NTS Silicon Valley
www.nts.com
41039 Boyce Road
Fremont, CA 94538
510-578-3500 Phone
510-440-9525 Fax

EMC Test Report

Application for Grant of Equipment Authorization

Industry Canada RSS-Gen Issue 4 / RSS 247 Issue 1
FCC Part 15 Subpart C

Model: XI-AC3470

IC CERTIFICATION #:	5428A-XIAC3470
FCC ID:	SK6-XIAC3370
APPLICANT:	Xirrus, Inc. 2101 Corporate Center Drive Thousand Oaks, CA 91320
TEST SITE(S):	National Technical Systems - Silicon Valley 41039 Boyce Road. Fremont, CA. 94538-2435
IC SITE REGISTRATION #:	2845B-5, 2845B-7
REPORT DATE:	October 21, 2015
REISSUE DATE:	November 11, 2015
FINAL TEST DATES:	September 28, 29, 30, October 1, 7, 8, 9, and 19, 2015
TOTAL NUMBER OF PAGES:	109

PROGRAM MGR /
TECHNICAL REVIEWER:

Mark E Hill
Staff Engineer

QUALITY ASSURANCE DELEGATE /
FINAL REPORT PREPARER:

David Guidotti
Senior Technical Writer

ACCREDITED
Testing Cert #0214.26

REVISION HISTORY

Rev#	Date	Comments	Modified By
-	October 21, 2015	First release	
1.0	November 11, 2015	Updated model number Removed erroneous duty cycle information	MEH

TABLE OF CONTENTS

REVISION HISTORY **2**
TABLE OF CONTENTS **3**
SCOPE **4**
OBJECTIVE **4**
STATEMENT OF COMPLIANCE **5**
DEVIATIONS FROM THE STANDARDS **5**
TEST RESULTS SUMMARY **6**
DIGITAL TRANSMISSION SYSTEMS (2400 – 2483.5MHZ) 6
GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS 6
MEASUREMENT UNCERTAINTIES 7
EQUIPMENT UNDER TEST (EUT) DETAILS **8**
GENERAL 8
OTHER EUT DETAILS 8
ANTENNA SYSTEM 8
ENCLOSURE 8
MODIFICATIONS 8
SUPPORT EQUIPMENT 8
EUT INTERFACE PORTS 9
EUT OPERATION 9
TEST SITE **10**
GENERAL INFORMATION 10
CONDUCTED EMISSIONS CONSIDERATIONS 10
RADIATED EMISSIONS CONSIDERATIONS 10
MEASUREMENT INSTRUMENTATION **11**
RECEIVER SYSTEM 11
INSTRUMENT CONTROL COMPUTER 11
LINE IMPEDANCE STABILIZATION NETWORK (LISN) 11
FILTERS/ATTENUATORS 12
ANTENNAS 12
ANTENNA MAST AND EQUIPMENT TURNTABLE 12
INSTRUMENT CALIBRATION 12
TEST PROCEDURES **13**
EUT AND CABLE PLACEMENT 13
CONDUCTED EMISSIONS 13
RADIATED EMISSIONS 14
CONDUCTED EMISSIONS FROM ANTENNA PORT 17
BANDWIDTH MEASUREMENTS 17
SPECIFICATION LIMITS AND SAMPLE CALCULATIONS 18
CONDUCTED EMISSIONS SPECIFICATION LIMITS: FCC 15.207; FCC 15.107(A), RSS GEN 18
GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS 19
OUTPUT POWER LIMITS – DIGITAL TRANSMISSION SYSTEMS 19
TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS AND DTS SYSTEMS 19
SAMPLE CALCULATIONS - CONDUCTED EMISSIONS 19
SAMPLE CALCULATIONS - RADIATED EMISSIONS 20
SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION 21
APPENDIX A TEST EQUIPMENT CALIBRATION DATA **22**
APPENDIX B TEST DATA **24**
END OF REPORT **109**

SCOPE

An electromagnetic emissions test has been performed on the Xirrus, Inc. model XI-AC3470, pursuant to the following rules:

Industry Canada RSS-Gen Issue 4
RSS 247 Issue 1 "Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices"
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 National Technical Systems - Silicon Valley test procedures:

ANSI C63.10-2013
FCC DTS Measurement Guidance KDB558074

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

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

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

OBJECTIVE

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

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

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

Certification is a procedure where the manufacturer submits test data and technical information to a certification body and receives a certificate or grant of equipment authorization upon successful completion of the certification body's review of the submitted documents. Once the equipment authorization has been obtained, the label

indicating compliance must be attached to all identical units, which are subsequently manufactured.

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

STATEMENT OF COMPLIANCE

The tested sample of Xirrus, Inc. model XI-AC3470 complied with the requirements of the following regulations:

Industry Canada RSS-Gen Issue 4
RSS 247 Issue 1 "Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices"
FCC Part 15 Subpart C

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

The test results recorded herein are based on a single type test of Xirrus, Inc. model XI-AC3470 and therefore apply only to the tested sample. The sample was selected and prepared by Paul Zahra of Xirrus, Inc..

DEVIATIONS FROM THE STANDARDS

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

TEST RESULTS SUMMARY

DIGITAL TRANSMISSION SYSTEMS (2400 – 2483.5MHz)

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247(a)	RSS 247 5.2	Digital Modulation	Systems use OFDM / DSSS techniques	System must utilize a digital transmission technology	Complies
15.247 (a) (2)	RSS 247 5.2 (1)	6dB Bandwidth	b: 8.6 MHz g: 15.1 MHz HT20: 15.1 MHz HT40: 36.4 MHz	>500kHz	Complies
15.247 (b) (3)	RSS 247 5.4 (4)	Output Power (multipoint systems)	b: 25.3 dBm (0.338W) g: 24.9 dBm (0.310W) HT20: 23.6 dBm (0.232W) HT40: 19.8 dBm (0.096W) EIRP = 3.027 W Note 1	1Watt, EIRP limited to 4 Watts.	Complies
15.247(e)	RSS 247 5.2 (2)	Power Spectral Density	11b: 4.2 dBm/3kHz g: 1.6 dBm/3kHz HT20: 1.1 dBm/3kHz HT40: 5.5 dBm/3kHz	8dBm/3kHz	Complies
15.247(d)	RSS 247 5.5	Antenna Port Spurious Emissions 30MHz – 25 GHz	All emissions >-30dBc	< -30dBc Note 2	Complies
15.247(d) / 15.209	RSS 247 5.5 / RSS-GEN	Radiated Spurious Emissions 30MHz – 25 GHz	53.8 dBµV/m @ 2484.4 MHz (-0.2 dB)	15.207 in restricted bands, all others <-30dBc Note 2	Complies

Note 1: EIRP calculated using antenna. Refer to test data for details..
Note 2: Limit of -30dBc used because the power was measured using the UNII test procedure (maximum power averaged over a transmission burst).

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Antennas are fixed to the module	Unique or integral antenna required	Complies
15.207	RSS GEN Table 3	AC Conducted Emissions	58.3 dBµV @ 0.285 MHz (-2.4 dB)	Refer to page 18	Complies
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to MPE calculations in separate exhibit, RSS 102 declaration and User Manual statements.	Refer to OET 65, FCC Part 1 and RSS 102	Complies
-	RSP 100 RSS GEN 6.6	Occupied Bandwidth	b: 12.4 MHz g: 19.0 MHz HT20: 18.7 MHz HT40: 36.6 MHz	Information only	N/A

MEASUREMENT UNCERTAINTIES

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

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

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Xirrus, Inc. model XI-AC3470 is a 4x4 802.11abgn/ac module that is designed to be used in the Xirrus XR2000, XR4000 and XR6000 host systems. Since the host would be placed on a wall or ceiling mounted during operation, the EUT was treated as tabletop equipment. The host devices are powered from 802.3 PoE + Compliant power sources.

The sample was received on September 28, 2015 and tested on September 28, 29, 30, October 1, 7, 8, 9, and 19, 2015. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Xirrus Inc	XIAC3470	802.11abgn/ac module	Refer to data	SK6-XIAC3470

OTHER EUT DETAILS

The following EUT details should be noted:
2.4GHz - supports 11b, 11g, HT20, HT40
5GHz - supports 11a, HT20, HT40, AC80 (does not support 80+80 or 160MHz at this time)
2.4/5GHz - supports 4Tx and 4TxBF

ANTENNA SYSTEM

The antenna system consists of four internal pcb trace antennas.

ENCLOSURE

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

MODIFICATIONS

No modifications were made to the EUT during the time the product was at NTS Silicon Valley.

SUPPORT EQUIPMENT

The following equipment was used as support equipment for testing:

Company	Model	Description	Serial Number	FCC ID
Xirrus	XR4000	XR4000 motherboard/test fixture	-	-

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

Company	Model	Description	Serial Number	FCC ID
Xirrus	XP1-MSI-75	POE Injector	-	-
-	-	Laptop Computer	-	-

Note, the POE injector was placed locally for the AC conducted emission test.

EUT INTERFACE PORTS

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

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
EUT	test fixture	PCIe bus connector	-	-
Test Fixture – POE In	Remote POE Injector	CAT5	Unshielded	10
POE Injector	Laptop Computer	CAT5	Unshielded	2
POE Injector AC Input	AC Mains	3wire	Unshielded	1.5

EUT OPERATION

During testing, the EUT was configured to continuously transmit at maximum output power and noted data rate on the channel indicated. A preliminary evaluation was performed to determine the worse case data rate for each mode.

TEST SITE

GENERAL INFORMATION

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

Site	Designation / Registration Numbers		Location
	FCC	Canada	
Chamber 7	US0027	2845B-7	41039 Boyce Road Fremont, CA 94538-2435
Chamber 5	US0027	2845B-5	

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

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.10. 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 guidelines and meet the Normalized Site Attenuation (NSA) requirements of ANSI C63.4.

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

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

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

INSTRUMENT CONTROL COMPUTER

The receivers utilize either a Rohde & Schwarz EZM Spectrum Monitor/Controller or contain an internal Spectrum Monitor/Controller to view and convert the receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers. The software used for radiated and conducted emissions measurements is NTS EMI Test Software (rev 2.10)

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 C63.10 specifies that the test height above ground for table mounted devices shall be 80 centimeters for measurements below 1GHz and 1.5m for measurements above 1GHz. 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 as specified in ANSI C63.4. 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 C63.10, and the worst-case orientation is used for final measurements.

CONDUCTED EMISSIONS

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

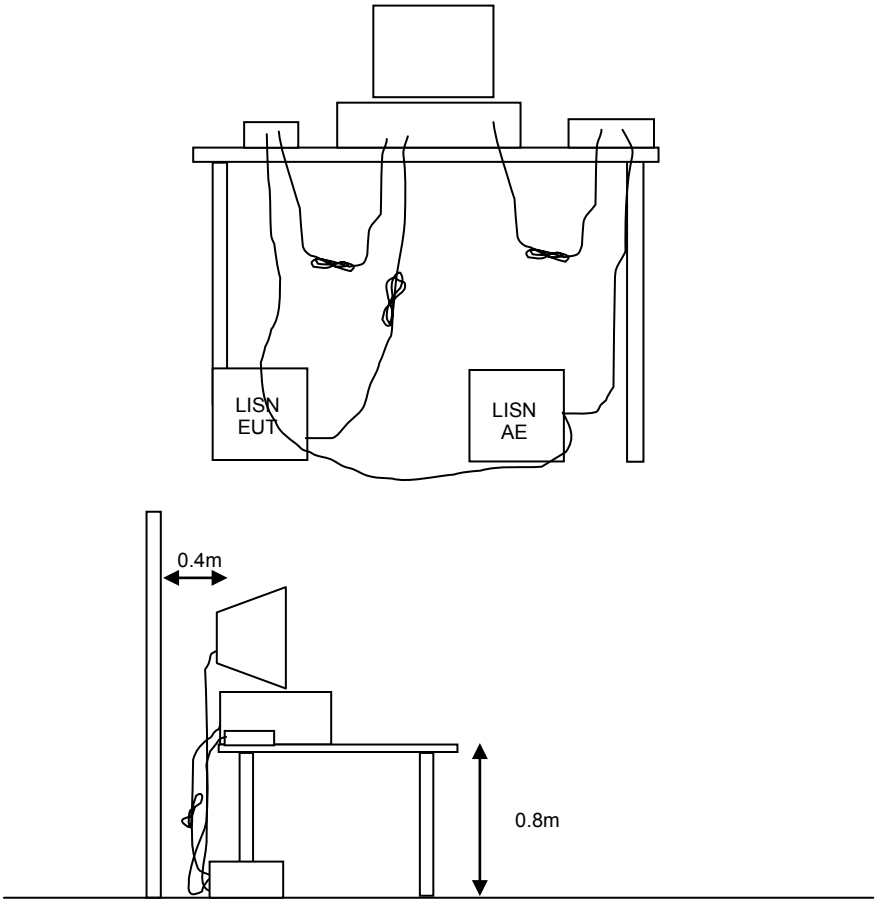


Figure 1 Typical Conducted Emissions Test Configuration

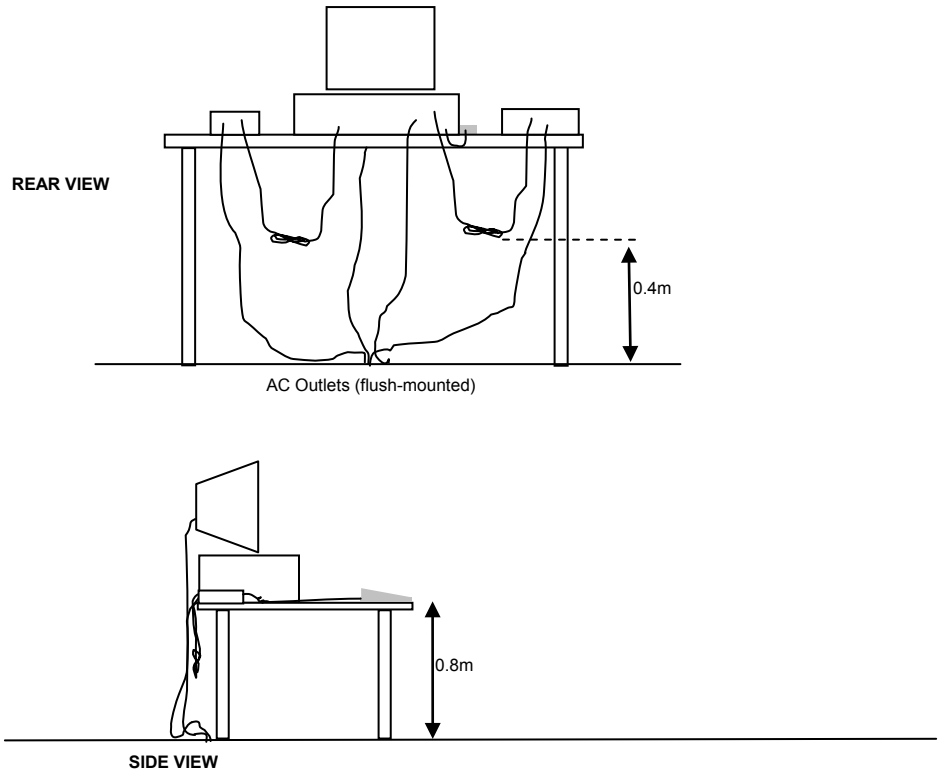
RADIATED EMISSIONS

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

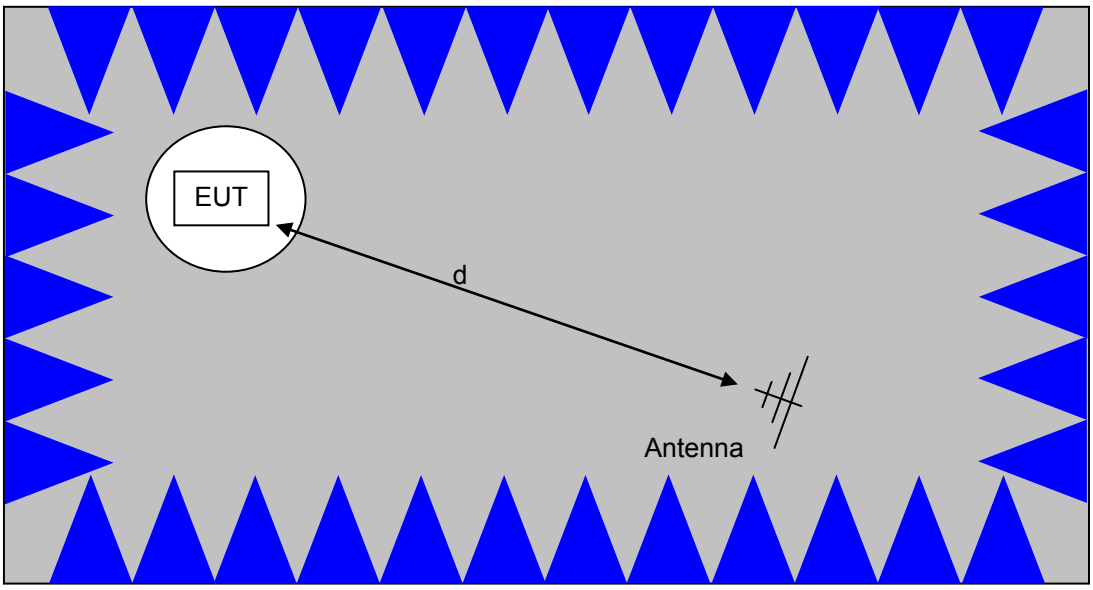
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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

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

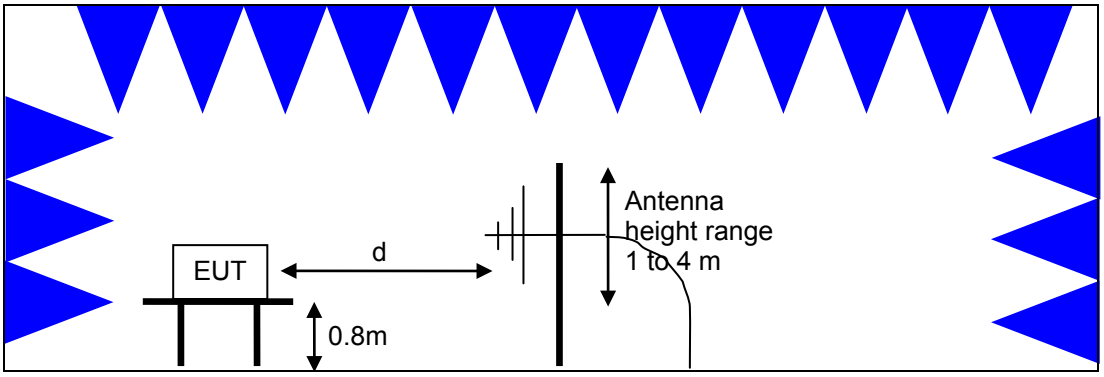


Typical Test Configuration for Radiated Field Strength Measurements



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

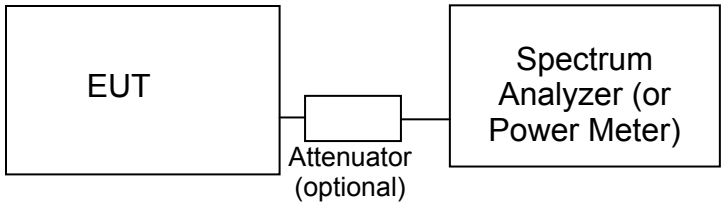
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



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

CONDUCTED EMISSIONS FROM ANTENNA PORT

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



Test Configuration for Antenna Port Measurements

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

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

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

BANDWIDTH MEASUREMENTS

The 6dB, 20dB, 26dB and/or 99% signal bandwidth are measured using the bandwidths recommended by ANSI C63.10 and RSS GEN.

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

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

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

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

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

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

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands[1].

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

OUTPUT POWER LIMITS – DIGITAL TRANSMISSION SYSTEMS

The table below shows the limits for output power and output power density.

Operating Frequency (MHz)	Output Power	Power Spectral Density
2400 – 2483.5	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 GEN. 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

[1] The restricted bands are detailed in FCC 15.205, RSS-GEN Table 3

SAMPLE CALCULATIONS - RADIATED EMISSIONS

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

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

$$F_d = 20*LOG_{10} (D_m/D_s)$$

where:

F_d = Distance Factor in dB

D_m = Measurement Distance in meters

D_s = Specification Distance in meters

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

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

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

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

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

R_r = Receiver Reading in dBuV/m

F_d = Distance Factor in dB

R_c = Corrected Reading in dBuV/m

L_s = Specification Limit in dBuV/m

M = Margin in dB Relative to Spec

SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION

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

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

where P is the eirp (Watts)

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

Appendix A Test Equipment Calibration Data

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Radiated Spurious Emissions, Bandedges, 28-Sep-15					
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/26/2014	6/26/2016
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	12/20/2014	12/20/2015
Radiated Spurious Emissions, 1000 - 6,500 MHz, Bandedges, 29-Sep-15					
NTS	NTS EMI Software (rev 2.10)	N/A	0		N/A
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/26/2014	6/26/2016
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	12/20/2014	12/20/2015
Conducted Emissions - AC Power Ports, 30-Sep-15					
NTS	NTS EMI Software (rev 2.10)	N/A	0		N/A
EMCO	LISN, 10 kHz-100 MHz	3825/2	1293	6/2/2015	6/2/2016
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1401	5/14/2015	5/14/2016
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	12/20/2014	12/20/2015
Radiated Emissions, 30 - 26,500 MHz, 01-Oct-15					
NTS	NTS EMI Software (rev 2.10)	N/A	0		N/A
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	10/31/2014	10/31/2015
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/26/2014	6/26/2016
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	5/2/2015	5/2/2016
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	2238	9/16/2015	9/16/2016
Radio Antenna Port (Power and Spurious Emissions), 07-Oct-15					
Agilent Technologies	3Hz -44GHz PSA Spectrum Analyzer	E4446A	2796	3/31/2015	3/31/2016
Radio Antenna Port (Power and Spurious Emissions), 08-Oct-15					
Agilent Technologies	3Hz -44GHz PSA Spectrum Analyzer	E4446A	2796	3/31/2015	3/31/2016
Radio Antenna Port (Power and Spurious Emissions), 09-Oct-15					
Manufacturer	**Description**	**Model**	**Asset #**	**Calibrated**	**Cal Due**
NTS	NTS UNII Power Software (rev 3.8)	N/A	0		N/A
Agilent Technologies	3Hz -44GHz PSA Spectrum Analyzer	E4446A	2796	3/31/2015	3/31/2016
Radiated Emissions, 1,000 - 18,000 MHz, 09-Oct-15					
EMCO	Antenna, Horn, 1-18 GHz	3115	487	7/29/2014	7/29/2016
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	2/20/2015	2/20/2016
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	9/20/2014	10/20/2015
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	7/13/2015	7/13/2016

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Conducted Emissions - AC Power Ports, 19-Oct-15					
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1594	5/14/2015	5/14/2016
Fischer Custom Comm	LISN, 25A, 150kHz to 30MHz, 25 Amp,	FCC-LISN-50-25-2-09	2000	8/18/2015	9/18/2016
Rohde & Schwarz	EMI Test Receiver, 20 Hz-40 GHz	ESIB40 (1088.7490.40)	2493	1/23/2015	1/23/2016

Appendix B Test Data

T99598 Pages 25 – 108

Client:	Xirrus	Job Number:	JD99498
Product	XI-AC3470	T-Log Number:	T99598
System Configuration:	-	Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Emissions Standard(s):	FCC 15.247, RSS-247	Class:	-
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Xirrus

Product

XI-AC3470

Date of Last Test: 10/19/2015

Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions

Test Specific Details

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

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.
For radiated emissions testing the measurement antenna was located 3 meters from the EUT, unless otherwise noted.

Ambient Conditions:

Temperature: 22-24 °C
Rel. Humidity: 30-35 %

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.

Sample Notes

Module S/N: BET3716XRU200027
Driver: 10.10. RC69.10
Antenna: Integral 4x4

Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

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

Run #	Mode	Channel	Target Power	Power Setting	Test Performed	Limit	Result / Margin
1	b	1 - 2412MHz	19	18	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	50.9 dBµV/m @ 2389.4 MHz (-3.1 dB)
		11 - 2462MHz		18	Restricted Band Edge (2483.5 MHz)		49.2 dBµV/m @ 2483.5 MHz (-4.8 dB)
2	g	1 - 2412MHz		13	Restricted Band Edge (2390 MHz)		50.6 dBµV/m @ 2390.0 MHz (-3.4 dB)
		2 - 2417MHz		17			53.7 dBµV/m @ 2387.5 MHz (-0.3 dB)
		9 - 2452MHz		19	Restricted Band Edge (2483.5 MHz)		52.9 dBµV/m @ 2484.6 MHz (-1.1 dB)
		10 - 2457MHz		16			51.5 dBµV/m @ 2483.6 MHz (-2.5 dB)
		11 - 2462MHz		14			51.6 dBµV/m @ 2483.7 MHz (-2.4 dB)
3	HT20	1 - 2412MHz	18	14	Restricted Band Edge (2390 MHz)		72.8 dBµV/m @ 2389.7 MHz (-1.2 dB)
		2 - 2417MHz		16			53.0 dBµV/m @ 2389.9 MHz (-1.0 dB)
		11 - 2462MHz		16	Restricted Band Edge (2483.5 MHz)		53.8 dBµV/m @ 2484.4 MHz (-0.2 dB)
4	HT40	3 - 2422MHz	17	11	Restricted Band Edge (2390 MHz)		53.6 dBµV/m @ 2387.0 MHz (-0.4 dB)
		4 - 2427MHz		11			52.0 dBµV/m @ 2389.7 MHz (-2.0 dB)
		5 - 2432MHz		13			53.4 dBµV/m @ 2387.4 MHz (-0.6 dB)
		6 - 2437MHz		13	Restricted Band Edge (2390 MHz)		53.1 dBµV/m @ 2390.0 MHz (-0.9 dB)
					Restricted Band Edge (2483.5 MHz)		50.5 dBµV/m @ 2499.9 MHz (-3.5 dB)
		8 - 2457MHz		13	Restricted Band Edge (2483.5 MHz)		73.1 dBµV/m @ 2488.0 MHz (-0.9 dB)
		9 - 2452MHz		12			73.7 dBµV/m @ 2487.2 MHz (-0.3 dB)

Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074
Peak measurements performed with: RBW=1MHz, VBW=3MHz, peak detector, max hold, auto sweep time
Unless otherwise stated/noted, emission has duty cycle ≥ 98% and was measured using RBW=1MHz, VBW=10Hz, peak detector, linear average mode, auto sweep time, max hold.
Preliminary measurements showed no difference in the results between beamforming and non-beamforming operation.

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11b	1 Mb/s	99.1%	Yes	1.923	0	0	10
11g	6 Mbps	99.1%	Yes	2.07	0	0	10
HT20	MCS0	99.0%	Yes	1.92	0	0	10
HT40	MCS0	98.0%	Yes	0.95	0	0	10

Measurement Specific Notes:

Note 1:	Emission in non-restricted band, but limit of 15.209 used.
Note 2:	Emission in non-restricted band, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 4:	Emission has duty cycle < 98% and is NOT constant, average measurement performed: RBW=1MHz, VBW> 1/T, peak detector, linear average mode, sweep time auto, max hold. Max hold for 50*(1/DC) traces
Note 6:	Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements.

Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Run #1: Radiated Bandedge Measurements

Date of Test: 9/28/2015 0:00
Test Engineer: John Caizzi
Test Location: Chamber 7

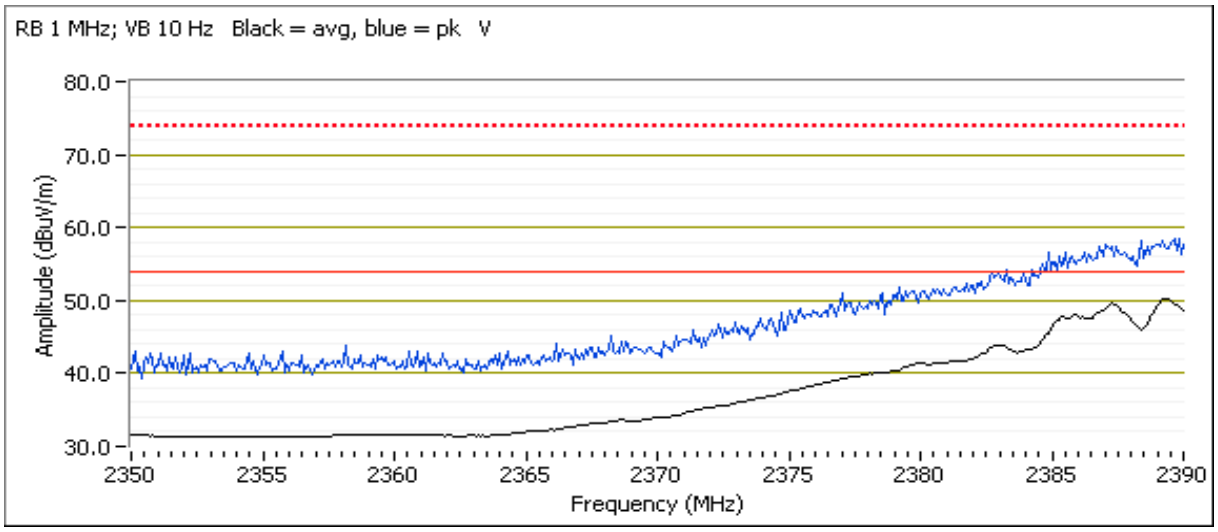
Config. Used: 1
Config Change: none
EUT Voltage: PoE

Channel: 1
Tx Chain: 4Tx

Mode: b
Data Rate: 1 Mb/s

Band Edge Signal Field Strength - Direct measurement of 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	
2389.360	50.9	V	54.0	-3.1	AVG	167	1.73	Setting = 18
2389.520	61.3	V	74.0	-12.7	PK	167	1.73	Setting = 18
2390.000	45.4	H	54.0	-8.6	AVG	200	2.46	Setting = 19
2389.760	55.0	H	74.0	-19.0	PK	200	2.46	Setting = 19

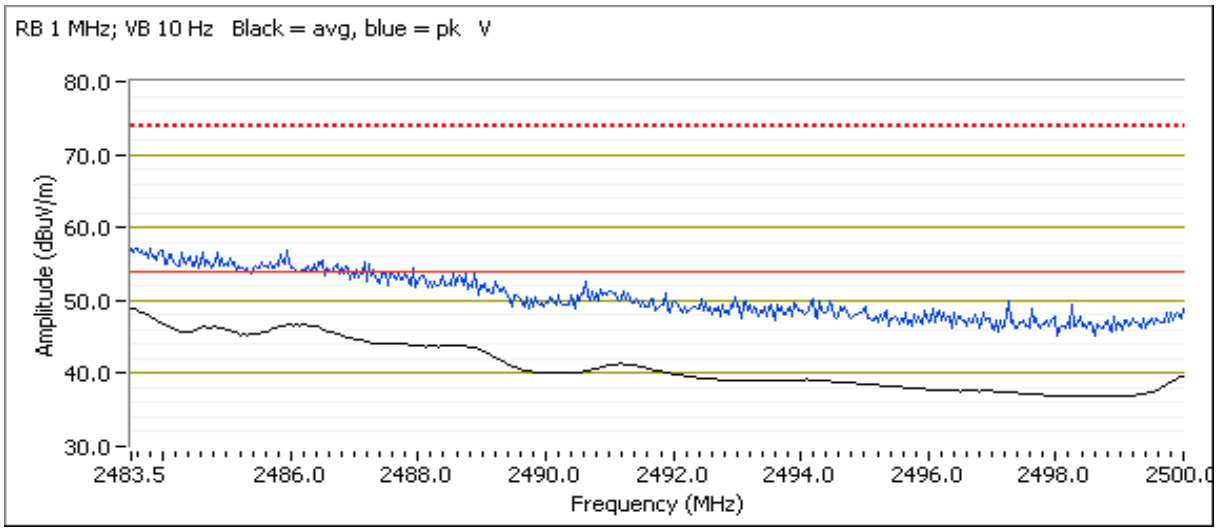


Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Channel: 11 Mode: b
Tx Chain: 4Tx Data Rate: 1 Mb/s

Band Edge Signal Field Strength - Direct measurement of 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	
2483.530	49.2	V	54.0	-4.8	AVG	172	1.45	Setting = 18
2483.730	58.5	V	74.0	-15.5	PK	172	1.45	Setting = 18



Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Run #2: Radiated Bandedge Measurements

Date of Test: 9/28/2015 0:00
Test Engineer: John Caizzi
Test Location: Chamber 7

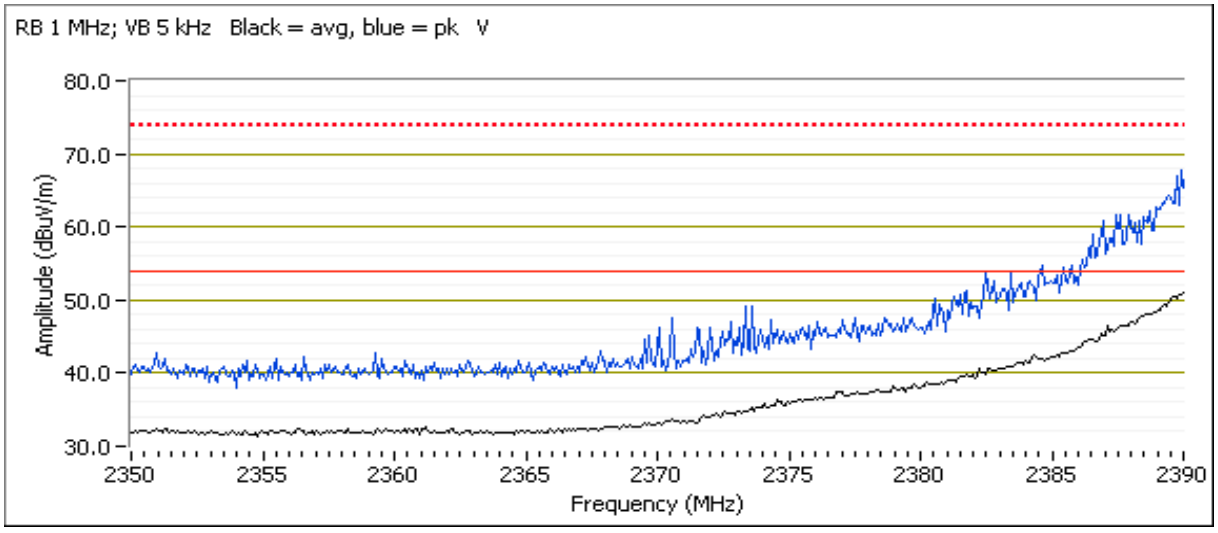
Config. Used: 1
Config Change: none
EUT Voltage: PoE

