41039 Boyce Road
Fremont, CA. 94538

510-578-3500 Phone
510-440-9525 Fax

EMC Test Report

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

Innovation, Science and Economic Development Canada
RSS-Gen Issue 5 / RSS-247 Issue 2
FCC Part 15, Subpart E

Model: NVG5X8AX

ISED CERTIFICATION #:	3439B-NGV5XDBAX
FCC ID:	PGR-NVG5XDBAX
APPLICANT:	Arris 310 Providence Mine Road Nevada City, CA 95959
TEST SITE(S):	National Technical Systems 41039 Boyce Road. Fremont, CA. 94538-2435
IC SITE REGISTRATION #:	2845B-3; 2845B-4, 2845B-5, 2845B-7
PROJECT NUMBER:	PR101106
REPORT DATE:	May 26, 2020
REISSUE DATE:	July 9, 2020
FINAL TEST DATES:	February 3 and 4, March 24 and April 6, 2020
TOTAL NUMBER OF PAGES:	209

A2LA ACCREDITED
Testing Cert #0214.26

VALIDATING SIGNATORIES

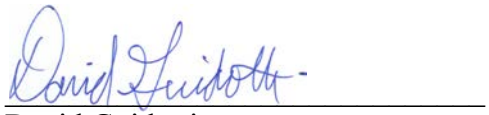
PROGRAM MGR

David W. Bare
Chief Engineer

TECHNICAL REVIEWER:

David W. Bare
Chief Engineer

FINAL REPORT PREPARER:



David Guidotti
Senior Technical Writer

QUALITY ASSURANCE DELEGATE

Gary Izard
Quality Assurance Representative

REVISION HISTORY

Rev#	Date	Comments	Modified By
-	May 26, 2020	First release	
1	July 9, 2020	Revised report correcting typographical errors in the individual chain antenna gains and adding units of dBi for directional gains.	David Guidotti

TABLE OF CONTENTS

SCOPE

An electromagnetic emissions test has been performed on the Arris model NVG5X8AX, pursuant to the following rules:

RSS-GEN Issue 5 "General Requirements for Compliance of Radio Apparatus"
RSS 247 Issue 2 "Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSS) and Licence-Exempt Local Area Network (LE-LAN) Devices"
FCC Part 15, Subpart E requirements for UNII Devices

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 test procedures:

ANSI C63.10-2013
FCC General UNII Test Procedures KDB789033

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.

National Technical Systems is accredited by the A2LA, certificate number 0214.26, to perform the test(s) listed in this report, except where noted otherwise.

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 Arris model NVG5X8AX complied with the requirements of the following regulations:

RSS 247 Issue 2 "Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSS) and Licence-Exempt Local Area Network (LE-LAN) Devices"
FCC Part 15, Subpart E requirements for UNII Devices

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

The test results recorded herein are based on a single type test of Arris model NVG5X8AX and therefore apply only to the tested sample. The sample was selected and prepared by Wilson Wang of Arris.

DEVIATIONS FROM THE STANDARDS

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

TEST RESULTS SUMMARY

UNII / LELAN DEVICES

OPERATION IN THE 5.25 – 5.35 GHZ BAND

Note: The device is restricted to indoor use only, therefore the spectral density of spurious emissions in the 5.15 – 5.25 GHz band were limited to the power spectral limits for intentional signals detailed in FCC 15.407(b)(2) and RSS 247 6.2.2 (2) i) b

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.407(a) (2)		26dB Bandwidth		N/A – limits output power if < 20MHz	N/A
	RSS-247 6.2.2 (1)	99% Bandwidth		N/A – limits EIRP if < 20MHz	N/A
15.407(a) (2)	RSS-247 6.2.1 (2)	Output Power	802.11a: 0.095 W ac20: 0.097 W ac40: 0.178 W ac80: 0.137 W ac160: 0.088 W (Max eirp: 0.658 W)	24 dBm (250 mW) EIRP <= 1W	Complies
15.407(a) (2)	RSS-247 6.2.2 (1)	Power Spectral Density	802.11a: 8.5 dBm/MHz ax20: 8.6 dBm/MHz ac40: 8.0 dBm/MHz ax80: 4.3 dBm/MHz ac160: 2.0 dBm/MHz	8.7 dBm/MHz	Complies
15.407(b) (2) / 15.209	RSS-247 6.2.2 (2)	Spurious Emissions above 1GHz	53.8 dBµV/m @ 5350.8 MHz	Refer to the limits section (p21) for restricted bands, all others -27 dBm/MHz EIRP	Complies
-	RSS-247 6.2.2 (3)	EIRP Above Horizon	Indoor device. Device's power table can be updated should ISED require a power reduction	Reduction in EIRP only if requested by ISED	Complies

OPERATION IN THE 5.47 – 5.725 GHZ BAND

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.407(a) (2)		26dB Bandwidth		N/A – limits output power if < 20MHz	N/A
	RSS-247 6.2.3 (1)	99% Bandwidth		N/A – limits EIRP if < 20MHz	N/A
15.407(a) (2)	RSS-210 A9.2(2)	Output Power[1]	802.11a: 0.091 W ac20: 0.097 W ac40: 0.181 W ac80: 0.195 W ac160: 0.134 W (Max eirp: 0.355 W)	24 dBm (250 mW) EIRP <= 1W	Complies
15.407(a) (2)	RSS-247 6.2.3 (1)	Power Spectral Density[1]	802.11a: 8.3 dBm/MHz ac20: 8.4 dBm/MHz ac40: 8.1 dBm/MHz ax80: 7.2 dBm/MHz ac160: 1.1 dBm/MHz	8.4 dBm/MHz	Complies

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.407(b) (3) / 15.209	RSS-247 6.2.3 (2)	Spurious Emissions above 1GHz	53.9 dBµV/m @ 5459.5 MHz	Refer to the limits section (p21) for restricted bands, all others -27 dBm/MHz EIRP	Complies
	RSS-247 6.2.3	Non-operation in 5600 – 5650 MHz sub band	Device cannot operate in the 5600 – 5650 MHz band –refer to Operational Description		Complies
Note 1: 160 MHz operation not possible in Canada					

REQUIREMENTS FOR ALL U-NII/LELAN BANDS

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.407	RSS-247 6.1	Modulation	No changes from original filing, OFDM modulation used.		
15.407(b) (6) / 15.209	RSS-247 6.2.1 (2)	Spurious Emissions below 1GHz	No change from original filing		
15.31 (m)	RSS-247 6.4 (1) RSS-Gen 6.9	Channel Selection	Emissions tested at outermost and middle channels in each band	Device was tested on the top, bottom and center channels in each band	N/A
15.407 (c)	RSS-247 6.4 (2)	Operation in the absence of information to transmit	No change from original filing		
15.407 (g)		Frequency Stability	Frequency stability is better than 10 ppm.	Signal shall remain within the allocated band	Complies
15.407 (h1)	RSS-247 6.2.2 (1) 6.2.3 (1)	Transmit Power Control	TCP mechanism is discussed in the Operational Description	The U-NII device shall have the capability to operate with a mean EIRP value lower than 24dBm (250mW)	Complies
15.407 (h2)	RSS-247 6.3	Dynamic frequency Selection (device with radar detection)	Refer to separate test report, reference FR-101106.03-NADFS Rev 0	Threshold -62dBm (-64dBm if eirp > 200mW) Channel Availability Check > 60s Channel closing transmission time < 260ms Channel move time < 10s Non occupancy period > 30minutes	Complies

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	No change from original filing		
15.407 (b) (6)	RSS-Gen Table 4	AC Conducted Emissions	No change from original filing		
15.247 (i) 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
-	RSS-Gen 6.8	User Manual	No change from original filing		
-	RSS-Gen 8.4	User Manual	No change from original filing		
-	RSP-100 RSS-Gen 6.7	Occupied Bandwidth	802.11a: 16.8 MHz ax20: 19.7 MHz ax40: 38.0 MHz ax80: 77.3 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 Arris model NVG5X8AX is an 802.11 radio module that is designed to be installed in Arris host equipment. Since the EUT would be installed in a host device during operation, the EUT was treated as tabletop equipment during testing to simulate the end-user environment. The electrical rating of the EUT is 3.3 Volts DC supplied from the host device.

The sample was received on July 9, 2019 and tested on February 3 and 4, March 24 and April 6, 2020. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Arris	NVG5X8AX	Radio Module	M11917QW000T	PGR-NVG5XDBAX

OTHER EUT DETAILS

The following EUT details should be noted: The EUT was installed on a metal carrier along with the Gateway PCB to allow testing. The antennas are mounted to a plastic holder as will be used in the host product. Canadian Certification number IC: 3439B-NVG5XDBAX

ANTENNA SYSTEM

The antenna system consists of 4 Airgain N2420DAR1 and 4 Airgain 5X30AR1 antennas mounted on a plastic carrier. Details of antenna gain are provided in a separate exhibit.

ENCLOSURE

The EUT does not have an enclosure. The PCB measures approximately 9.5 cm wide by 19 cm high.

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
Arris	NBS40B120375M2	Power Supply	None	-
Arris	None	Gateway PCB	0015	-

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

Company	Model	Description	Serial Number	FCC ID
Dell	Precision M6700	Laptop	9WB3CW1	-

EUT INTERFACE PORTS

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

EUT

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Antenna (x8)	Antennas	Coax	Shielded	Various

Additional on Support Equipment

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Gateway PCB Ethernet (x2)	Laptop Ethernet	Cat 6	Unshielded	7.5
Gateway PCB Power Input	Power Supply	Two wire	Unshielded	1
Power Supply AC	Mains	Two wire	Unshielded	1

EUT OPERATION

During emissions testing the EUT was commanded to operate continuously with the noted duty cycle on the desired channel at the selected power level using Mtool software on the Laptop communicating through the Gateway PCB. Testing was performed using the lowest data rate as this was found to produce the highest power during preliminary testing.

PROPOSED MODIFICATION DETAILS

GENERAL

This section details the modifications to the Arris model NVG5X8AX being proposed. All performance and construction deviations from the characteristics originally reported to the FCC are addressed

SOFTWARE

New firmware to enable operation in 5250-5350 MHz and 5470-5725 MHz bands will be installed.

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 6.2 of RSS-GEN, NTS has been recognized as an accredited test laboratory by the Commission and Innovation, Science and Economic Development Canada. A description of the facilities employed for testing is maintained by NTS.

Site	Company / Registration Numbers		Location
	FCC	Canada	
Chamber 3	US1031	2845B (Wireless Test Lab #US0027)	41039 Boyce Road Fremont, CA 94538-2435
Chamber 4			
Chamber 5			
Chamber 7			

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. Results from testing performed in this chamber have been correlated with results from an open area test site. 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

Software is used to view and convert 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)

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 testing below 1 GHz and 1.5m for testing above 1 GHz. 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.

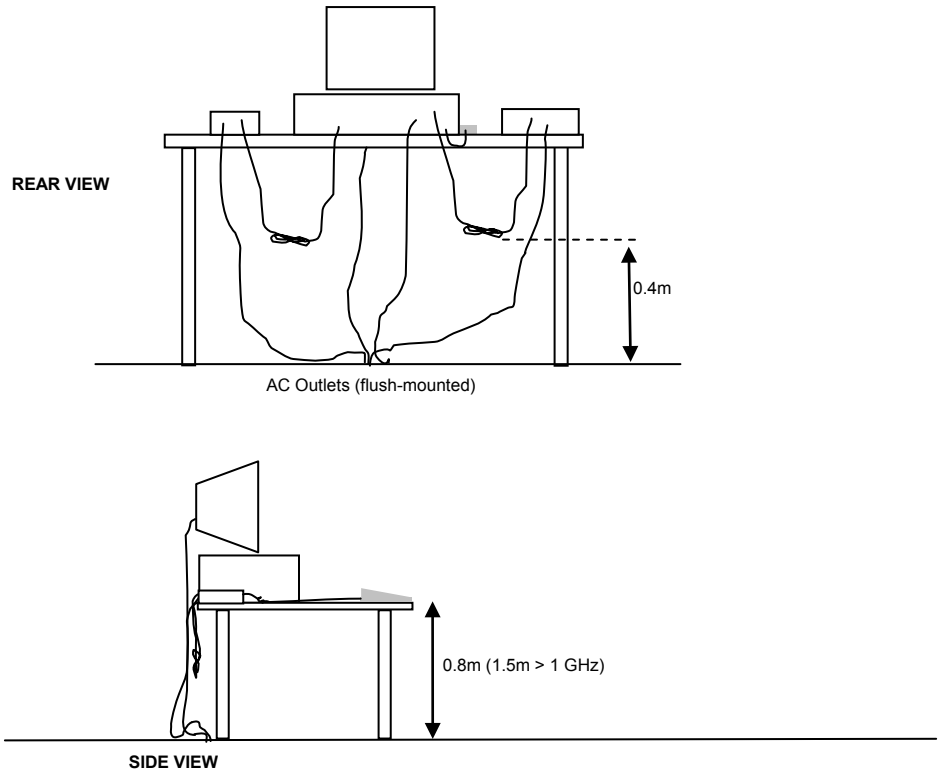
RADIATED EMISSIONS

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.

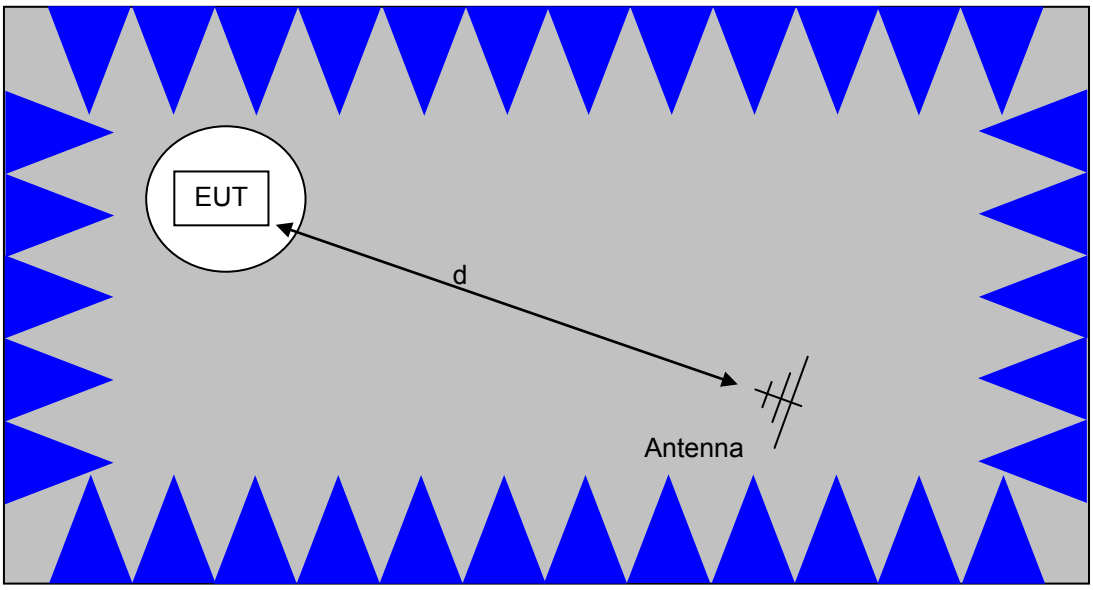
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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.

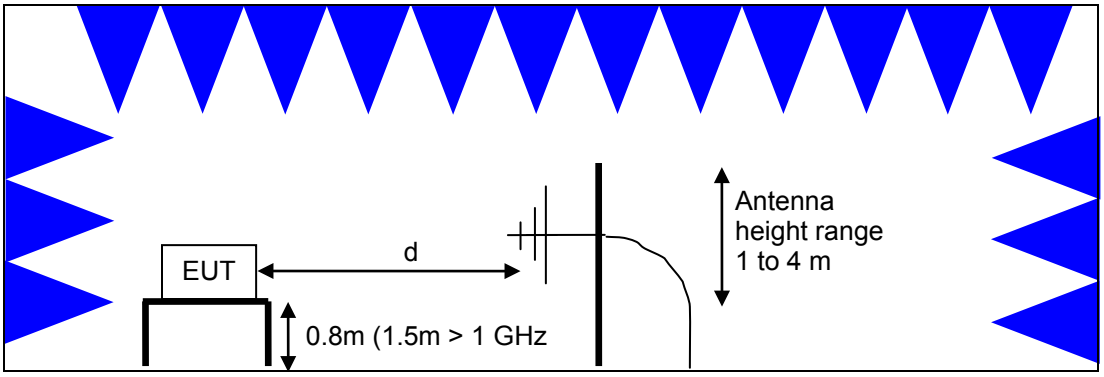


Typical Test Configuration for Radiated Field Strength Measurements



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.

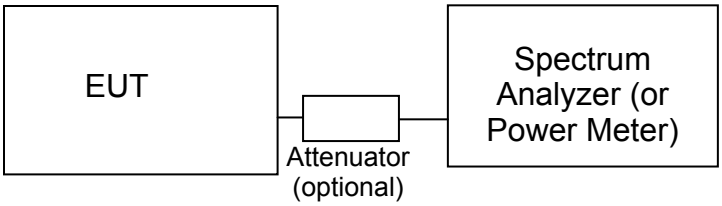
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



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; 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

[1] The restricted bands are detailed in FCC 15.205 and RSS-Gen Table 7

FCC 15.407 (a) OUTPUT POWER LIMITS

The table below shows the limits for output power and output power density. For the 5250-5350 and 5470-5725 MHz bands, where the signal bandwidth is less than 20 MHz the maximum output power is reduced to the power spectral density limit plus 10 times the log of the bandwidth (in MHz).

Operating Frequency (MHz)	Output Power	Power Spectral Density
5150 – 5250	1Watt (30 dBm)	17 dBm/MHz
5250–5350 and 5470-5725	250 mW (24 dBm)	11 dBm/MHz
5725–5850	1 Watt (30 dBm)	30 dBm/500kHz
5925–6425 and 6525–6875	1Watt (30 dBm)	17 dBm/MHz
6425–6525 and 6875–7125	250 mW (24 dBm)	11 dBm/MHz

For system using antennas with gains exceeding 6dBi, the output power and power spectral density limits are reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5850 MHz band may use antennas of any gain without this limitation.

OUTPUT POWER LIMITS –LELAN DEVICES

The table below shows the limits for output power and output power density defined by RSS 247. Where the signal bandwidth is less than 20 MHz the maximum output power is reduced to the power spectral density limit plus 10 times the log of the bandwidth (in MHz).

Operating Frequency (MHz)	Output Power	Power Spectral Density
5150 – 5250	200mW (23 dBm) eirp	10 dBm/MHz eirp
5250 – 5350 and 5470 - 5725	250 mW (24 dBm)2 1W (30dBm) eirp	11 dBm/MHz
5725 – 5850	1 Watt (30 dBm) 4W eirp	30 dBm/500kHz

For system using antennas with gains exceeding 6dBi, the output power and power spectral density limits are reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5850 MHz band may use antennas with any gain without this limitation.

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

SPURIOUS EMISSIONS LIMITS –UNII and LELAN DEVICES

The spurious emissions limits for signals below 1GHz are the FCC/RSS-Gen general limits. For emissions above 1GHz, signals in restricted bands are subject to the FCC/RSS-Gen general limits. All other signals have a limit of –27dBm/MHz, which is field strength of 68.3dBuV/m/MHz at a distance of 3m. For devices operating in the 5725-5850 MHz band under the LELAN/UNII rules, the limit within 5 MHz of the allocated band slopes from 27 dBm/MHz to 15.6 dBm/MHz, from 5 MHz to 25 MHz from the allocated band slopes from 15.6 dBm/MHz to 10 dBm/MHz, from 25 MHz to 75 MHz from the allocated band slopes from 10 dBm/MHz to -27 dBm/MHz and for more than 75 MHz from the allocated band is –27dBm/MHz.

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

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

$$R_r - S = M$$

where:

R_r = Receiver Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

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

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

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

where:

F_d = Distance Factor in dB
D_m = Measurement Distance in meters
D_s = Specification Distance in meters

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

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

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

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

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

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

SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION

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

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

where P is the eirp (Watts)

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

Appendix A Test Equipment Calibration Data

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Radiated Emissions, 1,000 - 6,000 MHz, 12-Jul-19					
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	9/18/2018	9/18/2020
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	9482	10/13/2018	10/13/2019
Radiated Emissions, 1,000 - 6,000 MHz, 15-Jul-19					
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	9/18/2018	9/18/2020
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	9482	10/13/2018	10/13/2019
Radiated Emissions, 1,000 - 12,000 MHz, 16-Jul-19					
EMCO	Antenna, Horn, 1-18 GHz	3115	487	8/9/2018	8/9/2020
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	9/5/2018	9/5/2019
Hewlett Packard	Spectrum Analyzer (SA40) Red 30 Hz -40 GHz	8564E (84125C)	1148	9/27/2018	9/27/2019
Micro-Tronics	Band Reject Filter, 2400-2500 MHz 18GHz	BRM50702-02	2238	4/26/2019	4/26/2020
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	2251	7/15/2019	7/15/2020
Radiated Emissions, 1,000 - 18,000 MHz, 17-Jul-19					
EMCO	Antenna, Horn, 1-18 GHz	3115	487	8/9/2018	8/9/2020
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	9/5/2018	9/5/2019
Hewlett Packard	Spectrum Analyzer (SA40) Red 30 Hz -40 GHz	8564E (84125C)	1148	9/27/2018	9/27/2019
Hewlett Packard	High Pass filter, 8.2 GHz (Purple System)	P/N 84300-80039	1767	7/15/2019	7/15/2020
Micro-Tronics	Band Reject Filter, 2400-2500 MHz 18GHz	BRM50702-02	2238	4/26/2019	4/26/2020
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	2251	7/15/2019	7/15/2020
Micro-Tronics	Band Reject Filter, 5725-5875 MHz	BRC50705-01	2738	7/15/2019	7/15/2020
Radiated Emissions, 1,000 - 40,000 MHz, 22-Jul-19					
EMCO	Antenna, Horn, 1-18 GHz	3115	487	8/9/2018	8/9/2020
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	7/18/2019	7/18/2020
HP / Miteq	SA40 R Head HF preAmplifier, 18-40 GHz (w/1148)	TTA1840-45-5P-HG-S	1145	9/8/2018	9/8/2019
Hewlett Packard	Spectrum Analyzer (SA40) Red 30 Hz -40 GHz	8564E (84125C)	1148	9/27/2018	9/27/2019
Hewlett Packard	High Pass filter, 8.2 GHz (Purple System)	P/N 84300-80039	1767	7/15/2019	7/15/2020
A. H. Systems	System Horn, 18-40GHz	SAS-574, p/n: 2581	2161	7/8/2019	7/8/2021
Micro-Tronics	Band Reject Filter, 2400-	BRM50702-02	2238	4/26/2019	4/26/2020

Micro-Tronics	2500 MHz 18GHz Band Reject Filter, 5150-5350 MHz	BRC50703-02	2251	7/15/2019	7/15/2020

Radio Antenna Port (Power and Spurious Emissions), 24-Jul-19

Rohde & Schwarz	Signal Analyzer 20 Hz - 26.5 GHz	FSQ26	2327	7/4/2019	7/4/2020

Radio Antenna Port (Power and Spurious Emissions), 25-Jul-19

Rohde & Schwarz	Signal Analyzer 20 Hz - 26.5 GHz	FSQ26	2327	7/4/2019	7/4/2020

Radio Antenna Port (Power and Spurious Emissions), 26-Jul-19

Rohde & Schwarz	Signal Analyzer 20 Hz - 26.5 GHz	FSQ26	2327	7/4/2019	7/4/2020

Radio Antenna Port (Power and Spurious Emissions), 29-Jul-19

Agilent Technologies	PSA, Spectrum Analyzer	E4446A	2139	7/18/2019	7/18/2020

Radio Antenna Port (Power and Spurious Emissions), 30-Jul-19

Agilent Technologies	PSA, Spectrum Analyzer	E4446A	2139	7/18/2019	7/18/2020

Radio Antenna Port (Power and Spurious Emissions), 31-Jul-19

Agilent Technologies	PSA, Spectrum Analyzer	E4446A	2139	7/18/2019	7/18/2020

Band edge Measurement, 20-Sep-19 through 25-Sep-2019

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
EMCO	Horn Antenna	3115	WC062583	7/9/2018	7/9/2020
Rohde & Schwarz	EMI test receiver	ESI 40	WC068000	3/15/2019	3/15/2020

Radiated Emissions, 1,000 - 40,000 MHz, 27-Sep-19 through 01-Oct-19

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Hewlett Packard	Spectrum Analyzer (Red)	8564E (84125C)	WC055584	9/27/2019	9/27/2020
Hewlett Packard	Microwave Preamplifier Head, 18-40 GHz (Red)	84125C Head	WC055586	7/25/2019	7/25/2020
EMCO	Horn Antenna	3115	WC062583	7/9/2018	7/9/2020
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	WC064416	7/18/2019	7/18/2020
Hewlett Packard	High Pass filter, 8.2 GHz	P/N 84300-80039	WC064433	4/25/2019	4/25/2020
A. H. Systems	Antenna, Horn, 18-40GHz	SAS-574	WC064553	9/5/2017	8/8/2020
Rohde & Schwarz	EMI test receiver	ESI 40	WC068000	3/15/2019	3/15/2020

Band edge Measurement, 3-Feb-20 through 11-Mar-20

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
EMCO	Horn Antenna	3115	WC062583	7/9/2018	7/9/2020
Rohde & Schwarz	EMI test receiver	ESI 40	WC068000	3/15/2019	3/15/2020

Radio Antenna Port (Power and Spurious Emissions), Feb 3-4 of 2020 and 11-Mar-20

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Rohde & Schwarz	Spectrum Analyzer	FSQ26	WC055662	7/4/2019	7/4/2020
Rohde & Schwarz	Open Switch and Control Unit	OSP 120 with B157	WC064756	7/16/2019	7/16/2020

Radio Antenna Port (Power and Spurious Emissions), 24-Mar-20

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Rohde & Schwarz	Spectrum Analyzer	FSQ26	WC055662	7/4/2019	7/4/2020
Rohde & Schwarz	Open Switch and Control Unit	OSP 120 with B157	WC064756	7/16/2019	7/16/2020

Bandedge Measurment, 24-Mar-20

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
EMCO	Horn Antenna	3115	WC062583	7/9/2018	7/9/2020
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	WC064455	2/11/2020	2/11/2021

Radio Antenna Port (Power and Spurious Emissions), 26-Mar-20

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Rohde & Schwarz	Spectrum Analyzer	FSQ26	WC055662	7/4/2019	7/4/2020
Rohde & Schwarz	Open Switch and Control Unit	OSP 120 with B157	WC064756	7/16/2019	7/16/2020

Appendix B Test Data

TL101106-RANA Pages 30 -208

Client:	Arris	PR Number:	PR101106
Product	NVG5X8AX	T-Log Number:	TL-101106-RANA
System Configuration:	Radio Module	Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Emissions Standard(s):	FCC Part 15, RSS-247	Class:	-
Immunity Standard(s):	-	Environment:	Radio

EMC Test Data

For The

Arris

Product

NVG5X8AX

Date of Last Test: 4/6/2020

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

RSS-247 and FCC 15.407 (UNII) Radiated Spurious Emissions

Test Specific Details

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

Ambient Conditions:

Temperature: 22-25 °C

Rel. Humidity: 39-43 %

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.

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:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
Scans on "center" channel in all five OFDM modes to determine the worst case mode.							
1	g / a	6 & 60	26 / 26	26 / 26	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	48.1 dBµV/m @ 4883.4 MHz (-5.9 dB)
	ac20	6 & 60	24 / 18	24 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	49.5 dBµV/m @ 4880.3 MHz (-4.5 dB)
	ac40	6 & 62	24 / 18	24 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	48.8 dBµV/m @ 2390.0 MHz (-5.2 dB)
	b / ac80	6 & 58	26 / 18	22.25 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.8 dBµV/m @ 4873.8 MHz (-1.2 dB)
	b / ac160	6 & 50	26 / 18	22.25 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.6 dBµV/m @ 4873.8 MHz (-1.4 dB)
Measurements on low and high channels in worst-case OFDM mode.							
2	ac20	1 & 52	24 / 18	24 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	51.0 dBµV/m @ 4812.4 MHz (-3.0 dB)
	ac20	11 & 64	24 / 18	23.5 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.3 dBµV/m @ 4925.3 MHz (-0.7 dB)
Scans on "center" channel in all four OFDM modes to determine the worst case mode. Channels 114 and 122 not used in Canada							
3	g / a	6 & 116	24 / 18	24 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	48.3 dBµV/m @ 18600.0 MHz (-5.7 dB)
	ac20	6 & 116	24 / 18	24 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	49.1 dBµV/m @ 4883.8 MHz (-4.9 dB)
	ac40	6 & 110	24 / 18	24 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	49.6 dBµV/m @ 22199.9 MHz (-4.4 dB)
	b / ac80	6 & 122	26 / 18	22.25 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.9 dBµV/m @ 4873.9 MHz (-1.1 dB)
	b / ac160	6 & 114	26 / 18	22.25 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.5 dBµV/m @ 4874.0 MHz (-1.5 dB)
80MHz - use if worse case from 3 but must do highest 20 MHz channel also							
4	b / ac80	1 & 106	26 / 18	18 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.6 dBµV/m @ 4824.1 MHz (-0.4 dB)
	b / ac80	11 & 138	26 / 18	16 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.8 dBµV/m @ 4924.1 MHz (-0.2 dB)

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033
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 50 traces. (method VB of KDB 789033)

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)		
11b	1	99.2%	Yes	12.422	0.0	0.0	10	1285	-1
11a/g	6	99.0%	Yes	5.06	0.0	0.0	10	7974	-1
ac20	6.5	0.98	Yes	5.271	0.1	0.2	190	4324	-1
ac40	13.5	0.97	Yes	5.24	0.1	0.2	191	8811	-1
ac80	29.3	0.96	Yes	1.432	0.2	0.4	698	5159	-1
ac160	58.5	0.96	Yes	1.439	0.2	0.4	695	10443	-1

Sample Notes

Sample S/N:
Driver:

Measurement Specific Notes:

Note 1:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector). Per KDB 789033 2) c) (i), compliance can be demonstrated by meeting the average and peak limits of 15.209, as an alternative.
Note 2:	Emission has a duty cycle ≥ 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces (method AD of KDB 789033)
Note 3:	Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear averaging, auto sweep,max hold 50*1/DC traces (method VB of KDB 789033)
Note 4:	Emission has a duty cycle < 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100*1/DC traces, measurement corrected by Pwr correction factor (method AD of KDB 789033)
Note 5:	Not releated to radio.
Note 6:	For SISO measurment, evaluation of each chain showed that chain 4 has the highest power measurment. All SISO test measurment were performed with chain 4 active.

Scan 1-3.5GHz using 10+6dB pads and 5GHz notch filter (RB 100kHz VB 100kHz)
Scan 3.5-6GHz using 10dB pad and 2.4GHz notch filter (RB 100kHz VB 100kHz)
Scan 6-12GHz using 5GHz and 2.4GHz notch filters (RB 300kHz VB 100kHz)

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

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

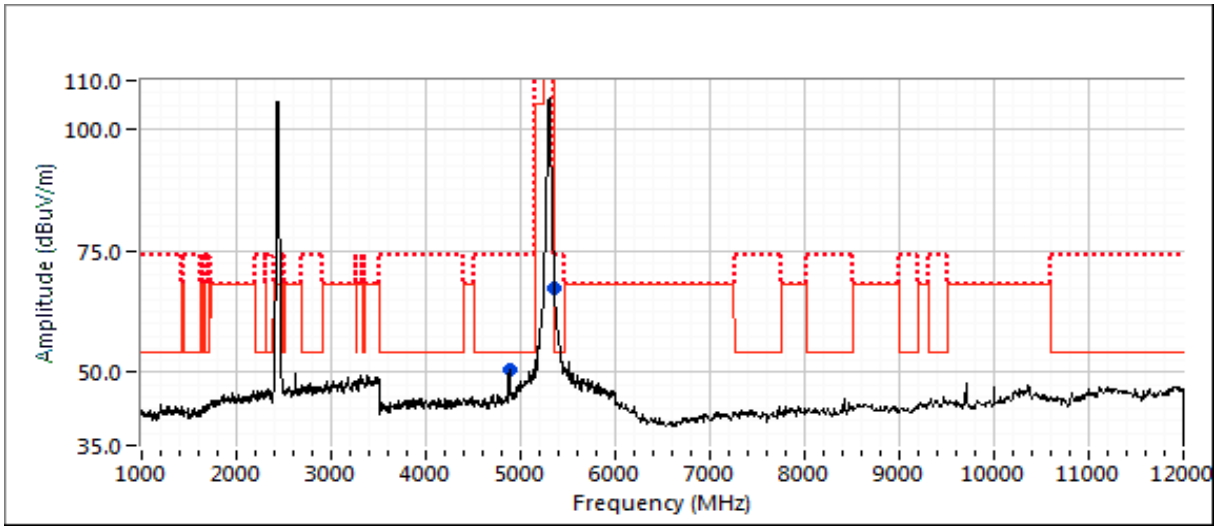
Date of Test: 07/17/19 Config. Used: 1
Test Engineer: Mehran Birgani Config Change: None
Test Location: FT Chamber #5 Host EUT Voltage: 110V/60Hz

Run #1a: Center Channel

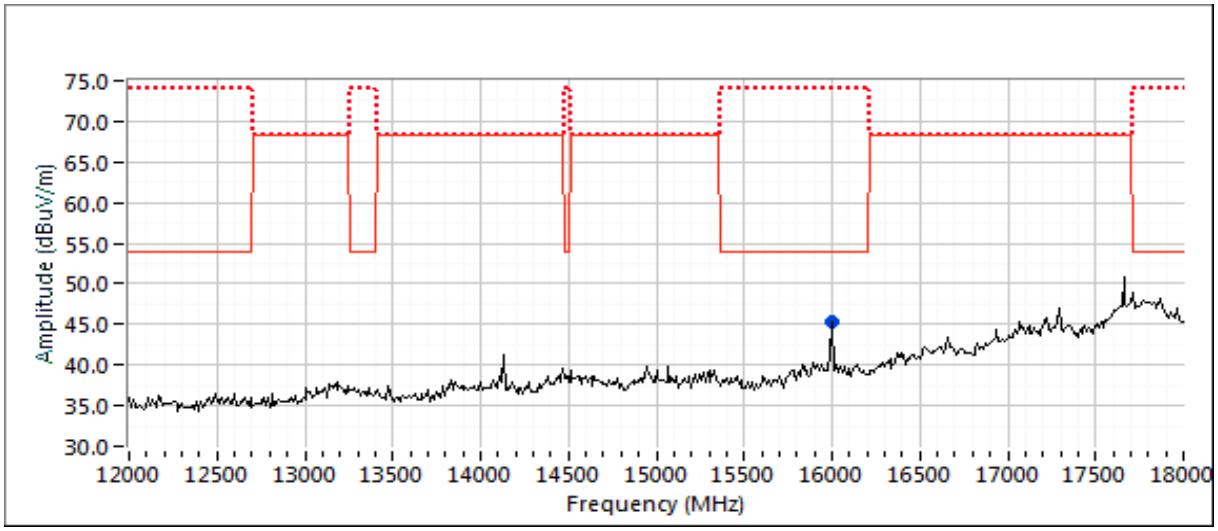
Channel: 6 & 60 Mode: g / a Pwr Setting: 26 (q104)
Tx Chain: 1TX Data Rate: 6 Mbps

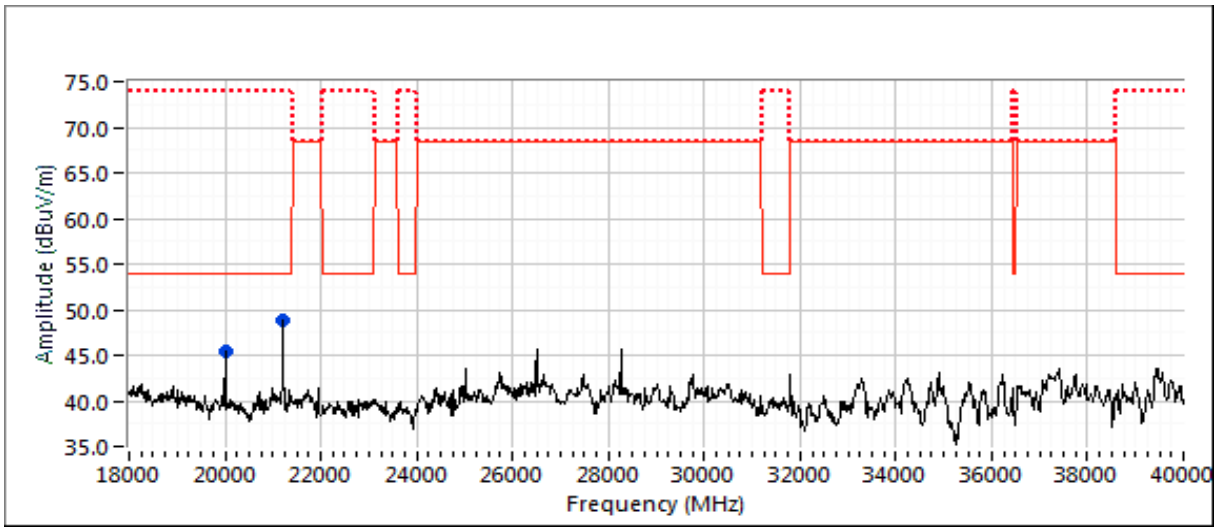
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments	
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters		
4883.380	48.1	V	54.0	-5.9	AVG	157	1.5	RB 1 MHz;VB 10 Hz	
4884.220	62.6	V	74.0	-11.4	PK	157	1.5	RB 1 MHz;VB 3 MHz	
16000.180	45.3	H	54.0	-8.7	AVG	321	1.5	RB 1 MHz;VB 10 Hz	Note 5
16000.170	52.1	H	74.0	-21.9	PK	321	1.5	RB 1 MHz;VB 3 MHz	Note 5
20000.250	41.0	H	54.0	-13.0	AVG	327	1.5	RB 1 MHz;VB 10 Hz	
20000.610	50.2	H	74.0	-23.8	PK	327	1.5	RB 1 MHz;VB 3 MHz	
21199.900	45.6	H	54.0	-8.4	AVG	143	1.5	RB 1 MHz;VB 10 Hz	
21200.220	53.7	H	74.0	-20.3	PK	143	1.5	RB 1 MHz;VB 3 MHz	
5358.330	67.5	V	-	-	PK	209	2.0	Refer to Bandedge test data	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A





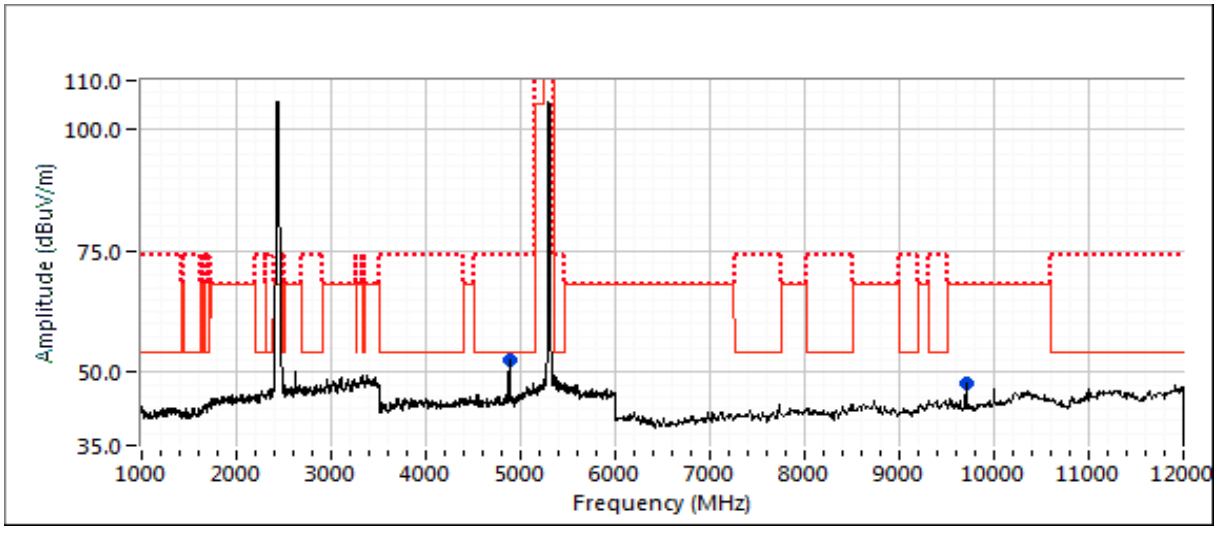
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #1b: Center Channel

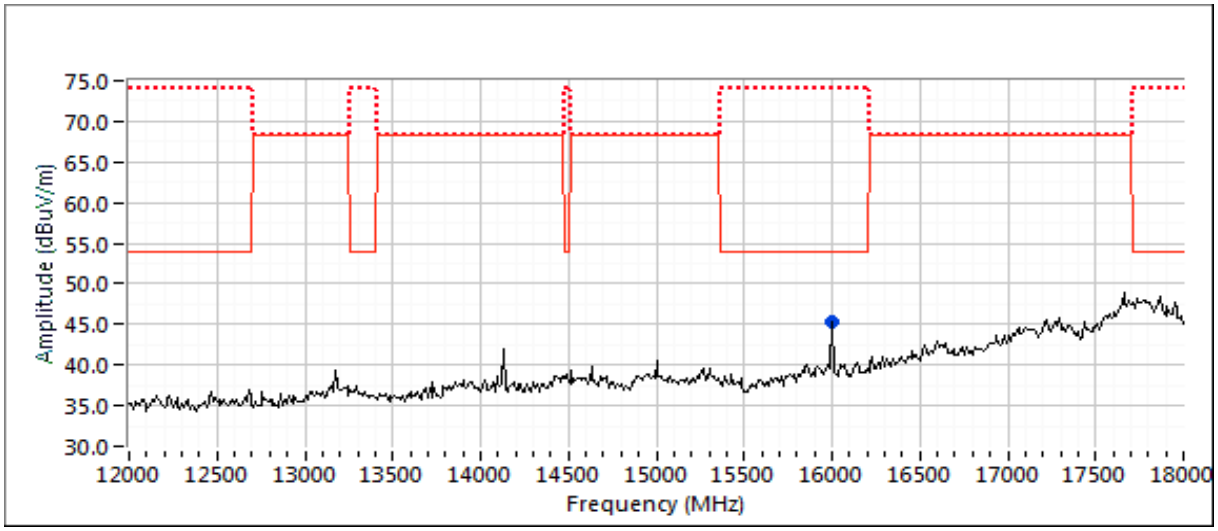
Channel: 6 & 60 Mode: ac20 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 4TX Data Rate: 6.5 Mbps

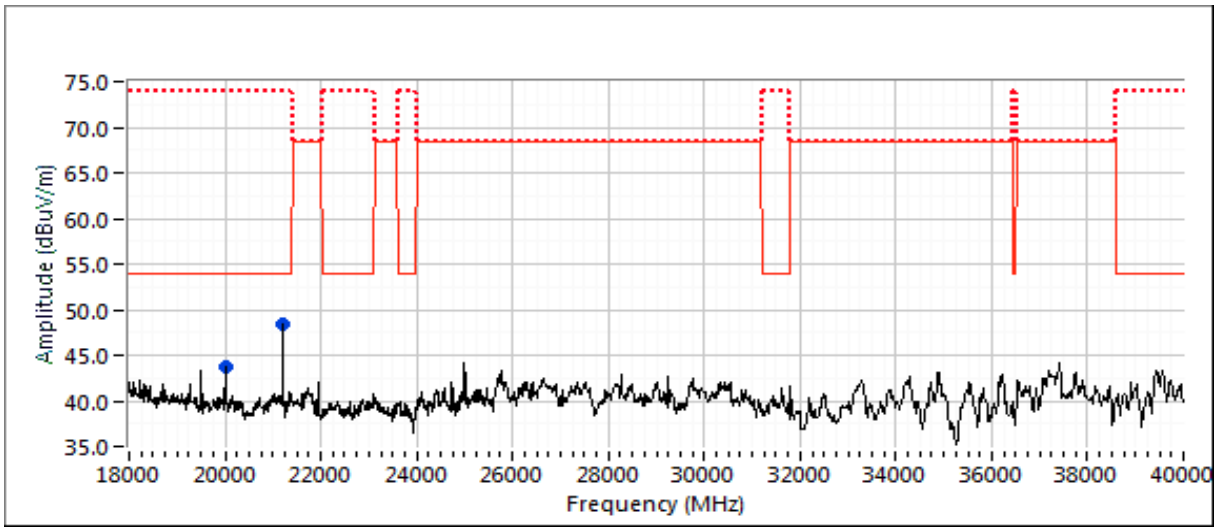
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
4880.310	49.5	V	54.0	-4.5	AVG	25	2.0	Note 3; RB 1 MHz;VB 300 Hz
4880.340	64.3	V	74.0	-9.7	PK	25	2.0	RB 1 MHz;VB 3 MHz
16000.230	43.9	H	54.0	-10.1	AVG	320	1.5	RB 1 MHz;VB 10 Hz Note 5
16000.250	51.7	H	74.0	-22.3	PK	320	1.5	RB 1 MHz;VB 3 MHz Note 5
21199.910	45.5	H	54.0	-8.5	AVG	146	1.5	Note 3; RB 1 MHz;VB 300 Hz
21200.060	51.4	H	74.0	-22.6	PK	146	1.5	RB 1 MHz;VB 3 MHz
20000.250	38.8	H	54.0	-15.2	AVG	325	1.5	Note 3; RB 1 MHz;VB 300 Hz
20000.530	49.3	H	74.0	-24.7	PK	325	1.5	RB 1 MHz;VB 3 MHz
9700.000	54.2	H	68.3	-14.1	PK	286	2.0	RB 1 MHz;VB 3 MHz

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A





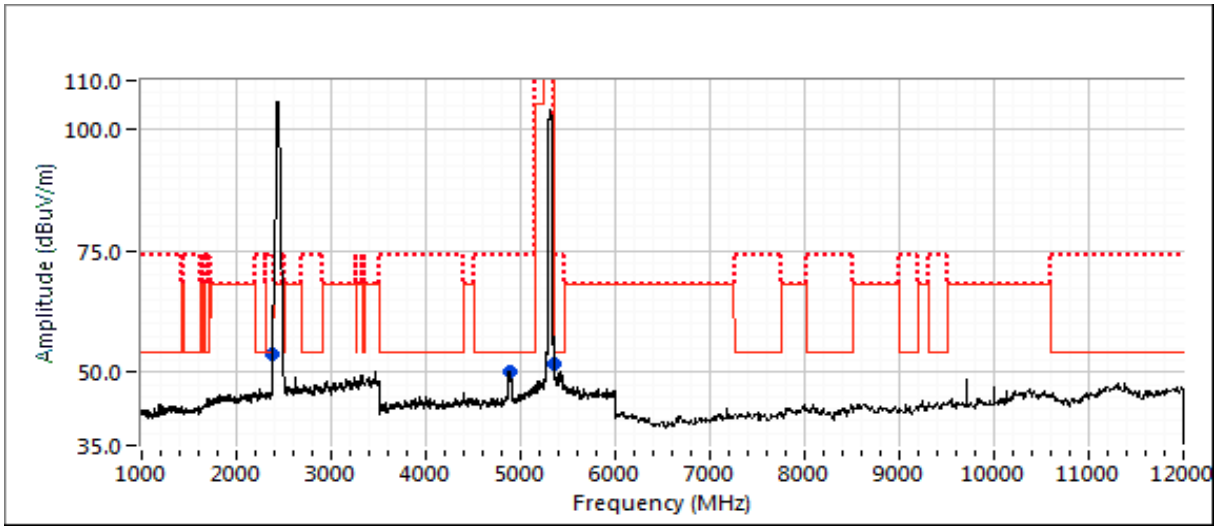
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #1c: Center Channel

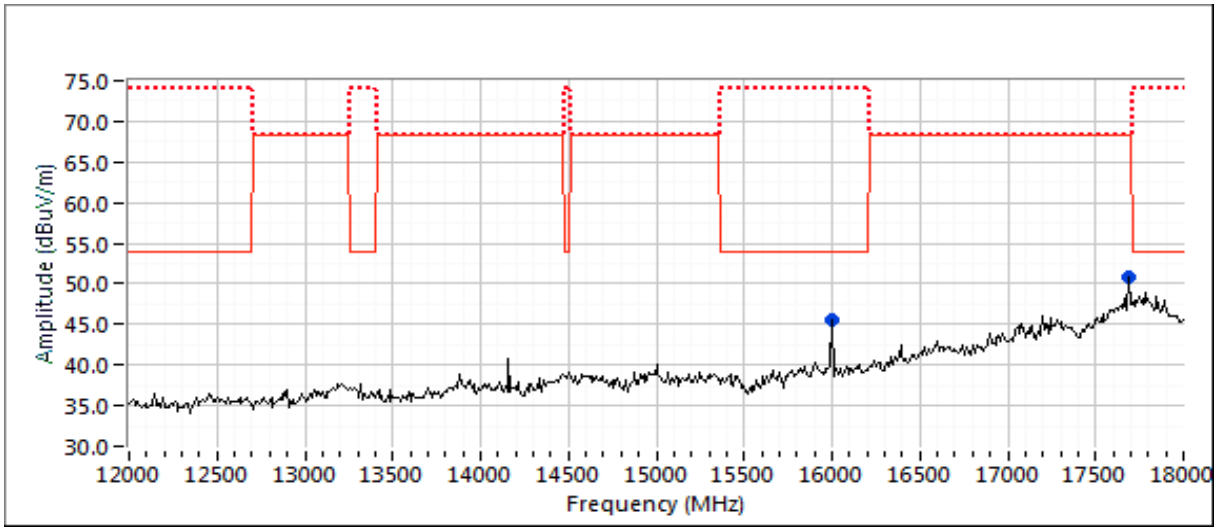
Channel: 6 & 62 Mode: ac40 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 4TX Data Rate: 13.5Mbps

