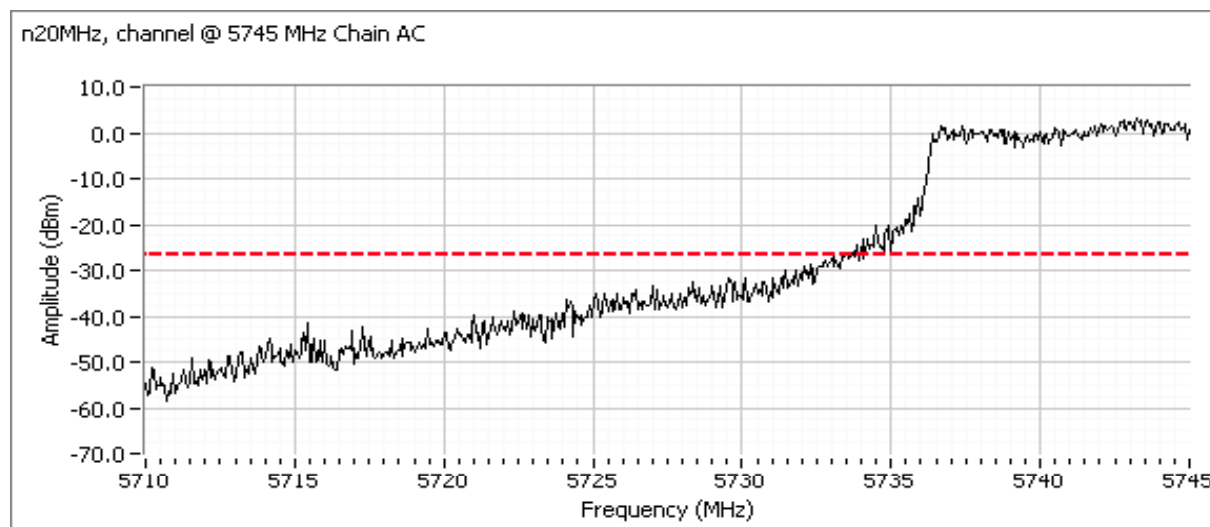
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Plots for low channel - 802.11n 20MHz, power setting(s) = 17.0

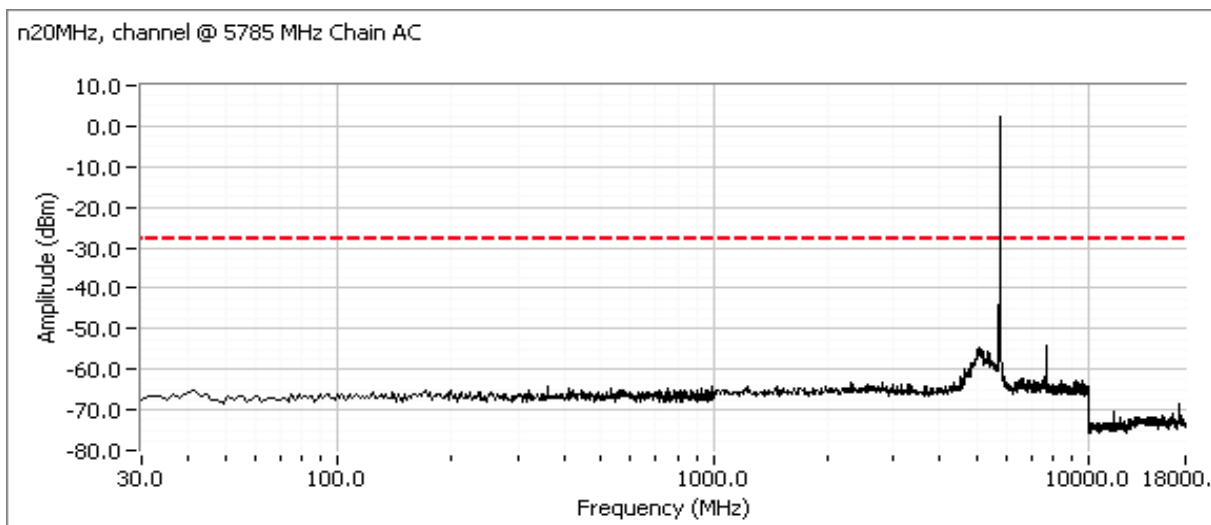


Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

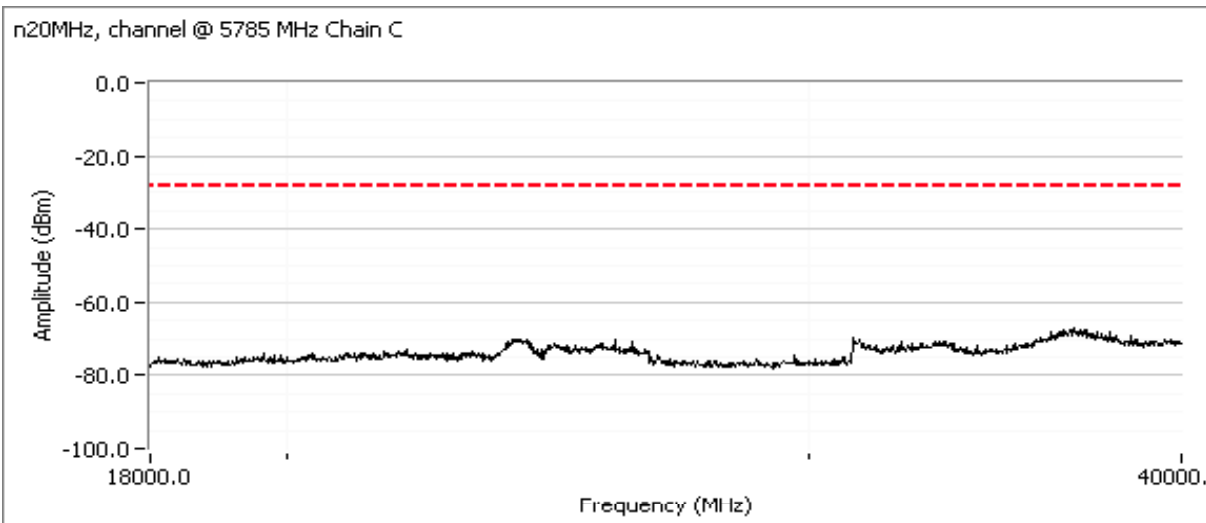
Additional plot showing compliance with -30dBc limit at 5725 MHz



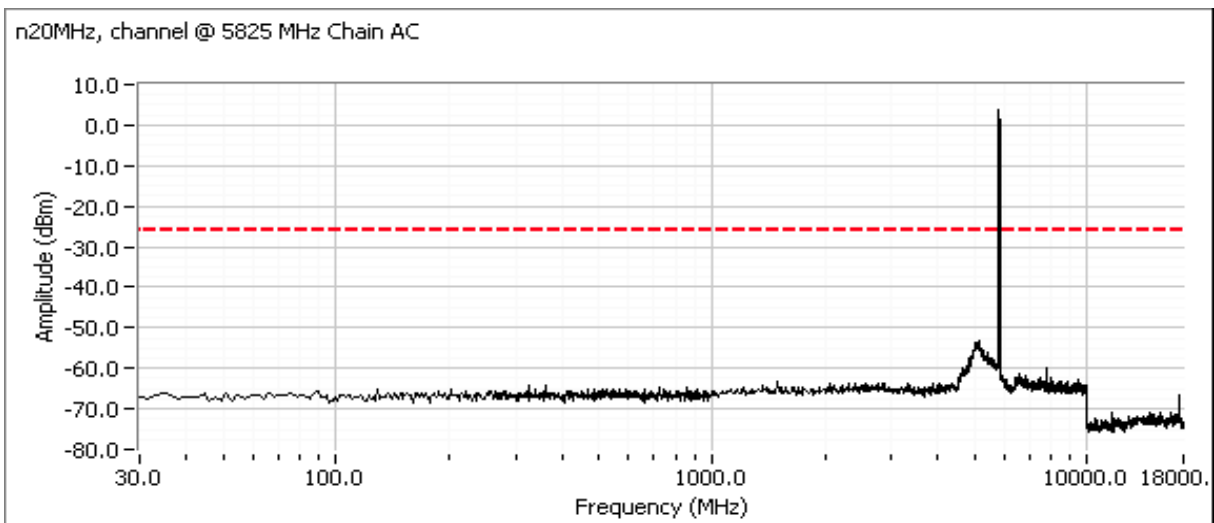
Plots for center channel - 802.11n 20MHz, power setting(s) = 17.0



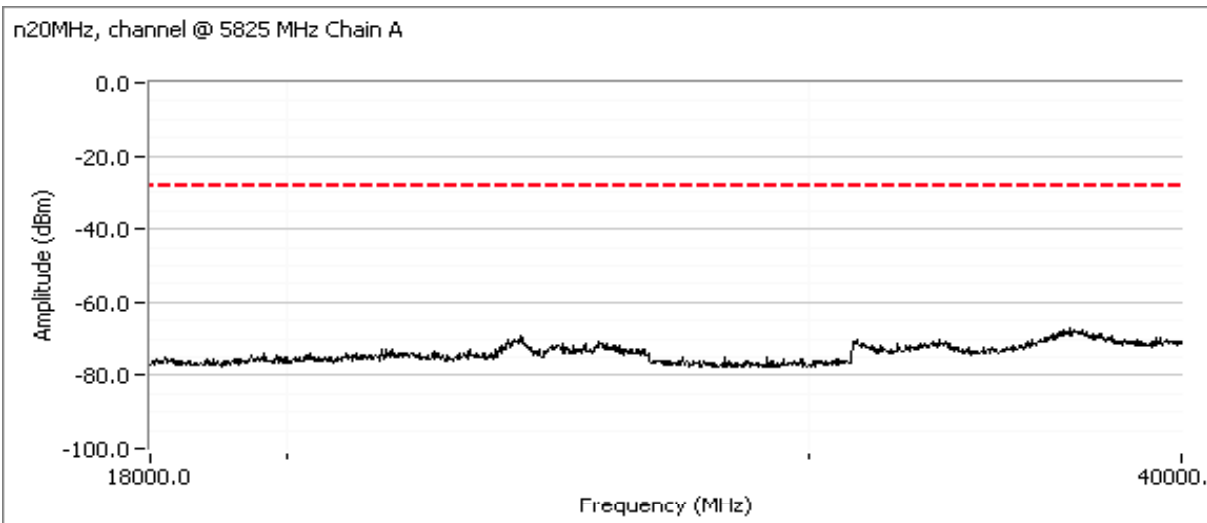
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



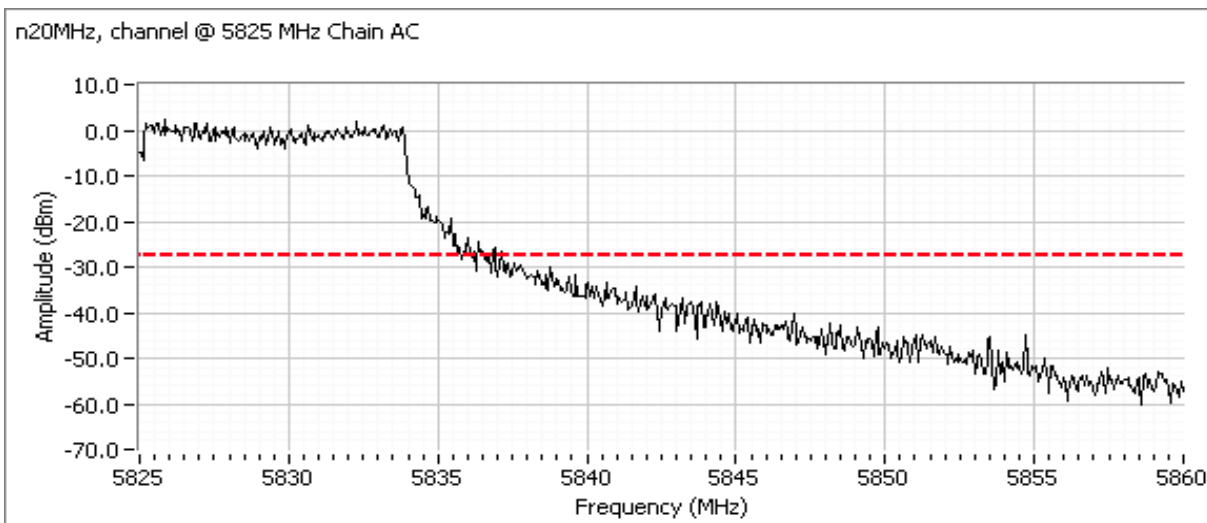
Plots for high channel - 802.11n 20MHz, power setting(s) = 17.0



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

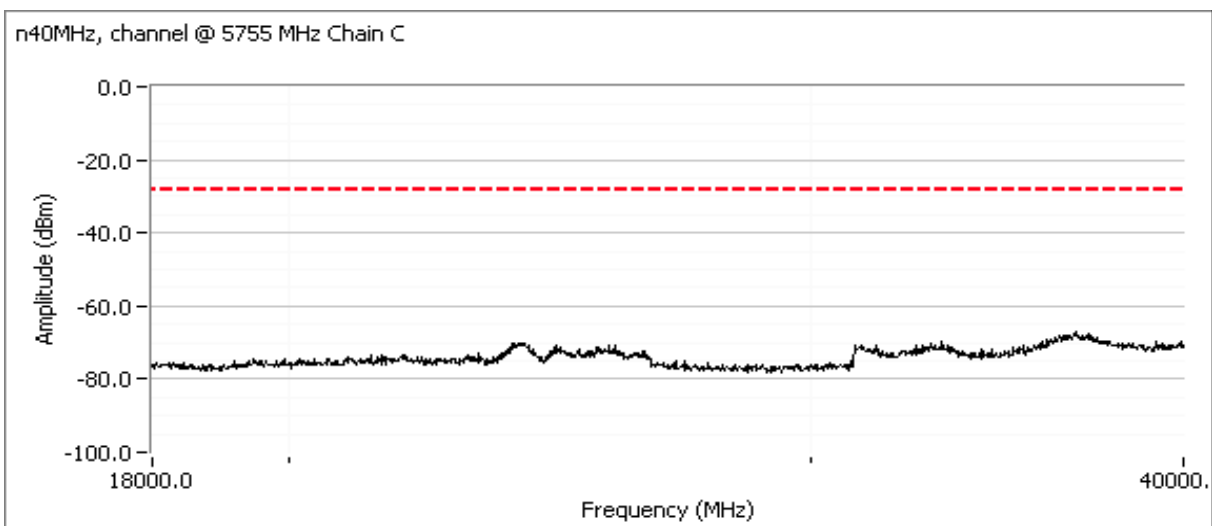
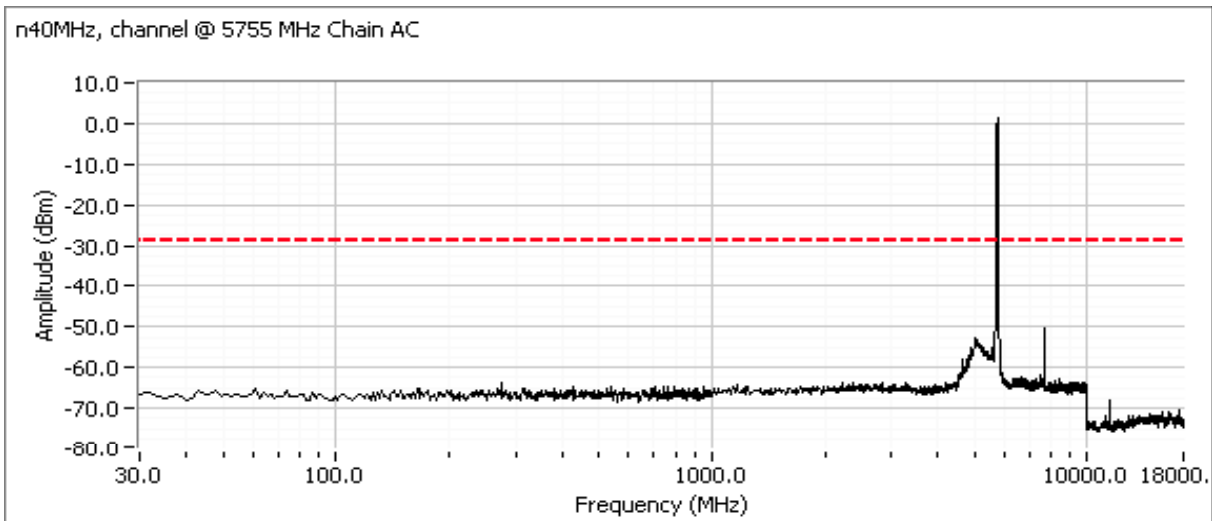


Additional plot showing compliance with -30dBc limit at 5850 MHz



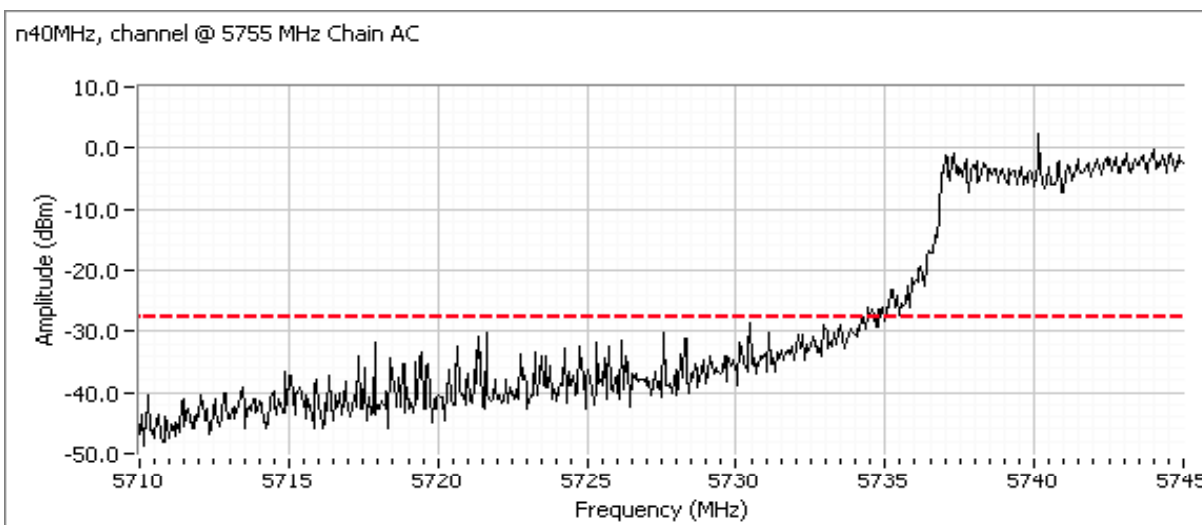
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Plots for low channel - 802.11n 40MHz, power setting(s) = 17.0

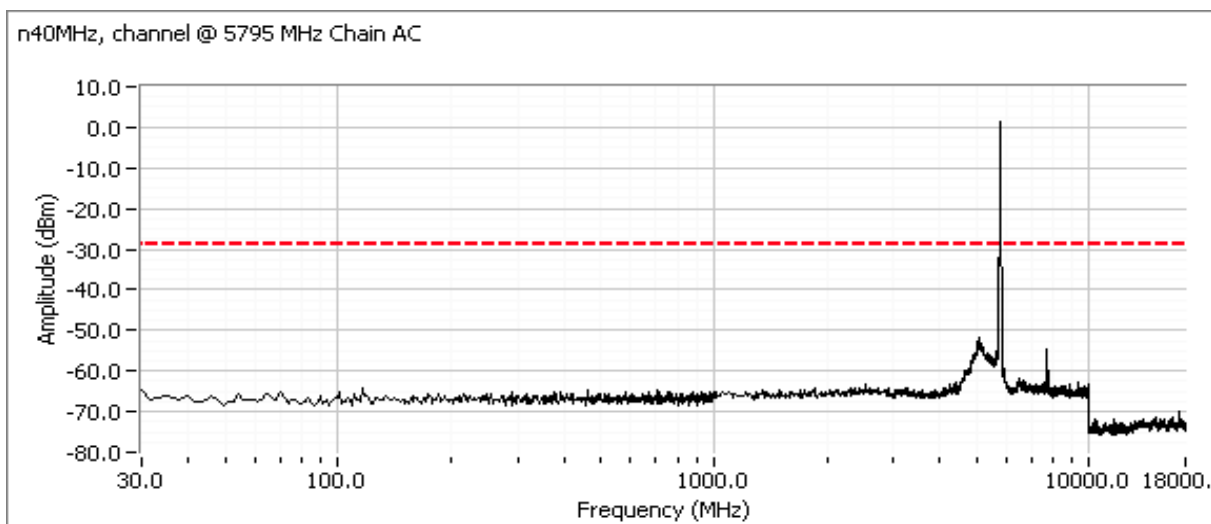


Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

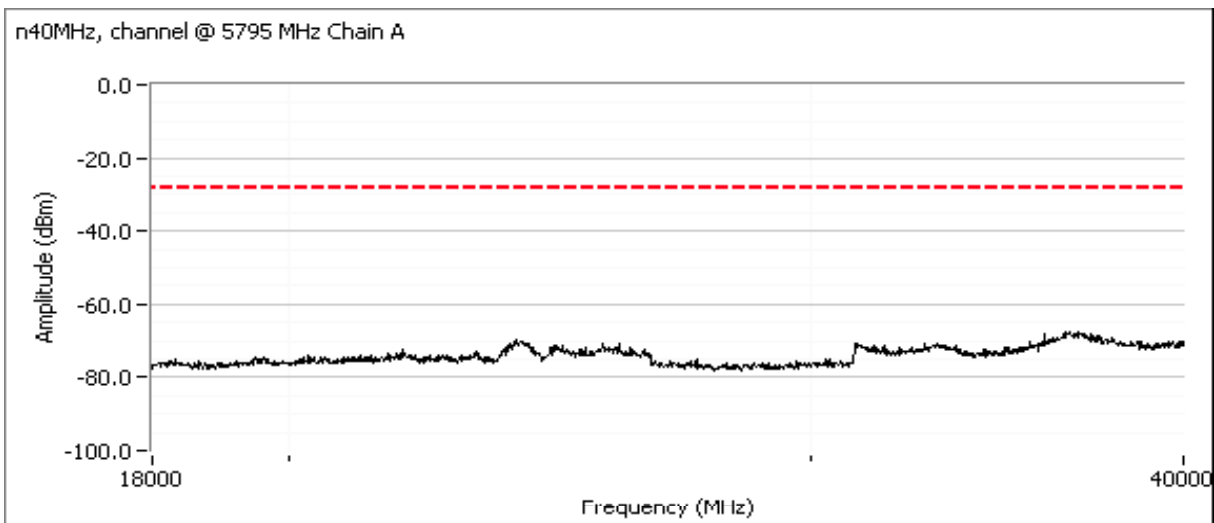
Additional plot showing compliance with -30dBc limit at 5725 MHz



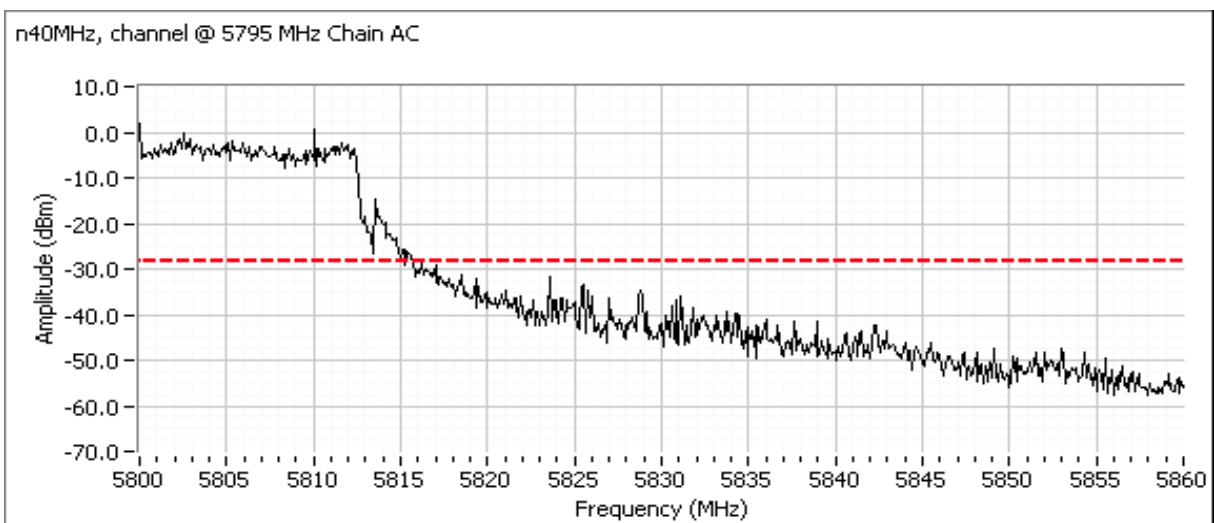
Plots for high channel - 802.11n 40MHz, power setting(s) = 17.0



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73386
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A