Channel: 1
Tx Chain: 4Tx

Mode: g
Data Rate: 6 Mbps

Band Edge Signal Field Strength - Direct measurement of 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	
2389.960	50.6	V	54.0	-3.4	Avg	143	1.42	Setting = 13, note 4. RB 1 MHz; VB: 5 kHz
2389.870	68.6	V	74.0	-5.4	PK	143	1.42	Setting = 13
2390.000	43.6	H	54.0	-10.4	Avg	174	1.48	Setting = 13, note 4. RB 1 MHz; VB: 5 kHz
2389.600	63.4	H	74.0	-10.6	PK	174	1.48	Setting = 13

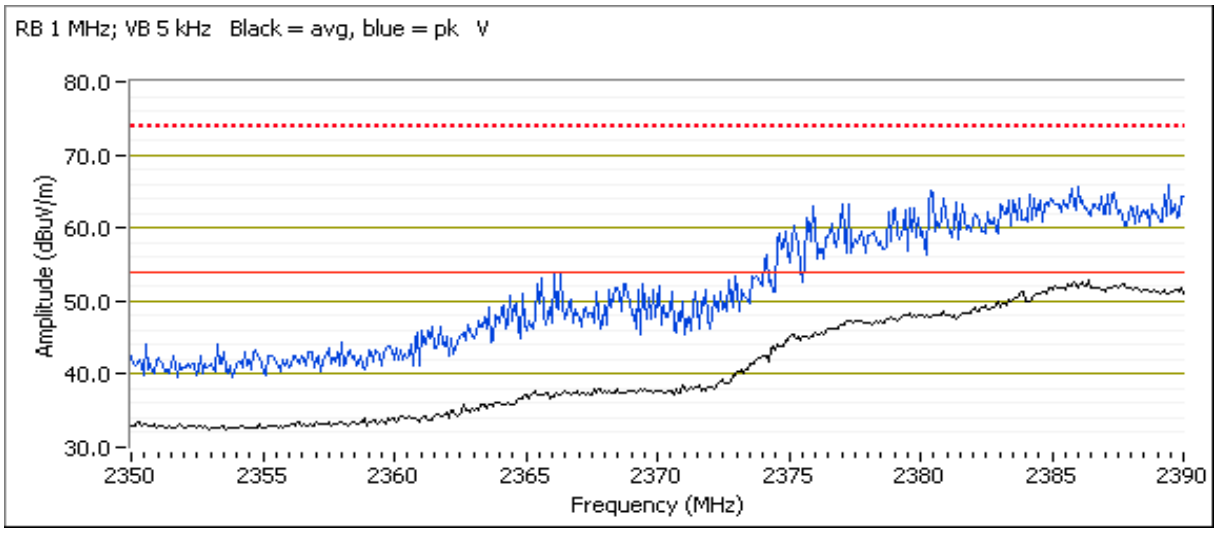


Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Channel: 2 Mode: g
Tx Chain: 4Tx Data Rate: 6 Mbps

Band Edge Signal Field Strength - Direct measurement of 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	
2387.510	53.7	V	54.0	-0.3	AVG	176	1.93	Setting = 17, note 4. RB 1 MHz; VB: 5 kHz
2386.400	68.1	V	74.0	-5.9	PK	176	1.93	Setting = 17

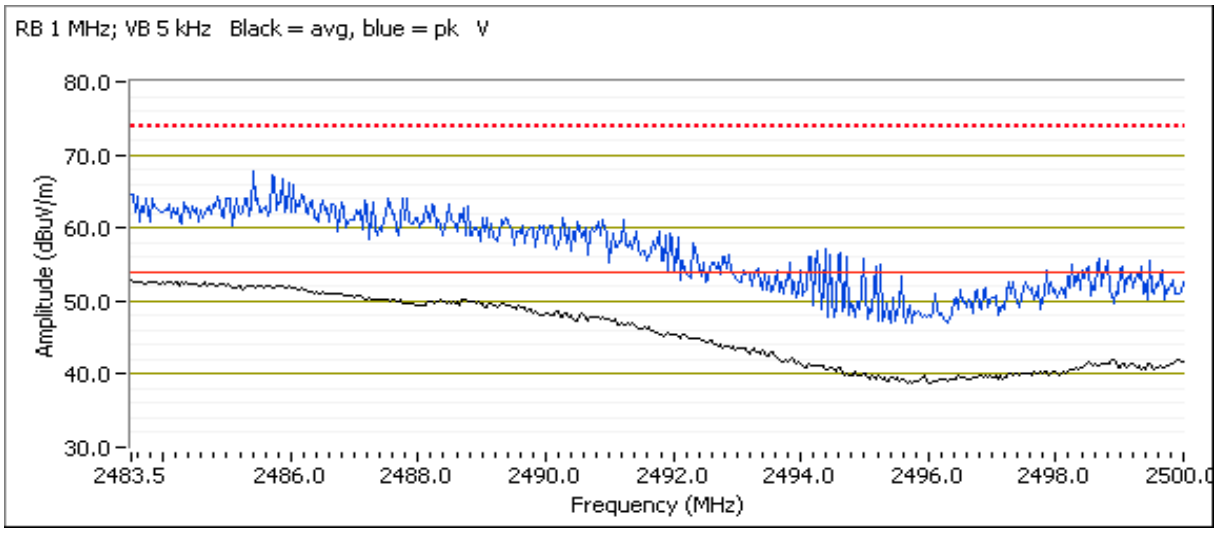


Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Channel: 9 Mode: g
Tx Chain: 4Tx Data Rate: 6 Mbps

Band Edge Signal Field Strength - Direct measurement of 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	
2484.580	52.9	V	54.0	-1.1	Avg	147	1.55	Setting = 19, note 4. RB 1 MHz; VB: 5 kHz
2487.790	68.1	V	74.0	-5.9	PK	147	1.55	Setting = 19

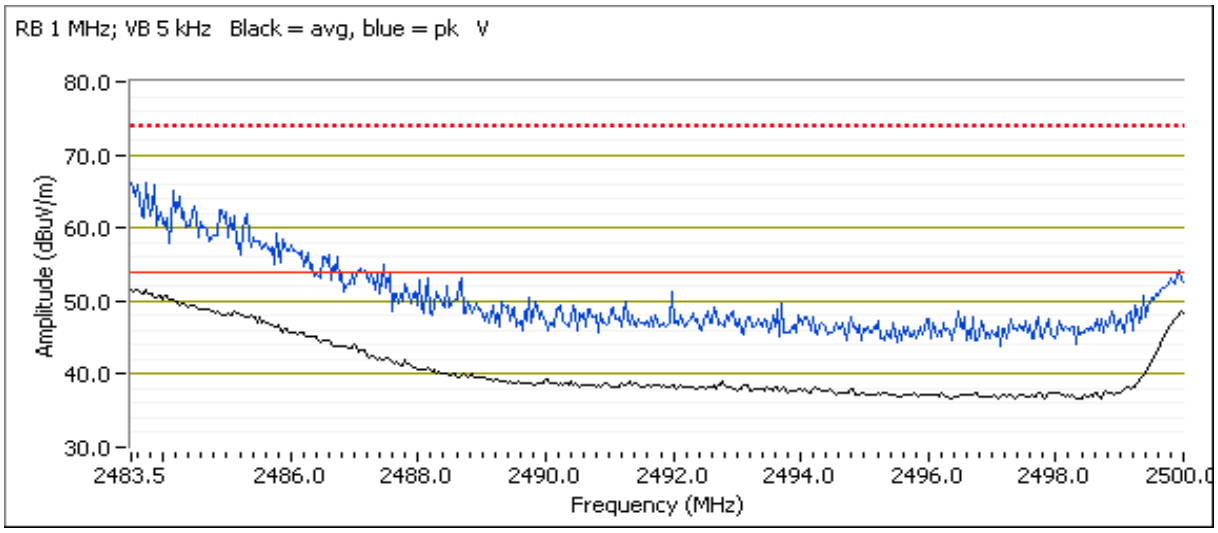


Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Channel: 10 Mode: g
Tx Chain: 4Tx Data Rate: 6 Mbps

Band Edge Signal Field Strength - Direct measurement of 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	
2483.630	51.5	V	54.0	-2.5	Avg	230	1.80	Setting = 16, note 4. RB 1 MHz; VB: 5 kHz
2483.830	66.1	V	74.0	-7.9	PK	230	1.80	Setting = 16

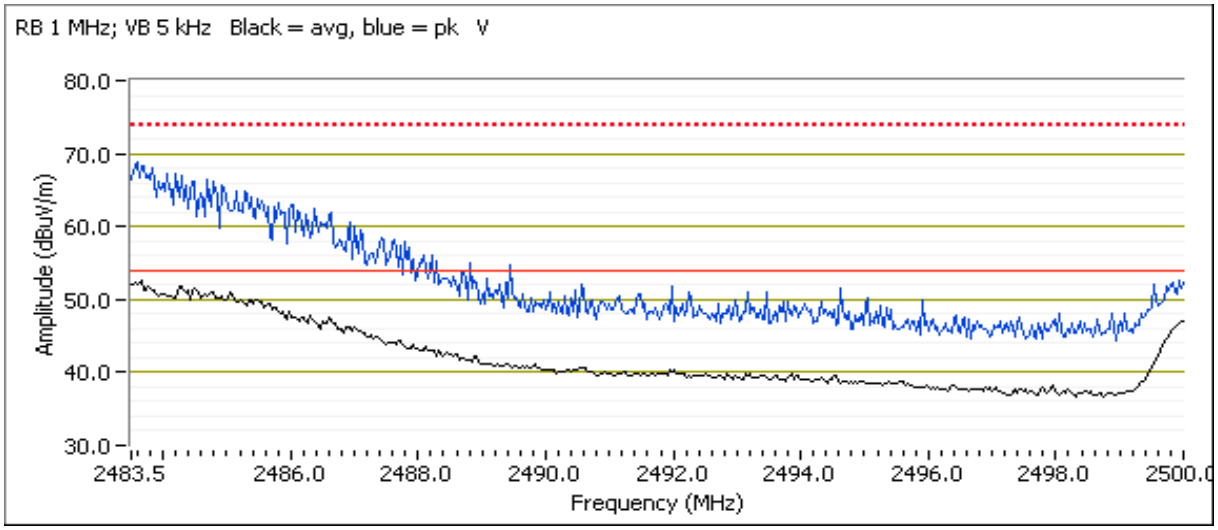


Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Channel: 11 Mode: g
Tx Chain: 4Tx Data Rate: 6 Mbps

Band Edge Signal Field Strength - Direct measurement of 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	
2483.710	51.6	V	54.0	-2.4	Avg	196	1.50	Setting = 14, note 4. RB 1 MHz; VB: 5 kHz
2483.820	69.3	V	74.0	-4.7	PK	196	1.50	Setting = 14



Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Run #3: Radiated Bandedge Measurements

Date of Test: 9/28/2015 0:00
Test Engineer: John Caizzi
Test Location: Chamber 7

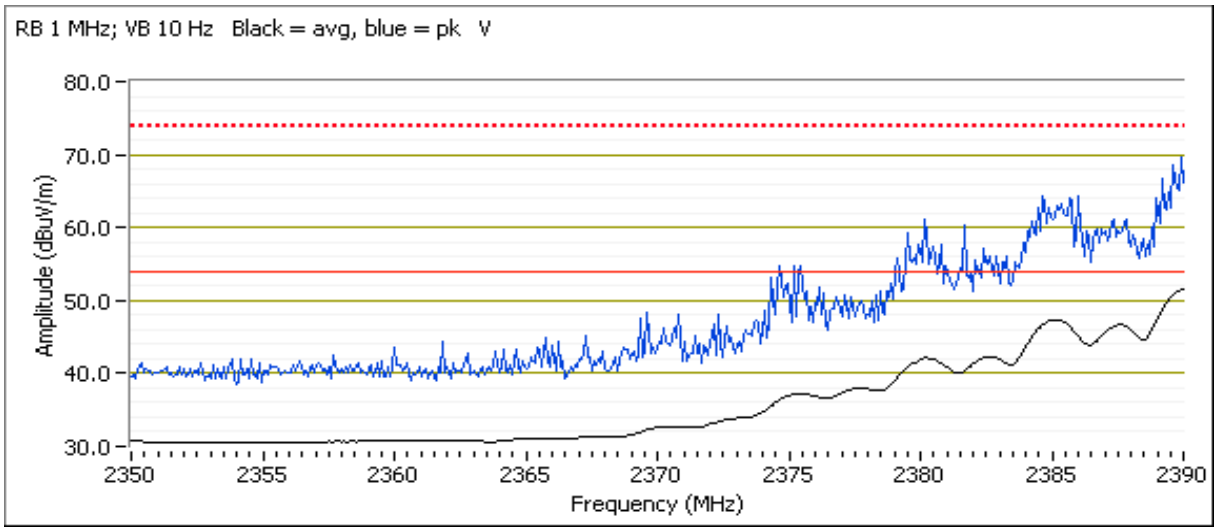
Config. Used: 1
Config Change: none
EUT Voltage: PoE

Channel: 1
Tx Chain: 4Tx

Mode: HT20
Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of 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	
2389.990	52.0	V	54.0	-2.0	AVG	220	1.55	Setting = 14
2389.650	72.8	V	74.0	-1.2	PK	220	1.55	Setting = 14
2390.000	45.9	H	54.0	-8.1	AVG	178	2.04	Setting = 14
2389.600	63.5	H	74.0	-10.5	PK	178	2.04	Setting = 14

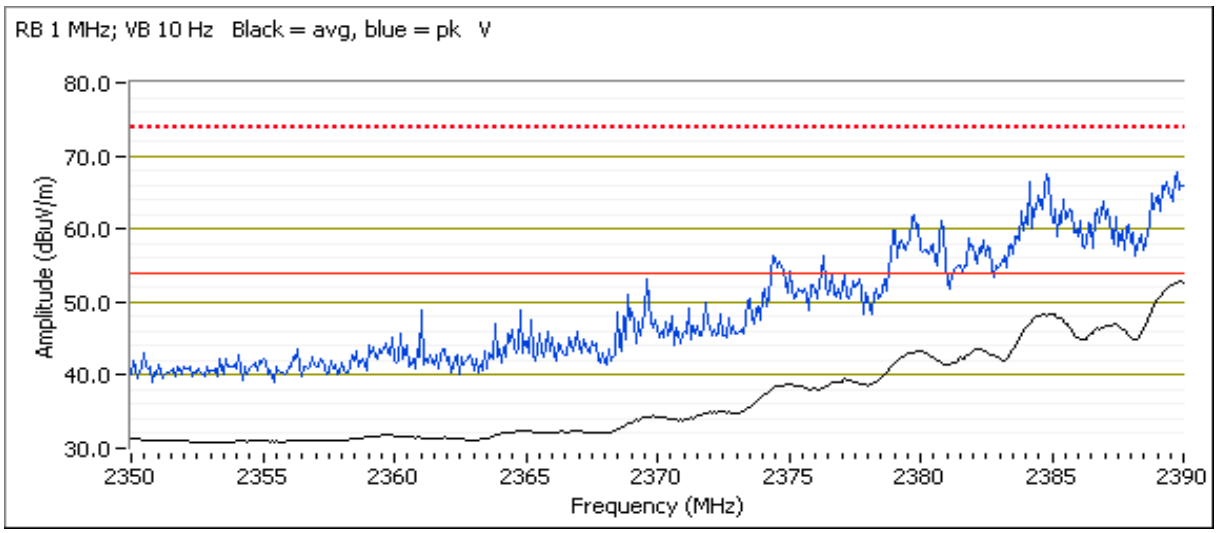


Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Channel: 2 Mode: HT20
Tx Chain: 4Tx Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of 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	
2389.880	53.0	V	54.0	-1.0	AVG	227	1.58	Setting = 16
2389.530	70.9	V	74.0	-3.1	PK	227	1.58	Setting = 16

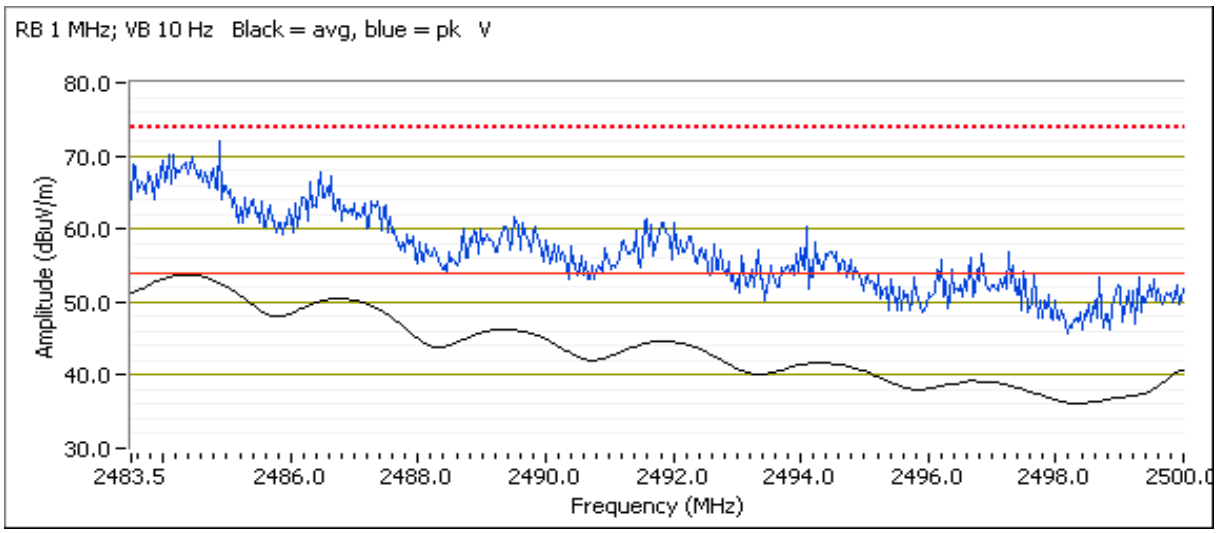


Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Channel: 11 Mode: HT20
Tx Chain: 4Tx Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of 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	
2484.370	53.8	V	54.0	-0.2	AVG	145	2.27	Setting = 16
2484.550	73.6	V	74.0	-0.4	PK	145	2.27	Setting = 16



Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Run #4: Radiated Bandedge Measurements

Date of Test: 09/28/15 Test Location: Chamber #7

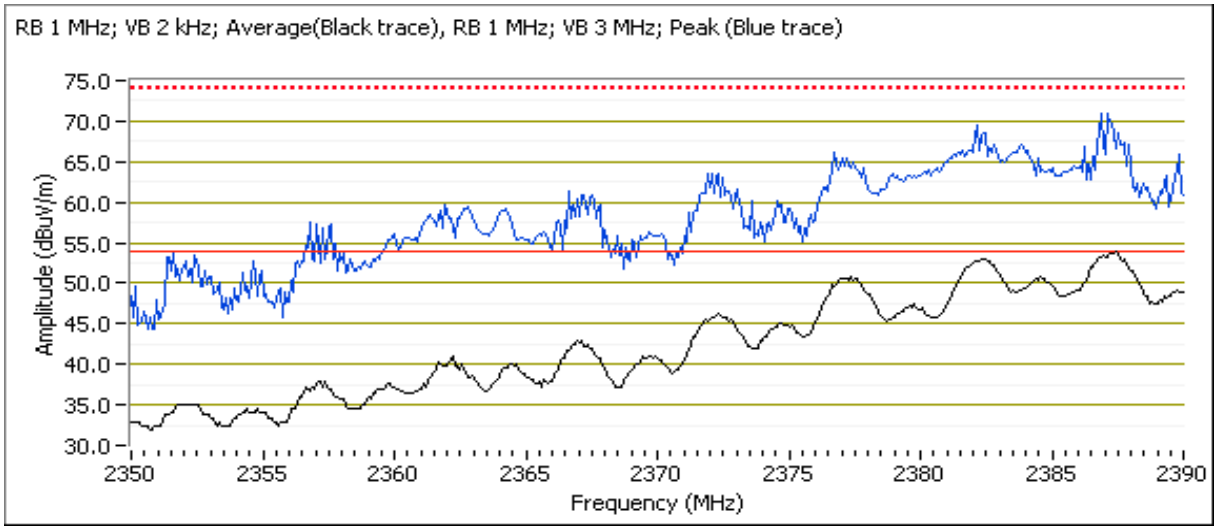
Test Engineer: M. Birgani Config. Used: 1

Channel: 3 Mode: HT40 Power Setting: 11

Tx Chain: 4Tx Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of 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	
2387.030	53.6	V	54.0	-0.4	AVG	175	1.5	Note 4; POS; RB 1 MHz; VB: 2 kHz
2387.680	70.8	V	74.0	-3.2	PK	175	1.5	POS; RB 1 MHz; VB: 3 MHz
2389.840	49.2	H	54.0	-4.8	AVG	199	1.5	Note 4; POS; RB 1 MHz; VB: 2 kHz
2388.400	64.7	H	74.0	-9.3	PK	199	1.5	POS; RB 1 MHz; VB: 3 MHz

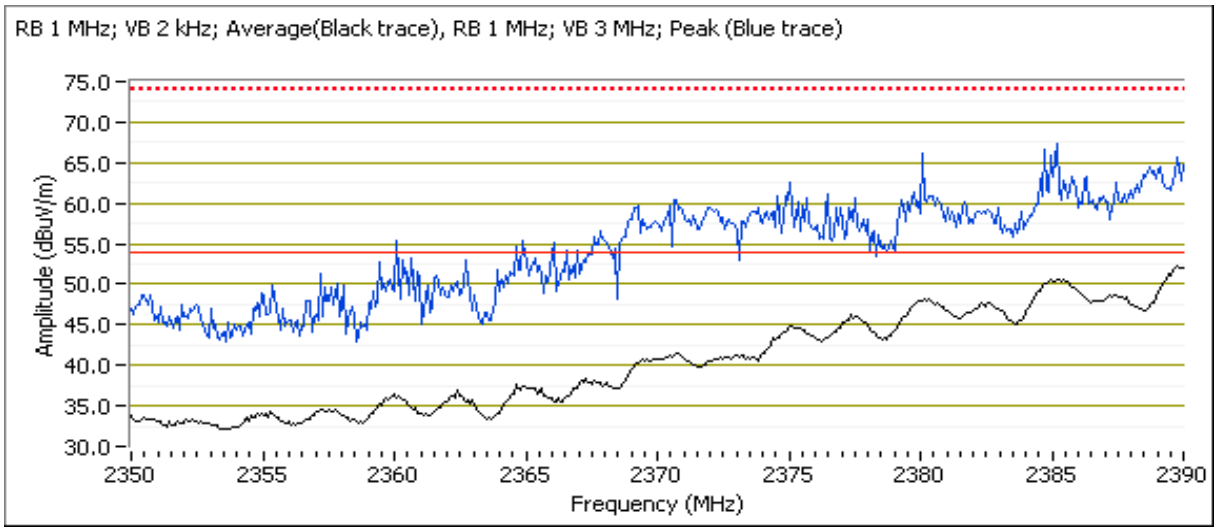


Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Channel: 4 Mode: HT40 Power Setting: 11
Tx Chain: 4Tx Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of 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	
2389.680	52.0	V	54.0	-2.0	AVG	221	1.5	Note 4; POS; RB 1 MHz; VB: 2 kHz
2389.200	65.5	V	74.0	-8.5	PK	221	1.5	POS; RB 1 MHz; VB: 3 MHz

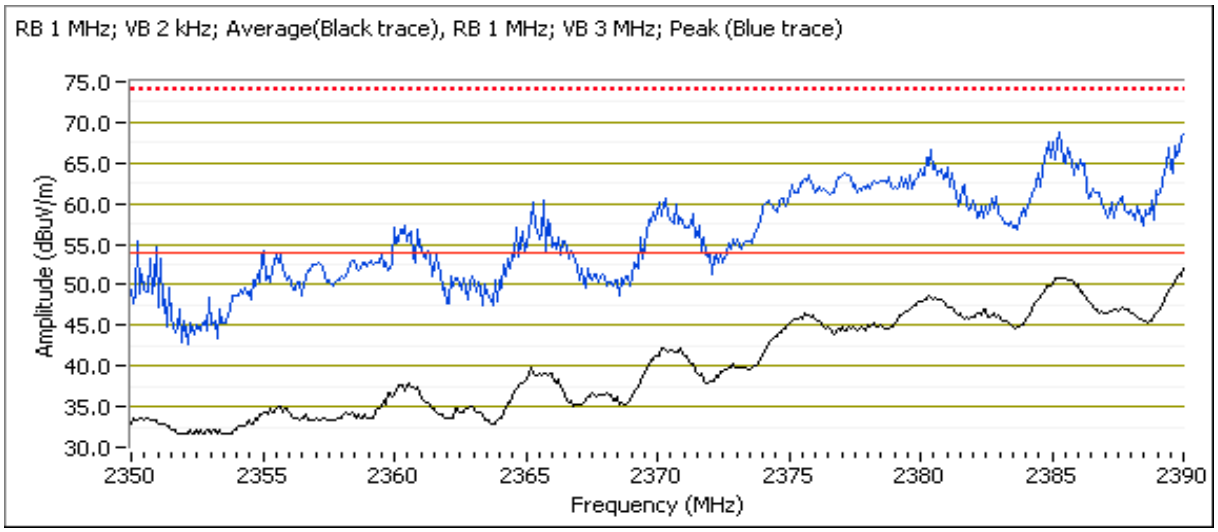


Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Channel: 5 Mode: HT40 Power Setting: 13
Tx Chain: 4Tx Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of 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	
2387.430	53.4	V	54.0	-0.6	AVG	221	1.5	Note 4; POS; RB 1 MHz; VB: 2 kHz
2382.870	69.4	V	74.0	-4.6	PK	221	1.5	POS; RB 1 MHz; VB: 3 MHz

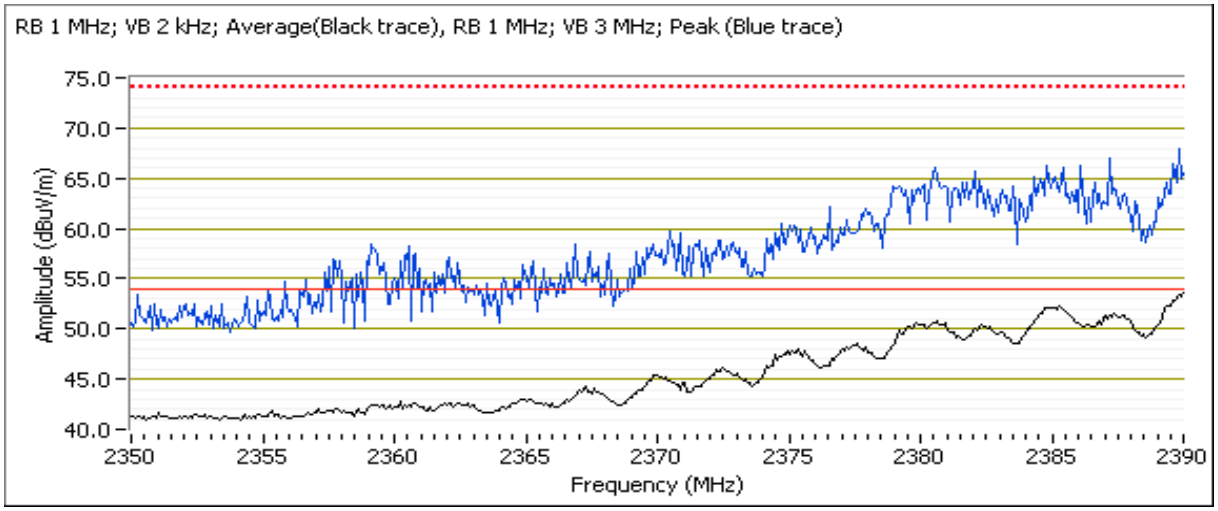


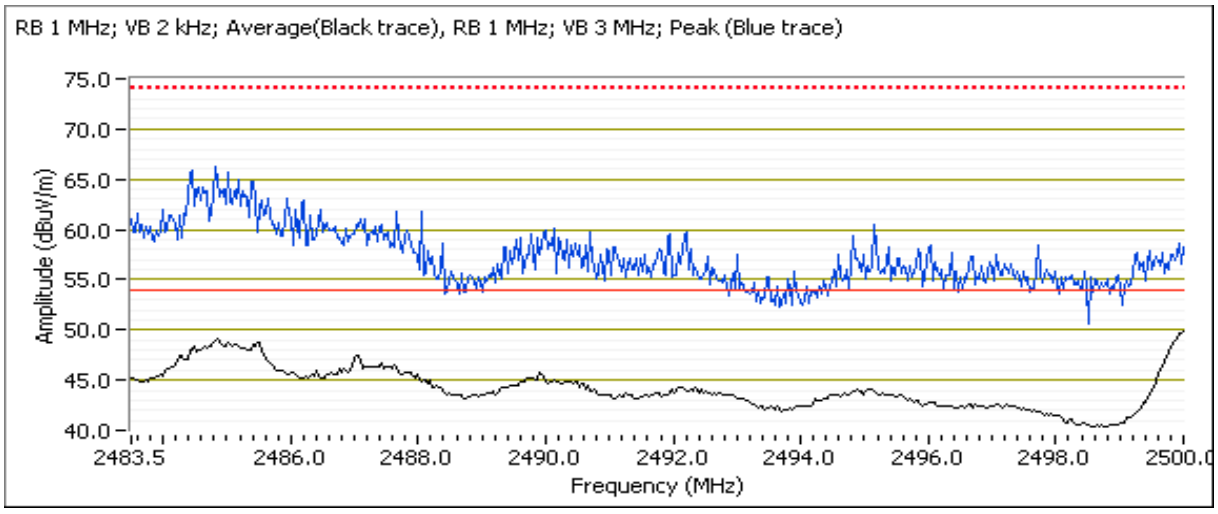
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Channel: 6 Mode: HT40 Power Setting: 13
Tx Chain: 4Tx Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of 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	
2390.000	53.1	V	54.0	-0.9	AVG	220	1.6	Note 4; POS; RB 1 MHz; VB: 2 kHz
2380.460	69.2	V	74.0	-4.8	PK	220	1.6	POS; RB 1 MHz; VB: 3 MHz
2499.930	50.5	V	54.0	-3.5	AVG	220	1.6	Note 4; POS; RB 1 MHz; VB: 2 kHz
2484.990	65.5	V	74.0	-8.5	PK	220	1.6	POS; RB 1 MHz; VB: 3 MHz



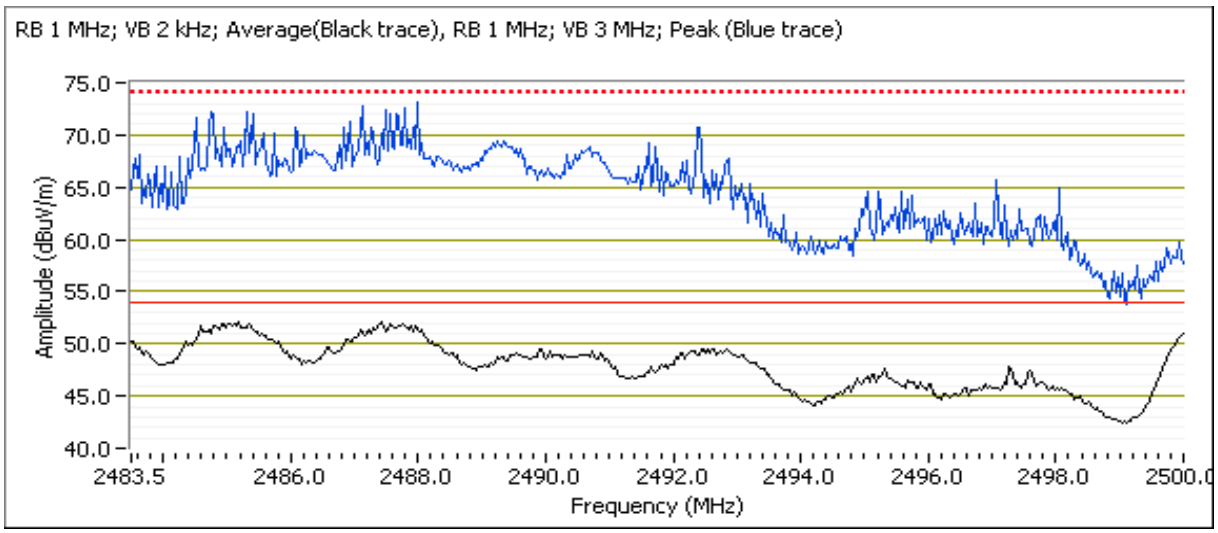


Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Channel: 8 Mode: HT40 Power Setting: 13
Tx Chain: 4Tx Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of 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	
2488.030	73.1	V	74.0	-0.9	PK	221	1.5	POS; RB 1 MHz; VB: 3 MHz
2487.530	51.7	V	54.0	-2.3	AVG	221	1.5	Note 4; POS; RB 1 MHz; VB: 2 kHz

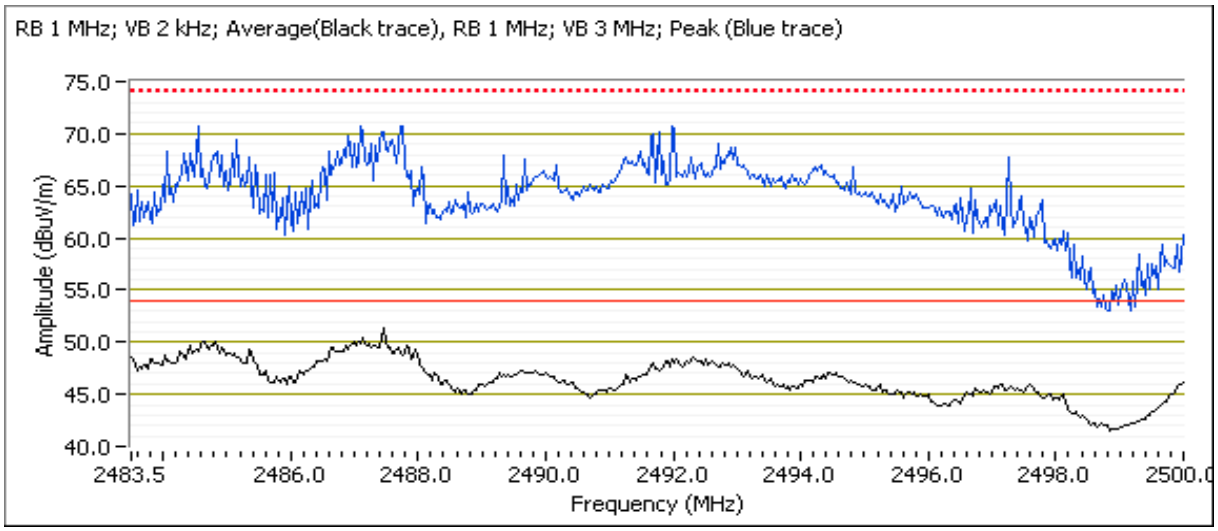


Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Channel: 9 Mode: HT40 Power Setting: 12
Tx Chain: 4Tx Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of 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	
2487.200	73.7	V	74.0	-0.3	PK	189	1.5	POS; RB 1 MHz; VB: 3 MHz
2487.200	49.9	V	54.0	-4.1	AVG	189	1.5	Note 4; POS; RB 1 MHz; VB: 2 kHz



Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

RSS 247 and FCC 15.247 (DTS) Radiated Spurious Emissions

Test Specific Details

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

General Test Configuration

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

For radiated emissions testing the measurement antenna was located 3 meters from the EUT, unless otherwise noted.