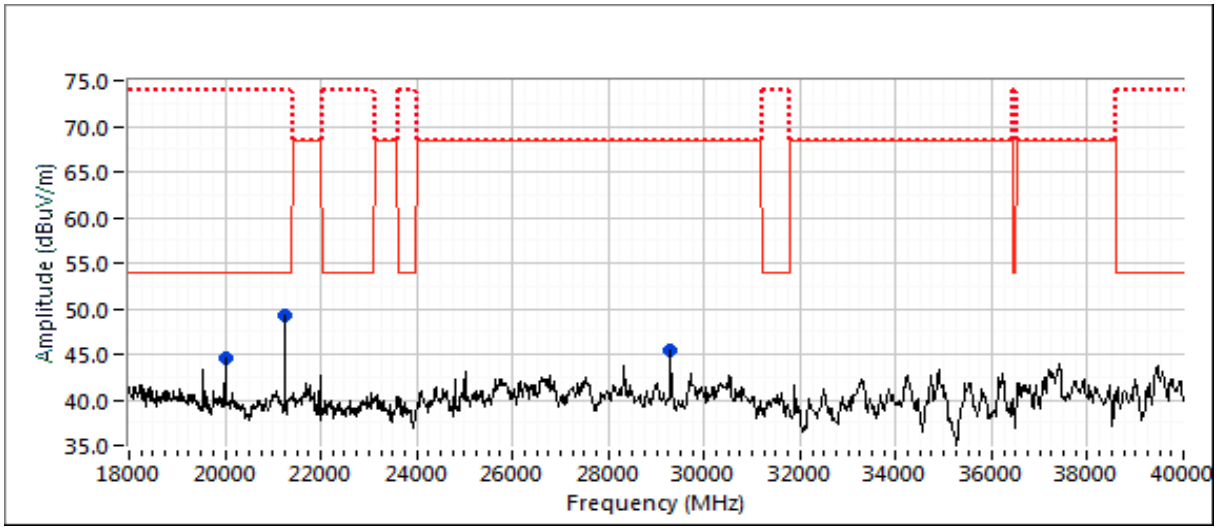
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
2389.970	48.8	V	54.0	-5.2	AVG	105	1.6	Note 3; RB 1 MHz;VB 300 Hz
2389.860	67.4	V	74.0	-6.6	PK	105	1.6	RB 1 MHz;VB 3 MHz;Peak
21239.920	48.6	H	54.0	-5.4	AVG	147	1.5	Note 3; RB 1 MHz;VB 1 kHz
21239.860	53.2	H	74.0	-20.8	PK	147	1.5	RB 1 MHz;VB 3 MHz
16000.000	45.6	H	54.0	-8.4	AVG	265	1.5	RB 1 MHz;VB 10 Hz Note 5
16000.180	51.7	H	74.0	-22.3	PK	265	1.5	RB 1 MHz;VB 3 MHz Note 5
17690.000	56.9	H	68.3	-11.4	PK	6	1.5	RB 1 MHz;VB 3 MHz
9710.000	54.4	H	68.3	-13.9	PK	278	1.5	RB 1 MHz;VB 3 MHz
29290.000	51.8	V	68.3	-16.5	PK	153	1.5	RB 1 MHz;VB 3 MHz
20000.260	39.4	H	54.0	-14.6	AVG	327	1.5	Note 3; RB 1 MHz;VB 1 kHz
20000.100	50.0	H	74.0	-24.0	PK	327	1.5	RB 1 MHz;VB 3 MHz
4889.630	47.3	V	54.0	-6.7	AVG	334	2.0	Note 3; RB 1 MHz;VB 300 Hz
4889.970	61.2	V	74.0	-12.8	PK	334	2.0	RB 1 MHz;VB 3 MHz
5354.170	51.8	V	-	-	PK	193	1.5	Refer to Bandedge test data

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A





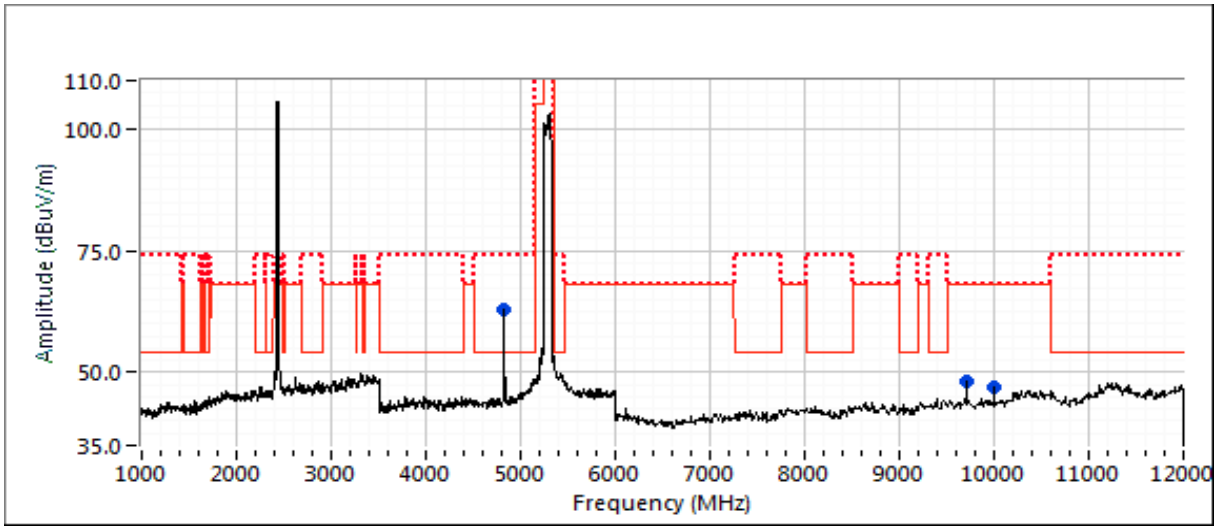
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #1d: Center Channel

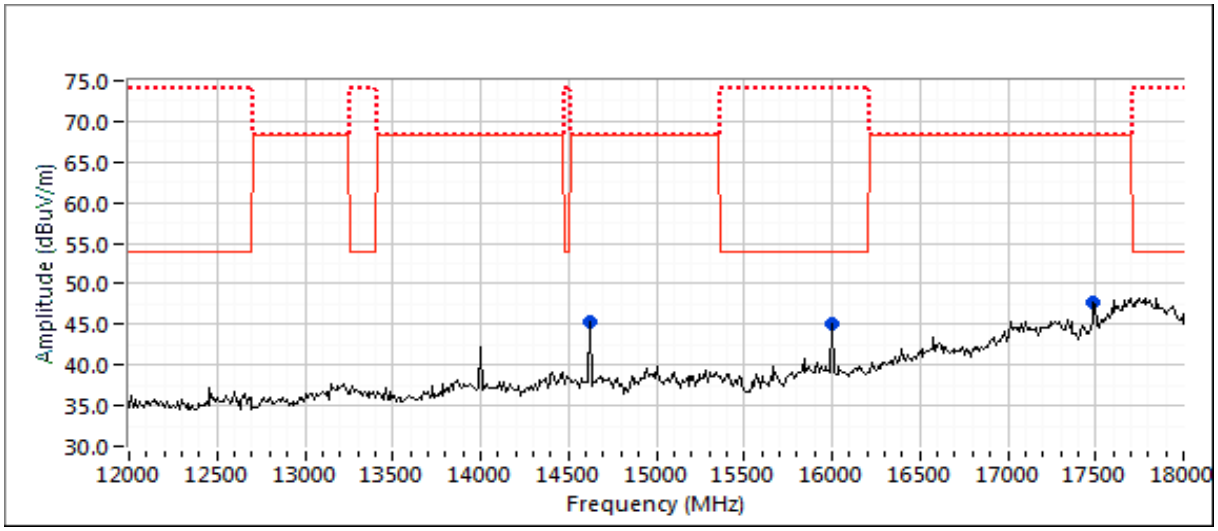
Channel: 6 & 58 Mode: b & ac80 Pwr Setting: 22.25 (q89) & 18 (q72)
Tx Chain: 1TX & 4TX Data Rate: 1 Mbps & MCS0

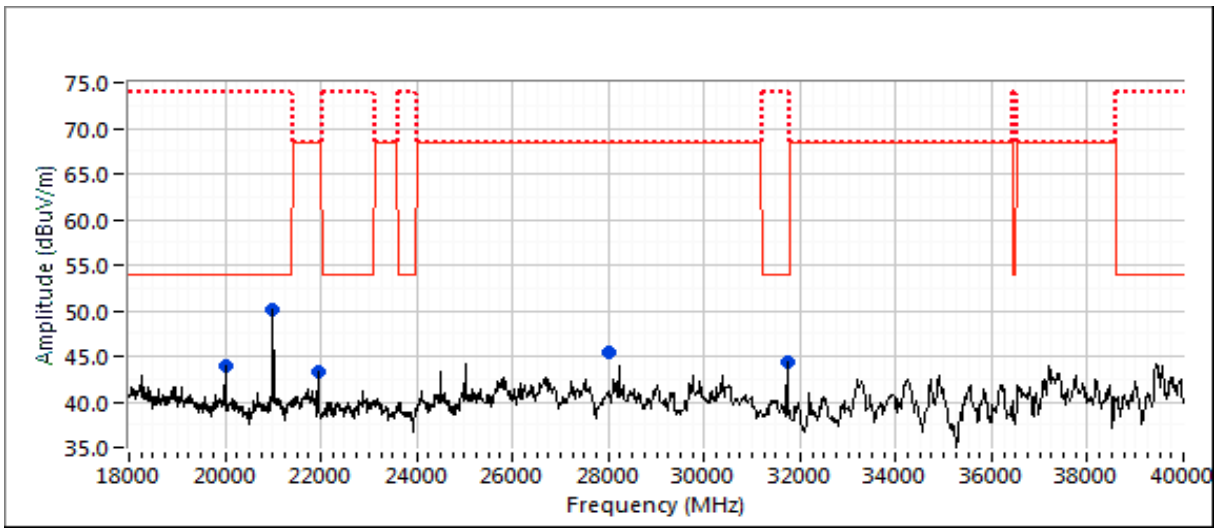
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments	
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters		
4873.780	52.8	V	54.0	-1.2	AVG	148	1.6	RB 1 MHz;VB 10 Hz	
4873.980	59.0	V	74.0	-15.0	PK	148	1.6	RB 1 MHz;VB 3 MHz	
17630.000	55.6	V	68.3	-12.7	PK	48	1.5	RB 1 MHz;VB 3 MHz	
14620.000	53.1	H	68.3	-15.2	PK	137	1.5	RB 1 MHz;VB 3 MHz	
16000.000	44.8	H	54.0	-9.2	AVG	318	1.5	RB 1 MHz;VB 10 Hz	Note 5
16000.220	51.2	H	74.0	-22.8	PK	318	1.5	RB 1 MHz;VB 3 MHz	Note 5
9710.000	54.1	H	68.3	-14.2	PK	255	1.5	RB 1 MHz;VB 3 MHz	
10000.000	53.1	H	68.3	-15.2	PK	29	1.5	RB 1 MHz;VB 3 MHz	
21159.900	43.7	H	54.0	-10.7	AVG	145	1.5	Note 3; RB 1 MHz;VB 1 kHz	
21159.790	51.6	H	74.0	-22.4	PK	145	1.5	RB 1 MHz;VB 3 MHz	
31739.800	42.8	H	54.0	-11.2	AVG	165	1.5	Note 3; RB 1 MHz;VB 1 kHz	
31739.590	50.5	H	74.0	-23.5	PK	165	1.5	RB 1 MHz;VB 3 MHz	
20010.750	36.0	H	54.0	-18.0	AVG	325	1.5	Note 3; RB 1 MHz;VB 1 kHz	
20010.480	46.8	H	74.0	-27.2	PK	325	1.5	RB 1 MHz;VB 3 MHz	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A





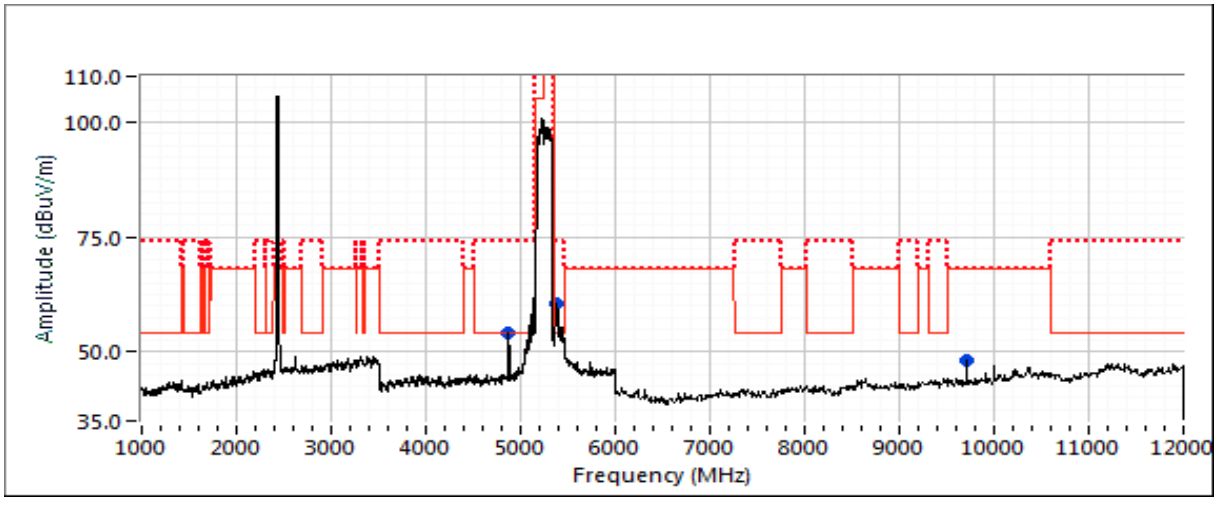
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #1e: Center Channel

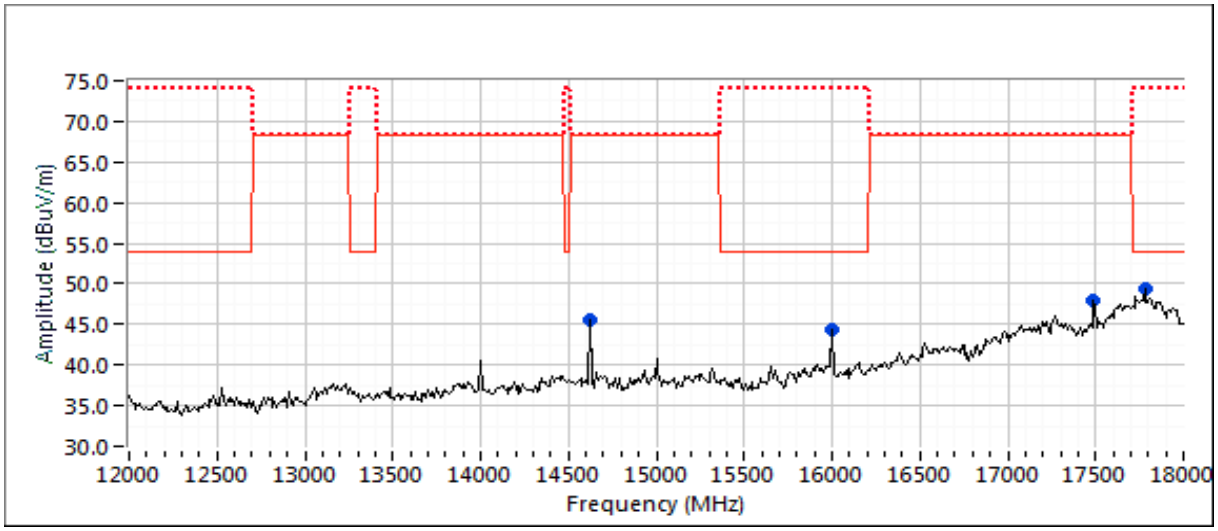
Channel: 6 & 50 Mode: b & ac160 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 1TX & 4TX Data Rate: 1 Mbps & MCS0

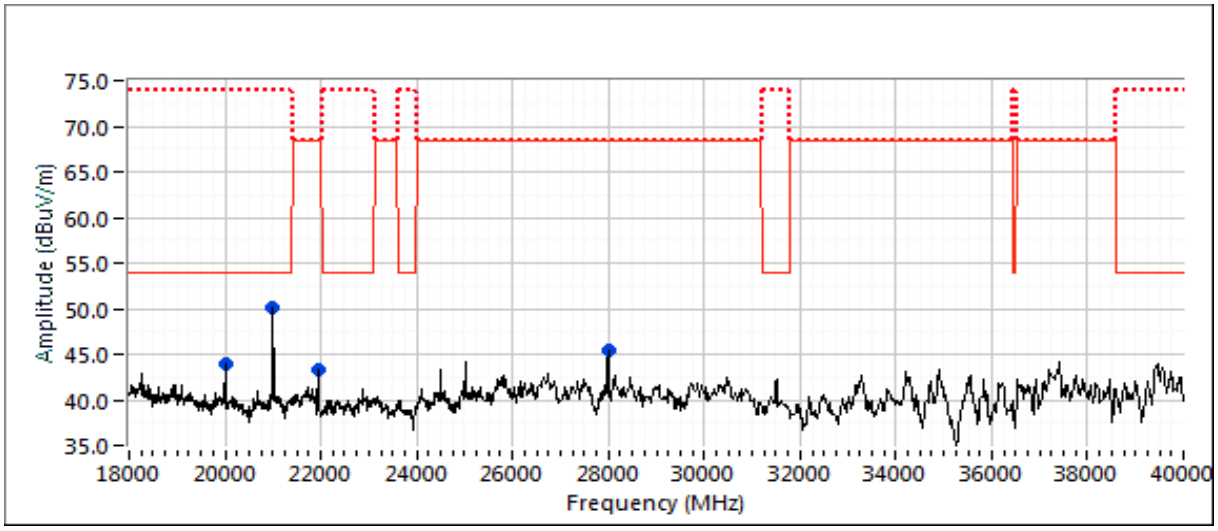
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
4873.780	52.6	V	54.0	-1.4	AVG	201	1.5	RB 1 MHz;VB 10 Hz
20999.910	49.3	H	54.0	-4.7	AVG	160	1.5	Note 3; RB 1 MHz;VB 1 kHz
17781.430	45.2	V	54.0	-8.8	AVG	173	1.0	Note 3; RB 1 MHz;VB 1 kHz
16000.000	44.4	H	54.0	-9.6	AVG	310	1.5	RB 1 MHz;VB 10 Hz Note 5
9710.000	54.4	H	68.3	-13.9	PK	271	1.5	RB 1 MHz;VB 3 MHz
17490.000	54.2	V	68.3	-14.1	PK	138	1.5	RB 1 MHz;VB 3 MHz
20000.220	38.5	H	54.0	-15.5	AVG	13	1.5	Note 3; RB 1 MHz;VB 1 kHz
4873.980	58.3	V	74.0	-15.7	PK	201	1.5	RB 1 MHz;VB 3 MHz
14620.000	51.9	H	68.3	-16.4	PK	130	1.5	RB 1 MHz;VB 3 MHz
28007.500	51.3	H	68.3	-17.0	PK	161	2.0	RB 1 MHz;VB 3 MHz
17780.290	56.6	V	74.0	-17.4	PK	173	1.0	RB 1 MHz;VB 3 MHz
21938.330	49.6	H	68.3	-18.7	PK	117	2.0	RB 1 MHz;VB 3 MHz
20999.940	54.2	H	74.0	-19.8	PK	160	1.5	RB 1 MHz;VB 3 MHz
16000.220	51.2	H	74.0	-22.8	PK	310	1.5	RB 1 MHz;VB 3 MHz Note 5
20000.120	48.6	H	74.0	-25.4	PK	13	1.5	RB 1 MHz;VB 3 MHz
5375.000	60.4	V	-	-	PK	212	2.0	Refer to Bandedge test data

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A





Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #2: Radiated Spurious Emissions, 1,000 - 40000 MHz. Operating Mode: Worse case from Run #1

Date of Test: 07/22/19 Config. Used: 1

Test Engineer: Rafael Varelas Config Change: -

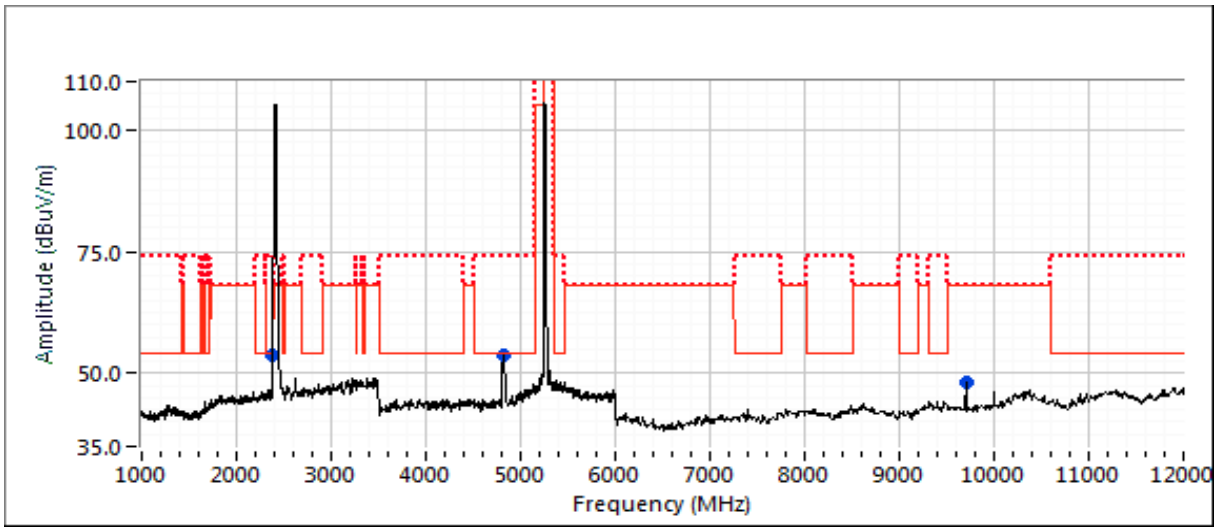
Test Location: FT Chamber #5 Host EUT Voltage: 110V/60Hz

Run #2a: Low Channel

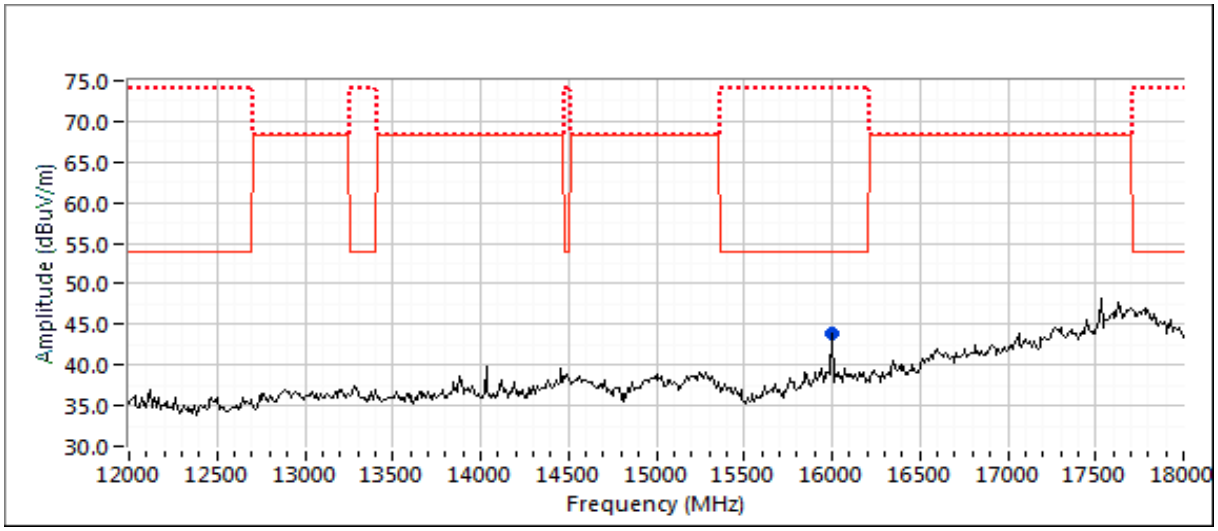
Channel: 1 & 52 Mode: ac20 Pwr Setting: 24 (q96) & 18 (q72)

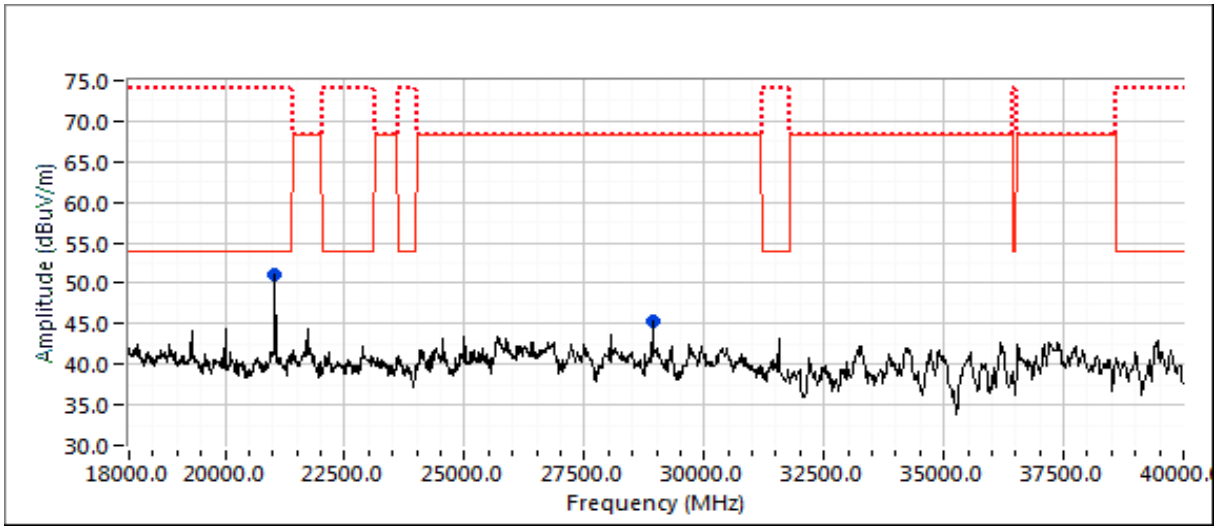
Tx Chain: 4TX Data Rate: 6.5 Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
4812.420	51.0	V	54.0	-3.0	AVG	319	2.0	Note 3; RB 1 MHz;VB 300 Hz
4808.850	65.7	V	74.0	-8.3	PK	319	2.0	RB 1 MHz;VB 3 MHz
9700.970	54.5	H	68.3	-13.8	PK	280	1.3	RB 1 MHz;VB 3 MHz
16000.000	47.1	H	54.0	-6.9	AVG	300	1.0	RB 1 MHz;VB 10 Hz Note 5
16000.410	58.1	H	74.0	-15.9	PK	300	1.0	RB 1 MHz;VB 3 MHz Note 5
21039.900	51.0	H	54.0	-3.0	AVG	173	1.2	Note 3; RB 1 MHz;VB 300 Hz
21039.960	55.0	H	74.0	-19.0	PK	173	1.2	RB 1 MHz;VB 3 MHz
28943.960	50.9	H	68.3	-17.4	PK	160	2.0	RB 1 MHz;VB 3 MHz
2379.170	53.6	V	54.0	-0.4	Peak	97	1.5	Refer to bandedge test data



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A



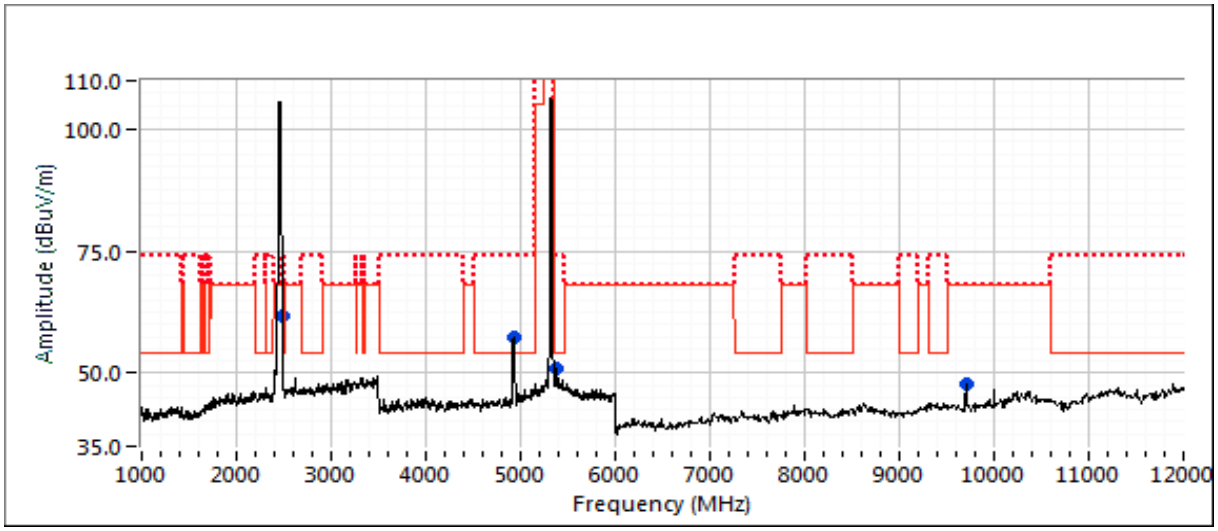


Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

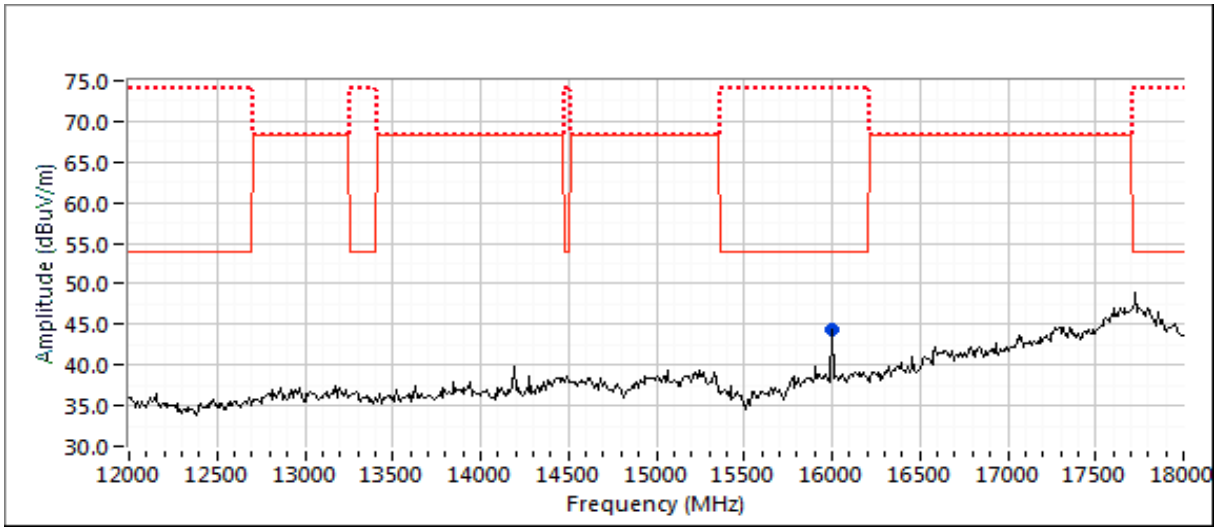
Run #2b: High Channel

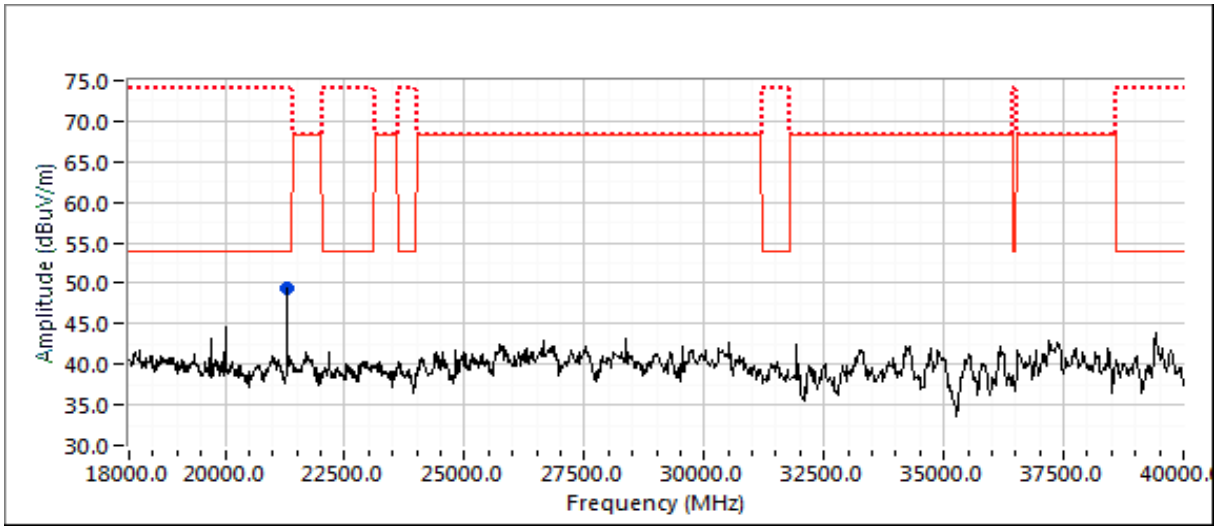
Channel: 11 & 64 Mode: ac20 Pwr Setting: 23.5 (q94) & 18 (q72)
Tx Chain: 4TX Data Rate: 6.5 Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
4925.290	53.3	H	54.0	-0.7	AVG	279	1.7	Note 3; RB 1 MHz;VB 300 Hz
4925.460	67.5	H	74.0	-6.5	PK	279	1.7	RB 1 MHz;VB 3 MHz
5382.380	50.2	V	54.0	-3.8	AVG	209	2.1	Note 3; RB 1 MHz;VB 300 Hz
5379.710	62.1	V	74.0	-11.9	PK	209	2.1	RB 1 MHz;VB 3 MHz
9704.030	54.4	H	68.3	-13.9	PK	277	2.0	RB 1 MHz;VB 3 MHz
16000.110	47.1	H	54.0	-6.9	AVG	300	1.0	RB 1 MHz;VB 10 Hz Note 5
15999.950	58.5	H	74.0	-15.5	PK	300	1.0	RB 1 MHz;VB 3 MHz Note 5
21279.800	49.5	H	54.0	-4.7	AVG	164	1.1	Note 3; RB 1 MHz;VB 300 Hz
21279.800	53.3	H	74.0	-20.7	PK	164	1.1	RB 1 MHz;VB 3 MHz
2487.500	61.8	V	54.0	7.8	Peak	121	1.5	Refer to bandedge test data



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A





Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #3, Radiated Spurious Emissions, 1,000 - 40,000 MHz. Operation in the 5470-5725 MHz Band

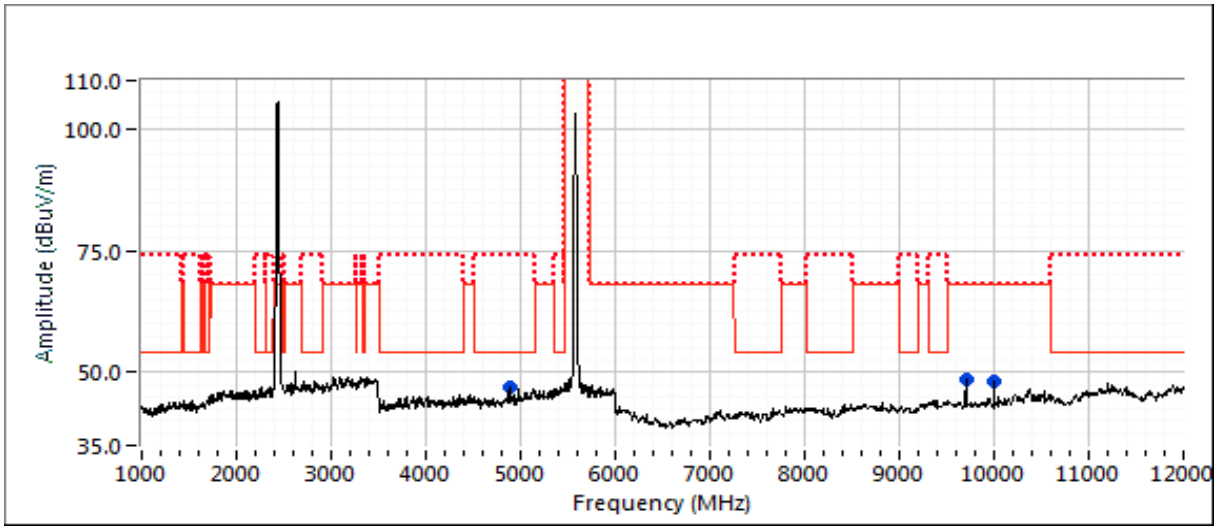
Date of Test: 7/22-23/2019 Config. Used: 1
Test Engineer: R. Varelas & M. Birgani Config Change: -
Test Location: FT Chamber #5 Host EUT Voltage: 110V/60Hz

Run #3a: Center Channel

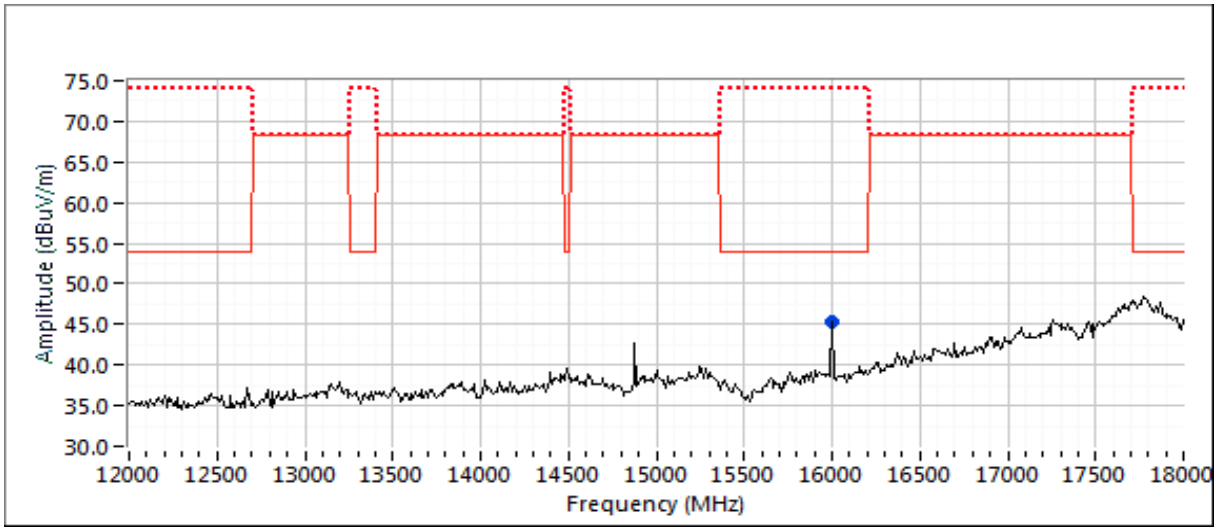
Channel: 6 &116 Mode: g / a Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 1Tx Data Rate: 6

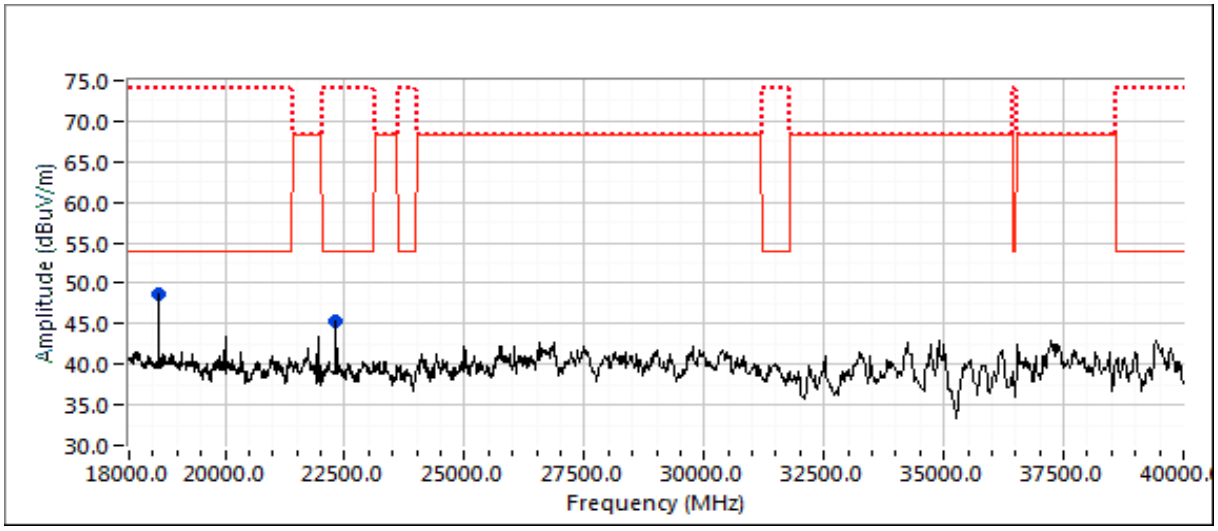
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments	
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters		
18599.990	48.3	H	54.0	-5.7	AVG	51	1.2	RB 1 MHz;VB 10 Hz	
4883.020	47.0	V	54.0	-7.0	AVG	146	2.0	RB 1 MHz;VB 10 Hz	
22319.900	42.9	H	54.0	-11.1	AVG	159	1.2	RB 1 MHz;VB 10 Hz	
4884.020	62.0	V	74.0	-12.0	PK	146	2.0	RB 1 MHz;VB 3 MHz	
9705.490	54.9	H	68.3	-13.4	PK	278	1.4	RB 1 MHz;VB 3 MHz	
10000.070	54.6	H	68.3	-13.7	PK	0	1.1	RB 1 MHz;VB 3 MHz	
16000.180	38.9	H	54.0	-15.1	AVG	257	1.4	RB 1 MHz;VB 10 Hz	Note 5
18599.940	53.5	H	74.0	-20.5	PK	51	1.2	RB 1 MHz;VB 3 MHz	
22320.100	50.6	H	74.0	-23.4	PK	159	1.2	RB 1 MHz;VB 3 MHz	
16000.470	48.7	H	74.0	-25.3	PK	257	1.4	RB 1 MHz;VB 3 MHz	Note 5

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A





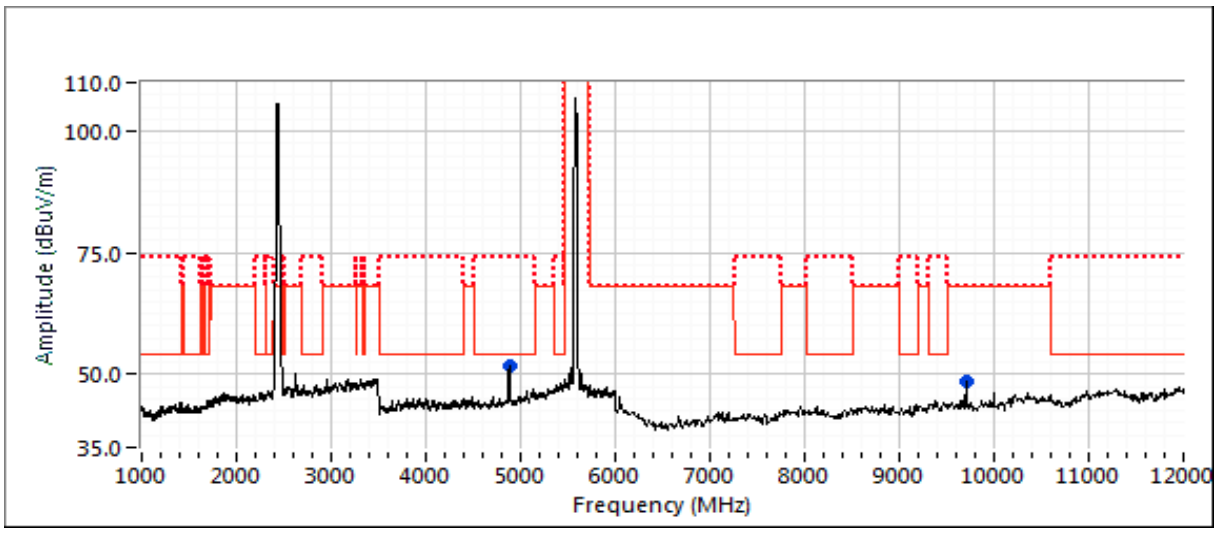
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #3b: Center Channel

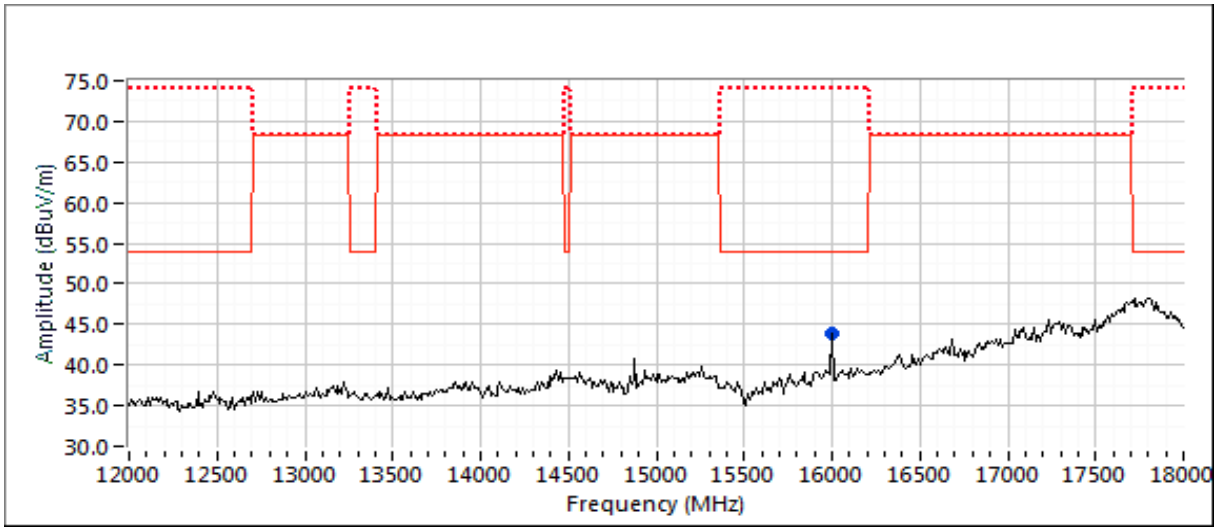
Channel: 6 & 116 Mode: ac20 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 4Tx Data Rate: 6.5

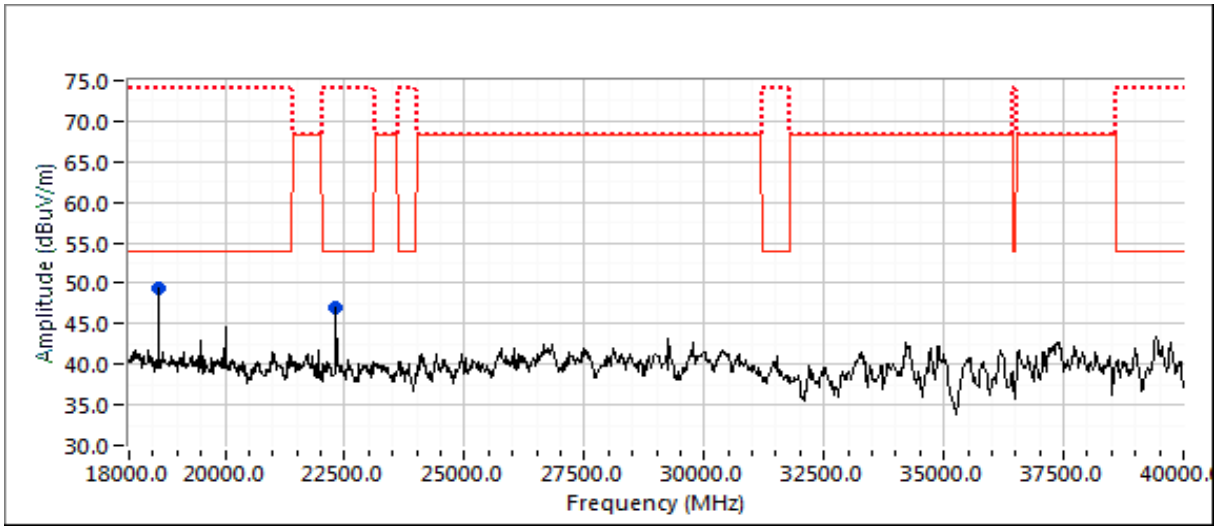
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
4883.810	49.1	V	54.0	-4.9	AVG	153	2.0	Note 3; RB 1 MHz;VB 300 Hz
18599.870	48.7	H	54.0	-5.3	AVG	43	1.1	Note 3; RB 1 MHz;VB 300 Hz
22319.900	46.0	H	54.0	-8.0	AVG	183	1.8	Note 3; RB 1 MHz;VB 300 Hz
4884.150	63.7	V	74.0	-10.3	PK	153	2.0	RB 1 MHz;VB 3 MHz
16000.210	41.9	V	54.0	-12.1	AVG	271	1.6	RB 1 MHz;VB 10 Hz Note 5
9710.000	54.7	H	68.3	-13.6	PK	295	1.6	RB 1 MHz;VB 3 MHz
18599.890	53.5	H	74.0	-20.5	PK	43	1.1	RB 1 MHz;VB 3 MHz
22319.890	52.3	H	74.0	-21.7	PK	183	1.8	RB 1 MHz;VB 3 MHz
15999.800	50.5	V	74.0	-23.5	PK	271	1.6	RB 1 MHz;VB 3 MHz Note 5

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A





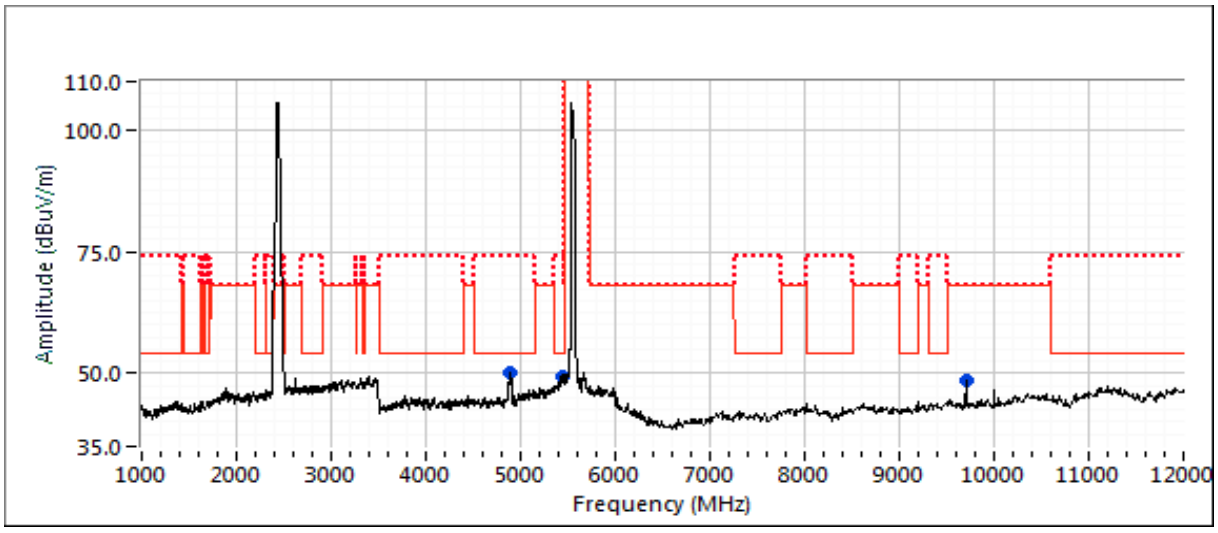
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #3c: Center Channel