Additional plot showing compliance with -30dBc limit at 5850 MHz



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
		Account Manager:	Susan Pelzl
Contact:	Steve Smith		Mark Briggs
Emissions Standard(s):	FCC 15.247 / RSS 210	Class:	DTS
Immunity Standard(s):	-	Environment:	Wireless

DTS Radiated Emissions Test Data

For The

Xirrus

Model

XN4

Date of Last Test: 11/14/2008

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions 2390 MHz and 2483.5 MHz Restricted 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: 10-25 °C
Rel. Humidity: 25-65 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

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

Run #	Mode	Channel	Power Setting	Test Performed	Limit	Result / Margin
1a	802.11b Chain A	2412	19dBm	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	52.2dBμV/m (407.4μV/m) @ 2387.4MHz (-1.8dB)
1b		2462	19dBm	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	53.5dBμV/m (473.2μV/m) @ 2487.9MHz (-0.5dB)
2a	802.11b Chain A+B+C	2412	18dBm	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	51.8dBμV/m (389.0μV/m) @ 2386.9MHz (-2.2dB)
2b		2462	19dBm	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	48.8dBμV/m (275.4μV/m) @ 2488.0MHz (-5.2dB)
3a	802.11g Chain A	2412	17dBm	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	46.3dBμV/m (206.5μV/m) @ 2389.9MHz (-7.7dB)
3b		2462	17dBm	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	51.3dBμV/m (367.3μV/m) @ 2483.6MHz (-2.7dB)
4a	802.11g Chain A+B+C	2412	17dBm	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	49.8dBμV/m (309.0μV/m) @ 2389.9MHz (-4.2dB)
4b		2462	17dBm	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	51.1dBμV/m (358.9μV/m) @ 2483.7MHz (-2.9dB)
5a	802.11n20 Chain A+B+C	2412	17dBm	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	51.8dBμV/m (389.0μV/m) @ 2389.9MHz (-2.2dB)
5b		2462	17dBm	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	53.5dBμV/m (473.2μV/m) @ 2483.5MHz (-0.5dB)
6a	802.11n40 Chain A+B+C	2412	15dBm	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	71.3dBμV/m (3672.8μV/m) @ 2388.7MHz (-2.7dB)
6b		2462	14dBm	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	72.7dBμV/m (4315.2μV/m) @ 2484.7MHz (-1.3dB)

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #1: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11b, Single Chain, Radio 2

Date of Test: 10/23/2008
Test Engineer: Suhaila Khushzad
Test Location: OATS # 1

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

Run #1a: 802.11b, Single Chain @ 2412 MHz with power setting of 19dBm

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2413.170	100.5	V	-	-	AVG	154	1.0	RB 1.000 MHz; VB: 10 Hz
2413.420	103.7	V	-	-	PK	154	1.0	RB 1.000 MHz; VB: 1.000 MHz
2413.330	100.2	H	-	-	AVG	191	1.3	RB 1.000 MHz; VB: 10 Hz
2413.500	103.4	H	-	-	PK	191	1.3	RB 1.000 MHz; VB: 1.000 MHz
2413.420	98.9	H	-	-	PK	191	1.3	RB 100 kHz; VB: 100 kHz
2413.920	99.0	V	-	-	PK	154	1.0	RB 100 kHz; VB: 100 kHz

	V	H
Fundamental emission level @ 3m in 100kHz RBW:	99	98.9
Limit for emissions outside of restricted bands:	69 dBμV/m	

Limit is -30dBc (UNII power measurement)

Band Edge Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2386.600	51.7	H	54.0	-2.3	AVG	191	1.3	RB 1.000 MHz; VB: 10 Hz
2387.400	52.2	V	54.0	-1.8	AVG	154	1.0	RB 1.000 MHz; VB: 10 Hz
2386.330	60.5	H	74.0	-13.5	PK	191	1.3	RB 1.000 MHz; VB: 1.000 MHz
2386.600	59.8	V	74.0	-14.2	PK	154	1.0	RB 1.000 MHz; VB: 1.000 MHz

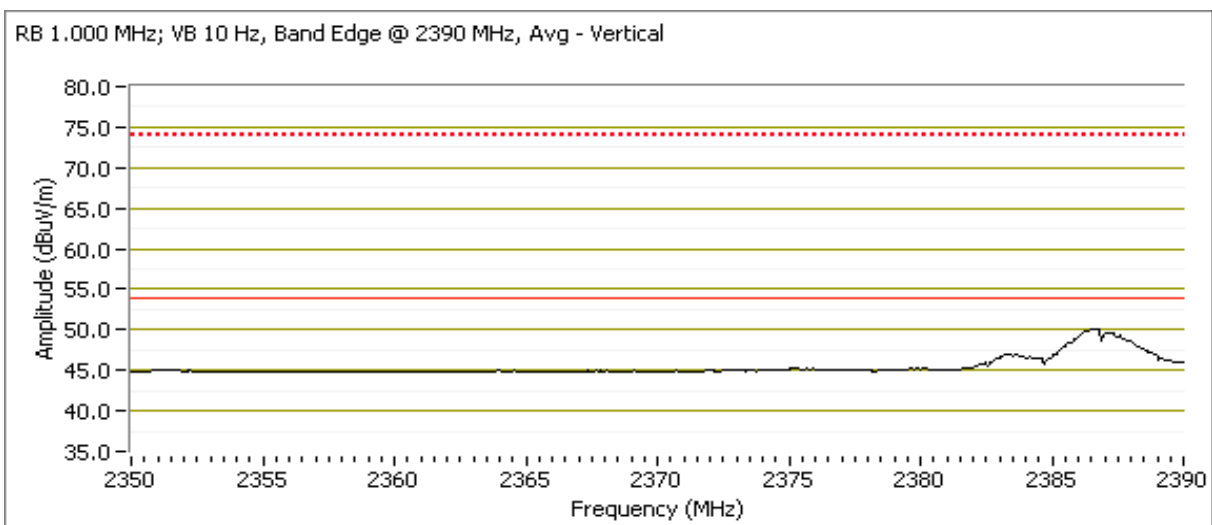
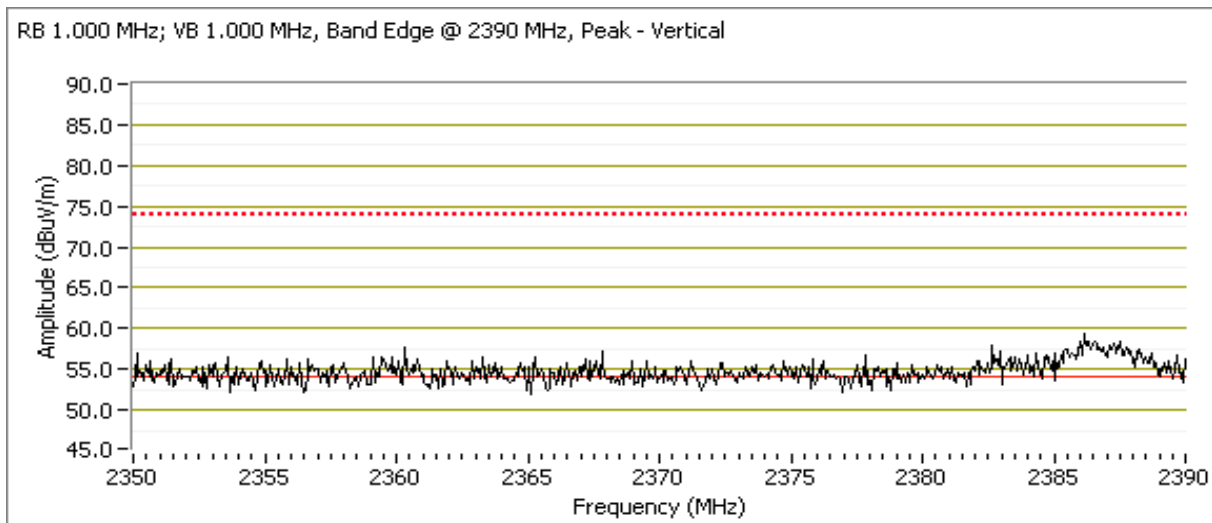
Note 1:

The restricted band edge is at 2390 MHz. For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #1: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11b, Single Chain, Radio 2

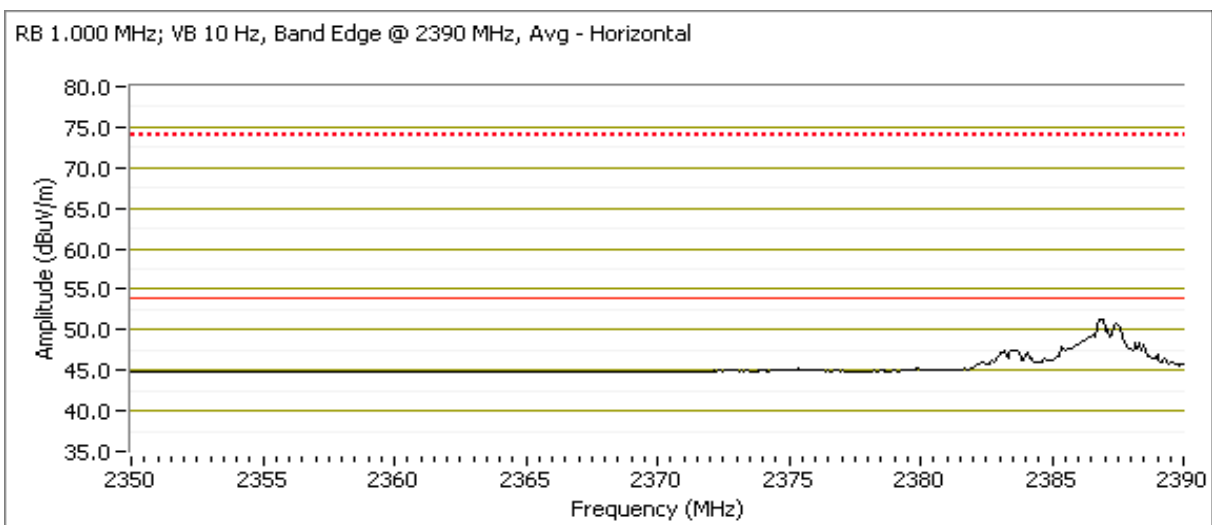
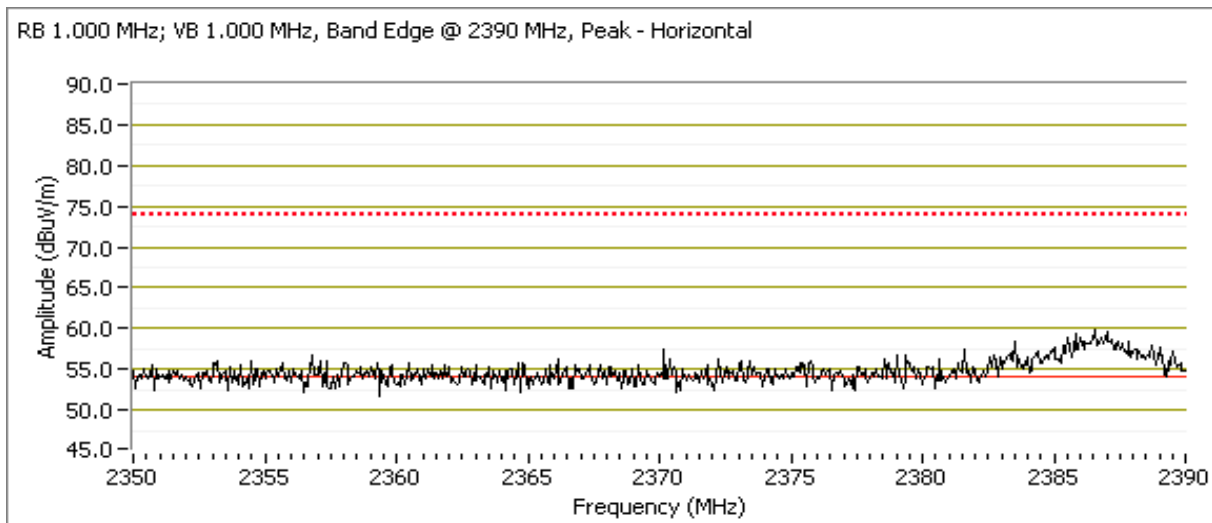
Run #1a: 802.11b, Single Chain @ 2412 MHz with power setting of 19dBm



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #1: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11b, Single Chain, Radio 2

Run #1a: 802.11b, Single Chain @ 2412 MHz with power setting of 19dBm



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #1: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11b, Single Chain, Radio 2

Run #1b: 802.11b, Single Chain @ 2462 MHz with power setting of 19dBm

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2461.360	99.5	V	-	-	AVG	152	1.2	RB 1.000 MHz; VB: 10 Hz
2461.360	102.4	V	-	-	PK	152	1.2	RB 1.000 MHz; VB: 1.000 MHz
2461.430	97.4	H	-	-	AVG	244	1.8	RB 1.000 MHz; VB: 10 Hz
2461.360	100.4	H	-	-	PK	244	1.8	RB 1.000 MHz; VB: 1.000 MHz
2461.860	96.8	H	-	-	PK	244	1.8	RB 100 kHz; VB: 100 kHz
2462.860	97.9	V	-	-	PK	152	1.2	RB 100 kHz; VB: 100 kHz

	V	H
Fundamental emission level @ 3m in 100kHz RBW:	97.9	96.8
Limit for emissions outside of restricted bands:	67.9 dBμV/m	

Limit is -30dBc (UNII power measurement)

Band Edge Signal Field Strength

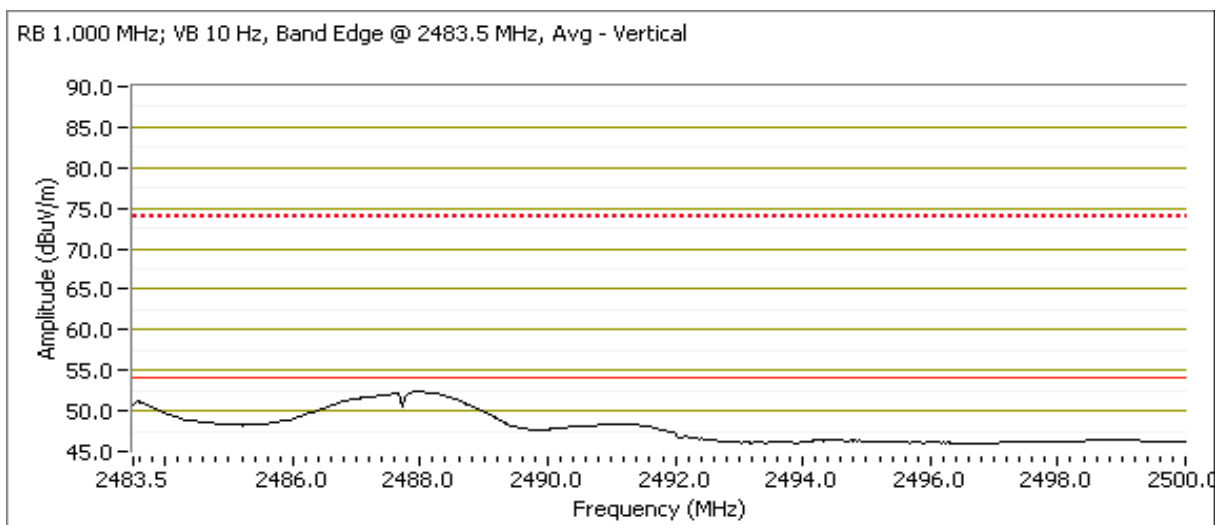
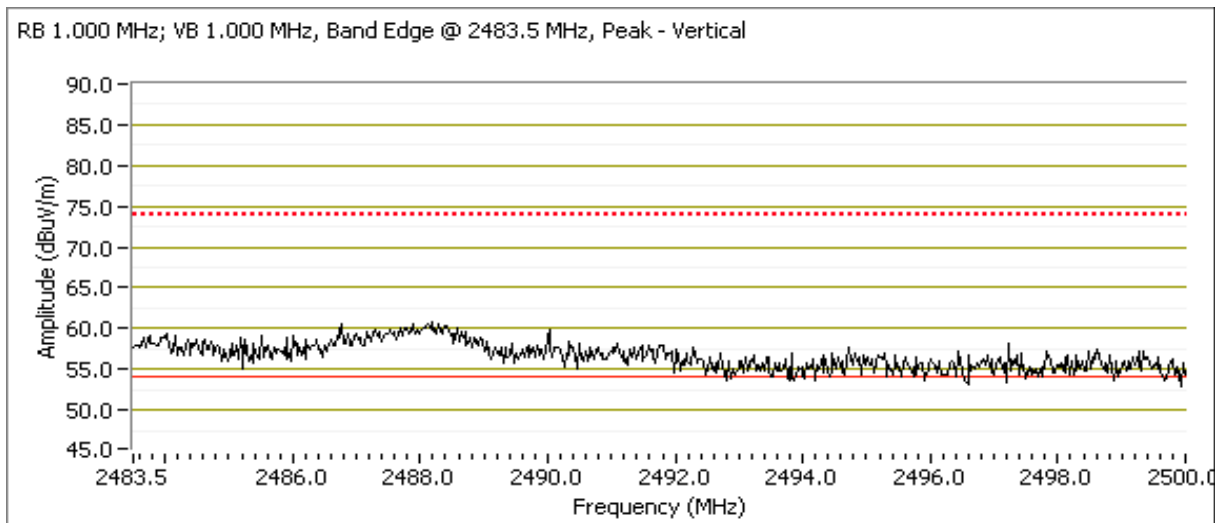
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2487.870	53.5	V	54.0	-0.5	AVG	152	1.2	RB 1.000 MHz; VB: 10 Hz
2487.870	51.8	H	54.0	-2.2	AVG	244	1.8	RB 1.000 MHz; VB: 10 Hz
2484.430	60.6	H	74.0	-13.4	PK	244	1.8	RB 1.000 MHz; VB: 1.000 MHz
2487.820	61.6	V	74.0	-12.4	PK	152	1.2	RB 1.000 MHz; VB: 1.000 MHz

Note 1: The restricted band edge is at 2483.5 MHz. For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #1: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11b, Single Chain, Radio 2

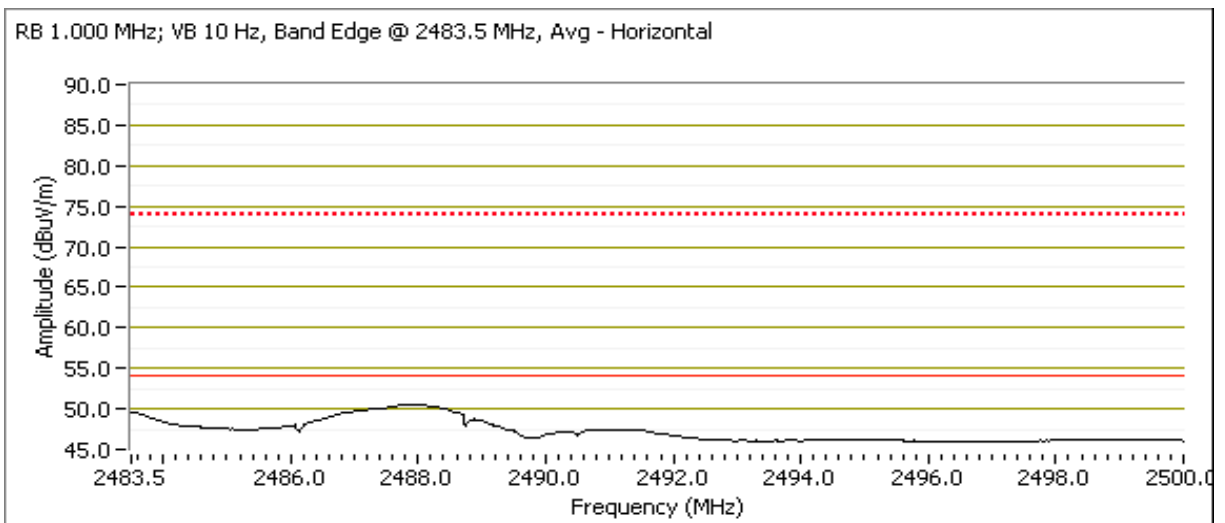
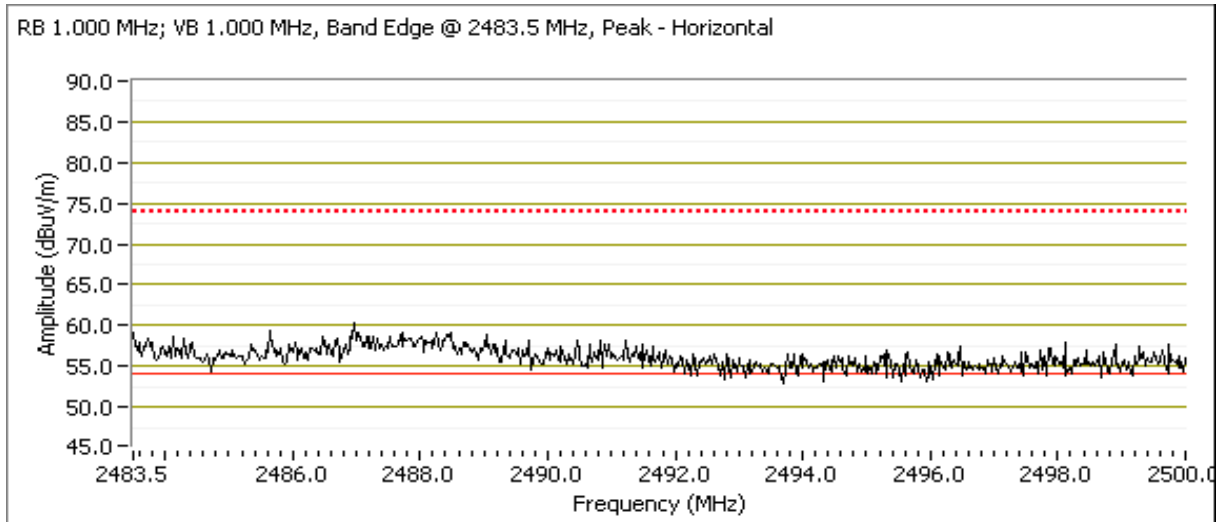
Run #1b: 802.11b, Single Chain @ 2462 MHz with power setting of **19dBm**



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #1: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11b, Single Chain, Radio 2

Run #1b: 802.11b, Single Chain @ 2462 MHz with power setting of **19dBm**



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #2: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11b, All Chains Active

Date of Test: 10/23/2008
Test Engineer: Suhaila Khushzad
Test Location: OATS # 1

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

Run #2a: 802.11b, All Chains Active @ 2412 MHz with power setting of 18dBm

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2415.330	105.4	V	-	-	AVG	179	1.0	RB 1.000 MHz; VB: 10 Hz
2414.830	107.7	V	-	-	PK	179	1.0	RB 1.000 MHz; VB: 1.000 MHz
2414.330	102.7	H	-	-	AVG	105	1.3	RB 1.000 MHz; VB: 10 Hz
2414.170	104.2	H	-	-	PK	105	1.3	RB 1.000 MHz; VB: 1.000 MHz
2409.830	102.0	H	-	-	PK	105	1.3	RB 100 kHz; VB: 100 kHz
2411.500	102.3	V	-	-	PK	179	1.0	RB 100 kHz; VB: 100 kHz

	V	H
Fundamental emission level @ 3m in 100kHz RBW:	102.3	102.0
Limit for emissions outside of restricted bands:	72.3 dBμV/m	

Limit is -30dBc (UNII power measurement)

Band Edge Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2386.600	47.8	H	54.0	-6.2	AVG	105	1.3	RB 1.000 MHz; VB: 10 Hz
2386.870	51.8	V	54.0	-2.2	AVG	179	1.0	RB 1.000 MHz; VB: 10 Hz
2367.870	57.4	H	74.0	-16.6	PK	105	1.3	RB 1.000 MHz; VB: 1.000 MHz
2382.470	57.3	V	74.0	-16.7	PK	179	1.0	RB 1.000 MHz; VB: 1.000 MHz