Ambient Conditions:

Temperature: 18-20 °C

Rel. Humidity: 35-40 %

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

Run #	Mode	Channel	Target Power	Power Setting	Test Performed	Limit	Result / Margin
1	b	1 - 2412MHz	18	18	Radiated Emissions 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	26.2 dBµV/m @ 4824.0 MHz (-27.8 dB)
	b	6 - 2437MHz	19	19	Radiated Emissions 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	52.2 dBµV/m @ 7311.8 MHz (-1.8 dB)
	b	11 - 2462MHz	18	18	Radiated Emissions 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	52.5 dBµV/m @ 7386.8 MHz (-1.5 dB)
Scans on center channel in all OFDM modes to determine the worst case mode.							
2	g	6 - 2437MHz	19	19	Radiated Emissions 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	43.5 dBµV/m @ 7311.0 MHz (-10.5 dB)
	HT20	6 - 2437MHz	18	18	Radiated Emissions 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	42.5 dBµV/m @ 7311.0 MHz (-11.5 dB)
	HT40	6 - 2437MHz	16	16	Radiated Emissions 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	41.0 dBµV/m @ 7311.1 MHz (-13.0 dB)
Measurements on low and high channels in worst-case OFDM mode.							
3	g	1 - 2412MHz	19	19	Radiated Emissions 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	33.4 dBµV/m @ 4825.6 MHz (-20.6 dB)
	g	11 - 2462MHz	19	19	Radiated Emissions 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	43.0 dBµV/m @ 7386.1 MHz (-11.0 dB)

Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Sample Notes

Module S/N: BET3716XRU200027
Driver: 10.10. RC69.10
Antenna: Integral 4x4

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074
Peak measurements performed with: RBW=1MHz, VBW=3MHz, peak detector, max hold, auto sweep time
Unless otherwise stated/noted, emission has duty cycle ≥ 98% and was measured using RBW=1MHz, VBW=10Hz, peak detector, linear average mode, auto sweep time, max hold.
2.4GHz band reject filter used
All testing performed 4Tx at the maximum 1Tx power setting
Preliminary measurements showed no difference in the results between beamforming and non-beamforming operation.

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11b	1 Mb/s	99.1%	Yes	1.923	0	0	10
11g	6 Mbps	99.1%	Yes	2.07	0	0	10
HT20	MCS0	99.0%	Yes	1.92	0	0	10
HT40	MCS0	98.0%	Yes	0.95	0	0	10

Measurement Specific Notes:

Note 1:	Emission in non-restricted band, but limit of 15.209 used.
Note 2:	Emission in non-restricted band, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Emission has duty cycle ≥ 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces
Note 4:	Emission has duty cycle < 98% and is NOT constant, average measurement performed: RBW=1MHz, VBW> 1/T, peak detector, linear average mode, sweep time auto, max hold. Max hold for 50*(1/DC) traces
Note 5:	Emission has duty cycle < 98%, but constant, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces, measurement corrected by Pwr correction factor
Note 6:	Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements.

Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Run #1: Radiated Spurious Emissions, 1,000 - 25000 MHz. Operating Mode: 802.11b

Date of Test: 10/01/15 Test Location: Chamber 7

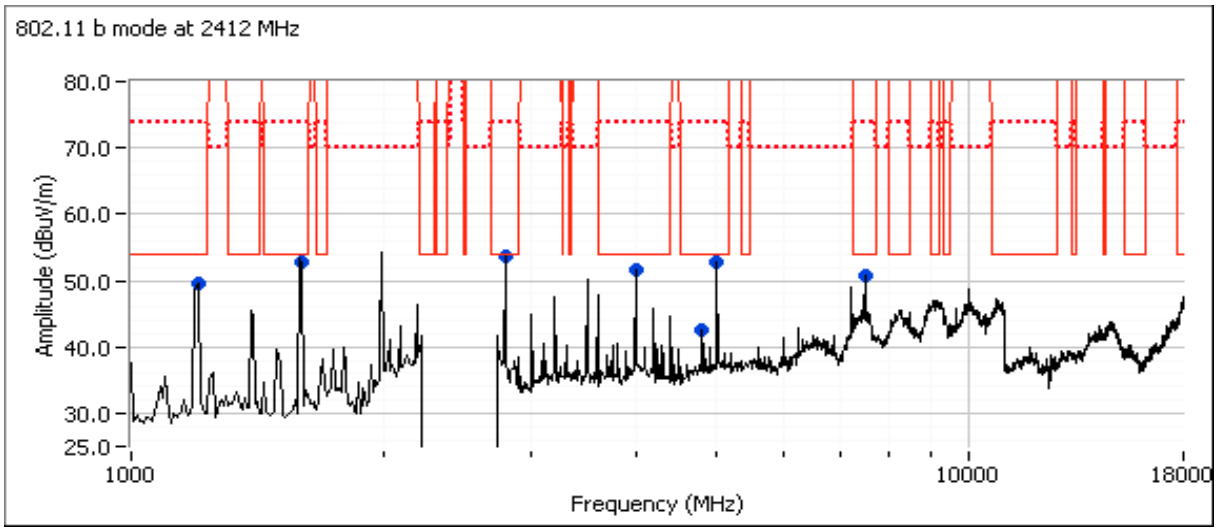
Test Engineer: Mehran Birgani EUT Voltage: PoE

Run #1a: Low Channel

Channel: 1 Mode: b Setting: 18

Tx Chain: 4Tx Data Rate: 1 Mb/s

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4824.040	26.2	V	54.0	-27.8	AVG	234	2.0	RB 1 MHz;VB 10 Hz;Peak
4824.040	33.2	V	74.0	-40.8	PK	234	2.0	RB 1 MHz;VB 3 MHz;Peak
2799.950	-	V	54.0	-	Peak	158	1.6	Not related to Radio
5000.000	-	V	54.0	-	Peak	27	2.2	Not related to Radio
1599.940	-	V	54.0	-	Peak	268	1.6	Not related to Radio
4000.000	-	V	54.0	-	Peak	290	1.6	Not related to Radio
7500.140	-	V	54.0	-	Peak	48	2.2	Not related to Radio
1200.000	-	V	54.0	-	Peak	126	1.0	Not related to Radio



Note:	Scans made between 18 - 25 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range

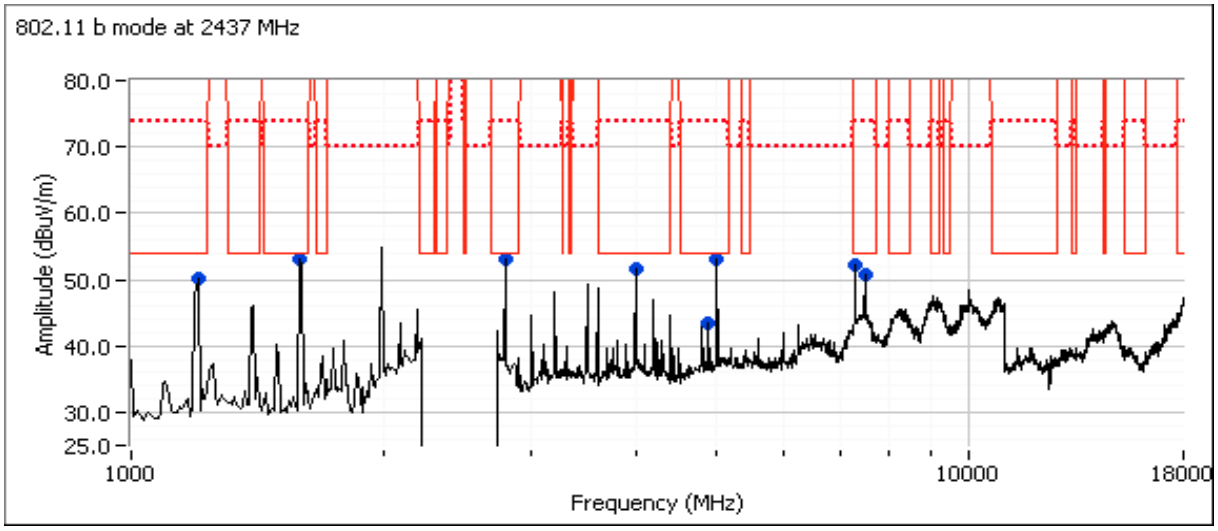
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Run #1b: Center Channel

Channel: 6 Mode: b Setting: 19

Tx Chain: 4Tx Data Rate: 1 Mb/s

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7311.790	52.2	V	54.0	-1.8	AVG	85	2.4	RB 1 MHz;VB 10 Hz;Peak
7312.250	58.2	V	74.0	-15.8	PK	85	2.4	RB 1 MHz;VB 3 MHz;Peak
4874.000	40.2	V	54.0	-13.8	AVG	226	2.0	RB 1 MHz;VB 10 Hz;Peak
4873.730	45.8	V	74.0	-28.2	PK	226	2.0	RB 1 MHz;VB 3 MHz;Peak
1591.670	-	V	54.0	-	Peak	264	1.6	Not related to Radio
1200.000	-	V	54.0	-	Peak	126	1.0	Not related to Radio
2791.670	-	V	54.0	-	Peak	110	1.0	Not related to Radio
5000.000	-	V	54.0	-	Peak	242	1.9	Not related to Radio
4000.000	-	V	54.0	-	Peak	288	1.3	Not related to Radio
7500.000	-	V	54.0	-	Peak	41	2.5	Not related to Radio



Note:	Scans made between 18 - 25 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range

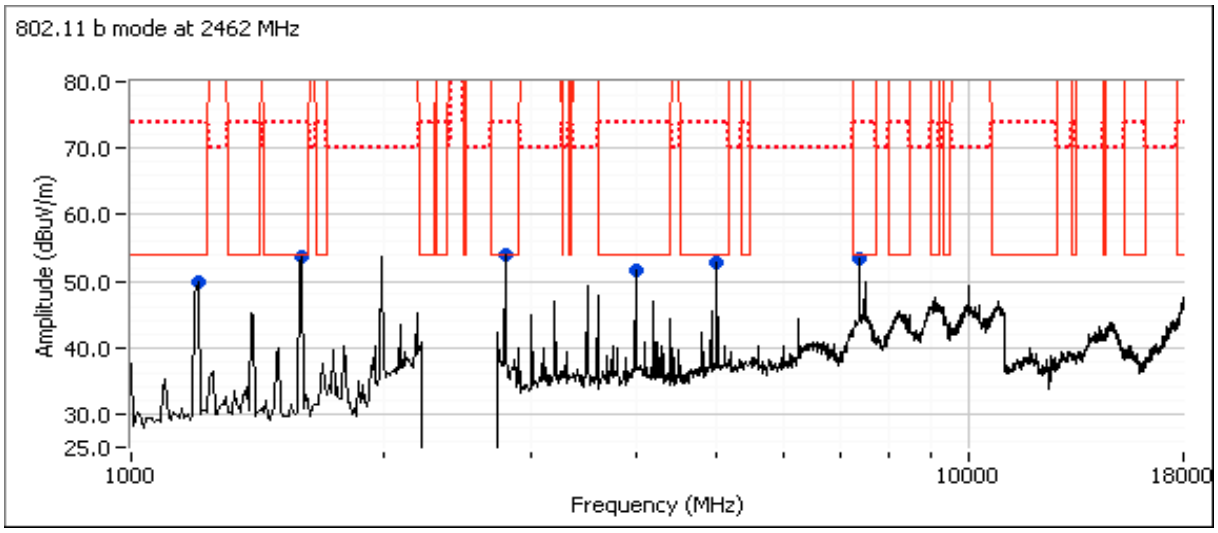
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Run #1c: High Channel

Channel: 11 Mode: b Setting: 18

Tx Chain: 4Tx Data Rate: 1 Mb/s

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7386.770	52.5	V	54.0	-1.5	AVG	90	2.5	RB 1 MHz;VB 10 Hz;Peak
7384.510	58.7	V	74.0	-15.3	PK	90	2.5	RB 1 MHz;VB 3 MHz;Peak
2799.990	-	V	54.0	-	Peak	158	1.6	Not related to Radio
1600.000	-	V	54.0	-	Peak	104	1.0	Not related to Radio
5000.000	-	V	54.0	-	Peak	241	1.9	Not related to Radio
4000.000	-	V	54.0	-	Peak	300	1.6	Not related to Radio
1200.030	-	V	54.0	-	Peak	130	1.3	Not related to Radio



Note:	Scans made between 18 - 25 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range

Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Run #2: Radiated Spurious Emissions, 1,000 - 25000 MHz. Operating Mode: OFDM

Date of Test: 10/01/15 Test Location: Chamber 7

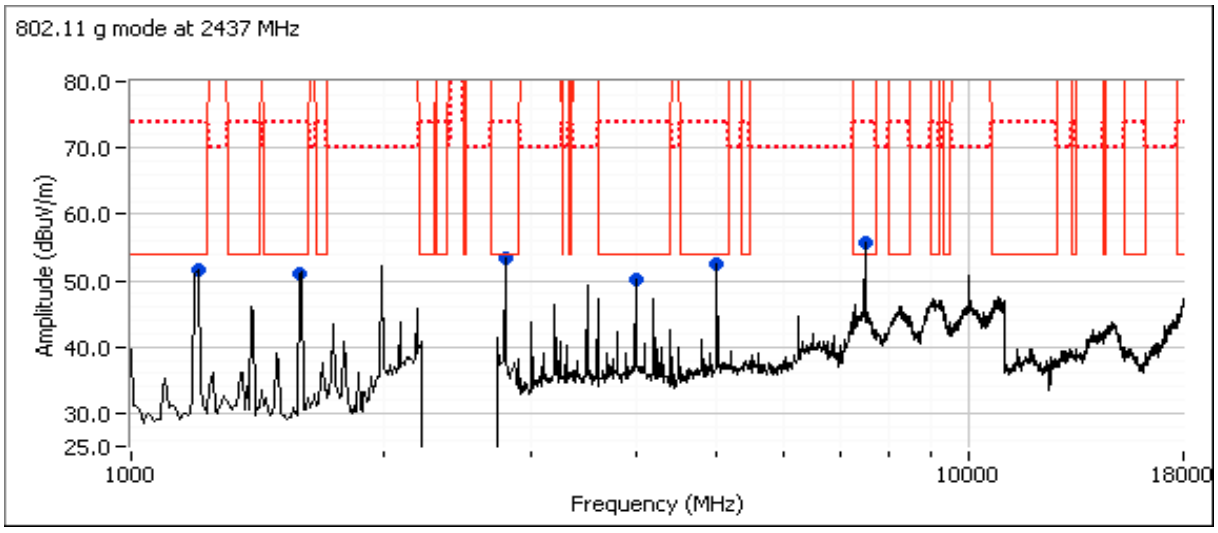
Test Engineer: Mehran Birgani EUT Voltage: PoE

Run #2a: Center Channel

Channel: 6 Mode: g Setting: 19

Tx Chain: 4Tx Data Rate: 6 Mbps

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7311.030	43.5	V	54.0	-10.5	AVG	84	2.5	RB 1 MHz;VB 10 Hz;Peak
7311.320	55.9	V	74.0	-18.1	PK	84	2.5	RB 1 MHz;VB 3 MHz;Peak
1200.000	-	V	54.0	-	Peak	112	1.3	Not related to Radio
1599.990	-	V	54.0	-	Peak	298	1.0	Not related to Radio
2799.990	-	V	54.0	-	Peak	144	1.3	Not related to Radio
4000.080	-	V	54.0	-	Peak	113	1.0	Not related to Radio
5000.000	-	V	54.0	-	Peak	155	1.9	Not related to Radio
7500.250	-	V	54.0	-	Peak	52	2.5	Not related to Radio



Note:	Scans made between 18 - 25 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range

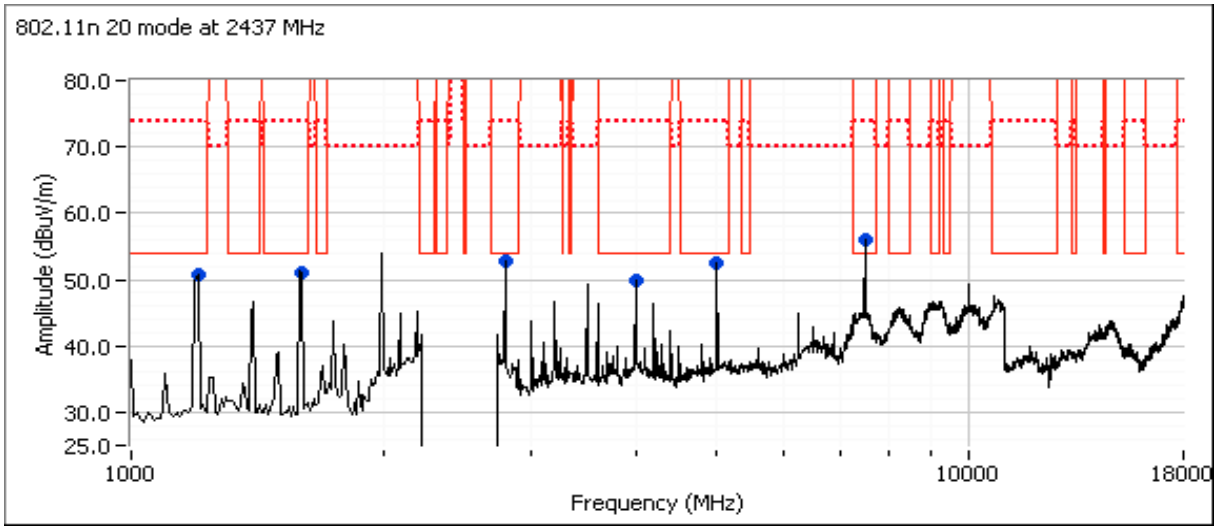
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Run #2b: Center Channel

Channel: 6 Mode: HT20 Setting: 18

Tx Chain: 4Tx Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7311.000	42.5	V	54.0	-11.5	AVG	82	2.5	RB 1 MHz;VB 10 Hz;Peak
7310.870	53.4	V	74.0	-20.6	PK	82	2.5	RB 1 MHz;VB 3 MHz;Peak
1200.080	-	V	54.0	-	Peak	112	1.3	
1600.000	-	V	54.0	-	Peak	106	1.0	
2799.990	-	V	54.0	-	Peak	146	1.3	
4000.000	-	V	54.0	-	Peak	138	1.0	
5000.000	-	V	54.0	-	Peak	22	1.9	
7500.250	-	V	54.0	-	Peak	47	2.5	



Note:	Scans made between 18 - 25 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range

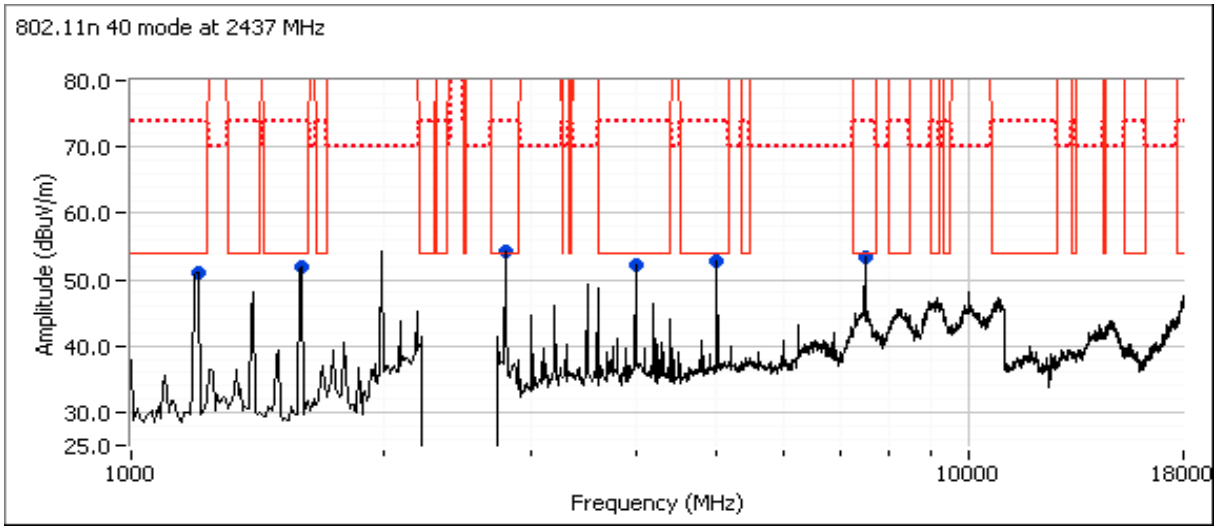
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Run #2c: Center Channel

Channel: 6 Mode: HT40 Setting: 16

Tx Chain: 4Tx Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7311.070	41.0	V	54.0	-13.0	AVG	74	1.8	RB 1 MHz;VB 10 Hz;Peak
7306.670	52.2	V	74.0	-21.8	PK	74	1.8	RB 1 MHz;VB 3 MHz;Peak
1200.080	-	V	54.0	-	Peak	106	1.0	
1600.000	-	V	54.0	-	Peak	89	1.0	
2799.990	-	V	54.0	-	Peak	102	1.3	
4000.000	-	V	54.0	-	Peak	102	1.3	
5000.580	-	V	54.0	-	Peak	24	1.9	
7500.170	-	V	54.0	-	Peak	54	2.5	



Note:	Scans made between 18 - 25 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range

Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Run #3: Radiated Spurious Emissions, 1,000 - 25000 MHz. Operating Mode: Worse case from Run #2

Date of Test: 10/01/15 Test Location: Chamber 7

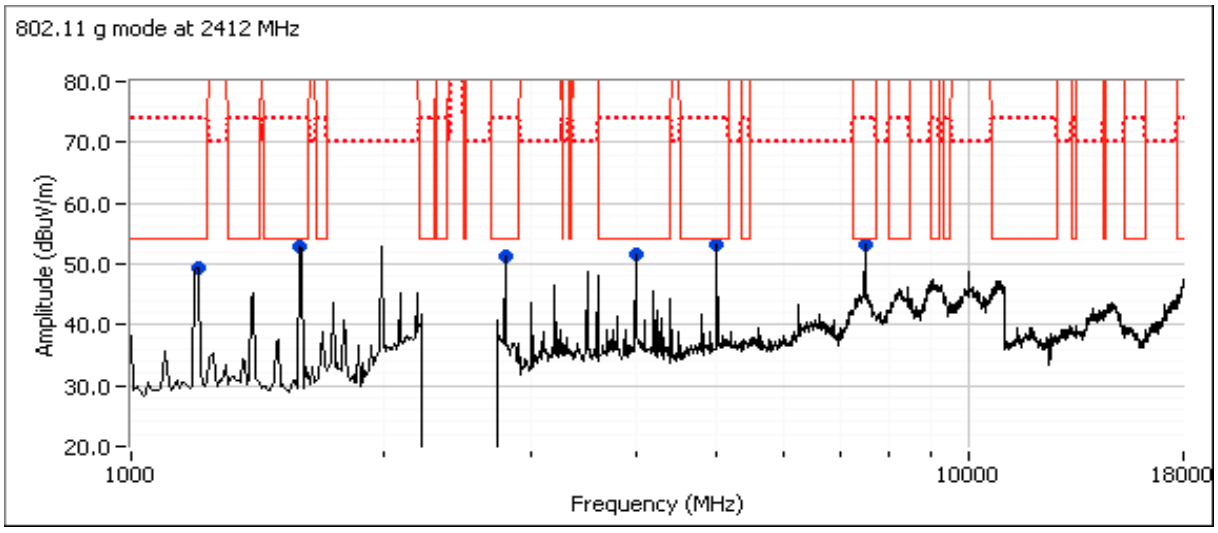
Test Engineer: Mehran Birgani EUT Voltage: PoE

Run #3a: Low Channel

Channel: 1 Mode: g Setting: 19

Tx Chain: 4Tx Data Rate: 6 Mbps

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4825.630	33.4	V	54.0	-20.6	AVG	0	2.5	RB 1 MHz;VB 10 Hz;Peak
4823.290	45.2	V	74.0	-28.8	PK	0	2.5	RB 1 MHz;VB 3 MHz;Peak
1200.000	-	V	54.0	-	Peak	104	2.2	
1599.990	-	V	54.0	-	Peak	86	1.3	
2799.990	-	V	54.0	-	Peak	86	1.3	
4000.000	-	V	54.0	-	Peak	145	1.6	
5000.000	-	V	54.0	-	Peak	6	1.9	
7500.170	-	V	54.0	-	Peak	319	2.2	



Note:	Scans made between 18 - 25 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range

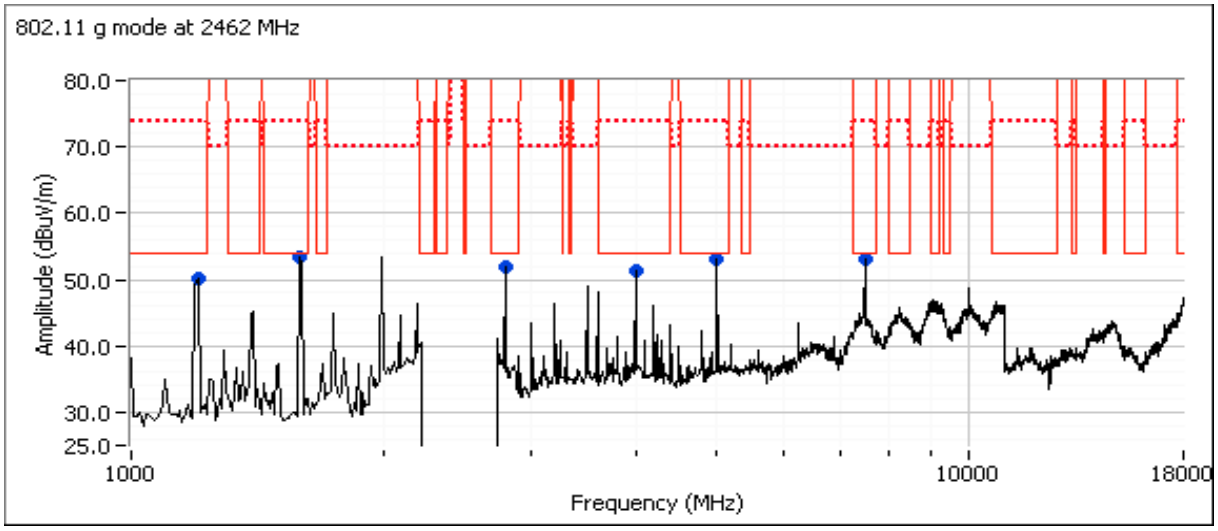
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Run #3b: High Channel

Channel: 11 Mode: g Setting: 19

Tx Chain: 4Tx Data Rate: 6 Mbps

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7386.070	43.0	V	54.0	-11.0	AVG	84	2.3	RB 1 MHz;VB 10 Hz;Peak
7387.470	56.0	V	74.0	-18.0	PK	84	2.3	RB 1 MHz;VB 3 MHz;Peak
1200.000	-	V	54.0	-	Peak	103	2.2	
1599.910	-	V	54.0	-	Peak	98	1.0	
2799.990	-	V	54.0	-	Peak	90	1.3	
4000.000	-	V	54.0	-	Peak	280	1.3	
5000.000	-	V	54.0	-	Peak	13	1.9	
7500.170	-	V	54.0	-	Peak	321	1.9	



Note:	Scans made between 18 - 25 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range

Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

RSS 247 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.

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:	20-22 °C
Rel. Humidity:	30-35 %

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:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Summary of Results

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
4Tx Modes						
3	-	-	Output Power	15.247(b)	Pass	b: 25.3 dBm (0.338W) g: 24.9 dBm (0.310W) HT20: 23.6 dBm (0.232W) HT40: 19.8 dBm (0.096W)
4	-	-	Power spectral Density (PSD)	15.247(d)	Pass	11b: 4.2 dBm/3kHz g: 1.6 dBm/3kHz HT20: 1.1 dBm/3kHz HT40: 5.5 dBm/3kHz
MIMO Modes						
3	-	-	Minimum 6dB Bandwidth	15.247(a)	Pass	b: 8.6 MHz g: 15.1 MHz HT20: 15.1 MHz HT40: 36.4 MHz
3	-	-	99% Bandwidth	RSS GEN	Pass	b: 12.4 MHz g: 19.0 MHz HT20: 18.7 MHz HT40: 36.6 MHz
4	-	-	Spurious emissions	15.247(b)	Pass	All emissions >-30dBc

Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11b	1 Mb/s	99.1%	Yes	1.923	0	0	10
11g	6 Mb/s	98.3%	Yes	2.086	0	0	10
HT20	MCS0	98.6%	Yes	1.906	0	0	10
HT40	MCS0	98.0%	Yes	0.942	0	0	10

Sample Notes

Module S/N: BET3716XRU200027
Driver: 10.10. RC69.10
Antenna: Integral 4x4
Chain 1= J400, chain 2 = J401, chain 3 = J500, chain 4 = J501.

Antenna Gain Information

Freq	Antenna Gain (dBi) / Chain				BF	MultiChain Legacy	CDD	Sectorized / Xpol	Dir G (PWR)	Dir G (PSD)
	1	2	3	4						
4Tx operation (worse case 4TxBF)										
2400-2483.5	0.8	3.5	0.4	-2.2	Yes	Yes	Yes	No	9.5	9.5

For devices that support CDD modes

Min # of spatial streams: 1
Max # of spatial streams: 4

Notes:	BF = beamforming mode supported, Multichain Legacy = 802.11 legacy data rates supported for multichain transmissions, CDD = Cyclic Delay Diversity (or Cyclic Shift Diversity) modes supported, Sectorized / Xpol = antennas are sectorized or cross polarized
Notes:	Dir G (PWR) = total gain (Gant + Array Gain) for power calculations; Dir G (PSD) = total gain for PSD calculations based on FCC KDB 662911. Depending on the modes supported, the Array Gain value for power could be different from the PSD value.
Notes:	Array gain for power/psd calculated per KDB 662911 D01

Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Run #1: Output Power

Date of Test: 10/8/2015 Config. Used: Conducted
Test Engineer: M. Birgani Config Change: -
Test Location: Lab 4 Host Unit Voltage POE

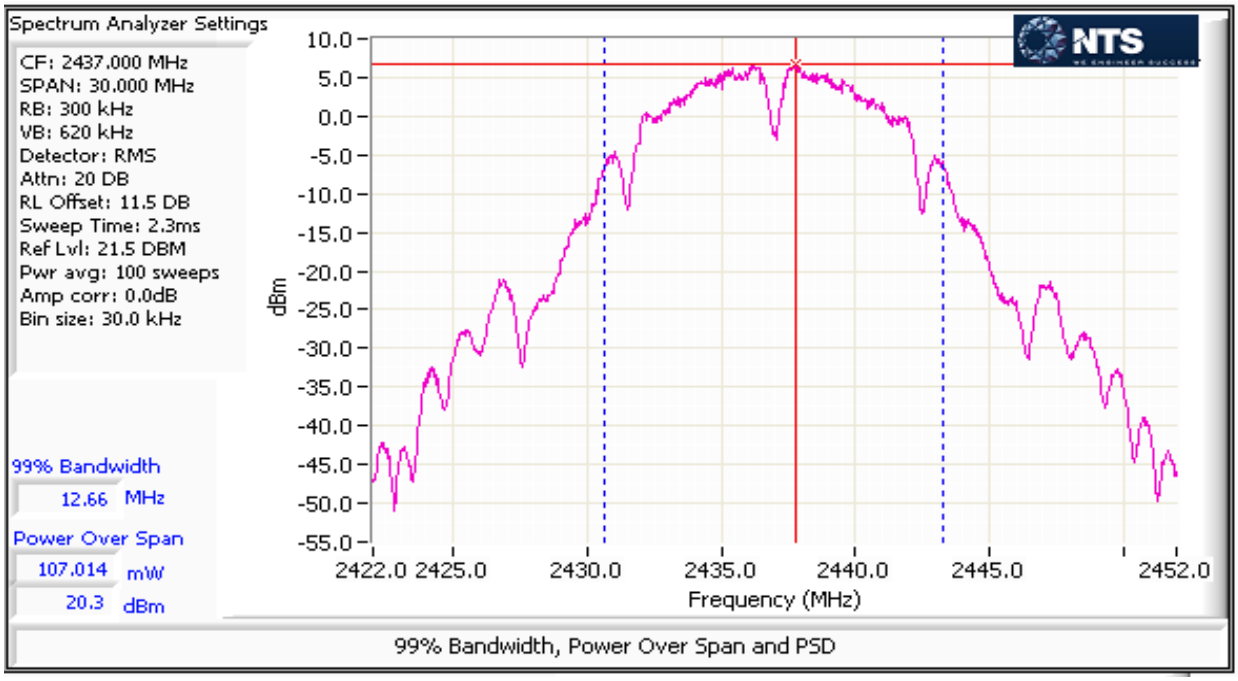
Operating Mode: 11b - 4Tx txchain 0xf
Directional Gain (dBi): 9.5

Max EIRP (mW): 3026.8

Frequency (MHz)	Chain	Software Setting	Power[1] dBm	Power[1] mW	Total mW	Total dBm	Max Power (W)	Limit dBm	Result	Power (dBm)[3]
2412	1	18	19.0	79.4	253.4	24.0	0.338	26.5	Pass	
	3		17.7	58.9						
	4		16.9	49.0						
	2		18.2	66.1						
2437	1	19	20.3	107.2	337.8	25.3		26.5	Pass	
	3		18.9	77.6						
	4		17.6	57.5						
	2		19.8	95.5						
2462	1	18	18.9	77.6	258.4	24.1		26.5	Pass	
	3		18.0	63.1						
	4		17.0	50.1						
	2		18.3	67.6						

Note 1:	Duty Cycle ≥ 98%. Output power measured using a spectrum analyzer (see plots below) with RBW= 1-5% of OBW, VB≥3* RBW, RMS detector, power averaging on, and power integration over the OBW, trace average 100 traces. Spurious limit becomes -30dBc.
Note 2:	Power setting - if a single number the same power setting was used for each chain. If multiple numbers the power setting for each chain is separated by a comma (e.g. x,y would indicate power setting x for chain 1, power setting y for chain 2.
Note 3:	Power measured using average power meter (non-gated) and is included for reference only.

Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



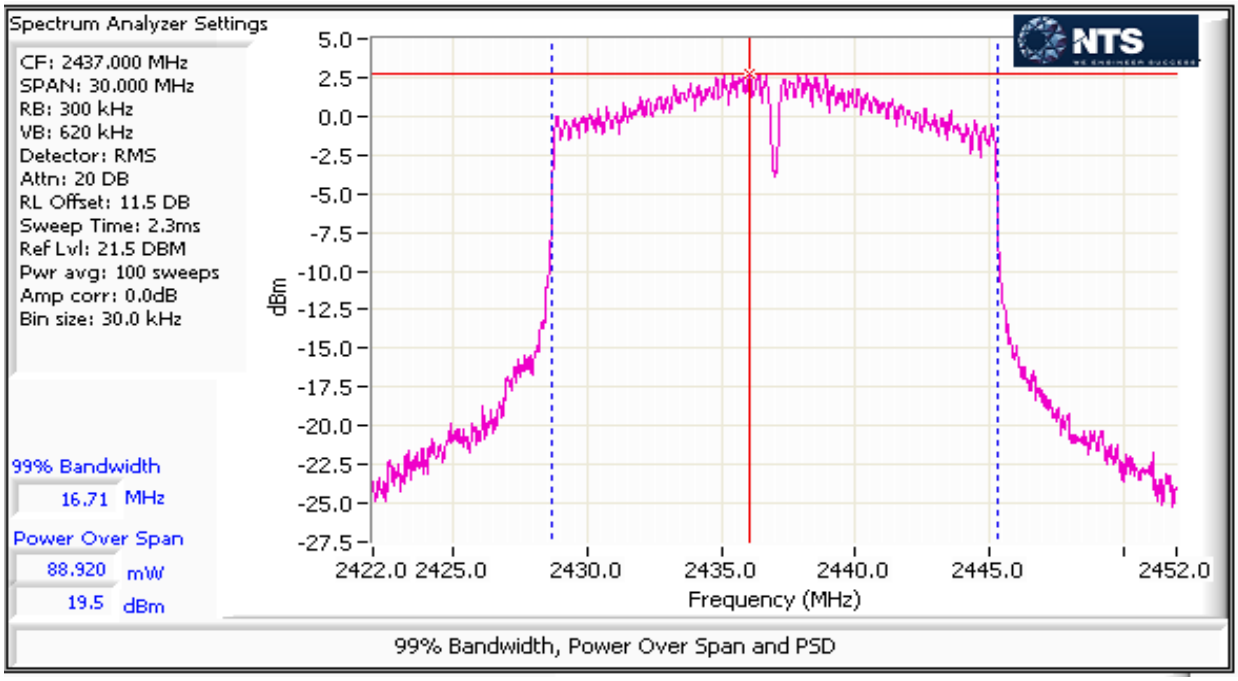
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Operating Mode: 11g - 4Tx txchain 0xf
Directional Gain (dBi): 9.5
Max EIRP (mW): 2776

Frequency (MHz)	Chain	Software Setting	Power[1] dBm	Power[1] mW	Total mW	Total dBm	Max Power (W)	Limit dBm	Result	Power (dBm)[3]
2412	1	13	15.2	33.1	104.0	20.2	0.310	26.5	Pass	
	3		13.8	24.0						
	4		13.0	20.0						
	2		14.3	26.9						
2437	1	19	19.5	89.1	310.1	24.9		26.5	Pass	
	3		19.0	79.4						
	4		17.8	60.3						
	2		19.1	81.3						
2462	1	14	15.7	37.2	125.3	21.0		26.5	Pass	
	3		14.7	29.5						
	4		14.2	26.3						
	2		15.1	32.4						

Note 1:	Duty Cycle ≥ 98%. Output power measured using a spectrum analyzer (see plots below) with RBW= 1-5% of OBW, VB≥3* RBW, RMS detector, power averaging on, and power integration over the OBW, trace average 100 traces. Spurious limit becomes -30dBc.
Note 2:	Power setting - if a single number the same power setting was used for each chain. If multiple numbers the power setting for each chain is separated by a comma (e.g. x,y would indicate power setting x for chain 1, power setting y for chain 2.
Note 3:	Power measured using average power meter (non-gated) and is included for reference only.

Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



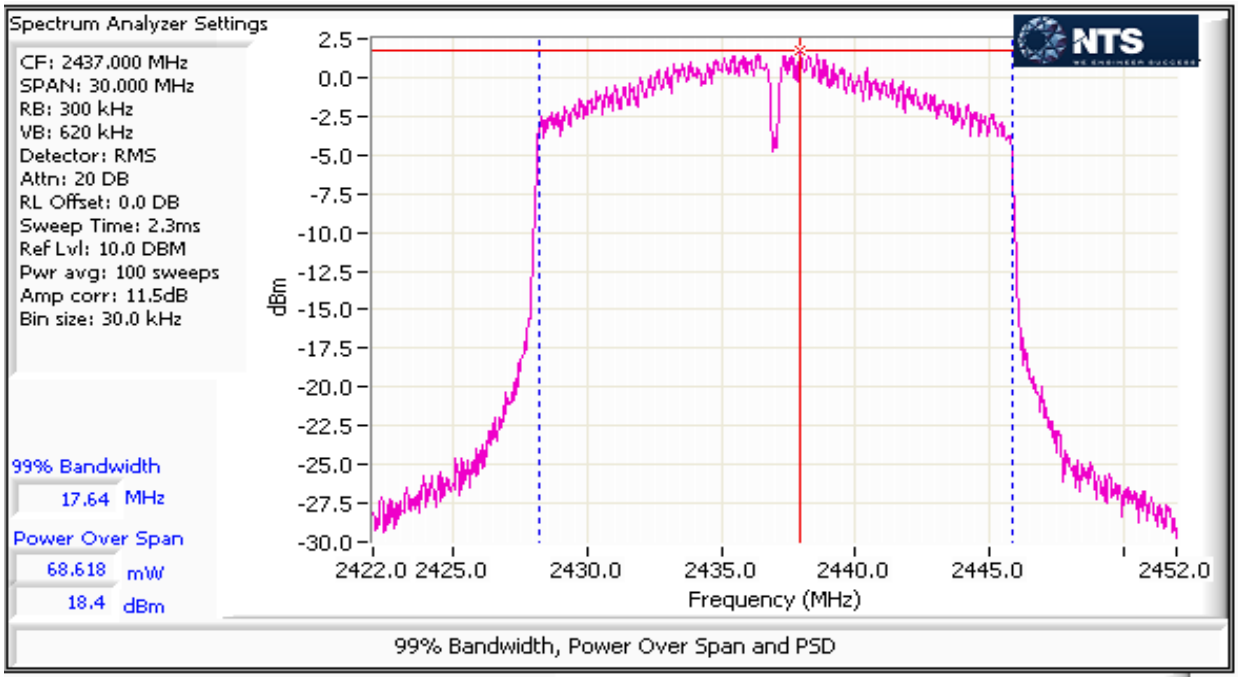
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Operating Mode: HT20 - 4Tx txchain 0xf
Directional Gain (dBi): 9.5
Max EIRP (mW): 2077.5

Frequency (MHz)	Chain	Software Setting	Power[1] dBm	Power[1] mW	Total mW	Total dBm	Max Power (W)	Limit dBm	Result	Power (dBm)[3]
2412	1	14	14.7	29.5	90.6	19.6	0.232	26.5	Pass	
	3		13.1	20.4						
	4		12.5	17.8						
	2		13.6	22.9						
2437	1	18	18.4	69.2	231.5	23.6		26.5	Pass	
	3		17.4	55.0						
	4		16.6	45.7						
	2		17.9	61.7						
2462	1	16	16.5	44.7	143.9	21.6		26.5	Pass	
	3		15.1	32.4						
	4		14.6	28.8						
	2		15.8	38.0						

Note 1:	Duty Cycle ≥ 98%. Output power measured using a spectrum analyzer (see plots below) with RBW= 1-5% of OBW, VB≥3* RBW, RMS detector, power averaging on, and power integration over the OBW, trace average 100 traces. Spurious limit becomes -30dBc.
Note 2:	Power setting - if a single number the same power setting was used for each chain. If multiple numbers the power setting for each chain is separated by a comma (e.g. x,y would indicate power setting x for chain 1, power setting y for chain 2.
Note 3:	Power measured using average power meter (non-gated) and is included for reference only.

Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



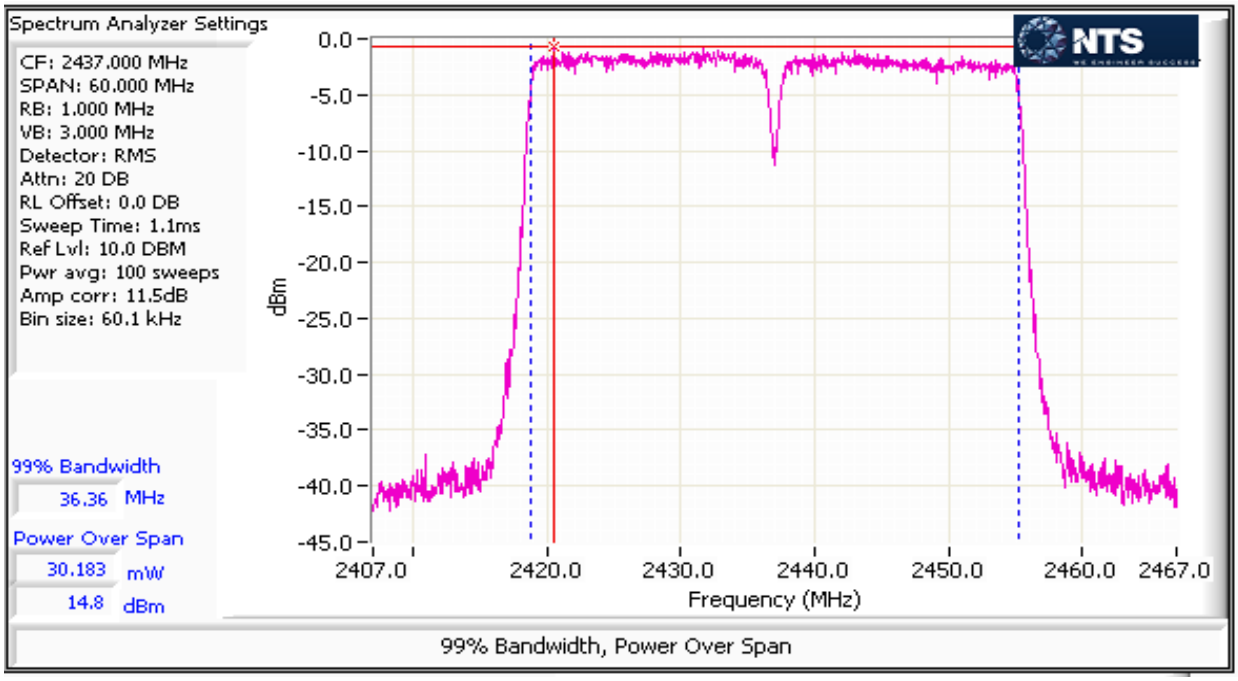
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Operating Mode: HT40 - 4Tx txchain 0xf
Directional Gain (dBi): 9.5
Max EIRP (mW): 859.7

Frequency (MHz)	Chain	Software Setting	Power[1] dBm	Power[1] mW	Total mW	Total dBm	Max Power (W)	Limit dBm	Result	Power (dBm)[3]
2422	1	11	12.7	18.6	60.3	17.8	0.096	26.5	Pass	
	3		11.6	14.5						
	4		10.7	11.7						
	2		11.9	15.5						
2437	1	13	14.8	30.2	96.2	19.8		26.5	Pass	
	3		13.5	22.4						
	4		12.8	19.1						
	2		13.9	24.5						
2452	1	12	13.7	23.4	75.5	18.8		26.5	Pass	
	3		12.5	17.8						
	4		11.7	14.8						
	2		12.9	19.5						

Note 1:	Duty Cycle ≥ 98%. Output power measured using a spectrum analyzer (see plots below) with RBW= 1-5% of OBW, VB≥3* RBW, RMS detector, power averaging on, and power integration over the OBW, trace average 100 traces. Spurious limit becomes -30dBc.
Note 2:	Power setting - if a single number the same power setting was used for each chain. If multiple numbers the power setting for each chain is separated by a comma (e.g. x,y would indicate power setting x for chain 1, power setting y for chain 2.
Note 3:	Power measured using average power meter (non-gated) and is included for reference only.

Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Run #2: Power spectral Density

Date of Test: 10/8/2015 Config. Used: Conducted

Test Engineer: M. Birgani Config Change: -

Test Location: Lab 4 Host Unit Voltage POE

Mode: 11b - 4Tx

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1					Limit dBm/3kHz	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
18	2412	-1.8	-1.6	-1.6	-2.2	4.2	8.0	Pass
19	2437	-1.6	-0.9	-3.2	-3.5	3.9	8.0	Pass
18	2462	-2.8	-3.3	-3.1	-3.7	2.8	8.0	Pass

Mode: 11g - 4Tx

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1					Limit dBm/3kHz	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
13	2412	-8.3	-8.9	-9.8	-10.8	-3.3	8.0	Pass
19	2437	-4.0	-4.3	-4.6	-5.0	1.6	8.0	Pass
14	2462	-8.0	-8.2	-8.8	-8.2	-2.3	8.0	Pass

Mode: HT20 - 4Tx

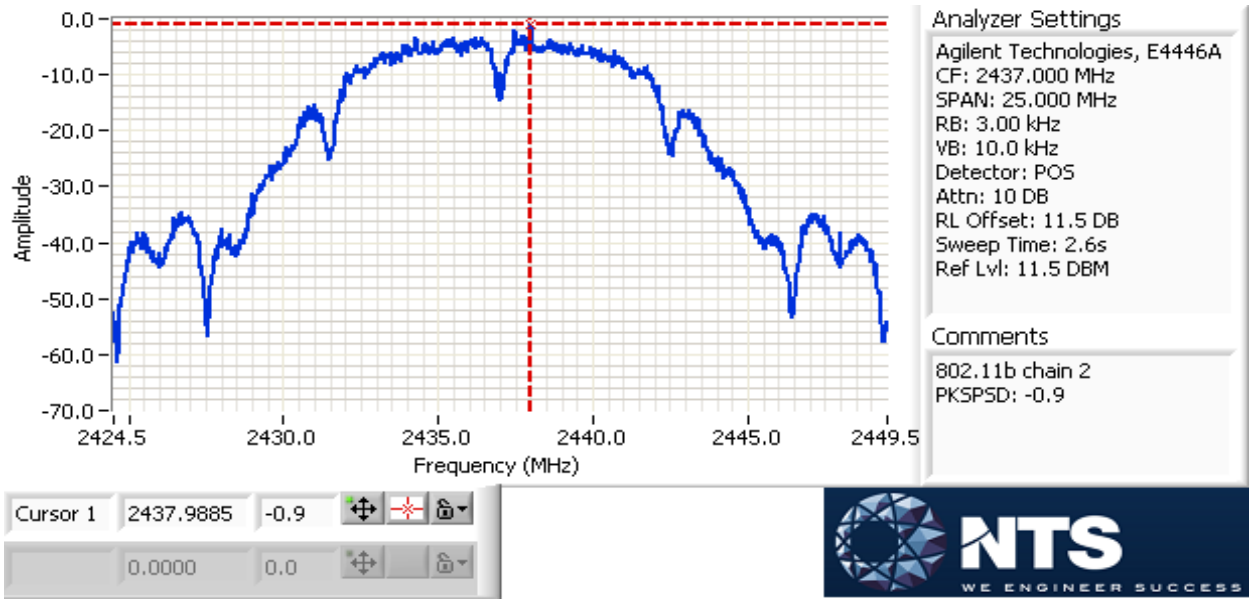
Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1					Limit dBm/3kHz	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
14	2412	-7.7	-9.2	-9.2	-10.0	-2.9	8.0	Pass
18	2437	-4.6	-4.9	-4.3	-6.2	1.1	8.0	Pass
16	2462	-6.1	-7.0	-7.4	-7.7	-1.0	8.0	Pass

Mode: HT40 - 4Tx

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1					Limit dBm/3kHz	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
11	2422	-13.7	-14.2	-13.6	-15.0	-8.1	8.0	Pass
13	2437	-10.6	-10.3	-12.9	-13.2	-5.5	8.0	Pass
12	2452	-11.6	-12.4	-12.7	-14.5	-6.7	8.0	Pass

Note 1:	Test performed per method PKSPD, in KDB 558074. Power spectral density measured using: 3kHz ≤ RBW ≤ 100kHz, VBW=3*RBW, peak detector, span = 1.5*DTS BW, auto sweep time, max hold.

Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Run #3: Signal Bandwidth

Date of Test: 10/8/2015 Config. Used: Conducted

Test Engineer: M. Birgani Config Change: -

Test Location: Lab 4 Host Unit Voltage PoE

Mode: 11b

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (kHz)	
		6dB	99%	6dB	99%
18	2412	9.0	11.9	100	200
19	2437	8.6	12.4		200
18	2462	9.0	11.9		200

Mode: 11g

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (kHz)	
		6dB	99%	6dB	99%
13	2412	15.1	16.8	100	300
19	2437	15.8	19.0		300
14	2462	15.1	16.9		300

Mode: HT20

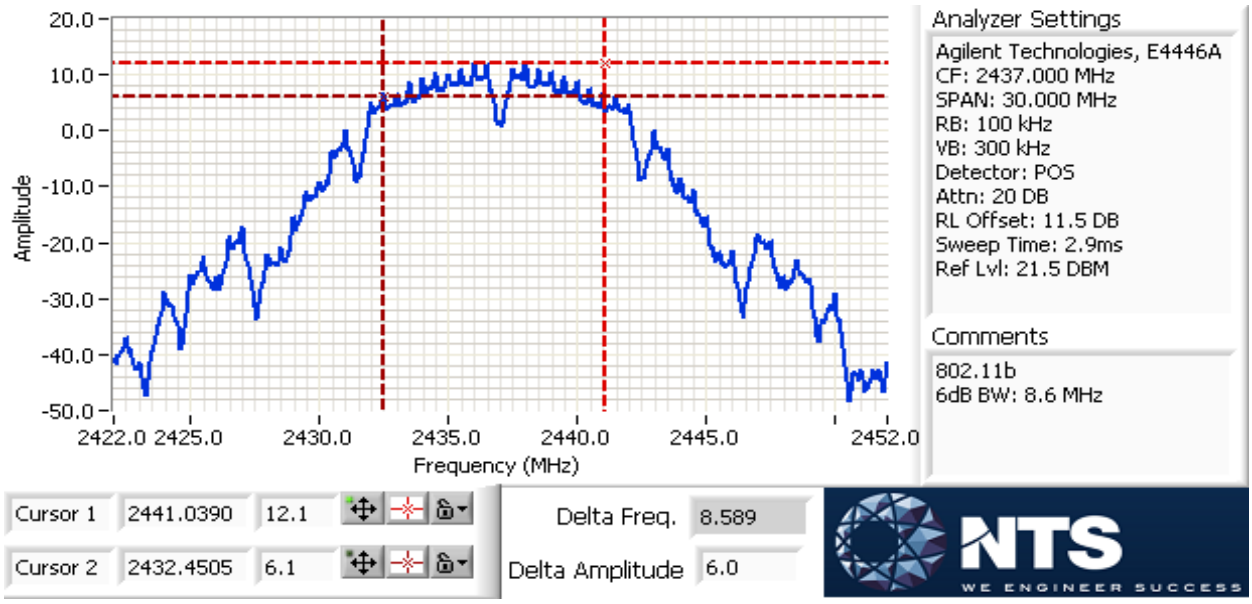
Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (kHz)	
		6dB	99%	6dB	99%
14	2412	15.1	17.7	100	300
18	2437	16.2	18.7		300
16	2462	16.1	18.1		300

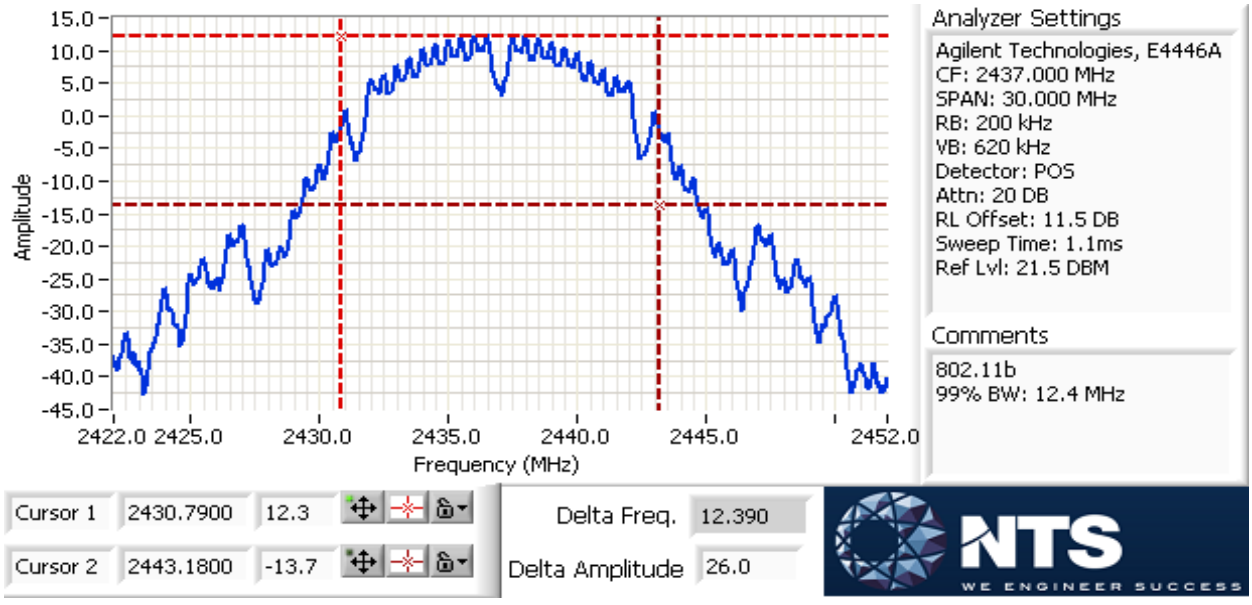
Mode: HT40

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (kHz)	
		6dB	99%	6dB	99%
11	2422	36.5	36.5	100	510
13	2437	36.4	36.6		510
12	2452	36.4	36.6		510

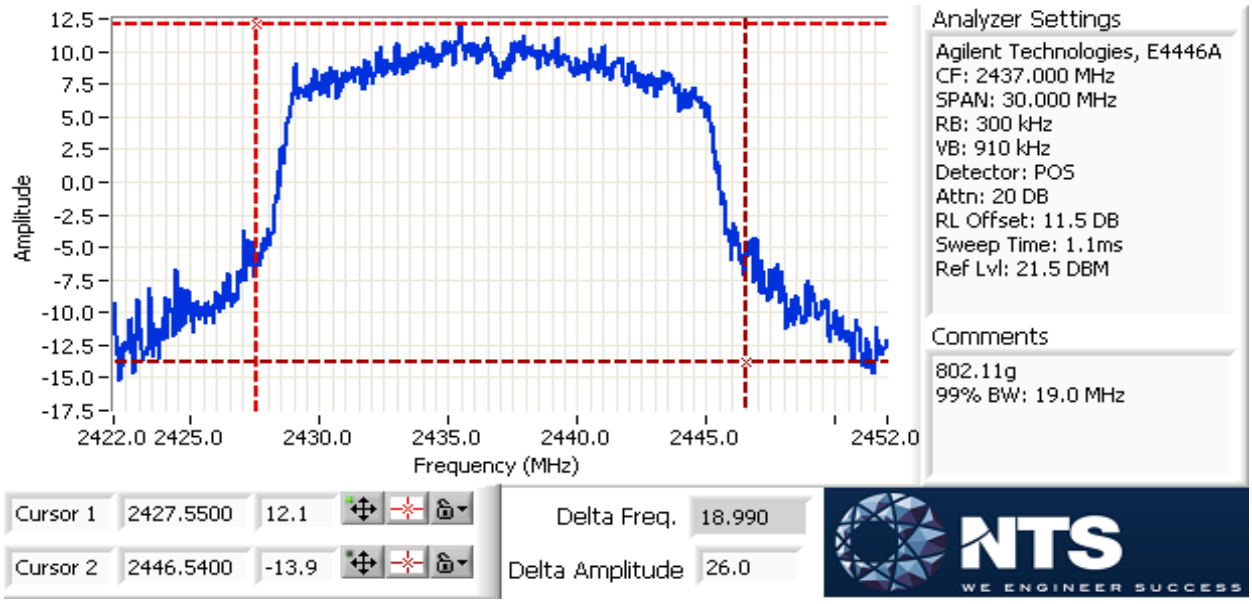
Note 1:	DTS BW: RBW=100kHz, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time, Span 2-5 times measured BW. 99% BW: RBW=1-5% of 99%BW, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time. Span 1.5-5 times OBW.
Note 2:	Measurements performed on chain 1.

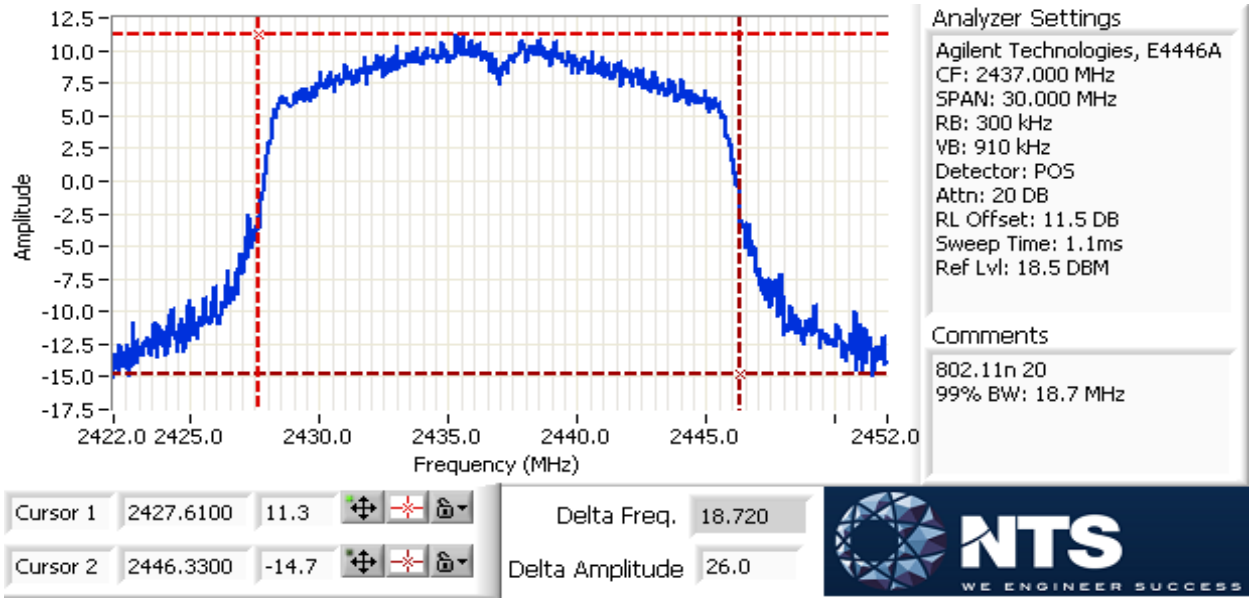
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



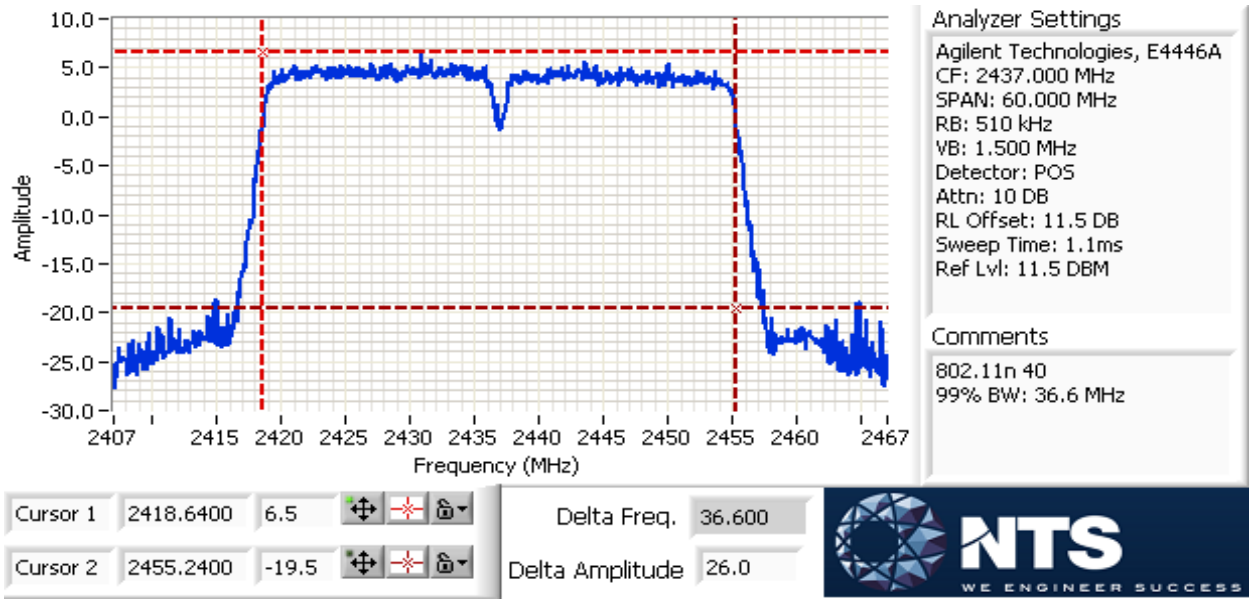


Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A





Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

Run #4a: Out of Band Spurious Emissions

Date of Test: 10/7/2015
Test Engineer: John Caizzi
Test Location: Lab 4A

Config. Used: 1
Config Change: none
Host Unit Voltage PoE

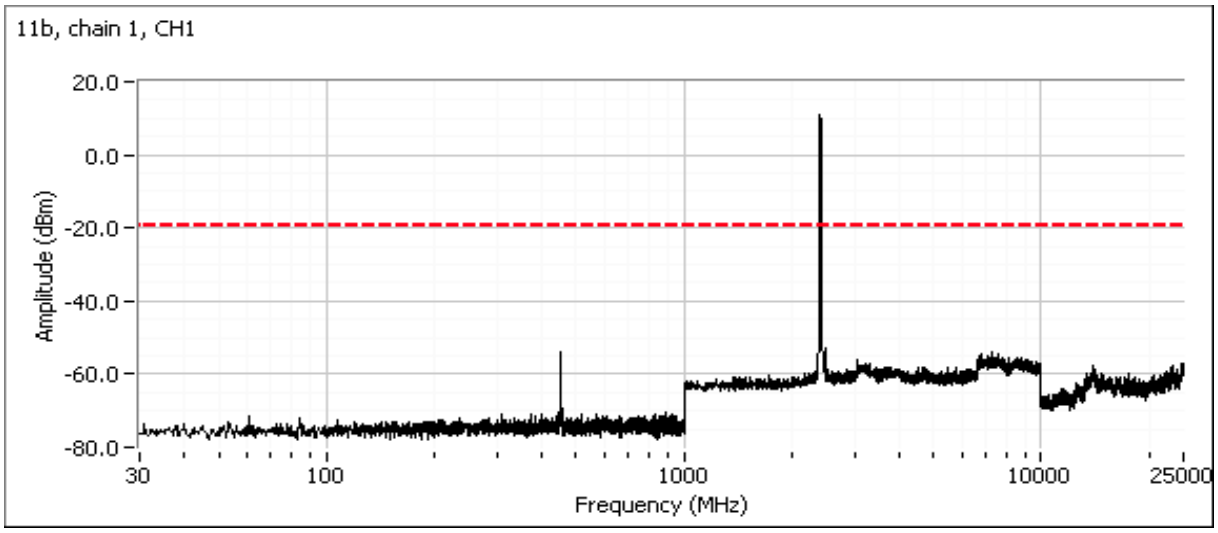
Power Setting Per Chain #1	#2	#3	#4	Mode	Frequency (MHz)	Reference (dBm)	Limit	Result
19	19	19	19	b	2412	11.4	-18.6	Pass
					2437	11.4	-18.6	Pass
					2462	11.4	-18.6	Pass
13	13	13	13	g	2412	10.1	-19.9	Pass
19	19	19	19		2437	10.1	-19.9	Pass
					2462	10.1	-19.9	Pass
14	14	14	14	HT20	2412	9.3	-20.7	Pass
18	18	18	18		2437	9.3	-20.7	Pass
					2462	9.3	-20.7	Pass
11	11	11	11	HT40	2422	1.2	-28.8	Pass
17	17	17	17		2437	1.2	-28.8	Pass
					2452	1.2	-28.8	Pass

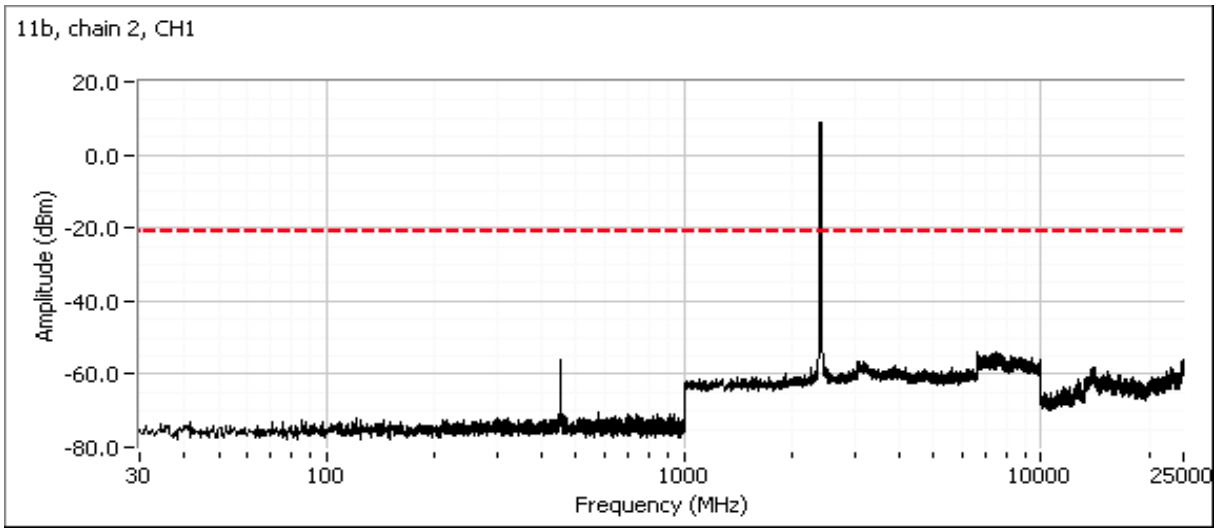
Note 1:	Measurements performed RBW=100kHz, VBW=300kHz, peak detector, max hold.
Note 2:	Measured on each chain individually.
Note 3:	All wide scan measurements performed at target power setting.
Note 4"	Limit based on -30dBc.