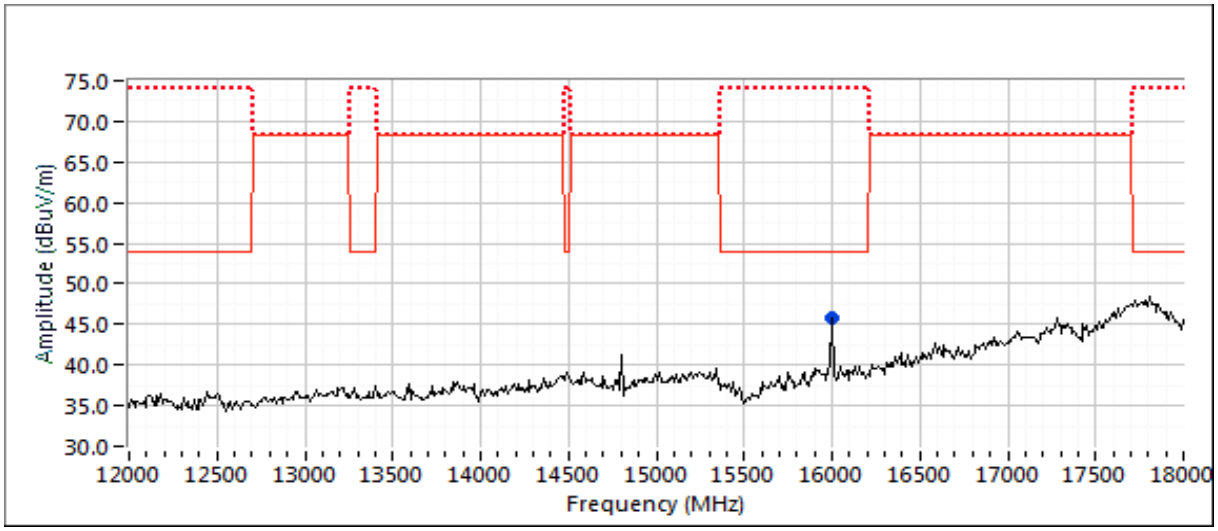
Channel: 6 &110 Mode: 11ac40 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 4Tx Data Rate: 13.5

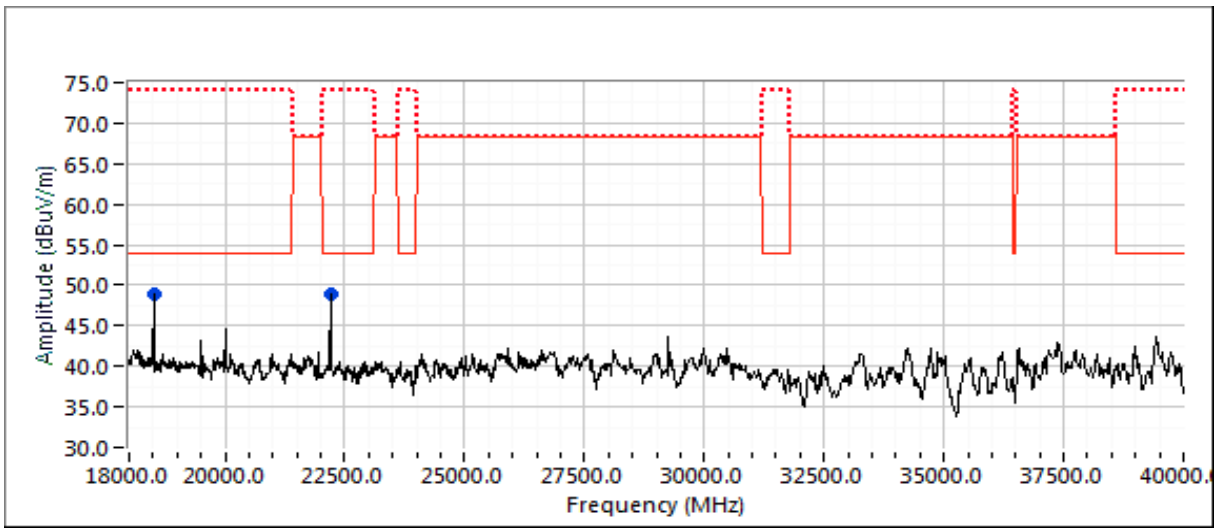
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
22199.920	49.6	H	54.0	-4.4	AVG	56	1.4	Note 3; RB 1 MHz;VB 300 Hz
18499.940	48.5	H	54.0	-5.5	AVG	55	1.1	Note 3; RB 1 MHz;VB 300 Hz
4894.490	48.2	V	54.0	-5.8	AVG	150	1.6	Note 3; RB 1 MHz;VB 300 Hz
5429.700	48.2	H	54.0	-5.8	AVG	66	2.2	Note 3; RB 1 MHz;VB 300 Hz
4894.020	63.6	V	74.0	-10.4	PK	150	1.6	RB 1 MHz;VB 3 MHz
16000.190	42.4	V	54.0	-11.6	AVG	271	1.6	RB 1 MHz;VB 10 Hz Note 5
9700.000	54.9	H	68.3	-13.4	PK	293	1.6	RB 1 MHz;VB 3 MHz
5429.430	59.7	H	74.0	-14.3	PK	66	2.2	RB 1 MHz;VB 3 MHz
22200.040	53.7	H	74.0	-20.3	PK	56	1.4	RB 1 MHz;VB 3 MHz
18499.910	53.5	H	74.0	-20.5	PK	55	1.1	RB 1 MHz;VB 3 MHz
15999.770	50.8	V	74.0	-23.2	PK	271	1.6	RB 1 MHz;VB 3 MHz Note 5

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A





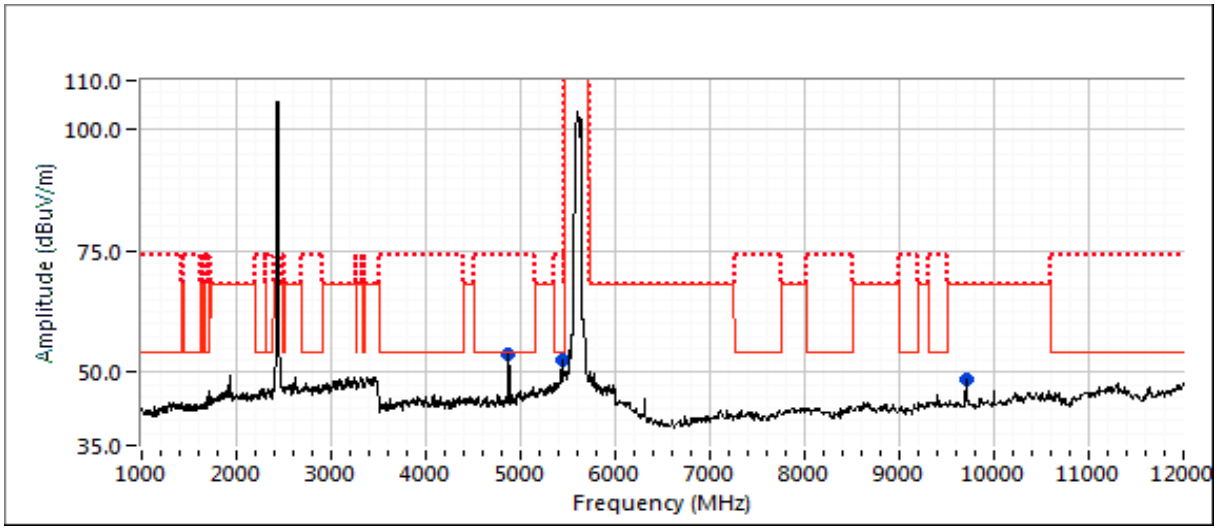
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #3d: Low Channel

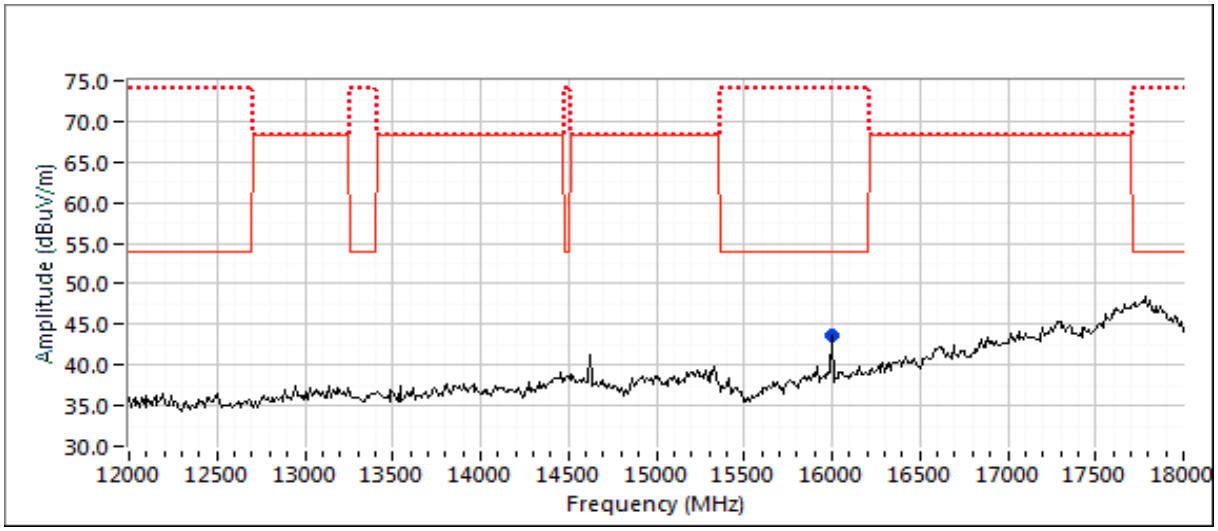
Channel: 6 & 122 Mode: b & ac80 Pwr Setting: 22.25 (q89) & 18 (q72)
Tx Chain: 1Tx & 4Tx Data Rate: 1 & 29.3

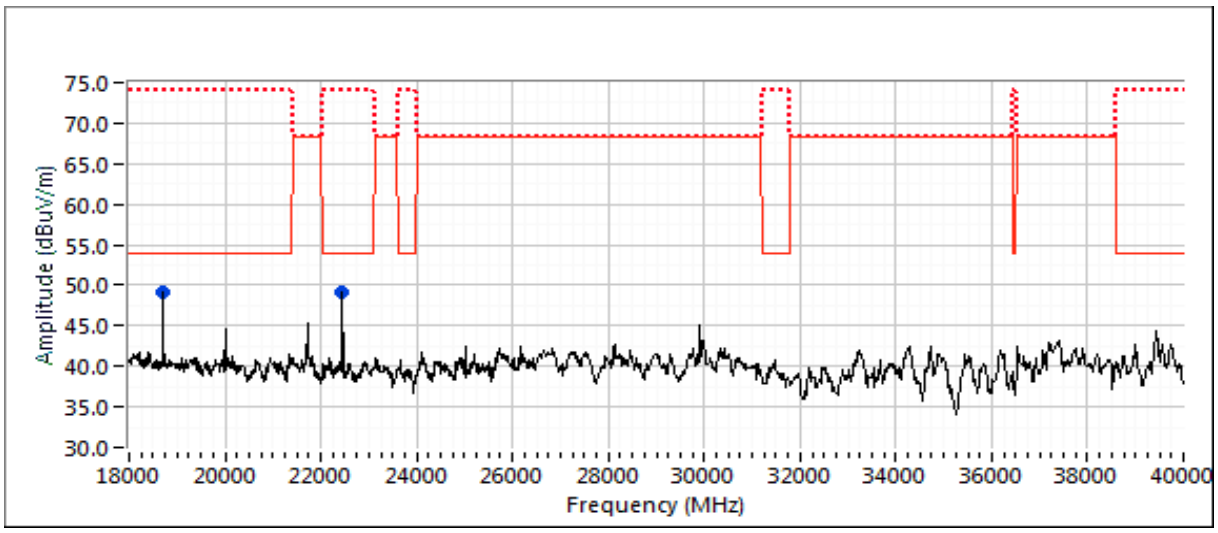
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
4873.890	52.9	V	54.0	-1.1	AVG	148	1.6	RB 1 MHz;VB 10 Hz
5434.680	52.0	V	54.0	-2.0	AVG	191	1.6	Note 3; RB 1 MHz;VB 1 kHz
18699.910	48.8	H	54.0	-5.2	AVG	38	1.6	Note 3; RB 1 MHz;VB 1 kHz
22439.870	48.1	H	54.0	-5.9	AVG	164	1.9	Note 3; RB 1 MHz;VB 1 kHz
16000.190	42.5	V	54.0	-11.5	AVG	272	1.6	RB 1 MHz;VB 10 Hz Note 5
5434.650	62.0	V	74.0	-12.0	PK	191	1.6	RB 1 MHz;VB 3 MHz
9700.000	54.7	H	68.3	-13.6	PK	257	1.6	RB 1 MHz;VB 3 MHz
4873.980	60.1	V	74.0	-13.9	PK	148	1.6	RB 1 MHz;VB 3 MHz
18699.930	53.5	H	74.0	-20.5	PK	38	1.6	RB 1 MHz;VB 3 MHz
22439.930	52.8	H	74.0	-21.2	PK	164	1.9	RB 1 MHz;VB 3 MHz
16000.290	50.3	V	74.0	-23.7	PK	272	1.6	RB 1 MHz;VB 3 MHz Note 5

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A





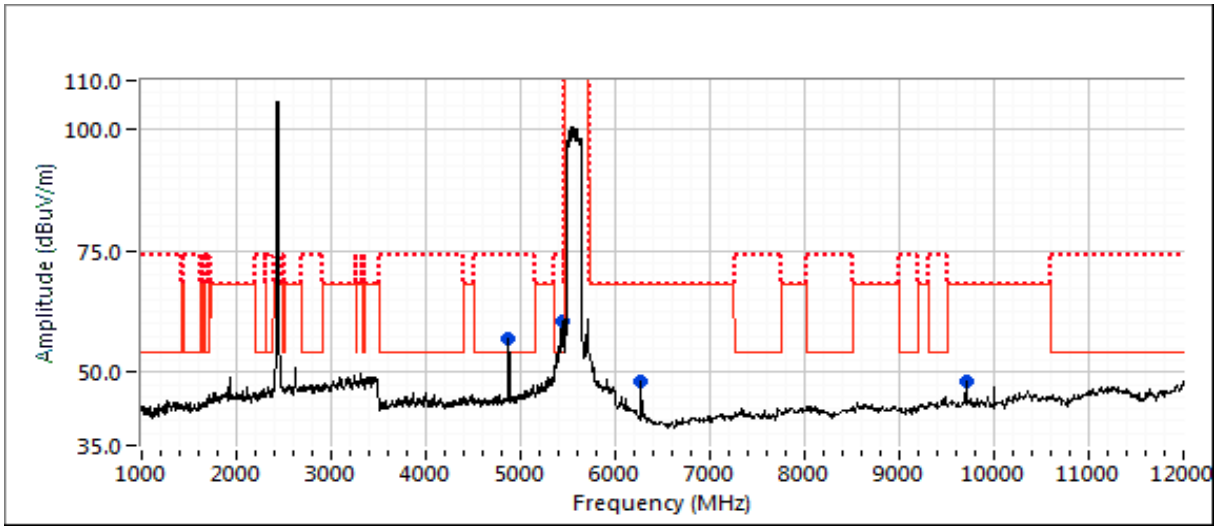
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #3e: Low Channel

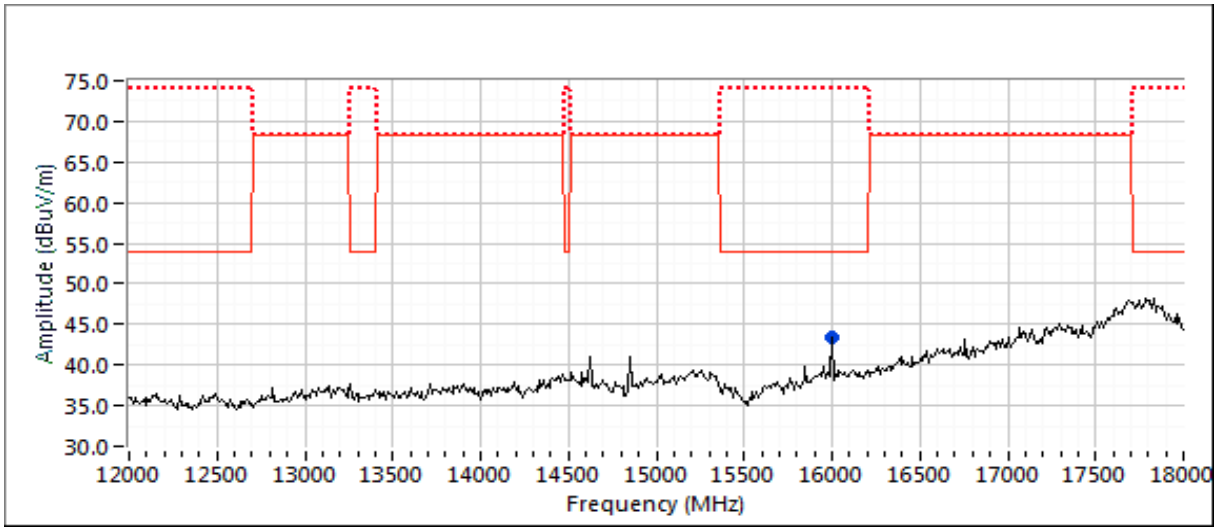
Channel: 6 & 114 Mode: 1 & ac160 Pwr Setting: 22.25 (q89) & 18 (q72)
Tx Chain: 1Tx & 4Tx Data Rate: 1 & 58.5 Mbps

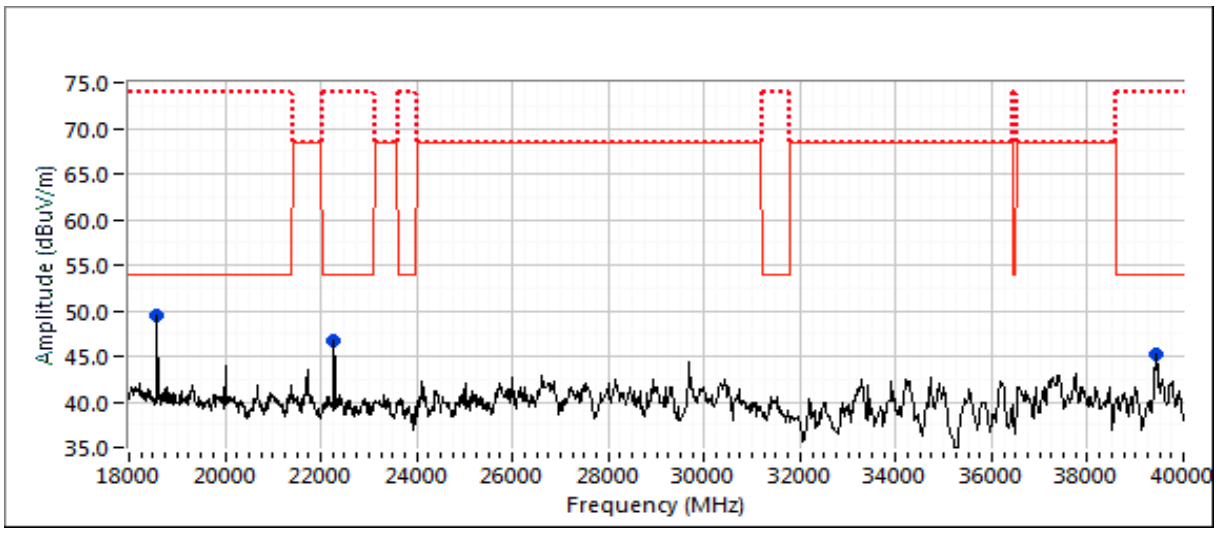
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
4874.010	52.5	V	54.0	-1.5	AVG	147	1.6	RB 1 MHz;VB 10 Hz
18566.600	48.3	H	54.0	-5.7	AVG	42	1.3	Note 3; RB 1 MHz;VB 1 kHz
22279.880	45.8	H	54.0	-8.2	AVG	169	1.9	Note 3; RB 1 MHz;VB 1 kHz
16000.160	41.0	H	54.0	-13.0	AVG	269	1.4	RB 1 MHz;VB 10 Hz Note 5
9700.000	54.5	H	68.3	-13.8	PK	277	1.6	RB 1 MHz;VB 3 MHz
6270.000	54.5	V	68.3	-13.8	PK	233	1.6	RB 1 MHz;VB 3 MHz
39438.730	39.9	V	54.0	-14.1	AVG	274	1.0	Note 3; RB 1 MHz;VB 1 kHz
4873.750	59.0	V	74.0	-15.0	PK	147	1.6	RB 1 MHz;VB 3 MHz
18566.540	53.3	H	74.0	-20.7	PK	42	1.3	RB 1 MHz;VB 3 MHz
39437.400	52.6	V	74.0	-21.4	PK	274	1.0	RB 1 MHz;VB 3 MHz
22279.830	52.1	H	74.0	-21.9	PK	169	1.9	RB 1 MHz;VB 3 MHz
15999.880	49.6	H	74.0	-24.4	PK	269	1.4	RB 1 MHz;VB 3 MHz Note 5
5441.670	60.7	V	-	-	PK	77	1.6	Refer to bandedge test data

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A





Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #4: Radiated Spurious Emissions, 1,000 - 40000 MHz. Operating Mode: Worse case from Run #3

Date of Test: 7/22-23/2019 Config. Used: 1

Test Engineer: R. Varelas & M. Birgani Config Change: -

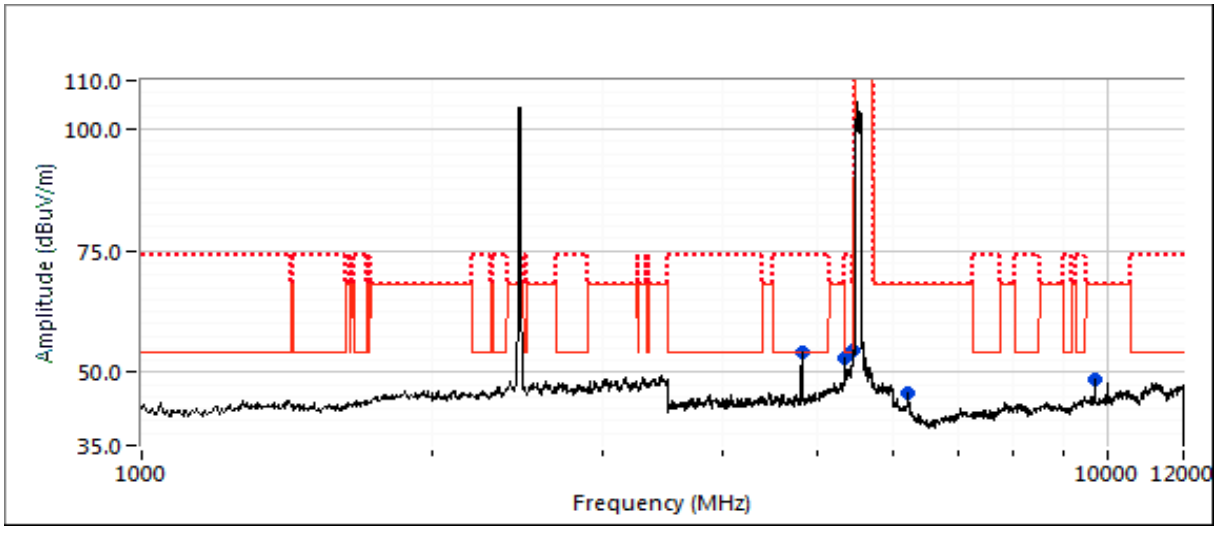
Test Location: FT Chamber #5 Host EUT Voltage: 110V/60Hz

Run #4a: Low Channel

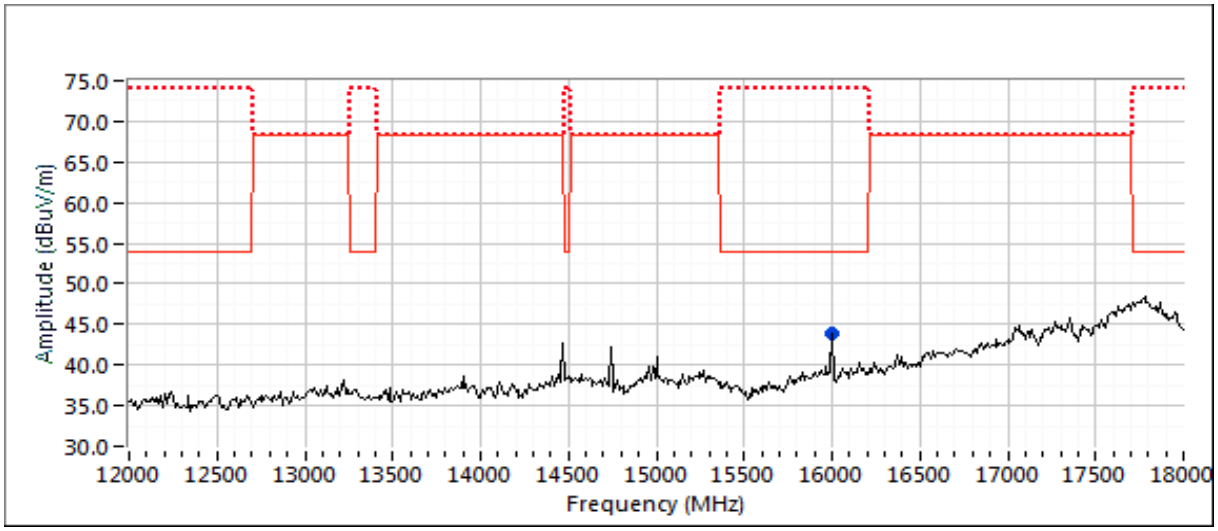
Channel: 1 & 106 Mode: b & ac80 Pwr Setting: 18 (q72) & 18 (q72)

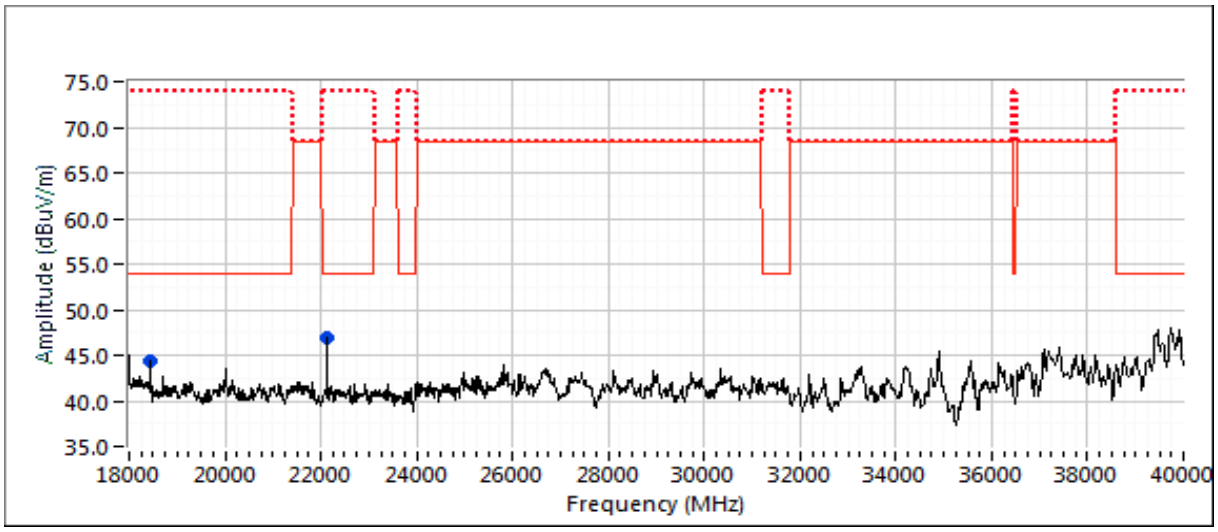
Tx Chain: 1Tx & 4Tx Data Rate: 1 & 29.3 Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
4824.060	53.6	V	54.0	-0.4	AVG	133	1.5	RB 1 MHz;VB 10 Hz
5357.160	48.7	V	54.0	-5.3	AVG	190	1.9	Note 3; RB 1 MHz;VB 1 kHz
5356.690	61.4	V	74.0	-12.6	PK	190	1.9	RB 1 MHz;VB 3 MHz
9710.000	54.7	H	68.3	-13.6	PK	276	2.2	RB 1 MHz;VB 3 MHz
4823.940	60.2	V	74.0	-13.8	PK	133	1.5	RB 1 MHz;VB 3 MHz
16000.120	38.9	H	54.0	-15.1	AVG	252	1.4	RB 1 MHz;VB 10 Hz Note 5
6230.000	52.1	V	68.3	-16.2	PK	183	1.3	RB 1 MHz;VB 3 MHz
15999.680	49.4	H	74.0	-24.6	PK	252	1.4	RB 1 MHz;VB 3 MHz Note 5
18439.170	44.4	V	54.0	-9.6	AVG	113	1.0	Note 3; RB 1 MHz;VB 1 kHz
18441.430	57.4	V	74.0	-16.6	PK	113	1.0	RB 1 MHz;VB 3 MHz
22122.500	46.9	V	54.0	-7.1	AVG	17	1.3	Note 3; RB 1 MHz;VB 1 kHz
22123.600	58.9	V	74.0	-15.1	PK	17	1.3	RB 1 MHz;VB 3 MHz
5454.170	54.7	V	-	-	PK	359	2.5	Refer to bandedge test data



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A



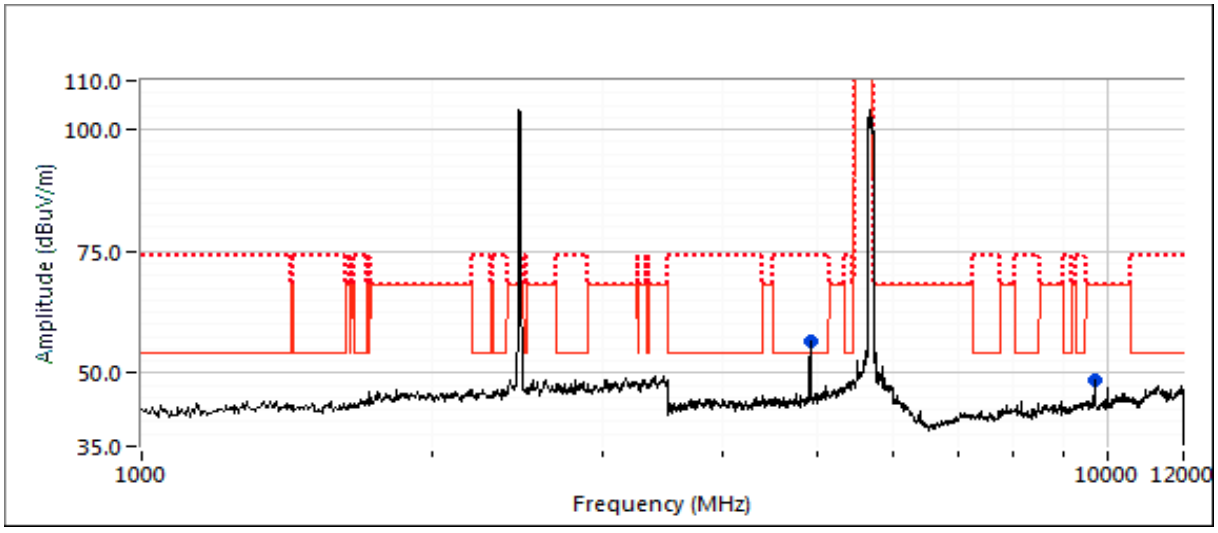


Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

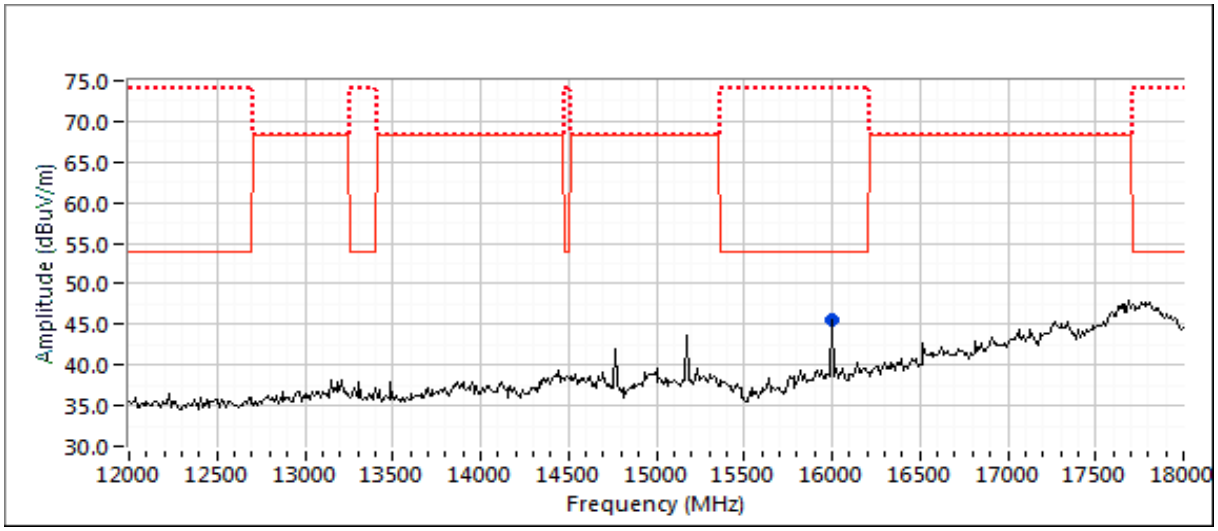
Run #4b: High Channel

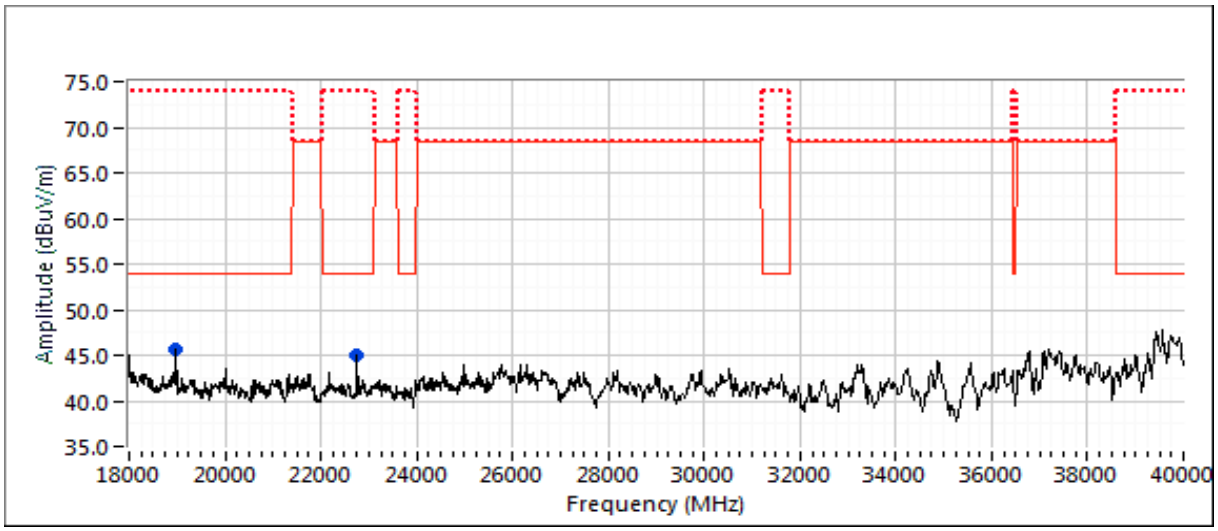
Channel: 11 & 138 Mode: b & ac80 Pwr Setting: 16 (q64) & 18 (q72)
Tx Chain: 1Tx & 4Tx Data Rate: 1 & 29.3 Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
4924.070	53.8	V	54.0	-0.2	AVG	132	1.5	RB 1 MHz;VB 10 Hz
16000.200	44.2	V	54.0	-9.8	AVG	274	1.6	RB 1 MHz;VB 10 Hz
4923.960	60.8	V	74.0	-13.2	PK	132	1.5	RB 1 MHz;VB 3 MHz
9710.000	54.6	H	68.3	-13.7	PK	290	1.7	RB 1 MHz;VB 3 MHz
18966.750	37.3	V	54.0	-16.7	AVG	112	1.3	Note 3; RB 1 MHz;VB 1 kHz
16000.090	51.5	V	74.0	-22.5	PK	274	1.6	RB 1 MHz;VB 3 MHz
18971.180	49.3	V	74.0	-24.7	PK	112	1.3	RB 1 MHz;VB 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A





Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

RSS-247 and FCC 15.407 (UNII) Radiated Spurious Emissions

Test Specific Details

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

Date of Test: 9/27-30/2019
Test Engineer: M. Birgani
Test Location: Chamber 7

Config. Used: 1
Config Change: -
EUT Voltage: 120V/ 60Hz

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: 24-26 °C
Rel. Humidity: 41-45 %

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:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Summary of Results

Run #	Mode	Channel	NBF Setting	BF Setting	Test Performed	Limit	Result / Margin
Scans on "center" channel in all four OFDM modes to determine the worst case mode.							
3	ac20	6 & 60	24 / 18	24 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	45.5 dBµV/m @ 16000.1 MHz (-8.5 dB)
	ac40	6 & 62	24 / 18	24 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	62.8 dBµV/m @ 17685.6 MHz (-5.5 dB)
	ac20 / ac80	6 & 58	24 / 18	24 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	51.8 dBµV/m @ 21160.0 MHz (-2.2 dB)
	ac20 / ac160	6 & 50	24 / 18	24 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	51.7 dBµV/m @ 20999.9 MHz (-2.3 dB)
Measurements on low and high channels in worst-case OFDM mode.							
4	ac20	1 & 52	24 / 18	24 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.8 dBµV/m @ 21039.9 MHz (-1.2 dB)
	ac20	11 & 64	24 / 18	23.5 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	45.7 dBµV/m @ 21279.9 MHz (-8.3 dB)
Scans on "center" channel in all four OFDM modes to determine the worst case mode.							
5	ac20	6 & 116	24 / 18	24 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	51.5 dBµV/m @ 18600.0 MHz (-2.5 dB)
	ac40	6 & 110	24 / 18	24 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	51.4 dBµV/m @ 22199.7 MHz (-2.6 dB)
	ac20 / ac80	6 & 122	26 / 18	24 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	48.7 dBµV/m @ 18699.9 MHz (-5.3 dB)
	ac20 / ac160	6 & 114	26 / 18	24 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	51.3 dBµV/m @ 18566.6 MHz (-2.7 dB)
Measurements on low and high channels in worst-case OFDM mode.							
6	ac20	1 & 100	24 / 18	24 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	45.5 dBµV/m @ 16000.1 MHz (-8.5 dB)
	ac20	11 & 144	24 / 18	24 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	51.8 dBµV/m @ 22879.9 MHz (-2.2 dB)

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033
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 50 traces. (method VB of KDB 789033)

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)		
ac20	6.5	0.98	Yes	5.271	0.1	0.2	190	4324	-1
ac40	13.5	0.97	Yes	5.24	0.1	0.2	191	8811	-1
ac80	29.3	0.96	Yes	1.432	0.2	0.4	698	5159	-1
ac160	58.5	0.96	Yes	1.439	0.2	0.4	695	10443	-1

Sample Notes

Sample S/N: M11917QW000T

Measurement Specific Notes:

Note 1:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector). Per KDB 789033 2) c) (i), compliance can be demonstrated by meeting the average and peak limits of 15.209, as an alternative.
Note 2:	Emission has a duty cycle ≥ 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces (method AD of KDB 789033)
Note 3:	Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear averaging, auto sweep,max hold 50*1/DC traces (method VB of KDB 789033)
Note 4:	Emission has a duty cycle < 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100*1/DC traces, measurement corrected by Pwr correction factor (method AD of KDB 789033)

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

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

Run #1a: Center Channel

Channel: 6 & 60 Mode: ac20 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 4TX Data Rate: 6.5 Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
16000.130	45.5	H	54.0	-8.5	AVG	261	1.6	RB 1 MHz;VB 300 Hz;Peak
19999.770	44.2	H	54.0	-9.8	AVG	321	1.4	RB 1 MHz;VB 300 Hz;Peak
9706.480	54.5	H	68.3	-13.8	PK	268	1.5	RB 1 MHz;VB 3 MHz;Peak
21199.760	57.3	H	74.0	-16.7	PK	165	1.4	RB 1 MHz;VB 3 MHz;Peak
16000.090	55.6	H	74.0	-18.4	PK	261	1.6	RB 1 MHz;VB 3 MHz;Peak
20000.220	54.4	H	74.0	-19.6	PK	321	1.4	RB 1 MHz;VB 3 MHz;Peak

Run #1b: Center Channel

Channel: 6 & 62 Mode: ac40 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 4TX Data Rate: 13.5Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
17685.600	62.8	H	68.3	-5.5	PK	77	1.4	RB 1 MHz;VB 3 MHz;Peak
21239.900	46.6	H	54.0	-7.4	AVG	0	1.2	RB 1 MHz;VB 300 Hz;Peak
20000.250	46.4	H	54.0	-7.6	AVG	2	1.4	RB 1 MHz;VB 300 Hz;Peak
16000.130	45.5	H	54.0	-8.5	AVG	261	1.6	RB 1 MHz;VB 300 Hz;Peak
29289.850	54.9	V	68.3	-13.4	PK	155	1.2	RB 1 MHz;VB 3 MHz;Peak
9706.480	54.5	H	68.3	-13.8	PK	268	1.5	RB 1 MHz;VB 3 MHz;Peak
16000.090	55.6	H	74.0	-18.4	PK	261	1.6	RB 1 MHz;VB 3 MHz;Peak
20000.320	55.2	H	74.0	-18.8	PK	2	1.4	RB 1 MHz;VB 3 MHz;Peak
21239.740	54.5	H	74.0	-19.5	PK	0	1.2	RB 1 MHz;VB 3 MHz;Peak

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #1c: Center Channel

Channel: 6 & 58 Mode: b & ac80 Pwr Setting: 22.25 (q89) & 18 (q72)
Tx Chain: 1TX & 4TX Data Rate: 1 Mbps & MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
21159.960	51.8	H	54.0	-2.2	AVG	155	1.3	RB 1 MHz;VB 1 kHz;Peak
14620.000	62.4	H	68.3	-5.9	PK	137	1.5	RB 1 MHz;VB 3 MHz;Peak
31739.950	46.5	H	54.0	-7.5	AVG	150	1.3	RB 1 MHz;VB 1 kHz;Peak
15999.990	46.2	H	54.0	-7.8	AVG	261	1.6	RB 1 MHz;VB 1 kHz;Peak
17630.000	54.8	V	68.3	-13.5	PK	48	1.5	RB 1 MHz;VB 3 MHz;Peak
9706.480	54.5	H	68.3	-13.8	PK	268	1.5	RB 1 MHz;VB 3 MHz;Peak
10000.220	54.0	H	68.3	-14.3	PK	145	1.6	RB 1 MHz;VB 3 MHz;Peak
20008.350	38.6	H	54.0	-15.4	AVG	0	1.0	RB 1 MHz;VB 1 kHz;Peak
21159.870	56.9	H	74.0	-17.1	PK	155	1.3	RB 1 MHz;VB 3 MHz;Peak
31739.610	55.8	H	74.0	-18.2	PK	150	1.3	RB 1 MHz;VB 3 MHz;Peak
16000.330	55.7	H	74.0	-18.3	PK	261	1.6	RB 1 MHz;VB 3 MHz;Peak
20014.130	51.4	H	74.0	-22.6	PK	0	1.0	RB 1 MHz;VB 3 MHz;Peak

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #1d: Center Channel

Channel: 6 & 50 Mode: b & ac160 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 1TX & 4TX Data Rate: 1 Mbps & MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
20999.910	51.7	H	54.0	-2.3	AVG	120	1.0	RB 1 MHz;VB 1 kHz;Peak
14620.000	62.4	H	68.3	-5.9	PK	137	1.5	RB 1 MHz;VB 3 MHz;Peak
15999.990	46.2	H	54.0	-7.8	AVG	261	1.6	RB 1 MHz;VB 1 kHz;Peak
20000.250	45.3	H	54.0	-8.7	AVG	28	1.3	RB 1 MHz;VB 1 kHz;Peak
17781.430	45.2	V	54.0	-8.8	AVG	10	1.3	RB 1 MHz;VB 1 kHz;Peak
9708.730	55.2	H	68.3	-13.1	PK	220	1.7	RB 1 MHz;VB 3 MHz;Peak
17780.290	59.3	V	74.0	-14.7	PK	10	1.3	RB 1 MHz;VB 3 MHz;Peak
20999.940	57.7	H	74.0	-16.3	PK	120	1.0	RB 1 MHz;VB 3 MHz;Peak
20000.320	55.8	H	74.0	-18.2	PK	28	1.3	RB 1 MHz;VB 3 MHz;Peak
16000.330	55.7	H	74.0	-18.3	PK	261	1.6	RB 1 MHz;VB 3 MHz;Peak
17490.000	49.2	V	68.3	-19.1	PK	110	1.3	RB 1 MHz;VB 3 MHz;Peak

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #2: Radiated Spurious Emissions, 1,000 - 40000 MHz. Operating Mode: Worse case from Run #1

Run #2a: Low Channel

Channel: 1 & 52 Mode: ac20 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 4TX Data Rate: 6.5 Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
21039.930	52.8	H	54.0	-1.2	AVG	148	1.4	RB 1 MHz;VB 300 Hz;Peak
16000.130	45.5	H	54.0	-8.5	AVG	261	1.6	RB 1 MHz;VB 300 Hz;Peak
28942.000	55.0	H	68.3	-13.3	PK	85	1.0	RB 1 MHz;VB 3 MHz;Peak
9706.480	54.5	H	68.3	-13.8	PK	268	1.5	RB 1 MHz;VB 3 MHz;Peak
21040.100	57.7	H	74.0	-16.3	PK	148	1.4	RB 1 MHz;VB 3 MHz;Peak
16000.090	55.6	H	74.0	-18.4	PK	261	1.6	RB 1 MHz;VB 3 MHz;Peak

Run #2b: High Channel

Channel: 11 & 64 Mode: ac20 Pwr Setting: 23.5 (q94) & 18 (q72)
Tx Chain: 4TX Data Rate: 6.5 Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
21279.880	45.7	H	54.0	-8.3	AVG	343	1.3	RB 1 MHz;VB 300 Hz;Peak
16000.130	45.5	H	54.0	-8.5	AVG	261	1.6	RB 1 MHz;VB 300 Hz;Peak
9706.480	54.5	H	68.3	-13.8	PK	268	1.5	RB 1 MHz;VB 3 MHz;Peak
16000.090	55.6	H	74.0	-18.4	PK	261	1.6	RB 1 MHz;VB 3 MHz;Peak
21280.140	54.3	H	74.0	-19.7	PK	343	1.3	RB 1 MHz;VB 3 MHz;Peak

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #3, Radiated Spurious Emissions, 1,000 - 40,000 MHz. Operation in the 5470-5725 MHz Band

Run #5a: Center Channel

Channel: 6 & 116 Mode: ac20 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 4Tx Data Rate: 6.5

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
18599.980	51.5	H	54.0	-2.5	AVG	26	1.3	RB 1 MHz;VB 300 Hz;Peak
22319.900	46.6	H	54.0	-7.4	AVG	46	1.3	RB 1 MHz;VB 300 Hz;Peak
16000.130	45.5	H	54.0	-8.5	AVG	261	1.6	RB 1 MHz;VB 300 Hz;Peak
9706.480	54.5	H	68.3	-13.8	PK	268	1.5	RB 1 MHz;VB 3 MHz;Peak
18599.980	57.0	H	74.0	-17.0	PK	26	1.3	RB 1 MHz;VB 3 MHz;Peak
16000.090	55.6	H	74.0	-18.4	PK	261	1.6	RB 1 MHz;VB 3 MHz;Peak
22319.890	54.9	H	74.0	-19.1	PK	46	1.3	RB 1 MHz;VB 3 MHz;Peak

Run #3b: Center Channel

Channel: 6 &110 Mode: 11ac40 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 4Tx Data Rate: 13.5

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
22199.650	51.4	H	54.0	-2.6	AVG	54	1.3	RB 1 MHz;VB 300 Hz;Peak
18499.920	50.9	H	54.0	-3.1	AVG	25	1.4	RB 1 MHz;VB 300 Hz;Peak
16000.130	45.5	H	54.0	-8.5	AVG	261	1.6	RB 1 MHz;VB 300 Hz;Peak
9706.480	54.5	H	68.3	-13.8	PK	268	1.5	RB 1 MHz;VB 3 MHz;Peak
22199.870	57.7	H	74.0	-16.3	PK	54	1.3	RB 1 MHz;VB 3 MHz;Peak
18499.800	56.2	H	74.0	-17.8	PK	25	1.4	RB 1 MHz;VB 3 MHz;Peak
16000.090	55.6	H	74.0	-18.4	PK	261	1.6	RB 1 MHz;VB 3 MHz;Peak

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #3d: Low Channel

Channel: 6 & 122 Mode: b & ac80 Pwr Setting: 22.25 (q89) & 18 (q72)
Tx Chain: 1Tx & 4Tx Data Rate: 1 & 29.3

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
18699.920	48.7	H	54.0	-5.3	AVG	38	1.4	RB 1 MHz;VB 1 kHz;Peak
22439.730	48.5	H	54.0	-5.5	AVG	61	1.3	RB 1 MHz;VB 1 kHz;Peak
15999.990	46.2	H	54.0	-7.8	AVG	261	1.6	RB 1 MHz;VB 1 kHz;Peak
9706.480	54.5	H	68.3	-13.8	PK	268	1.5	RB 1 MHz;VB 3 MHz;Peak
16000.330	55.7	H	74.0	-18.3	PK	261	1.6	RB 1 MHz;VB 3 MHz;Peak
22439.950	55.1	H	74.0	-18.9	PK	61	1.3	RB 1 MHz;VB 3 MHz;Peak
18700.050	54.0	H	74.0	-20.0	PK	38	1.4	RB 1 MHz;VB 3 MHz;Peak

Run #3e: Low Channel

Channel: 6 & 114 Mode: 1 & ac160 Pwr Setting: 22.25 (q89) & 18 (q72)
Tx Chain: 1Tx & 4Tx Data Rate: 1 & 58.5 Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
18566.600	51.3	H	54.0	-2.7	AVG	110	1.4	RB 1 MHz;VB 1 kHz;Peak
22279.880	50.2	H	54.0	-3.8	AVG	122	1.5	RB 1 MHz;VB 1 kHz;Peak
6270.000	62.8	V	68.3	-5.5	PK	360	2.1	POS; RB 1 MHz; VB: 3 MHz
15999.990	46.2	H	54.0	-7.8	AVG	261	1.6	RB 1 MHz;VB 1 kHz;Peak
18566.540	62.2	H	74.0	-11.8	PK	110	1.4	RB 1 MHz;VB 3 MHz;Peak
9706.480	54.5	H	68.3	-13.8	PK	268	1.5	RB 1 MHz;VB 3 MHz;Peak
22279.830	58.0	H	74.0	-16.0	PK	122	1.5	RB 1 MHz;VB 3 MHz;Peak
16000.330	55.7	H	74.0	-18.3	PK	261	1.6	RB 1 MHz;VB 3 MHz;Peak

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #4: Radiated Spurious Emissions, 1,000 - 40000 MHz. Operating Mode: Worse case from Run #3

Run #4a: Low Channel

Channel: 1 & 100 Mode: ac20 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 4Tx Data Rate: 6.5

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
16000.130	45.5	H	54.0	-8.5	AVG	261	1.6	RB 1 MHz;VB 300 Hz;Peak
18333.330	43.4	H	54.0	-10.6	AVG	137	1.6	RB 1 MHz;VB 300 Hz;Peak
21999.760	55.5	H	68.3	-12.8	PK	162	1.6	RB 1 MHz;VB 3 MHz;Peak
16000.090	55.6	H	74.0	-18.4	PK	261	1.6	RB 1 MHz;VB 3 MHz;Peak
18333.190	51.0	H	74.0	-23.0	PK	137	1.6	RB 1 MHz;VB 3 MHz;Peak

Run #4b: High Channel

Channel: 11 & 144 Mode: ac20 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 4Tx Data Rate: 6.5

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
22879.900	51.8	H	54.0	-2.2	AVG	144	1.5	RB 1 MHz;VB 300 Hz;Peak
16000.130	45.5	H	54.0	-8.5	AVG	261	1.6	RB 1 MHz;VB 300 Hz;Peak
19066.310	44.5	H	54.0	-9.5	AVG	132	1.6	RB 1 MHz;VB 300 Hz;Peak
22879.800	56.6	H	74.0	-17.4	PK	144	1.5	RB 1 MHz;VB 3 MHz;Peak
16000.090	55.6	H	74.0	-18.4	PK	261	1.6	RB 1 MHz;VB 3 MHz;Peak
19066.440	52.1	H	74.0	-21.9	PK	132	1.6	RB 1 MHz;VB 3 MHz;Peak

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

RSS-247 and FCC 15.407 (UNII) Radiated Spurious Emissions

Test Specific Details

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

General Test Configuration

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

Ambient Conditions:

Temperature: 19-23 °C
Rel. Humidity: 42-45 %

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:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Summary of Results

Run #	Mode	Channel Frequency	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
20MHz Bandwith Modes							
2	g / a	11 & 64	26 / 26	26 / 20	Restricted Band Edge at 5350 MHz	15.209	73.7 dBµV/m @ 5351.4 MHz (-0.3 dB)
	g / a	11 & 60	26 / 26	26 / 26	Restricted Band Edge at 5350 MHz	15.209	52.0 dBµV/m @ 5350.0 MHz (-2.0 dB)
3	g / a	1 & 100	26 / 26	26 / 26	Restricted Band Edge at 5460 MHz	15.209	73.6 dBµV/m @ 5459.4 MHz (-0.4 dB)
	g / a	1 & 100	26 / 26	26 / 13	Band Edge 5460 - 5470 MHz	15E	66.9 dBµV/m @ 5465.0 MHz (-1.4 dB)
	g / a	1 & 104	26 / 26	26 / 23	Band Edge 5460 - 5470 MHz	15E	67.1 dBµV/m @ 5469.9 MHz (-1.2 dB)
	g / a	11 & 140	26 / 26	26 / 12	Band Edge 5725MHz	15E	66.9 dBµV/m @ 5465.0 MHz (-1.4 dB)
	g / a	11 & 136	26 / 18	26 / 18	Band Edge 5725MHz	15E	66.1 dBµV/m @ 5758.8 MHz (-2.2 dB)
	g / a	11 & 132	26 / 26	26 / 25	Band Edge 5725MHz	15E	64.5 dBµV/m @ 5763.3 MHz (-3.8 dB)
4	ac20	11 & 64	24 / 18	24 / 18	Restricted Band Edge at 5350 MHz	15.209	52.2 dBµV/m @ 5372.0 MHz (-1.8 dB)
5	ac20	1 & 100	24 / 18	24 / 18	Restricted Band Edge at 5460 MHz	15.209	51.2 dBµV/m @ 5448.8 MHz (-2.8 dB)
	ac20	1 & 100	24 / 18	24 / 18	Band Edge 5460 - 5470 MHz	15E	64.2 dBµV/m @ 5469.8 MHz (-4.1 dB)
	ac20	11 & 140	24 / 18	24 / 18	Band Edge 5725MHz	15E	66.8 dBµV/m @ 5725.1 MHz (-1.5 dB)
40MHz Bandwith Modes							
6	ac40	9 & 62	24 / 18	24 / 16.75	Restricted Band Edge at 5350 MHz	15.209	53.8 dBµV/m @ 5350.8 MHz (-0.2 dB)
7	ac40	3 & 102	24 / 18	24 / 18	Restricted Band Edge at 5460 MHz	15.209	52.4 dBµV/m @ 5458.2 MHz (-1.6 dB)
	ac40	3 & 102	24 / 18	24 / 18	Band Edge 5460 - 5470 MHz	15E	66.7 dBµV/m @ 5463.1 MHz (-1.6 dB)
	ac40	9 & 134	24 / 18	24 / 18	Band Edge 5725MHz	15E	64.2 dBµV/m @ 5728.5 MHz (-4.1 dB)

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Summary of Results

Run #	Mode	Channel Frequency	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
80MHz Bandwith Modes							
8	b / ac80	6 & 58	26 / 18	26 / 16.5	Restricted Band Edge at 5350 MHz	15.209	53.3 dBµV/m @ 5350.8 MHz (-0.7 dB)
9	b / ac80	1 & 106	26 / 18	26 / 18	Restricted Band Edge at 5460 MHz	15.209	52.6 dBµV/m @ 5459.0 MHz (-1.4 dB)
	b / ac80	1 & 106	26 / 18	26 / 18	Band Edge 5460 - 5470 MHz	15E	66.5 dBµV/m @ 5463.6 MHz (-1.8 dB)
160MHz Bandwith Modes							
10	b / ac160	6 & 50	26 / 18	26 / 17.25	Restricted Band Edge at 5150 MHz	15.209	53.8 dBµV/m @ 5142.2 MHz (-0.2 dB)
	b / ac160	6 & 50	26 / 18	26 / 17.25	Restricted Band Edge at 5350 MHz	15.209	53.3 dBµV/m @ 5373.7 MHz (-0.7 dB)
11	b / ac160	6 & 114	26 / 18	26 / 17	Restricted Band Edge at 5460 MHz	15.209	53.5 dBµV/m @ 5459.0 MHz (-0.5 dB)
	b / ac160	6 & 114	26 / 18	26 / 17	Band Edge 5460 - 5470 MHz	15E	66.5 dBµV/m @ 5463.2 MHz (-1.8 dB)

Sample Notes

Sample S/N: M11917QW000T

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033
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 50 traces. (method VB of KDB 789033)

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)	Packet
11a	6	99.0%	Yes	5.06	0.0	0.0	10	7974
ac20	6.5	0.98	Yes	5.271	0.1	0.2	190	4324
ac40	13.5	0.97	Yes	5.24	0.1	0.2	191	8811
ac80	29.3	0.96	Yes	1.432	0.2	0.4	698	5159
ac160	58.5	0.96	Yes	1.439	0.2	0.4	695	10443

Measurement Specific Notes:

Note 1:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector). Per KDB 789033 2) c) (i), compliance can be demonstrated by meeting the average and peak limits of 15.209, as an alternative.
Note 2:	Emission has a duty cycle ≥ 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces (method AD of KDB 789033)
Note 3:	Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear averaging, auto sweep,max hold 50*1/DC traces (method VB of KDB 789033)
Note 4:	Emission has a duty cycle < 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100*1/DC traces, measurement corrected by Pwr correction factor (method AD of KDB 789033)
Note 5:	Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements.
Note 6:	For SISO measurment, evaluation of each chain showed that chain 4 has the highest power measurment. All SISO test measurment were performed with chain 4 active.