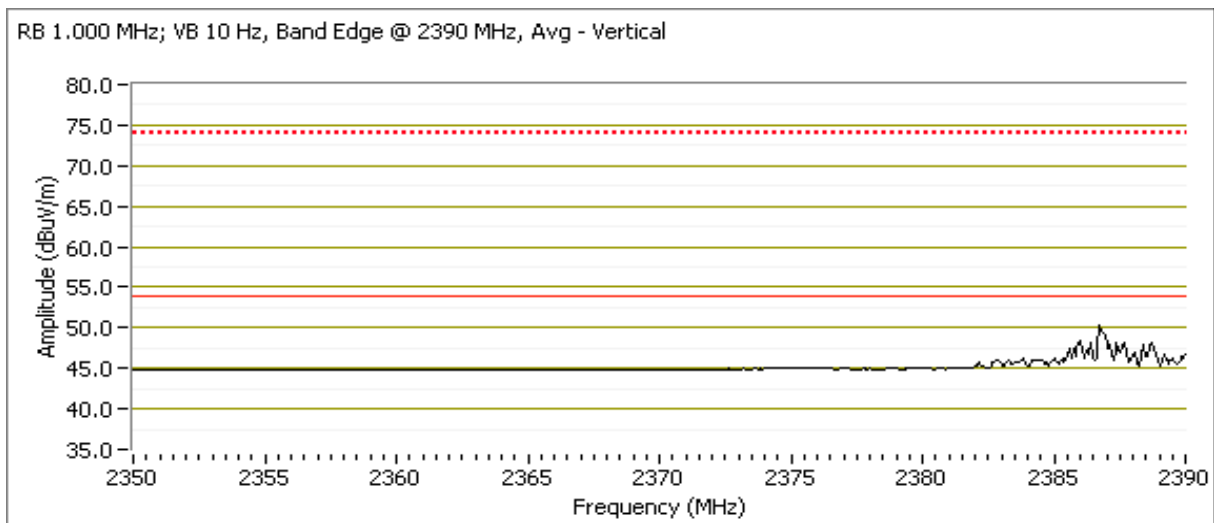
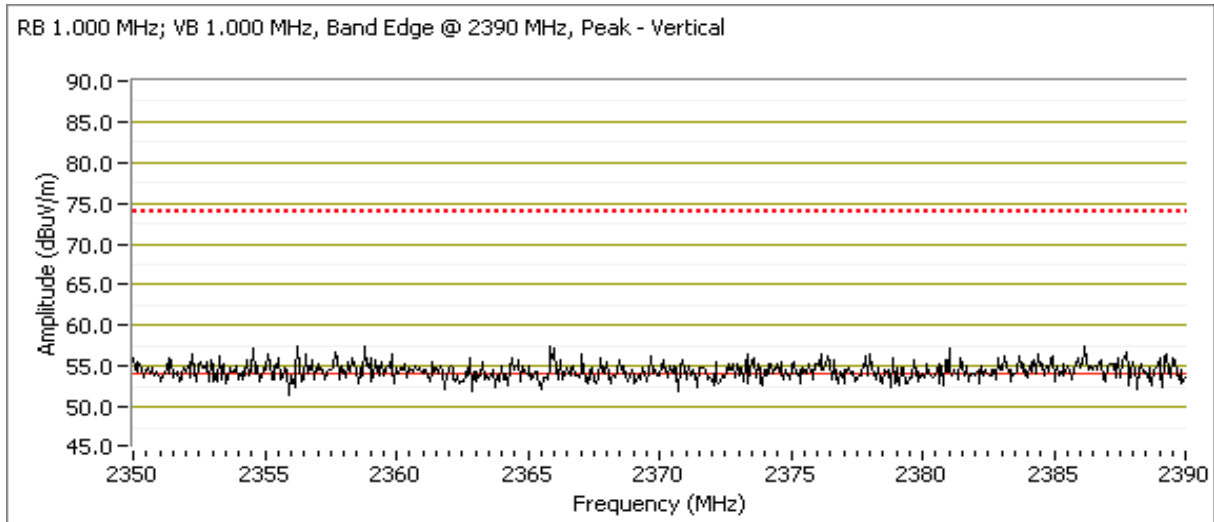
Note 1:

The restricted band edge is at 2390 MHz. For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #2: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11b, All Chains Active

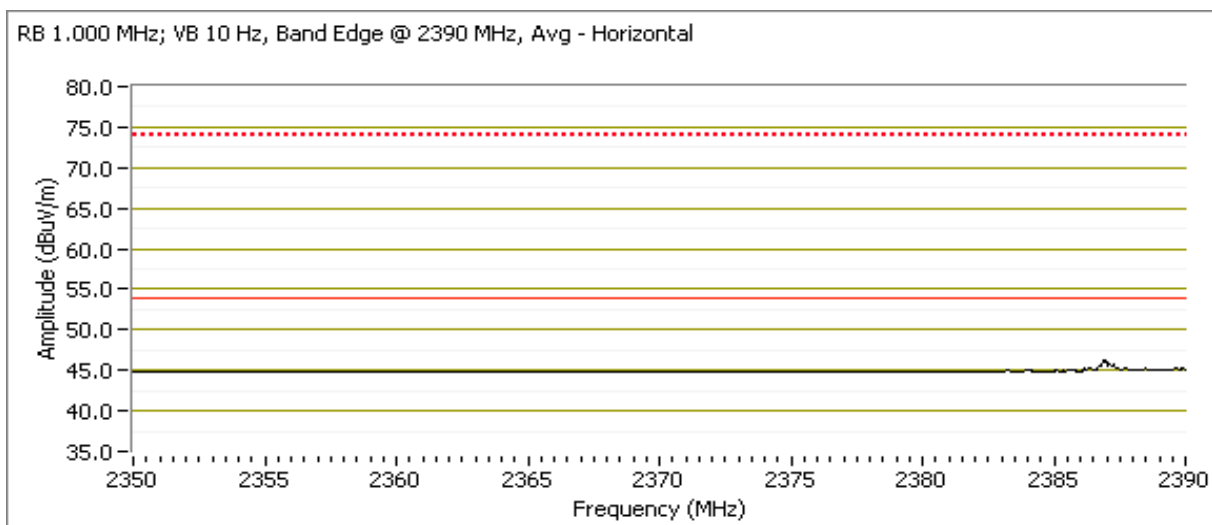
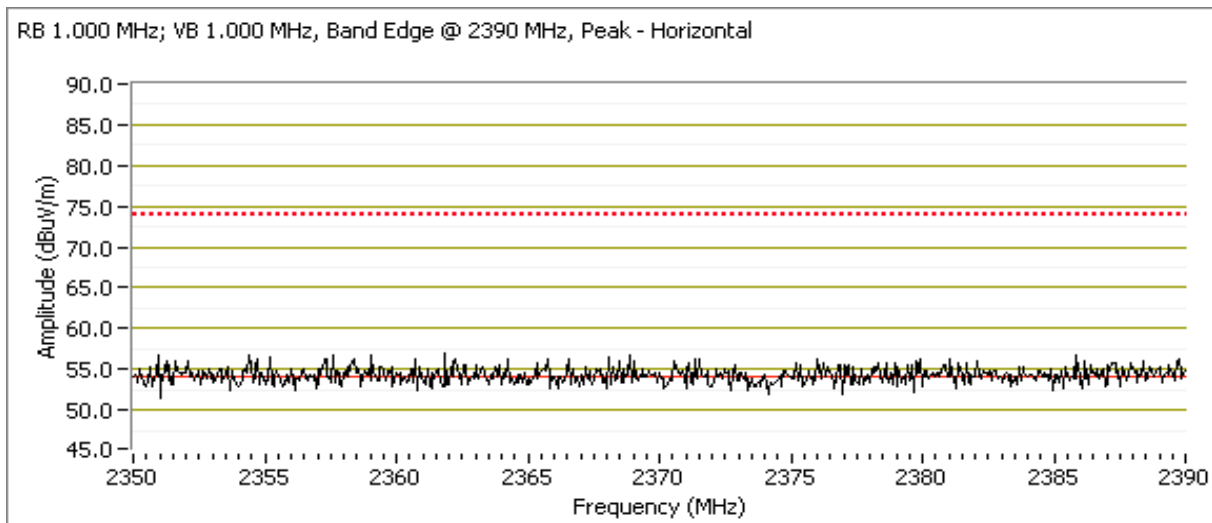
Run #2a: 802.11b, All Chains Active @ 2412 MHz with power setting of 18dBm



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #2: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11b, All Chains Active

Run #2a: 802.11b, All Chains Active @ 2412 MHz with power setting of 18dBm



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #2: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11b, All Chains Active

Run #2b: 802.11b, All Chains Active @ 2462 MHz with power setting of 19

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2459.560	105.5	V	-	-	AVG	172	1.4	RB 1.000 MHz; VB: 10 Hz
2460.710	108.6	V	-	-	PK	172	1.4	RB 1.000 MHz; VB: 1.000 MHz
2463.510	100.5	H	-	-	AVG	129	2.0	RB 1.000 MHz; VB: 10 Hz
2459.710	101.2	H	-	-	PK	129	2.0	RB 1.000 MHz; VB: 1.000 MHz
2458.780	98.5	H	-	-	PK	129	2.0	RB 100 kHz; VB: 100 kHz
2462.860	103.9	V	-	-	PK	172	1.4	RB 100 kHz; VB: 100 kHz

	V	H
Fundamental emission level @ 3m in 100kHz RBW:	103.9	98.5
Limit for emissions outside of restricted bands:	73.9 dB μ V/m	

Limit is -30dBc (UNII power measurement)

Band Edge Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2488.040	48.8	V	54.0	-5.2	AVG	172	1.4	RB 1.000 MHz; VB: 10 Hz
2488.280	48.2	H	54.0	-5.8	AVG	129	2.0	RB 1.000 MHz; VB: 10 Hz
2488.310	59.4	V	74.0	-14.6	PK	172	1.4	RB 1.000 MHz; VB: 1.000 MHz
2490.840	58.4	H	74.0	-15.6	PK	129	2.0	RB 1.000 MHz; VB: 1.000 MHz

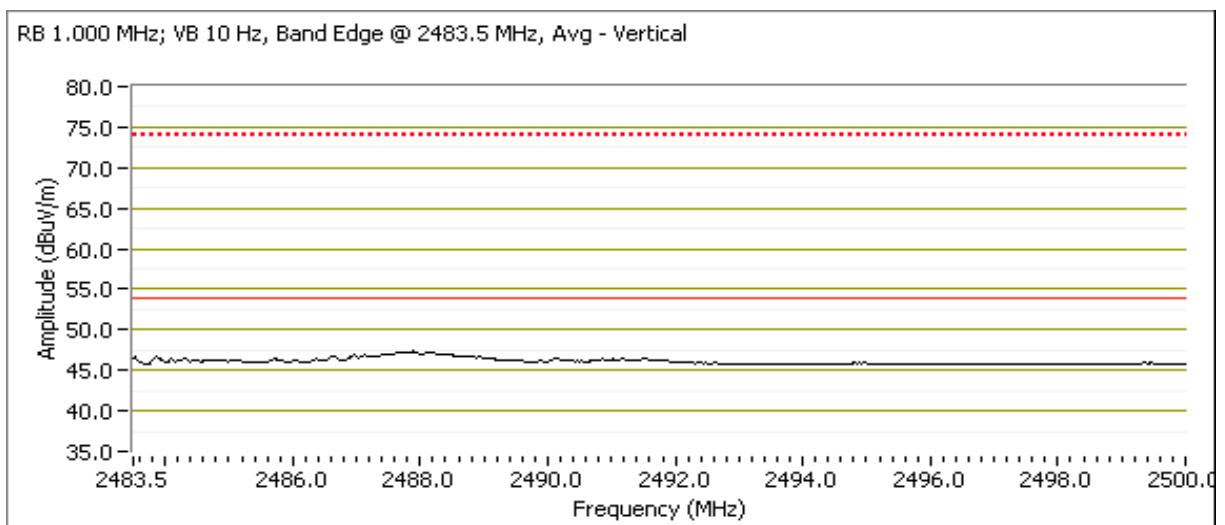
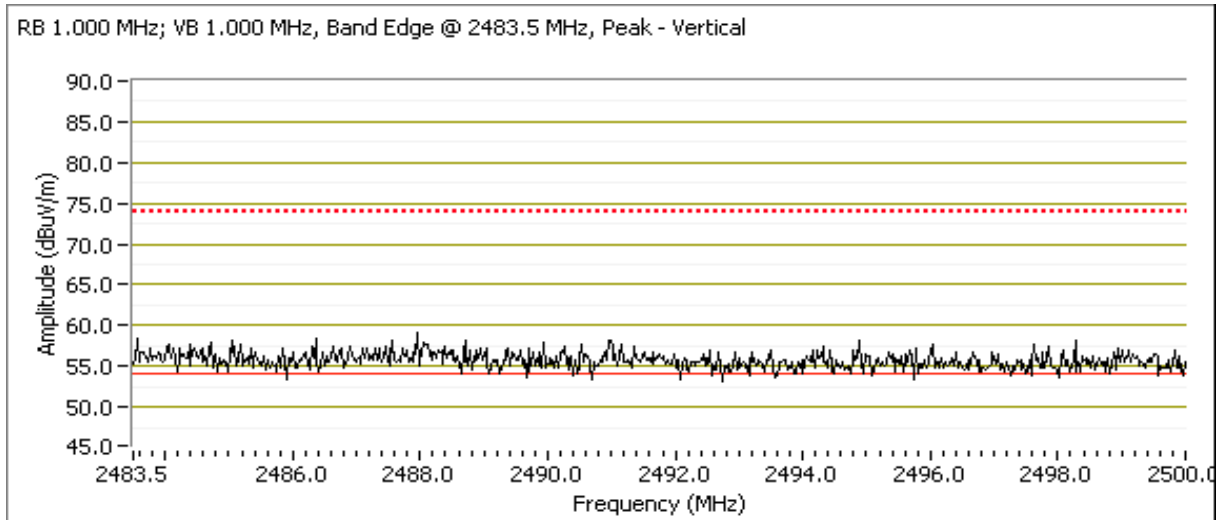
Note 1:

The restricted band edge is at 2483.5 MHz. For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #2: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11b, All Chains Active

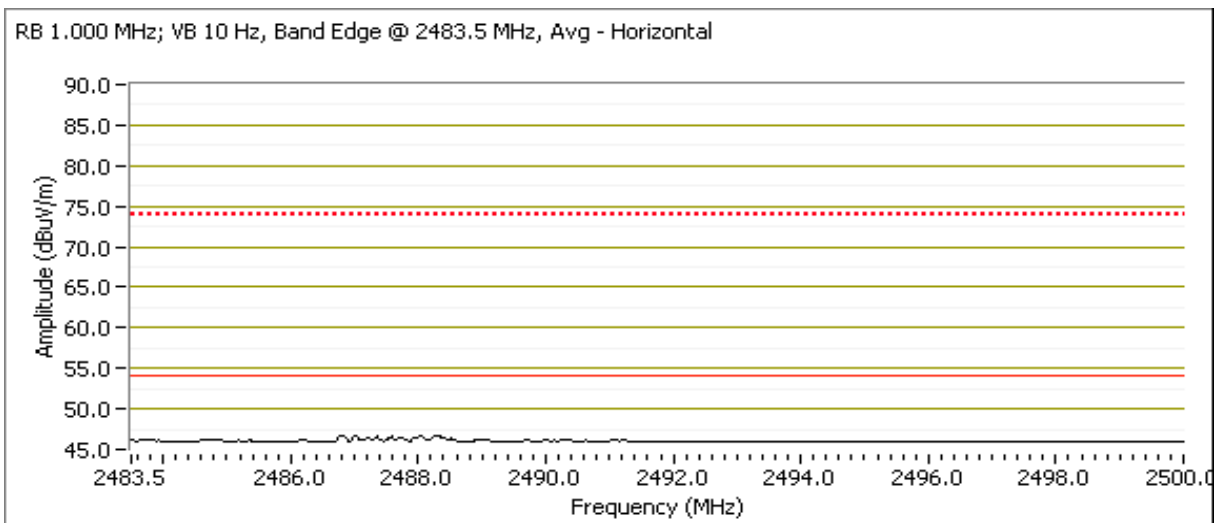
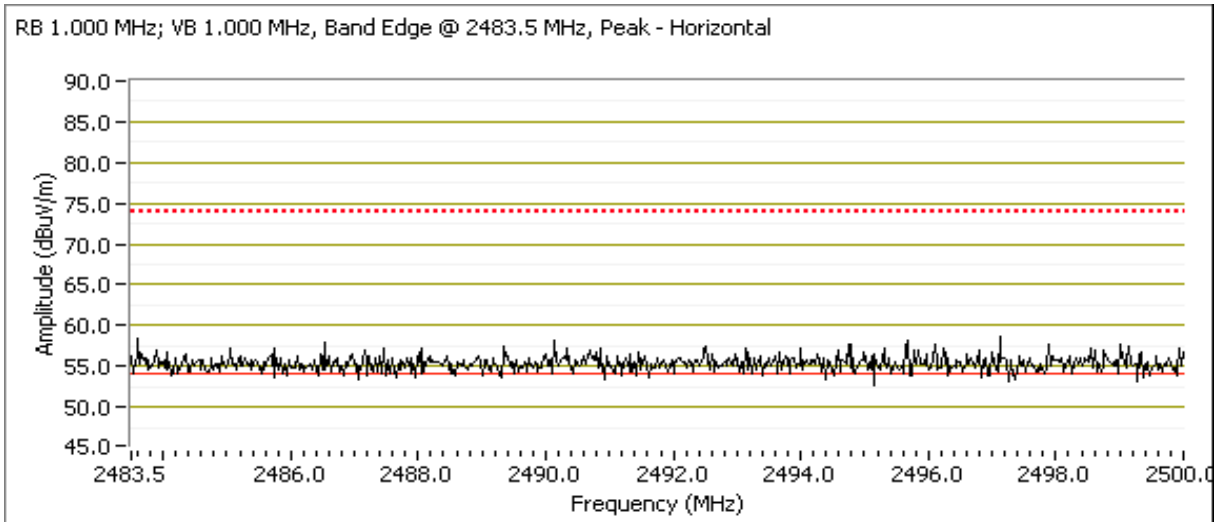
Run #2b: 802.11b, All Chains Active @ 2462 MHz with power setting of 19



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #2: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11b, All Chains Active

Run #2b: 802.11b, All Chains Active @ 2462 MHz with power setting of 19



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #3: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11g, Single Chain

Date of Test: 10/23/2008 Config. Used: 1
 Test Engineer: Suhaila Khushzad Config Change: None
 Joseph Cadiqal
 Test Location: OATS # 1 EUT Voltage: POE

Run #3a: 802.11g, Single Chain @ 2412 MHz with power setting of 17dBm

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2412.500	92.4	V	-	-	AVG	52	1.0	RB 1.000 MHz; VB: 10 Hz
2415.400	100.1	V	-	-	PK	52	1.0	RB 1.000 MHz; VB: 1.000 MHz
2412.420	90.2	H	-	-	AVG	58	1.0	RB 1.000 MHz; VB: 10 Hz
2416.500	98.2	H	-	-	PK	58	1.0	RB 1.000 MHz; VB: 1.000 MHz
2412.330	88.5	H	-	-	PK	58	1.0	RB 100 kHz; VB: 100 kHz
2412.330	90.3	V	-	-	PK	52	1.0	RB 100 kHz; VB: 100 kHz

	V	H
Fundamental emission level @ 3m in 100kHz RBW:	90.3	88.5
Limit for emissions outside of restricted bands:	60.3 dB μ V/m	

Limit is -30dBc (UNII power measurement)

Band Edge Signal Field Strength

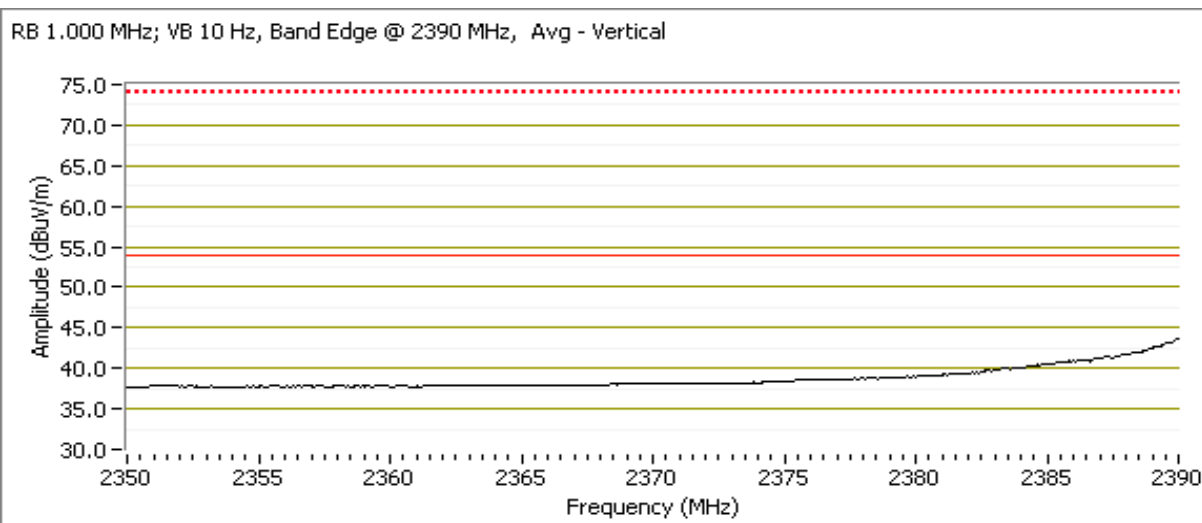
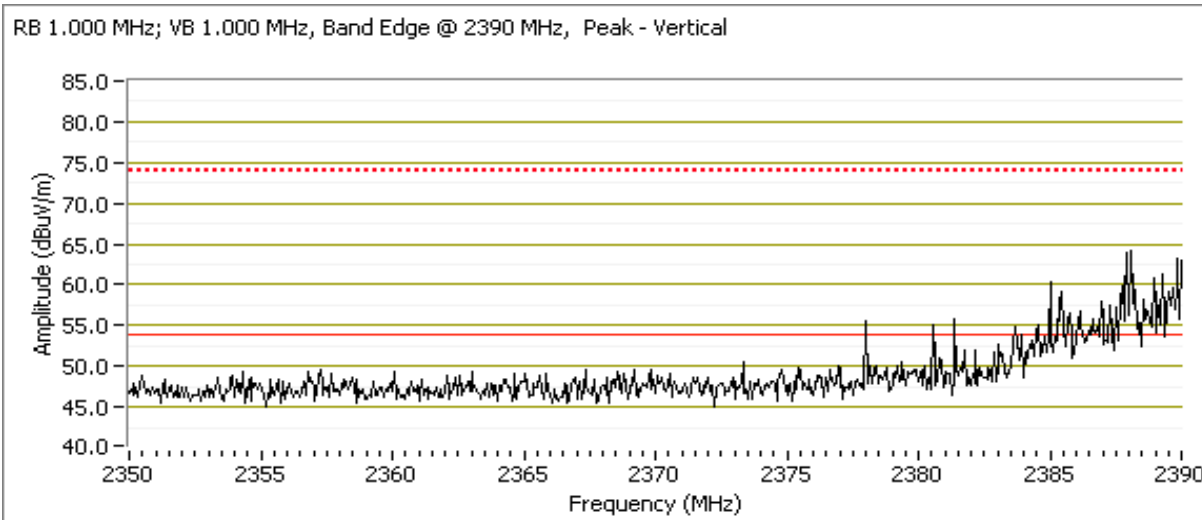
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.930	46.3	V	54.0	-7.7	AVG	52	1.0	RB 1.000 MHz; VB: 10 Hz
2389.930	45.2	H	54.0	-8.8	AVG	58	1.0	RB 1.000 MHz; VB: 10 Hz
2387.200	64.2	V	74.0	-9.8	PK	52	1.0	RB 1.000 MHz; VB: 1.000 MHz
2389.730	63.0	H	74.0	-11.0	PK	58	1.0	RB 1.000 MHz; VB: 1.000 MHz

Note 1: The restricted band edge is at 2390 MHz. For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #3: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11g, Single Chain