Measurement performed at the fundamental for each mode at the maximum power setting for the middle channel. The maximum value observed was used as the reference level for the -30dBc limit line on the plots.

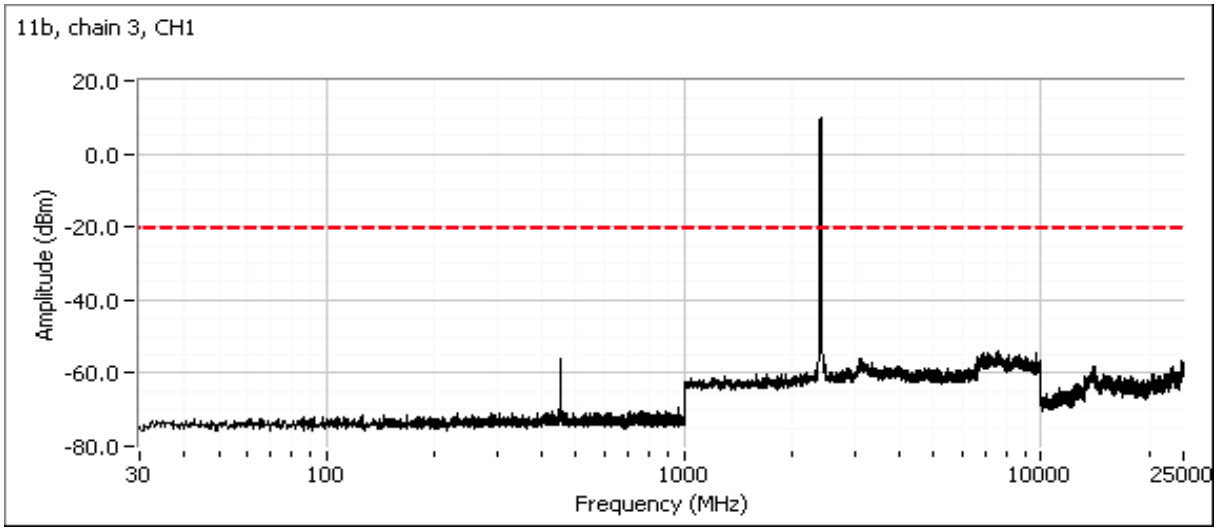
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

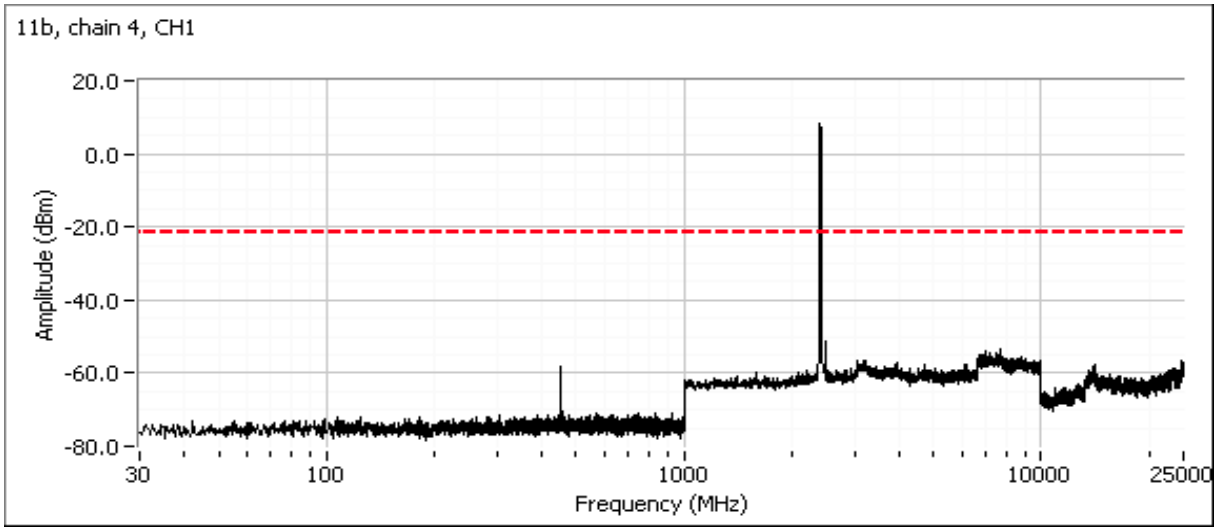
Plots for low channel



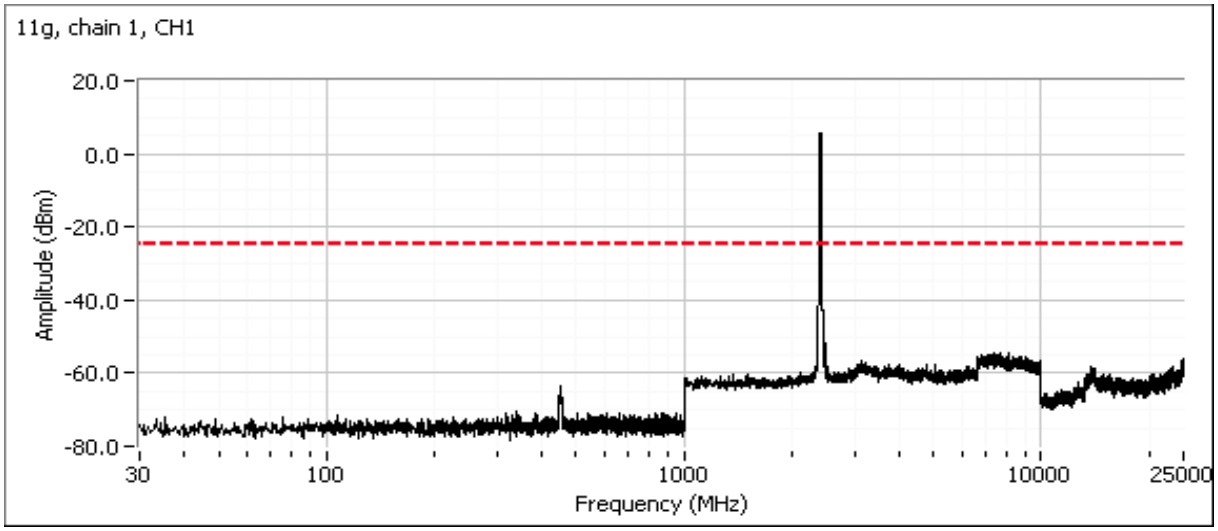


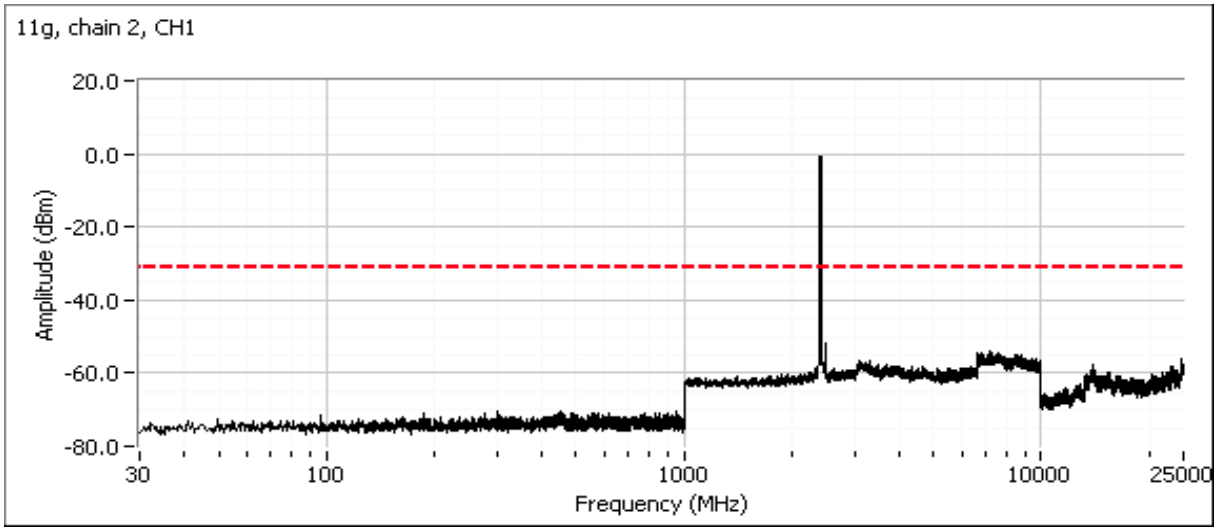
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



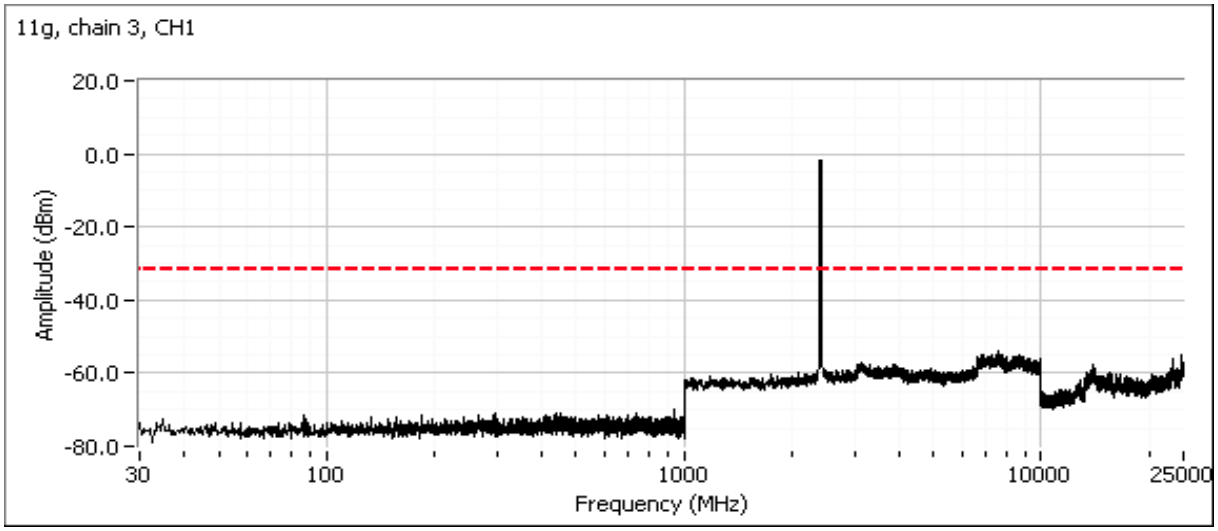


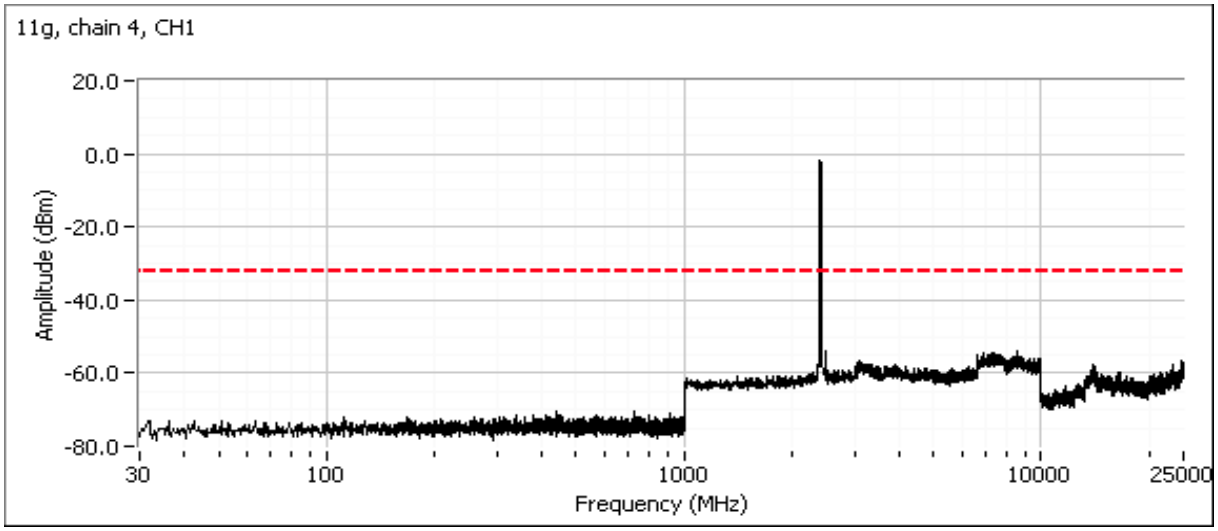
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



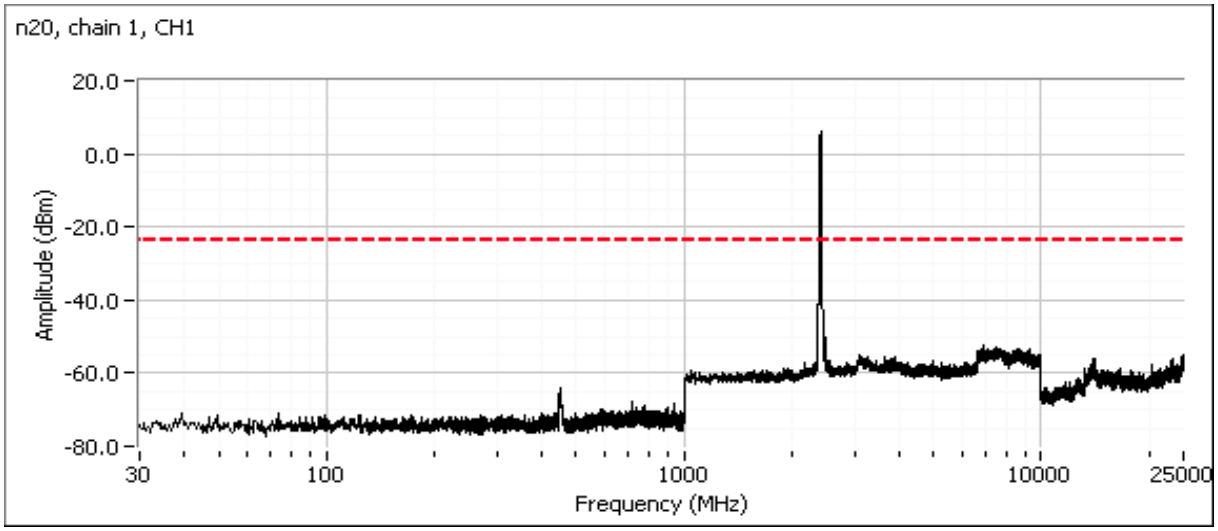


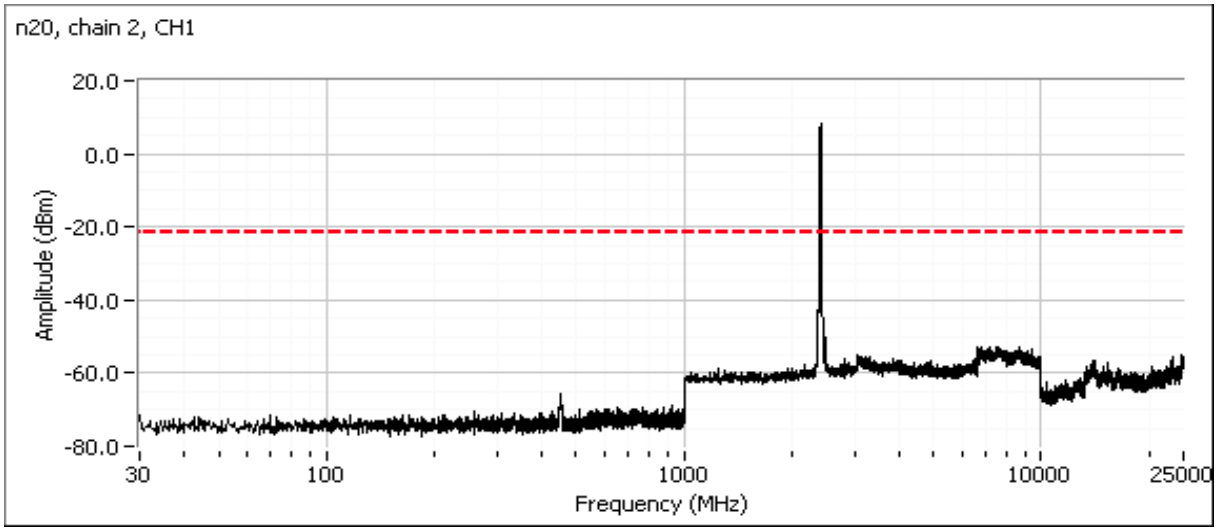
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



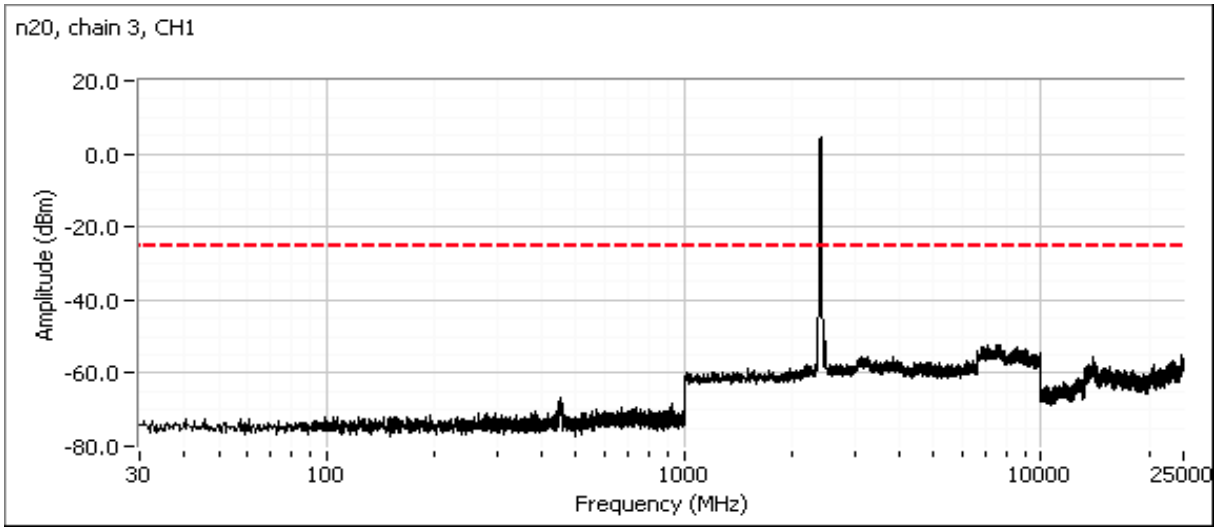


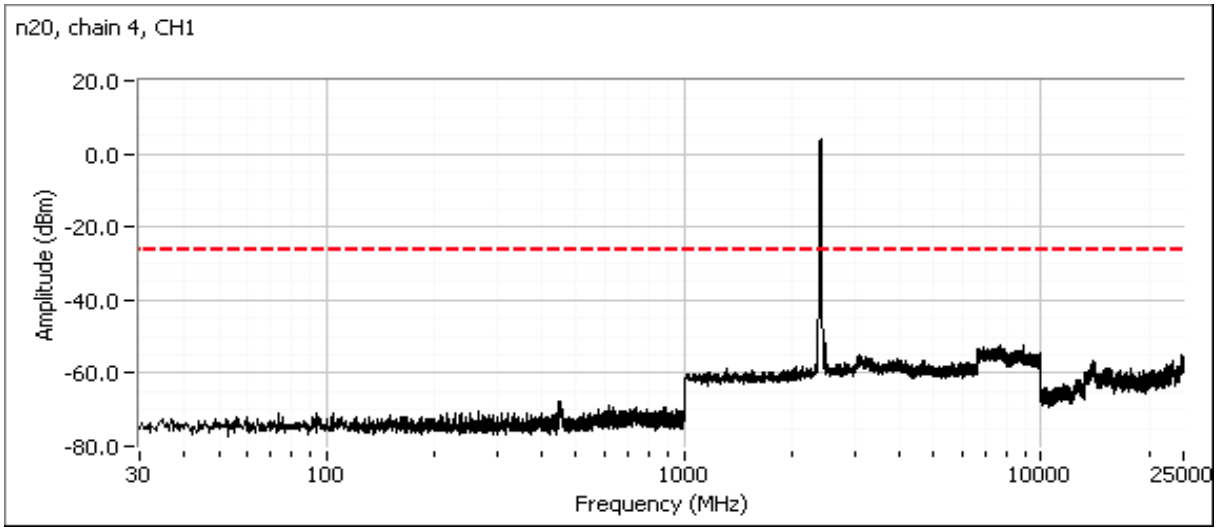
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



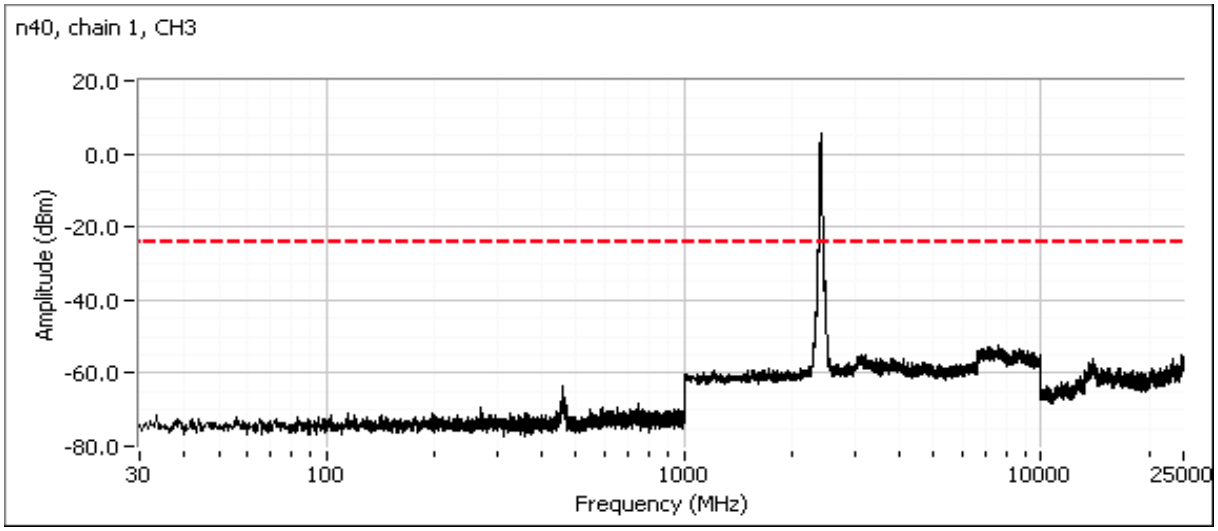


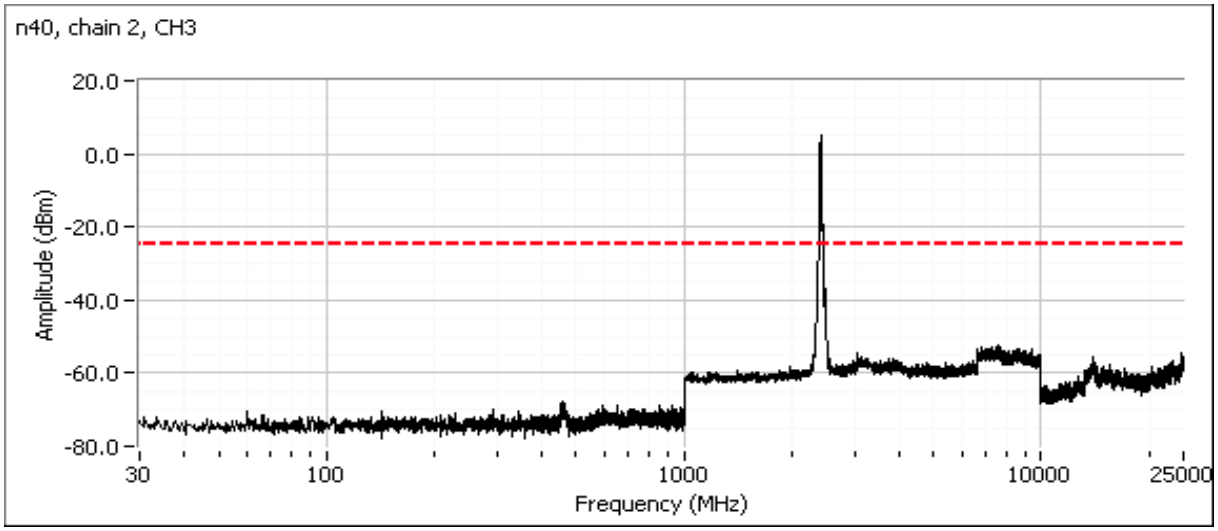
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



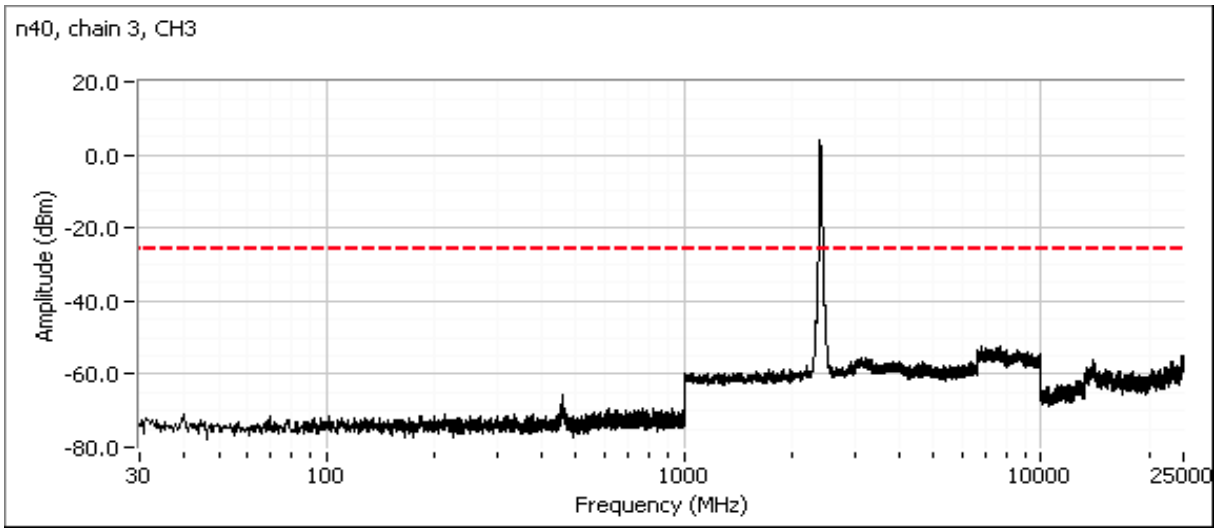


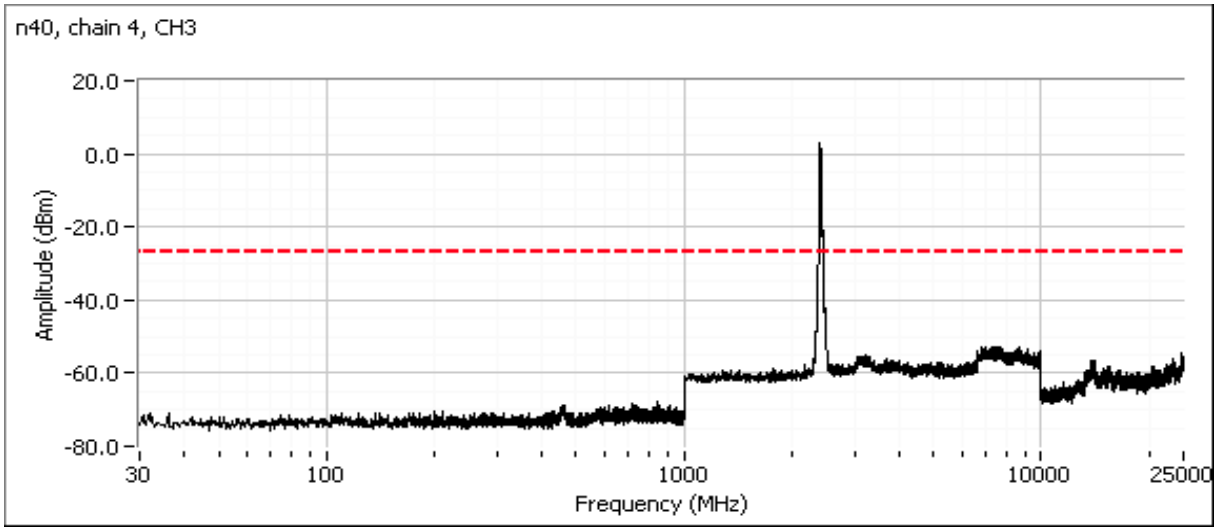
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A





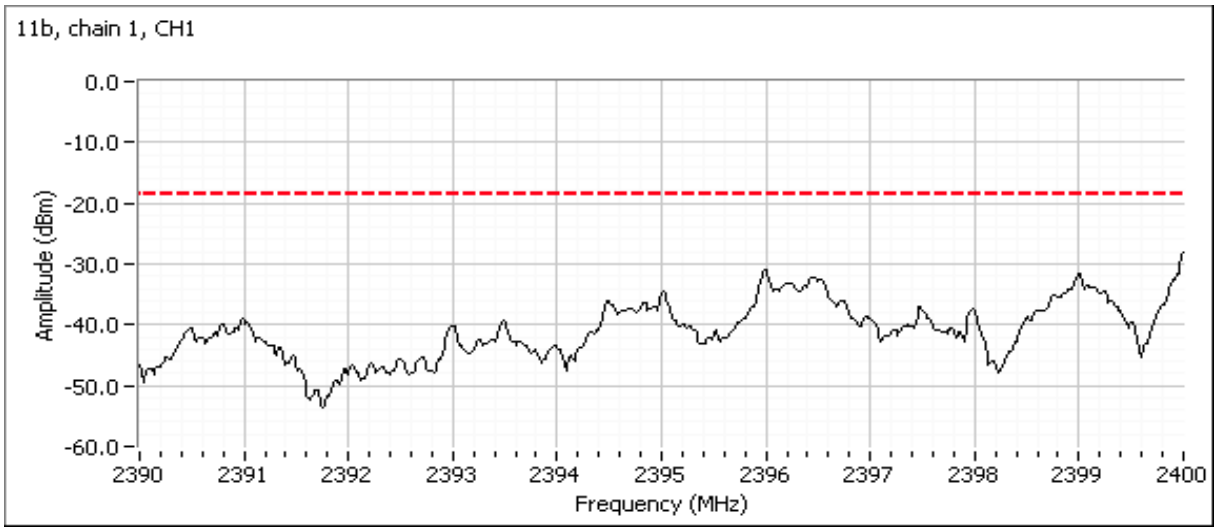
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

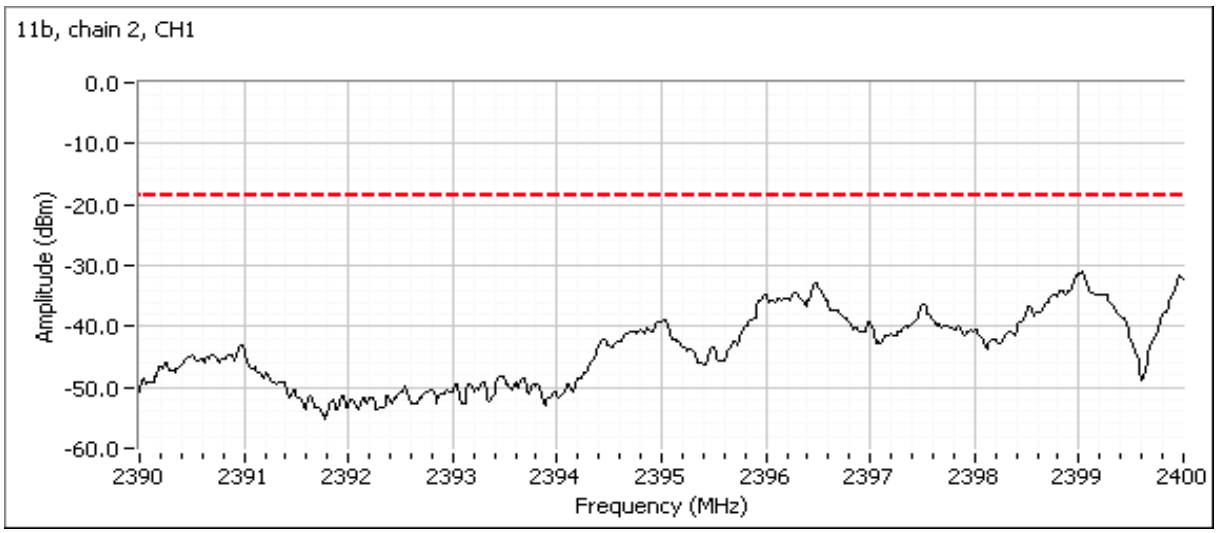




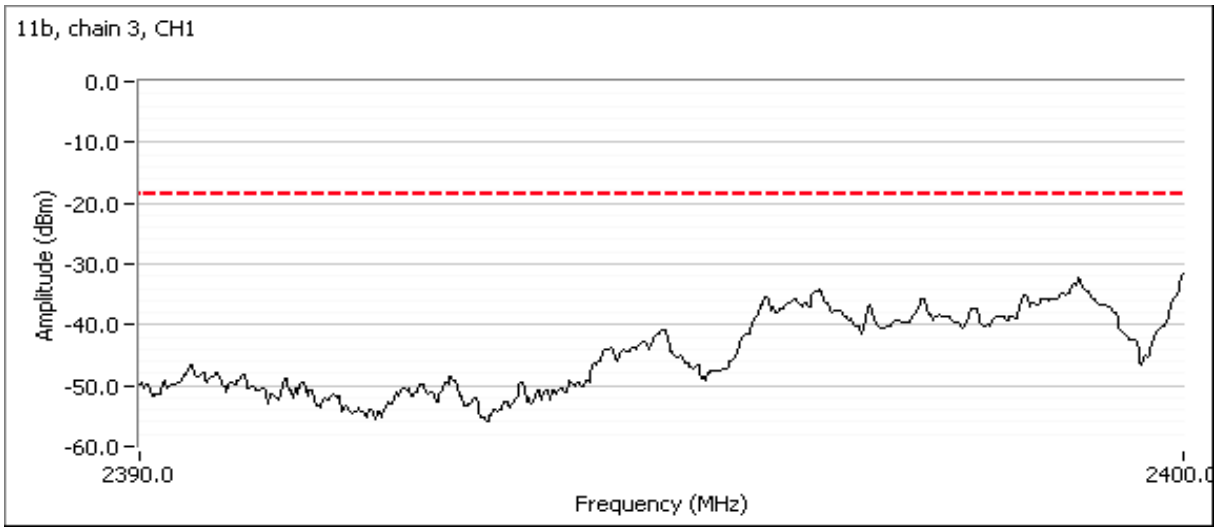
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

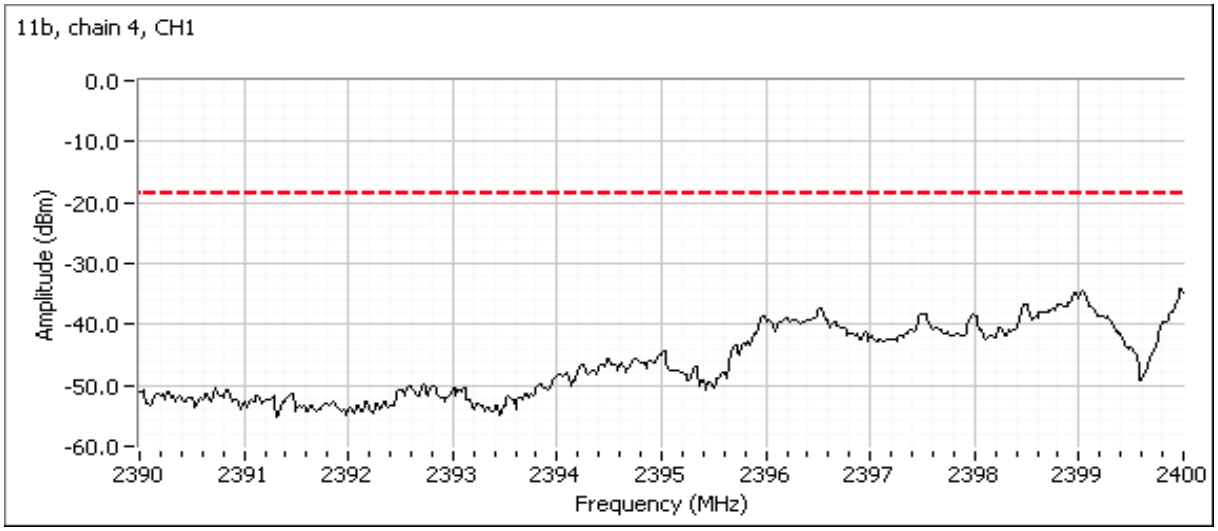
Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.