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #2: Radiated Bandedge Measurements, 5250-5350MHz

Date of Test: 07/12/19 Config. Used: 1

Test Engineer: Rafael Varelas Config Change: None

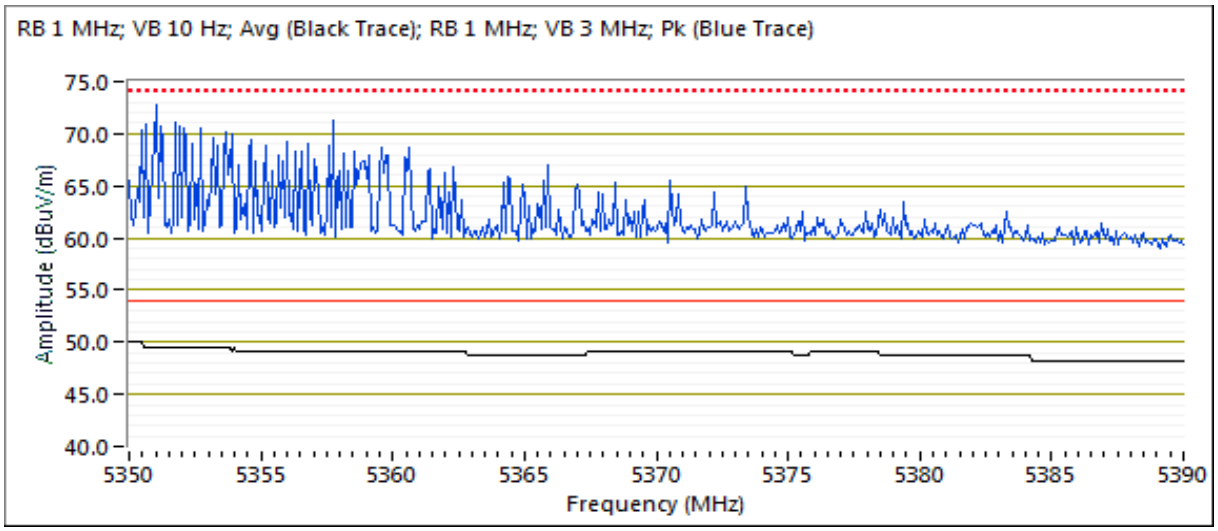
Test Location: FT Chamber #5 EUT Voltage: 120V/60Hz

Channel: 64 Mode: a Pwr Setting: 20 (q80)

Tx Chain: Tx1 Data Rate: 6.0 Mbps

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.020	50.0	V	54.0	-4.0	AVG	79	1.4	POS; RB 1 MHz; VB: 10 Hz
5351.420	73.7	V	74.0	-0.3	PK	79	1.4	POS; RB 1 MHz; VB: 3 MHz
5350.000	48.2	H	54.0	-5.8	AVG	178	1.3	POS; RB 1 MHz; VB: 10 Hz
5351.840	67.0	H	74.0	-7.0	PK	178	1.3	POS; RB 1 MHz; VB: 3 MHz

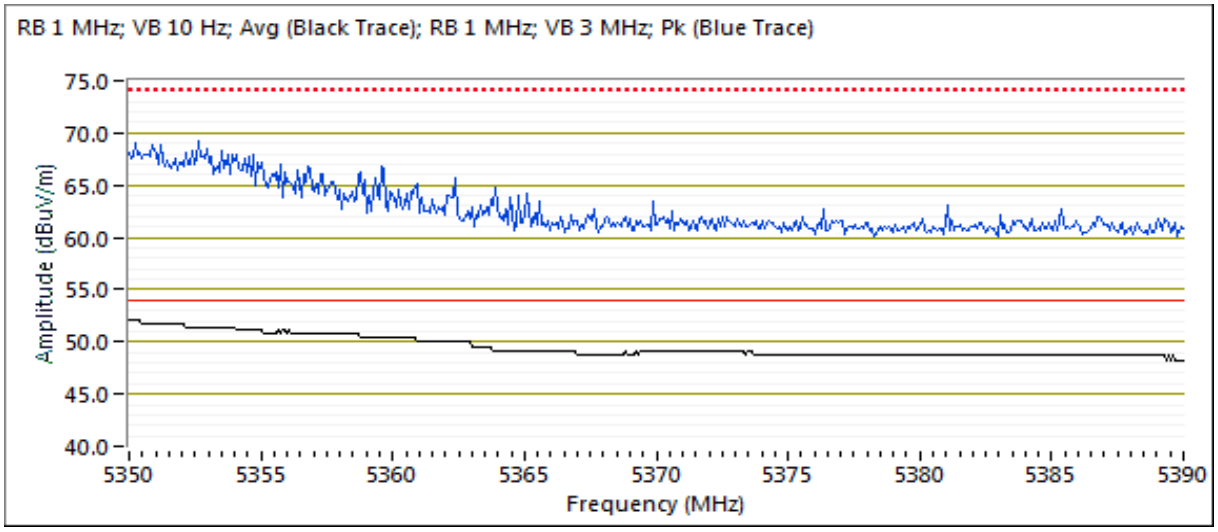


Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Channel: 60 Mode: a Pwr Setting: 26 (q104)
Tx Chain: Tx1 Data Rate: 6.0 Mbps

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.000	52.0	V	54.0	-2.0	AVG	204	1.0	POS; RB 1 MHz; VB: 10 Hz
5350.460	71.5	V	74.0	-2.5	PK	204	1.0	POS; RB 1 MHz; VB: 3 MHz
5350.000	48.2	H	54.0	-5.8	AVG	112	1.0	POS; RB 1 MHz; VB: 10 Hz
5353.230	62.6	H	74.0	-11.4	PK	112	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #3: Radiated Bandedge Measurements, 5470-5725MHz

Date of Test: 07/12/19 Config. Used: 1

Test Engineer: Mehran Birgani Config Change: None

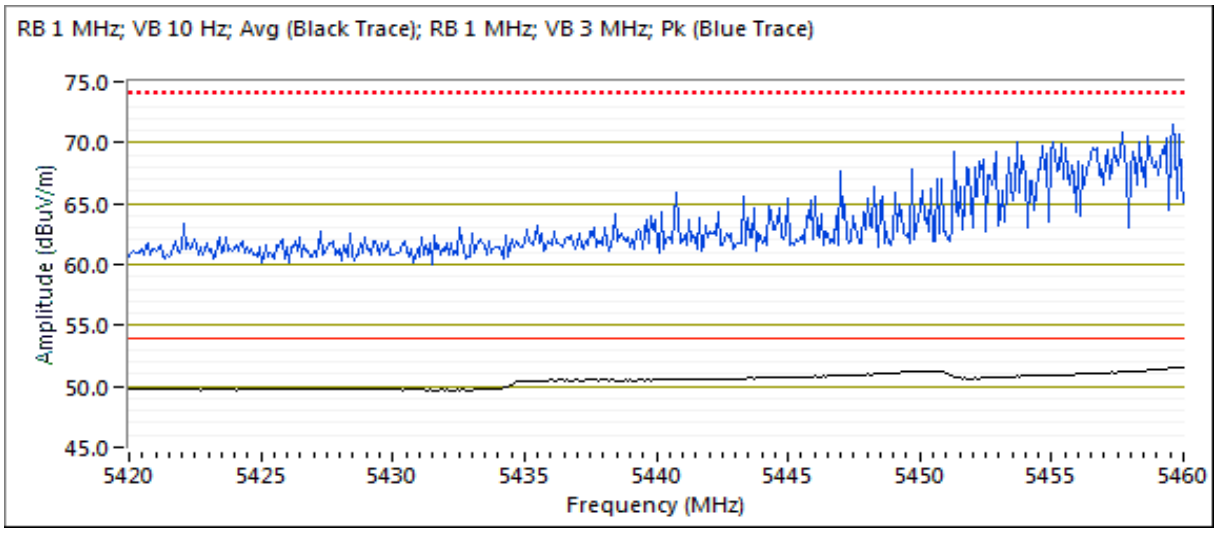
Test Location: FT Chamber #5 EUT Voltage: 120V/60Hz

Channel: 100 Mode: a Pwr Setting: 26 (q104)

Tx Chain: 1TX Data Rate: 6.0 Mbps

5460 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.430	73.6	V	74.0	-0.4	PK	210	1.3	POS; RB 1 MHz; VB: 3 MHz
5459.940	51.6	V	54.0	-2.4	AVG	210	1.3	POS; RB 1 MHz; VB: 10 Hz
5460.000	50.5	H	54.0	-3.5	AVG	46	1.3	POS; RB 1 MHz; VB: 10 Hz
5458.800	69.6	H	74.0	-4.4	PK	46	1.3	POS; RB 1 MHz; VB: 3 MHz

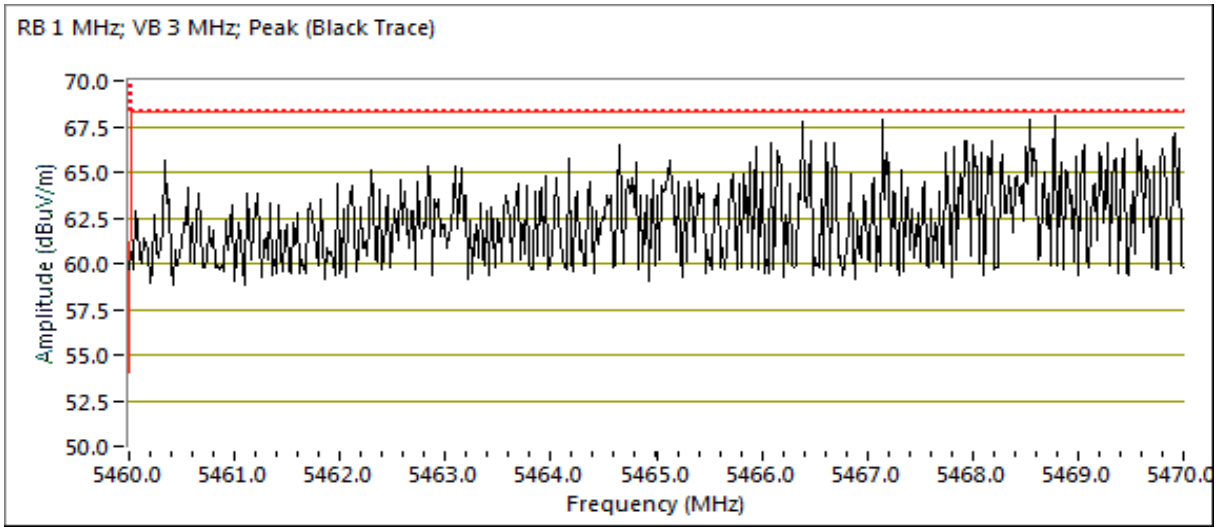


Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Channel: 100 Mode: a Pwr Setting: 13 (q52)
Tx Chain: 1TX Data Rate: 6.0 Mbps

5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5464.970	66.9	V	68.3	-1.4	PK	210	1.3	POS; RB 1 MHz; VB: 3 MHz
5460.380	60.8	H	68.3	-7.5	PK	360	1.3	POS; RB 1 MHz; VB: 3 MHz

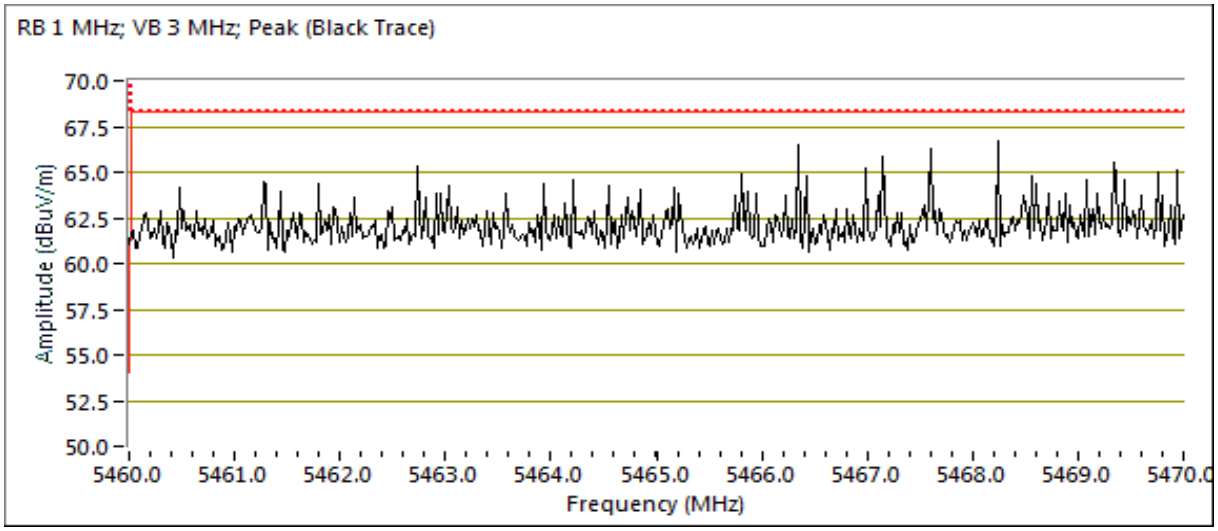


Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Channel: 104 Mode: a Pwr Setting: 23 (q92)
Tx Chain: 1TX Data Rate: 6.0 Mbps

5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5469.860	67.1	V	68.3	-1.2	PK	208	1.3	POS; RB 1 MHz; VB: 3 MHz
5463.650	61.6	H	68.3	-6.7	PK	360	1.3	POS; RB 1 MHz; VB: 3 MHz

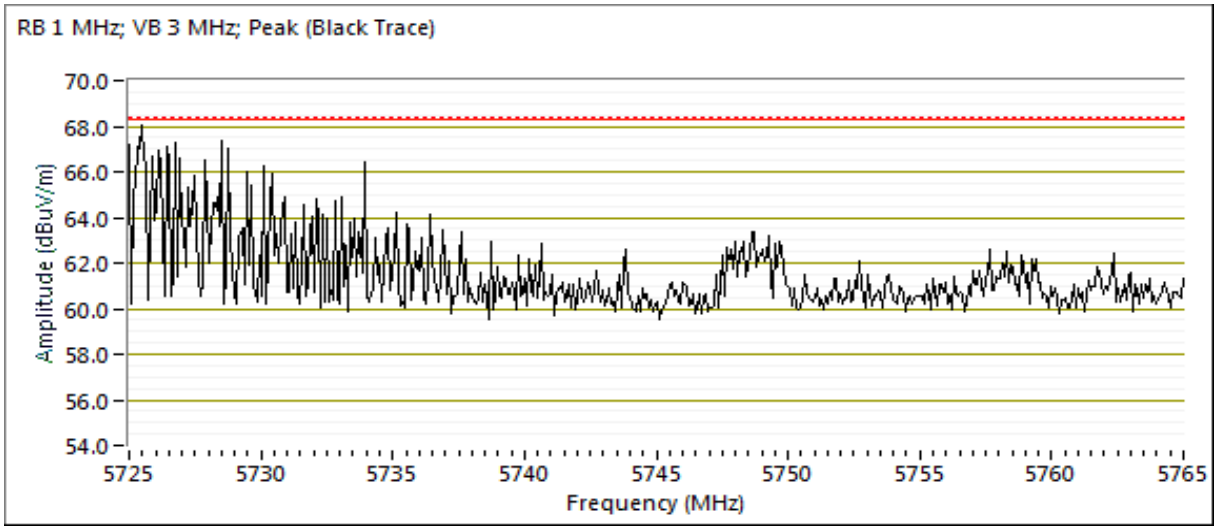


Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Channel: 140 Mode: a Pwr Setting: 12 (q48)
Tx Chain: 1TX Data Rate: 6.0 Mbps

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5732.640	67.4	V	68.3	-0.9	PK	208	1.3	POS; RB 1 MHz; VB: 3 MHz

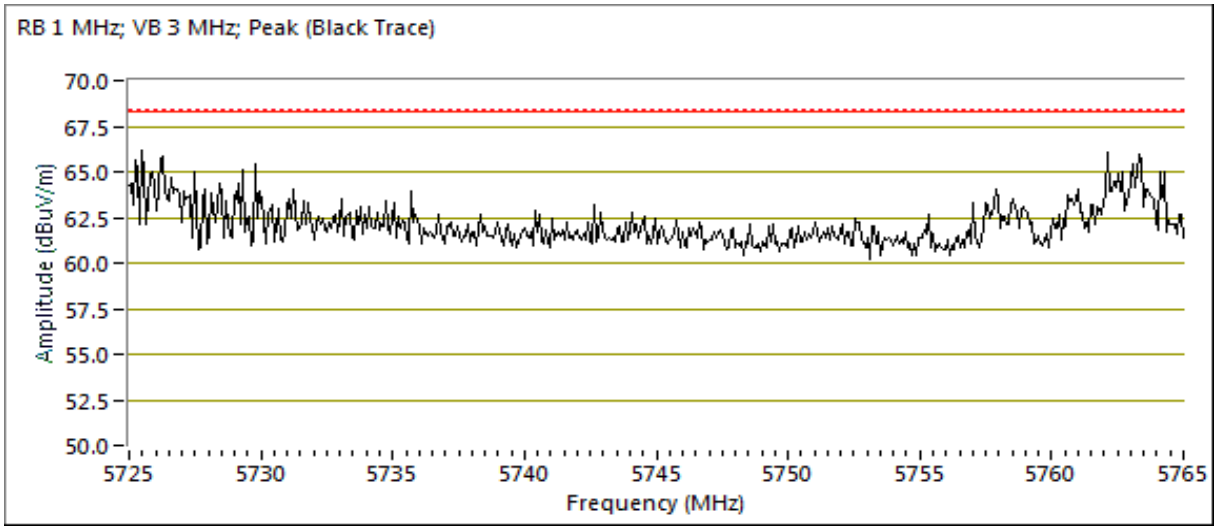


Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Channel: 136 Mode: a Pwr Setting: 18 (q72)
Tx Chain: 1TX Data Rate: 6.0 Mbps

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5758.750	66.1	V	68.3	-2.2	PK	208	1.3	RB 1 MHz; VB: 3 MHz

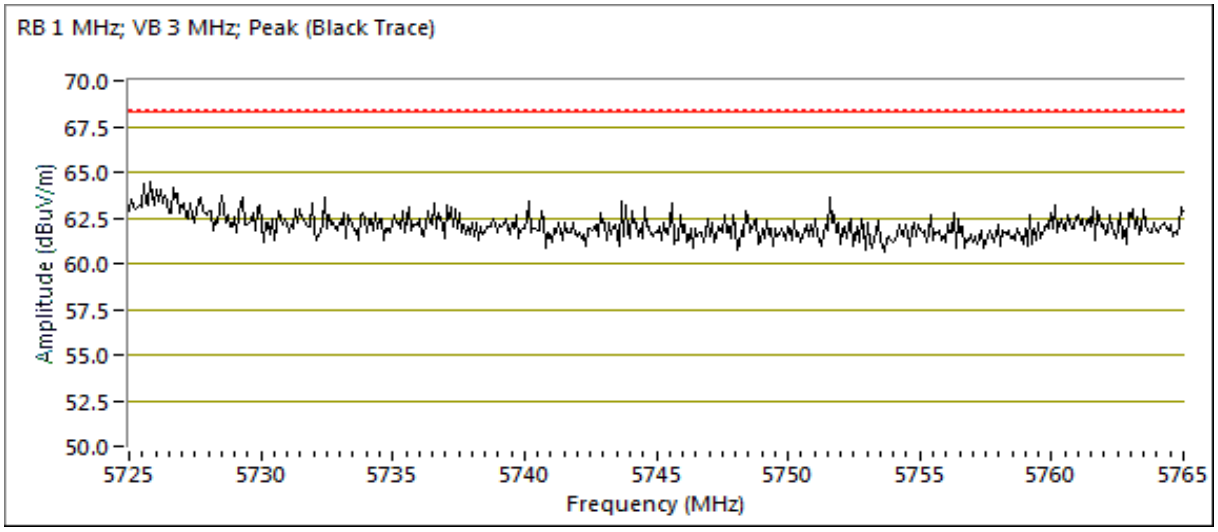


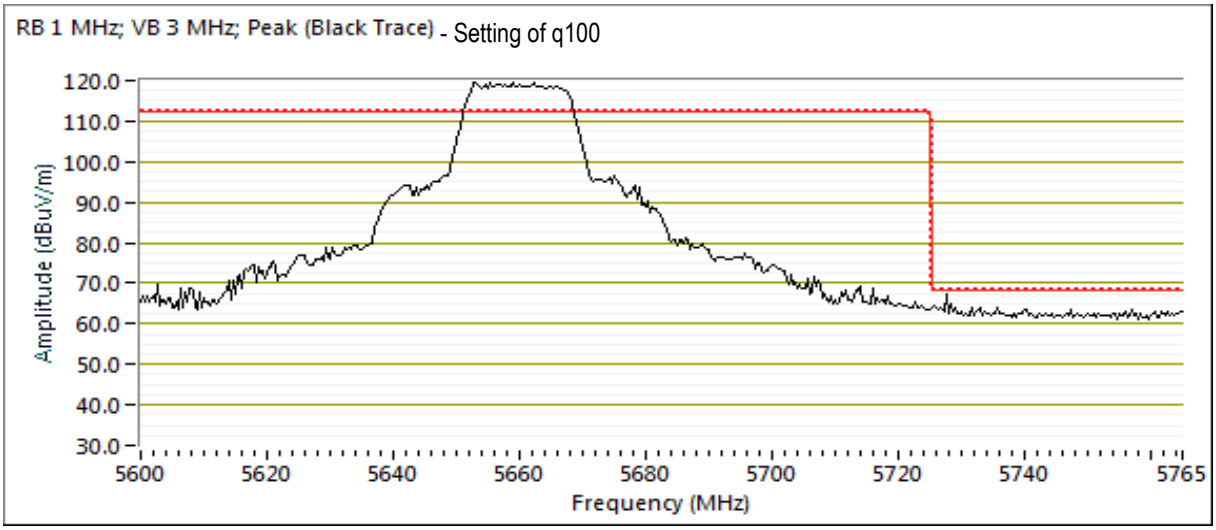
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Channel: 132 Mode: a Pwr Setting: 25 (a100)
Tx Chain: 1TX Data Rate: 6.0 Mbps

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5763.320	64.5	V	68.3	-3.8	PK	208	1.3	POS; RB 1 MHz; VB: 3 MHz





Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #4: Radiated Bandedge Measurements, 5250-5350MHz

Date of Test: 07/12/19 Config. Used: 1

Test Engineer: Mehran Birgani Config Change: None

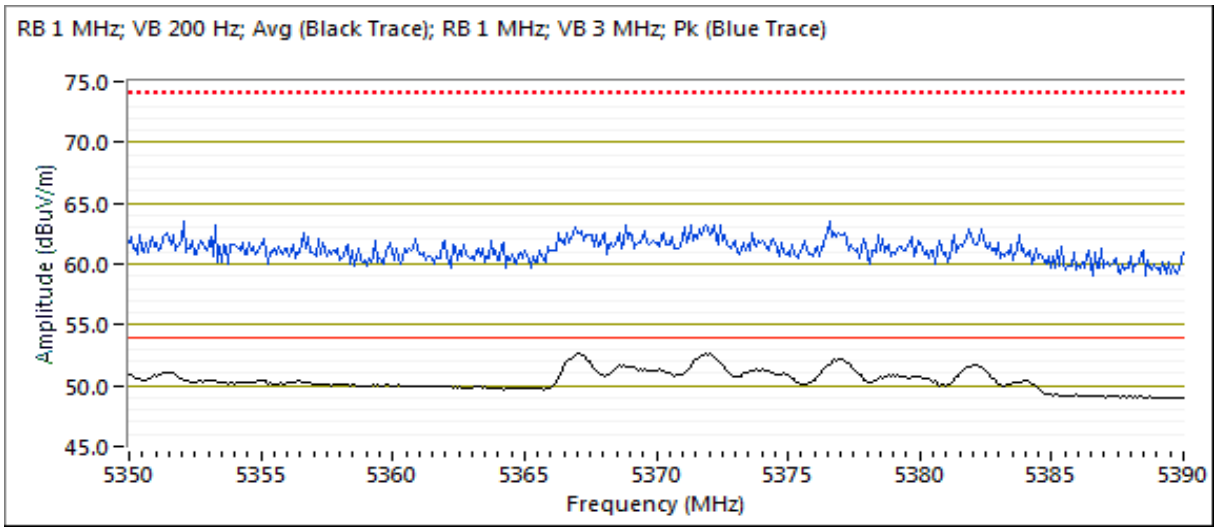
Test Location: FT Chamber #5 EUT Voltage: 120V/60Hz

Channel: 64 Mode: ac20 Pwr Setting: 18 (q72)

Tx Chain: 4TX Data Rate: 6.5 Mbps

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5372.040	52.2	V	54.0	-1.8	AVG	66	1.8	Note 3: RB 1 MHz; VB: 200 Hz
5367.070	63.4	V	74.0	-10.6	PK	66	1.8	RB 1 MHz; VB: 3 MHz
5370.680	51.5	H	54.0	-2.5	AVG	74	1.8	Note 3: RB 1 MHz; VB: 200 Hz
5379.260	62.8	H	74.0	-11.2	PK	74	1.8	POS; RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #5: Radiated Bandedge Measurements, 5470-5725MHz

Date of Test: 07/12/19 Config. Used: 1

Test Engineer: Mehran Birgani Config Change: None

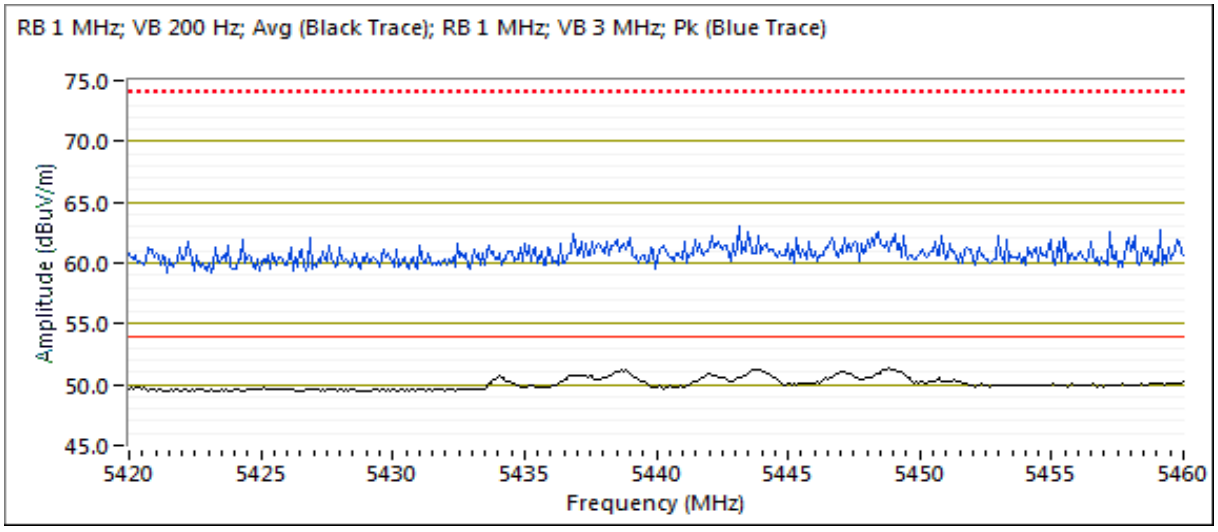
Test Location: FT Chamber #5 EUT Voltage: 120V/60Hz

Channel: 100 Mode: ac20 Pwr Setting: 18 (q72)

Tx Chain: 4TX Data Rate: 6.5 Mbps

5460 MHz Band Edge Signal Radiated Field Strength

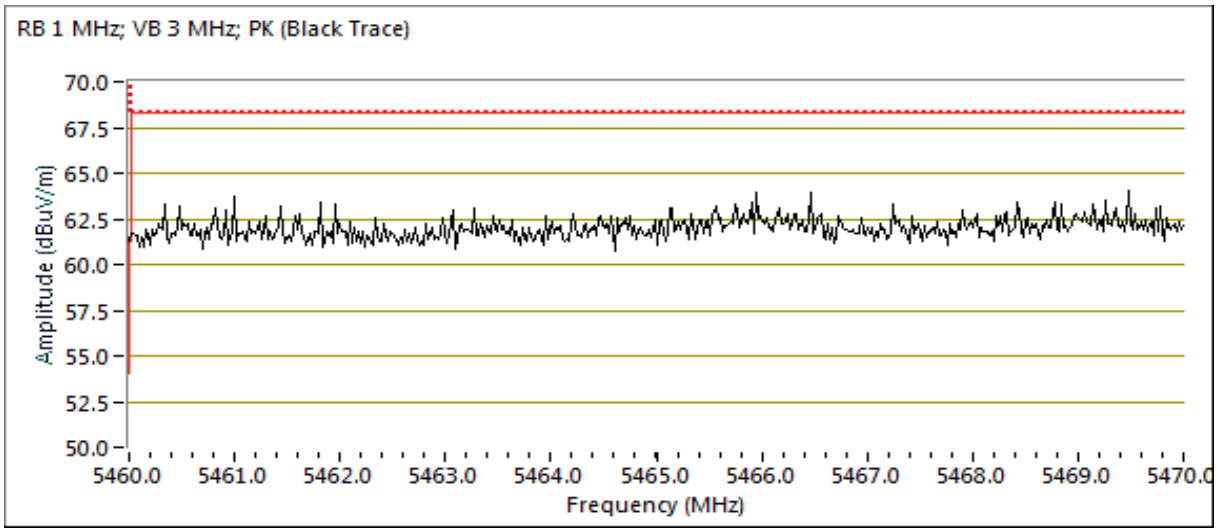
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5448.780	51.2	V	54.0	-2.8	AVG	26	1.8	Note 3: RB 1 MHz; VB: 200 Hz
5451.420	64.0	V	74.0	-10.0	PK	26	1.8	RB 1 MHz; VB: 3 MHz
5446.020	50.6	H	54.0	-3.4	AVG	79	1.8	Note 3: RB 1 MHz; VB: 200 Hz
5437.040	62.8	H	74.0	-11.2	PK	79	1.8	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5469.800	64.2	V	68.3	-4.1	PK	26	1.8	RB 1 MHz; VB: 3 MHz
5469.880	62.2	H	68.3	-6.1	PK	79	1.8	RB 1 MHz; VB: 3 MHz

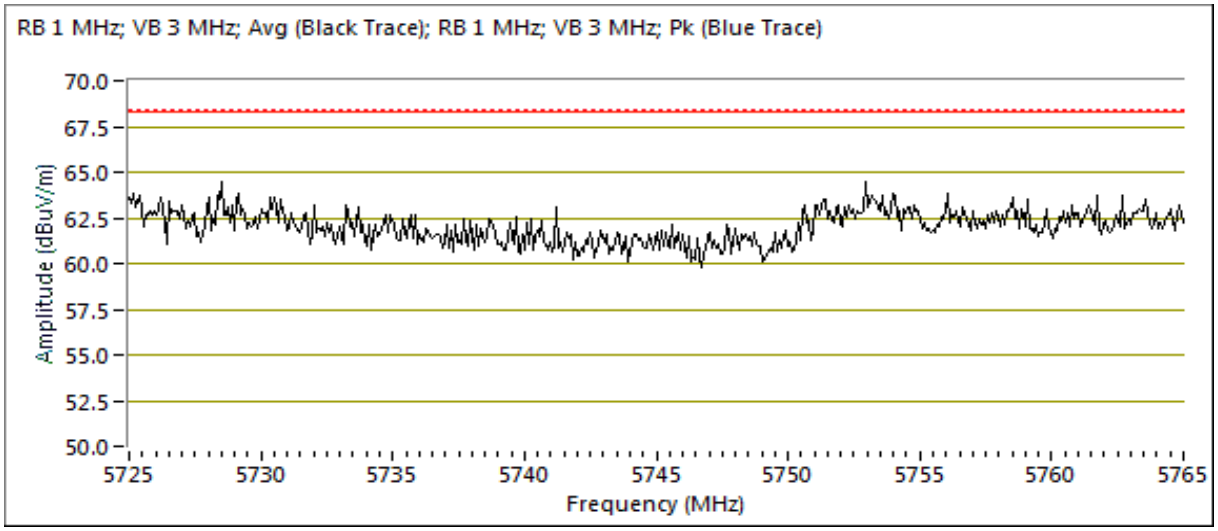


Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Channel: 140 Mode: ac20 Pwr Setting: 18 (q72)
Tx Chain: 4TX Data Rate: 6.5 Mbps

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5725.100	66.8	V	68.3	-1.5	PK	48	1.8	POS; RB 1 MHz; VB: 3 MHz
5726.760	62.0	H	68.3	-6.3	PK	202	1.8	POS; RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #6: Radiated Bandedge Measurements, 5250-5350MHz

Date of Test: 07/15/19 Config. Used: 1

Test Engineer: Rafael Varelas Config Change: None

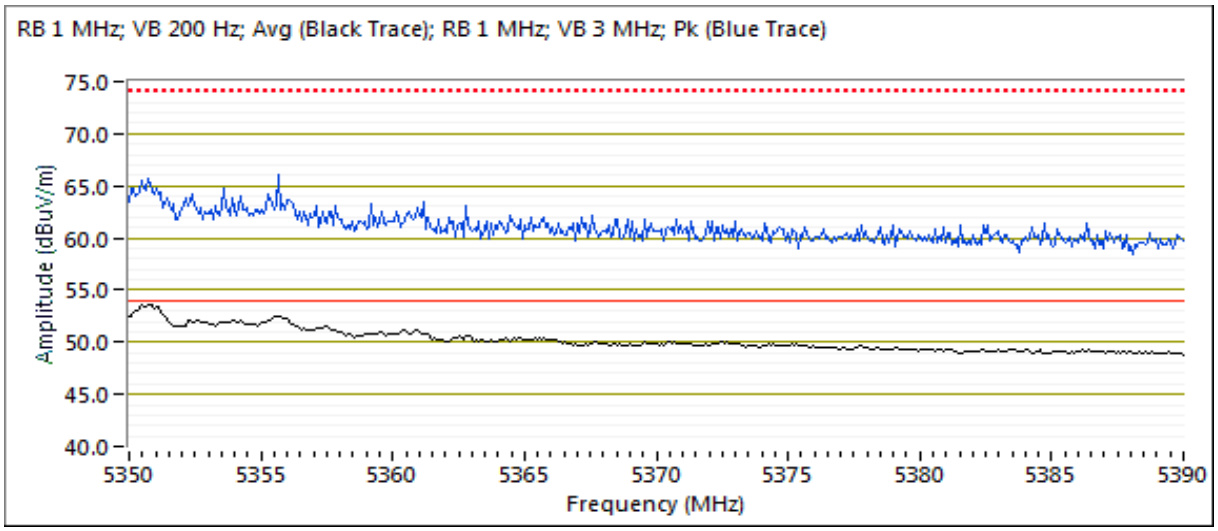
Test Location: FT Chamber #5 EUT Voltage: 120V/60Hz

Channel: 62 Mode: ac40 Pwr Setting: 16.75 (q67)

Tx Chain: 4TX Data Rate: 13.5

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.800	53.8	V	54.0	-0.2	Avg	23	1.9	Note 3: RB 1 MHz; VB: 200 Hz
5350.660	65.9	V	74.0	-8.1	PK	23	1.9	RB 1 MHz; VB: 3 MHz
5350.140	52.7	H	54.0	-1.3	Avg	73	1.3	Note 3: RB 1 MHz; VB: 200 Hz
5354.290	66.7	H	74.0	-7.3	PK	73	1.3	RB 1 MHz; VB: 3 MHz



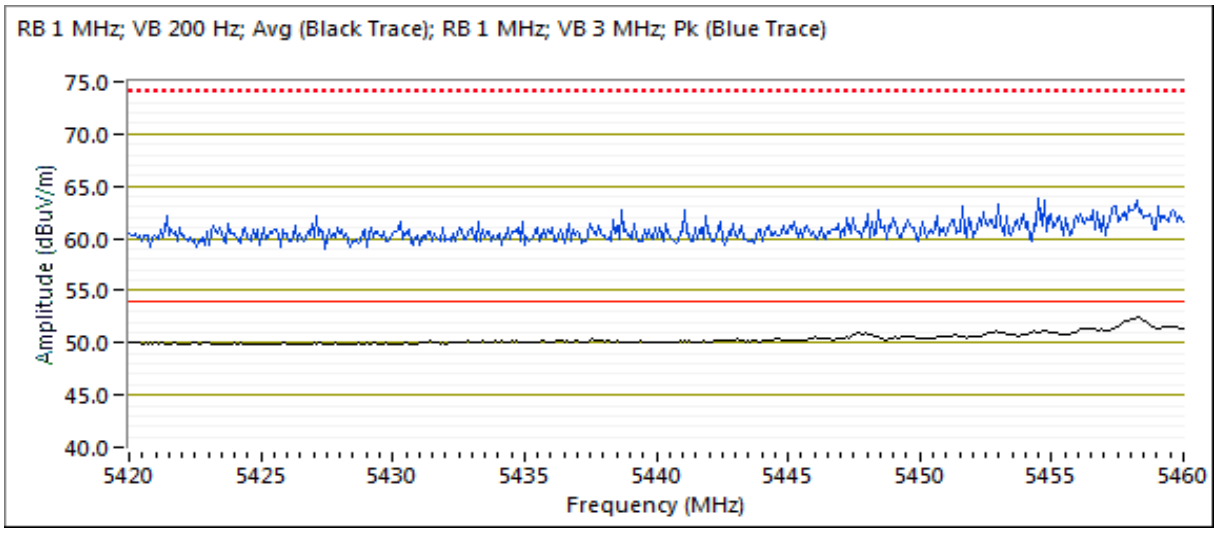
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #7: Radiated Bandedge Measurements, 5470-5725MHz

Channel: 102 Mode: ac40 Pwr Setting: 16.75 (q67)
Tx Chain: 5Tx Data Rate: 13.5

5460 MHz Band Edge Signal Radiated Field Strength

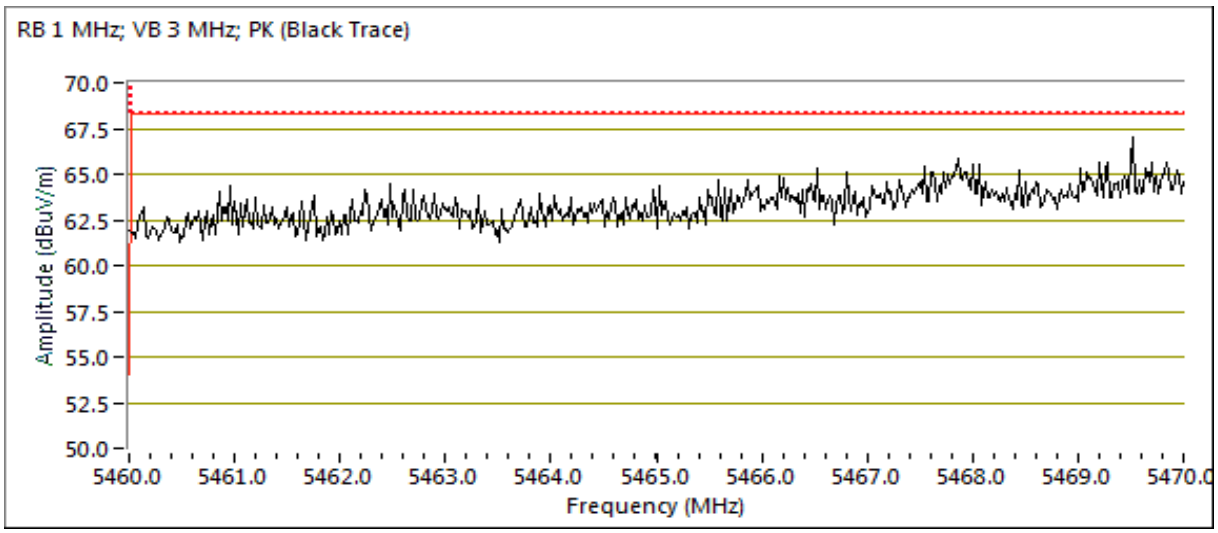
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5458.240	52.4	V	54.0	-1.6	Avg	191	1.7	Note 3: RB 1 MHz; VB: 200 Hz
5457.950	64.2	V	74.0	-9.8	PK	191	1.7	RB 1 MHz; VB: 3 MHz
5455.890	51.2	H	54.0	-2.8	Avg	62	2.3	Note 3: RB 1 MHz; VB: 200 Hz
5455.190	63.8	H	74.0	-10.2	PK	62	2.3	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5469.050	66.7	V	68.3	-1.6	PK	191	1.7	RB 1 MHz; VB: 3 MHz
5468.280	66.3	H	68.3	-2.0	PK	62	2.3	RB 1 MHz; VB: 3 MHz

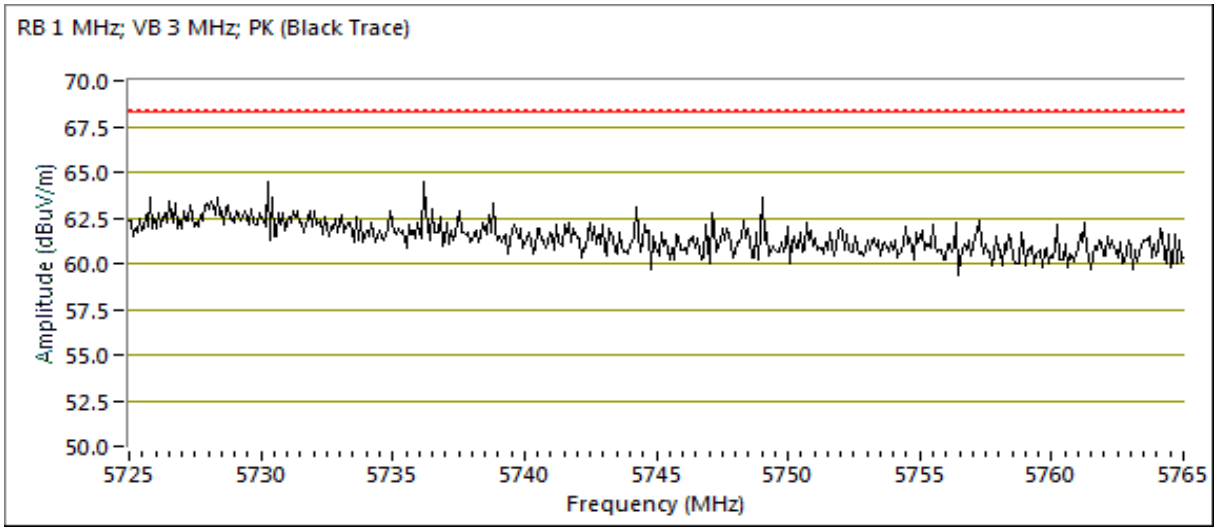


Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Channel: 134 Mode: ac40 Pwr Setting: 18 (q72)
Tx Chain: 4Tx Data Rate: 13.5

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5728.490	64.2	V	68.3	-4.1	PK	190	2.0	RB 1 MHz; VB: 3 MHz
5758.430	63.3	H	68.3	-5.0	PK	254	1.1	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #8: Radiated Bandedge Measurements, 5250-5350MHz

Date of Test: 07/15/19 Config. Used: 1

Test Engineer: Rafael Varelas Config Change: None

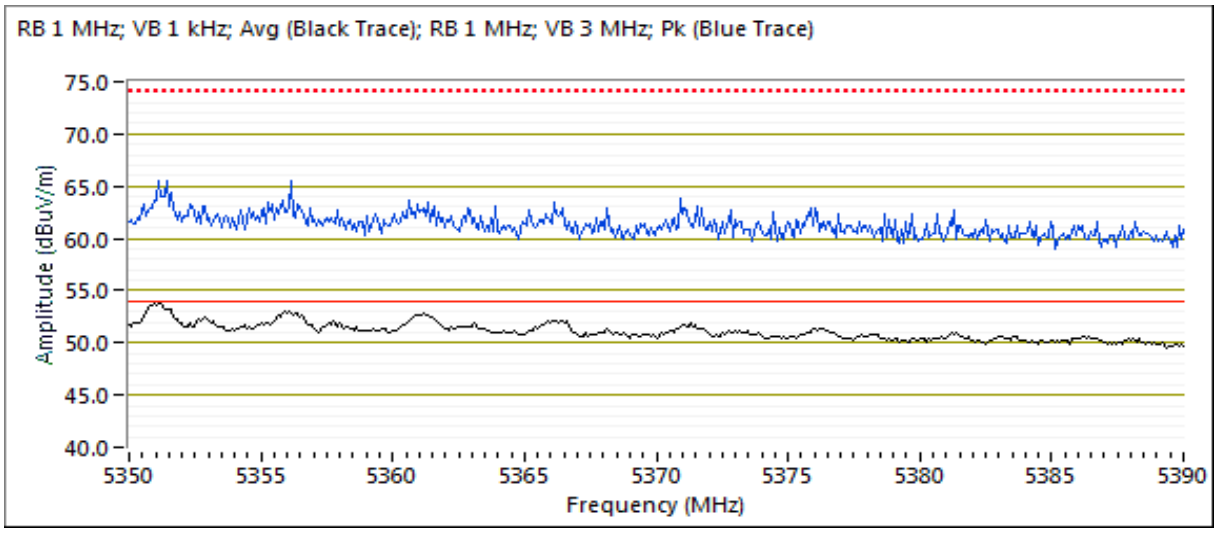
Test Location: FT Chamber #5 EUT Voltage: 120V/60Hz