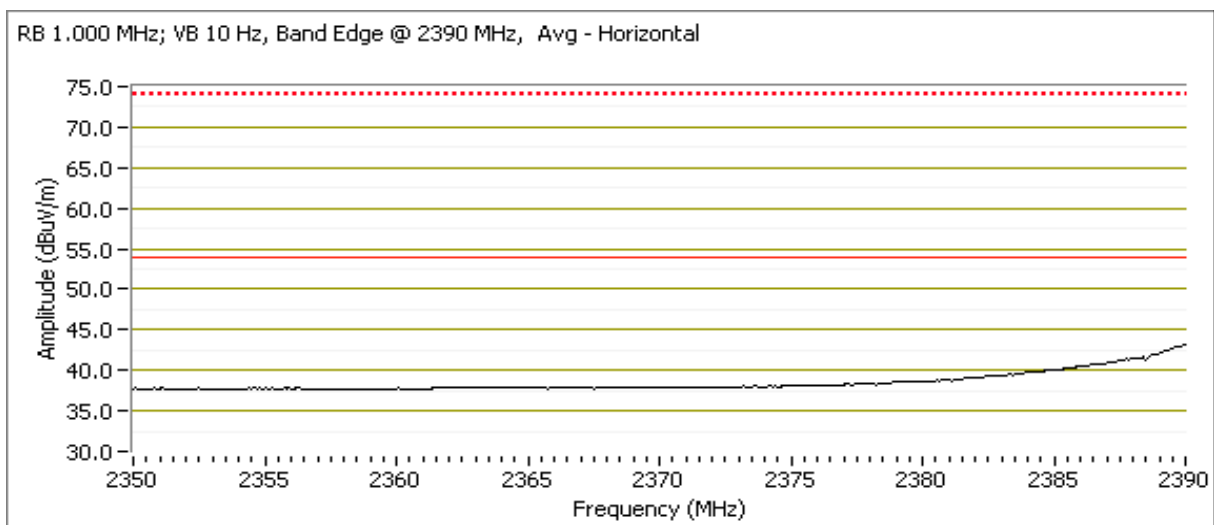
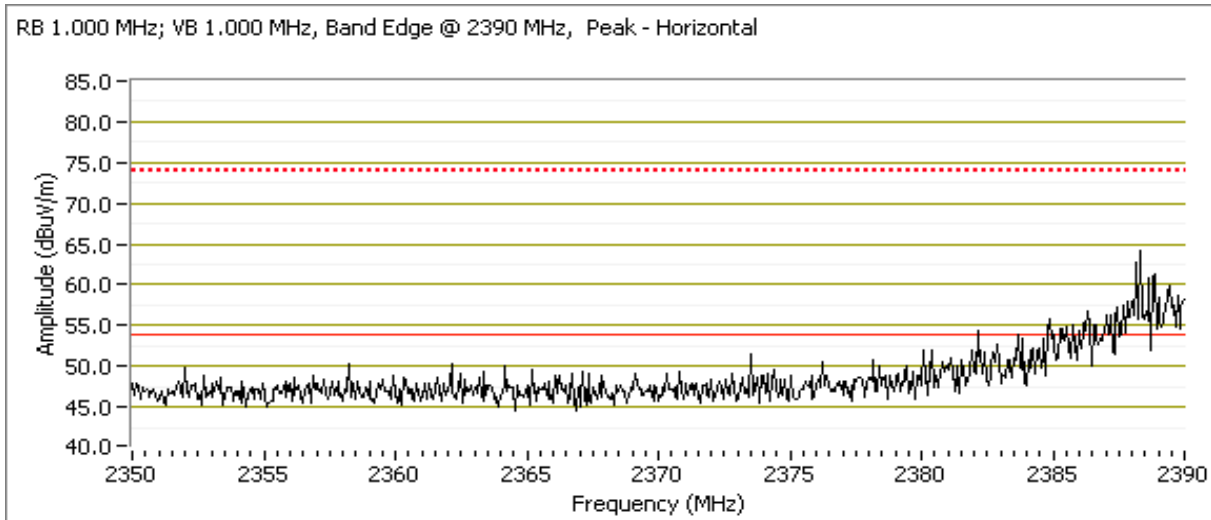
Run #3a: 802.11g, Single Chain @ 2412 MHz with power setting of **17**



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #3: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11g, Single Chain

Run #3a: 802.11g, Single Chain @ 2412 MHz with power setting of **17dBm**



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #3: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11g, Single Chain

Run #3b: 802.11g, Single Chain @ 2462 MHz with power setting of 17dBm

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	PK/QP/Avg	degrees	meters	
2460.780	94.7	V	-	-	AVG	133	1.5	RB 1.000 MHz; VB: 10 Hz
2459.920	103.0	V	-	-	PK	133	1.5	RB 1.000 MHz; VB: 1.000 MHz
2460.500	87.1	H	-	-	AVG	166	1.3	RB 1.000 MHz; VB: 10 Hz
2457.410	95.0	H	-	-	PK	166	1.3	RB 1.000 MHz; VB: 1.000 MHz
2468.590	85.6	H	-	-	PK	166	1.3	RB 100 kHz; VB: 100 kHz
2462.500	91.9	V	-	-	PK	133	1.5	RB 100 kHz; VB: 100 kHz

	V	H
Fundamental emission level @ 3m in 100kHz RBW:	91.9	85.6
Limit for emissions outside of restricted bands:	61.9 dB μ V/m	

Limit is -30dBc (UNII power measurement)

Band Edge Signal Field Strength

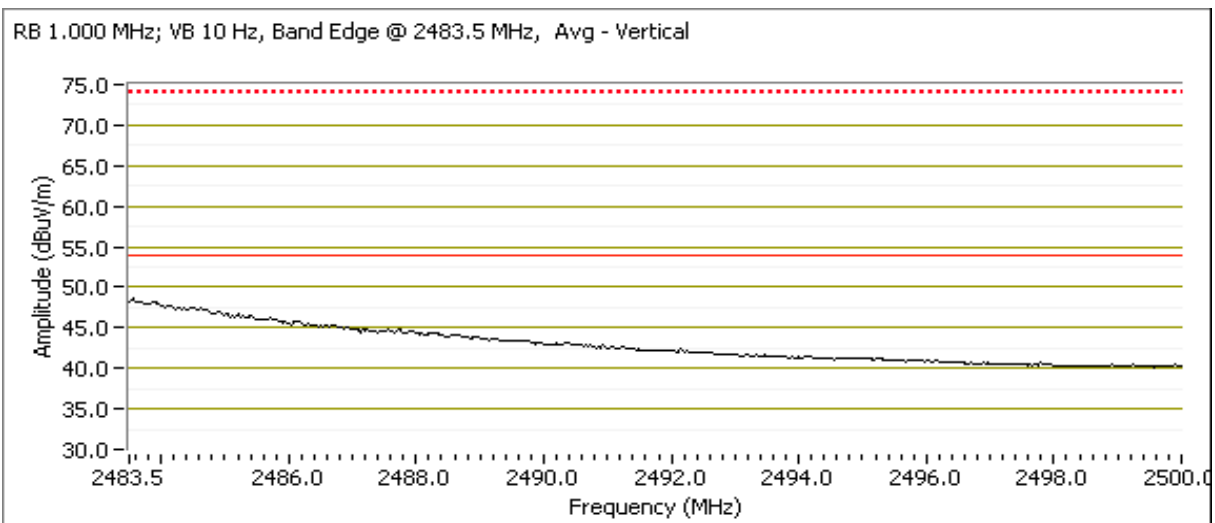
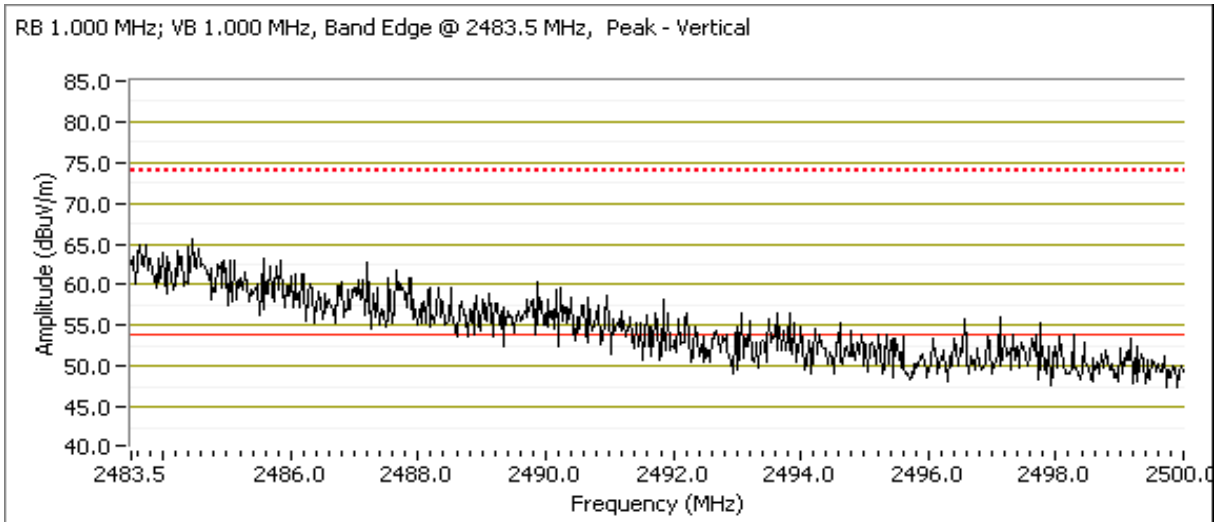
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	PK/QP/Avg	degrees	meters	
2483.500	45.4	H	54.0	-8.6	AVG	166	1.3	RB 1.000 MHz; VB: 10 Hz
2483.550	51.3	V	54.0	-2.7	AVG	133	1.5	RB 1.000 MHz; VB: 10 Hz
2483.530	61.0	H	74.0	-13.0	PK	166	1.3	RB 1.000 MHz; VB: 1.000 MHz
2484.050	68.9	V	74.0	-5.1	PK	133	1.5	RB 1.000 MHz; VB: 1.000 MHz

Note 1: The restricted band edge is at 2483.5 MHz. For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #3: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11g, Single Chain

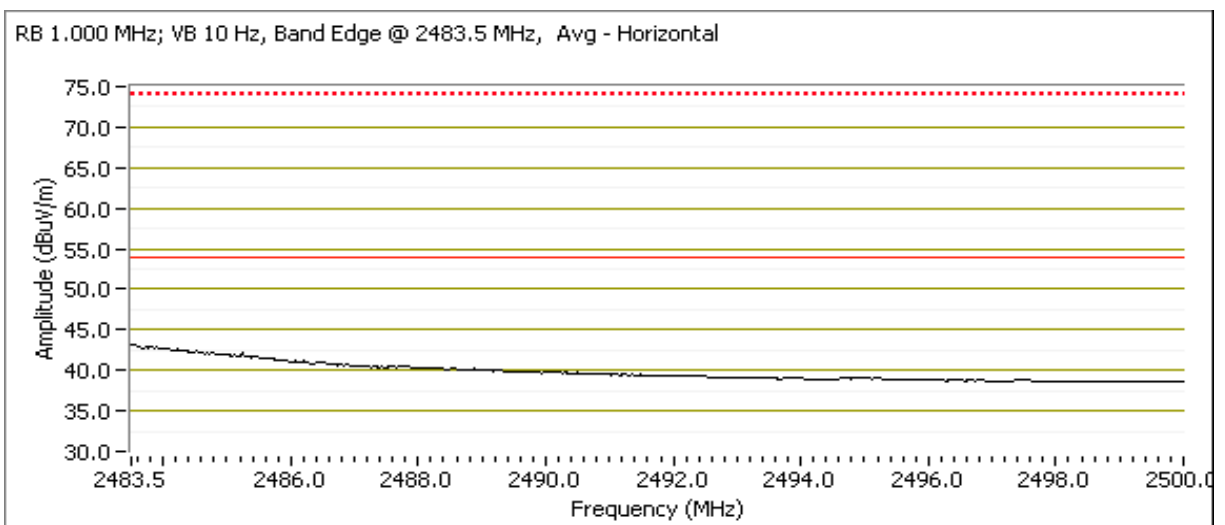
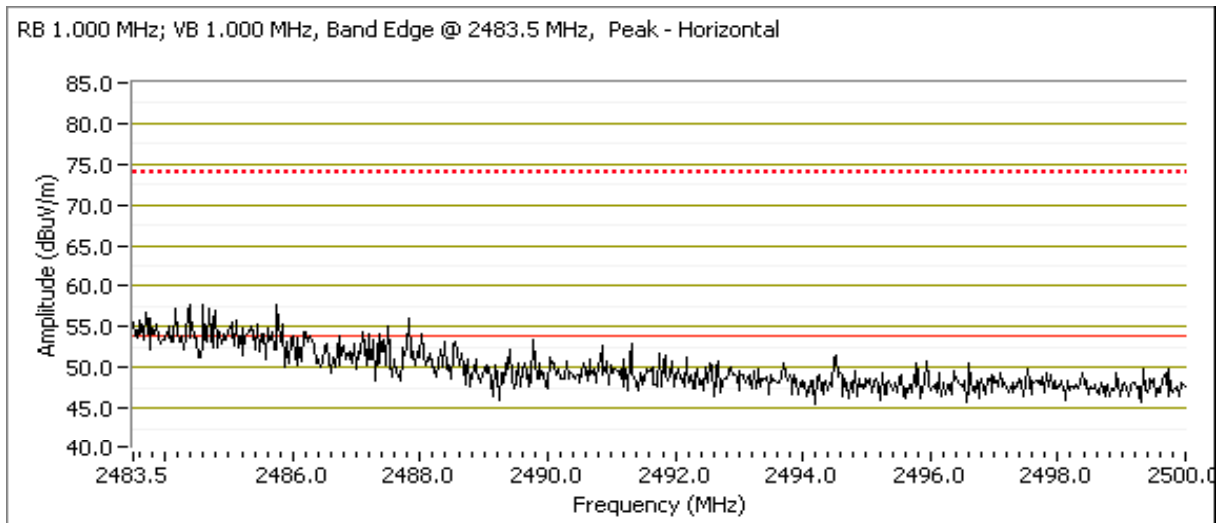
Run #3b: 802.11g, Single Chain @ 2462 MHz with power setting of 17dBm



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #3: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11g, Single Chain

Run #3b: 802.11g, Single Chain @ 2462 MHz with power setting of 17dBm



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #4: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11g, All Chains Active

Date of Test: 10/23/2008
Test Engineer: Joseph Cadigal
Test Location: OATS # 1

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

Run #4a: 802.11g, All Chains Active @ 2412 MHz with power setting of **17dBm**

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2412.250	94.6	V	-	-	AVG	49	1.0	RB 1.000 MHz; VB: 10 Hz
2417.250	102.9	V	-	-	PK	49	1.0	RB 1.000 MHz; VB: 1.000 MHz
2417.420	91.9	V	-	-	PK	49	1.0	RB 100 kHz; VB: 100 kHz
2413.490	96.8	H	-	-	AVG	67	1.1	RB 1.000 MHz; VB: 10 Hz
2413.490	105.8	H	-	-	PK	67	1.1	RB 1.000 MHz; VB: 1.000 MHz
2412.910	106.0	H	-	-	PK	67	1.1	RB 100 kHz; VB: 100 kHz

	V	H
Fundamental emission level @ 3m in 100kHz RBW:	91.9	106.0
Limit for emissions outside of restricted bands:	76 dB μ V/m	

Limit is -30dBc (UNII power measurement)

Band Edge Signal Field Strength

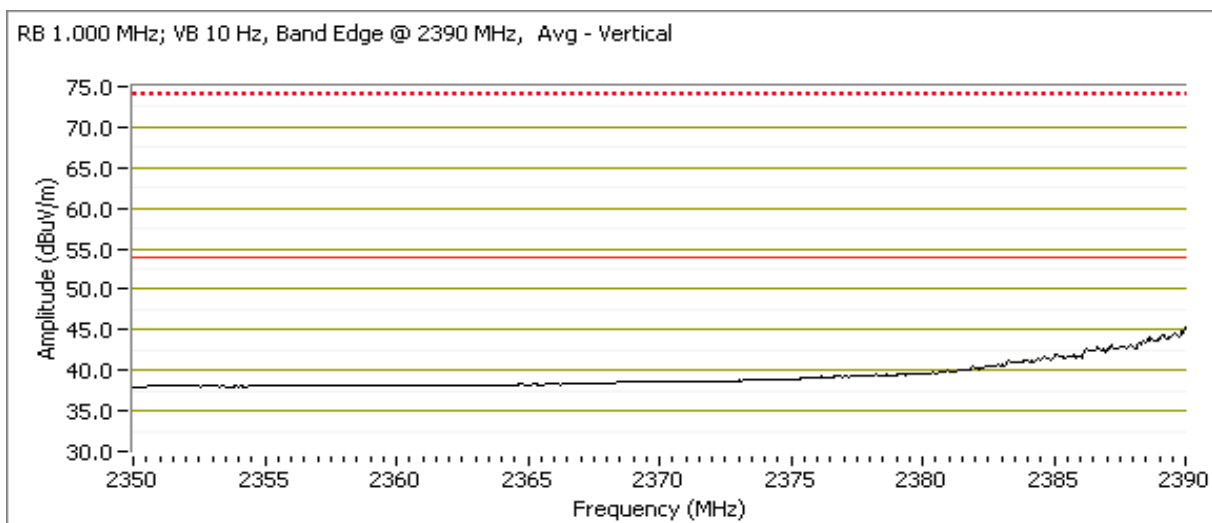
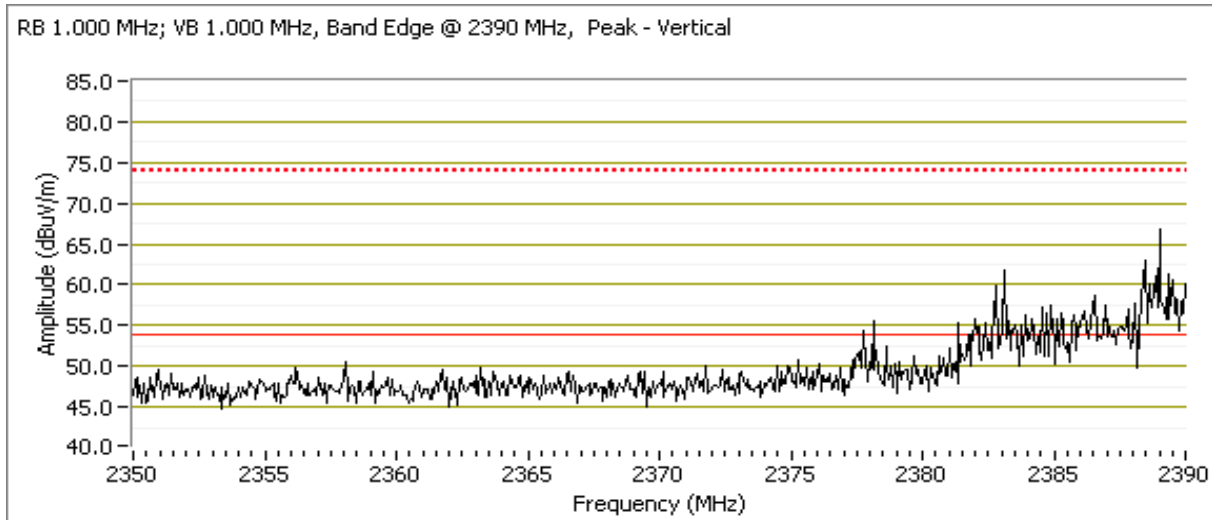
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.930	49.8	H	54.0	-4.2	AVG	67	1.1	RB 1 MHz; VB: 10 Hz
2389.930	47.3	V	54.0	-6.7	AVG	49	1.0	RB 1.000 MHz; VB: 10 Hz
2389.070	69.6	H	74.0	-4.4	PK	67	1.1	RB 1 MHz; VB: 1 MHz
2389.670	65.4	V	74.0	-8.6	PK	49	1.0	RB 1.000 MHz; VB: 1.000 MHz

Note 1: The restricted band edge is at 2390 MHz. For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #4: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11g, All Chains Active

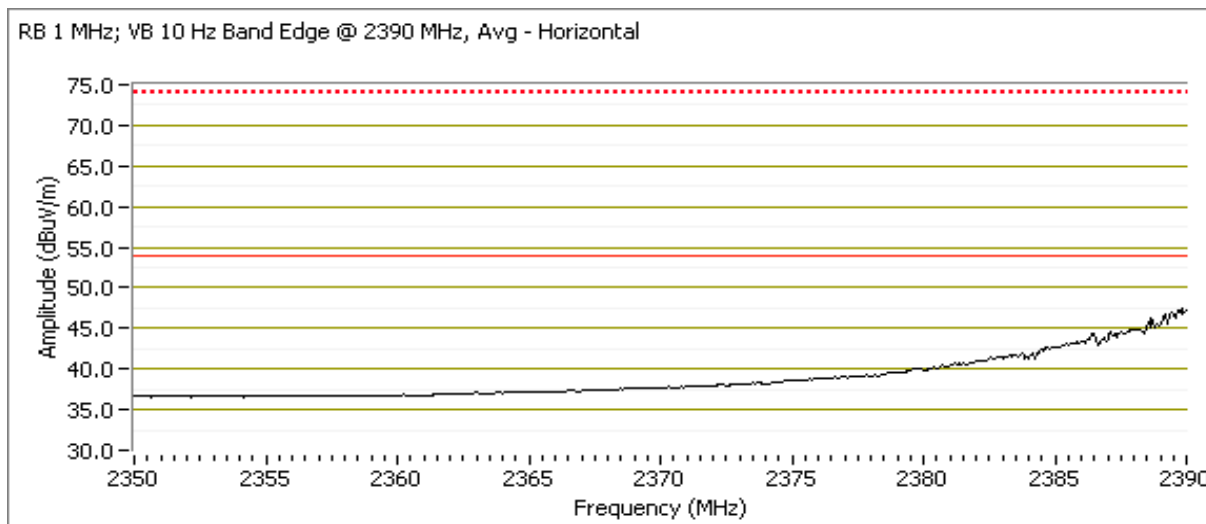
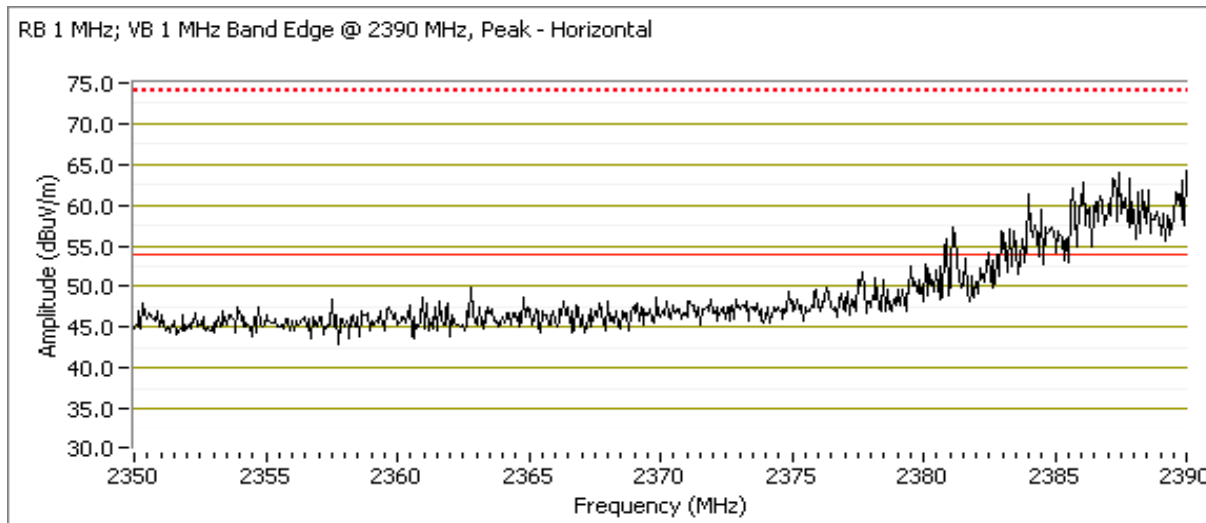
Run #4a: 802.11g, All Chains Active @ 2412 MHz with power setting of **17dBm**



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #4: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11g, All Chains Active

Run #4a: 802.11g, All Chains Active @ 2412 MHz with power setting of **17dBm**



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #4b: 802.11g, All Chains Active @ 2462 MHz with power setting of 17dBm

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2460.780	96.4	H	-	-	AVG	54	1.0	RB 1 MHz; VB: 10 Hz
2461.150	105.0	H	-	-	PK	54	1.0	RB 1 MHz; VB: 1 MHz
2460.830	96.3	H	-	-	PK	54	1.0	RB 100 kHz; VB: 100 kHz
2461.380	94.5	V	-	-	PK	43	1.0	RB 100 kHz; VB: 100 kHz
2461.840	95.5	V	-	-	AVG	43	1.0	RB 1 MHz; VB: 10 Hz
2462.220	104.7	V	-	-	PK	43	1.0	RB 1 MHz; VB: 1 MHz

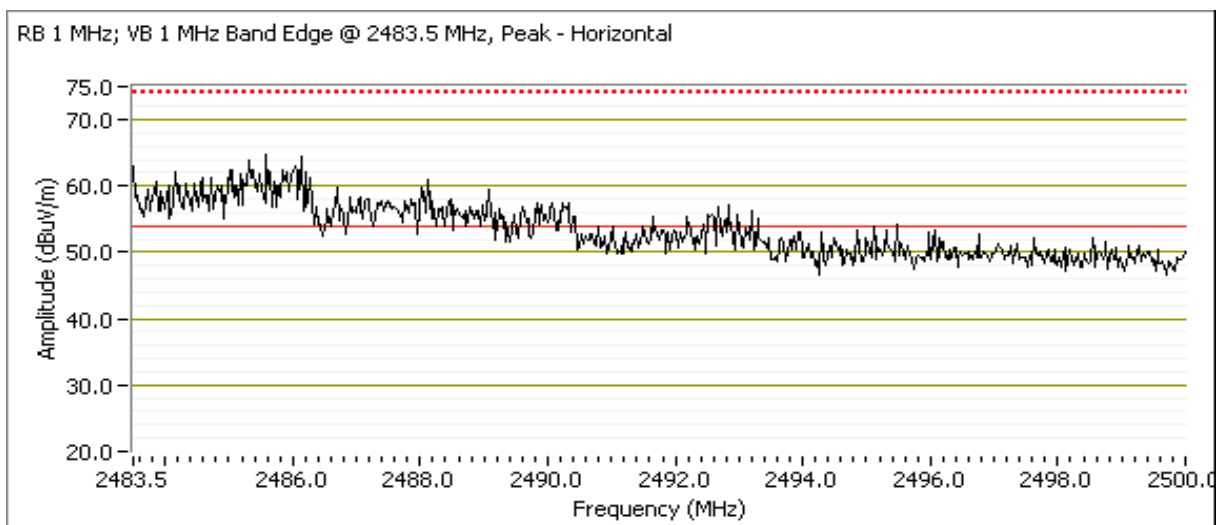
	V	H
Fundamental emission level @ 3m in 100kHz RBW:	94.5	96.3
Limit for emissions outside of restricted bands:	66.3 dB μ V/m	