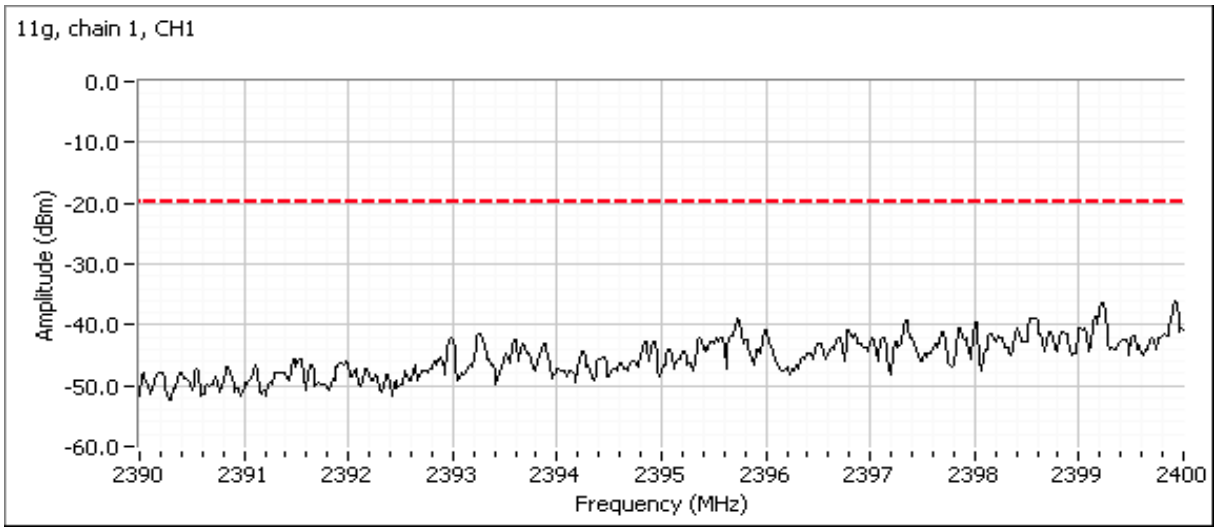


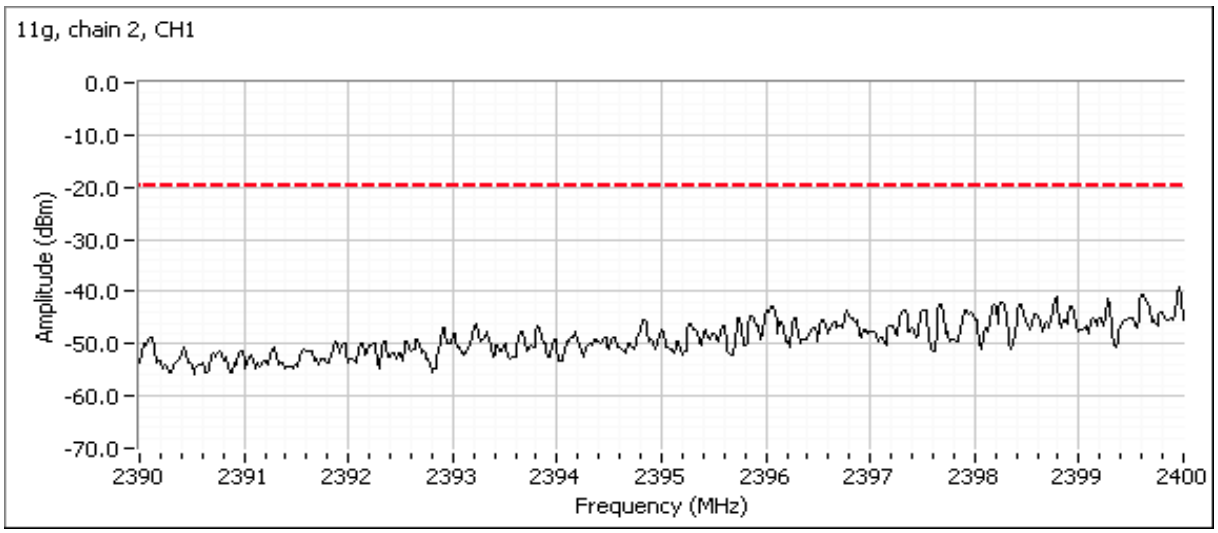
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



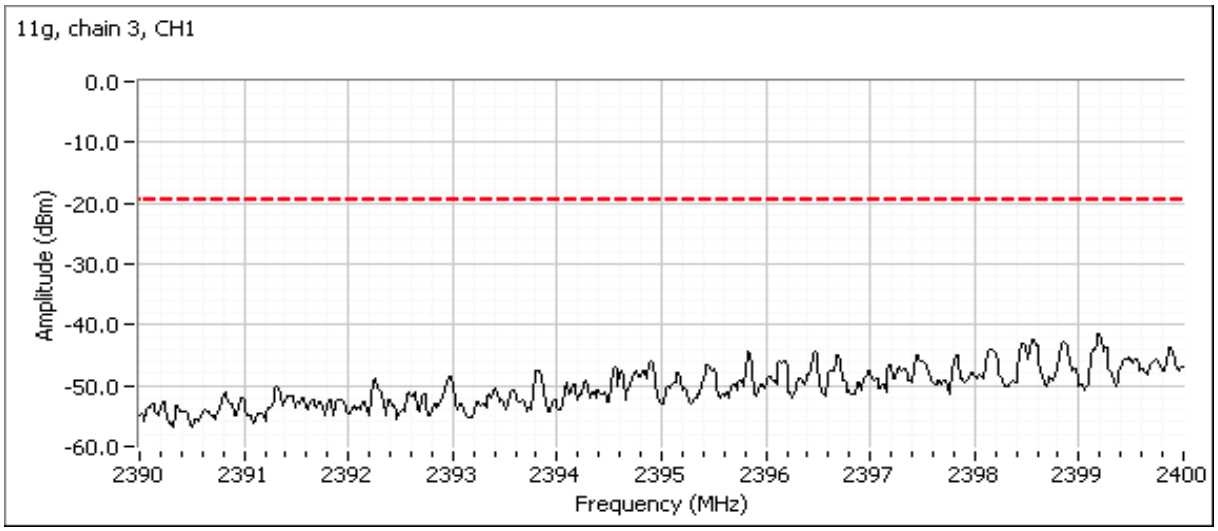


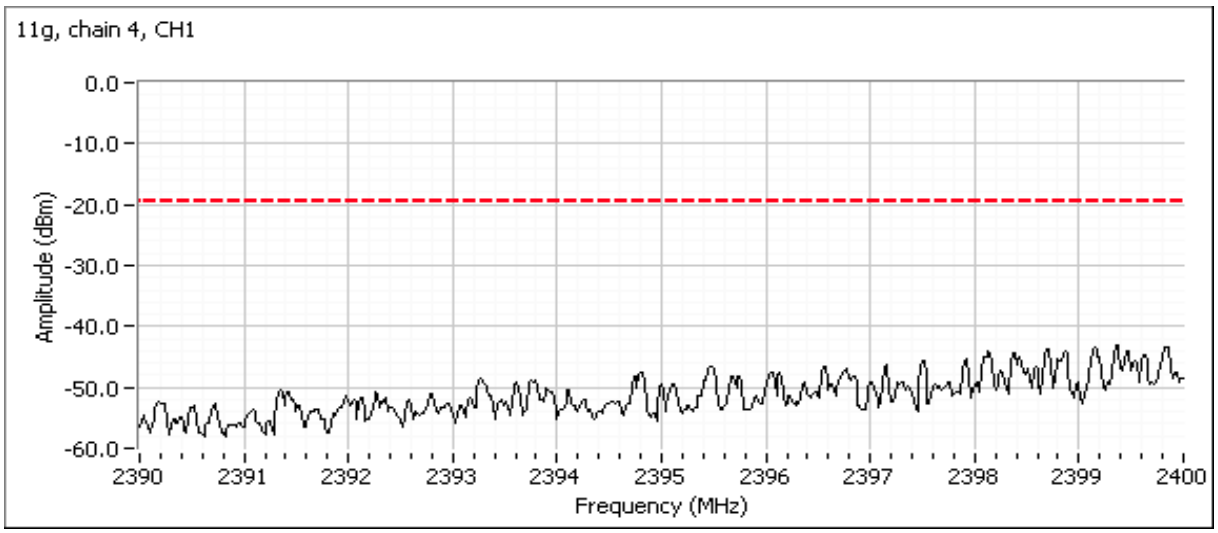
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



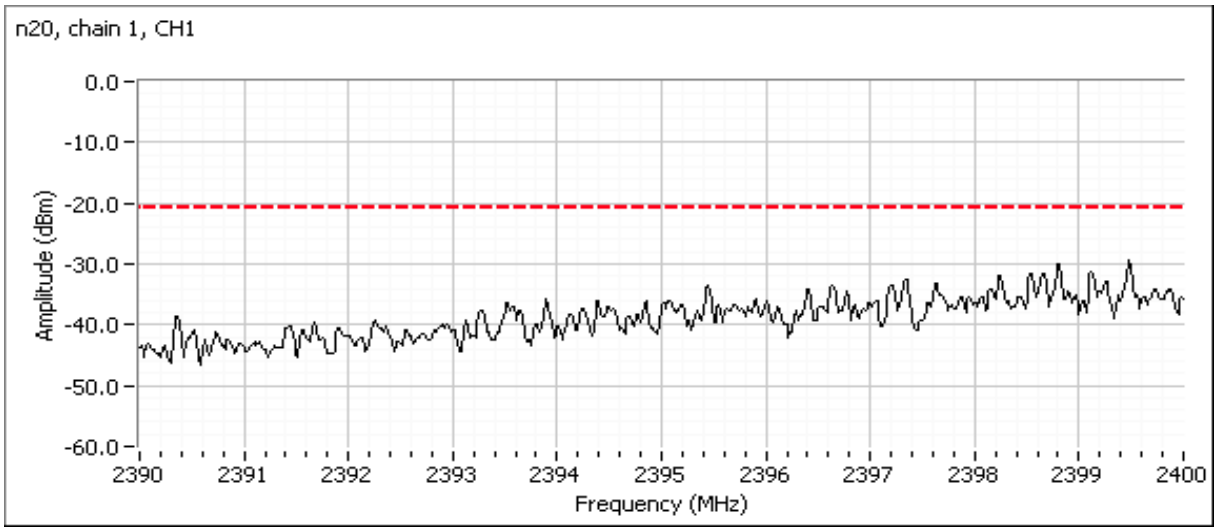


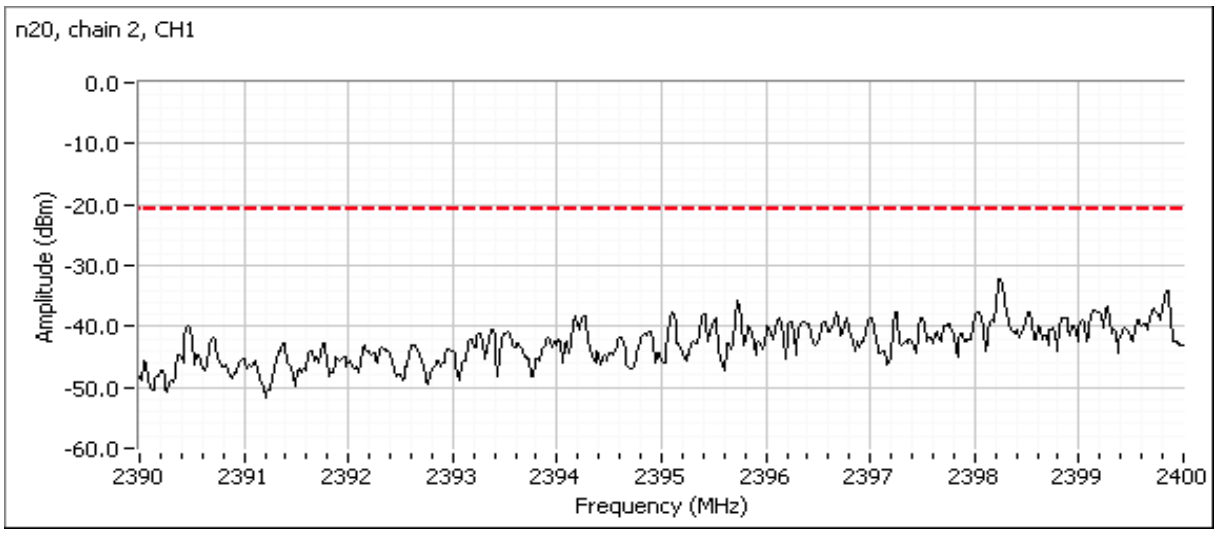
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



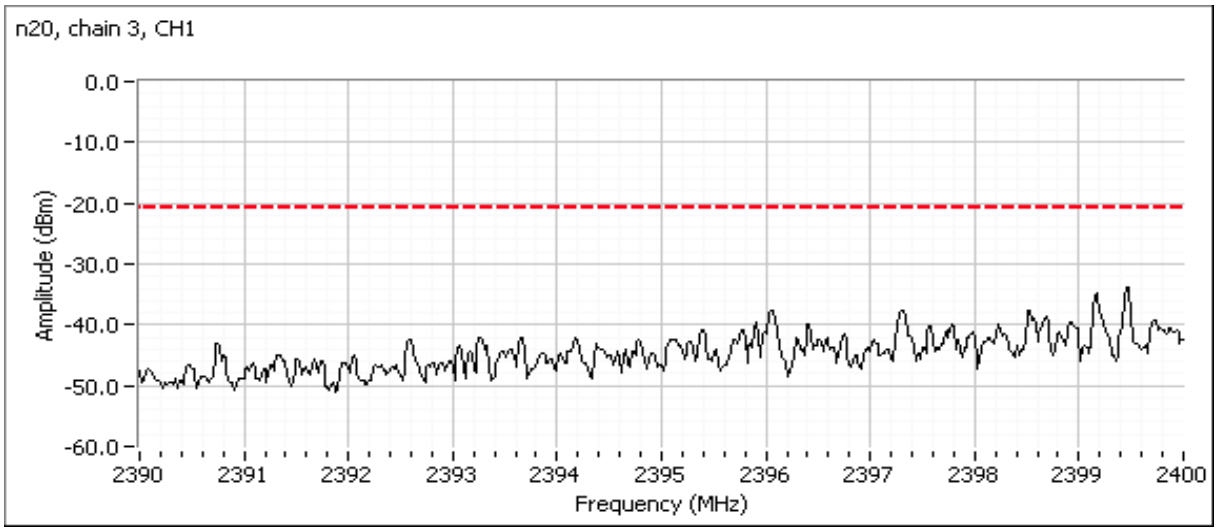


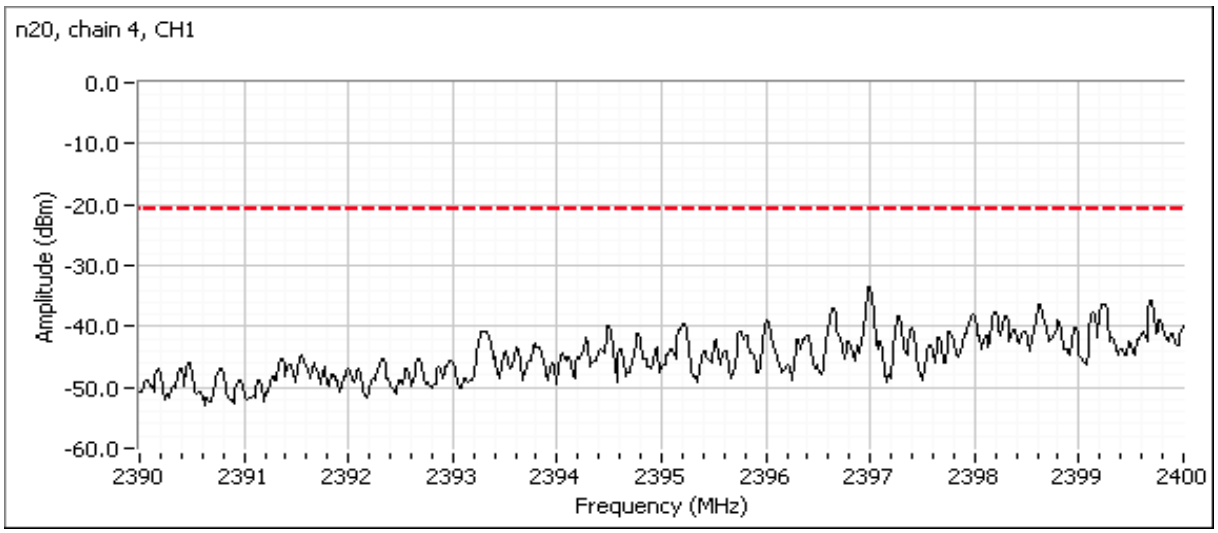
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



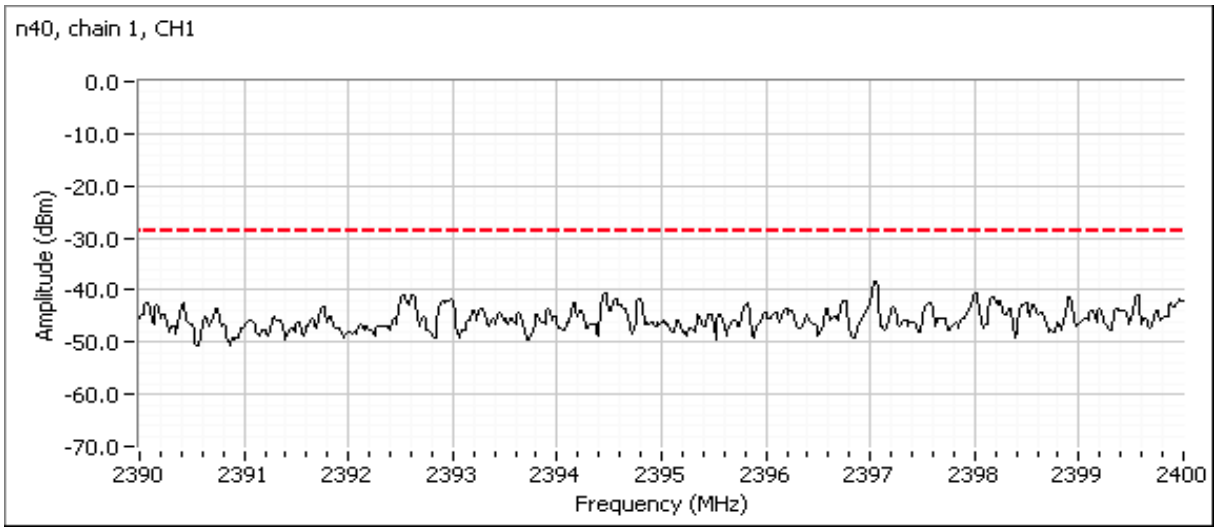


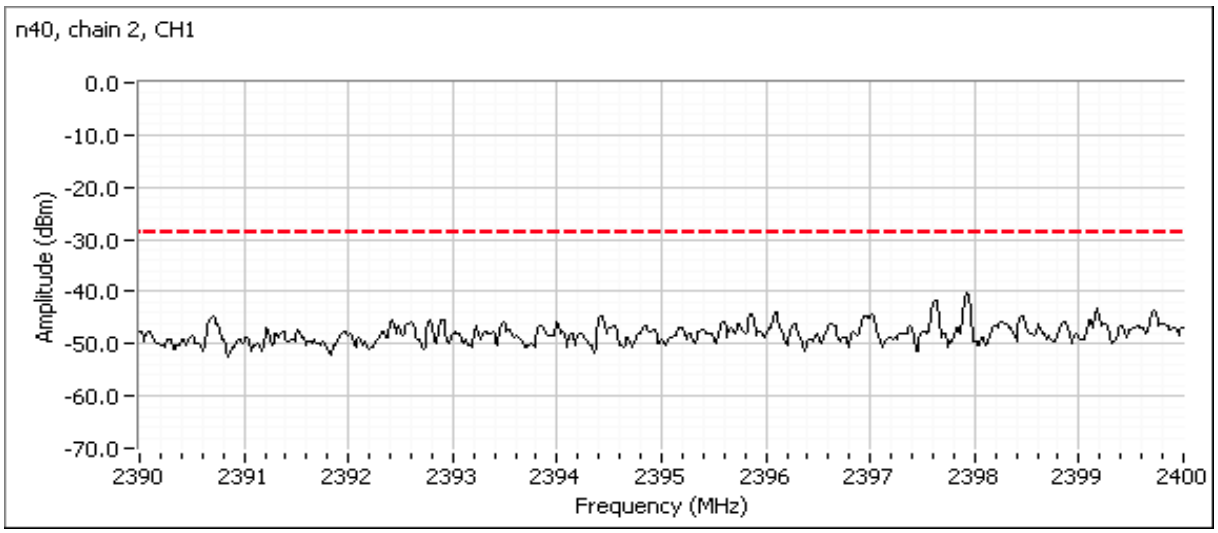
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



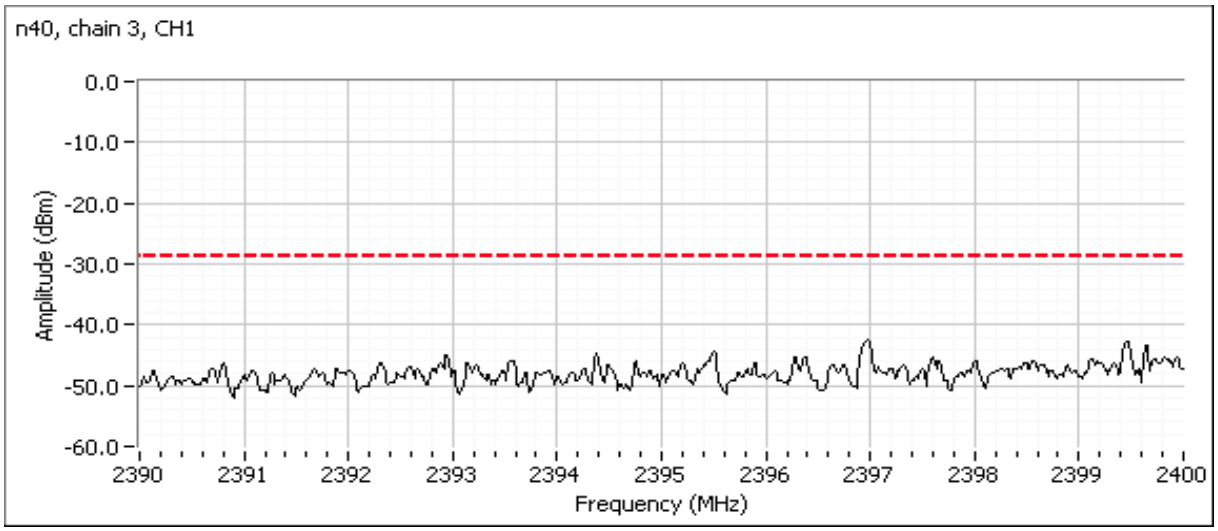


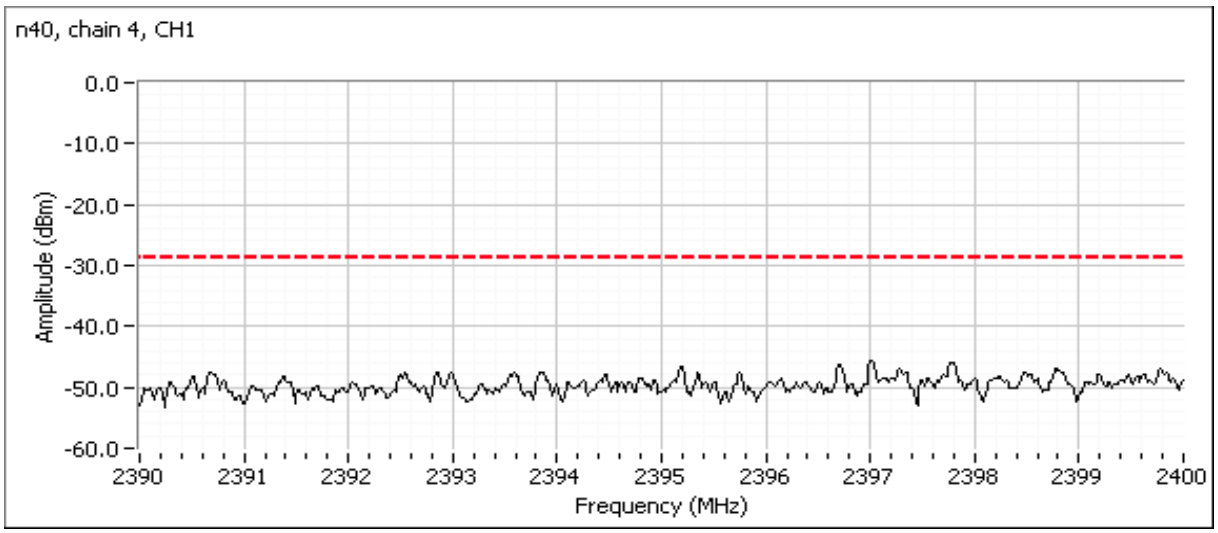
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A





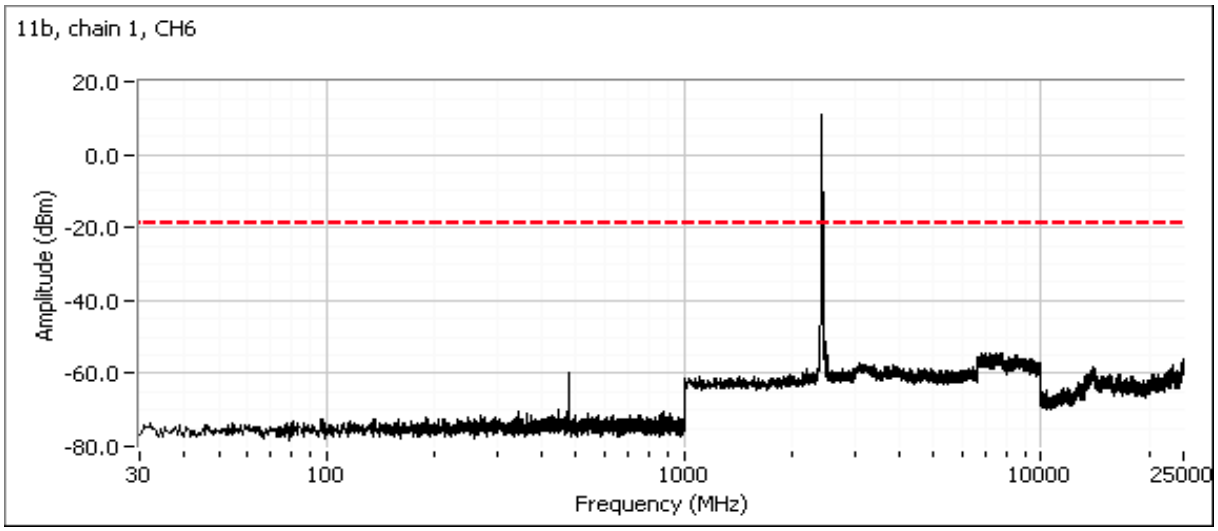
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

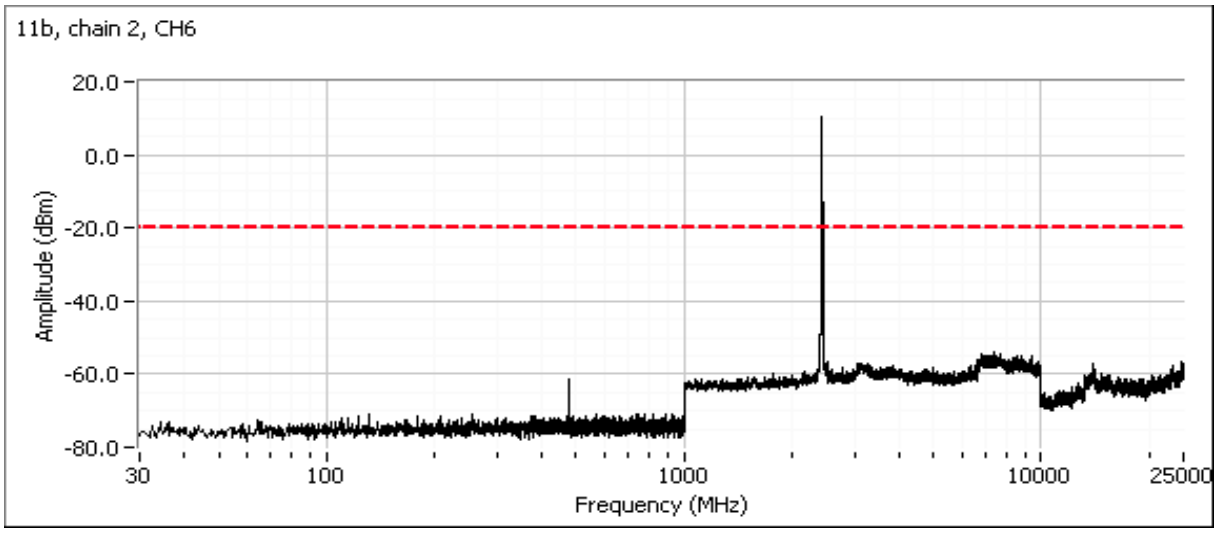




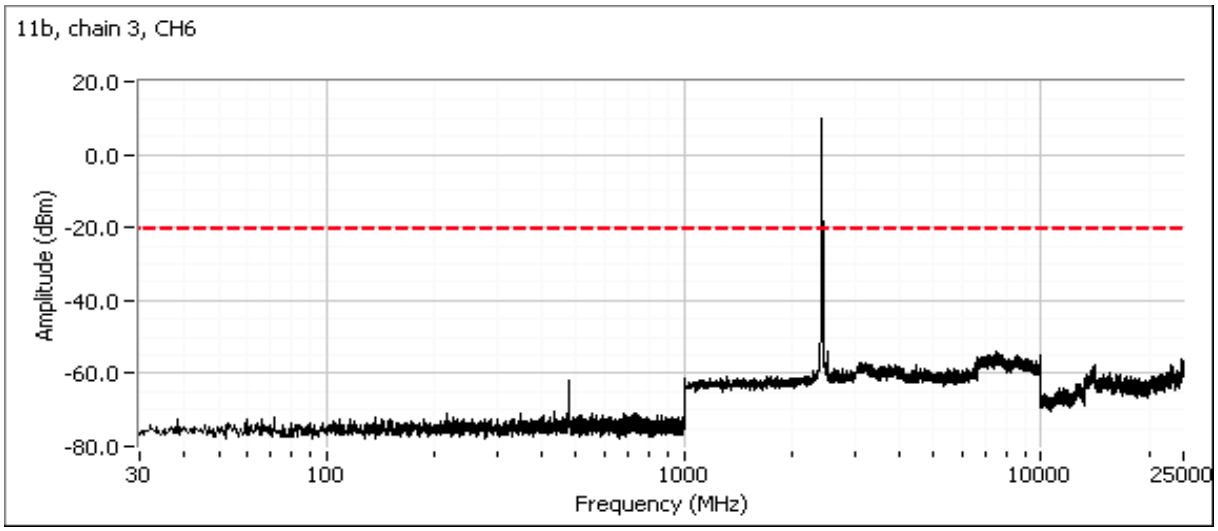
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