Channel: 58 Mode: ac80 Pwr Setting: 16.5 (q66)

Tx Chain: 4Tx Data Rate: 29.3

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.780	53.3	V	54.0	-0.7	Avg	17	1.9	Note 3: RB 1 MHz; VB: 1 kHz
5358.060	65.9	V	74.0	-8.1	PK	17	1.9	RB 1 MHz; VB: 3 MHz
5353.450	51.2	H	54.0	-2.8	Avg	79	2.2	Note 3: RB 1 MHz; VB: 1 kHz
5353.570	63.5	H	74.0	-10.5	PK	79	2.2	RB 1 MHz; VB: 3 MHz



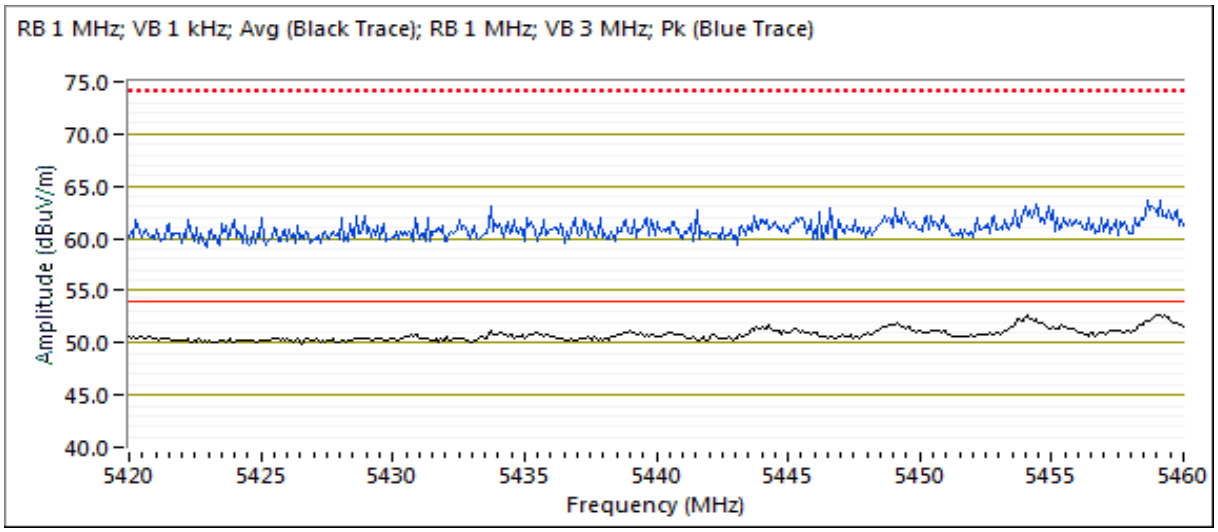
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #9: Radiated Bandedge Measurements, 5470-5725MHz

Channel: 106 Mode: ac80 Pwr Setting: 18 (q72)
Tx Chain: 4Tx Data Rate: 29.3

5460 MHz Band Edge Signal Radiated Field Strength

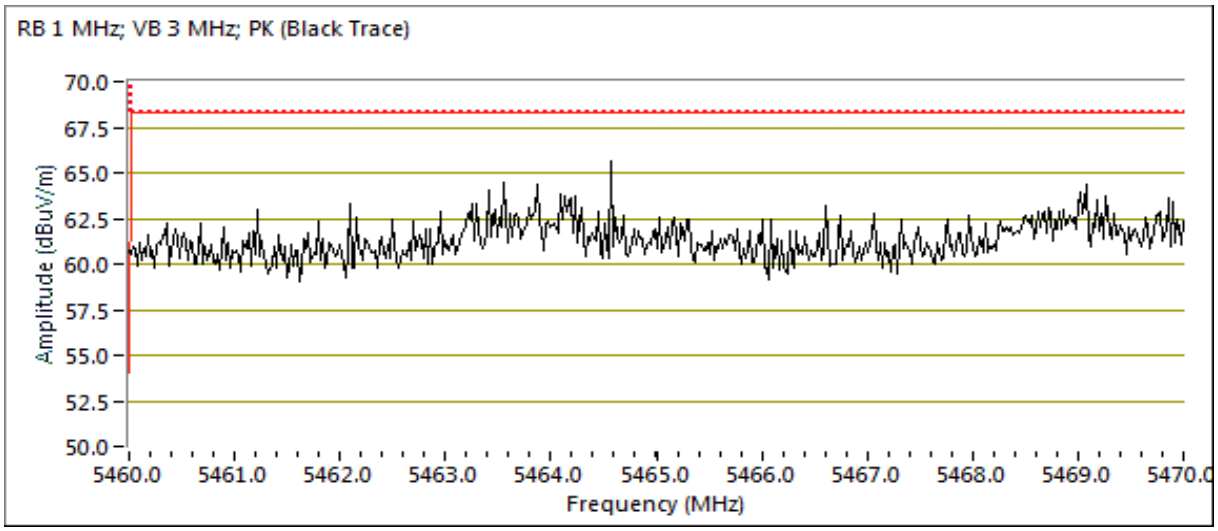
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5458.980	52.6	V	54.0	-1.4	Avg	206	2.3	Note 3: RB 1 MHz; VB: 1 kHz
5454.370	64.7	V	74.0	-9.3	PK	206	2.3	RB 1 MHz; VB: 3 MHz
5459.360	52.4	H	54.0	-1.6	Avg	77	1.1	Note 3: RB 1 MHz; VB: 1 kHz
5458.720	63.6	H	74.0	-10.4	PK	77	1.1	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5464.610	66.5	V	68.3	-1.8	PK	206	2.3	RB 1 MHz; VB: 3 MHz
5469.140	64.1	H	68.3	-4.2	PK	77	1.1	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #10: Radiated Bandedge Measurements, 5150-5350MHz

Date of Test: 07/15/19 Config. Used: 1

Test Engineer: Rafael Varelas Config Change: None

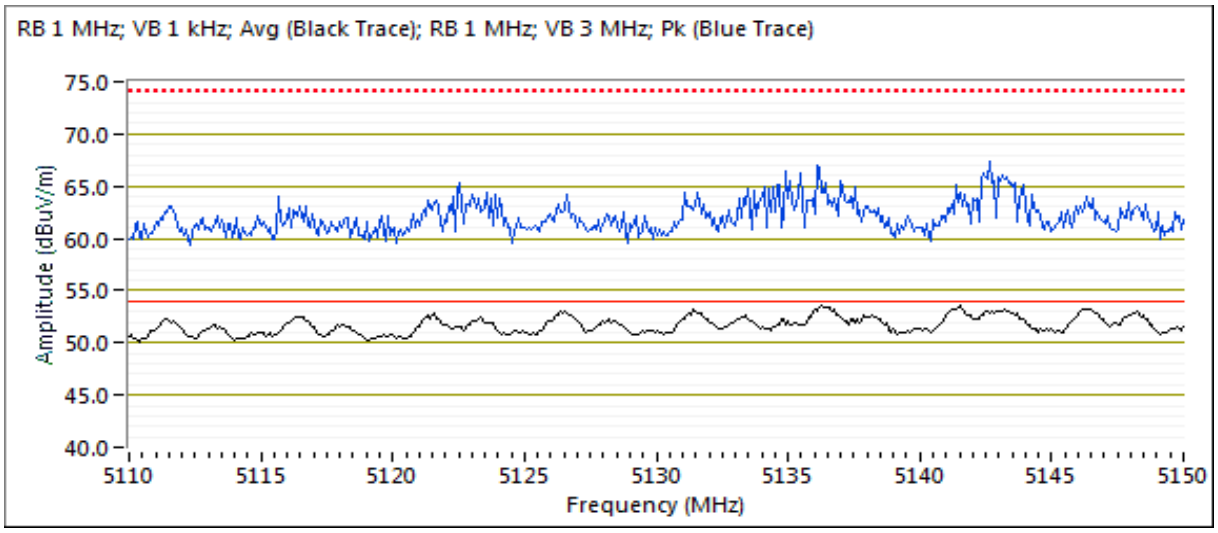
Test Location: FT Chamber #5 EUT Voltage: 120V/60Hz

Channel: 50 Mode: ac160 Pwr Setting: 17.25 (q69)

Tx Chain: 4Tx Data Rate: 58.5

5150 MHz Band Edge Signal Radiated Field Strength

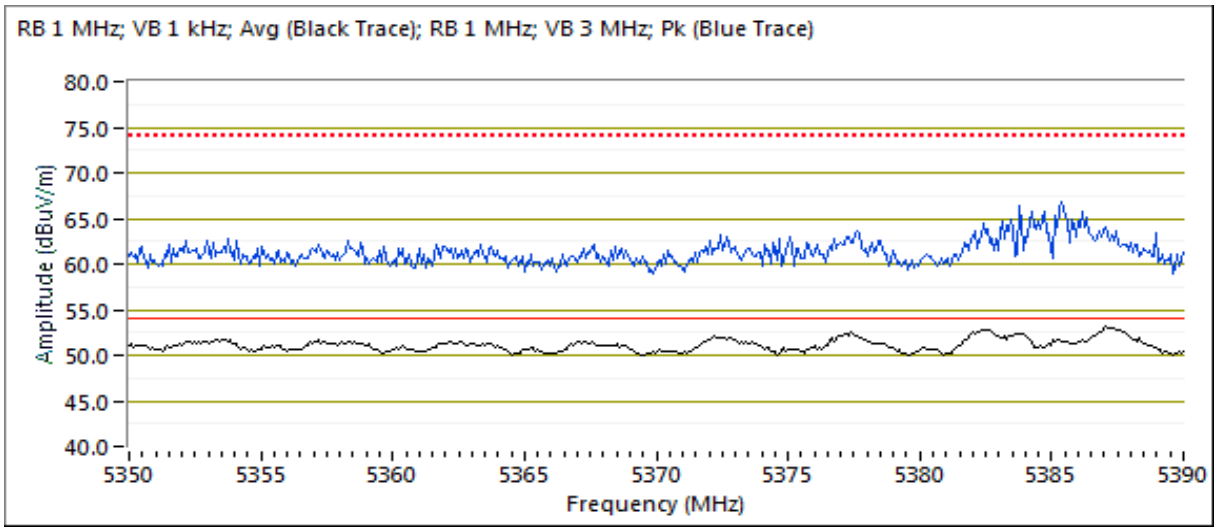
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5142.180	53.8	H	54.0	-0.2	Avg	233	1.1	Note 3: RB 1 MHz; VB: 1 kHz
5144.260	66.4	H	74.0	-7.6	PK	233	1.1	RB 1 MHz; VB: 3 MHz
5141.500	53.5	V	54.0	-0.5	Avg	205	1.6	Note 3: RB 1 MHz; VB: 1 kHz
5136.450	66.4	V	74.0	-7.6	PK	205	1.6	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5373.650	53.3	H	54.0	-0.7	Avg	78	1.9	Note 3: RB 1 MHz; VB: 1 kHz
5375.250	65.9	H	74.0	-8.1	PK	78	1.9	RB 1 MHz; VB: 3 MHz
5387.070	53.1	V	54.0	-0.9	Avg	60	2.4	Note 3: RB 1 MHz; VB: 1 kHz
5383.430	66.0	V	74.0	-8.0	PK	60	2.4	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #11: Radiated Bandedge Measurements, 5470-5725MHz

Date of Test: 07/15/19 Config. Used: 1

Test Engineer: Rafael Varelas Config Change: None

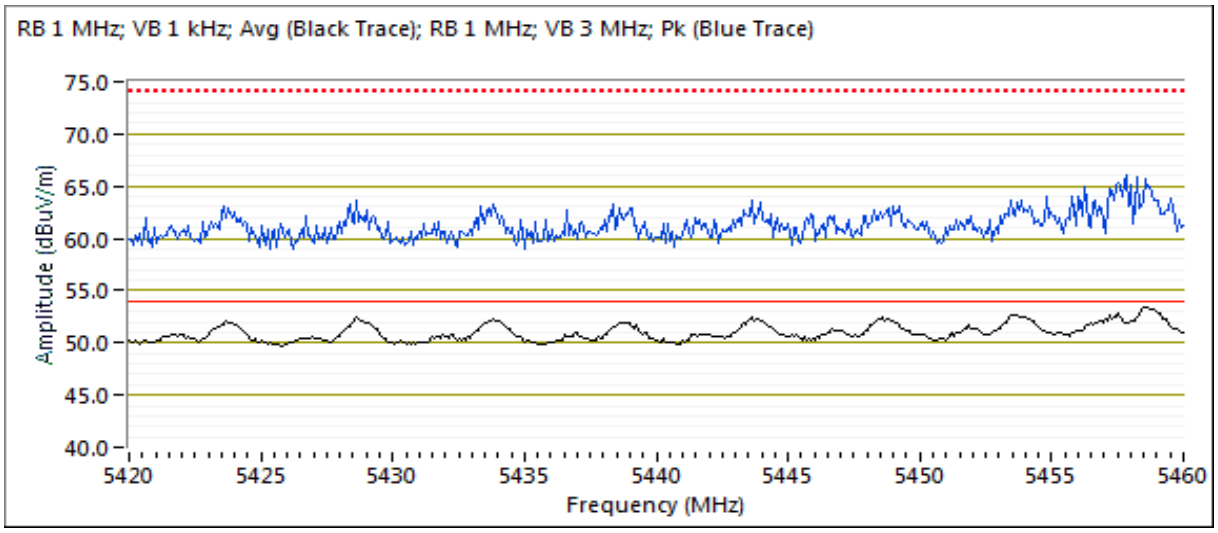
Test Location: FT Chamber #5 EUT Voltage: 120V/60Hz

Channel: 114 Mode: ac160 Pwr Setting: 17 (q68)

Tx Chain: 4Tx Data Rate: 58.5

5460 MHz Band Edge Signal Radiated Field Strength

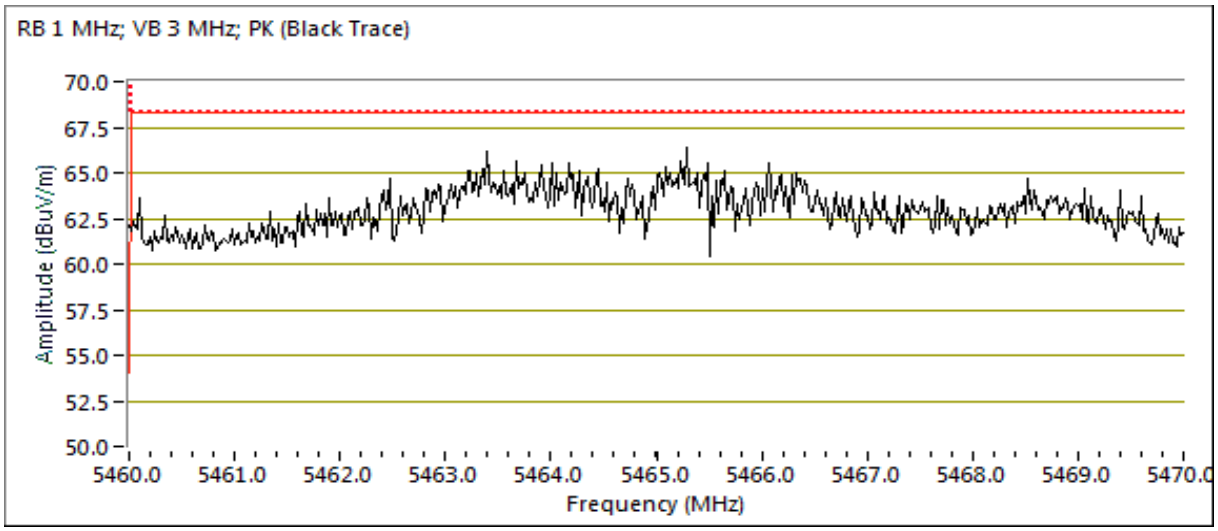
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5458.980	53.5	V	54.0	-0.5	Avg	201	2.1	Note 3: RB 1 MHz; VB: 1 kHz
5458.280	66.6	V	74.0	-7.4	PK	201	2.1	RB 1 MHz; VB: 3 MHz
5460.000	51.8	H	54.0	-2.2	Avg	60	1.5	Note 3: RB 1 MHz; VB: 1 kHz
5454.950	64.2	H	74.0	-9.8	PK	60	1.5	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5463.170	66.5	V	68.3	-1.8	PK	201	2.1	RB 1 MHz; VB: 3 MHz
5468.120	65.2	H	68.3	-3.1	PK	60	1.5	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

RSS-247 and FCC 15.407 (UNII) Radiated Spurious Emissions

Test Specific Details

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

General Test Configuration

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

Ambient Conditions:

Temperature: 24-26 °C
Rel. Humidity: 41-45 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Date of Test: 9/23-25/2019
Test Engineer: M. Birgani
Test Location: Chamber 7

Config. Used: 1
Config Change: -
EUT Voltage: 120V/ 60Hz

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Summary of Results

Run #	Mode	Channel Frequency	NBF Setting	BF Setting	Test Performed	Limit	Result / Margin
20MHz Bandwith Mode							
6	ac20	64 5320MHz	24 / 18	24 / 18	Restricted Band Edge at 5350 MHz	15.209	49.5 dBµV/m @ 5369.8 MHz (-4.5 dB)
7	ac20	100 5500MHz	24 / 18	24 / 9	Restricted Band Edge at 5460 MHz	15.209	53.7 dBµV/m @ 5403.9 MHz (-0.3 dB)
	ac20	100 5500MHz	24 / 18	24 / 9	Band Edge 5460 - 5470 MHz	15E	67.9 dBµV/m @ 5465.1 MHz (-0.4 dB)
	ac20	140 5700MHz	24 / 18	24 / 18	Band Edge 5725MHz	15E	62.8 dBµV/m @ 5763.3 MHz (-5.5 dB)
40MHz Bandwith Mode							
10	ac40	62 5310MHz	24 / 16.75	24 / 15.5	Restricted Band Edge at 5350 MHz	15.209	53.5 dBµV/m @ 5350.2 MHz (-0.5 dB)
11	ac40	102 5510MHz	24 / 18	24 / 17	Restricted Band Edge at 5460 MHz	15.209	50.1 dBµV/m @ 5459.8 MHz (-3.9 dB)
	ac40	102 5510MHz	24 / 18	24 / 17	Band Edge 5460 - 5470 MHz	15E	67.6 dBµV/m @ 5468.2 MHz (-0.7 dB)
	ac40	134 5670MHz	24 / 18	24 / 18	Band Edge 5725MHz	15E	63.1 dBµV/m @ 5764.2 MHz (-5.2 dB)
80MHz Bandwith Mode							
14	ac80	58 5290MHz	26 / 16.5	26 / 16.5	Restricted Band Edge at 5350 MHz	15.209	49.6 dBµV/m @ 5352.2 MHz (-4.4 dB)
15	ac80	106 5530MHz	26 / 18	26 / 17	Restricted Band Edge at 5460 MHz	15.209	53.2 dBµV/m @ 5459.1 MHz (-0.8 dB)
	ac80	106 5530MHz	26 / 18	26 / 17	Band Edge 5460 - 5470 MHz	15E	67.4 dBµV/m @ 5461.1 MHz (-0.9 dB)
160MHz Bandwith Mode							
17	ac160	50 5250MHz	26 / 18	26 / 17	Restricted Band Edge at 5150 MHz	15.209	53.2 dBµV/m @ 5146.2 MHz (-0.8 dB)
	ac160	50 5250MHz	26 / 18	26 / 17	Restricted Band Edge at 5350 MHz	15.209	53.6 dBµV/m @ 5355.7 MHz (-0.4 dB)
18	ac160	114 5570MHz	26 / 18	26 / 15	Restricted Band Edge at 5460 MHz	15.209	49.1 dBµV/m @ 5437.5 MHz (-4.9 dB)
	ac160	114 5570MHz	26 / 18	26 / 15	Band Edge 5460 - 5470 MHz	15E	67.9 dBµV/m @ 5463.9 MHz (-0.4 dB)

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033
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 50 traces. (method VB of KDB 789033)

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)	Packet
ac20	6.5	0.98	Yes	5.271	0.1	0.2	190	4324
ac40	13.5	0.97	Yes	5.24	0.1	0.2	191	8811
ac80	29.3	0.96	Yes	1.432	0.2	0.4	698	5159
ac160	58.5	0.96	Yes	1.439	0.2	0.4	695	10443

Sample Notes

Sample S/N: M11917QW000T

Measurement Specific Notes:

Note 1:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector). Per KDB 789033 2) c) (i), compliance can be demonstrated by meeting the average and peak limits of 15.209, as an alternative.
Note 2:	Emission has a duty cycle ≥ 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces (method AD of KDB 789033)
Note 3:	Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear averaging, auto sweep,max hold 50*1/DC traces (method VB of KDB 789033)
Note 4:	Emission has a duty cycle < 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100*1/DC traces, measurement corrected by Pwr correction factor (method AD of KDB 789033)
Note 5:	Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements.

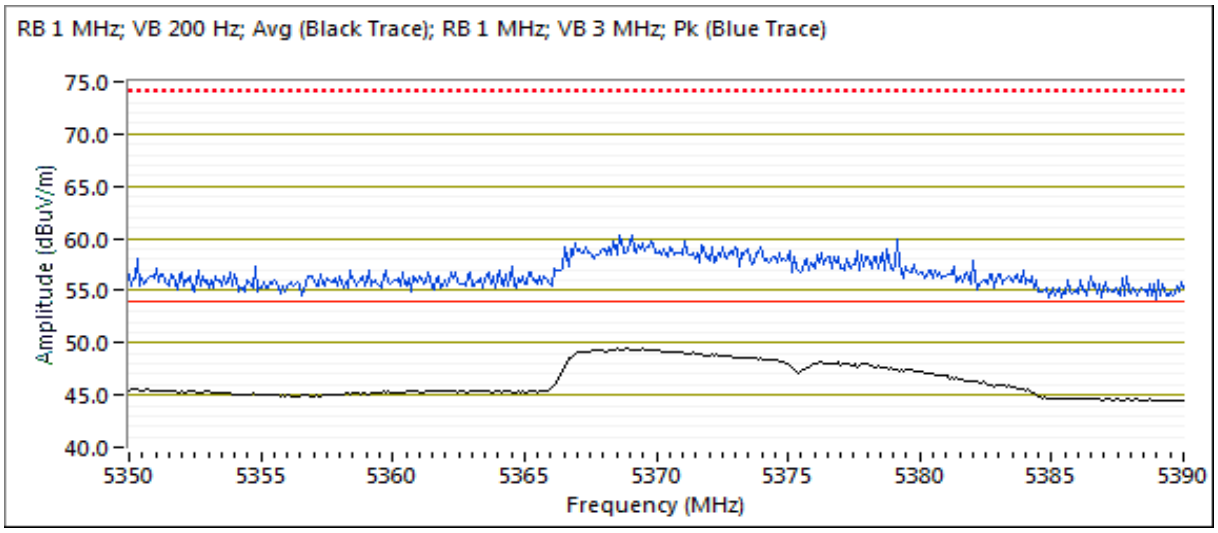
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #6: Radiated Bandedge Measurements, 5250-5350MHz

Channel: 64 Mode: n20 Pwr Setting: 18 (q72)
Tx Chain: 4TX Data Rate: 6.5 Mbps

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5369.830	49.5	V	54.0	-4.5	AVG	71	1.3	RB 1 MHz; VB: 200 Hz
5369.710	48.6	H	54.0	-5.4	AVG	78	2.1	RB 1 MHz; VB: 200 Hz
5367.930	60.8	V	74.0	-13.2	PK	71	1.3	RB 1 MHz; VB: 3 MHz
5367.890	60.3	H	74.0	-13.7	PK	78	2.1	RB 1 MHz; VB: 3 MHz



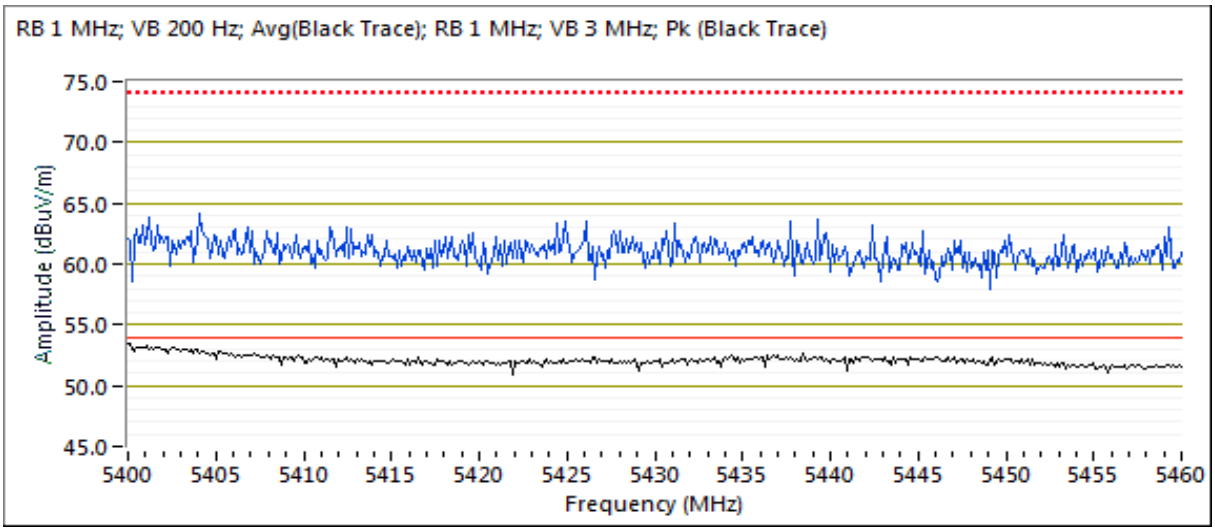
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #7: Radiated Bandedge Measurements, 5470-5725MHz

Channel: 100 Mode: n20 Pwr Setting: 9 (q36)
Tx Chain: 4TX Data Rate: 6.5 Mbps

5460 MHz Band Edge Signal Radiated Field Strength

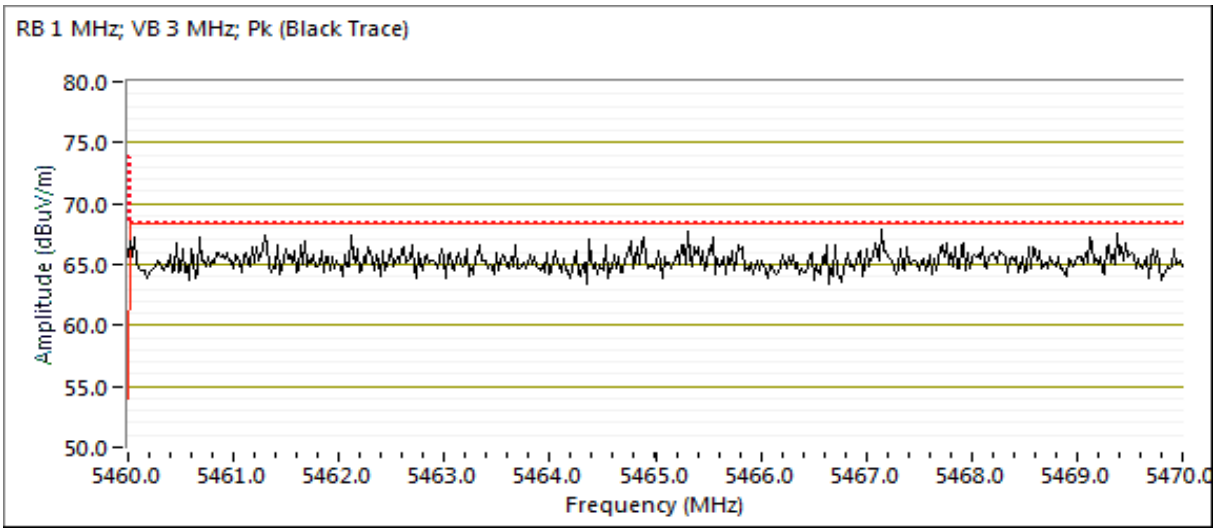
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5403.850	53.7	V	54.0	-0.3	AVG	196	1.8	RB 1 MHz; VB: 200 Hz
5425.450	47.6	H	54.0	-6.4	AVG	290	1.0	RB 1 MHz; VB: 200 Hz
5410.460	65.0	V	74.0	-9.0	PK	196	1.8	RB 1 MHz; VB: 3 MHz
5443.090	59.6	H	74.0	-14.4	PK	290	1.0	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5465.050	67.9	V	68.3	-0.4	PK	196	1.8	RB 1 MHz; VB: 3 MHz
5468.420	60.0	H	68.3	-8.3	PK	290	1.0	RB 1 MHz; VB: 3 MHz

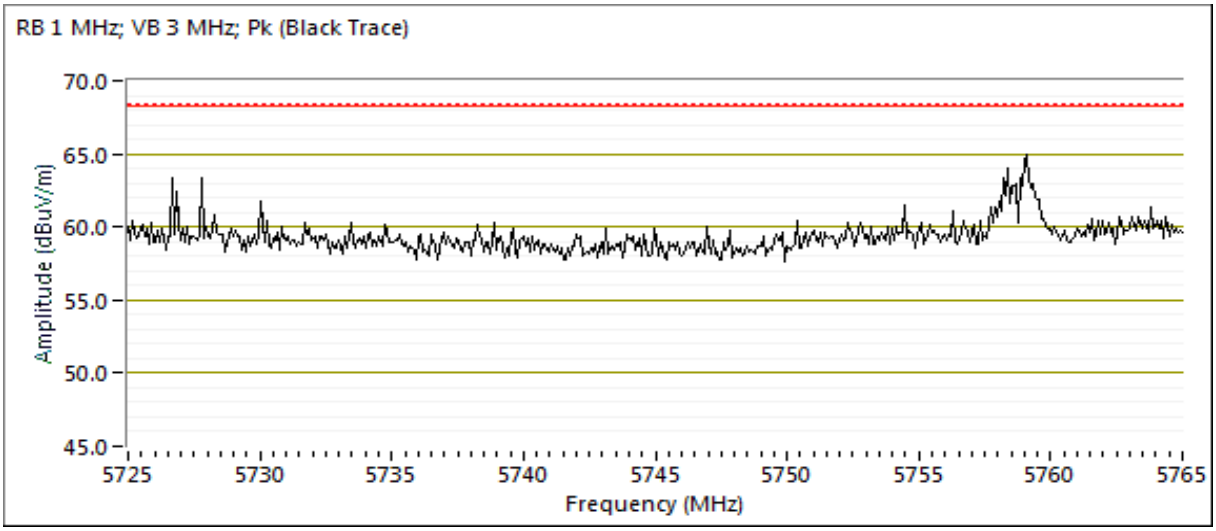


Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Channel: 140 Mode: n20 Pwr Setting: 18 (q72)
Tx Chain: 4TX Data Rate: 6.5 Mbps

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5763.320	62.8	V	68.3	-5.5	PK	80	1.2	RB 1 MHz; VB: 3 MHz
5745.440	61.6	H	68.3	-6.7	PK	190	1.2	RB 1 MHz; VB: 3 MHz



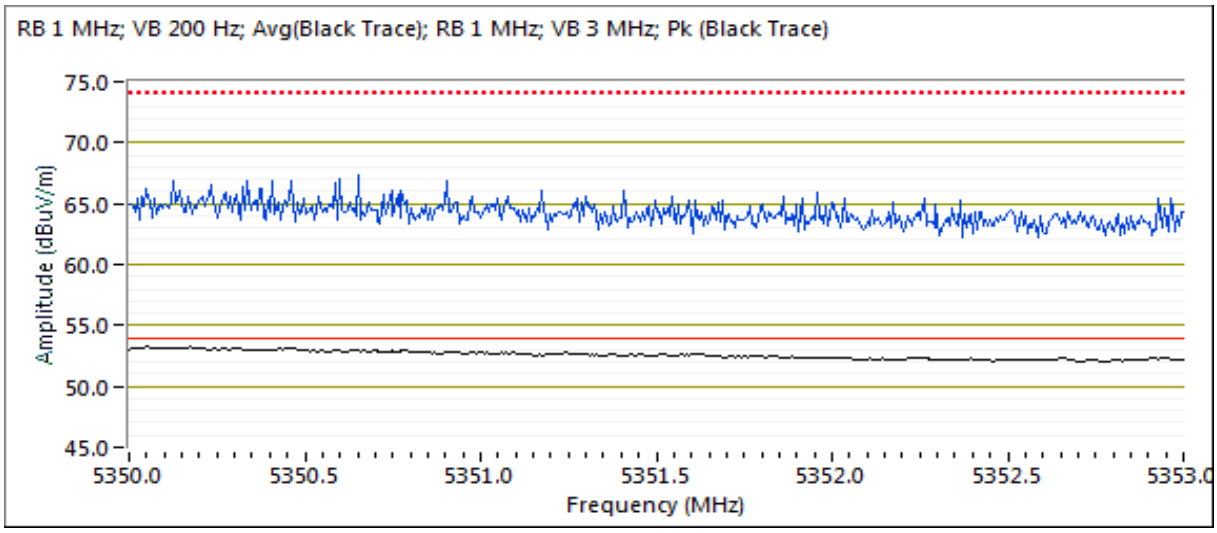
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #10: Radiated Bandedge Measurements, 5250-5350MHz

Channel: 62 Mode: n40 Pwr Setting: 15.5(q62)
Tx Chain: 4TX Data Rate: 13.5

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.220	53.5	V	54.0	-0.5	AVG	197	1.7	RB 1 MHz; VB: 200 Hz
5350.300	67.0	V	74.0	-7.0	PK	197	1.7	RB 1 MHz; VB: 3 MHz



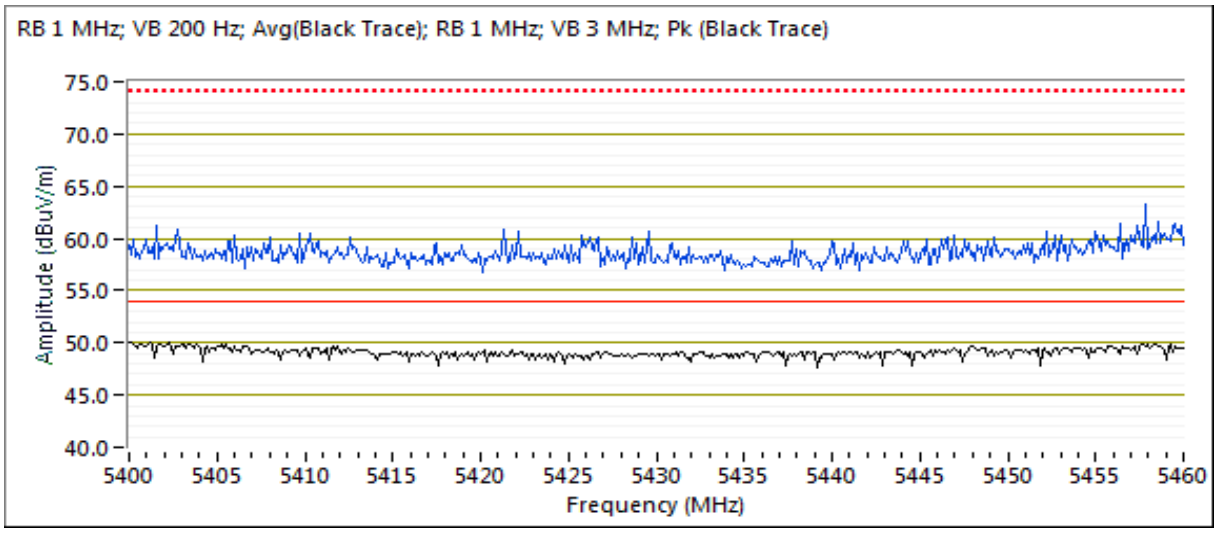
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #11: Radiated Bandedge Measurements, 5470-5725MHz

Channel: 102 Mode: n40 Pwr Setting: 17 (q68)
Tx Chain: 4TX Data Rate: 13.5

5460 MHz Band Edge Signal Radiated Field Strength

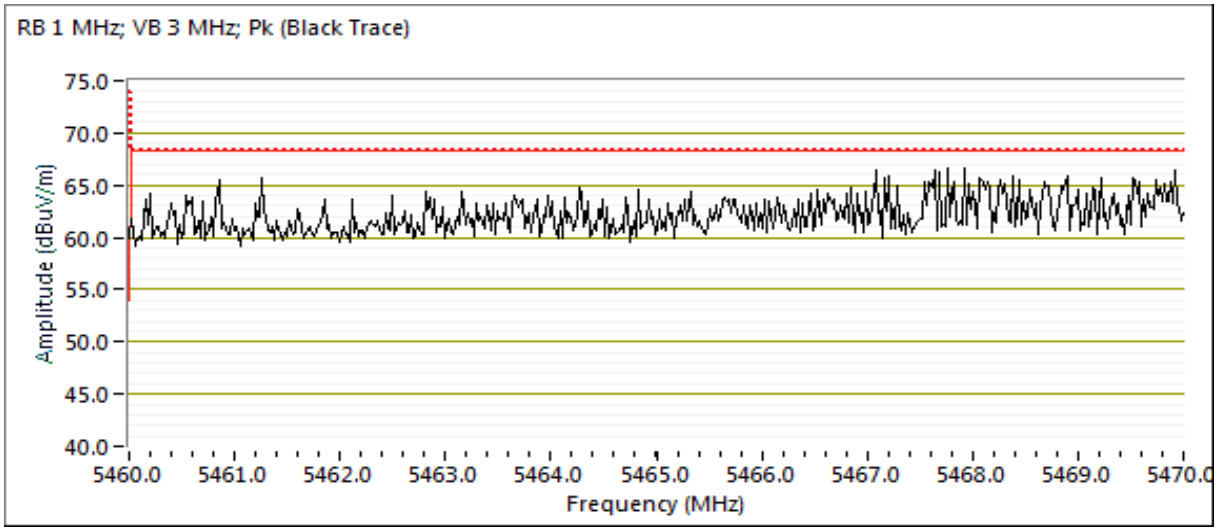
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.780	50.1	V	54.0	-3.9	AVG	83	1.4	POS; RB 1 MHz; VB: 200 Hz
5458.750	65.4	V	74.0	-8.6	PK	83	1.4	POS; RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5468.240	67.6	V	68.3	-0.7	PK	83	1.4	POS; RB 1 MHz; VB: 3 MHz

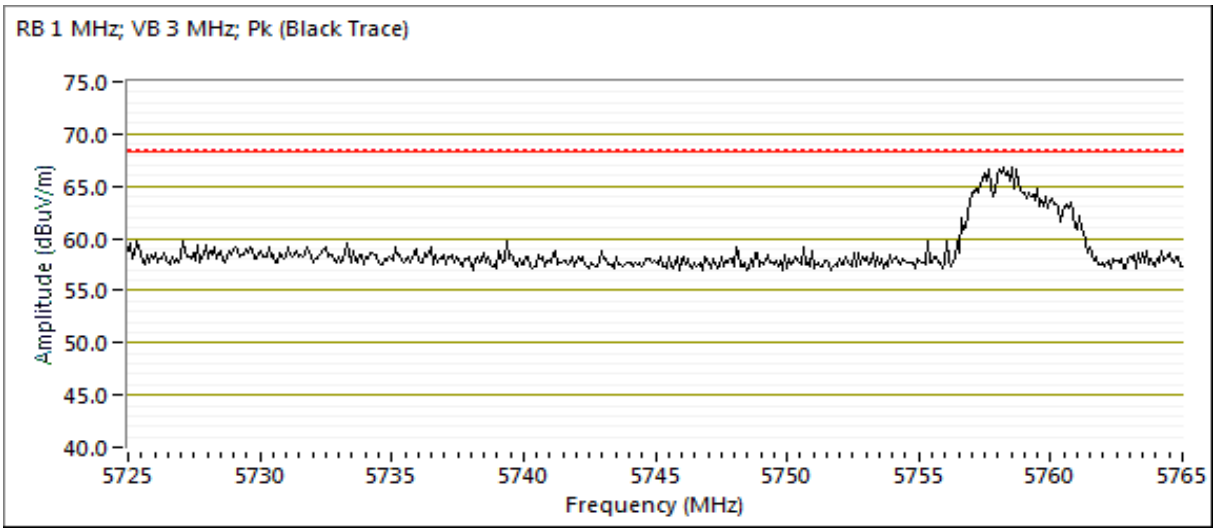


Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Channel: 134 Mode: n40 Pwr Setting: 18 (q72)
Tx Chain: 4TX Data Rate: 13.5

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5764.220	63.1	V	68.3	-5.2	PK	76	1.4	POS; RB 1 MHz; VB: 3 MHz



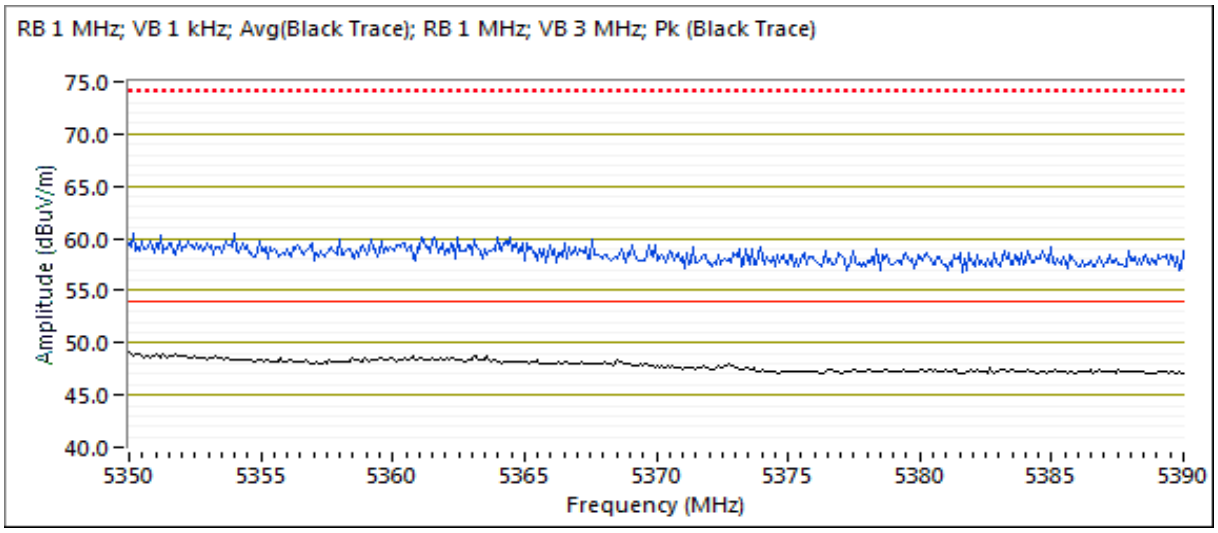
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #14: Radiated Bandedge Measurements, 5250-5350MHz

Channel: 58 Mode: ac80 Pwr Setting: 16.5 (q66)
Tx Chain: 4Tx Data Rate: 29.3

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5352.210	49.6	V	54.0	-4.4	AVG	194	1.8	RB 1 MHz; VB: 1 kHz
5354.700	61.0	V	74.0	-13.0	PK	194	1.8	RB 1 MHz; VB: 3 MHz



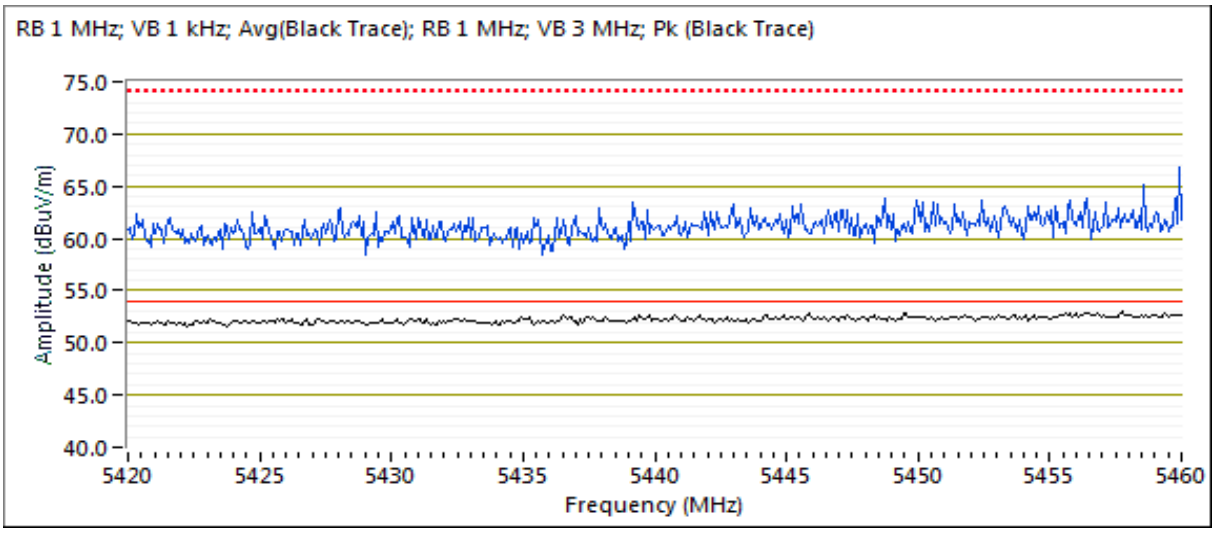
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #15: Radiated Bandedge Measurements, 5470-5725MHz

Channel: 106 Mode: ac80 Pwr Setting: 17 (q72)
Tx Chain: 4Tx Data Rate: 29.3

5460 MHz Band Edge Signal Radiated Field Strength

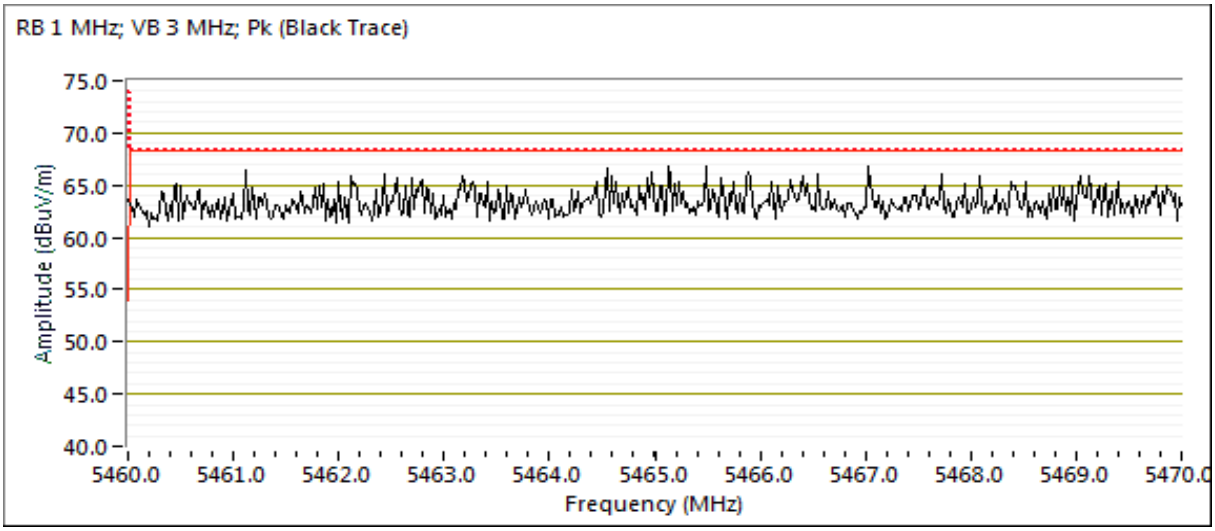
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.050	53.2	V	54.0	-0.8	AVG	194	1.8	RB 1 MHz; VB: 1 kHz
5456.910	67.5	V	74.0	-6.5	PK	194	1.8	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5461.120	67.4	V	68.3	-0.9	PK	194	1.8	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #17: Radiated Bandedge Measurements, 5150-5350MHz

Date of Test: 10/22/19 Config. Used: 1

Test Engineer: M. Birgani Config Change: -

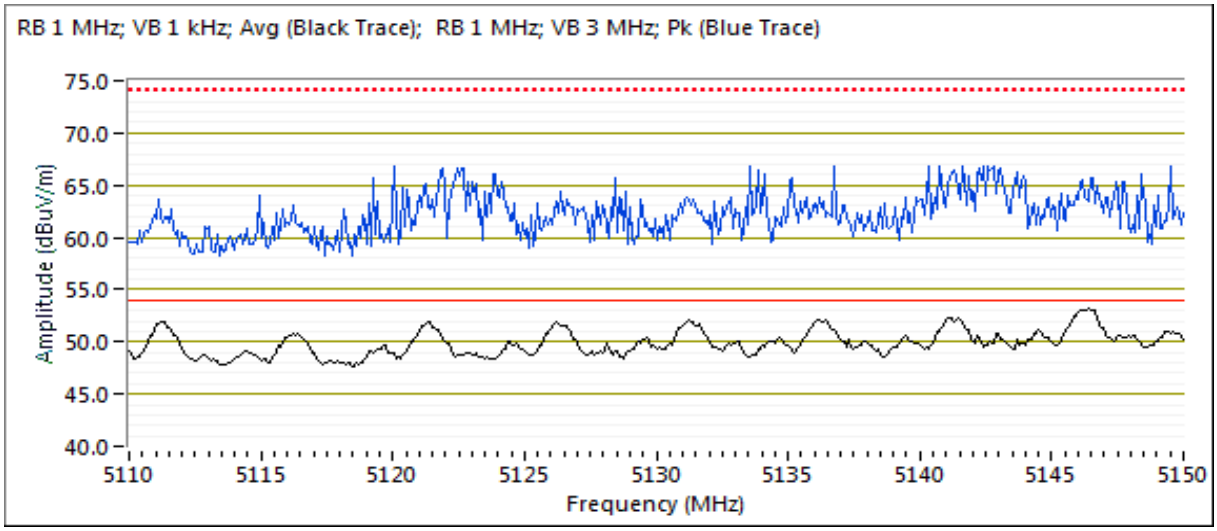
Test Location: Chamber 4 EUT Voltage: 120V/ 60Hz

Channel: 50 Mode: ac160 Pwr Setting: 17 (q68)