Limit is -30dBc (UNII power measurement)

Band Edge Signal Field Strength

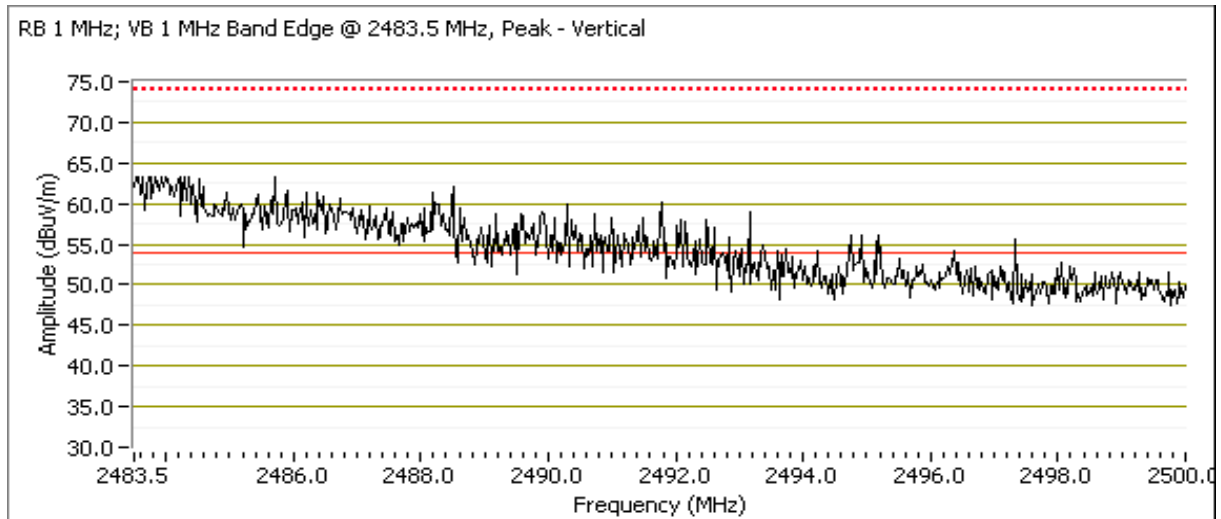
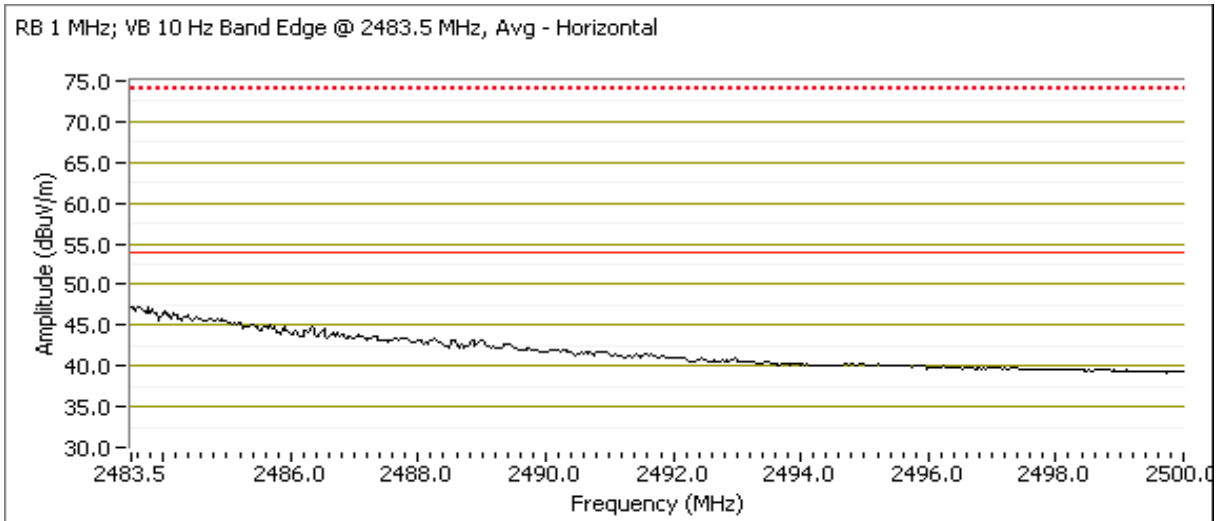
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.500	50.1	H	54.0	-3.9	AVG	54	1.0	RB 1 MHz; VB: 10 Hz
2483.720	51.1	V	54.0	-2.9	AVG	43	1.0	RB 1 MHz; VB: 10 Hz
2483.970	65.1	H	74.0	-8.9	PK	54	1.0	RB 1 MHz; VB: 1 MHz
2484.540	68.1	V	74.0	-5.9	PK	43	1.0	RB 1 MHz; VB: 1 MHz

Note 1: The restricted band edge is at 2483.5 MHz. For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.



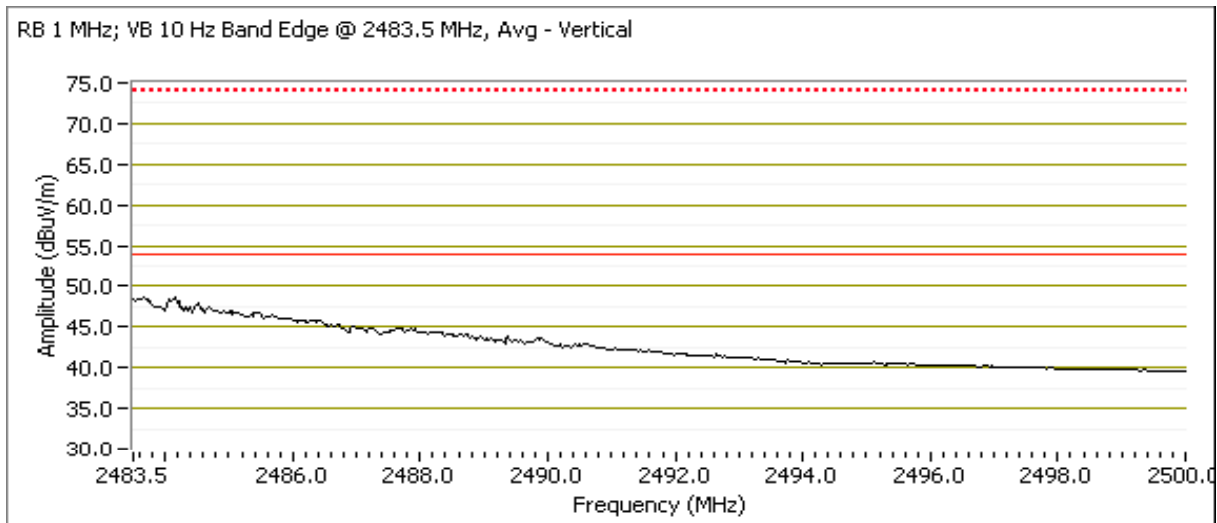
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #4b: 802.11g, All Chains Active @ 2462 MHz with power setting of 17dBm



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #4b: 802.11g, All Chains Active @ 2462 MHz with power setting of **17dBm**



Run #5: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11n (20MHz bandwidth), All Chains Active

Date of Test: 10/23/2008
Test Engineer: Joseph Cadigal
Test Location: OATS # 1

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

Run #5a: 802.11n (20MHz bandwidth), All Chains Active @ 2412 MHz with power setting of **17dBm**

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2413.220	95.7	V	-	-	AVG	37	1.0	RB 1 MHz; VB: 10 Hz
2412.350	105.0	V	-	-	PK	37	1.0	RB 1 MHz; VB: 1 MHz
2412.690	94.3	V	-	-	PK	37	1.0	RB 100 kHz; VB: 100 kHz
2412.550	97.7	H	-	-	AVG	83	1.3	RB 1 MHz; VB: 10 Hz
2412.740	107.8	H	-	-	PK	83	1.3	RB 1 MHz; VB: 1 MHz
2413.290	97.8	H	-	-	PK	83	1.3	RB 100 kHz; VB: 100 kHz

	V	H
Fundamental emission level @ 3m in 100kHz RBW:	94.3	97.8
Limit for emissions outside of restricted bands:	67.8 dB μ V/m	

Limit is -30dBc (UNII power measurement)

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #5a: 802.11n (20MHz bandwidth), All Chains Active @ 2412 MHz with power setting of **17dBm**

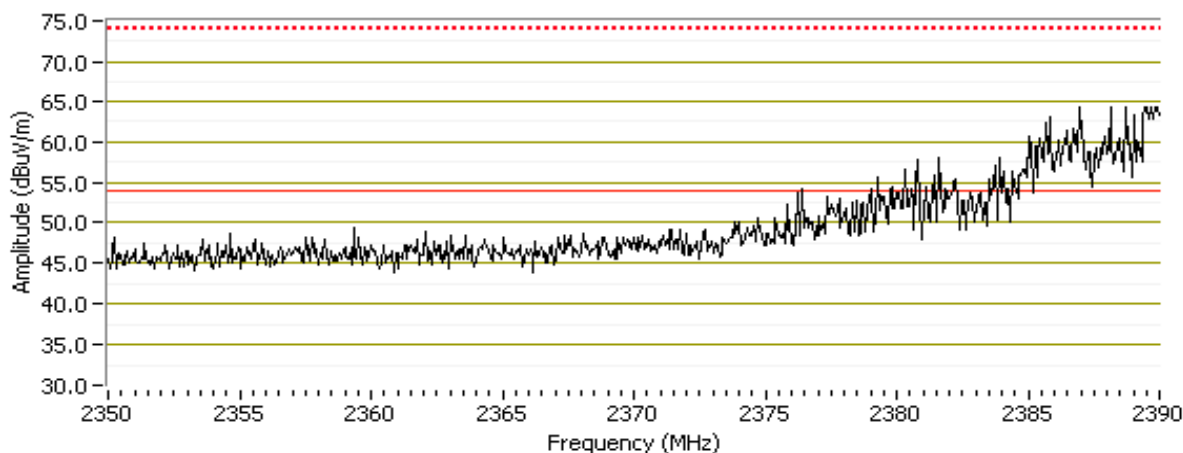
Band Edge Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.930	51.8	H	54.0	-2.2	AVG	83	1.3	RB 1 MHz; VB: 10 Hz
2390.000	50.0	V	54.0	-4.0	AVG	37	1.0	RB 1 MHz; VB: 10 Hz
2389.200	68.9	H	74.0	-5.1	PK	83	1.3	RB 1 MHz; VB: 1 MHz
2389.600	67.8	V	74.0	-6.2	PK	37	1.0	RB 1 MHz; VB: 1 MHz

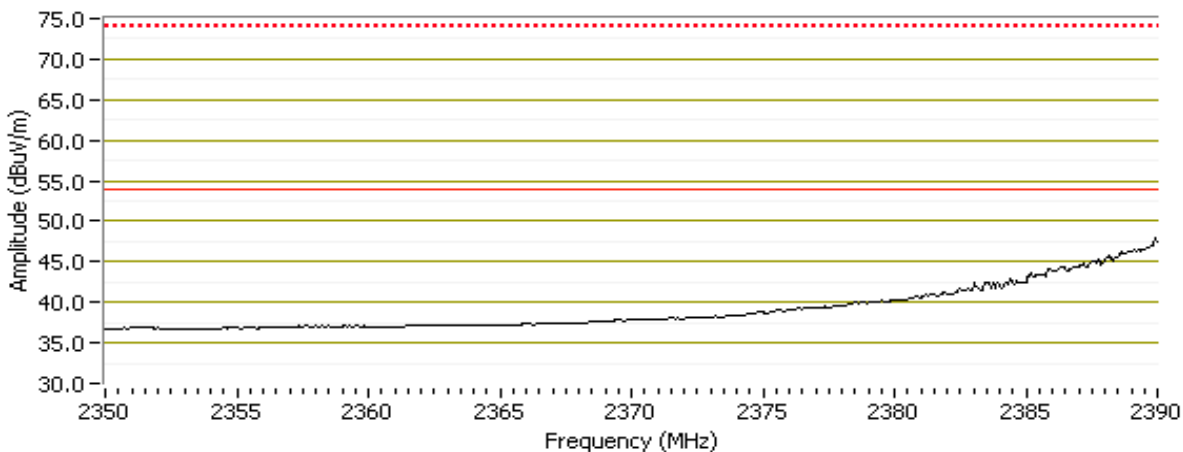
Note 1:

The restricted band edge is at 2390 MHz. For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

RB 1 MHz; VB 1 MHz Band Edge @ 2390 MHz, Peak - Vertical



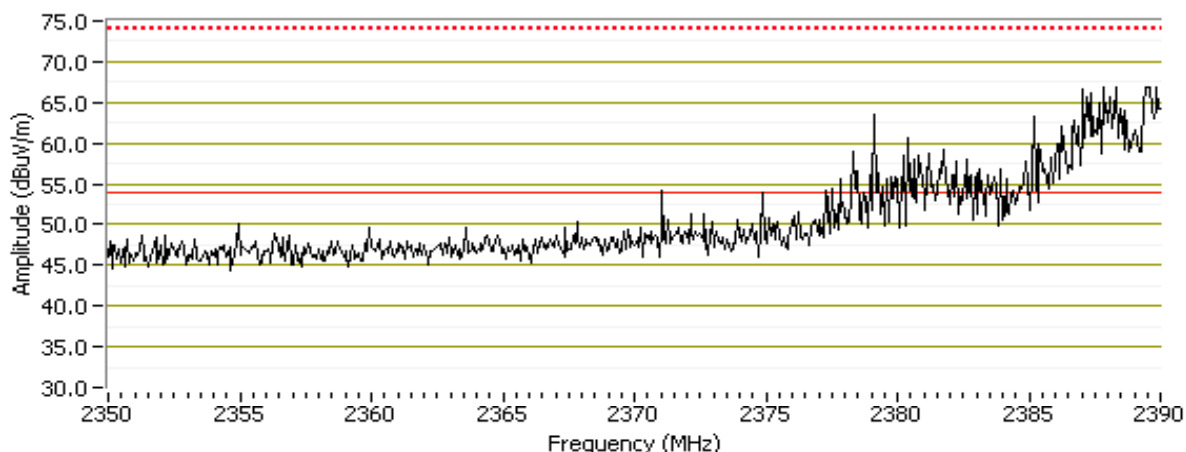
RB 1 MHz; VB 10 Hz Band Edge @ 2390 MHz, Avg - Vertical



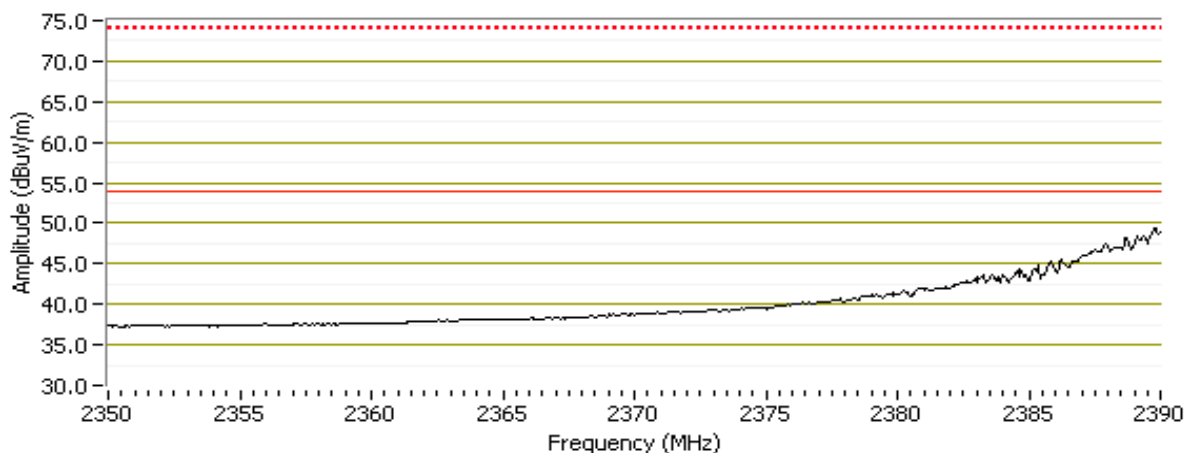
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #5a: 802.11n (20MHz bandwidth), All Chains Active @ 2412 MHz with power setting of **17dBm**

RB 1 MHz; VB 1 MHz Band Edge @ 2390 MHz, Peak - Horizontal



RB 1 MHz; VB 10 Hz Band Edge @ 2390 MHz, Avg - Horizontal



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #5b: 802.11n (20MHz bandwidth), All Chains Active @ 2462 MHz with power setting of 17dBm

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2460.540	96.1	H	-	-	AVG	52	1.6	RB 1 MHz; VB: 10 Hz
2460.610	105.7	H	-	-	PK	52	1.6	RB 1 MHz; VB: 1 MHz
2460.520	94.7	H	-	-	PK	52	1.6	RB 100 kHz; VB: 100 kHz
2463.190	96.6	V	-	-	AVG	33	1.0	RB 1 MHz; VB: 10 Hz
2463.300	105.8	V	-	-	PK	33	1.0	RB 1 MHz; VB: 1 MHz
2461.770	95.2	V	-	-	PK	33	1.0	RB 100 kHz; VB: 100 kHz

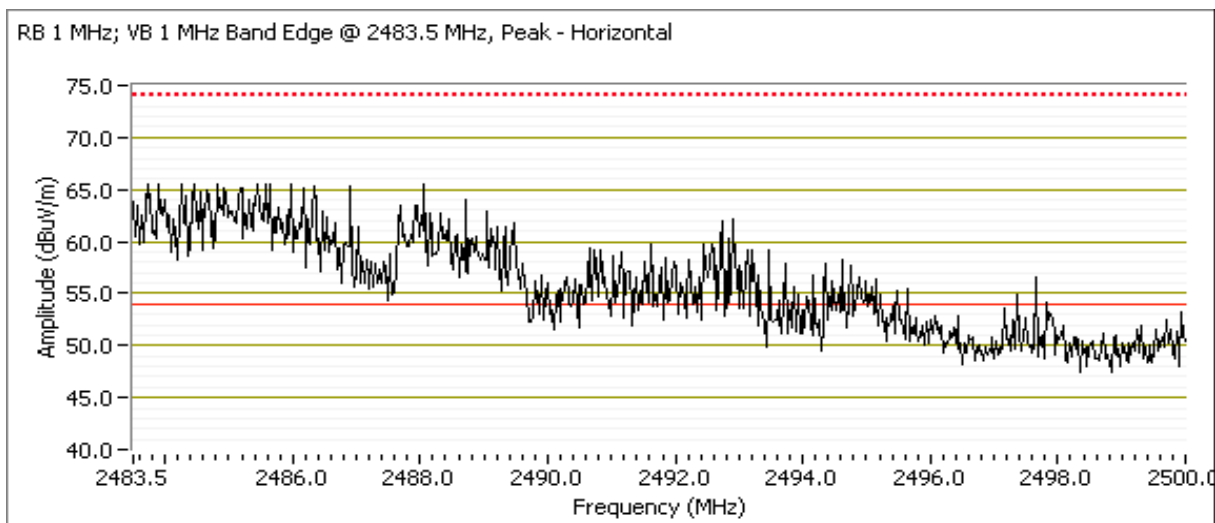
	V	H
Fundamental emission level @ 3m in 100kHz RBW:	95.2	94.7
Limit for emissions outside of restricted bands:	65.2 dB μ V/m	

Limit is -30dBc (UNII power measurement)

Band Edge Signal Field Strength

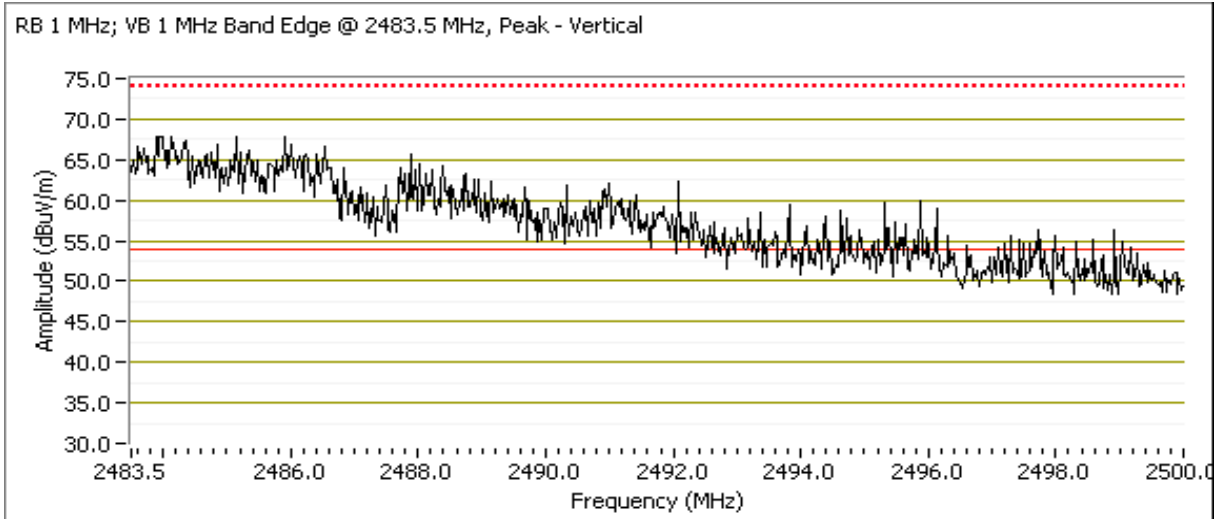
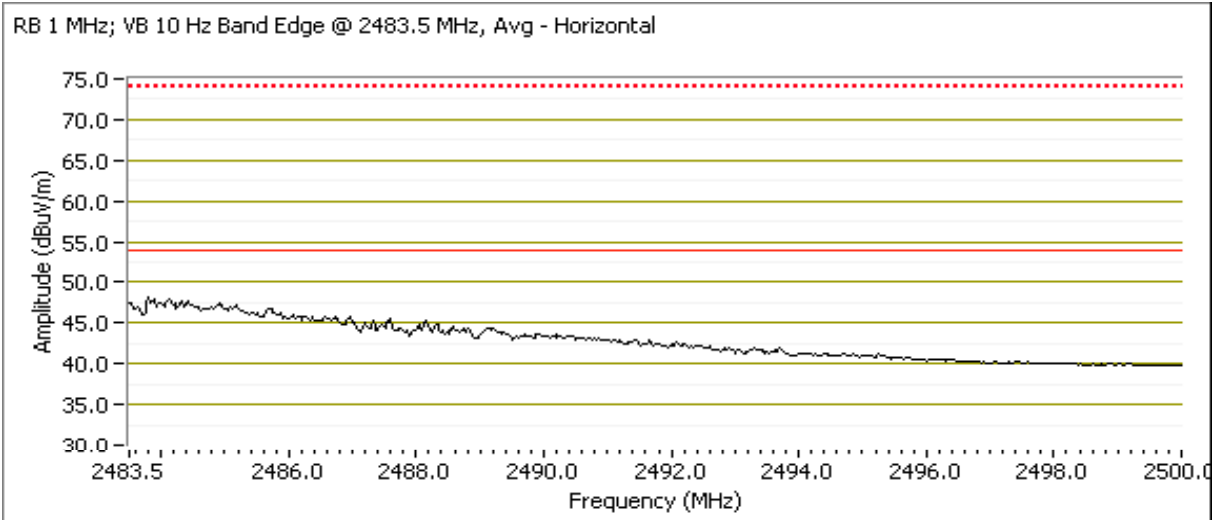
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.530	53.5	V	54.0	-0.5	AVG	33	1.0	RB 1 MHz; VB: 10 Hz
2483.720	51.6	H	54.0	-2.4	AVG	83	1.6	RB 1 MHz; VB: 10 Hz
2484.900	68.6	H	74.0	-5.4	PK	83	1.6	RB 1 MHz; VB: 1 MHz
2485.120	70.1	V	74.0	-3.9	PK	33	1.0	RB 1 MHz; VB: 1 MHz

Note 1: The restricted band edge is at 2483.5 MHz. For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.