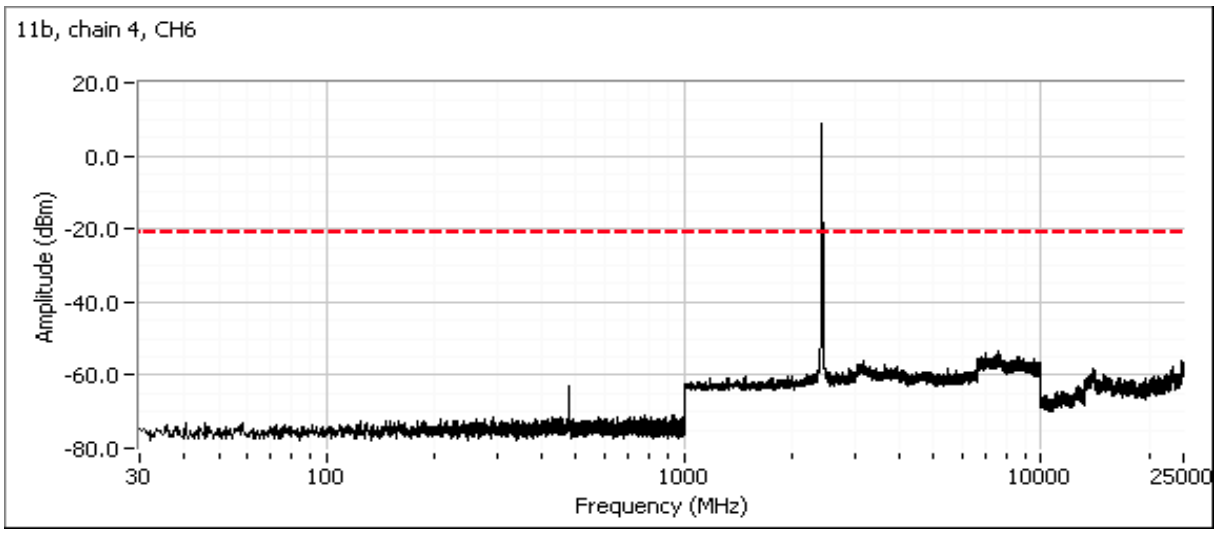
Plots for center channel



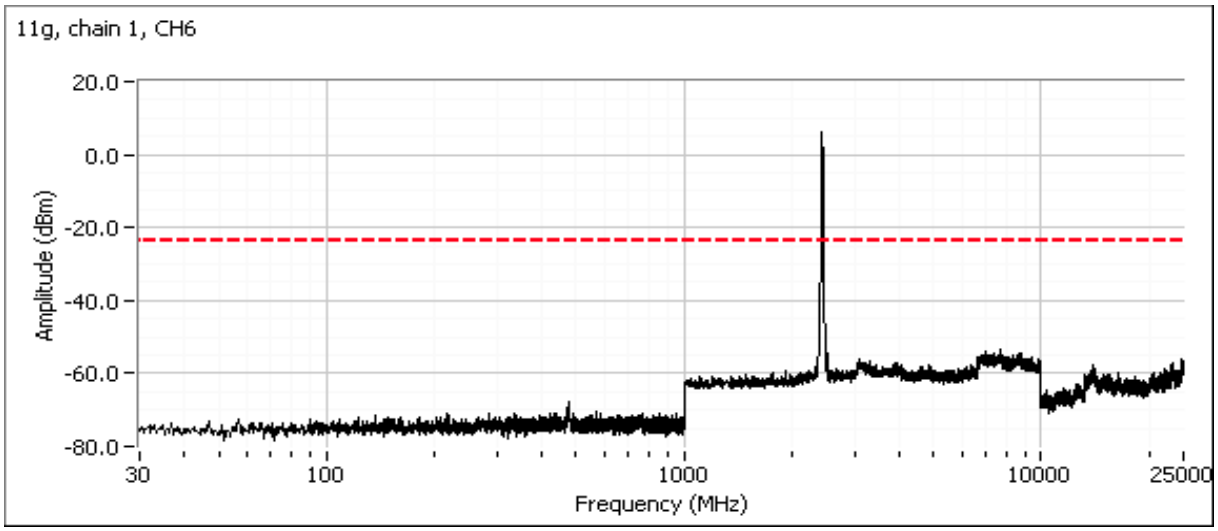


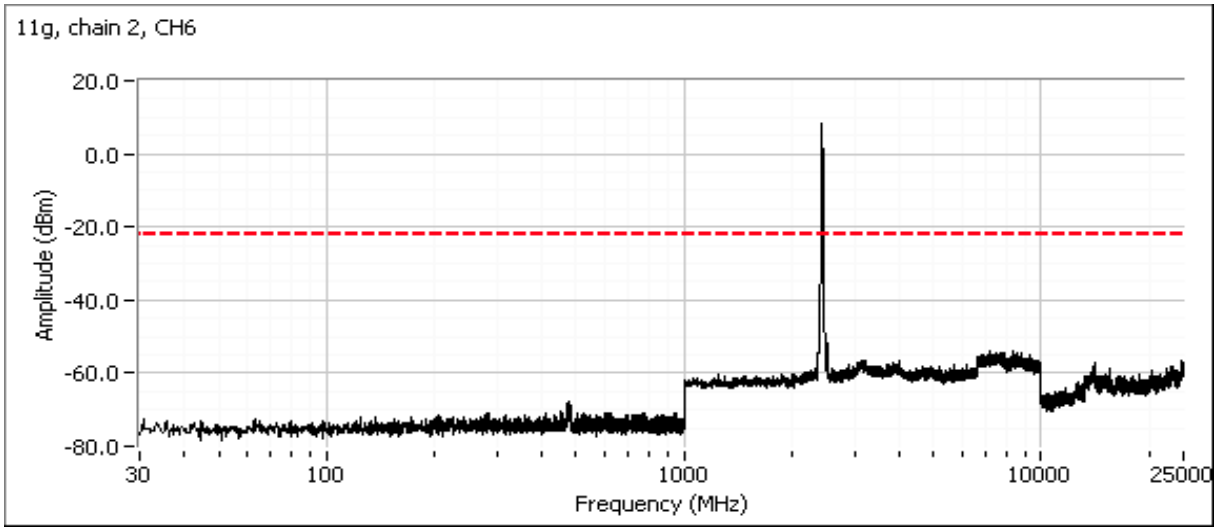
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



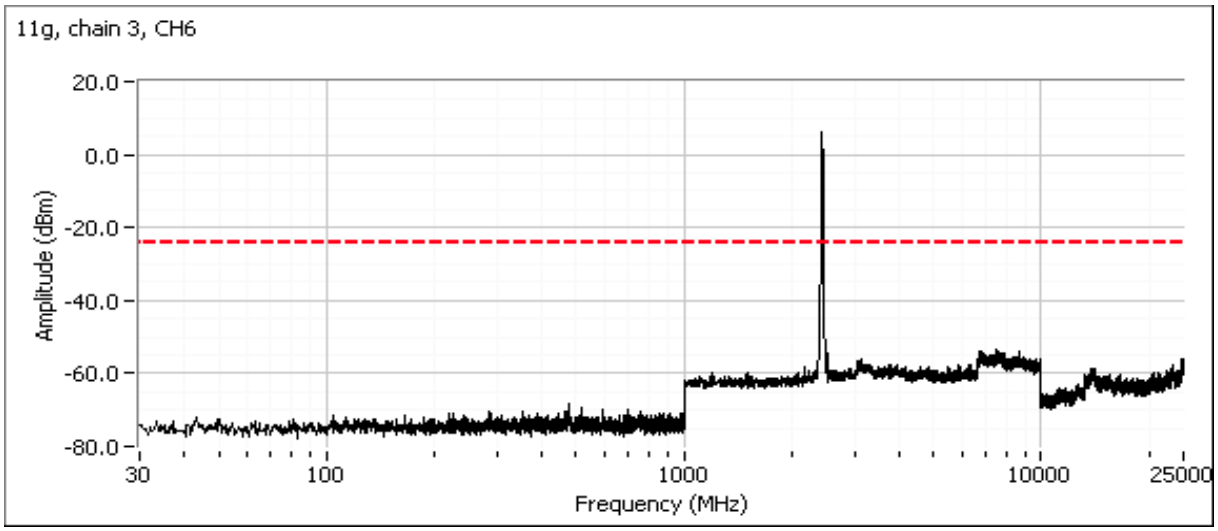


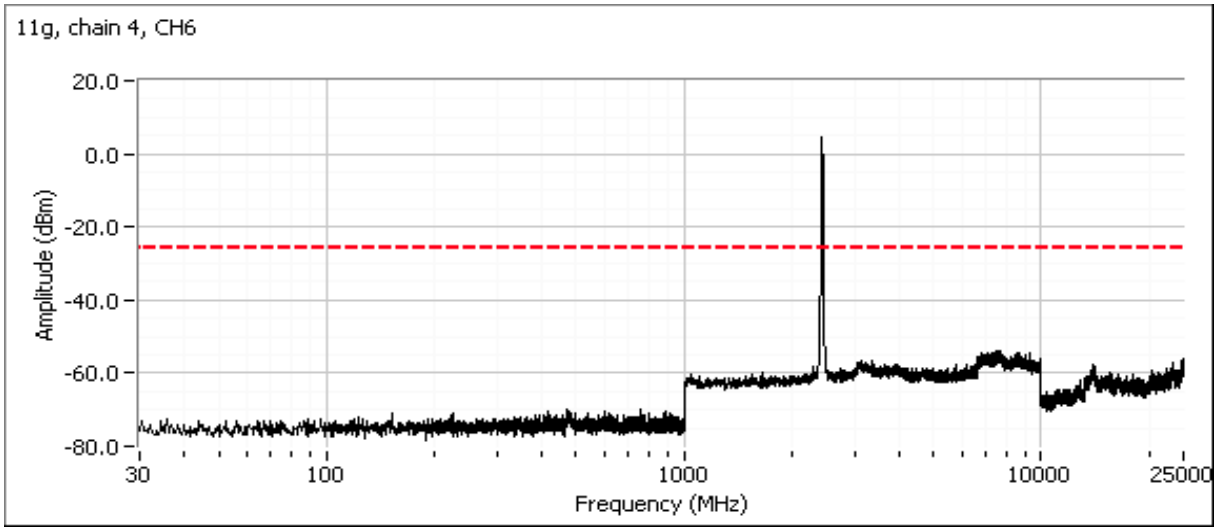
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



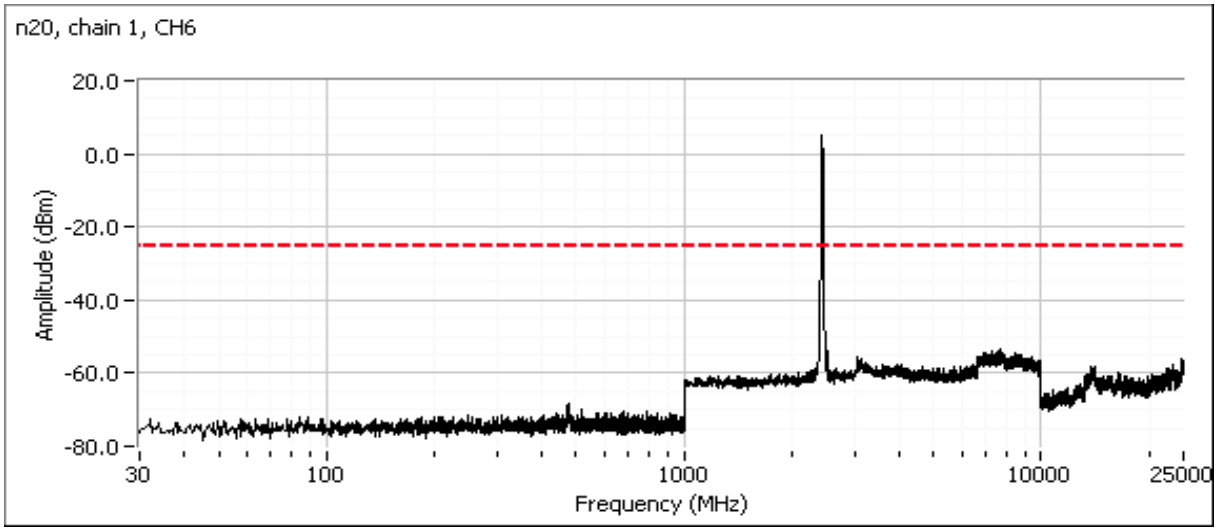


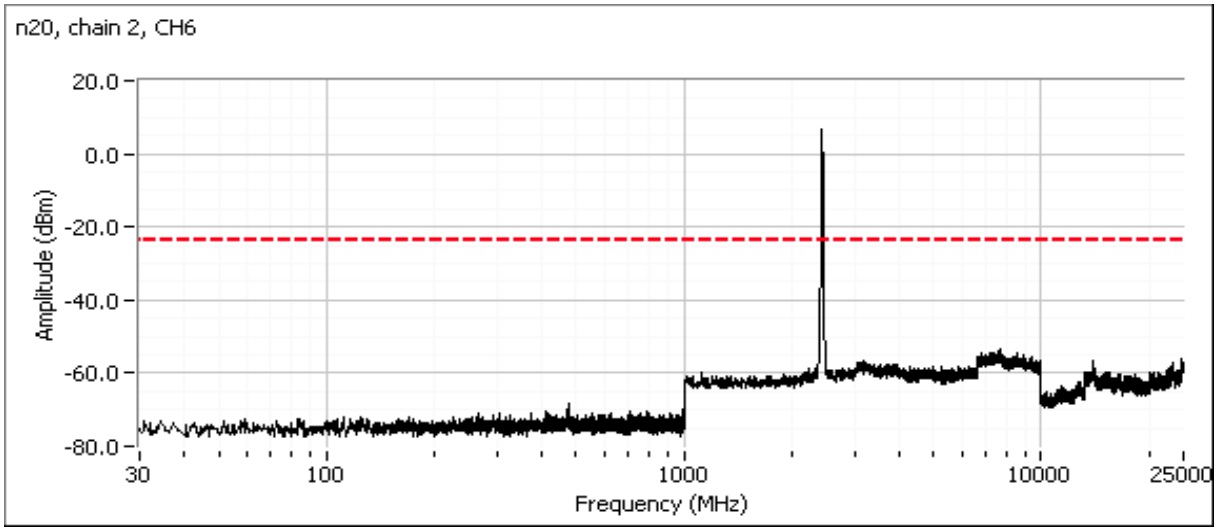
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



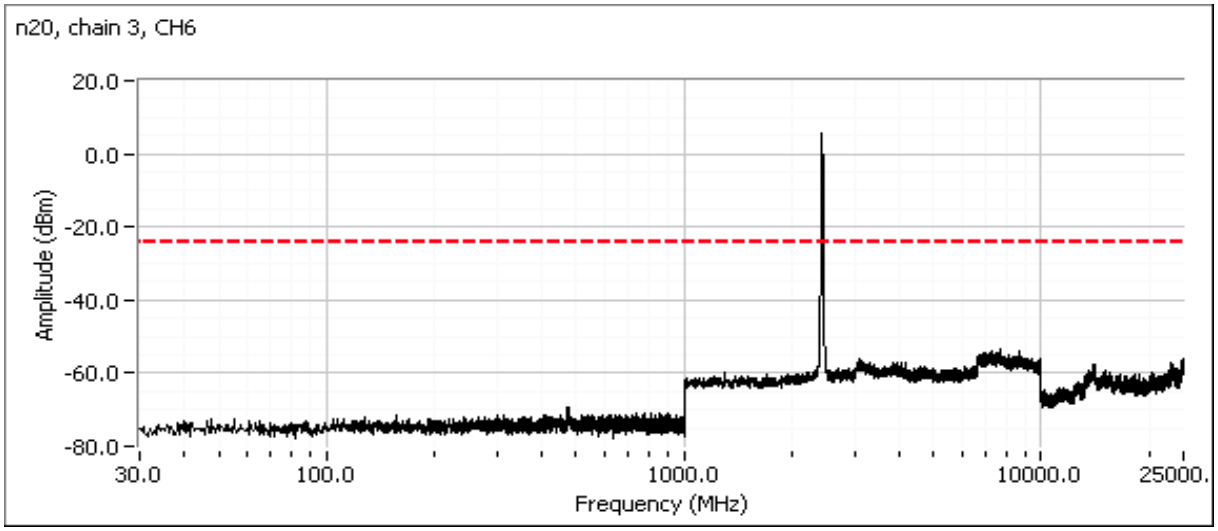


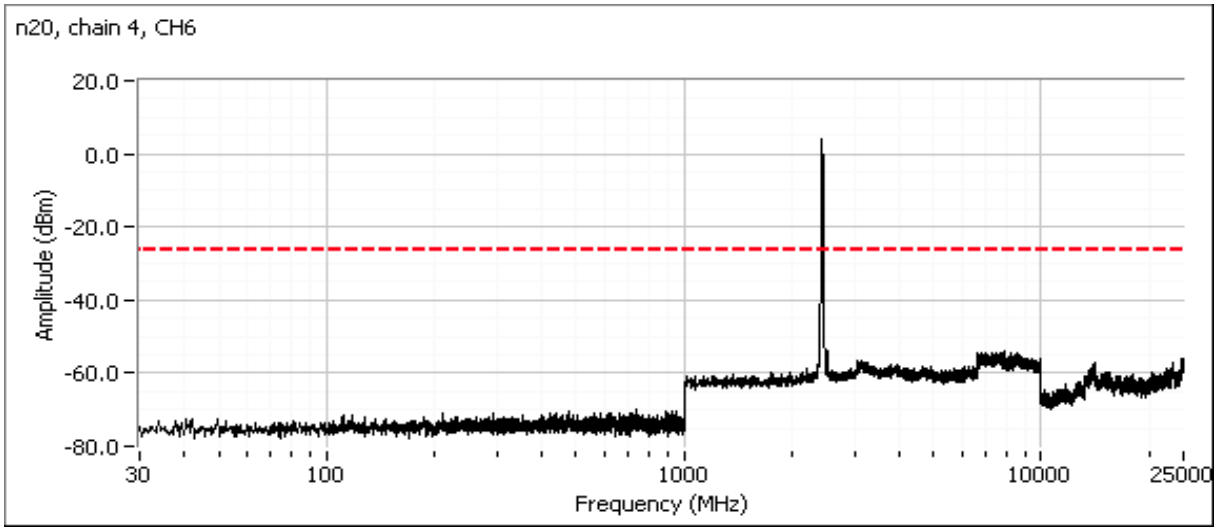
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



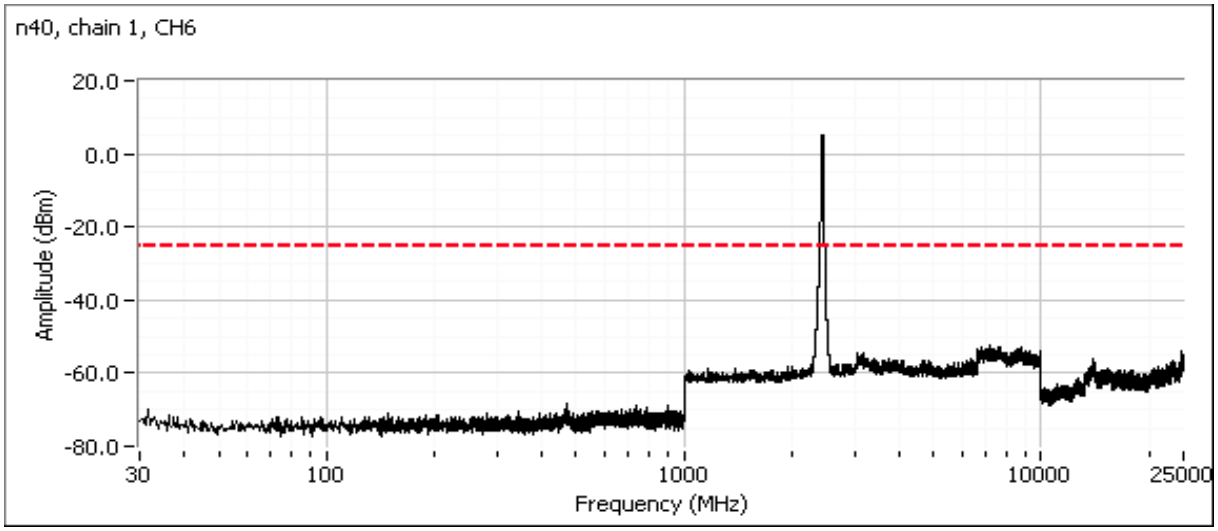


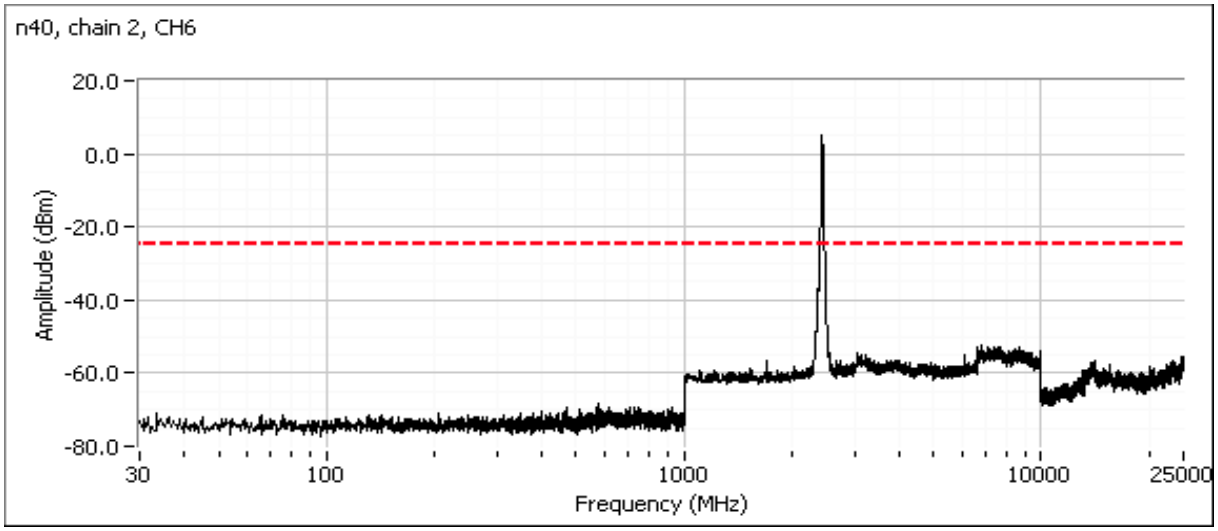
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



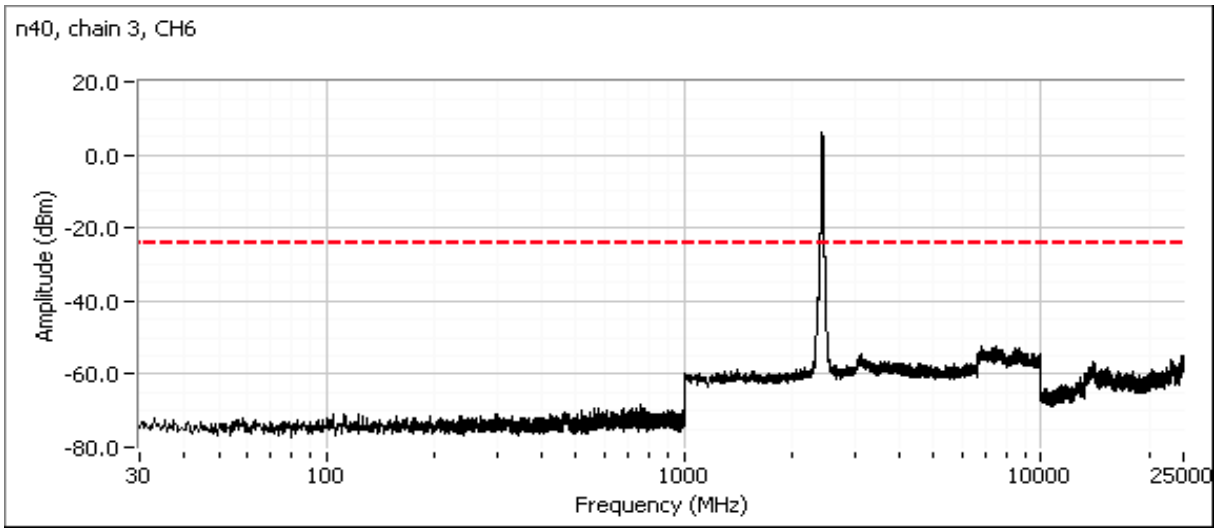


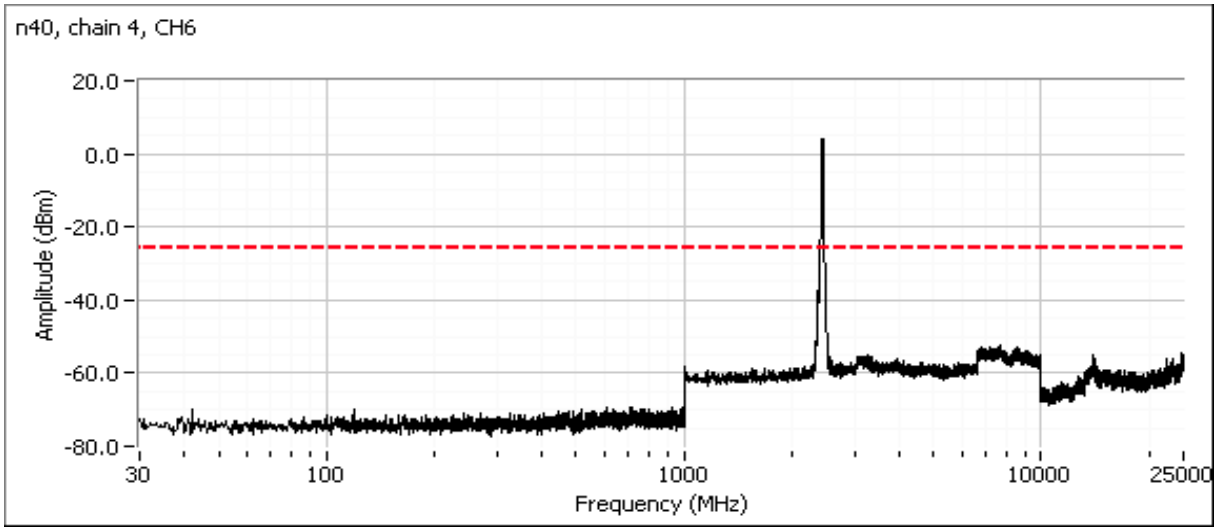
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A





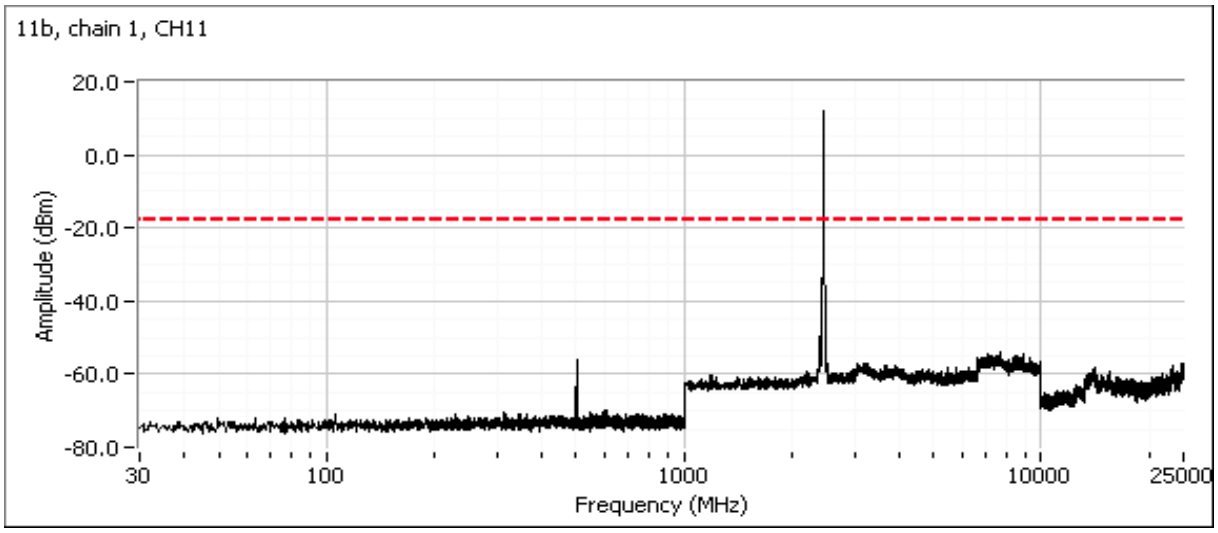
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

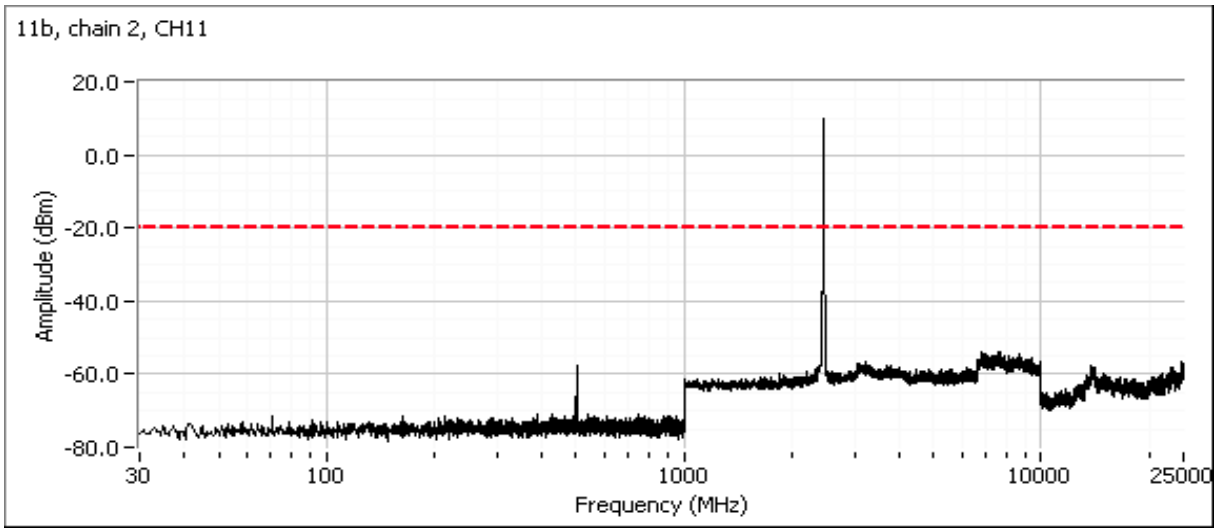




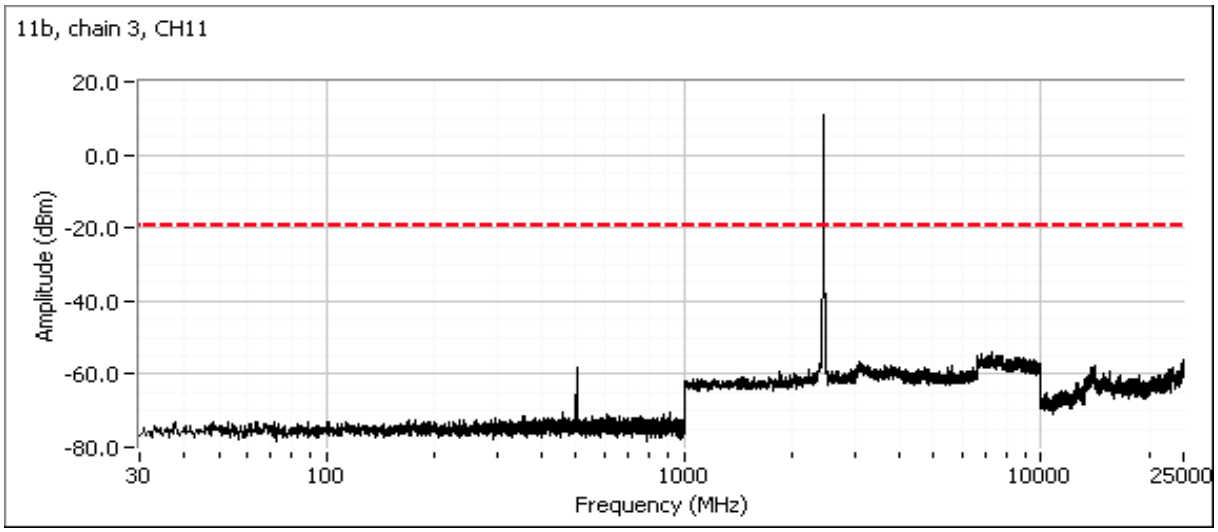
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A