Tx Chain: 4Tx Data Rate: 58.5

5150 MHz Band Edge Signal Radiated Field Strength

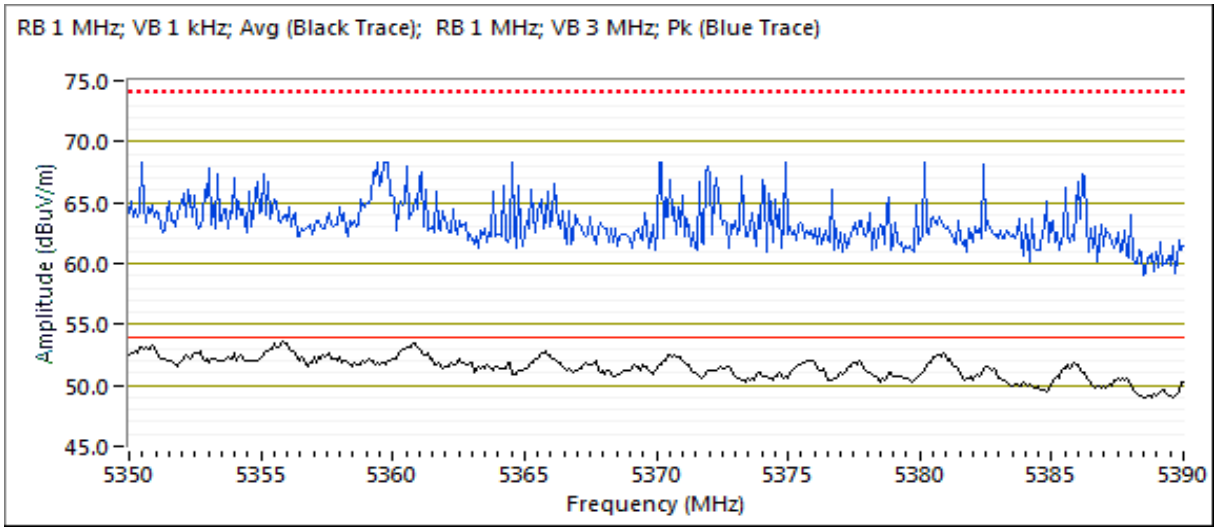
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5146.150	53.2	V	54.0	-0.8	AVG	206	1.6	POS; RB 1 MHz; VB: 1 kHz
5128.040	71.0	V	74.0	-3.0	PK	206	1.6	POS; RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5355.690	53.6	V	54.0	-0.4	AVG	178	1.7	POS; RB 1 MHz; VB: 1 kHz
5371.240	71.9	V	74.0	-2.1	PK	178	1.7	POS; RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #18: Radiated Bandedge Measurements, 5470-5725MHz

Date of Test: 10/22/19 Config. Used: 1

Test Engineer: M. Birgani Config Change: -

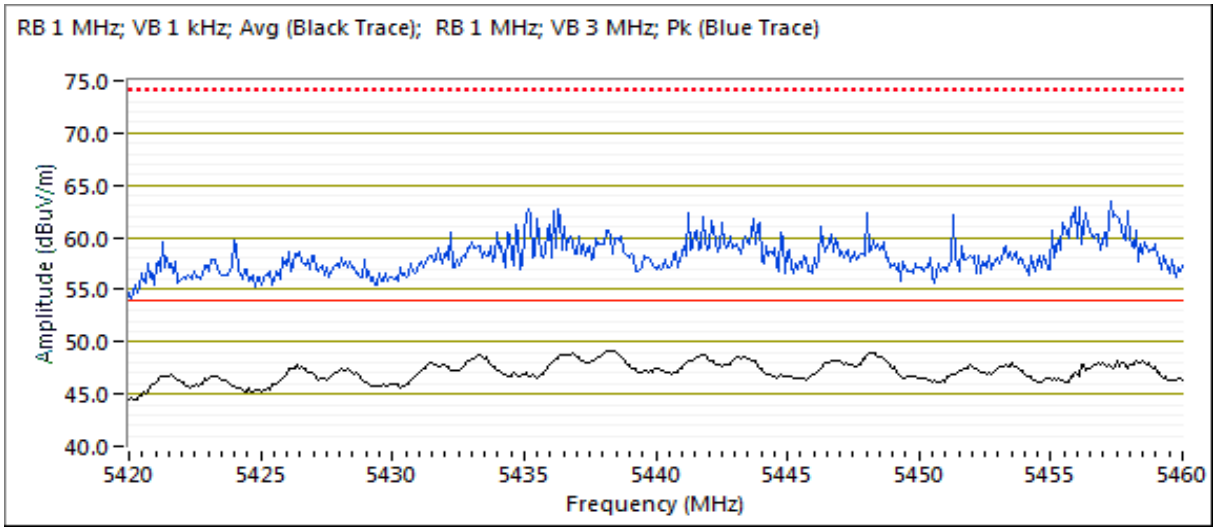
Test Location: Chamber 4 EUT Voltage: 120V/ 60Hz

Channel: 114 Mode: ac160 Pwr Setting: 15 (q60)

Tx Chain: 4Tx Data Rate: 58.5

5460 MHz Band Edge Signal Radiated Field Strength

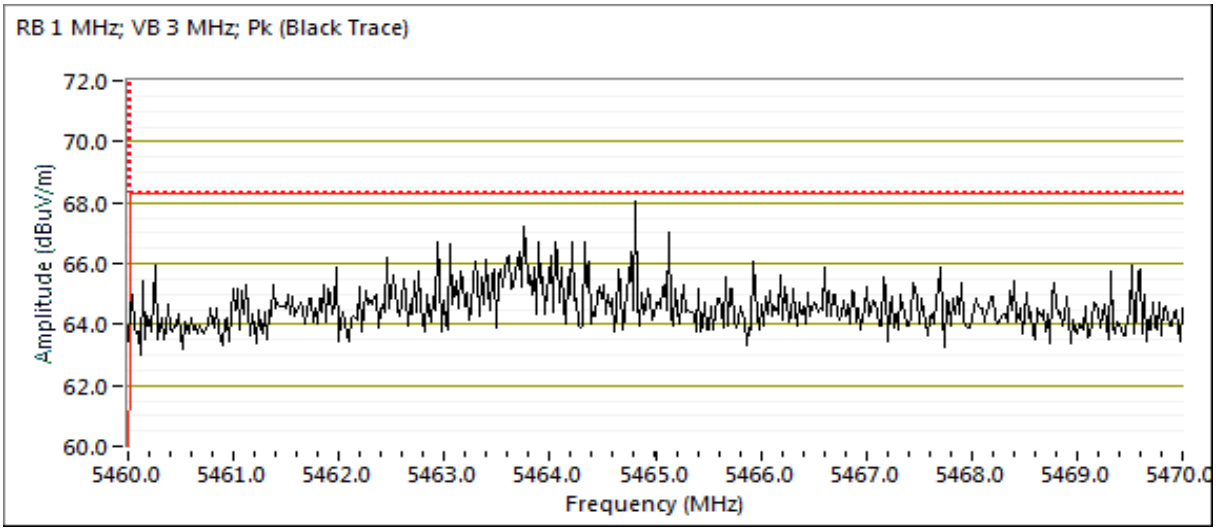
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5437.480	49.1	V	54.0	-4.9	AVG	44	1.0	POS; RB 1 MHz; VB: 1 kHz
5446.690	62.7	V	74.0	-11.3	PK	44	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5463.930	67.9	V	68.3	-0.4	PK	44	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

RSS-247 and FCC 15.407 (UNII) Radiated Spurious Emissions

Test Specific Details

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

General Test Configuration

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

Ambient Conditions:

Temperature: 18-19 °C
Rel. Humidity: 48-51 %

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

Sample S/N: M11917QW000T

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Summary of Results

Run #	Mode	Channel Frequency	Power Setting		Test Performed	Limit	Result / Margin
20MHz Bandwith Modes							
4	ax20	11 & 64	24 / 18		Restricted Band Edge at 5350 MHz	15.209	51.3 dBµV/m @ 5350.7 MHz (-2.7 dB)
5	ax20	1 & 100	24 / 18		Restricted Band Edge at 5460 MHz	15.209	49.5 dBµV/m @ 5438.6 MHz (-4.5 dB)
	ax20	1 & 100	24 / 18		Band Edge 5460 - 5470 MHz	15E	64.8 dBµV/m @ 5466.5 MHz (-3.5 dB)
	ax20	11 & 140	24 / 18		Band Edge 5725MHz	15E	66.3 dBµV/m @ 5728.9 MHz (-2.0 dB)
40MHz Bandwith Modes							
6	ax40	9 & 62	24 / 16.75		Restricted Band Edge at 5350 MHz	15.209	53.2 dBµV/m @ 5350.4 MHz (-0.8 dB)
7	ax40	3 & 102	24 / 18		Restricted Band Edge at 5460 MHz	15.209	52.9 dBµV/m @ 5458.8 MHz (-1.1 dB)
	ax40	3 & 102	24 / 18		Band Edge 5460 - 5470 MHz	15E	67.2 dBµV/m @ 5466.5 MHz (-1.1 dB)
	ax40	9 & 134	24 / 18		Band Edge 5725MHz	15E	65.7 dBµV/m @ 5741.4 MHz (-2.6 dB)
80MHz Bandwith Modes							
8	ax20 / ax80	6 & 58	24 / 16.5		Restricted Band Edge at 5350 MHz	15.209	50.8 dBµV/m @ 5351.0 MHz (-3.2 dB)
9	ax20 / ax80	1 & 106	24 / 18		Restricted Band Edge at 5460 MHz	15.209	51.5 dBµV/m @ 5458.5 MHz (-2.5 dB)
	ax20 / ax80	1 & 106	24 / 18		Band Edge 5460 - 5470 MHz	15E	64.0 dBµV/m @ 5463.7 MHz (-4.3 dB)
160MHz Bandwith Modes							
10	ax20 / ax160	6 & 50	24 / 17.25		Restricted Band Edge at 5150 MHz	15.209	51.3 dBµV/m @ 5149.0 MHz (-2.7 dB)
	ax20 / ax160	6 & 50	24 / 17.25		Restricted Band Edge at 5350 MHz	15.209	51.0 dBµV/m @ 5378.6 MHz (-3.0 dB)
11	ax20 / ax160	6 & 114	24 / 17		Restricted Band Edge at 5460 MHz	15.209	46.4 dBµV/m @ 5451.4 MHz (-7.6 dB)
	ax20 / ax160	6 & 114	24 / 17		Band Edge 5460 - 5470 MHz	15E	59.3 dBµV/m @ 5466.6 MHz (-9.0 dB)

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033
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 50 traces. (method VB of KDB 789033)

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)	Packet
ac20	6.5	97.6%	Yes	5.27	0.1	0.2	190	4324
ac40	13.5	97.3%	Yes	5.24	0.1	0.2	191	8811
ac80	29.3	96.0%	Yes	1.43	0.2	0.4	698	5159
ac160	58.5	95.6%	Yes	1.44	0.2	0.4	695	10443

Measurement Specific Notes:

Note 1:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector). Per KDB 789033 2) c) (i), compliance can be demonstrated by meeting the average and peak limits of 15.209, as an alternative.
Note 2:	Emission has a duty cycle ≥ 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces (method AD of KDB 789033)
Note 3:	Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear averaging, auto sweep,max hold 50*1/DC traces (method VB of KDB 789033)
Note 4:	Emission has a duty cycle < 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100*1/DC traces, measurement corrected by Pwr correction factor (method AD of KDB 789033)
Note 5:	Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements.
Note 6:	For SISO measurment, evaluation of each chain showed that chain 4 has the highest power measurment. All SISO test measurment were performed with chain 4 active.

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #4: Radiated Bandedge Measurements, 5250-5350MHz

Date of Test: 02/03/20 Config. Used: 1

Test Engineer: M. Birgani Config Change: None

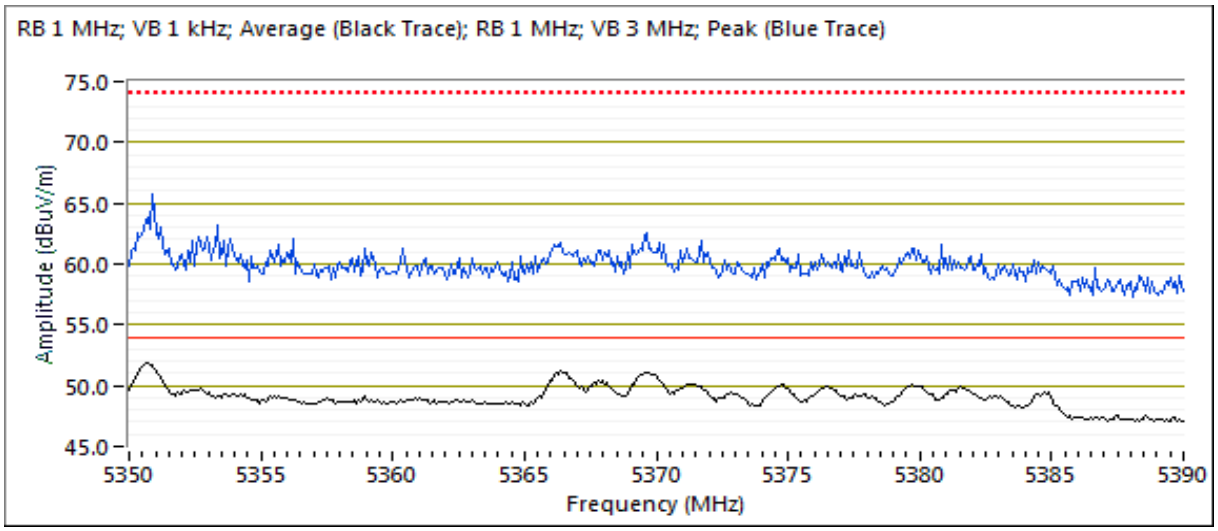
Test Location: Fremont Chamber #7 EUT Voltage: 120V/60Hz

Channel: 11 & 64 Mode: ax20 Pwr Setting: 24 (q96) & 18 (q72)

Tx Chain: 4TX Data Rate: 8.6mbps / chain

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.720	51.3	V	54.0	-2.7	AVG	197	1.7	RB 1 MHz; VB: 10 Hz
5368.440	50.2	H	54.0	-3.8	AVG	82	1.8	RB 1 MHz; VB: 10 Hz
5366.670	67.7	V	74.0	-6.3	PK	197	1.7	RB 1 MHz; VB: 3 MHz
5368.200	62.6	H	74.0	-11.4	PK	82	1.8	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #5: Radiated Bandedge Measurements, 5470-5725MHz

Date of Test: 02/03/20 Config. Used: 1

Test Engineer: M. Birgani Config Change: None

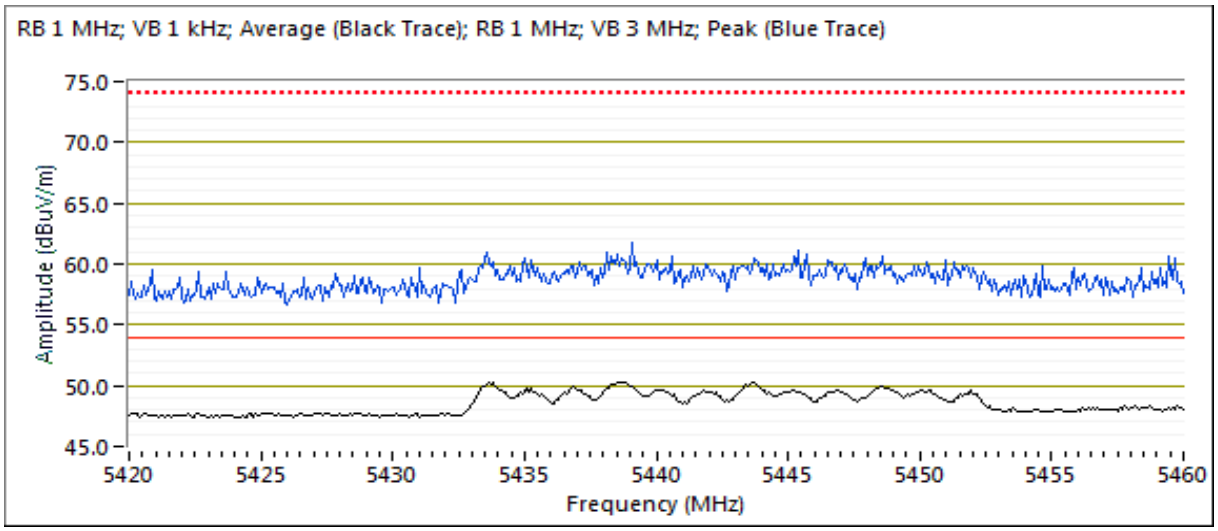
Test Location: Fremont Chamber #7 EUT Voltage: 120V/60Hz

Channel: 1 & 100 Mode: ax20 Pwr Setting: 24 (q96) & 18 (q72)

Tx Chain: 4TX Data Rate: 8.6mbps / chain

5460 MHz Band Edge Signal Radiated Field Strength

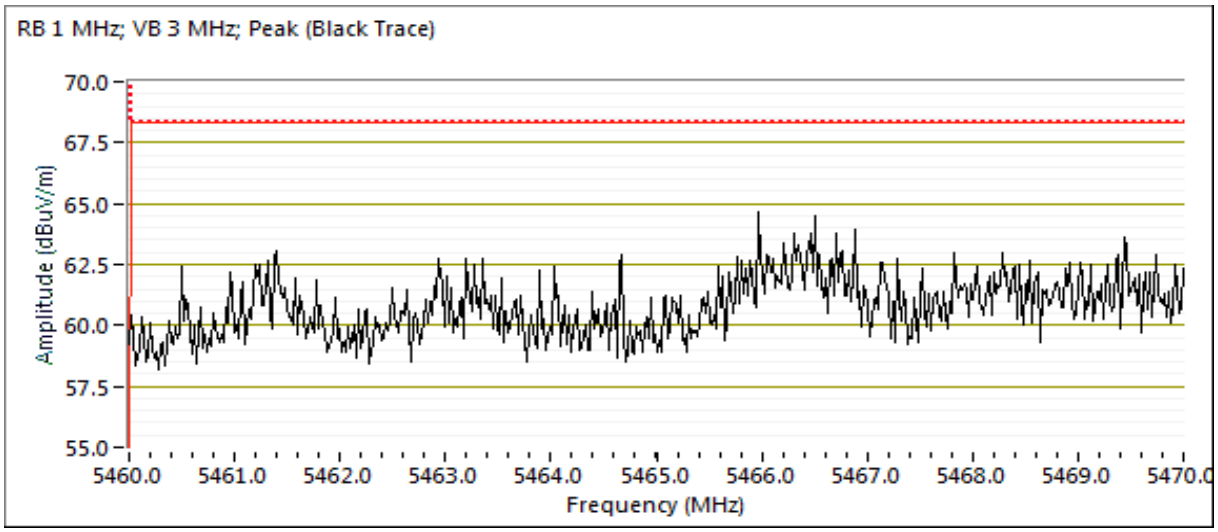
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5438.600	49.5	V	54.0	-4.5	AVG	193	1.5	RB 1 MHz; VB: 10 Hz
5440.360	48.3	H	54.0	-5.7	AVG	58	1.5	RB 1 MHz; VB: 10 Hz
5443.650	61.9	V	74.0	-12.1	PK	193	1.5	RB 1 MHz; VB: 3 MHz
5435.310	61.1	H	74.0	-12.9	PK	58	1.5	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5466.450	64.8	V	68.3	-3.5	PK	193	1.5	POS; RB 1 MHz; VB: 3 MHz
5469.540	62.0	H	68.3	-6.3	PK	58	1.5	POS; RB 1 MHz; VB: 3 MHz

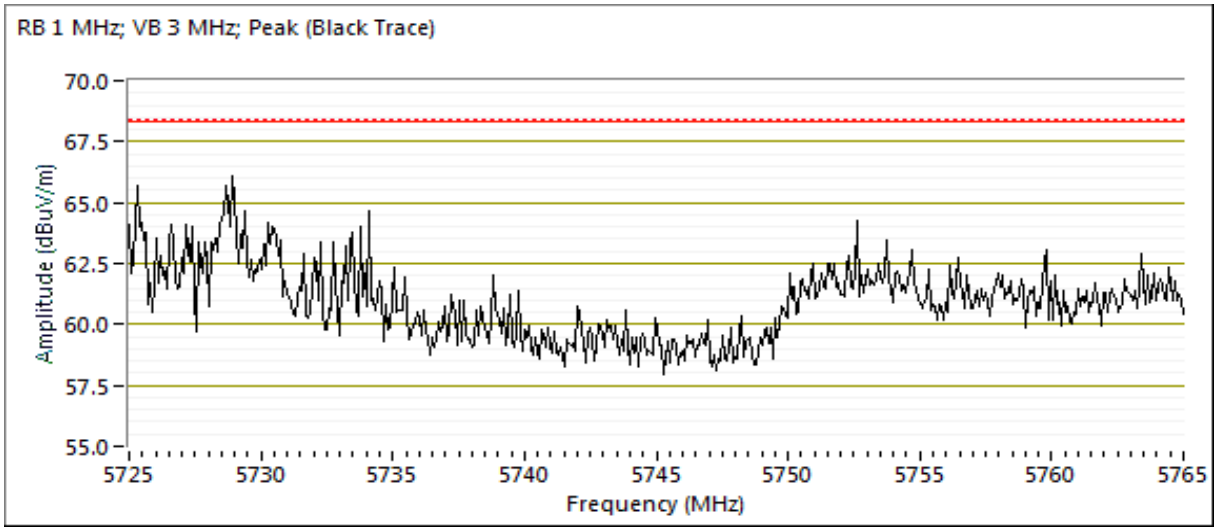


Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Channel: 11 & 140 Mode: ax20 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 4TX Data Rate: 8.6mbps / chain

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5728.850	66.3	V	68.3	-2.0	PK	183	1.6	RB 1 MHz; VB: 3 MHz
5728.450	63.5	H	68.3	-4.8	PK	112	1.5	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #6: Radiated Bandedge Measurements, 5250-5350MHz

Date of Test: 02/03/20 Config. Used: 1

Test Engineer: M. Birgani Config Change: None

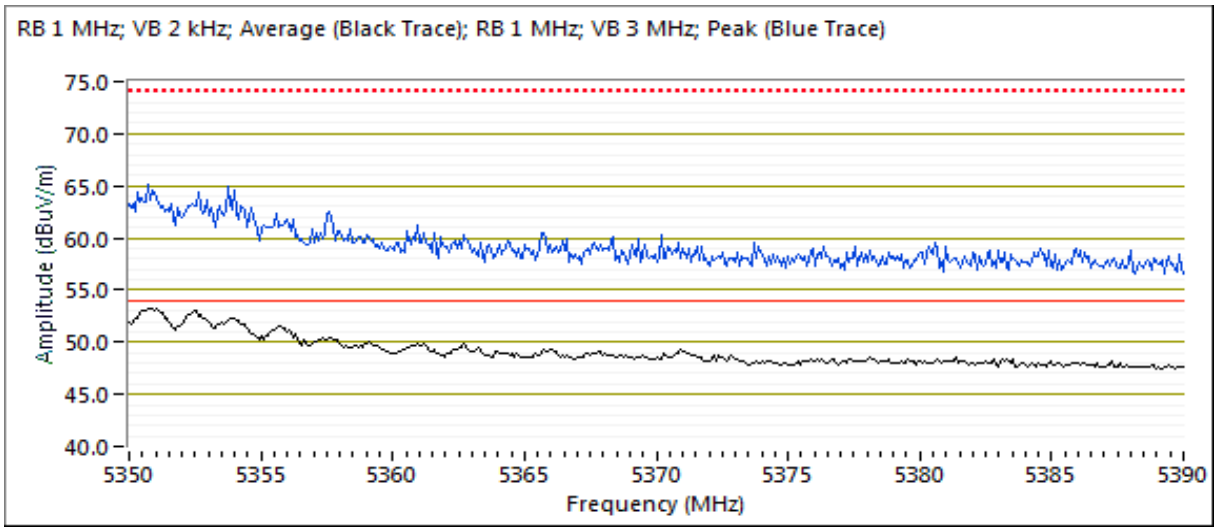
Test Location: Fremont Chamber #7 EUT Voltage: 120V/60Hz

Channel: 9 & 62 Mode: ax40 Pwr Setting: 24 (q96) & 16.75 (q67)

Tx Chain: 4TX Data Rate: 17.2mbps / chain

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.400	53.2	V	54.0	-0.8	AVG	90	1.8	RB 1 MHz; VB: 10 Hz
5350.900	52.3	H	54.0	-1.7	AVG	194	1.7	RB 1 MHz; VB: 10 Hz
5350.400	68.0	V	74.0	-6.0	PK	90	1.8	RB 1 MHz; VB: 3 MHz
5350.900	66.8	H	74.0	-7.2	PK	194	1.7	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #7: Radiated Bandedge Measurements, 5470-5725MHz

Date of Test: 02/03/20 Config. Used: 1

Test Engineer: M. Birgani Config Change: None

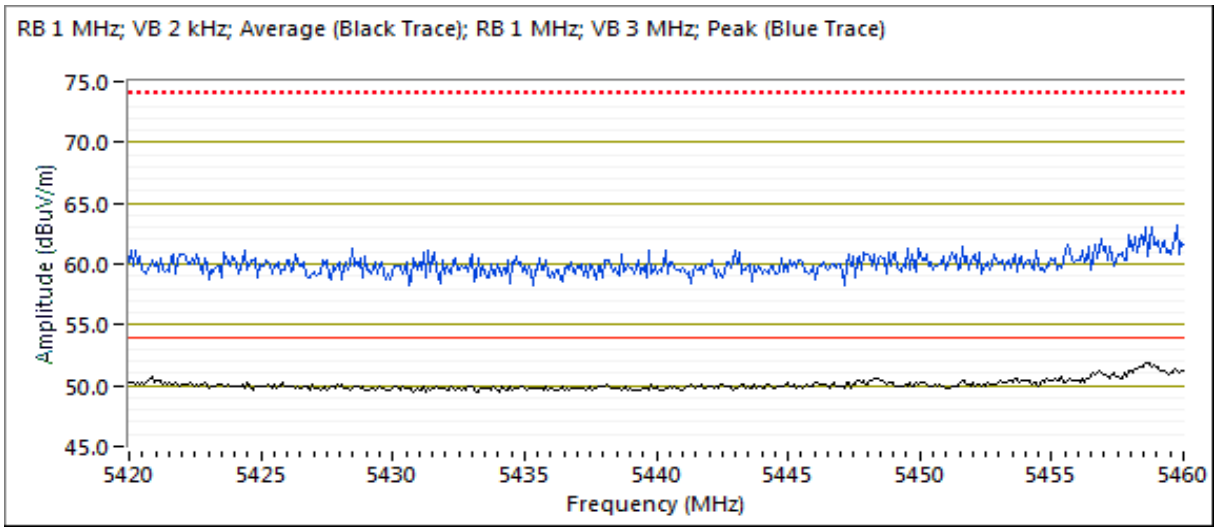
Test Location: Fremont Chamber #7 EUT Voltage: 120V/60Hz

Channel: 3 & 102 Mode: ax40 Pwr Setting: 24 (q96) & 18 (q72)

Tx Chain: 4Tx Data Rate: 17.2mbps / chain

5460 MHz Band Edge Signal Radiated Field Strength

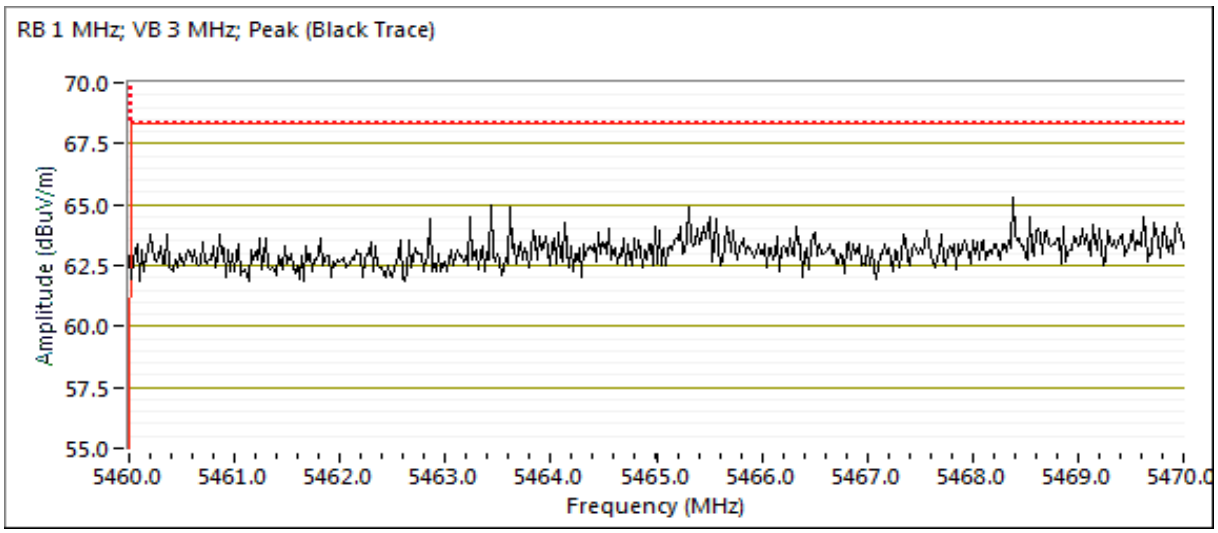
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5458.800	52.9	V	54.0	-1.1	AVG	183	1.7	RB 1 MHz; VB: 10 Hz
5459.280	51.4	H	54.0	-2.6	AVG	110	1.7	RB 1 MHz; VB: 10 Hz
5452.870	65.6	V	74.0	-8.4	PK	183	1.7	RB 1 MHz; VB: 3 MHz
5450.140	64.5	H	74.0	-9.5	PK	110	1.7	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5466.490	67.2	V	68.3	-1.1	PK	183	1.7	RB 1 MHz; VB: 3 MHz
5464.450	65.3	H	68.3	-3.0	PK	110	1.7	RB 1 MHz; VB: 3 MHz

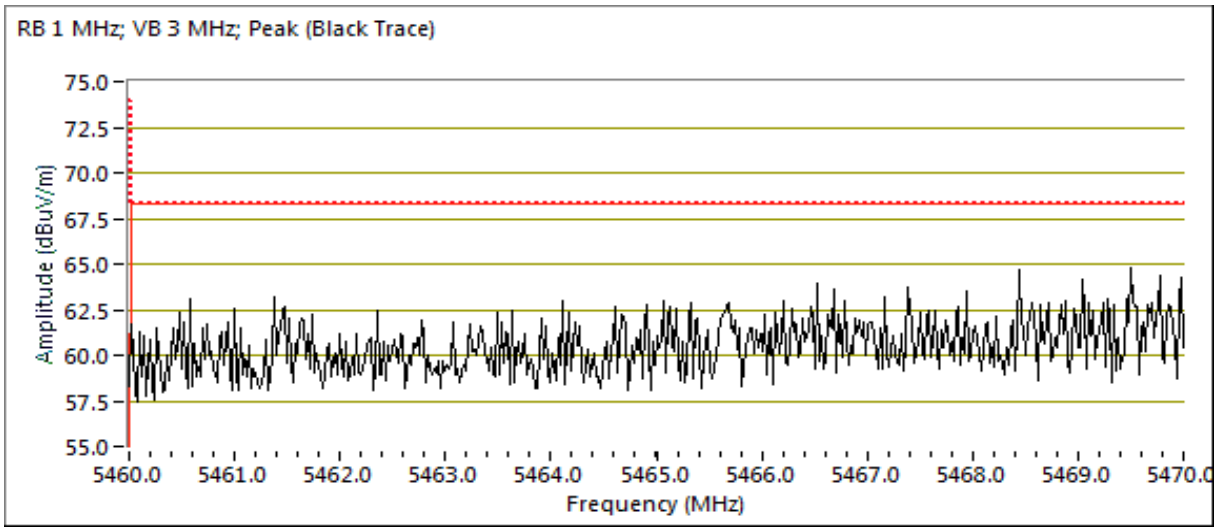


Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Channel: 9 & 134 Mode: ax40 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 4Tx Data Rate: 17.2mbps / chain

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5741.350	65.7	V	68.3	-2.6	PK	183	1.7	RB 1 MHz; VB: 3 MHz
5727.240	64.7	H	68.3	-3.6	PK	178	1.7	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #8: Radiated Bandedge Measurements, 5250-5350MHz

Date of Test: 02/04/20 Config. Used: 1

Test Engineer: M. Birgani Config Change: None

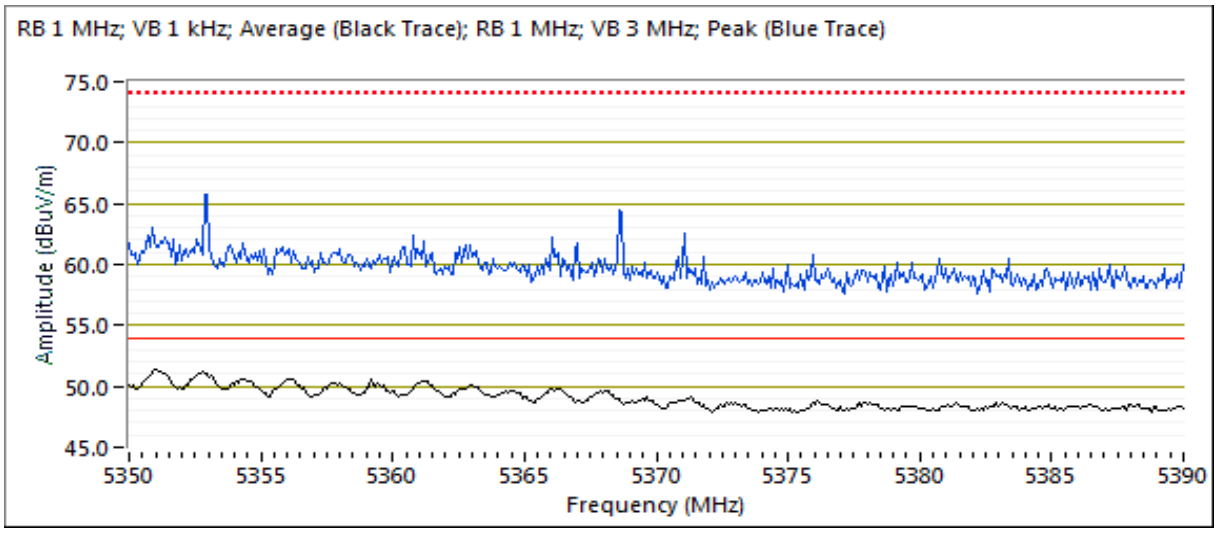
Test Location: Fremont Chamber #7 EUT Voltage: 120V/60Hz

Channel: 6 & 58 Mode: ax20 & ax80 Pwr Setting: 24 (q96) & 16.5 (q66)

Tx Chain: 4Tx Data Rate: 36mbps / chain

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5351.040	50.8	V	54.0	-3.2	AVG	191	1.8	Note 3: RB 1 MHz; VB: 1 kHz
5350.720	70.3	V	74.0	-3.7	PK	191	1.8	RB 1 MHz; VB: 3 MHz
5358.260	69.5	H	74.0	-4.5	PK	84	2.0	RB 1 MHz; VB: 3 MHz
5352.650	49.1	H	54.0	-4.9	AVG	84	2.0	Note 3: RB 1 MHz; VB: 1 kHz



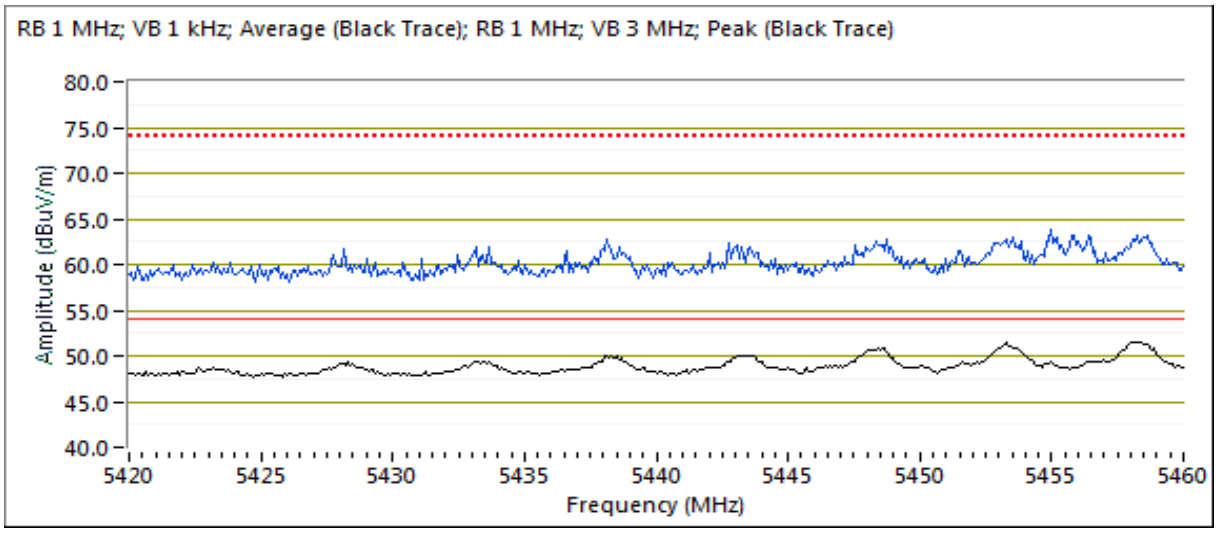
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #9: Radiated Bandedge Measurements, 5470-5725MHz

Channel: 1 & 106 Mode: ax20 & ax80 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 4Tx Data Rate: 36mbps / chain

5460 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5458.450	51.5	V	54.0	-2.5	AVG	20	2.1	Note 3: RB 1 MHz; VB: 1 kHz
5457.320	50.1	H	54.0	-3.9	AVG	77	2.1	Note 3: RB 1 MHz; VB: 1 kHz
5455.810	64.9	V	74.0	-9.1	PK	20	2.1	RB 1 MHz; VB: 3 MHz
5457.350	61.1	H	74.0	-12.9	PK	77	2.1	RB 1 MHz; VB: 3 MHz

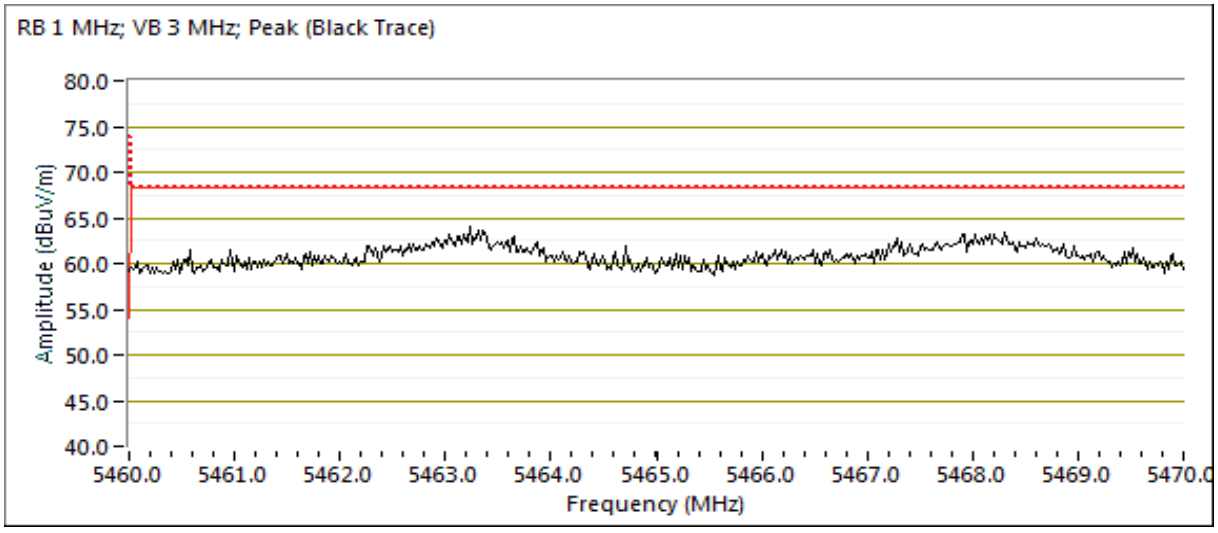


Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Channel: 1 & 106 Mode: ax20 & ax80 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 4Tx Data Rate: 36mbps / chain

5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5463.650	64.0	V	68.3	-4.3	PK	20	2.1	RB 1 MHz; VB: 3 MHz
5467.580	63.9	H	68.3	-4.4	PK	77	2.1	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #10: Radiated Bandedge Measurements, 5150-5350MHz

Date of Test: 02/04/20 Config. Used: 1

Test Engineer: M. Birgani Config Change: None

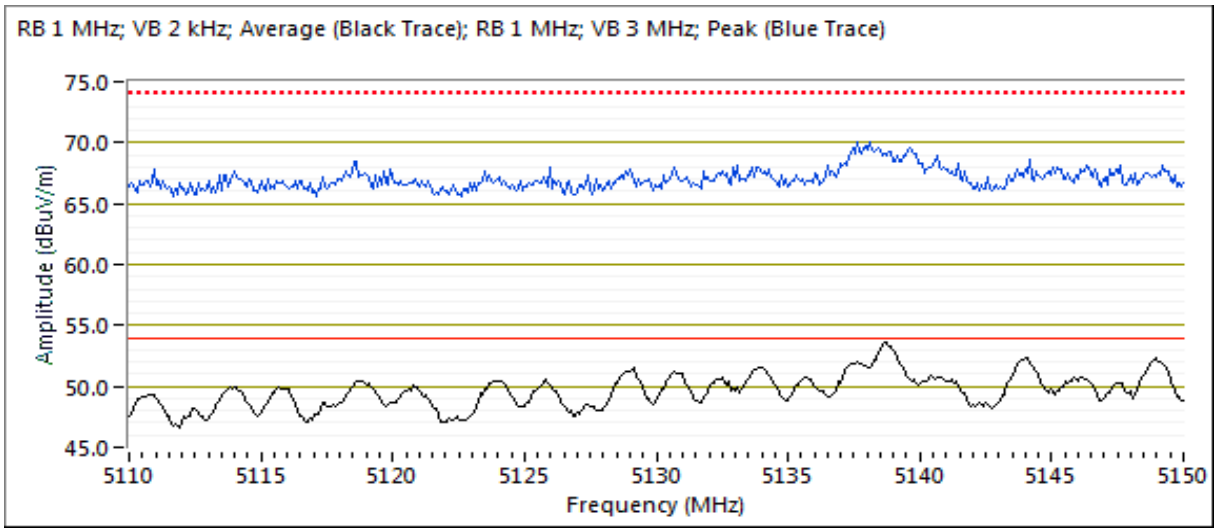
Test Location: Fremont Chamber # EUT Voltage: 120V/60Hz

Channel: 6 & 50 Mode: ax20 & ax160 Pwr Setting: 24 (q96) & 17.25 (q69)

Tx Chain: 4Tx Data Rate: 72Mbps / chain

5150 MHz Band Edge Signal Radiated Field Strength

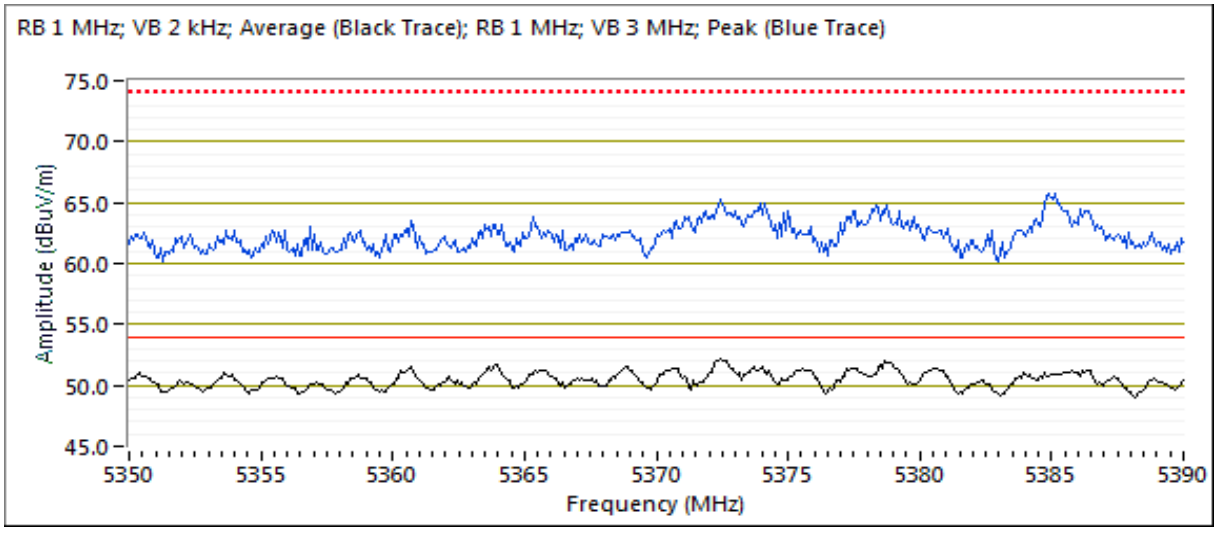
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.040	51.3	V	54.0	-2.7	AVG	198	2.0	Note 3: RB 1 MHz; VB: 2 kHz
5147.440	49.0	H	54.0	-5.0	AVG	94	2.0	Note 3: RB 1 MHz; VB: 2 kHz
5138.300	66.2	V	74.0	-7.8	PK	198	2.0	RB 1 MHz; VB: 3 MHz
5145.830	64.6	H	74.0	-9.4	PK	94	2.0	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5378.620	51.0	H	54.0	-3.0	AVG	84	1.9	Note 3: RB 1 MHz; VB: 2 kHz
5380.620	50.6	V	54.0	-3.4	AVG	198	2.0	Note 3: RB 1 MHz; VB: 2 kHz
5374.050	65.7	H	74.0	-8.3	PK	84	1.9	RB 1 MHz; VB: 3 MHz
5384.630	65.6	V	74.0	-8.4	PK	198	2.0	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #11: Radiated Bandedge Measurements, 5470-5725MHz

Date of Test: 02/04/20 Config. Used: 1

Test Engineer: M. Birgani Config Change: None

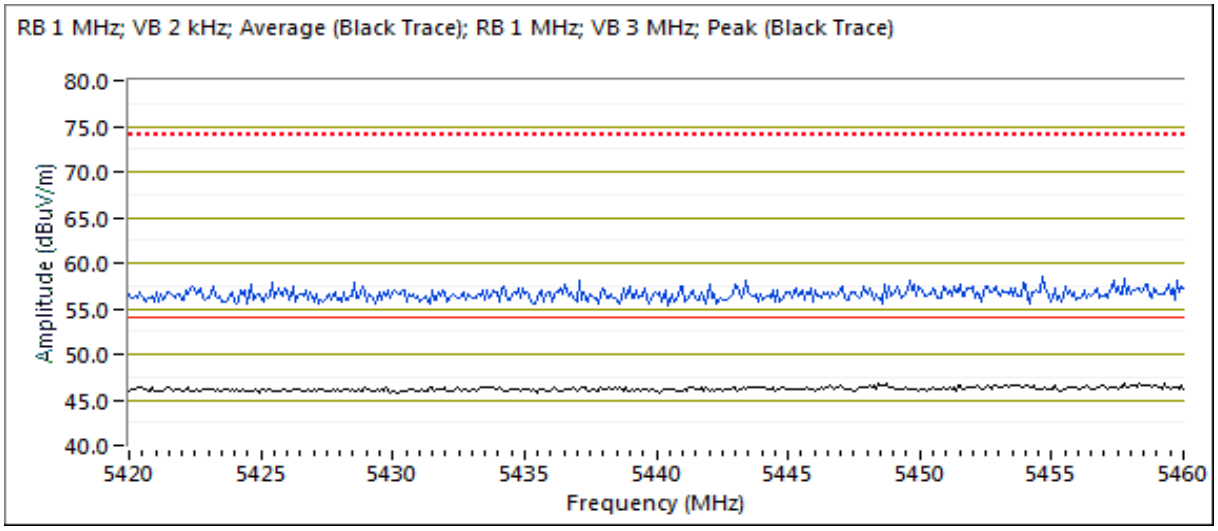
Test Location: Fremont Chamber #7 EUT Voltage: 120V/60Hz

Channel: 6 & 114 Mode: ax20 & ax160 Pwr Setting: 17 (q68)

Tx Chain: 4Tx Data Rate: 72Mbps / chain

5460 MHz Band Edge Signal Radiated Field Strength

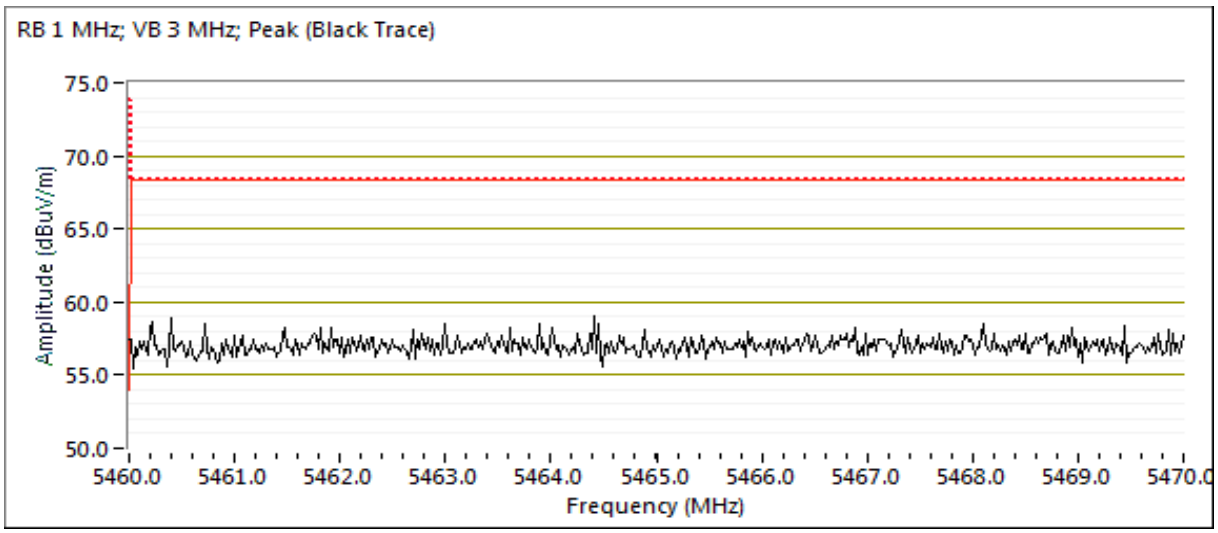
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5451.420	46.4	V	54.0	-7.6	AVG	20	2.1	RB 1 MHz; VB: 3 MHz
5450.540	58.8	V	74.0	-15.2	PK	20	2.1	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5466.610	59.3	V	68.3	-9.0	PK	20	2.1	RB 1 MHz; VB: 3 MHz
5464.890	48.5	H	68.3	-19.8	PK	263	2.1	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

RSS-247 and FCC 15.407 (UNII) Radiated Spurious Emissions

Test Specific Details

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

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.
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: 38-40 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Date of Test: 2/5-2/7 & 3/11/2020
Test Engineer: M. Birgani & David Bare
Test Location: Fremont Chamber #7

Config. Used: 1
Config Change: -
EUT Voltage: 120V/ 60Hz

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Summary of Results

Run #	Mode	Channel Frequency	Power Setting		Test Performed	Limit	Result / Margin
20MHz Bandwith Mode							
6	ax20	11 & 64	24 / 18		Restricted Band Edge at 5350 MHz	15.209	50.0 dBµV/m @ 5350.6 MHz (-4.0 dB)
7	ax20	1 & 100	24 / 9		Restricted Band Edge at 5460 MHz	15.209	46.0 dBµV/m @ 5448.0 MHz (-8.0 dB)
	ax20	1 & 100	24 / 9		Band Edge 5460 - 5470 MHz	15E	58.7 dBµV/m @ 5468.7 MHz (-9.6 dB)
	ax20	11 & 140	24 / 18		Band Edge 5725MHz	15E	67.2 dBµV/m @ 5757.3 MHz (-1.1 dB)
40MHz Bandwith Mode							
10	ax40	9 & 62	24 / 15.5		Restricted Band Edge at 5350 MHz	15.209	51.6 dBµV/m @ 5352.6 MHz (-2.4 dB)
11	ax40	3 & 102	24 / 17	24 / 14	Restricted Band Edge at 5460 MHz	15.209	53.9 dBµV/m @ 5459.5 MHz (-0.1 dB)
	ax40	3 & 102	24 / 17	24 / 14	Band Edge 5460 - 5470 MHz	15E	67.8 dBµV/m @ 5467.1 MHz (-0.5 dB)
	ax40	9 & 134	24 / 18		Band Edge 5725MHz	15E	67.8 dBµV/m @ 5727.7 MHz (-0.5 dB)
80MHz Bandwith Mode							
14	ax20 / ax80	6 & 58	24 / 16.5		Restricted Band Edge at 5350 MHz	15.209	51.4 dBµV/m @ 5351.6 MHz (-2.6 dB)
15	ax20 / ax80	1 & 106	24 / 17		Restricted Band Edge at 5460 MHz	15.209	50.6 dBµV/m @ 5459.3 MHz (-3.4 dB)
	ax20 / ax80	1 & 106	24 / 17		Band Edge 5460 - 5470 MHz	15E	67.9 dBµV/m @ 5469.8 MHz (-0.4 dB)
160MHz Bandwith Mode							
17	ax20 / ax160	6 & 50	24 / 17	24 / 14	Restricted Band Edge at 5150 MHz	15.209	50.9 dBµV/m @ 5145.1 MHz (-3.1 dB)
	ax20 / ax160	6 & 50	24 / 17	24 / 14	Restricted Band Edge at 5350 MHz	15.209	53.4 dBµV/m @ 5388.7 MHz (-0.6 dB)
18	ax20 / ax160	6 & 114	24 / 15		Restricted Band Edge at 5460 MHz	15.209	66.3 dBµV/m @ 5456.5 MHz (-7.7 dB)
	ax20 / ax160	6 & 114	24 / 15		Band Edge 5460 - 5470 MHz	15E	67.7 dBµV/m @ 5465.4 MHz (-0.6 dB)

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033
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 50 traces. (method VB of KDB 789033)

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
ax20	MCS0	94.2%	Yes	11.80	0.3	0.5	85
ax40	MCS0	84.9%	Yes	4.37	0.7	1.4	229
ax80	MCS0	88.5%	Yes	16.32	0.5	1.1	61
ax160	MCS 0	94.0%	Yes	5.05	0.3	0.5	198

Sample Notes

Sample S/N: M11917QW000T

Measurement Specific Notes:

Note 1:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector). Per KDB 789033 2) c) (i), compliance can be demonstrated by meeting the average and peak limits of 15.209, as an alternative.
Note 2:	Emission has a duty cycle ≥ 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces (method AD of KDB 789033)
Note 3:	Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear averaging, auto sweep,max hold 50*1/DC traces (method VB of KDB 789033)
Note 4:	Emission has a duty cycle < 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100*1/DC traces, measurement corrected by Pwr correction factor (method AD of KDB 789033)
Note 5:	Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements.