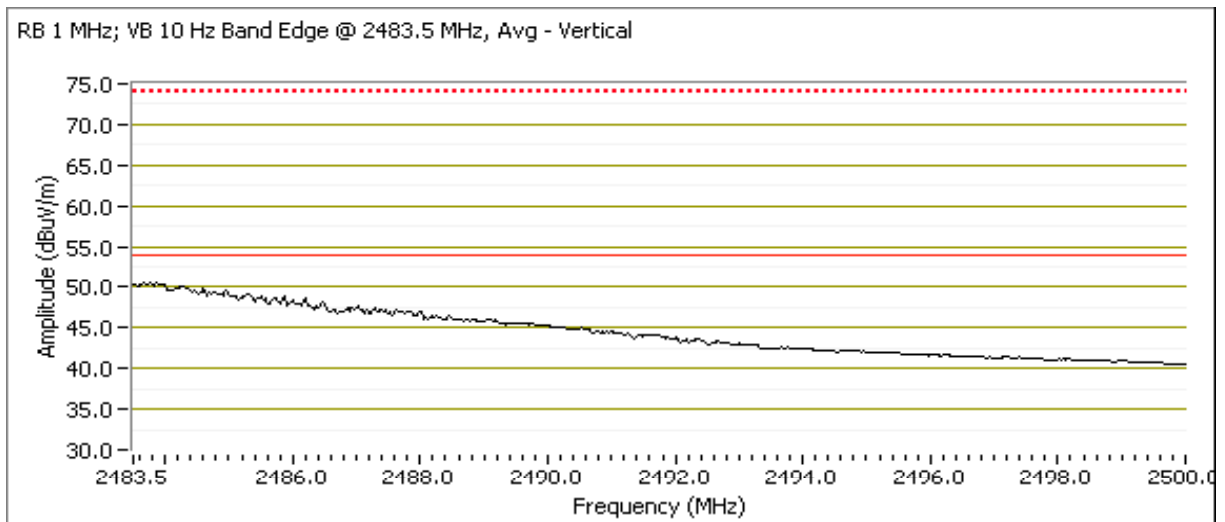
Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #5b: 802.11n (20MHz bandwidth), All Chains Active @ 2462 MHz with power setting of 17dBm



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #5b: 802.11n (20MHz bandwidth), All Chains Active @ 2462 MHz with power setting of 17dBm



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #6: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11n (40MHz bandwidth), All Chains Active

Date of Test: 10/24/2008
 Test Engineer: Mehran Birgani
 Test Location: SV OATS #1

Config. Used: 1
 Config Change: -
 EUT Voltage: POE

Run #6a: 802.11n (40MHz bandwidth), All Chains Active @ 2422 MHz with power setting of 15dBm

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2428.800	91.4	V	-	-	AVG	236	1.0	RB 1 MHz; VB: 10 Hz
2428.270	101.0	V	-	-	PK	236	1.0	RB 1 MHz; VB: 1 MHz
2433.800	89.5	H	-	-	AVG	279	1.3	RB 1 MHz; VB: 10 Hz
2429.270	100.8	H	-	-	PK	279	1.3	RB 1 MHz; VB: 1 MHz
2422.330	92.1	V	-	-	-	236	1.0	RB 100 kHz; VB: 100 kHz

	V	H
Fundamental emission level @ 3m in 100kHz RBW:	92.1	91.8
Limit for emissions outside of restricted bands:	62.1 dBμV/m	

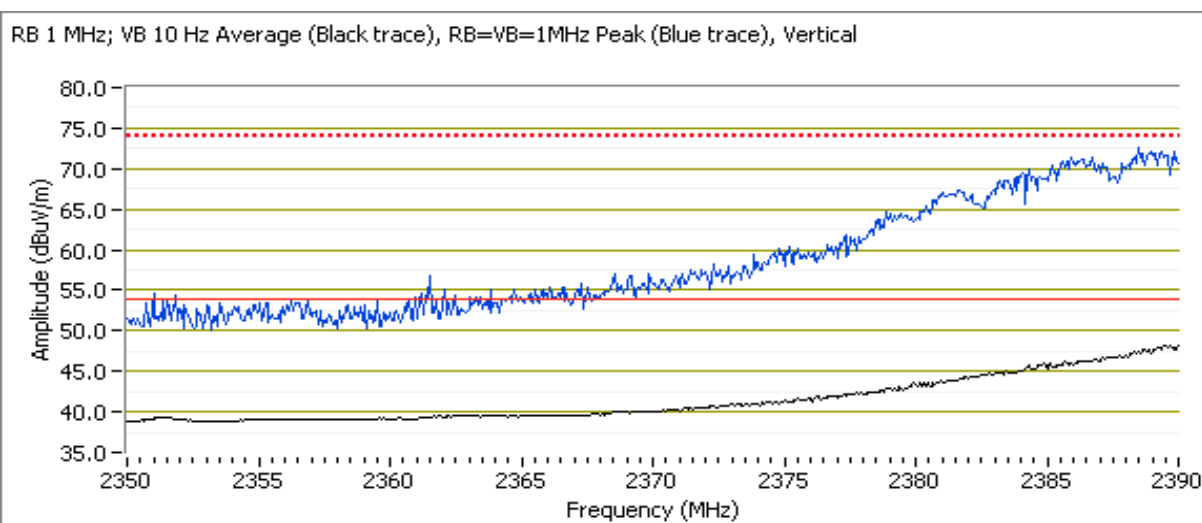
Limit is -30dBc (UNII power measurement)

Band Edge Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.530	49.7	V	54.0	-4.3	AVG	236	1.0	RB 1 MHz; VB: 10 Hz
2388.730	71.3	V	74.0	-2.7	PK	236	1.0	RB 1 MHz; VB: 1 MHz

Note 1:

The restricted band edge is at 2390 MHz. For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #6b: 802.11n (40MHz bandwidth), All Chains Active @ 2452 MHz with power setting of **14dBm**

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2452.330	89.8	V	-	-	AVG	239	1.0	RB 1 MHz; VB: 10 Hz
2463.600	98.8	V	-	-	PK	239	1.0	RB 1 MHz; VB: 1 MHz
2442.330	86.7	H	-	-	AVG	186	1.5	RB 1 MHz; VB: 10 Hz
2438.070	96.8	H	-	-	PK	186	1.5	RB 1 MHz; VB: 1 MHz
2456.070	91.3	V	-	-	-	239	1.0	RB 100 kHz; VB: 100 kHz

	V	H
Fundamental emission level @ 3m in 100kHz RBW:	91.3	89.9
Limit for emissions outside of restricted bands:	61.3 dB μ V/m	

Limit is -30dBc (UNII power measurement)

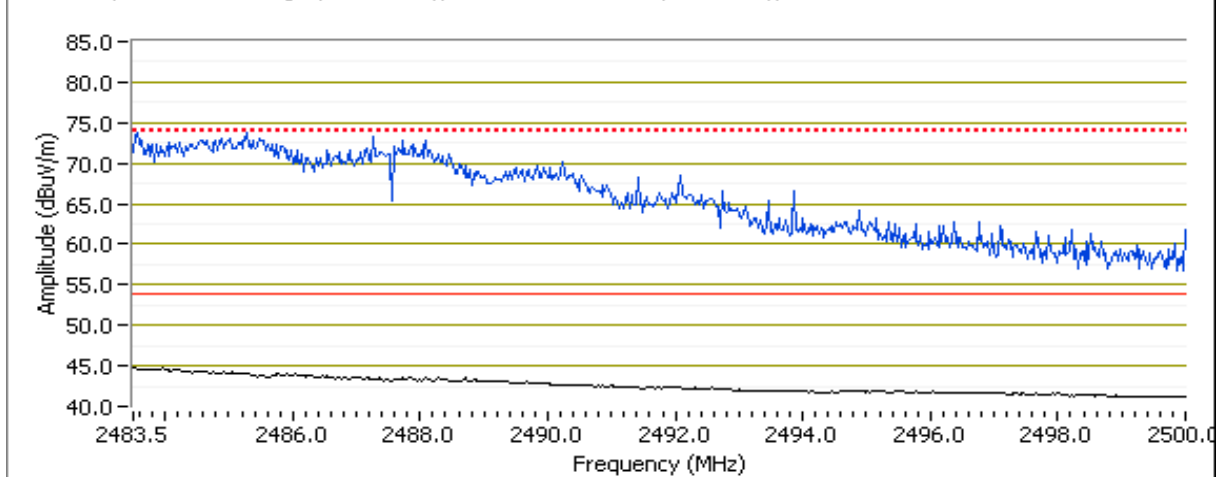
Band Edge Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.500	47.4	V	54.0	-6.6	AVG	239	1.0	RB 1 MHz; VB: 10 Hz
2484.740	72.7	V	74.0	-1.3	PK	239	1.0	RB 1 MHz; VB: 1 MHz

Note 1:

The restricted band edge is at 2483.5 MHz. For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

RB 1 MHz; VB 10 Hz Average (Black trace), RB=VB=1MHz Peak (Blue trace), Vertical



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) 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.

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 or routed in overhead in the GR-1089 test configuration.

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

Ambient Conditions:

Temperature: 10-25 °C
Rel. Humidity: 25 - 65 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

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

Run #	Mode	Channel	Power Setting	Test Performed	Limit	Result / Margin
1a	802.11n40 (A+B+C)	2422	20	Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	46.0dBμV/m (199.5μV/m) @ 4824.1MHz (-8.0dB)
	802.11b (A+B+C)	2412	20			
	802.11g (A+B+C)	2412	20			
	n20 (A+B+C)	2412	20			
1b	802.11n40 (A+B+C)	2437	20	Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	47.1dBμV/m (226.5μV/m) @ 4874.1MHz (-6.9dB)
	802.11b (A+B+C)	2437	20			
	802.11g (A+B+C)	2437	20			
	n20 (A+B+C)	2437	20			
1c	802.11n40 (A+B+C)	2452	20	Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	68.1dBμV/m (2541.0μV/m) @ 4923.9MHz (-5.9dB)
	802.11b (A+B+C)	2462	20			
	802.11g (A+B+C)	2462	20			
	n20 (A+B+C)	2462	20			

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #1: Radiated Spurious Emissions, 1 - 26GHz. 802.11b

Date of Test: 10/30/2008
 Test Engineer: Mehran Birgani
 Test Location: SV OAT#2

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

Run #1a: 802.11g, 802.11n20 and 802.11n40, Low Channel, All Chains Active and set to 20dBm power level

Radio 1	Radio 2	Radio 3	Radio 4
2412MHz, g	2412MHz, n20	2422MHz, n40	2412MHz b

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
1320.000	41.7	V	54.0	-12.3	AVG	211	1.1	RB 1 MHz; VB: 10 Hz
1320.100	42.8	H	54.0	-11.2	AVG	239	1.0	RB 1 MHz; VB: 10 Hz
4824.060	46.0	V	54.0	-8.0	AVG	337	1.0	RB 1 MHz; VB: 10 Hz
4824.130	44.0	H	54.0	-10.0	AVG	182	2.3	RB 1 MHz; VB: 10 Hz
7261.530	37.8	V	54.0	-16.2	AVG	100	2.0	RB 1 MHz; VB: 10 Hz
7262.200	36.0	H	54.0	-18.0	AVG	92	2.2	RB 1 MHz; VB: 10 Hz
1319.990	47.0	H	74.0	-27.0	PK	239	1.0	RB 1 MHz; VB: 1 MHz
1320.080	45.5	V	74.0	-28.5	PK	211	1.1	RB 1 MHz; VB: 1 MHz
4824.120	51.9	V	74.0	-22.1	PK	337	1.0	RB 1 MHz; VB: 1 MHz
4824.150	49.2	H	74.0	-24.8	PK	182	2.3	RB 1 MHz; VB: 1 MHz
7267.180	46.9	H	74.0	-27.1	PK	92	2.2	RB 1 MHz; VB: 1 MHz
7269.570	52.8	V	74.0	-21.2	PK	100	2.0	RB 1 MHz; VB: 1 MHz

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Preliminary scans identified all significant signals were at second harmonics of the 802.11b and third harmonics of all four operating modes. Third harmonic of 2412MHz is not in a restricted band. No emissions above the third harmonic were observed, tests were performed to 26GHz.
Note 3:	Emission at 1320MHz is independent of operating mode and operating channel. It is only measured with the radios operating on the low channel.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #1b: 802.11g, 802.11n20 and 802.11n40, Center Channel, All Chains Active and set to 20dBm power level

Radio 1	Radio 2	Radio 3	Radio 4
2437MHz, g	2437MHz, n20	2437MHz n40	2437MHz b

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	PK/QP/Avg	degrees	meters	
4873.970	42.4	H	54.0	-11.6	AVG	229	1.0	RB 1 MHz; VB: 10 Hz
4874.130	47.1	V	54.0	-6.9	AVG	327	1.0	RB 1 MHz; VB: 10 Hz
7308.600	40.5	H	54.0	-13.5	AVG	243	2.0	RB 1 MHz; VB: 10 Hz
7313.380	41.5	V	54.0	-12.5	AVG	102	1.0	RB 1 MHz; VB: 10 Hz
4874.070	55.2	H	74.0	-18.8	PK	229	1.0	RB 1 MHz; VB: 1 MHz
4874.080	58.7	V	74.0	-15.3	PK	327	1.0	RB 1 MHz; VB: 1 MHz
7310.200	50.0	H	74.0	-24.0	PK	243	2.0	RB 1 MHz; VB: 1 MHz
7310.270	50.8	V	74.0	-23.2	PK	102	1.0	RB 1 MHz; VB: 1 MHz

Run #1c: 802.11g, 802.11n20 and 802.11n40, high Channel, All Chains Active and set to 20dBm power level

Radio 1	Radio 2	Radio 3	Radio 4
2462MHz, g	2462MHz, n20	2452MHz n40	2462MHz b

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	PK/QP/Avg	degrees	meters	
4923.870	47.4	V	54.0	-6.6	AVG	192	1.0	RB 1 MHz; VB: 10 Hz
4924.040	38.5	H	54.0	-15.5	AVG	83	2.3	RB 1 MHz; VB: 10 Hz
7351.080	36.3	H	54.0	-17.7	AVG	148	2.0	RB 1 MHz; VB: 10 Hz
7352.730	39.9	V	54.0	-14.1	AVG	87	2.3	RB 1 MHz; VB: 10 Hz
7384.570	42.9	V	54.0	-11.1	AVG	193	1.0	RB 1 MHz; VB: 10 Hz
7385.080	38.4	H	54.0	-15.6	AVG	142	1.0	RB 1 MHz; VB: 10 Hz
4923.910	68.1	V	74.0	-5.9	PK	192	1.0	RB 1 MHz; VB: 1 MHz
4924.130	58.6	H	74.0	-15.4	PK	83	2.3	RB 1 MHz; VB: 1 MHz
7355.130	47.7	H	74.0	-26.3	PK	148	2.0	RB 1 MHz; VB: 1 MHz
7356.970	53.8	V	74.0	-20.2	PK	87	2.3	RB 1 MHz; VB: 1 MHz
7385.380	53.8	V	74.0	-20.2	PK	193	1.0	RB 1 MHz; VB: 1 MHz
7387.570	47.9	H	74.0	-26.1	PK	142	1.0	RB 1 MHz; VB: 1 MHz

- Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
- Note 2: Preliminary scans identified all significant signals were at second harmonics of the 802.11b and third harmonics of all four operating modes. No emissions above the third harmonic were observed, tests were performed to 26GHz.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions 2390 MHz and 2483.5 MHz 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.

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: 10-25 °C
Rel. Humidity: 25 - 65 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

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

Run #	Mode	Channel	Power Setting	Test Performed	Limit	Result / Margin
1a	802.11b	2412	19 dBm	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	52.7dBµV/m @ 2386.5MHz (-1.3dB)
1b		2462	19 dBm	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	47.3dBµV/m @ 2494.8MHz (-6.7dB)
2a	802.11g	2412	17 dBm	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	47.6dBµV/m @ 2389.9MHz (-6.4dB)
2b		2462	17 dBm	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	47.4dBµV/m @ 2483.5MHz (-6.6dB)

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #1: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11b

Date of Test: 11/5/2008
Test Engineer: Suhaila Khushzad
Test Location: OATS # 1

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

Run #1a: 802.11b, Single Chain @ 2412 MHz with power setting of 19dBm

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2413.100	91.6	H	-	-	AVG	50	1.0	RB 1 MHz; VB: 10 Hz
2413.350	94.8	H	-	-	PK	50	1.0	RB 1 MHz; VB: 1 MHz
2415.080	103.6	V	-	-	AVG	0	1.0	RB 1 MHz; VB: 10 Hz
2413.420	106.9	V	-	-	PK	0	1.0	RB 1 MHz; VB: 1 MHz
2412.920	102.2	V	-	-	PK	0	1.0	RB 100 kHz; VB: 100 kHz
2410.330	90.7	H	-	-	PK	50	1.0	RB 100 kHz; VB: 100 kHz

	V	H
Fundamental emission level @ 3m in 100kHz RBW:	102.2	90.7
Limit for emissions outside of restricted bands:	72.2 dB μ V/m	Limit is -30dBc (UNII power measurement)

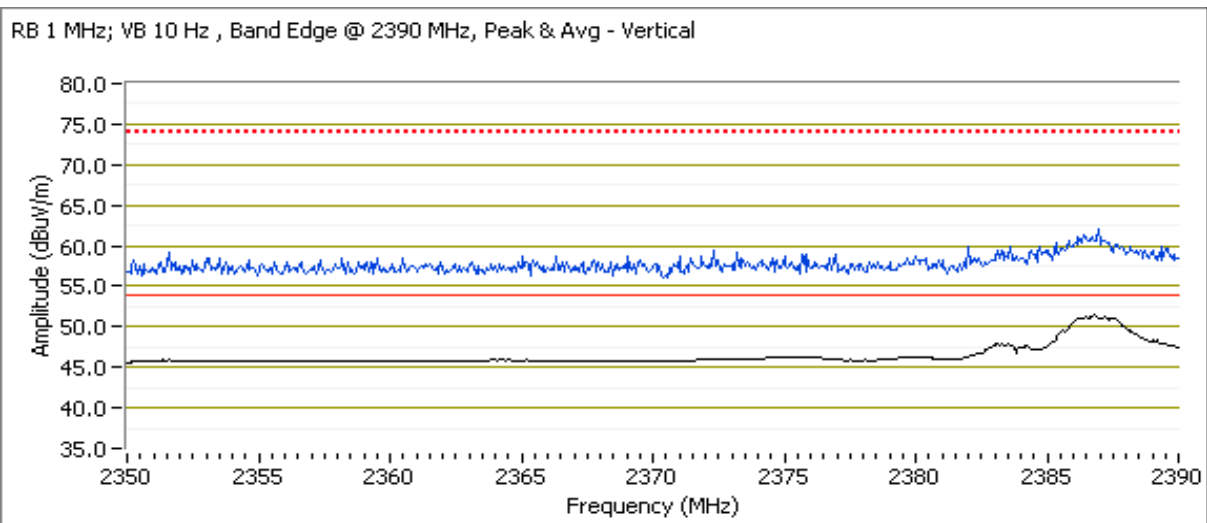
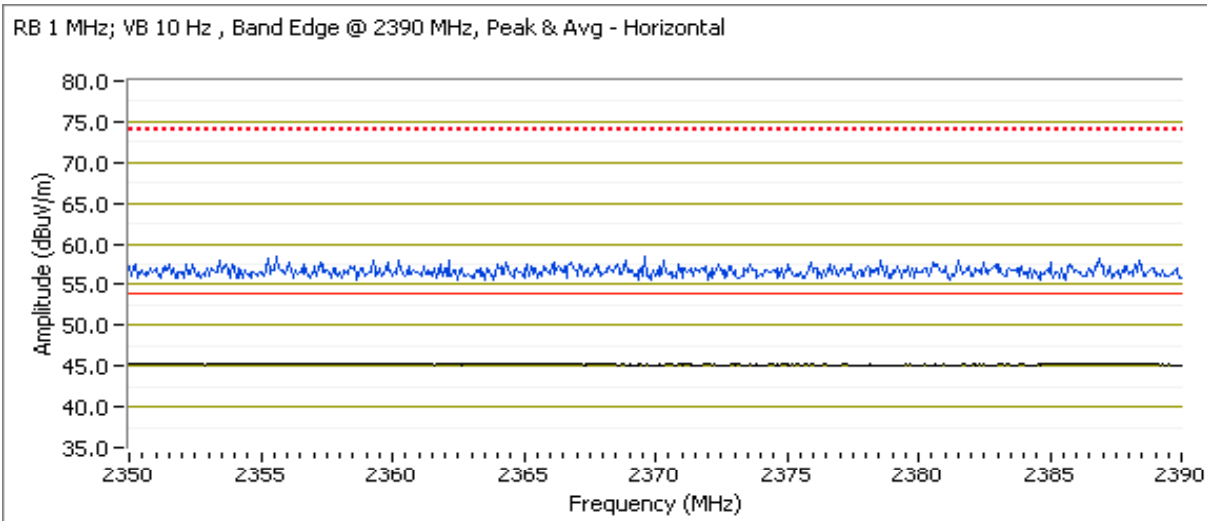
Band Edge Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2386.530	52.7	V	54.0	-1.3	AVG	0	1.0	RB 1 MHz; VB: 10 Hz
2386.670	60.8	V	74.0	-13.2	PK	0	1.0	RB 1 MHz; VB: 1 MHz
2386.200	46.7	H	54.0	-7.3	AVG	50	1.0	RB 1 MHz; VB: 10 Hz
2354.270	57.8	H	74.0	-16.2	PK	50	1.0	RB 1 MHz; VB: 1 MHz

Note 1: The restricted band edge is at 2390 MHz. For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #1: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11b



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #1b: 802.11b, Single Chain @ 2462 MHz with power setting of 19dBm

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2459.420	95.5	V	-	-	AVG	284	1.2	RB 1 MHz; VB: 10 Hz
2461.280	98.3	V	-	-	PK	284	1.2	RB 1 MHz; VB: 1 MHz
2459.590	89.2	H	-	-	AVG	67	1.0	RB 1 MHz; VB: 10 Hz
2461.240	92.0	H	-	-	PK	67	1.0	RB 1 MHz; VB: 1 MHz
2460.740	87.5	H	-	-	PK	67	1.0	RB 100 kHz; VB: 100 kHz
2461.120	94.6	V	-	-	PK	284	1.2	RB 100 kHz; VB: 100 kHz

	V	H
Fundamental emission level @ 3m in 100kHz RBW:	94.6	87.5
Limit for emissions outside of restricted bands:	64.6 dB μ V/m	

Limit is -30dBc (UNII power measurement)

Band Edge Signal Field Strength

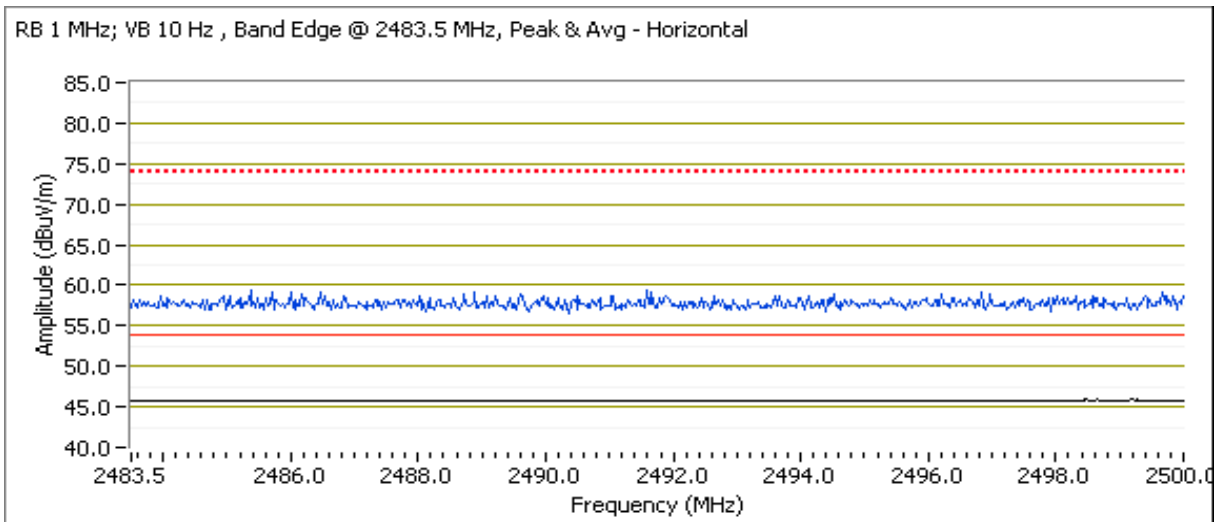
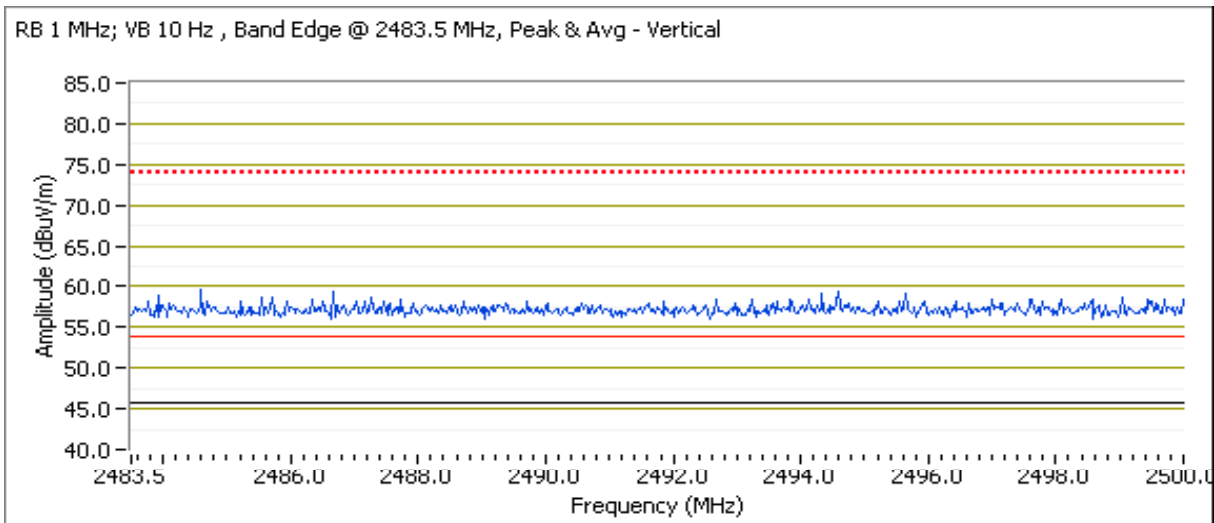
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2494.830	47.3	V	54.0	-6.7	AVG	284	1.2	RB 1 MHz; VB: 10 Hz
2483.610	58.1	V	74.0	-15.9	PK	284	1.2	RB 1 MHz; VB: 1 MHz
2495.710	47.1	H	54.0	-6.9	AVG	67	1.0	RB 1 MHz; VB: 10 Hz
2493.150	58.9	H	74.0	-15.1	PK	67	1.0	RB 1 MHz; VB: 1 MHz