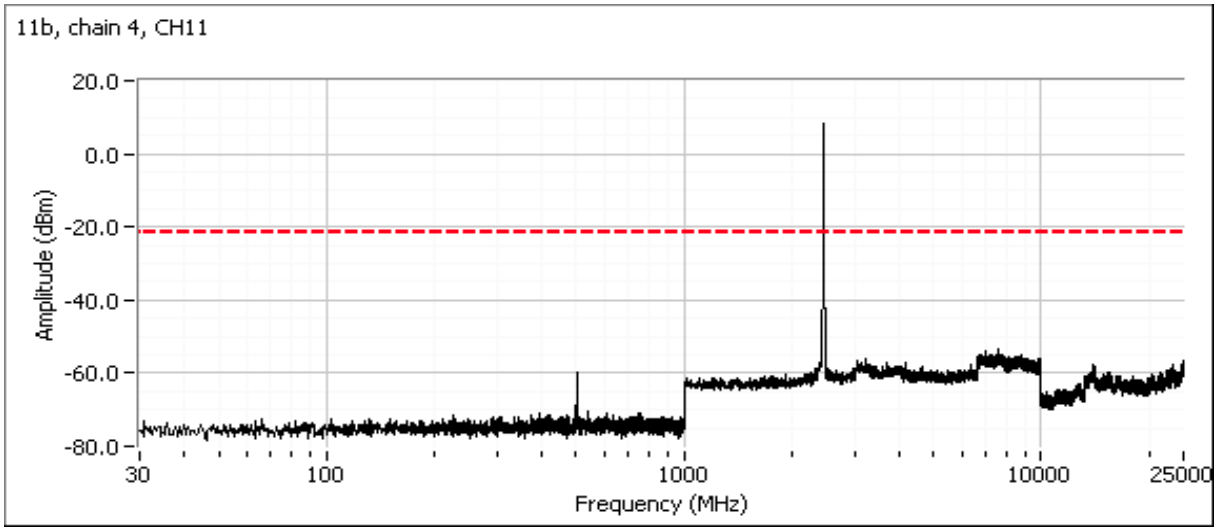
Plots for high channel



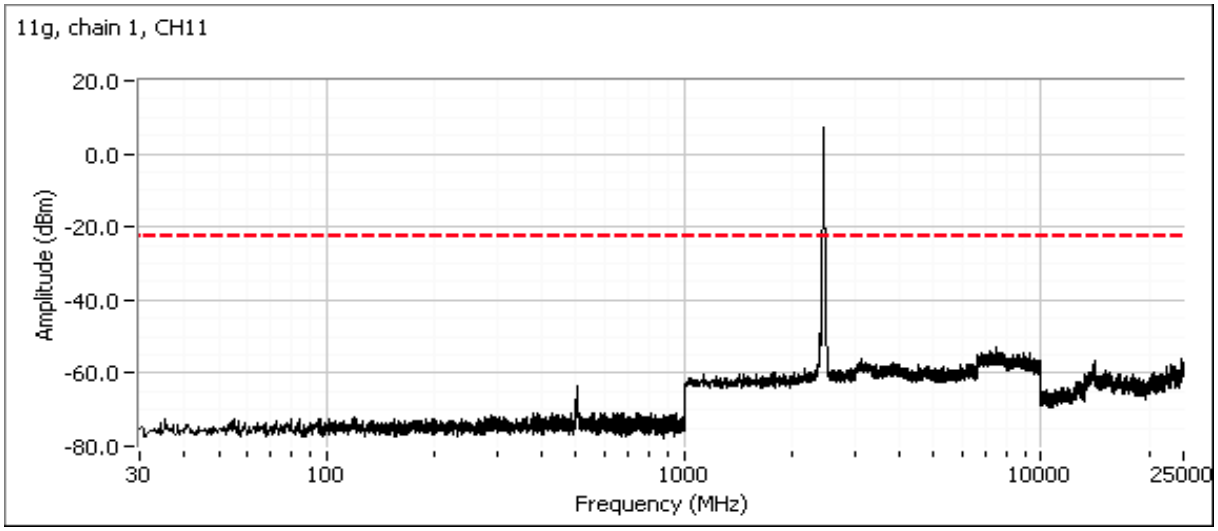


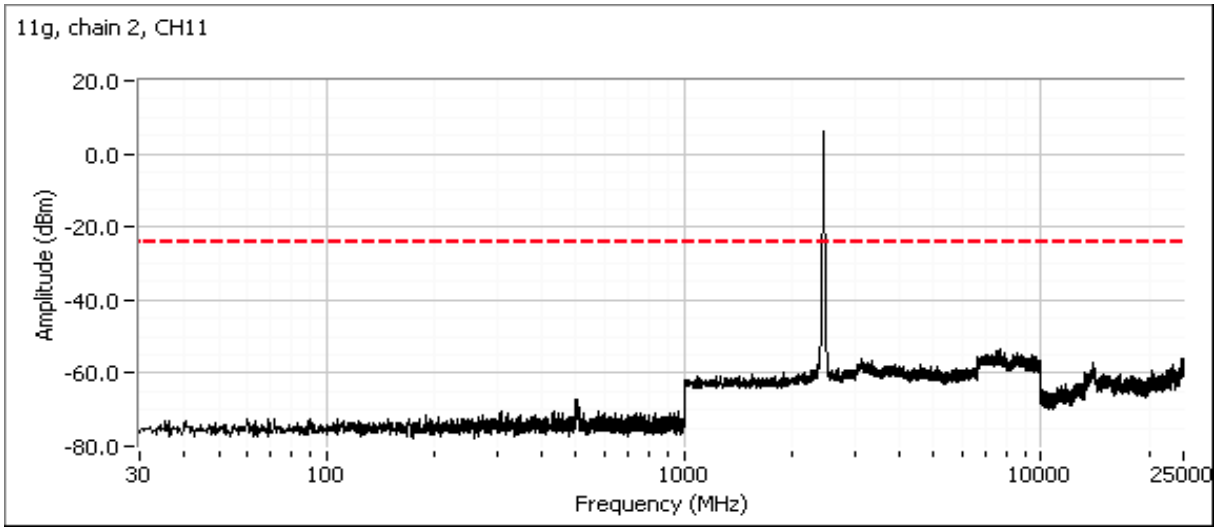
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



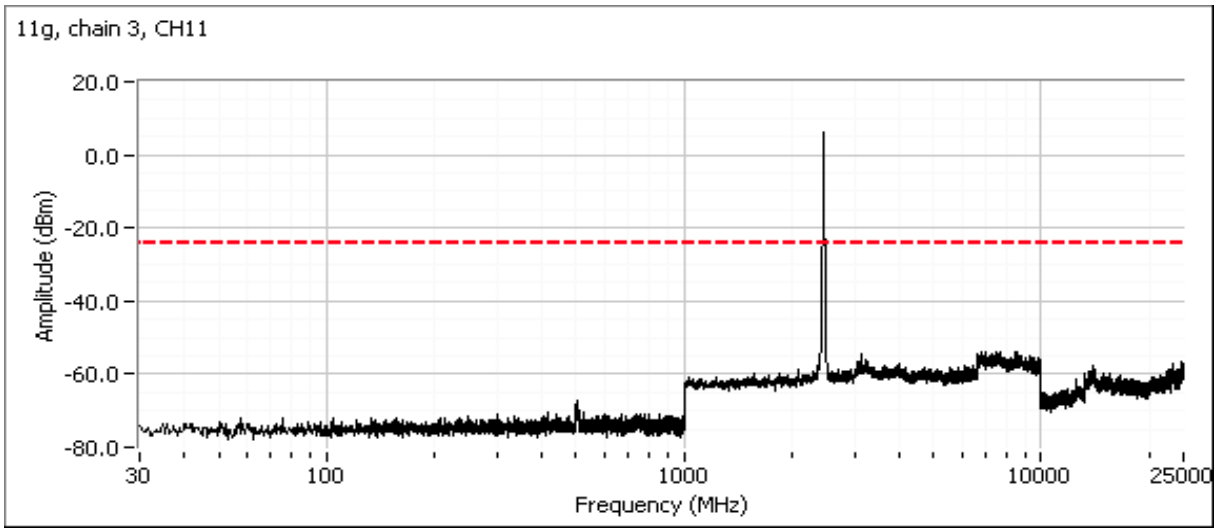


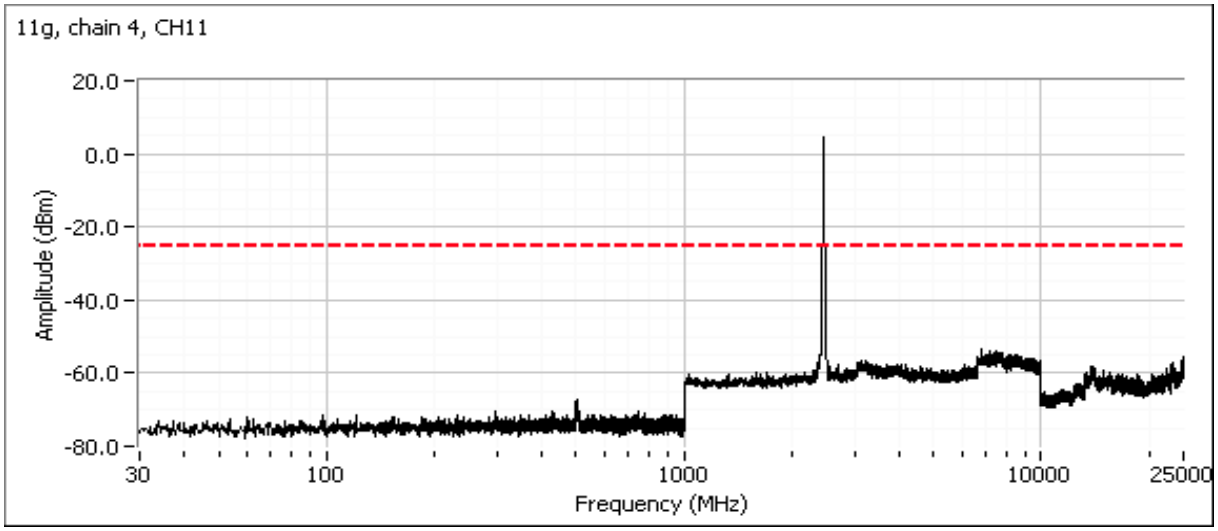
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



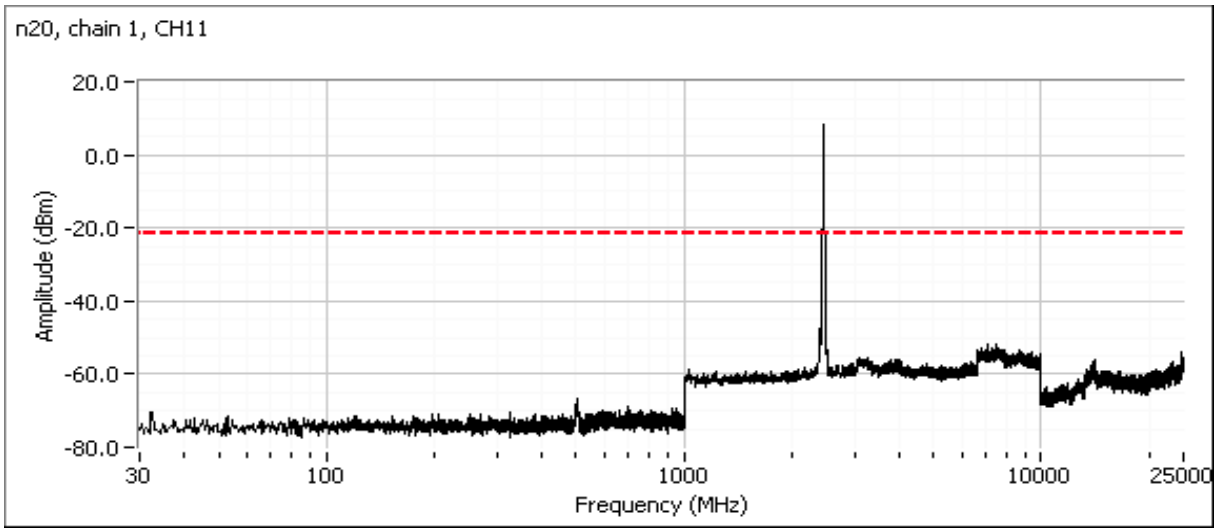


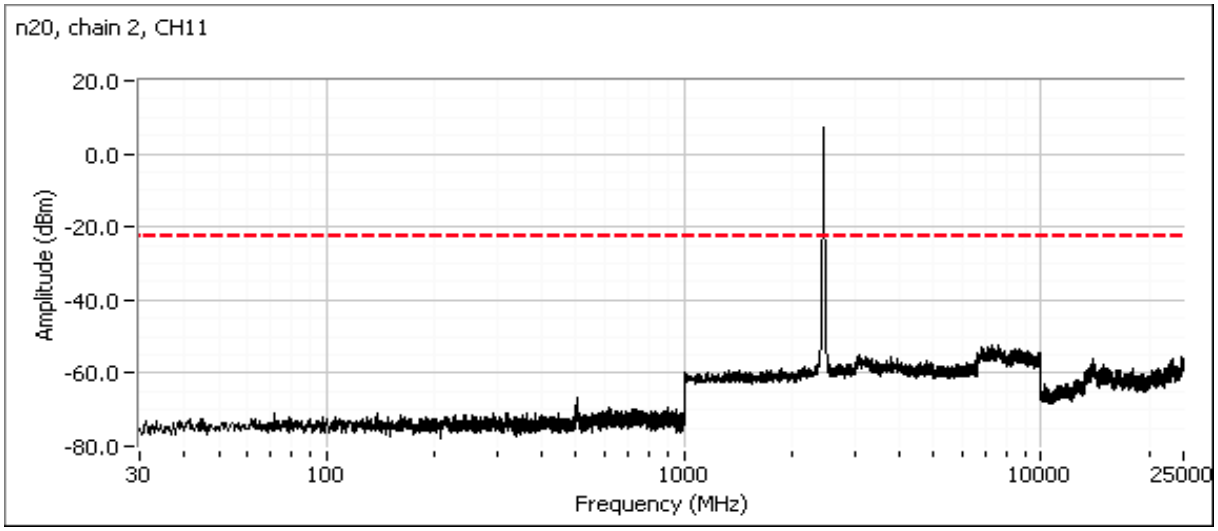
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



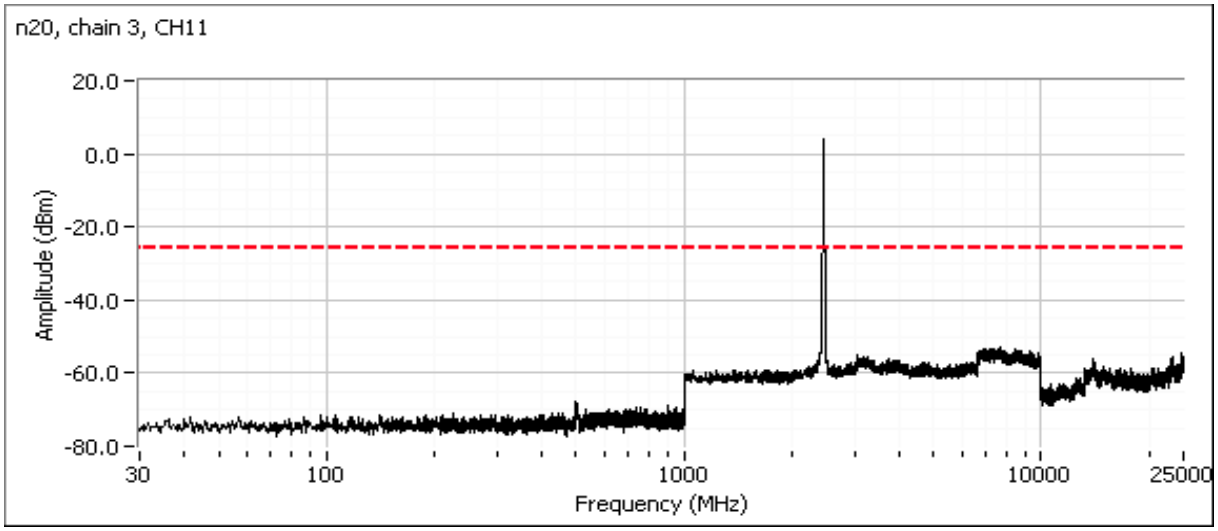


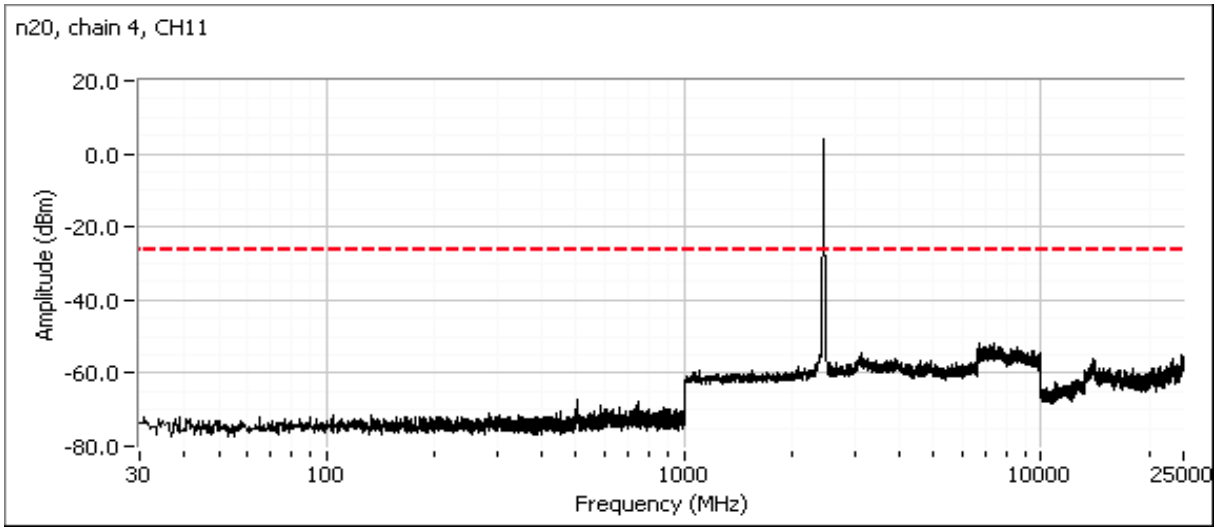
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



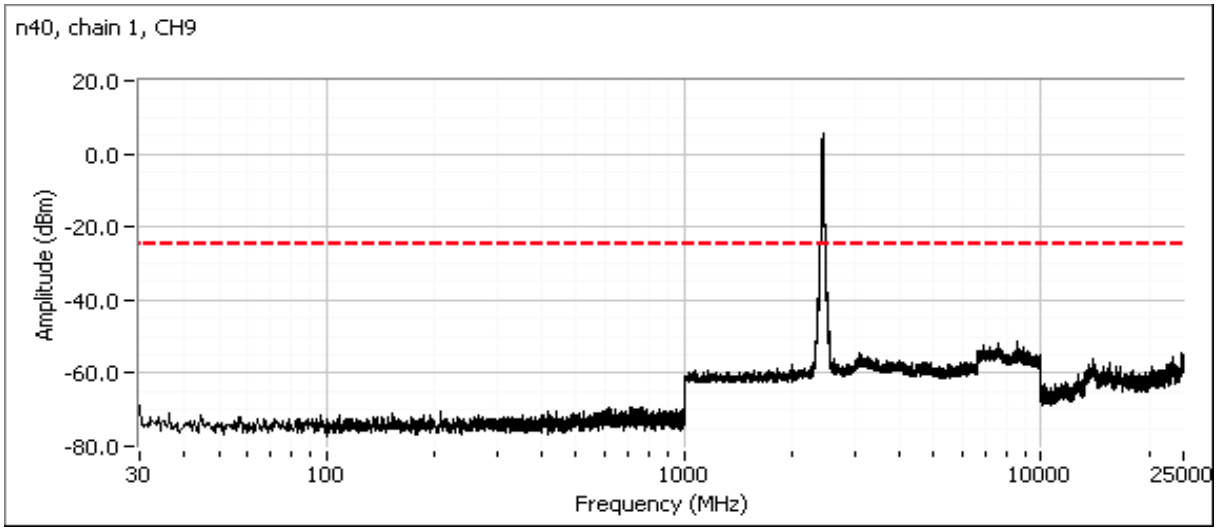


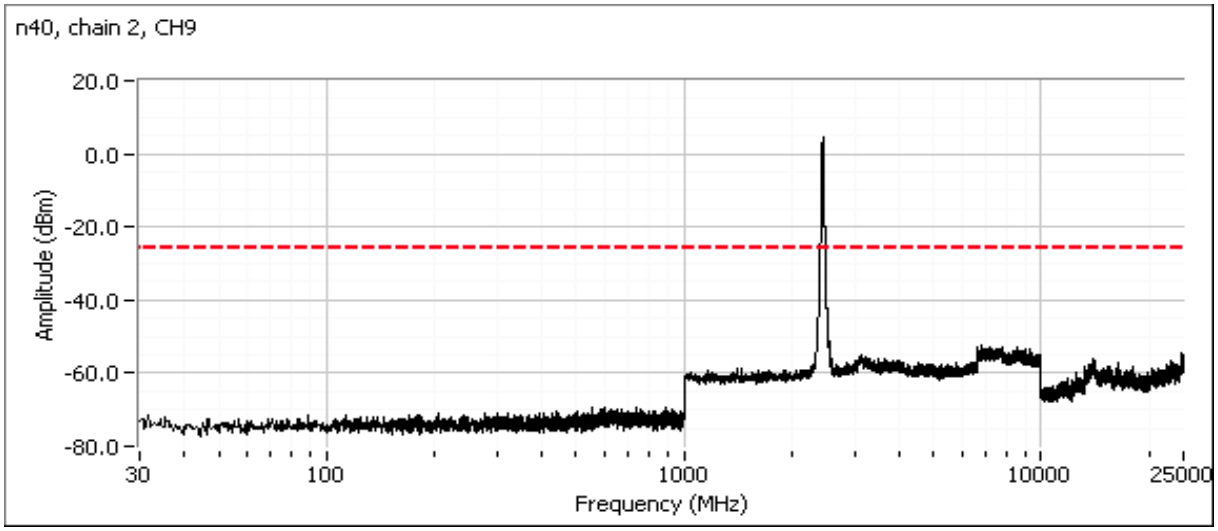
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A



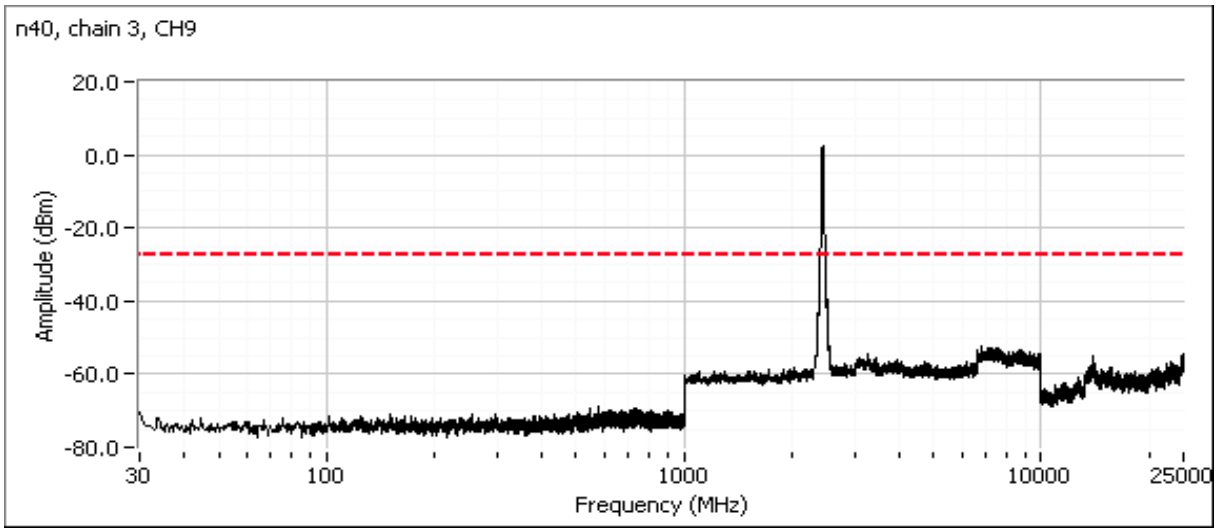


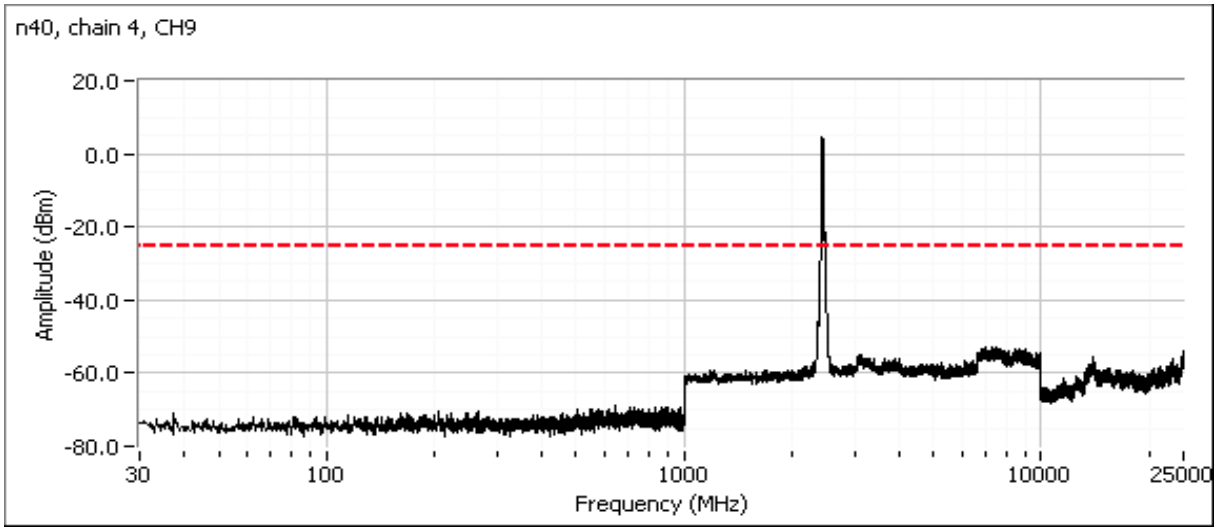
Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A





Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	N/A





Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	-

Conducted Emissions

(NTS Silicon Valley, Fremont Facility, Semi-Anechoic Chamber)

Test Specific Details

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

Date of Test: 10/19/2015
Test Engineer: John Caizzi
Test Location: Fremont Chamber #5
Config. Used: 1
Config Change: none
EUT Voltage: PoE

General Test Configuration

For tabletop equipment, the EUT host system was located on a wooden table inside the semi-anechoic chamber, 40 cm from a vertical coupling plane and 80cm from the LISN. Remote support equipment was located outside of the semi-anechoic chamber. Any cables running to remote support equipment were routed through metal conduit and passed through a ferrite clamp upon exiting the chamber.

Ambient Conditions:

Temperature: 24 °C
Rel. Humidity: 33 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
2	CE, AC Power,120V/60Hz	Class B	Pass	58.3 dBµV @ 0.285 MHz (-2.4 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

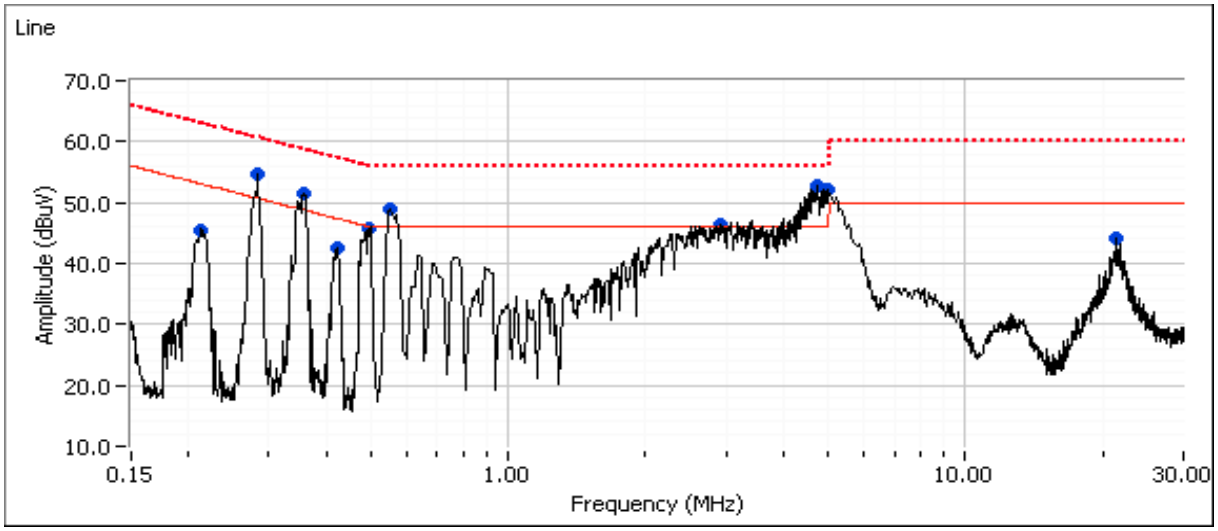
No deviations were made from the requirements of the standard.

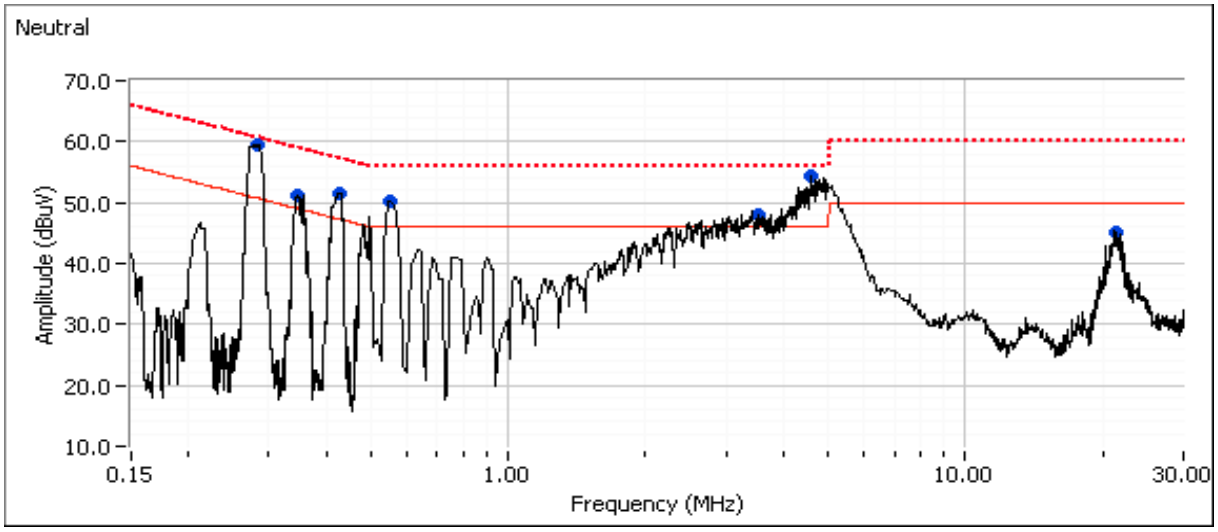
Notes

EUT was configured to continuously transmit on channel 6, 802.11b, 1Mb/s, power setting 19

Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	-

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





Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	-

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

Frequency	Level	AC	Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
4.738	52.7	Line	46.0	6.7	Peak	
4.960	52.0	Line	46.0	6.0	Peak	
0.285	54.7	Line	50.7	4.0	Peak	
0.551	48.8	Line	46.0	2.8	Peak	
0.355	51.6	Line	48.8	2.8	Peak	
2.906	46.5	Line	46.0	0.5	Peak	
0.497	45.7	Line	46.1	-0.4	Peak	
0.427	42.4	Line	47.4	-5.0	Peak	
21.360	44.3	Line	50.0	-5.7	Peak	
0.211	45.5	Line	53.1	-7.6	Peak	
0.285	59.6	Neutral	50.7	8.9	Peak	
4.593	54.3	Neutral	46.0	8.3	Peak	
0.426	51.6	Neutral	47.3	4.3	Peak	
0.573	50.1	Neutral	46.0	4.1	Peak	
0.350	51.2	Neutral	49.0	2.2	Peak	
3.489	48.1	Neutral	46.0	2.1	Peak	
0.494	48.0	Neutral	46.0	2.0	Peak	
21.358	45.2	Neutral	50.0	-4.8	Peak	

Client:	Xirrus	Job Number:	JD99498
Model:	XI-AC3470	T-Log Number:	T99598
		Project Manager:	Christine Krebill
Contact:	Paul Zahra	Project Coordinator:	-
Standard:	FCC 15.247, RSS-247	Class:	-

Final quasi-peak and average readings

Frequency	Level	AC	Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
4.773	32.5	Line	46.0	-13.5	AVG	
4.773	47.5	Line	56.0	-8.5	QP	
4.960	32.6	Line	46.0	-13.4	AVG	
4.960	47.6	Line	56.0	-8.4	QP	
0.285	42.5	Line	50.7	-8.2	AVG	
0.285	58.3	Line	60.7	-2.4	QP	
0.551	32.6	Line	46.0	-13.4	AVG	
0.551	48.4	Line	56.0	-7.6	QP	
0.355	33.6	Line	48.8	-15.2	AVG	
0.355	50.6	Line	58.8	-8.2	QP	
2.906	25.7	Line	46.0	-20.3	AVG	
2.906	42.1	Line	56.0	-13.9	QP	
0.497	26.5	Line	46.0	-19.5	AVG	
0.497	45.0	Line	56.0	-11.0	QP	
0.427	31.1	Line	47.3	-16.2	AVG	
0.427	49.0	Line	57.3	-8.3	QP	
21.360	32.0	Line	50.0	-18.0	AVG	
21.360	37.3	Line	60.0	-22.7	QP	
0.211	35.3	Line	53.2	-17.9	AVG	
0.211	44.0	Line	63.2	-19.2	QP	
0.285	38.5	Neutral	50.7	-12.2	AVG	
0.285	56.5	Neutral	60.7	-4.2	QP	
4.593	32.4	Neutral	46.0	-13.6	AVG	
4.593	47.6	Neutral	56.0	-8.4	QP	
0.426	29.0	Neutral	47.3	-18.3	AVG	
0.426	49.1	Neutral	57.3	-8.2	QP	
0.573	16.0	Neutral	46.0	-30.0	AVG	
0.573	38.2	Neutral	56.0	-17.8	QP	
0.350	36.0	Neutral	49.0	-13.0	AVG	
0.350	50.5	Neutral	59.0	-8.5	QP	
3.489	28.9	Neutral	46.0	-17.1	AVG	
3.489	42.8	Neutral	56.0	-13.2	QP	
0.494	29.0	Neutral	46.1	-17.1	AVG	
0.494	46.5	Neutral	56.1	-9.6	QP	
21.358	35.9	Neutral	50.0	-14.1	AVG	
21.358	40.5	Neutral	60.0	-19.5	QP	

End of Report

This page is intentionally blank and
marks the last page of this test report.