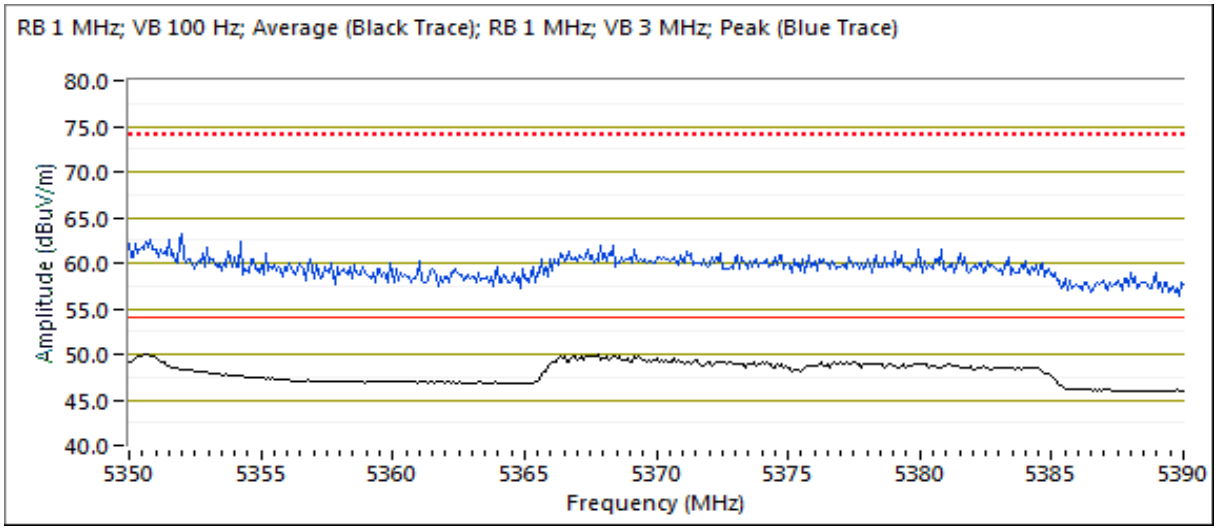
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #6: Radiated Bandedge Measurements, 5250-5350MHz

Channel: 11 & 64 Mode: ax20 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 4TX Data Rate: 8.6mbps / chain

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.560	50.0	V	54.0	-4.0	AVG	181	1.7	Note 3: RB 1 MHz; VB: 100 Hz
5350.400	44.8	H	54.0	-9.2	AVG	181	1.7	POS; RB 1 MHz; VB: 100 Hz
5350.480	63.9	V	74.0	-10.1	PK	181	1.7	RB 1 MHz; VB: 3 MHz
5368.840	57.7	H	74.0	-16.3	PK	181	1.7	Note 3: RB 1 MHz; VB: 100 Hz



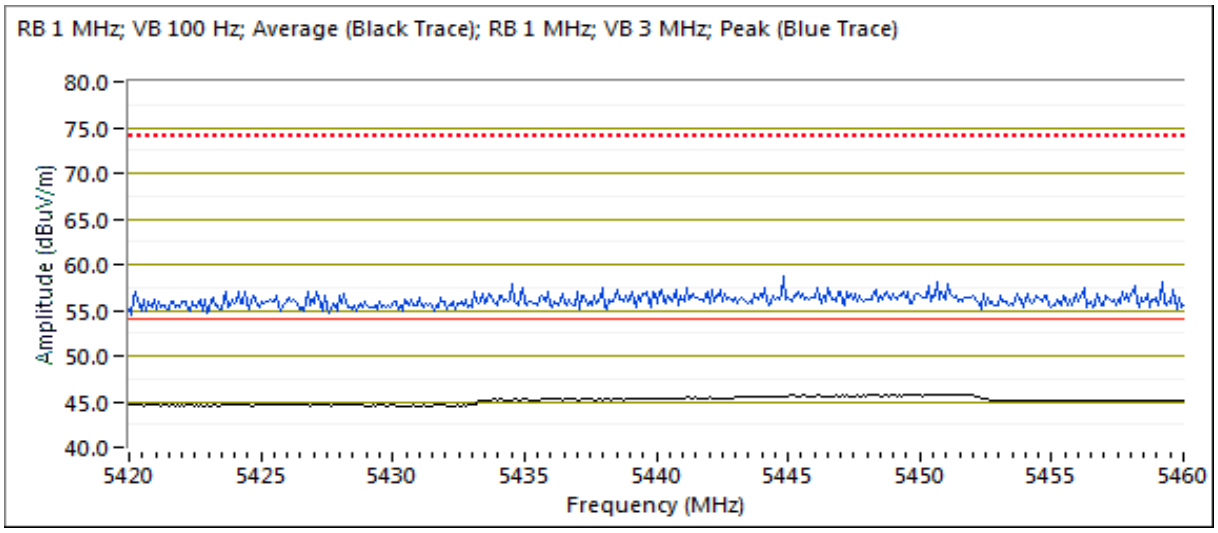
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #7: Radiated Bandedge Measurements, 5470-5725MHz

Channel: 1 & 100 Mode: ax20 Pwr Setting: 24 (q96) & 9 (q36)
Tx Chain: 4TX Data Rate: 8.6mbps / chain

5460 MHz Band Edge Signal Radiated Field Strength

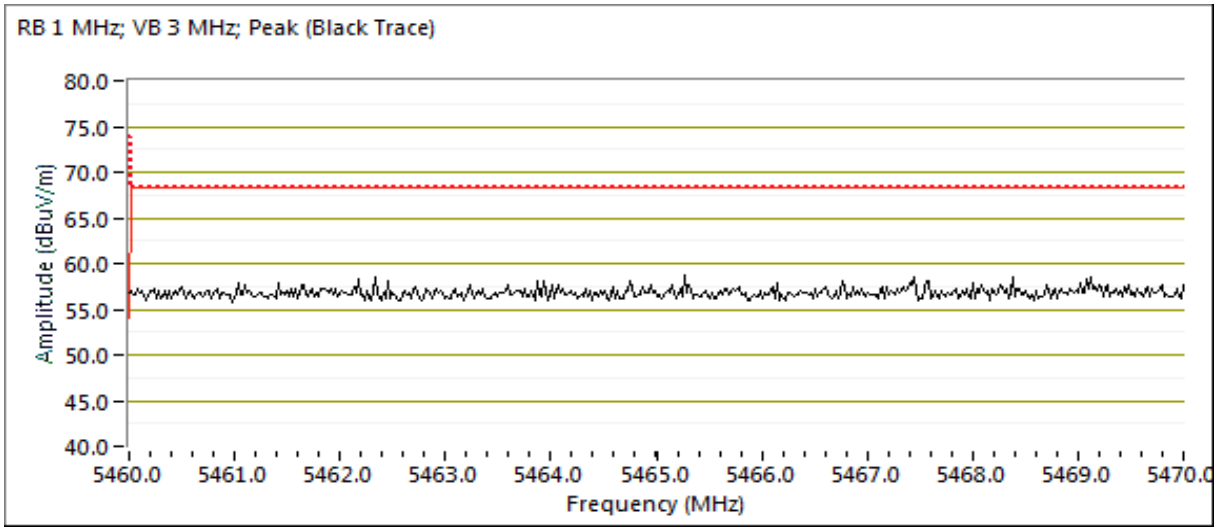
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5447.980	46.0	V	54.0	-8.0	AVG	186	1.6	Note 3: RB 1 MHz; VB: 100 Hz
5459.840	58.9	V	74.0	-15.1	PK	186	1.6	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5468.660	58.7	V	68.3	-9.6	PK	186	1.6	POS; RB 1 MHz; VB: 3 MHz

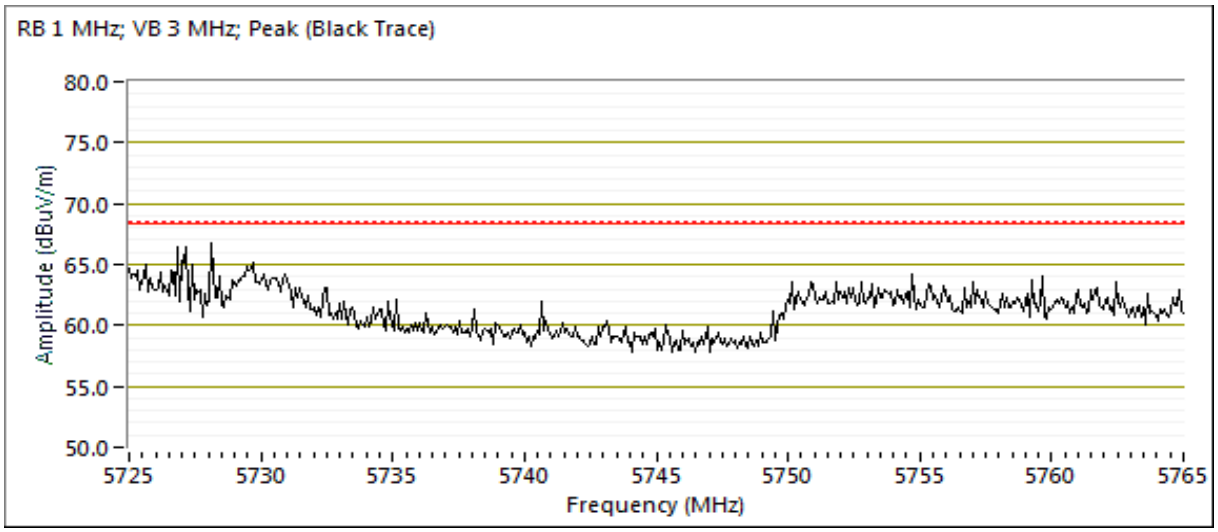


Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Channel: 11 & 140 Mode: ax20 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 4TX Data Rate: 8.6mbps / chain

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5757.300	67.2	V	68.3	-1.1	PK	187	1.5	POS; RB 1 MHz; VB: 3 MHz



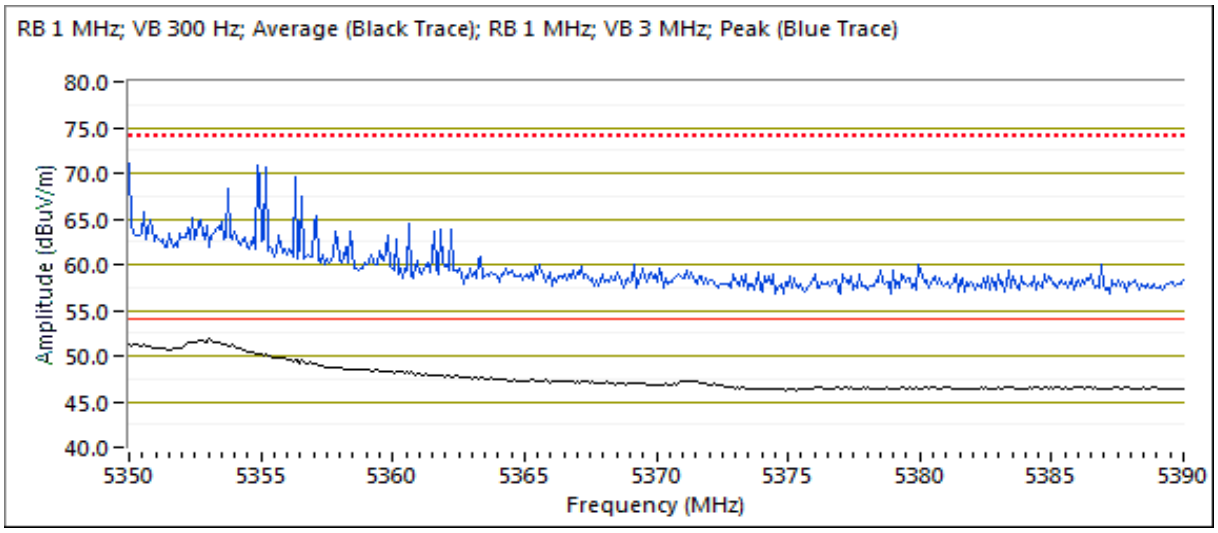
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #10: Radiated Bandedge Measurements, 5250-5350MHz

Channel: 9 & 62 Mode: ax40 Pwr Setting: 24 (q96) & 15.5(q62)
Tx Chain: 4TX Data Rate: 17.2mbps / chain

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5352.600	51.6	V	54.0	-2.4	AVG	185	1.7	Note 3: RB 1 MHz; VB: 300 Hz
5351.040	71.1	V	74.0	-2.9	PK	185	1.7	RB 1 MHz; VB: 3 MHz

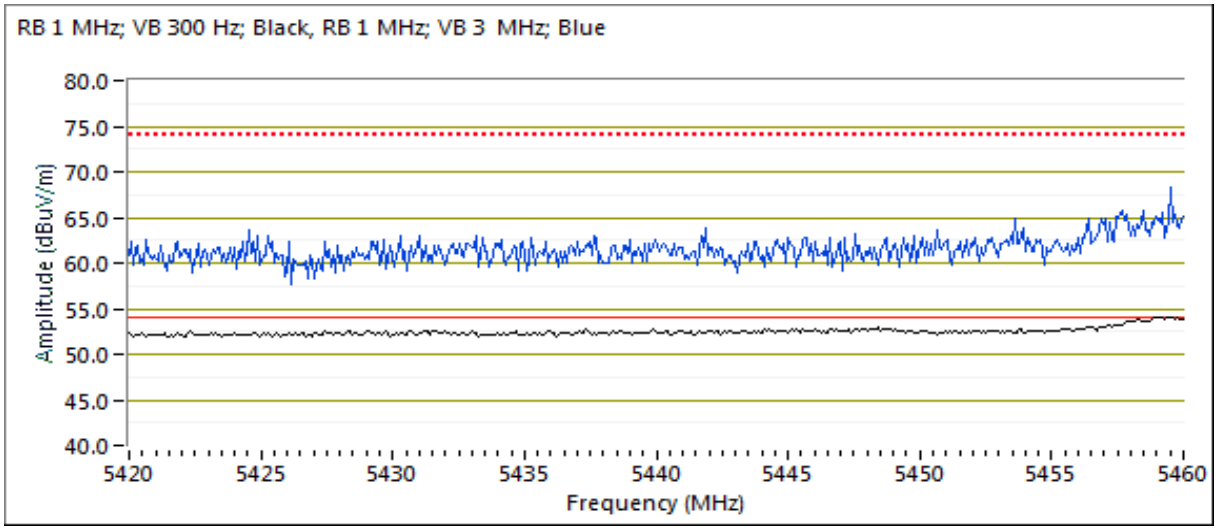


Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #11: Radiated Bandedge Measurements, 5470-5725MHz
3/11/2020
Channel: 3 & 102 Mode: ax40 Pwr Setting: 24 (q96) & 14 (q56)
Tx Chain: 4TX Data Rate: 17.2mbps / chain

5460 MHz Band Edge Signal Radiated Field Strength

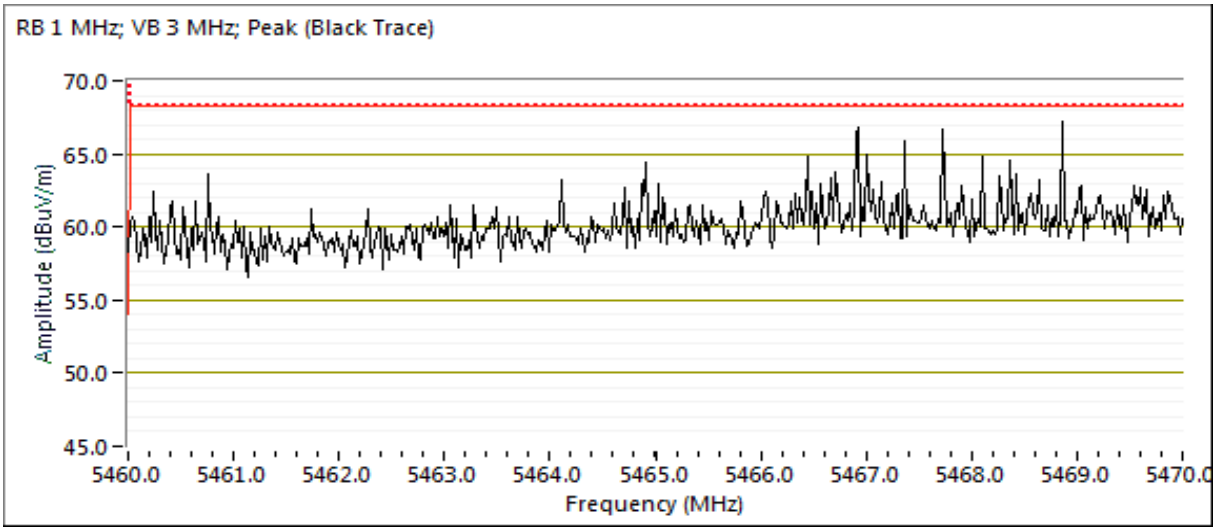
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.480	53.9	V	54.0	-0.1	AVG	181	1.8	POS; RB 1MHz; VB: 300Hz; Note 3
5457.630	69.2	V	74.0	-4.8	PK	181	1.8	POS; RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5467.090	67.8	V	68.3	-0.5	PK	225	1.8	POS; RB 1 MHz; VB: 3 MHz

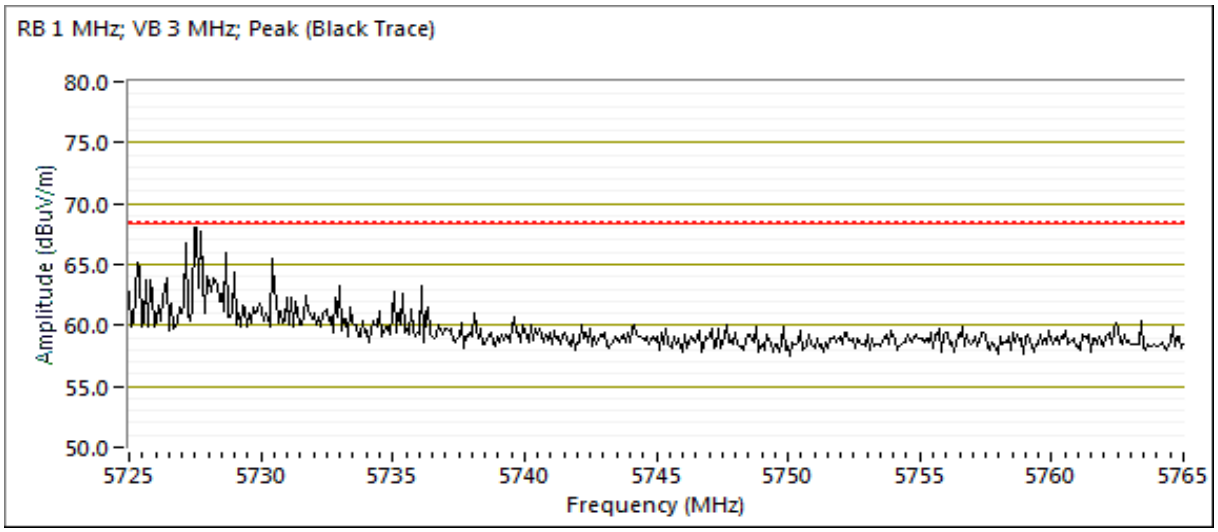


Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Channel: 9 & 134 Mode: ax40 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 4TX Data Rate: 17.2mbps / chain

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5727.650	67.8	V	68.3	-0.5	PK	187	1.9	POS; RB 1 MHz; VB: 3 MHz



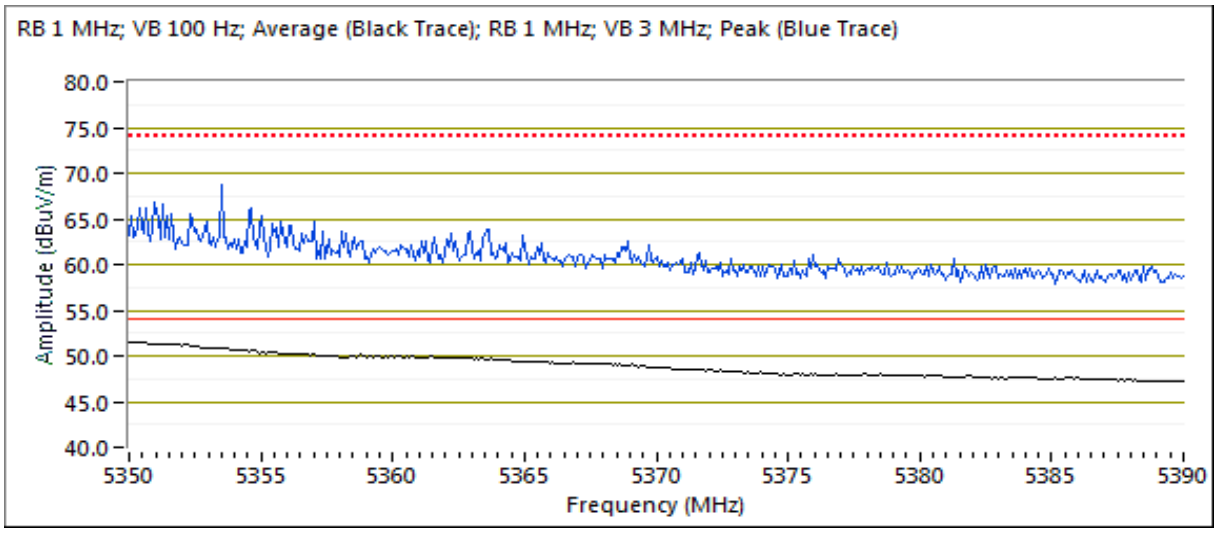
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #14: Radiated Bandedge Measurements, 5250-5350MHz

Channel: 6 & 58 Mode: ax20 & ax80 Pwr Setting: 24 (q96) & 16.5 (q66)
Tx Chain: 4Tx Data Rate: 36mbps / chain

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5351.630	51.4	V	54.0	-2.6	AVG	182	1.7	Note 3: RB 1 MHz; VB: 100 Hz
5351.420	67.9	V	74.0	-6.1	PK	182	1.7	RB 1 MHz; VB: 3 MHz



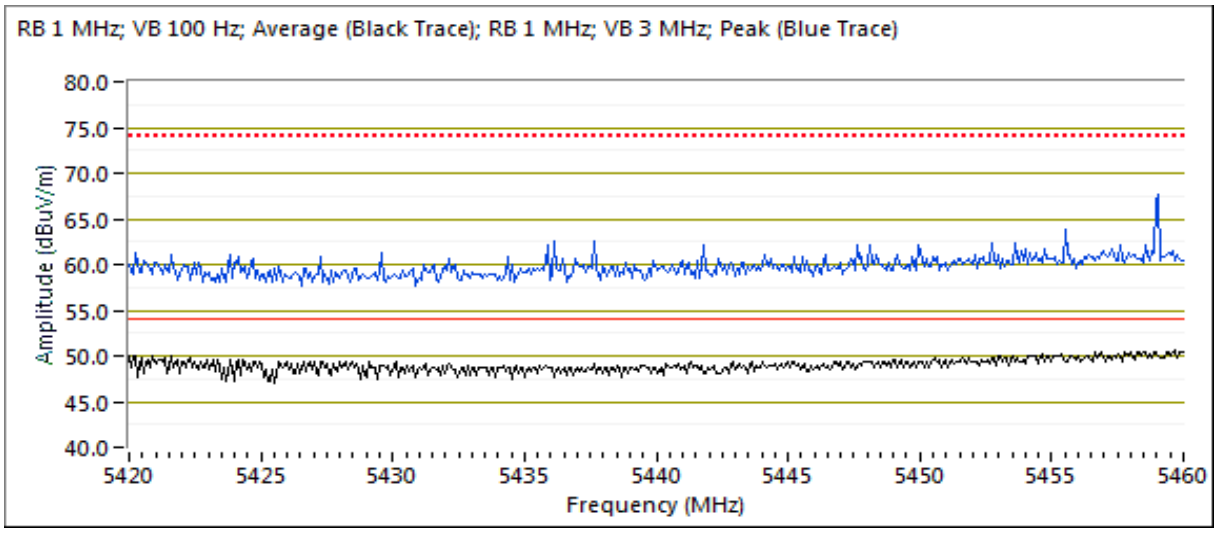
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #15: Radiated Bandedge Measurements, 5470-5725MHz

Channel: 1 & 106 Mode: ax20 & ax80 Pwr Setting: 24 (q96) & 17 (q68)
Tx Chain: 4Tx Data Rate: 36mbps / chain

5460 MHz Band Edge Signal Radiated Field Strength

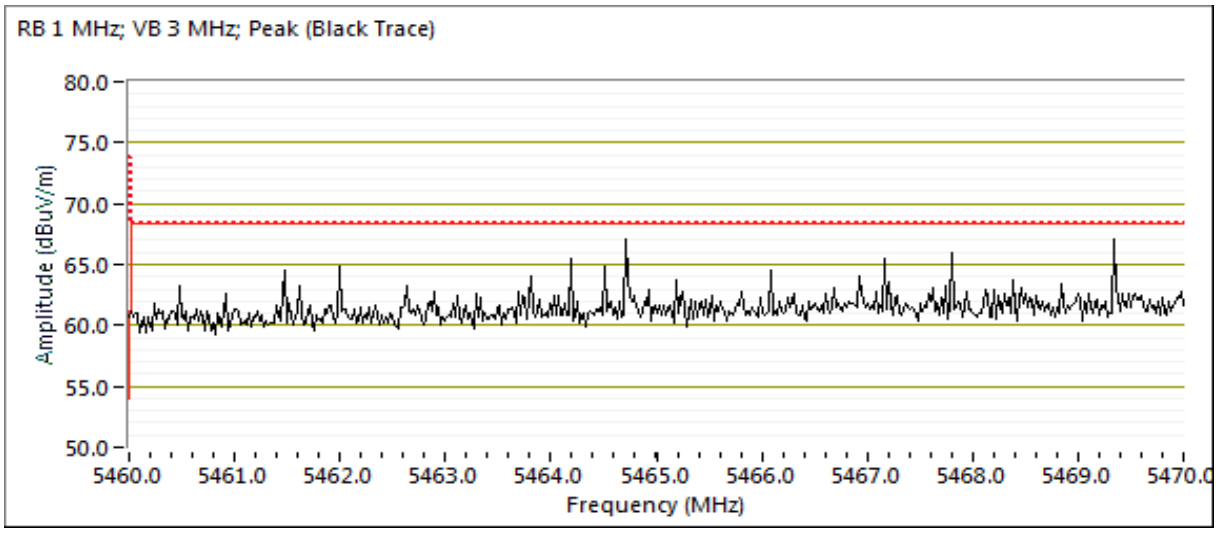
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.280	50.6	V	54.0	-3.4	AVG	182	1.9	Note 3: RB 1 MHz; VB: 100 Hz
5459.840	67.8	V	74.0	-6.2	PK	182	1.9	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5469.760	67.9	V	68.3	-0.4	PK	182	1.9	POS; RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #17: Radiated Bandedge Measurements, 5150-5350MHz

Date of Test: 03/11/20 Config. Used: 1

Test Engineer: M. Birgani Config Change: -

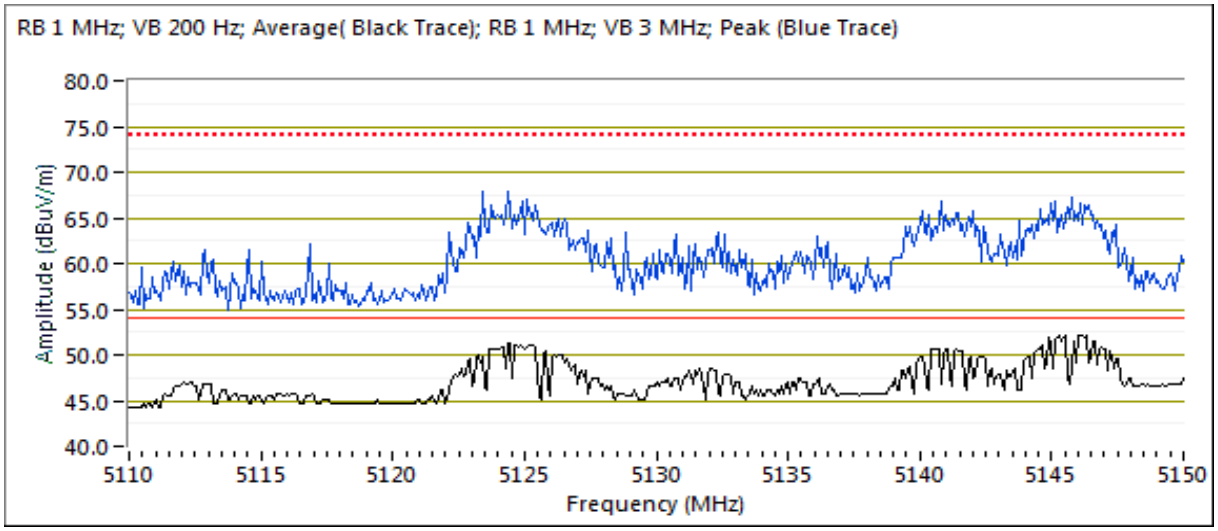
Test Location: Chamber 4 EUT Voltage: 120V/ 60Hz

Channel: 6 & 50 Mode: ax20 & ax160 Pwr Setting: 24 (q96) & 17 (q68)

Tx Chain: 4Tx Data Rate: 72mbps / chain

5150 MHz Band Edge Signal Radiated Field Strength

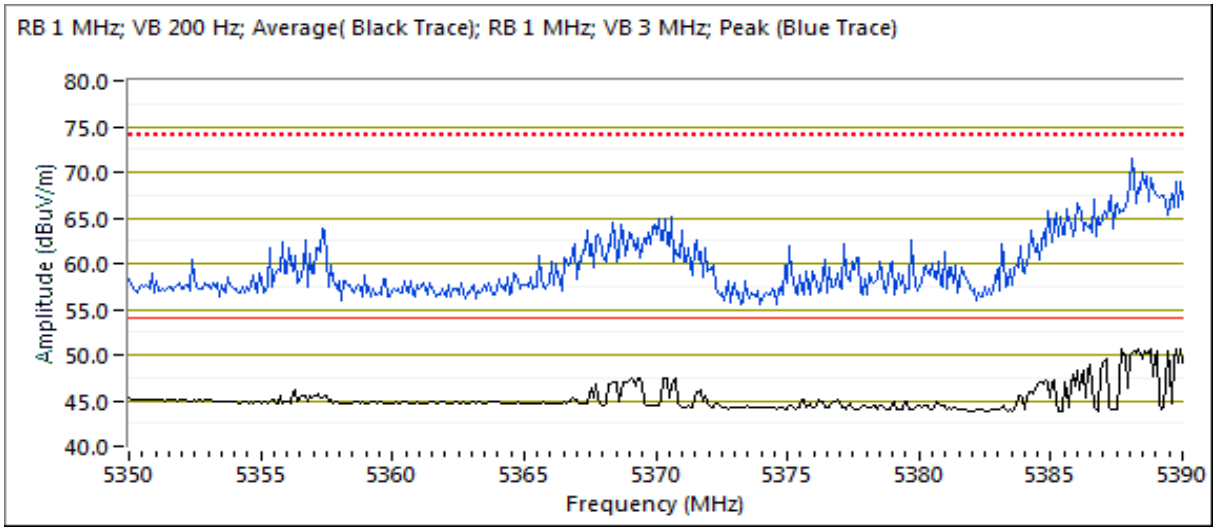
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5145.120	50.9	V	54.0	-3.1	AVG	167	1.6	RB 1 MHz; VB: 200 Hz; Note 3
5146.170	70.3	V	74.0	-3.7	PK	167	1.6	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5388.690	53.4	V	54.0	-0.6	AVG	166	1.6	RB 1 MHz; VB: 200 Hz; Note 3
5389.910	73.0	V	74.0	-1.0	PK	166	1.6	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #18: Radiated Bandedge Measurements, 5470-5725MHz

Date of Test: 03/24/20 Config. Used: 1

Test Engineer: M. Birgani Config Change: -

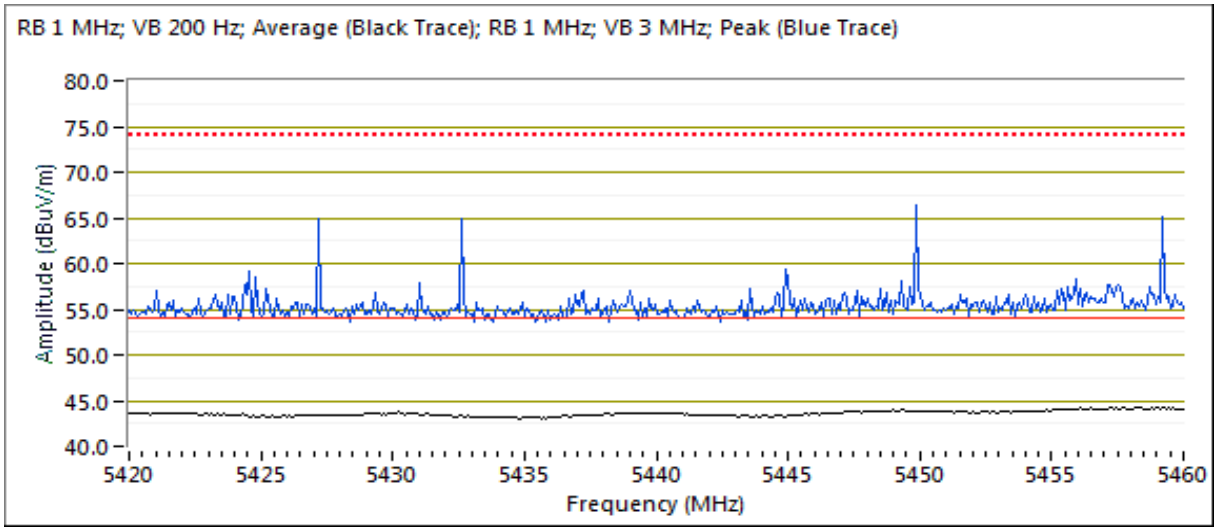
Test Location: Chamber 4 EUT Voltage: 120V/ 60Hz

Channel: 6 & 114 Mode: ax20 & ax160 Pwr Setting: 24 (q96) & 15.0 (q60)

Tx Chain: 4Tx Data Rate: 72mbps / chain

5460 MHz Band Edge Signal Radiated Field Strength

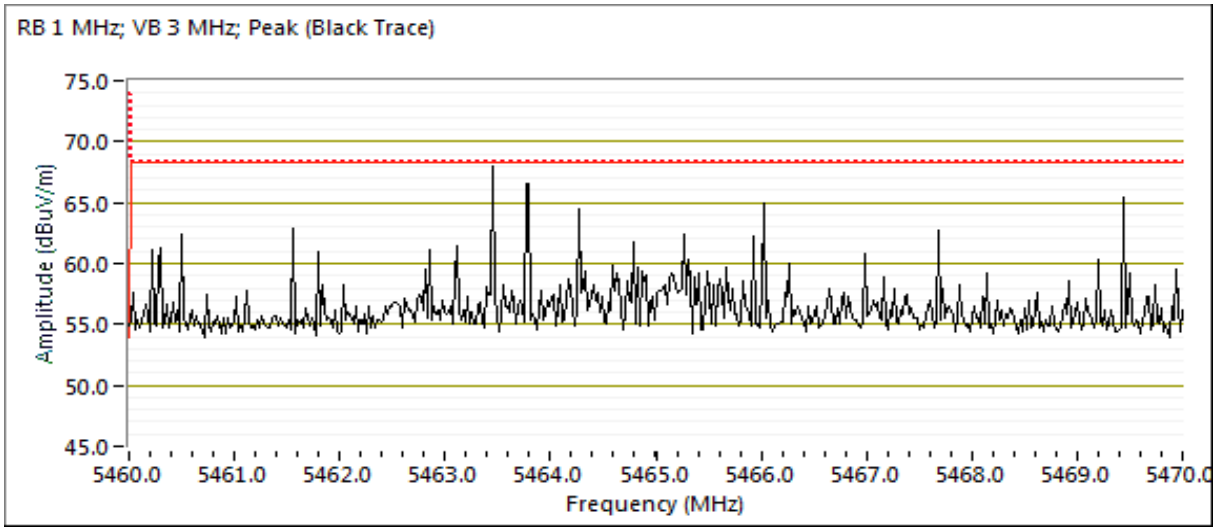
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5456.470	66.3	V	74.0	-7.7	PK	360	1.0	RB 1 MHz; VB: 3 MHz
5457.440	44.2	V	54.0	-9.8	AVG	360	1.0	RB 1 MHz; VB: 200 Hz; Note 3



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5465.410	67.7	V	68.3	-0.6	PK	360	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

RSS-247 (LELAN) and FCC 15.407(UNII)
Antenna Port Measurements
Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

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

General Test Configuration

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

Ambient Conditions:

Temperature: 20-22 °C
Rel. Humidity: 42-45 %

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

Sample S/N: M11917QW000T
Driver:

Date of Test: 7/25-29/19
Test Engineer: R. Varelas; M. Birgani
Test Location: Lab 3

Config. Used: 1
Config Change: -
Host EUT Voltage: 110V/ 60Hz

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5250 - 5350MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 95.5 mW ac20: 97.3 mW ac40: 178.1 mW ac80: 136.6 mW ac160: 87.5 mW
1	PSD, 5250 - 5350MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 7.1 mW/MHz ac20: 6.9 mW/MHz ac40: 6.3 mW/MHz ac80: 2.5 mW/MHz ac160: 1.6 mW/MHz
1	Max EIRP 5250 - 5350MHz	TPC required if EIRP≥ 500mW (27dBm). EIRP ≥ 200mW (23dBm) DFS threshold = -64dBm.	Pass	EIRP = 28.2 dBm (657.8 mW)
1	26dB Bandwidth	15.407 (Information only)	-	> 20MHz for all modes
1	99% Bandwidth	RSS-247 (Information only)	N/A	a: 16.8 MHz ac20: 17.9 MHz ac40: 36.6 MHz ac80: 76.1 MHz ac160: 155.0 MHz
2	Antenna Conducted - Out of Band Spurious	15.407(b) -27dBm/MHz		All emissions below the -27dBm/MHz limit

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033 D01

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)	Packet	pkt duty
11a	6	99.0%	Yes	5.06	0.0	0.0	10	7974	-1
ac20	6.5	97.6%	Yes	5.271	0.1	0.2	190	4324	-1
ac40	13.5	97.3%	Yes	5.24	0.1	0.2	191	8811	-1
ac80	29.3	96.0%	Yes	1.432	0.2	0.4	698	5159	-1
ac160	58.5	95.6%	Yes	1.439	0.2	0.4	695	10443	-1

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

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

Note 1:	Duty Cycle ≥ 98%. Output power measured using a spectrum analyzer (see plots below). RBW=1MHz, VB=3 MHz, Span > OBW, # of points in sweep ≥ 2*span/RBW, auto sweep, RMS detector, power averaging on (transmitted signal was continuous, duty cycle ≥ 98%) and power integration over the OBW (method SA-1 of ANSI C63.10).
Note 1:	Constant Duty Cycle < 98%. Output power measured using a spectrum analyzer (see plots below). RBW=1MHz, VB=3 MHz, Span > OBW, # of points in sweep ≥ 2*span/RBW, RMS detector, trace average 100 traces (at least 100 traces, increase the number to get true average), power averaging on and power integration over the OBW. Tthe measurements were adjusted by adding YY dB. This is based on 10log(1/x), where x is the duty cycle. (method SA-2 of ANSI C63.10)
Note 2:	Measured using the same analyzer settings used for output power.
Note 3:	99% Bandwidth measured in accordance with C63.10 - RB between 1-5 % of OBW and VB ≥ 3*RB, Span between 1.5 and 5 times OBW.
Note 4:	For MIMO systems the total output power and total PSD are calculated from the sum of the powers of the individual chains (in linear terms). The antenna gain used to determine the EIRP and limits for PSD/Output power depends on the operating mode of the MIMO device. If the signals on the non-coherent between the transmit chains then the gain used to determine the limits is the highest gain of the individual chains and the EIRP is the sum of the products of gain and power on each chain. If the signals are coherent then the effective antenna gain is the sum (in linear terms) of the gains for each chain and the EIRP is the product of the effective gain and total power.

Antenna Gain Information

Freq	Antenna Gain (dBi) / Chain				BF	MultiChain Legacy	CDD	Sectorized / Xpol	Dir G (dBi) (PWR)	Dir G (dBi) (PSD)
	1	2	3	4						
5250-5350	4.8	4.4	4.3	4.7	Yes	Yes	Yes	Yes	2.5	8.3

For devices that support CDD modes

Min # of spatial streams:	1	Chain 1 = Blue antenna cable	Chain 3 = Grey antenna cable
Max # of spatial streams:	4	Chain 2 = White antenna cable	Chain 4 = Black antenna cable

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; GA (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.
Notes:	For systems with Beamforming and CDD, choose one the following options: Option 1: Delays are optimized for beamforming, rather than being selected from cyclic delay table of 802.11; Array gains calculated based on beamforming criteria. Option 2: Antennas are paired for beamforming, and the pairs are configured to use the cyclic delay diversity of 802.11; the array gain associated with beamforming with 2 antennas (3dB), and the array gain associated with CDD with two antennas (3dB for PSD and 0 dB for power)

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5250-5350 MHz Band - FCC Single chain mode uses Ant 1

Mode: 11a Antenna Gain: 4.8 dBi Ant 1 Max EIRP (mW): 288.4

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5260	2	21.5	21.4	99		87.1	19.4	24.0	0.096	Pass
	1				19.4					
	2									
	2									
5300	2	21.5	21.1	99		95.5	19.8	24.0		Pass
	1				19.8					
	2									
	2									
5320	2	20.0	21.2	99		69.2	18.4	24.0		Pass
	1				18.4					
	2									
	2									

MIMO Device - 5250-5350 MHz Band - ISED

Mode: 11a Max EIRP (mW): 288.4

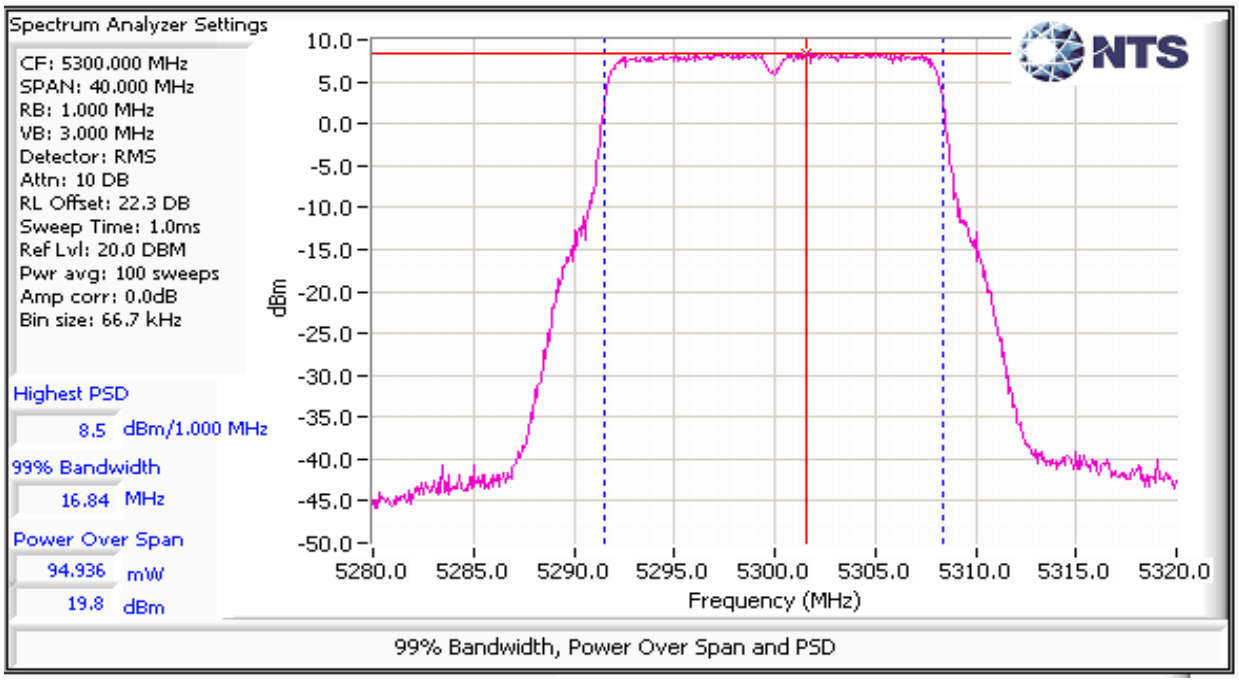
Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	ISED Limit dBm	Max Power (W)	Result
5260	2	21.5	16.8	99		87.1	19.4	23.3	0.096	Pass
	1				19.4					
	2									
	2									
5300	2	21.5	16.8	99		95.5	19.8	23.3		Pass
	1				19.8					
	2									
	2									
5320	2	20.0	16.8	99		69.2	18.4	23.3		Pass
	1				18.4					
	2									
	2									

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5250-5350 PSD - FCC/ISED

Mode: 11a

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	ISED Limit dBm/MHz	Result
5260	2	21.5		99		6.5	8.1	11.0	11.0	Pass
	1				8.1					
	2									
	2									
5300	2	21.5		99		7.1	8.5	11.0	11.0	Pass
	1				8.5					
	2									
	2									
5320	2	21.0		99		5.1	7.1	11.0	11.0	Pass
	1				7.1					
	2									
	2									



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5250-5350 MHz Band - FCC

Mode: ac20 Max EIRP (mW): 173.0

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5260	1	15	21.1	98	13.4	94.0	19.7	24.0	0.097	Pass
	3				13.6					
	4				13.5					
	2				13.9					
5300	1	15	21.4	98	13.8	97.3	19.9	24.0		Pass
	3				13.6					
	4				13.6					
	2				14.0					
5320	1	14.5	21.5	98	13.6	96.7	19.9	24.0		Pass
	3				13.6					
	4				13.7					
	2				14.0					

MIMO Device - 5250-5350 MHz Band - ISED

Mode: ac20 Max EIRP (mW): 173.0

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power[1] mW	Total Power[1] dBm	ISED Limit dBm	Max Power (W)	Result
5260	1	15	17.9	98	13.4	94.0	19.7	23.5	0.097	Pass
	3				13.6					
	4				13.5					
	2				13.9					
5300	1	15	17.9	98	13.8	97.3	19.9	23.5		Pass
	3				13.6					
	4				13.6					
	2				14.0					
5320	1	14.5	17.9	98	13.6	96.7	19.9	23.5		Pass
	3				13.6					
	4				13.7					
	2				14.0					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5250-5350 MHz Band - FCC

Mode: ac20 w /BF — Max EIRP (mW): 657.8

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5260	1	15	21.1	98	13.4	94.0	19.7	21.7	0.097	Pass
	3				13.6					
	4				13.5					
	2				13.9					
5300	1	15	21.4	98	13.8	97.3	19.9	21.7		Pass
	3				13.6					
	4				13.6					
	2				14.0					
5320	1	14.5	21.5	98	13.6	96.7	19.9	21.7		Pass
	3				13.6					
	4				13.7					
	2				14.0					

MIMO Device - 5250-5350 MHz Band - ISED

Mode: ac20 w /BF — Max EIRP (mW): 657.8

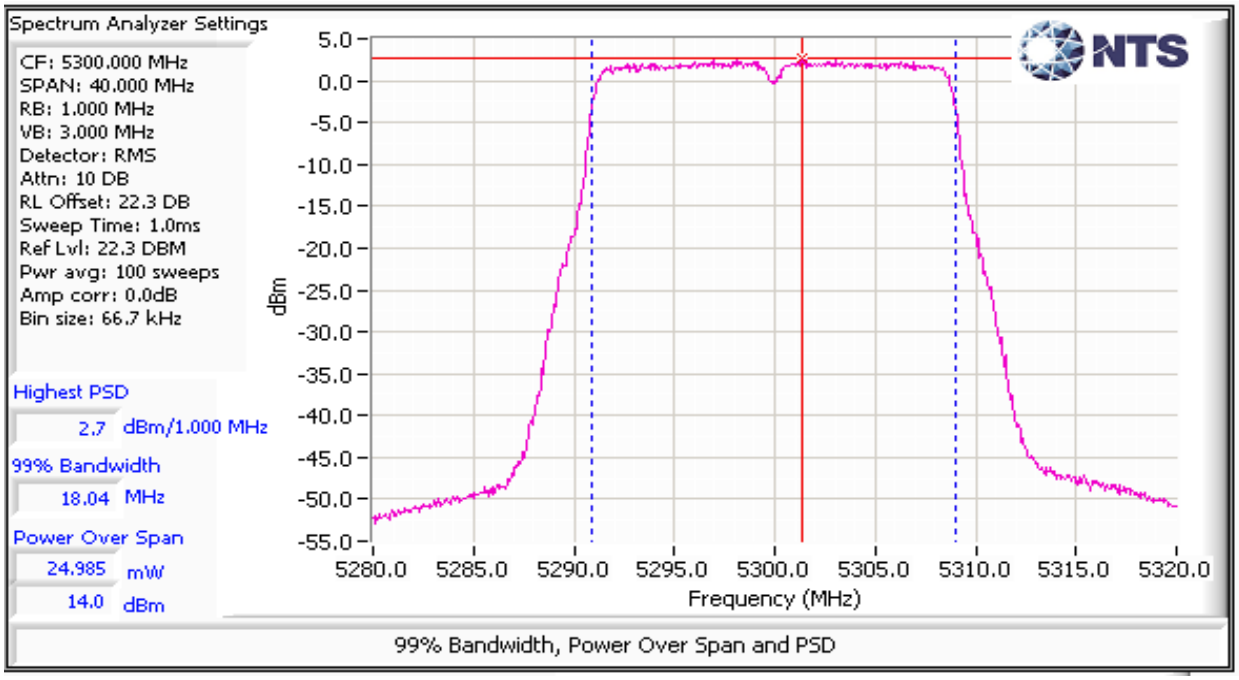
Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power[1] mW	Total Power[1] dBm	ISED Limit dBm	Max Power (W)	Result
5260	1	15	17.9	98	13.4	94.0	19.7	21.2	0.097	Pass
	3				13.6					
	4				13.5					
	2				13.9					
5300	1	15	17.9	98	13.8	97.3	19.9	21.2		Pass
	3				13.6					
	4				13.6					
	2				14.0					
5320	1	14.5	17.9	98	13.6	96.7	19.9	21.2		Pass
	3				13.6					
	4				13.7					
	2				14.0					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5250-5350 PSD - FCC/ISED