Note 1:

The restricted band edge is at 2483.5 MHz. For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #1b: 802.11b, Single Chain @ 2462 MHz with power setting of 19dBm



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #2: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11g

Date of Test: 11/5/2008
Test Engineer: Suhaila Khushzad
Test Location: OATS # 1

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

Run #2a: 802.11g, Single Chain @ 2412 MHz with power setting of 17dBm

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2412.170	88.4	V	-	-	AVG	276	1.1	RB 1 MHz; VB: 10 Hz
2412.580	97.3	V	-	-	PK	276	1.1	RB 1 MHz; VB: 1 MHz
2410.580	85.6	H	-	-	AVG	242	1.3	RB 1 MHz; VB: 10 Hz
2414.920	93.7	H	-	-	PK	242	1.3	RB 1 MHz; VB: 1 MHz
2411.750	83.1	H	-	-	PK	242	1.3	RB 100 kHz; VB: 100 kHz
2412.330	85.5	V	-	-	PK	276	1.1	RB 100 kHz; VB: 100 kHz

	V	H
Fundamental emission level @ 3m in 100kHz RBW:	85.5	83.1
Limit for emissions outside of restricted bands:	55.5 dB μ V/m	

Limit is -30dBc (UNII power measurement)

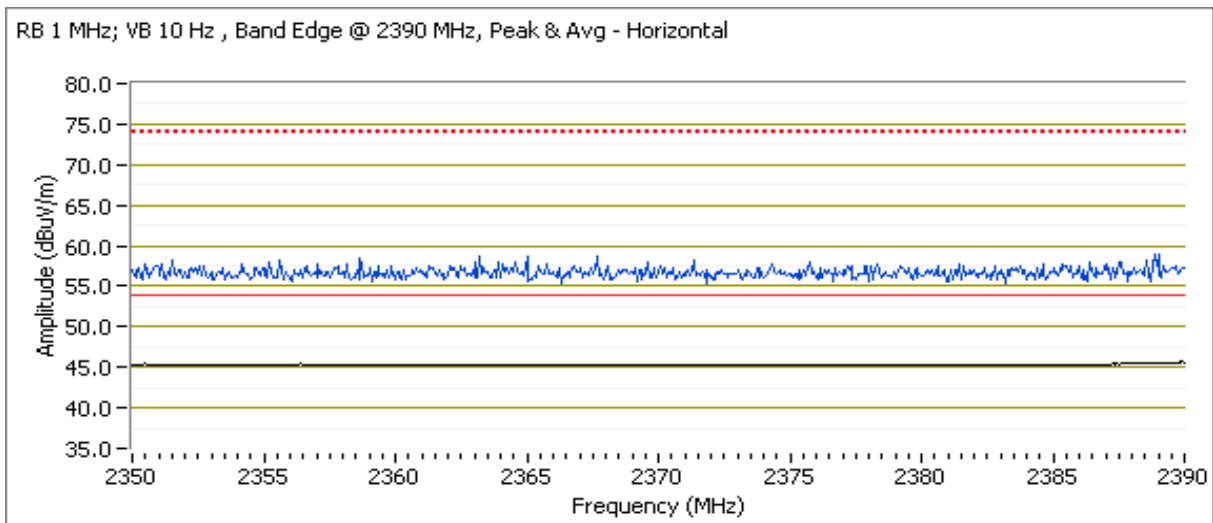
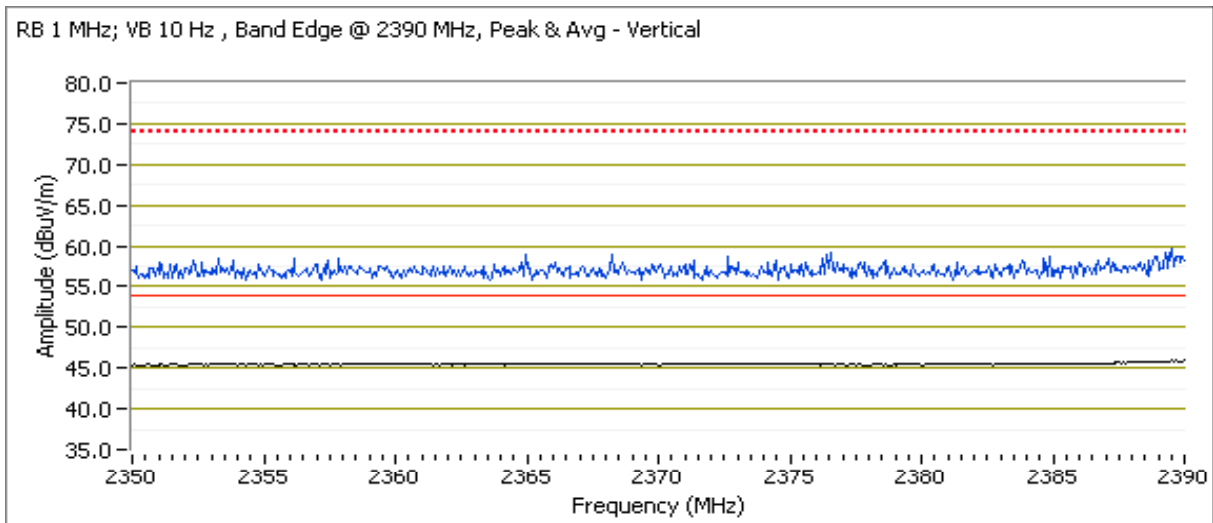
Band Edge Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.870	47.6	V	54.0	-6.4	AVG	276	1.1	RB 1 MHz; VB: 10 Hz
2390.000	58.7	V	74.0	-15.3	PK	276	1.1	RB 1 MHz; VB: 1 MHz
2389.270	46.9	H	54.0	-7.1	AVG	242	1.3	RB 1 MHz; VB: 10 Hz
2373.930	57.9	H	74.0	-16.1	PK	242	1.3	RB 1 MHz; VB: 1 MHz

Note 1: The restricted band edge is at 2390 MHz. For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #2: Band-Edge Radiated Spurious Emissions. Operating Mode: 802.11g



Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #2b: 802.11g, Single Chain @ 2462 MHz with power setting of 17dBm

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2459.910	89.7	V	-	-	AVG	278	1.0	RB 1 MHz; VB: 10 Hz
2461.990	98.1	V	-	-	PK	278	1.0	RB 1 MHz; VB: 1 MHz
2460.850	84.9	H	-	-	AVG	60	1.5	RB 1 MHz; VB: 10 Hz
2462.430	93.6	H	-	-	PK	60	1.5	RB 1 MHz; VB: 1 MHz
2454.760	83.5	H	-	-	PK	60	1.5	RB 100 kHz; VB: 100 kHz
2456.910	87.1	V	-	-	PK	278	1.0	RB 100 kHz; VB: 100 kHz

	V	H
Fundamental emission level @ 3m in 100kHz RBW:	87.1	83.5
Limit for emissions outside of restricted bands:	57.1 dB μ V/m	

Limit is -30dBc (UNII power measurement)

Band Edge Signal Field Strength

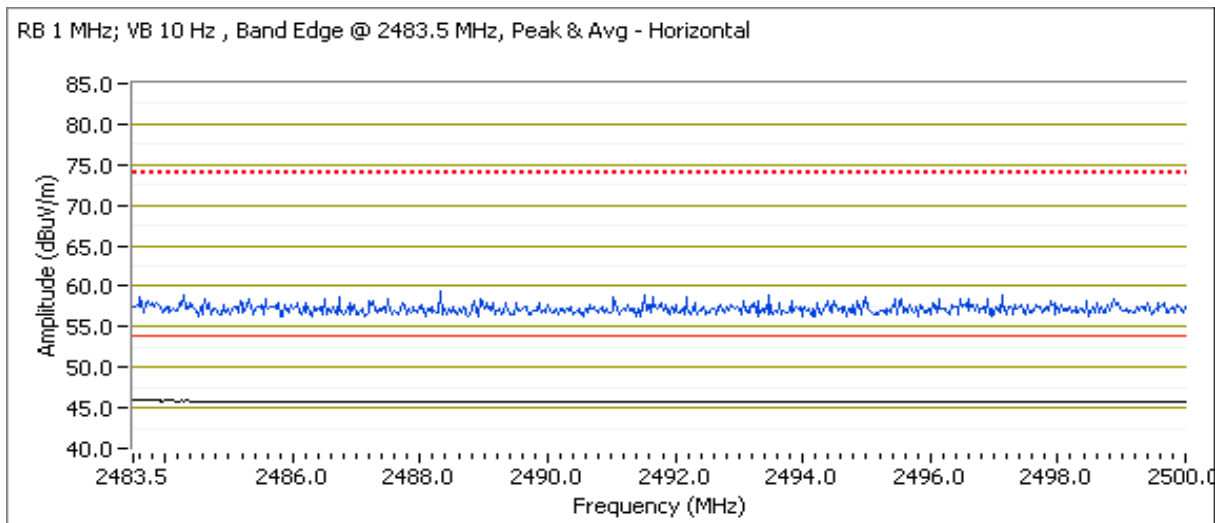
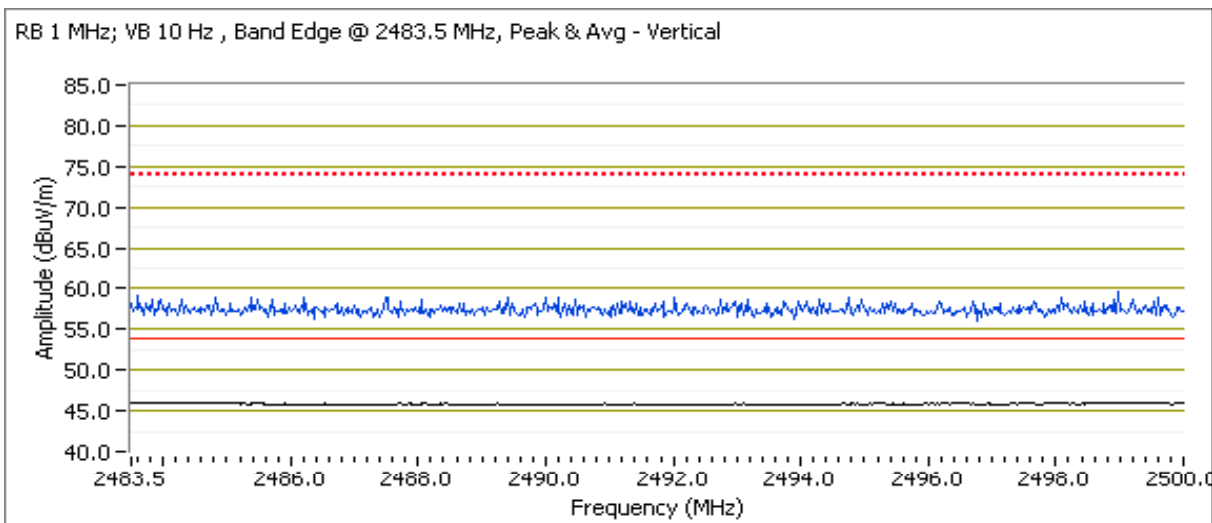
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.530	47.4	V	54.0	-6.6	AVG	278	1.0	RB 1 MHz; VB: 10 Hz
2489.220	58.3	V	74.0	-15.7	PK	278	1.0	RB 1 MHz; VB: 1 MHz
2483.530	47.3	H	54.0	-6.7	AVG	60	1.5	RB 1 MHz; VB: 10 Hz
2488.700	58.7	H	74.0	-15.3	PK	60	1.5	RB 1 MHz; VB: 1 MHz

Note 1:

The restricted band edge is at 2483.5 MHz. For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

Run #2b: 802.11g, Single Chain @ 2462 MHz with power setting of 17dBm



Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

RSS 210 and FCC 15.247 (DTS) 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.

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: 10-25 °C
Rel. Humidity: 25 - 65 %

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

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

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

Run #	Mode	Channel	Power Setting	Test Performed	Limit	Result / Margin
1a	802.11b	2412	20	Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	45.5dBµV/m (188.4µV/m) @ 4824.0MHz (-8.5dB)
1b		2437	20	Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	41.9dBµV/m (124.5µV/m) @ 4874.0MHz (-12.1dB)
1c		2462	20	Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	37.6dBµV/m (75.9µV/m) @ 4924.1MHz (-16.4dB)
2a	802.11g	2412	20	Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	35.1dBµV/m (56.9µV/m) @ 4824.8MHz (-18.9dB)
2b		2437	20	Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	37.8dBµV/m (77.6µV/m) @ 7309.6MHz (-16.2dB)
2c		2462	20	Radiated Emissions 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	35.5dBµV/m (59.6µV/m) @ 7384.5MHz (-18.5dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #1: Radiated Spurious Emissions, 1 - 26GHz. 802.11b

Run #1a: 802.11b, 2412 MHz (Low channel), Power set to 20dBm

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
4823.990	36.4	H	54.0	-17.6	AVG	279	1.1	RB 1 MHz; VB: 10 Hz Note 2
4824.030	45.5	V	54.0	-8.5	AVG	279	1.8	RB 1 MHz; VB: 10 Hz Note 2
4823.970	45.9	H	74.0	-28.1	PK	279	1.1	RB 1 MHz; VB: 1 MHz Note 2
4824.150	50.1	V	74.0	-23.9	PK	279	1.8	RB 1 MHz; VB: 1 MHz Note 2

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is in a restricted band.
Note 3:	Preliminary scans identified all significant signals were at second harmonics of the 802.11b and third harmonics of all four operating modes. Third harmonic of 2412MHz is not in a restricted band. No emissions above the third harmonic were observed, tests were performed to 26GHz.

Run #1b: 802.11b, 2437 MHz (Center channel), Power set to 20dBm

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
4873.940	34.1	H	54.0	-19.9	AVG	213	1.0	RB 1 MHz; VB: 10 Hz
4874.010	41.9	V	54.0	-12.1	AVG	255	1.3	RB 1 MHz; VB: 10 Hz
7309.620	35.0	H	54.0	-19.0	AVG	204	1.0	RB 1 MHz; VB: 10 Hz
7311.850	38.8	V	54.0	-15.2	AVG	142	1.9	RB 1 MHz; VB: 10 Hz
4873.630	45.3	H	74.0	-28.7	PK	213	1.0	RB 1 MHz; VB: 1 MHz
4873.830	47.8	V	74.0	-26.2	PK	255	1.3	RB 1 MHz; VB: 1 MHz
7309.830	46.7	H	74.0	-27.3	PK	204	1.0	RB 1 MHz; VB: 1 MHz
7310.060	53.4	V	74.0	-20.6	PK	142	1.9	RB 1 MHz; VB: 1 MHz

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is in a restricted band.
Note 3:	Preliminary scans identified all significant signals were at second harmonics of the 802.11b and third harmonics of all four operating modes. Third harmonic of 2412MHz is not in a restricted band. No emissions above the third harmonic were observed, tests were performed to 26GHz.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #1c: 802.11b, 2462 MHz (High channel), Power set to 20dBm

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
4924.010	34.1	H	54.0	-19.9	AVG	205	1.0	RB 1 MHz; VB: 10 Hz
4924.090	37.6	V	54.0	-16.4	AVG	333	2.3	RB 1 MHz; VB: 10 Hz
7384.500	35.2	H	54.0	-18.8	AVG	277	0.9	RB 1 MHz; VB: 10 Hz
7384.530	35.4	V	54.0	-18.6	AVG	197	1.0	RB 1 MHz; VB: 10 Hz
4923.770	45.2	H	74.0	-28.8	PK	205	1.0	RB 1 MHz; VB: 1 MHz
4923.880	45.7	V	74.0	-28.3	PK	333	2.3	RB 1 MHz; VB: 1 MHz
7385.650	46.8	V	74.0	-27.2	PK	197	1.0	RB 1 MHz; VB: 1 MHz
7386.040	46.1	H	74.0	-27.9	PK	277	0.9	RB 1 MHz; VB: 1 MHz

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is in a restricted band.
Note 3:	Preliminary scans identified all significant signals were at second harmonics of the 802.11b and third harmonics of all four operating modes. Third harmonic of 2412MHz is not in a restricted band. No emissions above the third harmonic were observed, tests were performed to 26GHz.

Run #2: Radiated Spurious Emissions, 1 - 26GHz. 802.11g

Run #2a: 802.11g, 2412 MHz (Low channel), Power set to 20dBm

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
4822.500	33.5	H	54.0	-20.5	AVG	284	1.1	RB 1 MHz; VB: 10 Hz Note 2
4824.790	35.1	V-	54.0	-18.9	AVG	279	1.8	RB 1 MHz; VB: 10 Hz Note 2
4825.120	44.6	H	74.0	-29.4	PK	284	1.1	RB 1 MHz; VB: 1 MHz Note 2
4825.370	46.7	V-	74.0	-27.3	PK	279	1.8	RB 1 MHz; VB: 1 MHz Note 2

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is in a restricted band.
Note 3:	Preliminary scans identified all significant signals were at second harmonics of the 802.11g and third harmonics of all four operating modes. Third harmonic of 2412MHz is not in a restricted band. No emissions above the third harmonic were observed, tests were performed to 26GHz.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #2b: 802.11g, 2437 MHz (Center channel), Power set to 20dBm

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
4872.500	33.4	H	54.0	-20.6	AVG	213	1.0	RB 1 MHz; VB: 10 Hz
4874.120	34.7	V	54.0	-19.3	AVG	255	1.3	RB 1 MHz; VB: 10 Hz
7309.560	35.0	H	54.0	-19.0	AVG	204	1.0	RB 1 MHz; VB: 10 Hz
7309.620	37.8	V	54.0	-16.2	AVG	142	1.7	RB 1 MHz; VB: 10 Hz
4872.910	45.7	V	74.0	-28.3	PK	255	1.3	RB 1 MHz; VB: 1 MHz
4875.100	44.4	H	74.0	-29.6	PK	213	1.0	RB 1 MHz; VB: 1 MHz
7311.620	50.3	V	74.0	-23.7	PK	142	1.7	RB 1 MHz; VB: 1 MHz
7311.880	46.0	H	74.0	-28.0	PK	204	1.0	RB 1 MHz; VB: 1 MHz

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is in a restricted band.
Note 3:	Preliminary scans identified all significant signals were at second harmonics of the 802.11g and third harmonics of all four operating modes. Third harmonic of 2412MHz is not in a restricted band. No emissions above the third harmonic were observed, tests were performed to 26GHz.

Run #2c: 802.11g, 2462 MHz (High channel), Power set to 20dBm

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
4922.500	34.1	V	54.0	-19.9	AVG	333	2.3	RB 1 MHz; VB: 10 Hz
4923.480	32.9	H	54.0	-21.1	AVG	205	1.0	RB 1 MHz; VB: 10 Hz
7384.500	35.1	H	54.0	-18.9	AVG	277	1.0	RB 1 MHz; VB: 10 Hz
7384.520	35.5	V	54.0	-18.5	AVG	197	1.0	RB 1 MHz; VB: 10 Hz
4923.080	43.5	H	74.0	-30.5	PK	205	1.0	RB 1 MHz; VB: 1 MHz
4923.830	45.7	V	74.0	-28.3	PK	333	2.3	RB 1 MHz; VB: 1 MHz
7385.020	46.5	V	74.0	-27.5	PK	197	1.0	RB 1 MHz; VB: 1 MHz
7386.520	46.2	H	74.0	-27.8	PK	277	1.0	RB 1 MHz; VB: 1 MHz

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is in a restricted band.
Note 3:	Preliminary scans identified all significant signals were at second harmonics of the 802.11g and third harmonics of all four operating modes. Third harmonic of 2412MHz is not in a restricted band. No emissions above the third harmonic were observed, tests were performed to 26GHz.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

RSS 210 and FCC 15.247 (DTS) 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.

Summary of Results - Device Operating in the 5725-5850 MHz Band

Run #	Mode	Channel	Power Setting	Test Performed	Limit	Result / Margin
1a	802.11a	5745	17	Radiated Emissions, 1 - 40 GHz	FCC Part 15.209 / 15.247(c)	47.5dBμV/m (237.1μV/m) @ 7660.1MHz (-6.5dB)
	n20	5745	17			
	n40	5755	17			
1b	802.11a	5785	17	Radiated Emissions, 1 - 40 GHz	FCC Part 15.209 / 15.247(c)	45.1dBμV/m (179.9μV/m) @ 11571.4MHz (-8.9dB)
	n20	5785	17			
1c	802.11a	5825	17	Radiated Emissions, 1 - 40 GHz	FCC Part 15.209 / 15.247(c)	44.0dBμV/m (158.5μV/m) @ 11651.4MHz (-10.0dB)
	n20	5825	17			
	n40	5795	17			

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: 10-25 °C
Rel. Humidity: 25 - 65 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #1: Radiated Spurious Emissions, 1 - 40GHz. 802.11n Chains A and B Chains Active and set to highest power level

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

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

Run #1a: 802.11A, n20, n40 (low channel), Chains A and C Chains Active and set to highest power level

Radio	Channel (MHz)	Mode	Power Setting		Comments
			Chain A	Chain C	
1	5745	a	17	17	
2	5745	n20	17	17	
3	5755	n40	17	17	
4	-	-	-	-	

Spurious Emissions(All 3 channels for n20 & n40)

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7632.820	36.2	H	54.0	-17.8	AVG	281	1.0	Note 1, RB 1 MHz; VB: 10 Hz
7634.350	36.4	V	54.0	-17.6	AVG	312	2.3	Note 1, RB 1 MHz; VB: 10 Hz
7660.020	38.6	H	54.0	-15.4	AVG	328	2.4	Note 1, RB 1 MHz; VB: 10 Hz
7660.100	47.5	V	54.0	-6.5	AVG	259	1.8	Note 1, RB 1 MHz; VB: 10 Hz
11491.030	42.9	V	54.0	-11.1	AVG	349	1.8	Note 1, RB 1 MHz; VB: 10 Hz
11491.750	41.9	H	54.0	-12.1	AVG	281	2.0	Note 1, RB 1 MHz; VB: 10 Hz
11508.250	42.4	V	54.0	-11.6	AVG	90	1.9	Note 1, RB 1 MHz; VB: 10 Hz
11509.680	40.3	H	54.0	-13.7	AVG	64	1.0	Note 1, RB 1 MHz; VB: 10 Hz
7639.850	47.9	V	74.0	-26.1	PK	312	2.3	Note 1, RB 1 MHz; VB: 1 MHz
7642.020	47.7	H	74.0	-26.3	PK	281	1.0	Note 1, RB 1 MHz; VB: 1 MHz
7660.010	48.9	H	74.0	-25.1	PK	328	2.4	Note 1, RB 1 MHz; VB: 1 MHz
7660.100	52.5	V	74.0	-21.5	PK	259	1.8	Note 1, RB 1 MHz; VB: 1 MHz
11487.000	54.6	V	74.0	-19.4	PK	349	1.8	Note 1, RB 1 MHz; VB: 1 MHz
11492.170	53.8	H	74.0	-20.2	PK	281	2.0	Note 1, RB 1 MHz; VB: 1 MHz
11506.970	53.8	V	74.0	-20.2	PK	90	1.9	Note 1, RB 1 MHz; VB: 1 MHz
11508.900	52.0	H	74.0	-22.0	PK	64	1.0	Note 1, RB 1 MHz; VB: 1 MHz

Note 1:	Signal is in a restricted band.
Note 2:	Preliminary scans identified all significant signals were at second harmonics of the intentional signal plus a signal at approximately 1.33 times the fundamental frequency. No emissions above the second harmonic were observed, tests were performed to 40GHz.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #1b: 802.11a, n20MHz (center channels), Chains A and C Chains Active and set to highest power level

Radio	Channel (MHz)	Mode	Power Setting		Comments
			Chain A	Chain C	
1	5785	a	17	17	
2	5785	n20	17	17	
3	-	-	17	17	
4	-	-	17	17	

Spurious Emissions(All 2 channels for a, n20 modes)

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7701.900	36.1	V	54.0	-17.9	AVG	314	1.0	Note 1, RB 1 MHz; VB: 10 Hz
7703.970	36.2	H	54.0	-17.8	AVG	10	1.0	Note 1, RB 1 MHz; VB: 10 Hz
11570.930	40.0	H	54.0	-14.0	AVG	253	1.0	Note 1, RB 1 MHz; VB: 10 Hz
11571.370	45.1	V	54.0	-8.9	AVG	335	1.8	Note 1, RB 1 MHz; VB: 10 Hz
7699.300	47.2	H	74.0	-26.8	PK	10	1.0	Note 1, RB 1 MHz; VB: 1 MHz
7702.970	47.5	V	74.0	-26.5	PK	314	1.0	Note 1, RB 1 MHz; VB: 1 MHz
11570.600	51.9	H	74.0	-22.1	PK	253	1.0	Note 1, RB 1 MHz; VB: 1 MHz
11570.700	56.6	V	74.0	-17.4	PK	335	1.8	Note 1, RB 1 MHz; VB: 1 MHz

Note 1:	Signal is in a restricted band.
Note 2:	Preliminary scans identified all significant signals were at second harmonics of the intentional signal plus a signal at approximately 1.33 times the fundamental frequency. No emissions above the second harmonic were observed, tests were performed to 40GHz.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #1c: 802.11A, n20, n40 (high channel), Chains A and C Chains Active and set to highest power level

Radio	Channel (MHz)	Mode	Power Setting		Comments
			Chain A	Chain C	
1	5825	a	17	17	
2	5825	n20	17	17	
3	5795	n40	17	17	
4	-	-	17	17	

Spurious Emissions(All 3 channels for a, n20 & n40)

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7713.630	36.3	H	54.0	-17.7	AVG	0	1.0	Note 1, RB 1 MHz; VB: 10 Hz
7714.730	36.4	V	54.0	-17.6	AVG	88	1.0	Note 1, RB 1 MHz; VB: 10 Hz
7737.000	36.1	V	54.0	-17.9	AVG	101	1.0	Note 1, RB 1 MHz; VB: 10 Hz
11589.930	38.8	H	54.0	-15.2	AVG	44	1.0	Note 1, RB 1 MHz; VB: 10 Hz
11590.300	41.1	V	54.0	-12.9	AVG	43	1.0	Note 1, RB 1 MHz; VB: 10 Hz
11651.030	39.8	H	54.0	-14.2	AVG	243	1.0	Note 1, RB 1 MHz; VB: 10 Hz
11651.370	44.0	V	54.0	-10.0	AVG	332	1.8	Note 1, RB 1 MHz; VB: 10 Hz
7711.970	47.0	H	74.0	-27.0	PK	0	1.0	Note 1, RB 1 MHz; VB: 1 MHz
7715.670	47.4	V	74.0	-26.6	PK	88	1.0	Note 1, RB 1 MHz; VB: 1 MHz
7747.130	47.5	V	74.0	-26.5	PK	101	1.0	Note 1, RB 1 MHz; VB: 1 MHz
11589.200	52.1	V	74.0	-21.9	PK	43	1.0	Note 1, RB 1 MHz; VB: 1 MHz
11593.170	50.0	H	74.0	-24.0	PK	44	1.0	Note 1, RB 1 MHz; VB: 1 MHz
11650.400	50.8	H	74.0	-23.2	PK	243	1.0	Note 1, RB 1 MHz; VB: 1 MHz
11652.800	56.9	V	74.0	-17.1	PK	332	1.8	Note 1, RB 1 MHz; VB: 1 MHz

Note 1:	Signal is in a restricted band.
Note 2:	Preliminary scans identified all significant signals were at second harmonics of the intentional signal plus a signal at approximately 1.33 times the fundamental frequency. No emissions above the second harmonic were observed, tests were performed to 40GHz.

Client: Xirrus	Job Number: J71484
Model: XN4	T-Log Number: T73387
Contact: Steve Smith	Account Manager: Susan Pelzl
Standard: FCC 15.247 / RSS 210	Class: N/A

RSS 210 and FCC 15.247 (DTS) 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.

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: 10-25 °C
Rel. Humidity: 25 - 65 %

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

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

Summary of Results - Device Operating in the 5725-5850 MHz Band

Run #	Mode	Channel	Power Setting	Test Performed	Limit	Result / Margin
1a	802.11a External Antenna	5745	20	Radiated Emissions, 1 - 40 GHz	FCC Part 15.209 / 15.247(c)	43.9dBµV/m (156.7µV/m) @ 11489.9MHz (-10.1dB)
1b		5785	20	Radiated Emissions, 1 - 40 GHz	FCC Part 15.209 / 15.247(c)	46.2dBµV/m (204.2µV/m) @ 11568.2MHz (-7.8dB)
1c		5825	20	Radiated Emissions, 1 - 40 GHz	FCC Part 15.209 / 15.247(c)	43.5dBµV/m (149.6µV/m) @ 11648.3MHz (-10.5dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #1: Radiated Spurious Emissions, 1 - 40GHz. 802.11a Chain B Chains Active and set to highest power level

Run #1a: 802.11a, 5745 MHz (Low channel), Chains B Chain Active and set to highest power level (20dBm)

Fundamental emission level @ 3m in 100kHz RBW:	100.0 dB μ V/m
Limit for emissions outside of restricted bands:	70.0 dB μ V/m

Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11489.380	41.6	H	54.0	-12.4	AVG	244	2.4	RB 1 MHz; VB: 10 Hz
11489.870	43.9	V	54.0	-10.1	AVG	279	1.7	RB 1 MHz; VB: 10 Hz
11491.240	55.6	V	74.0	-18.4	PK	279	1.7	RB 1 MHz; VB: 1 MHz
11492.900	53.0	H	74.0	-21.0	PK	244	2.4	RB 1 MHz; VB: 1 MHz

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

Run #1b: 802.11a, 5785 MHz (Center channel), Chain B Active and set to highest power level (20dBm)

Fundamental emission level @ 3m in 100kHz RBW:	104.4 dB μ V/m
Limit for emissions outside of restricted bands:	74.4 dB μ V/m

Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11568.230	46.2	V	54.0	-7.8	AVG	293	2.4	RB 1 MHz; VB: 10 Hz
11573.120	39.2	H	54.0	-14.8	AVG	325	1.0	RB 1 MHz; VB: 10 Hz
11565.700	58.7	V	74.0	-15.3	PK	293	2.4	RB 1 MHz; VB: 1 MHz
11566.920	51.0	H	74.0	-23.0	PK	325	1.0	RB 1 MHz; VB: 1 MHz

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

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	N/A

Run #1c: 802.11a, 5825 MHz (High channel), Chain A Active and set to highest power level (20dBm)

Fundamental emission level @ 3m in 100kHz RBW:	106.0 dB μ V/m
Limit for emissions outside of restricted bands:	76.0 dB μ V/m

Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11648.330	43.5	V	54.0	-10.5	AVG	106	2.4	RB 1 MHz; VB: 10 Hz
11654.020	39.9	H	54.0	-14.1	AVG	264	1.0	RB 1 MHz; VB: 10 Hz
11646.280	50.9	H	74.0	-23.1	PK	264	1.0	RB 1 MHz; VB: 1 MHz
11654.920	55.9	V	74.0	-18.1	PK	106	2.4	RB 1 MHz; VB: 1 MHz

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

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	DTS

Radiated Emissions

Test Specific Details

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

General Test Configuration

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

The test distance and extrapolation factor (if applicable) are detailed under each run description.

Note, **preliminary** testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. **Maximized** testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

Ambient Conditions:

Temperature:	10-25 °C
Rel. Humidity:	25 - 65 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1 (Internal Antenna)	RE, 1000 - 18000 MHz Maximized Emissions	RSS GEN	Pass	44.2dBμV/m (162.2μV/m) @ 1320.1MHz (-9.8dB)
2 (External Antenna)	RE, 1000 - 18000 MHz Maximized Emissions	RSS GEN	Pass	39.2dBμV/m @ 7713.5MHz (-14.8dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 18,000 MHz	3	3	0.0

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	DTS

Run #1: Maximized readings, 1000 - 18,000 MHz, Internal Antenna

Date of Test: 10/30/08
Test Engineer: Mehran Birgani
Test Location: SV OATS #2

Config. Used: 1
Config Change: -
EUT Voltage: POE

Radio 1	Radio 2	Radio 3	Radio 4
2437 single	2437 All	5785 Single	5785 All

Single = only one Rx chain active. All = all RX chains active (2 in 5Ghz band, 3 in 2.4 band)

Frequency	Level	Pol	RSS GEN		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1320.050	44.2	H	54.0	-9.8	AVG	241	1.0	RB 1 MHz; VB: 10 Hz Note 1
1320.060	43.2	V	54.0	-10.8	AVG	38	2.1	RB 1 MHz; VB: 10 Hz Note 1
1386.040	35.4	H	54.0	-18.6	AVG	242	1.0	RB 1 MHz; VB: 10 Hz Note 1
1386.130	32.8	V	54.0	-21.2	AVG	237	1.1	RB 1 MHz; VB: 10 Hz Note 1
1642.100	28.4	H	54.0	-25.6	AVG	90	1.0	RB 1 MHz; VB: 10 Hz Note 1
1642.880	30.0	V	54.0	-24.0	AVG	306	1.2	RB 1 MHz; VB: 10 Hz Note 1
2303.000	30.7	H	54.0	-23.3	AVG	63	1.0	RB 1 MHz; VB: 10 Hz Note 1
2626.670	35.3	H	54.0	-18.7	AVG	0	1.0	RB 1 MHz; VB: 10 Hz Note 1
2969.990	32.7	H	54.0	-21.3	AVG	86	1.0	RB 1 MHz; VB: 10 Hz Note 1
7463.710	35.8	H	54.0	-18.2	AVG	187	1.0	RB 1 MHz; VB: 10 Hz Note 2
7713.360	37.7	H	54.0	-16.3	AVG	128	2.0	RB 1 MHz; VB: 10 Hz Note 2
7713.420	38.4	V	54.0	-15.6	AVG	173	1.0	RB 1 MHz; VB: 10 Hz Note 2
1320.120	47.5	H	74.0	-26.5	PK	241	1.0	RB 1 MHz; VB: 1 MHz Note 1
1320.330	47.1	V	74.0	-26.9	PK	38	2.1	RB 1 MHz; VB: 1 MHz Note 1
1386.070	44.2	H	74.0	-29.8	PK	242	1.0	RB 1 MHz; VB: 1 MHz Note 1
1386.100	41.5	V	74.0	-32.5	PK	237	1.1	RB 1 MHz; VB: 1 MHz Note 1
1641.800	40.6	H	74.0	-33.4	PK	90	1.0	RB 1 MHz; VB: 1 MHz Note 1
1642.220	42.5	V	74.0	-31.5	PK	306	1.2	RB 1 MHz; VB: 1 MHz Note 1
2302.970	40.5	H	74.0	-33.5	PK	63	1.0	RB 1 MHz; VB: 1 MHz Note 1
2628.290	53.9	H	74.0	-20.1	PK	0	1.0	RB 1 MHz; VB: 1 MHz Note 1
2970.380	42.0	H	74.0	-32.0	PK	86	1.0	RB 1 MHz; VB: 1 MHz Note 1
7469.530	46.9	H	74.0	-27.1	PK	187	1.0	RB 1 MHz; VB: 1 MHz Note 2
7713.100	48.8	V	74.0	-25.2	PK	173	1.0	RB 1 MHz; VB: 1 MHz Note 2
7713.280	47.7	H	74.0	-26.3	PK	128	2.0	RB 1 MHz; VB: 1 MHz Note 2

Note 1: Signal is independent of the tuned frequency and related to the digital device operation.

Note 2: Related to the receivers tuned to 5.785 GHz

Note 3: Preliminary scans showed no significant emissions related to the receiver when the receivers were operating in the 5150-5350 and 5470-5725 MHz bands.

Client:	Xirrus	Job Number:	J71484
Model:	XN4	T-Log Number:	T73387
Contact:	Steve Smith	Account Manager:	Susan Pelzl
Standard:	FCC 15.247 / RSS 210	Class:	DTS

Run #2: Maximized readings, 1000 - 18,000 MHz, External Antenna

Date of Test: 11/14/2008
Test Engineer: Suhaila Khushzad
Test Location: OATS # 1

Config. Used: 1
Config Change: -
EUT Voltage: POE

Radio 1	Radio 2	Radio 3	Radio 4
-	-	-	5785

Frequency	Level	Pol	RSS GEN		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7713.470	39.2	V	54.0	-14.8	AVG	357	1.0	RB 1 MHz; VB: 10 Hz
7713.870	48.2	V	74.0	-25.8	PK	357	1.0	RB 1 MHz; VB: 1 MHz
7713.440	37.0	H	54.0	-17.0	AVG	204	1.7	RB 1 MHz; VB: 10 Hz Noise Floor
7727.190	48.4	H	74.0	-25.6	PK	204	1.7	RB 1 MHz; VB: 1 MHz Noise Floor
7442.280	35.7	V	54.0	-18.3	AVG	15	1.7	RB 1 MHz; VB: 10 Hz Noise Floor
7473.100	46.9	V	74.0	-27.1	PK	15	1.7	RB 1 MHz; VB: 1 MHz Noise Floor
7442.210	35.7	H	54.0	-18.3	AVG	325	1.0	RB 1 MHz; VB: 10 Hz Noise Floor
7455.830	47.4	H	74.0	-26.6	PK	325	1.0	RB 1 MHz; VB: 1 MHz Noise Floor

Note 1: Signals related to the digital device were excluded from being measured. Only receiver-related emissions were evaluated.

Note 2: Preliminary scans showed no significant emissions related to the receiver when the receivers were operating in the 5150-5350 and 5470-5725 MHz bands.

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

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

Conducted Emissions - Power Ports

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: 1/7/2009 12:48
Test Engineer: Joseph Cadigal
Test Location: SVOATS #1

Config. Used: 1
Config Change: None
EUT Voltage: 230V/50Hz, 120V/60Hz

General Test Configuration

The EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from the LISN. A second LISN was used for all local support equipment. Remote support equipment was located approximately 30 meters from the test area. All I/O connections were routed overhead.

Ambient Conditions:

Temperature:	13 °C
Rel. Humidity:	66 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power, 120V/60Hz	FCC 15.209 FCC Class B	Pass	41.3dBµV @ 2.972MHz (-4.7dB)
2	CE, AC Power, 120V/60Hz	EN 55022 Class A	Pass	48.3dBµV @ 3.397MHz (-11.7dB)

Modifications Made During Testing

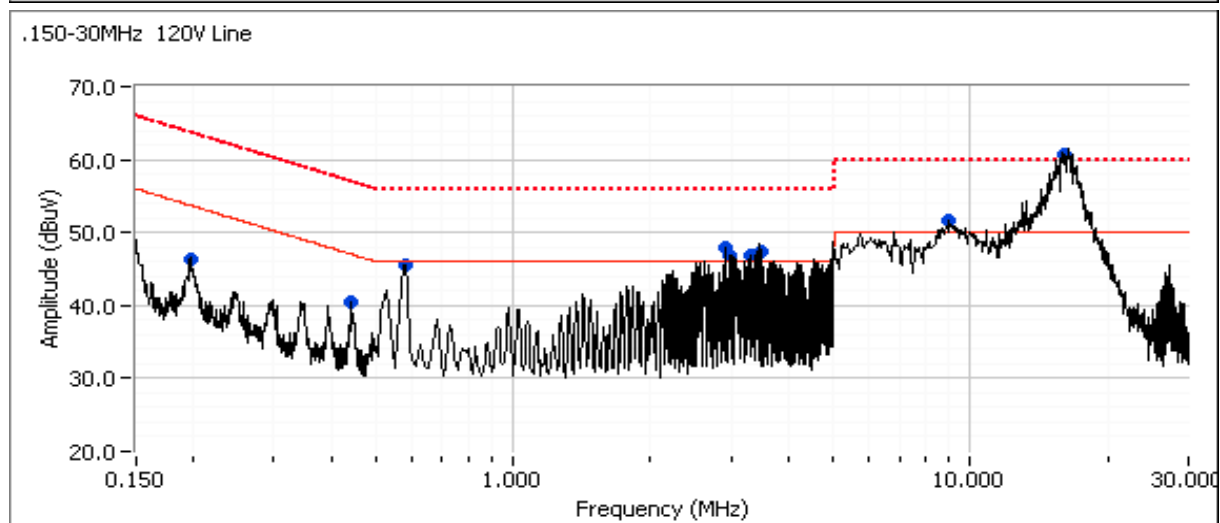
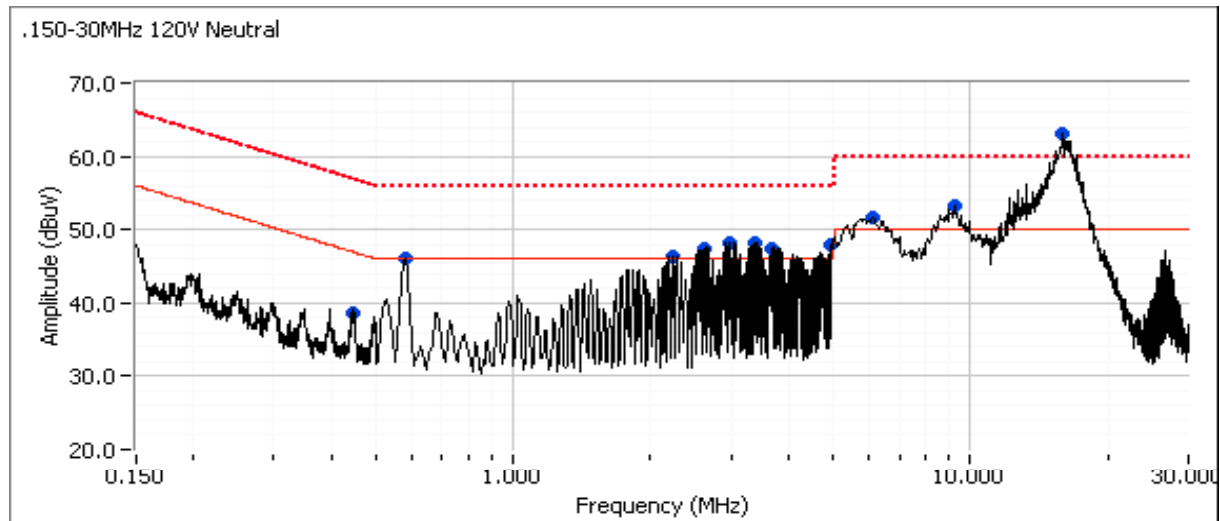
No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

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

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



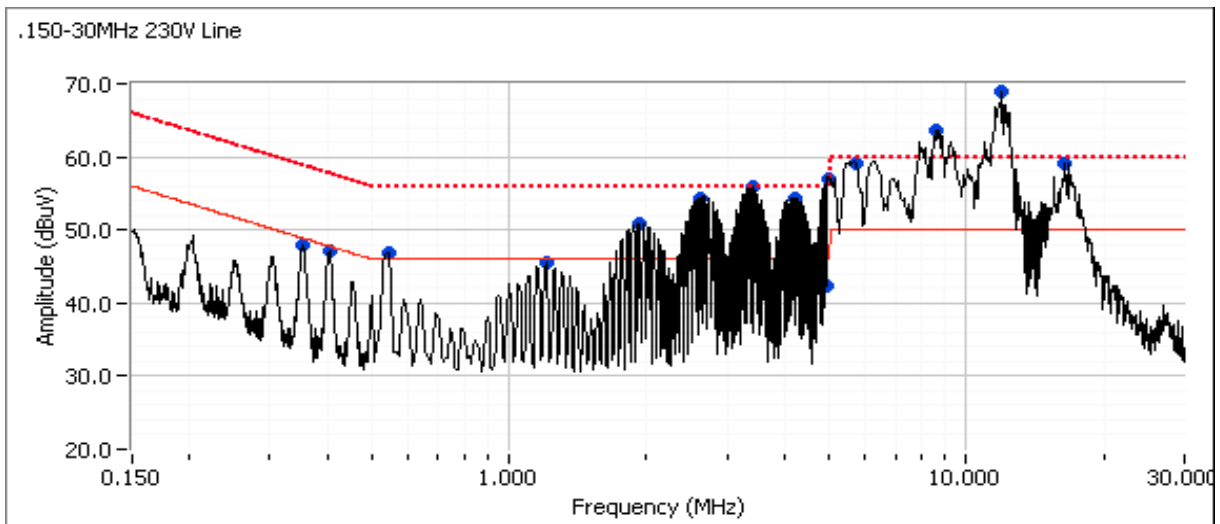
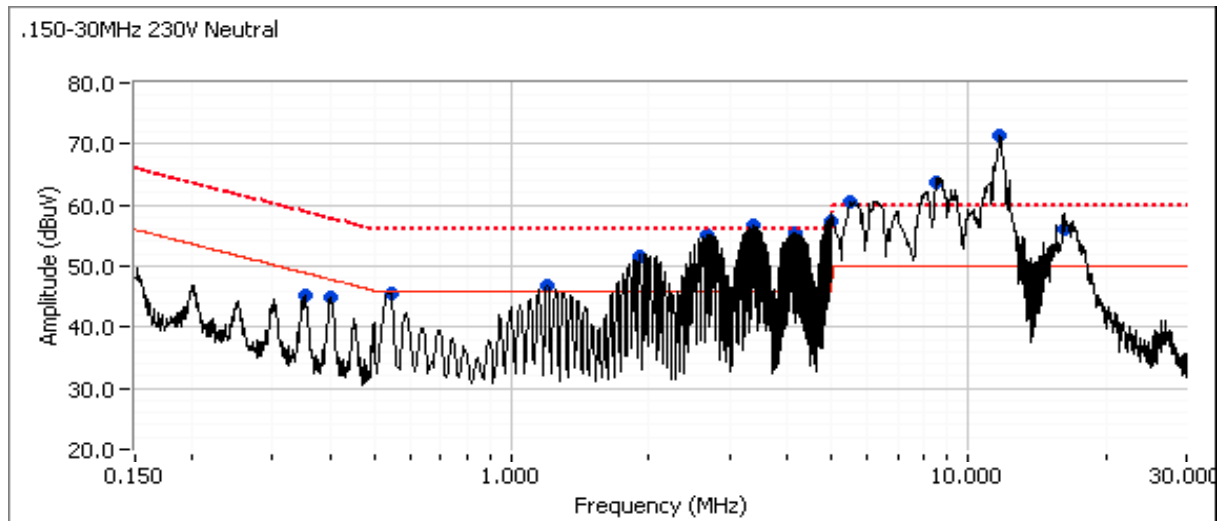
Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz Continued next page...

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

Frequency MHz	Level dBμV	AC Line	Class B		Detector QP/Ave	Comments
			Limit	Margin		
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	-7.3	AVG	AVG (0.100s)
3.677	34.8	Neutral	46.0	-11.2	AVG	AVG (0.100s)
2.634	42.7	Neutral	56.0	-13.3	QP	QP (1.000s)
15.905	46.6	Neutral	60.0	-13.4	QP	QP (1.000s)
3.466	42.5	Line 1	56.0	-13.5	QP	QP (1.000s)
2.972	42.5	Line 1	56.0	-13.5	QP	QP (1.000s)
0.594	42.3	Line 1	56.0	-13.7	QP	QP (1.000s)
2.921	42.0	Line 1	56.0	-14.0	QP	QP (1.000s)
3.318	41.9	Line 1	56.0	-14.1	QP	QP (1.000s)
2.981	41.9	Neutral	56.0	-14.1	QP	QP (1.000s)
16.098	45.7	Line 1	60.0	-14.3	QP	QP (1.000s)
2.236	41.2	Neutral	56.0	-14.8	QP	QP (1.000s)
3.378	40.9	Neutral	56.0	-15.1	QP	QP (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	QP (1.000s)
0.444	33.2	Line 1	57.0	-23.8	QP	QP (1.000s)
6.114	26.0	Neutral	50.0	-24.0	AVG	AVG (0.100s)
0.198	39.4	Line 1	63.7	-24.3	QP	QP (1.000s)
8.966	35.5	Line 1	60.0	-24.5	QP	QP (1.000s)
0.447	32.1	Neutral	56.9	-24.8	QP	QP (1.000s)
6.114	32.6	Neutral	60.0	-27.4	QP	QP (1.000s)

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

Run #2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz



Run #2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz Continued next page...

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

Frequency MHz	Level dBμV	AC Line	EN55022 A		Detector QP/Ave	Comments
			Limit	Margin		
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

EXHIBIT 4: Proposed FCC ID Label & Label Location

Uploaded as a separate document

EXHIBIT 5: Detailed Photographs

Uploaded as a separate document

EXHIBIT 6: Operator's Manual

Uploaded as a separate document

EXHIBIT 7: Block Diagram

Uploaded as a separate document

EXHIBIT 8: Schematic Diagrams

Uploaded as a separate document

EXHIBIT 9: Theory of Operation

Uploaded as a separate document

EXHIBIT 10: RF Exposure Information

Uploaded as a separate document