Mode: ac20

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	ISED Limit dBm/MHz	Result
5260	1	15		97.6	1.8	6.6	8.2	8.7	11.0	Pass
	3				2.0					
	4				2.0					
	2				2.5					
5300	1	15		97.6	2.2	6.9	8.4	8.7	11.0	Pass
	3				2.2					
	4				2.0					
	2				2.7					
5320	1	14.5		97.6	2.0	6.8	8.3	8.7	11.0	Pass
	3				2.1					
	4				2.3					
	2				2.4					



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5250-5350 MHz Band - FCC

Mode: ac40 Max EIRP (mW): 316.7

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5270	1	18	40.3	97	16.1	178.1	22.5	24.0	0.178	Pass
	3				16.2					
	4				16.1					
	2				17.0					
5310	1	16.75	39.6	97	15.4	148.6	21.7	24.0		Pass
	3				15.4					
	4				15.9					
	2				15.6					

MIMO Device - 5250-5350 MHz Band - ISED

Mode: ac40 Max EIRP (mW): 316.7

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power[1] mW	Total Power[1] dBm	ISED Limit dBm	Max Power (W)	Result
5270	1	18	36.6	97	16.1	178.1	22.5	24.0	0.178	Pass
	3				16.2					
	4				16.1					
	2				17.0					
5310	1	16.75	36.6	97	15.4	148.6	21.7	24.0		Pass
	3				15.4					
	4				15.9					
	2				15.6					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5250-5350 MHz Band - FCC

Mode: ac40 w/ BF — Max EIRP (mW): 256.8

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5270	1	16.5	38.0	97	15.5	144.4	21.6	21.7	0.144	Pass
	3				14.2					
	4				16.0					
	2				15.9					
5310	1	15.5	38.0	97	14.6	115.7	20.6	21.7		Pass
	3				13.1					
	4				15.2					
	2				14.8					

MIMO Device - 5250-5350 MHz Band - ISED

Mode: ac40 w/ BF — Max EIRP (mW): 256.8

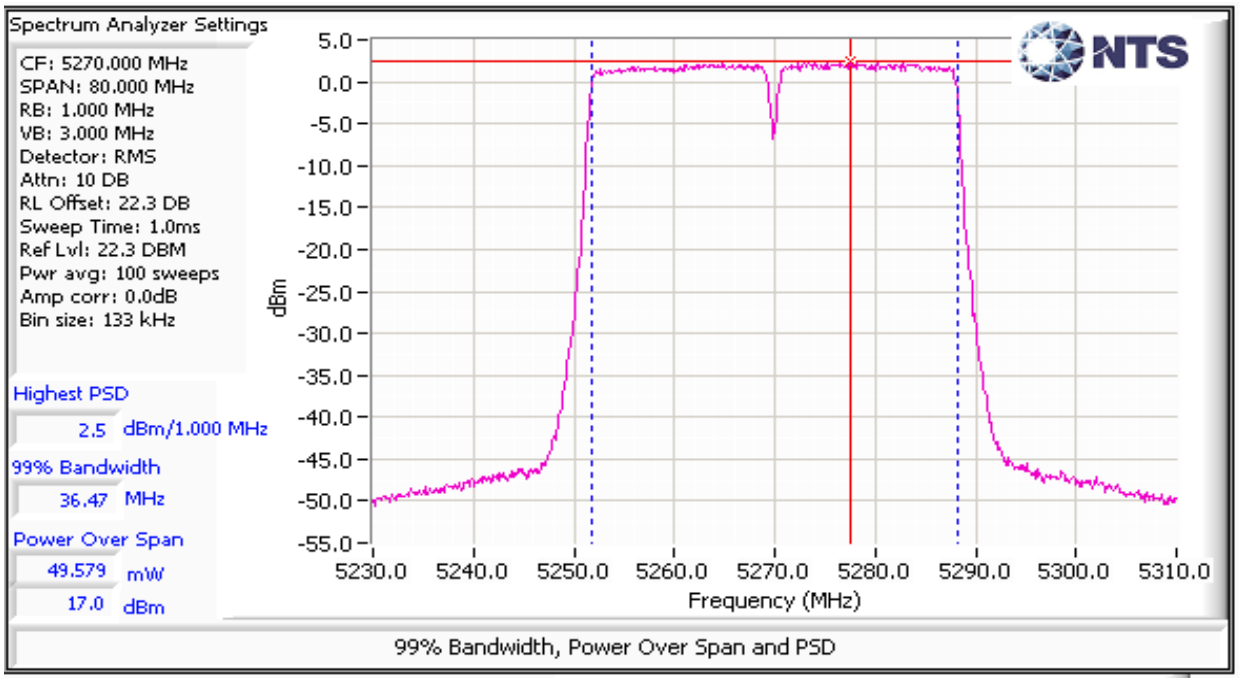
Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power[1] mW	Total Power[1] dBm	ISED Limit dBm	Max Power (W)	Result
5270	1	16.5	36.6	97	15.5	144.4	21.6	21.7	0.144	Pass
	3				14.2					
	4				16.0					
	2				15.9					
5310	1	15.5	36.6	97	14.6	115.7	20.6	21.7		Pass
	3				13.1					
	4				15.2					
	2				14.8					

MIMO Device 5250-5350 PSD - FCC/ISED

Mode: ac40

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	ISED Limit dBm/MHz	Result
5270	1	18		97	1.5	6.3	8.0	8.7	11.0	Pass
	3				1.8					
	4				1.5					
	2				2.5					
5310	1	16.75		97	0.8	5.2	7.2	8.7	11.0	Pass
	3				0.9					
	4				1.3					
	2				1.2					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5250-5350 MHz Band - FCC

Mode: ac80 Max EIRP (mW): 242.9

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5290	1	16.5	81.9	96	14.8	136.6	21.4	24.0	0.137	Pass
	3				15.2					
	4				15.4					
	2				15.2					

MIMO Device - 5250-5350 MHz Band - ISED

Mode: ac80 Max EIRP (mW): 242.9

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power[1] mW	Total Power[1] dBm	ISED Limit dBm	Max Power (W)	Result
5290	1	16.5	76.1	96	14.8	136.6	21.4	24.0	0.137	Pass
	3				15.2					
	4				15.4					
	2				15.2					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5250-5350 MHz Band - FCC

Mode: ac80 w/ BF — Max EIRP (mW): 242.9

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5290	1	16.5	81.9	96	14.8	136.6	21.4	21.7	0.137	Pass
	3				15.2					
	4				15.4					
	2				15.2					

MIMO Device - 5250-5350 MHz Band - ISED

Mode: ac80 w/ BF — Max EIRP (mW): 242.9

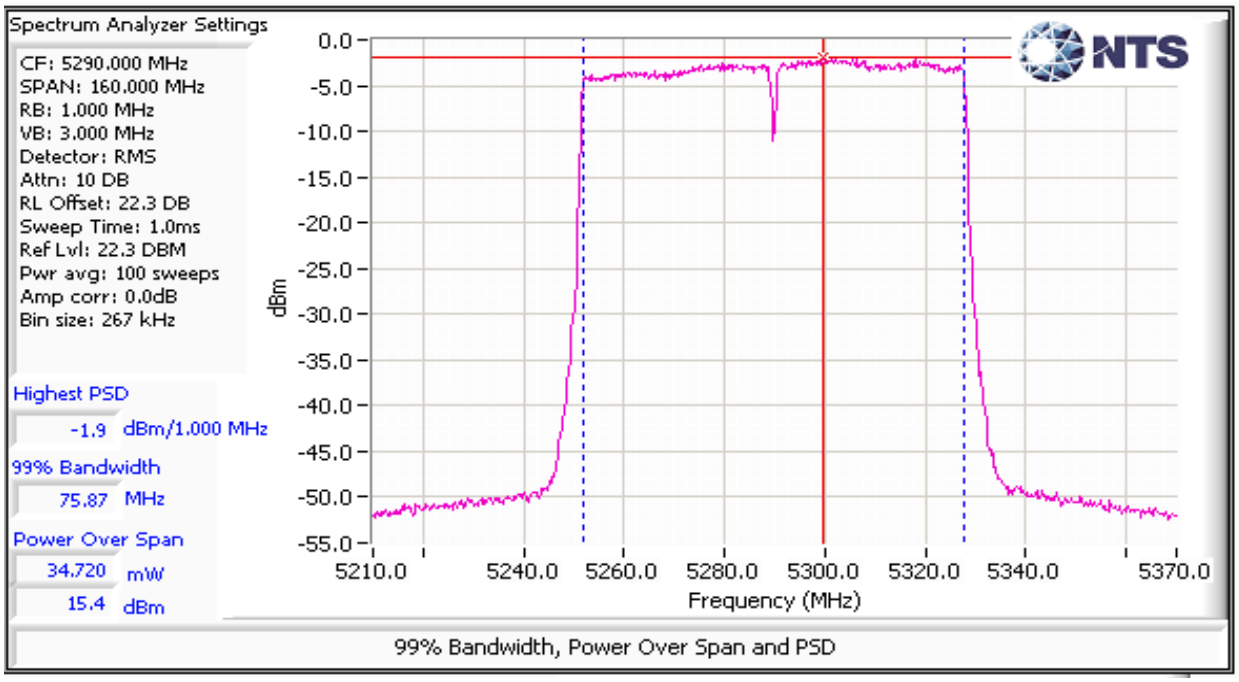
Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power[1] mW	Total Power[1] dBm	ISED Limit dBm	Max Power (W)	Result
5290	1	16.5	76.1	96	14.8	136.6	21.4	21.7	0.137	Pass
	3				15.2					
	4				15.4					
	2				15.2					

MIMO Device 5250-5350 PSD - FCC/ISED

Mode: ac80

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	ISED Limit dBm/MHz	Result
5290	1	16.5		96	-2.6	2.5	4.0	8.7	11.0	Pass
	3				-2.2					
	4				-1.9					
	2				-2.1					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - Portion within 5250-5350 MHz Band (UNII-2A) - FCC

Mode: ac160 Max EIRP (mW): 155.6

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5250	1	17.25		96	12.9	87.5	19.4	24.0	0.088	Pass
	3				13.3					
	4				13.1					
	2				13.5					

Portion within 5150-5250 MHz band (UNII-1)

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5250	1	17.25	82.14	96	12.8	82.6	19.2	30.0	0.083	Pass
	3				13.1					
	4				13.1					
	2				12.8					

MIMO Device - Portion within 5250-5350 MHz Band (UNII-2A) - ISED

Mode: ac160 Max EIRP (mW): 155.6

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power[1] mW	Total Power[1] dBm	ISED Limit dBm	Max Power (W)	Result
5250	1	17.25	77.47	96	12.9	87.5	19.4	24.0	0.088	Pass
	3				13.3					
	4				13.1					
	2				13.5					

Portion within 5150-5250 MHz band (UNII-1)

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power dBm	Total Power dBm (eirp)	ISED Limit dBm (eirp)	Max Power (W)	Result
5250	1	17.25	77.47	96	12.8	19.2	19.2	23.0	0.019	Pass
	3				13.1					
	4				13.1					
	2				12.8					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - Portion within 5250-5350 MHz Band (UNII-2A) - FCC

Mode: ac160 w/ BF — Max EIRP (mW): 155.6

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5250	1	17.25		96	12.9	87.5	19.4	21.7	0.088	Pass
	3				13.3					
	4				13.1					
	2				13.5					

Portion within 5150-5250 MHz band (UNII-1)

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5250	1	17.25	82.1	96	12.8	82.6	19.2	27.9	0.083	Pass
	3				13.1					
	4				13.1					
	2				12.8					

MIMO Device - Portion within 5250-5350 MHz Band (UNII-2A) - ISED

Mode: ac160 w/ BF — Max EIRP (mW): 69.5

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power[1] mW	Total Power[1] dBm	ISED Limit dBm	Max Power (W)	Result
5250	1	13.5	77.3	96	9.8	39.1	15.9	21.7	0.039	Pass
	3				8.8					
	4				10.1					
	2				10.0					

Portion within 5150-5250 MHz band (UNII-1)

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power dBm	Total Power dBm (eirp)	ISED Limit dBm (eirp)	Max Power (W)	Result
5250	1	13.5	77.3	96	9.0	14.9	23.0	23.0	0.015	Pass
	3				7.4					
	4				8.8					
	2				9.2					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - Portion within 5250-5350 MHz Band (UNII-2A) PSD - FCC

Mode: ac160

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	Result
5250	1	17.25		96	-4.3	1.6	2.0	8.7	Pass
	3				-4.3				
	4				-4.4				
	2				-4.2				

Portion within 5150-5250 MHz band (UNII-1)

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	Result
5250	1	17.25		96	-4.6	1.6	2.0	14.9	Pass
	3				-4.1				
	4				-4.1				
	2				-4.3				

MIMO Device - Portion within 5250-5350 MHz Band (UNII-2A) PSD - ISED

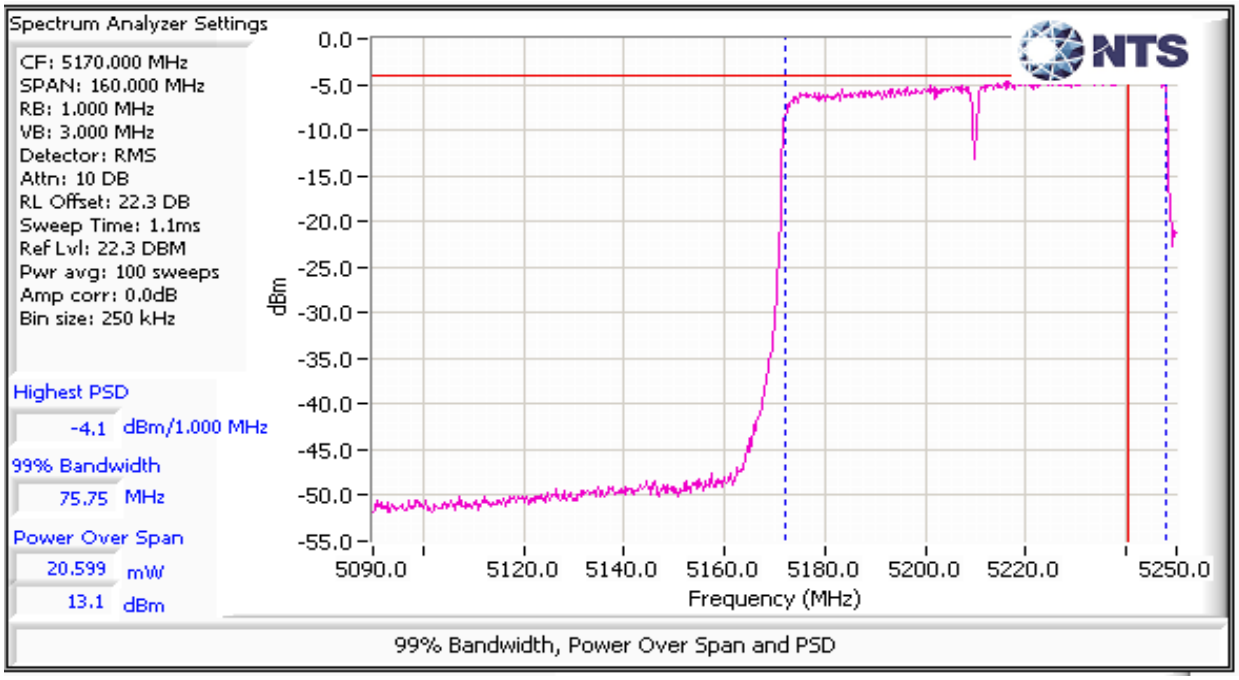
Mode: ac160

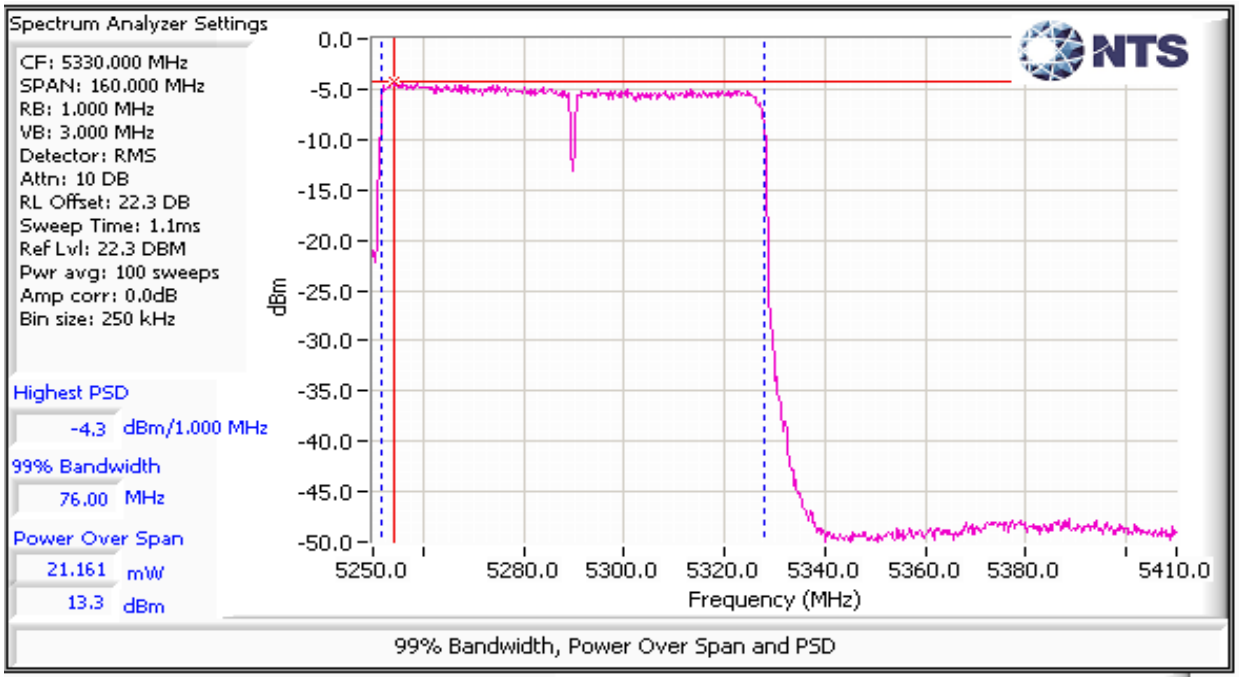
Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	ISED Limit dBm/MHz	Result
5250	1	13.5		96	-7.9	0.7	-1.5	11.0	Pass
	3				-8.9				
	4				-7.7				
	2				-7.8				

Portion within 5150-5250 MHz band (UNII-1)

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	ISED Limit dBm/MHz	Result
5250	1	13.5		96	-8.0	0.6	-2.2	1.9	Pass
	3				-9.5				
	4				-8.2				
	2				-7.8				

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A





Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

RSS-247 (LELAN) and FCC 15.407(UNII)
Antenna Port Measurements
Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

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

General Test Configuration

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

Ambient Conditions:

Temperature: 20 °C
Rel. Humidity: 45 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	PSD, 5250 - 5350MHz	15.407(a) (1), (2), (3) RSS-247 6.2		ax20: 7.3 mW/MHz ax40: 5.0 mW/MHz ax80: 2.7 mW/MHz ax160: 1.6 mW/MHz
1	99% Bandwidth	RSS-247 (Information only)	N/A	ax20: 19.2 MHz ax40: 38.0 MHz ax80: 77.3 MHz ax160: 155.0 MHz

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Procedure Comments:

Measurements performed in accordance with ANSI C63.10

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)	Packet
ac20	6.5	97.6%	Yes	5.27	0.1	0.2	190	4324
ac40	13.5	97.3%	Yes	5.24	0.1	0.2	191	8811
ac80	29.3	96.0%	Yes	1.43	0.2	0.4	698	5159
ac160	58.5	95.6%	Yes	1.44	0.2	0.4	695	10443

Sample Notes

Sample S/N: M11917QW000T

Date of Test: 03/11/20
Test Engineer: M. Birgani
Test Location: Fremont EMC Lab #3

Config. Used: 1
Config Change: None
EUT Voltage: 3.3Vdc

Antenna chain information: Chain 1: Blue Chain 2: White
Chain 3: Gray Chain 4: Black

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

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

Note 2:	Measured using the same analyzer settings used for output power.
Note 3:	For RSS-247 the limit for the 5150 - 5250 MHz band accounts for the antenna gain as the maximum eirp allowed is 10dBm/MHz. The limits are also corrected for instances where the highest measured value of the PSD exceeds the average PSD (calculated from the measured power divided by the measured 99% bandwidth) by more than 3dB by the amount that the measured value exceeds the average by more than 3dB.
Note 4:	99% Bandwidth measured in accordance with C63.10 - RB between 1-5 % of OBW and VB ≥ 3*RB, Span between 1.5 and 5 times OBW.
Note 5:	For MIMO systems the total output power and total PSD are calculated from the sum of the powers of the individual chains (in linear terms). The antenna gain used to determine the EIRP and limits for PSD/Output power depends on the operating mode of the MIMO device. If the signals on the non-coherent between the transmit chains then the gain used to determine the limits is the highest gain of the individual chains and the EIRP is the sum of the products of gain and power on each chain. If the signals are coherent then the effective antenna gain is the sum (in linear terms) of the gains for each chain and the EIRP is the product of the effective gain and total power.

Antenna Gain Information

Freq	Antenna Gain (dBi) / Chain				BF	MultiChain Legacy	CDD	Sectorized / Xpol	Dir G (dBi) (PWR)	Dir G (dBi) (PSD)
	1	2	3	4						
5250-5350	4.8	4.4	4.3	4.7	Yes	Yes	Yes	Yes	2.5	8.3

For devices that support CDD modes
Min # of spatial streams:
Max # of spatial streams:

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; GA (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.
Notes:	For systems with Beamforming and CDD, choose one the following options: Option 1: Delays are optimized for beamforming, rather than being selected from cyclic delay table of 802.11; Array gains calculated based on beamforming criteria. Option 2: Antennas are paired for beamforming, and the pairs are configured to use the cyclic delay diversity of 802.11; the array gain associated with beamforming with 2 antennas (3dB), and the array gain associated with CDD with two antennas (3dB for PSD and 0 dB for power)

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5250-5350 PSD - FCC/ISED

Mode: ax20

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[2] mW/MHz	Total PSD[2] dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5260	1	15	19.2	97.6	2.6	7.1	8.5	8.7	11.0	Pass
	3				2.0					
	4				2.0					
	2				2.8					
5300	1	15	19.2	97.6	2.8	7.3	8.6	8.7	11.0	Pass
	3				2.3					
	4				2.0					
	2				2.9					
5320	1	14.5	19.2	97.6	2.4	6.6	8.2	8.7	11.0	Pass
	3				2.5					
	4				1.3					
	2				2.0					

MIMO Device 5250-5350 PSD - FCC/ISED

Mode: ax40

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[2] mW/MHz	Total PSD[2] dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5270	1	16.5	38.0	97.3	0.8	5.0	7.0	8.7	11.0	Pass
	3				0.9					
	4				0.5					
	2				1.1					
5310	1	15.5	38.0	97.3	0.3	4.2	6.2	8.7	11.0	Pass
	3				0.1					
	4				-0.7					
	2				0.4					

MIMO Device 5250-5350 PSD - FCC/ISED

Mode: ax80

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[2] mW/MHz	Total PSD[2] dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5290	1	16.5	77.3	96.0	-1.7	2.7	4.3	8.7	11.0	Pass
	3				-1.9					
	4				-2.4					
	2				-1.7					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device 5250-5350 PSD - FCC/ISED

Mode: ax160

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[2] mW/MHz	Total PSD[2] dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5250	1	17	155.0	95.6	-4.2	1.6	2.0	8.7	11.0	Pass
	3				-4.2					
	4				-4.7					
	2				-4.0					

Mode: ax160 w/BF

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[2] mW/MHz	Total PSD[2] dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5250	1	14		95.6	-4.7	1.4	1.5	8.7	11.0	Pass
	3				-4.5					
	4				-5.4					
	2				-4.3					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

RSS-247 (LELAN) and FCC 15.407(UNII)
Antenna Port Measurements
Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

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

General Test Configuration

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

Ambient Conditions:

Temperature: 20-22 °C
Rel. Humidity: 42-45 %

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

Sample S/N: M11917QW000T
Driver:

Date of Test: 7/29-31/19
Test Engineer: R. Varelas; M. Birgani
Test Location: Lab #3

Config. Used: 1
Config Change: -
Host EUT Voltage: 110V/ 60Hz

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5470 - 5725MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 91.2 mW ac20: 96.9 mW ac40: 180.7 mW ac80: 195.1 mW ac160: 134.0 mW
1	PSD, 5470 - 5725MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 6.8 mW/MHz ac20: 6.9 mW/MHz ac40: 6.4 mW/MHz ac80: 3.5 mW/MHz ac160: 1.3 mW/MHz
1	Max EIRP 5470 - 5725MHz	TPC required if EIRP≥ 500mW (27dBm). EIRP ≥ 200mW (23dBm) DFS threshold	Pass	EIRP = 30.0 dBm (995.4 mW)
1	26dB Bandwidth	15.407 (Information only)	-	> 20MHz for all modes
1	99% Bandwidth	RSS-247 (Information only)	N/A	a: 17.0 MHz ac20: 18.0 MHz ac40: 36.5 MHz ac80: 75.9 MHz ac160: 154.0 MHz
2	Antenna Conducted - Out of Band Spurious	15.407(b) -27dBm/MHz		All emissions below the -27dBm/MHz limit

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033 D01

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)	Packet	pkt duty
11a	6	99.0%	Yes	5.06	0.0	0.0	10	7974	-1
ac20	6.5	97.6%	Yes	5.271	0.1	0.2	190	4324	-1
ac40	13.5	97.3%	Yes	5.24	0.1	0.2	191	8811	-1
ac80	29.3	96.0%	Yes	1.432	0.2	0.4	698	5159	-1
ac160	58.5	95.6%	Yes	1.439	0.2	0.4	695	10443	-1

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

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

Note 1:	Duty Cycle ≥ 98%. Output power measured using a spectrum analyzer (see plots below). RBW=1MHz, VB=3 MHz, Span > OBW, # of points in sweep ≥ 2*span/RBW, auto sweep, RMS detector, power averaging on (transmitted signal was continuous, duty cycle ≥ 98%) and power integration over the OBW (method SA-1 of ANSI C63.10).
Note 1:	Constant Duty Cycle < 98%. Output power measured using a spectrum analyzer (see plots below). RBW=1MHz, VB=3 MHz, Span > OBW, # of points in sweep ≥ 2*span/RBW, RMS detector, trace average 100 traces (at least 100 traces, increase the number to get true average), power averaging on and power integration over the OBW. Tthe measurements were adjusted by adding YY dB. This is based on 10log(1/x), where x is the duty cycle. (method SA-2 of ANSI C63.10)
Note 2:	Measured using the same analyzer settings used for output power.
Note 3:	99% Bandwidth measured in accordance with C63.10 - RB between 1-5 % of OBW and VB ≥ 3*RB, Span between 1.5 and 5 times OBW.
Note 4:	For MIMO systems the total output power and total PSD are calculated from the sum of the powers of the individual chains (in linear terms). The antenna gain used to determine the EIRP and limits for PSD/Output power depends on the operating mode of the MIMO device. If the signals on the non-coherent between the transmit chains then the gain used to determine the limits is the highest gain of the individual chains and the EIRP is the sum of the products of gain and power on each chain. If the signals are coherent then the effective antenna gain is the sum (in linear terms) of the gains for each chain and the EIRP is the product of the effective gain and total power.

Antenna Gain Information

Freq	Antenna Gain (dBi) / Chain				BF	MultiChain Legacy	CDD	Sectorized / Xpol	Dir G (dBi) (PWR)	Dir G (dBi) (PSD)
	1	2	3	4						
5470-5725	4.6	4.9	5.6	5	Yes	Yes	Yes	Yes	2.6	8.6

For devices that support CDD modes

Min # of spatial streams:	1	Chain 1 = Blue antenna cable	Chain 3 = Grey antenna cable
Max # of spatial streams:	4	Chain 2 = White antenna cable	Chain 4 = Black antenna cable

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; GA (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.
Notes:	For systems with Beamforming and CDD, choose one the following options: Option 1: Delays are optimized for beamforming, rather than being selected from cyclic delay table of 802.11; Array gains calculated based on beamforming criteria. Option 2: Antennas are paired for beamforming, and the pairs are configured to use the cyclic delay diversity of 802.11; the array gain associated with beamforming with 2 antennas (3dB), and the array gain associated with CDD with two antennas (3dB for PSD and 0 dB for power)

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5470-5725 MHz band (UNII-2C) - FCC Single chain mode uses Ant 1

Mode: 11a Antenna Gain: 4.6 dBi Ant 1 Max EIRP (mW): 263.0

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5500	2	13.0	21.3	99.0		12.3	10.9	24.0	0.091	Pass
	1				10.9					
	2									
	2									
5580	2	22.0	21.5	99.0		91.2	19.6	24.0		Pass
	1				19.6					
	2									
	2									
5700	2	12.0	21.5	99.0		11.0	10.4	24.0		Pass
	1				10.4					
	2									
	2									
Portion within 5475-5725 MHz band (UNII-2C)										
5720	2	21.0	15.8	99.0		58.9	17.7	23.0		Pass
	1				17.7					
	2									
	2									
Portion within 5725-5850 MHz band (UNII-3)										
5720	2	21.0		99.0		14.1	11.5	30.0	0.0141	Pass
	1				11.5					
	2									
	2									

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5470-5725 MHz band (UNII-2C) - ISED

Mode: 11a

Max EIRP (mW): 263.0

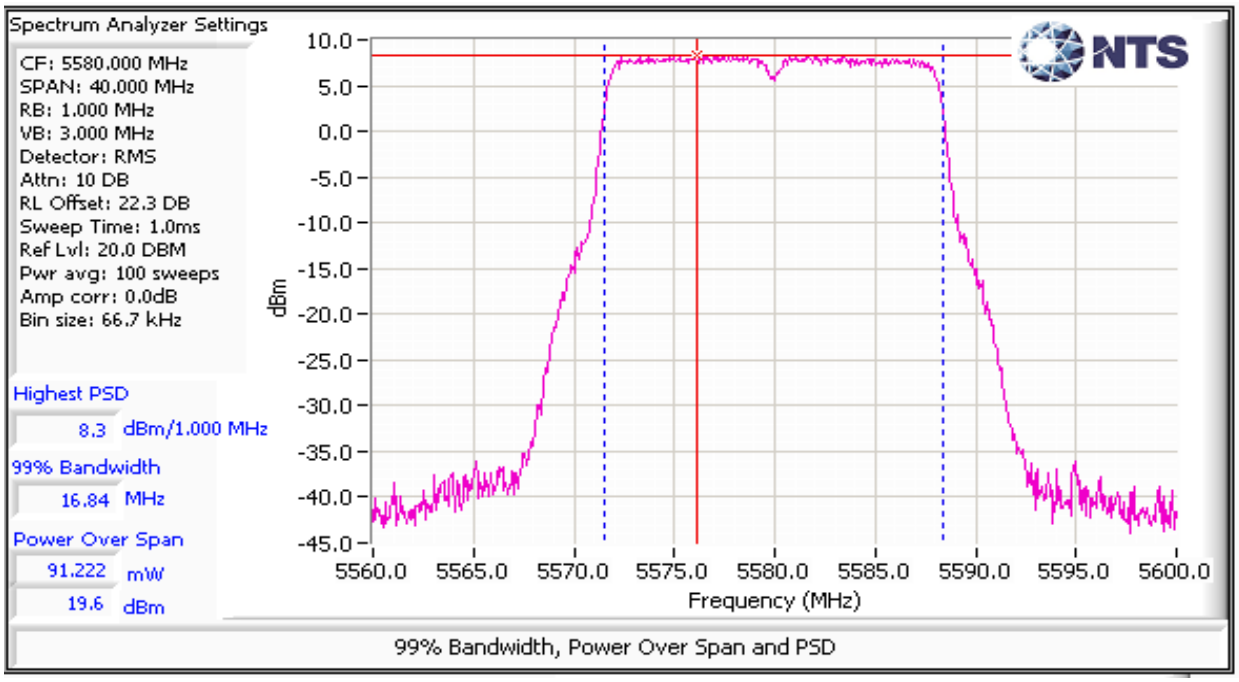
Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	ISED Limit dBm	Max Power (W)	Result
5500	1	13.0	16.8	99.0	10.9	13.9	11.4	23.3	0.091	Pass
5580	1	22.0	17.0	99.0	19.6	91.2	19.6	23.3		Pass
5700	1	12.0	16.8	99.0	10.4	11.0	10.4	23.3		Pass
Portion within 5475-5725 MHz band (UNII-2C)										
5720	1	21.0	13.5	99.0	17.7	58.9	17.7	22.3		Pass
Portion within 5725-5850 MHz band (UNII-3)										
5720	1 1 2 2	21	3.9	99.0	11.5	14.1	11.5	30.0	0.0141	Pass

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5470-5725 MHz band PSD (UNII-2C)
Mode: 11a

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	ISED Limit dBm/MHz	Result
5500	1	13.0		99.0	-0.3	0.9	-0.5	11.0	11.0	Pass
5580	1	22.0		99.0	8.3	6.8	8.3	11.0	11.0	Pass
5700	1	12.0		99.0	-0.7	0.9	-0.5	11.0	11.0	Pass
Portion within 5475-5725 MHz band (UNII-2C)										
5720	1	21.0		99.0	7.3	5.4	7.3	11.0	11.0	Pass
Portion within 5725-5850 MHz band (UNII-3)										
5720	1	21		99.0	7.2	5.2	7.2	30.0	27.2	Pass

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5470-5725 MHz Band - FCC

Mode: ac20 Max EIRP (mW): 176.3

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5500	1	15.5	21.3	97.6	13.5	95.6	19.8	24.0	0.097	Pass
	3				13.5					
	4				13.7					
	2				14.0					
5580	1	15.5	21.7	97.6	13.4	96.9	19.9	24.0		Pass
	3				13.4					
	4				13.9					
	2				14.2					
5700	1	15.5	21.2	97.6	13.8	91.9	19.6	24.0		Pass
	3				13.6					
	4				13.1					
	2				13.5					
Portion within 5475-5725 MHz band (UNII-2C)										
5720	1	15.5	15.9	97.6	13.0	74.8	18.7	23.0		Pass
	3				12.7					
	4				12.1					
	2				12.6					
Portion within 5725-5850 MHz band (UNII-3)										
5720	1	15.5		97.6	7.2	20.2	13.1	30.0	0.020	Pass
	3				6.9					
	4				6.5					
	2				7.1					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5470-5725 MHz Band - ISED

Mode: ac20 Max EIRP (mW): 176.3

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	ISED Limit dBm	Max Power (W)	Result
5500	1	15.5	18.0	97.6	13.5	95.6	19.8	23.6	0.097	Pass
	3				13.5					
	4				13.7					
	2				14.0					
5580	1	15.5	18.0	97.6	13.4	96.9	19.9	23.6		Pass
	3				13.4					
	4				13.9					
	2				14.2					
5700	1	15.5	18.0	97.6	13.8	91.9	19.6	23.6		Pass
	3				13.6					
	4				13.1					
	2				13.5					
Portion within 5475-5725 MHz band (UNII-2C)										
5720	1	15.5	14.1	97.6	13.0	74.8	18.7	22.5		Pass
	3				12.7					
	4				12.1					
	2				12.6					
Portion within 5725-5850 MHz band (UNII-3)										
5720	1	15.5		97.6	7.2	20.2	13.1	30.0	0.020	Pass
	3				6.9					
	4				6.5					
	2				7.1					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5470-5725 MHz Band - FCC

Mode: ac20 w/ BF — Max EIRP (mW): 702

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5500	1	15.5	21.3	97.6	13.5	95.6	19.8	21.4	0.097	Pass
	3				13.5					
	4				13.7					
	2				14.0					
5580	1	15.5	21.7	97.6	13.4	96.9	19.9	21.4		Pass
	3				13.4					
	4				13.9					
	2				14.2					
5700	1	15.5	21.2	97.6	13.8	91.9	19.6	21.4		Pass
	3				13.6					
	4				13.1					
	2				13.5					
Portion within 5475-5725 MHz band (UNII-2C)										
5720	1	15.5	15.9	97.6	13.0	74.8	18.7	20.4		Pass
	3				12.7					
	4				12.1					
	2				12.6					
Portion within 5725-5850 MHz band (UNII-3)										
5720	1	15.5		97.6	7.2	20.2	13.1	27.2	0.020	Pass
	3				6.9					
	4				6.5					
	2				7.1					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5470-5725 MHz Band - ISED

Mode: ac20 w/ BF

Max EIRP (mW): 702

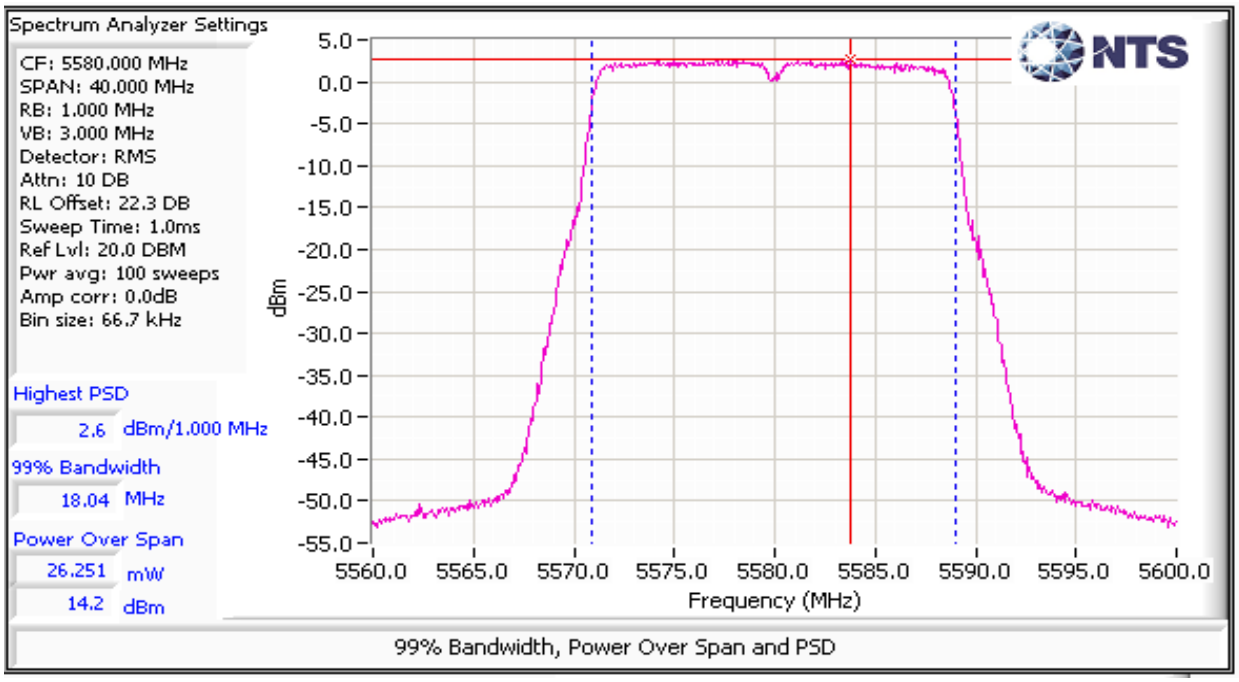
Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	ISED Limit dBm	Max Power (W)	Result
5500	1	15.5	18.0	97.6	13.5	95.6	19.8	21.0	0.097	Pass
	3				13.5					
	4				13.7					
	2				14.0					
5580	1	15.5	18.0	97.6	13.4	96.9	19.9	21.0		Pass
	3				13.4					
	4				13.9					
	2				14.2					
5700	1	15.5	18.0	97.6	13.8	91.9	19.6	21.0		Pass
	3				13.6					
	4				13.1					
	2				13.5					
Portion within 5475-5725 MHz band (UNII-2C)										
5720	1	15.5	14.1	97.6	13.0	74.8	18.7	19.9		Pass
	3				12.7					
	4				12.1					
	2				12.6					
Portion within 5725-5850 MHz band (UNII-3)										
5720	1	15.5		97.6	7.2	20.2	13.1	27.2	0.020	Pass
	3				6.9					
	4				6.5					
	2				7.1					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5470-5725 MHz band PSD (UNII-2C)
Mode: ac20

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	ISED Limit dBm/MHz	Result
5500	1	15.5		97.6	2.0	6.9	8.4	8.4	11.0	Pass
	3				1.9					
	4				2.4					
	2				2.6					
5580	1	15.5		97.6	2.1	6.9	8.4	8.4	11.0	Pass
	3				2.0					
	4				2.3					
	2				2.6					
5700	1	15.5		97.6	2.3	6.5	8.1	8.4	11.0	Pass
	3				2.0					
	4				1.6					
	2				2.0					
Portion within 5475-5725 MHz band (UNII-2C)										
5720	1	15.5		97.6	2.4	6.7	8.3	8.4	11.0	Pass
	3				2.2					
	4				1.6					
	2				2.2					
Portion within 5725-5850 MHz band (UNII-3)										
5720	1	15.5		97.6	2.2	6.2	7.9	27.2	27.2	Pass
	3				1.7					
	4				1.4					
	2				1.9					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5470-5725 MHz Band - FCC

Mode: ac40 Max EIRP (mW): 328.8

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5510	1	18	40.3	97.3	15.8	177.9	22.5	24.0	0.181	Pass
	3				16.5					
	4				16.6					
	2				16.5					
5550	1	18	39.6	97.3	16.2	180.7	22.6	24.0		Pass
	3				16.6					
	4				16.2					
	2				16.7					
5670	1	18	39.7	97.3	16.2	174.5	22.4	24.0		Pass
	3				16.3					
	4				16.1					
	2				16.5					
Portion within 5475-5725 MHz band (UNII-2C)										
5710	1	18	35.14	97.3	15.7	145.2	21.6	24.0		Pass
	3				15.5					
	4				15.1					
	2				15.6					
Portion within 5725-5850 MHz band (UNII-3)										
5710	1	18		97.3	5.4	13.6	11.3	30.0	0.0136	Pass
	3				5.2					
	4				4.8					
	2				5.3					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5470-5725 MHz Band - ISED

Mode: ac40 Max EIRP (mW): 328.8

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	ISED Limit dBm	Max Power (W)	Result
5510	1	18	36.5	97.3	15.8	177.9	22.5	24.0	0.181	Pass
	3				16.5					
	4				16.6					
	2				16.5					
5550	1	18	36.5	97.3	16.2	180.7	22.6	24.0		Pass
	3				16.6					
	4				16.2					
	2				16.7					
5670	1	18	36.5	97.3	16.2	174.5	22.4	24.0		Pass
	3				16.3					
	4				16.1					
	2				16.5					
Portion within 5475-5725 MHz band (UNII-2C)										
5710	1	18	33.4	97.3	15.7	145.2	21.6	24.0		Pass
	3				15.5					
	4				15.1					
	2				15.6					
Portion within 5725-5850 MHz band (UNII-3)										
5710	1	18		97.3	5.4	13.6	11.3	30.0	0.0136	Pass
	3				5.2					
	4				4.8					
	2				5.3					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5470-5725 MHz Band - FCC

Mode: ac40 w/ BF

Max EIRP (mW): 995.4

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5510	1	16.0	40.3	97.3	14.9	119.4	20.8	21.4	0.137	Pass
	3				13.7					
	4				15.1					
	2				14.7					
5550	1	16.5	39.6	97.3	14.7	115.8	20.6	21.4		Pass
	3				13.7					
	4				14.8					
	2				14.7					
5670	1	16.5	39.7	97.3	15.5	137.4	21.4	21.4		Pass
	3				14.7					
	4				15.6					
	2				15.1					
Portion within 5475-5725 MHz band (UNII-2C)										
5710	1	17.0	33.35	97.3	15.1	125.9	21.0	21.4		Pass
	3				14.4					
	4				15.2					
	2				14.7					
Portion within 5725-5850 MHz band (UNII-3)										
5710	1	17.0		97.3	4.8	11.9	10.8	27.2	0.0119	Pass
	3				4.1					
	4				5.1					
	2				4.4					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5470-5725 MHz Band - ISED

Mode: ac40 w/ BF

Max EIRP (mW): 995.4

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	ISED Limit dBm	Max Power (W)	Result
5510	1	16.0	38.0	97.3	14.9	119.4	20.8	21.4	0.137	Pass
	3				13.7					
	4				15.1					
	2				14.7					
5550	1	16.5	38.0	97.3	14.7	115.8	20.6	21.4		Pass
	3				13.7					
	4				14.8					
	2				14.7					
5670	1	16.5	38.0	97.3	15.5	137.4	21.4	21.4		Pass
	3				14.7					
	4				15.6					
	2				15.1					
Portion within 5475-5725 MHz band (UNII-2C)										
5710	1	17.0	33.9	97.3	15.1	125.9	21.0	21.4		Pass
	3				14.4					
	4				15.2					
	2				14.7					
Portion within 5725-5850 MHz band (UNII-3)										
5710	1	17.0		97.3	4.8	11.9	10.8	27.2	0.0119	Pass
	3				4.1					
	4				5.1					
	2				4.4					

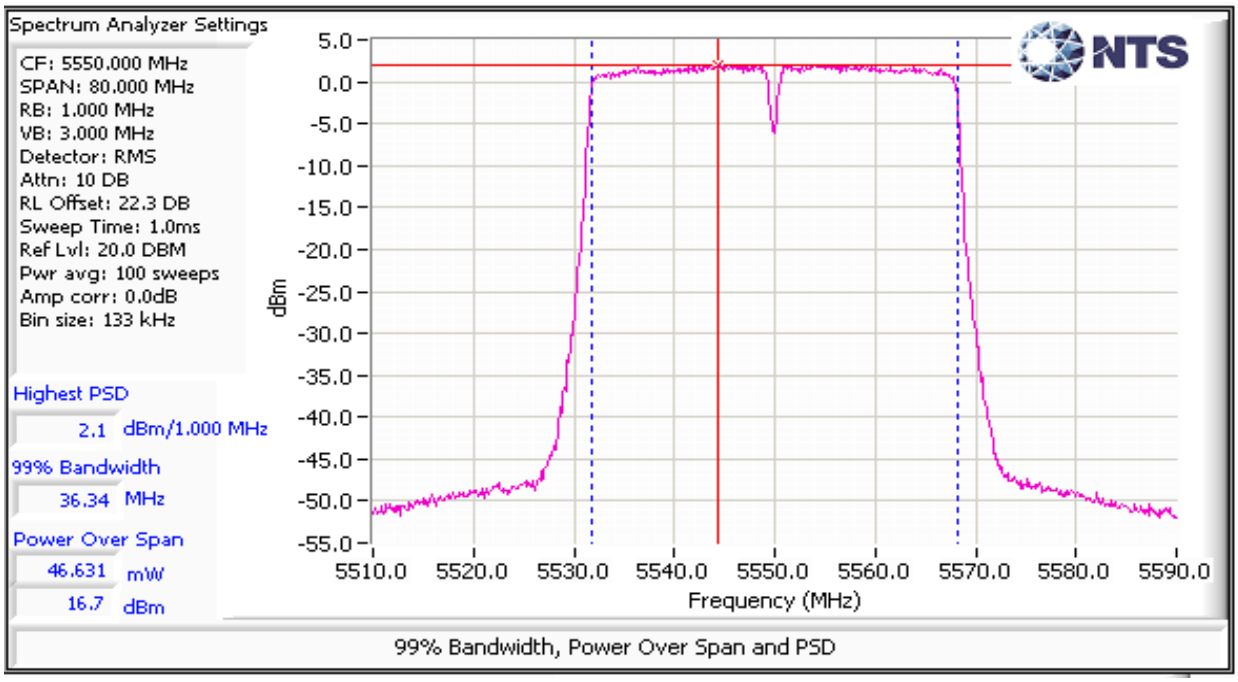
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device 5470-5725 PSD - FCC/ISED

Mode: ac40

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	ISED Limit dBm/MHz	Result
5510	1	18.0		97.3	1.2	6.1	7.9	8.4	11.0	Pass
	3				1.9					
	4				1.9					
	2				1.9					
5550	1	18.0		97.3	1.7	6.4	8.1	8.4	11.0	Pass
	3				2.1					
	4				1.9					
	2				2.1					
5670	1	18.0		97.3	1.7	6.3	8.0	8.4	11.0	Pass
	3				1.8					
	4				1.7					
	2				2.1					
Portion within 5475-5725 MHz band (UNII-2C)										
5710	1	18.0		97.3	1.6	5.7	7.6	8.4	11.0	Pass
	3				1.5					
	4				1.1					
	2				1.5					
Portion within 5725-5850 MHz band (UNII-3)										
5710	1	18.0		97.3	1.1	4.9	6.9	27.2	27.2	Pass
	3				0.7					
	4				0.3					
	2				0.9					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5470-5725 MHz Band - FCC

Mode: ac80 Max EIRP (mW): 355.0

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5530	1	18.0	81.9	96.0	16.4	190.6	22.8	24.0	0.195	Pass
	3				16.7					
	4				16.5					
	2				16.8					
5610	1	18.0	81.3	96.0	16.6	195.1	22.9	24.0		Pass
	3				17.0					
	4				16.4					
	2				16.8					
Portion within 5475-5725 MHz band (UNII-2C)										
5690	1	18.0	76.1	96.0	16.0	168.0	22.3	24.0		Pass
	3				16.3					
	4				15.7					
	2				16.2					
Portion within 5725-5850 MHz band (UNII-3)										
5690	1	18.0		96.0	1.3	6.0	7.8	30.0	0.006	Pass
	3				1.7					
	4				1.3					
	2				1.9					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5470-5725 MHz Band - ISED

Mode: ac80 Max EIRP (mW): 346.8

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	ISED Limit dBm	Max Power (W)	Result
5530	1	18.0	75.9	96.0	16.4	190.6	22.8	24.0	0.191	Pass
	3				16.7					
	4				16.5					
	2				16.8					
Portion within 5475-5725 MHz band (UNII-2C)										
5690	1	18.0	73.2	96.0	16.0	168.0	22.3	24.0		Pass
	3				16.3					
	4				15.7					
	2				16.2					
Portion within 5725-5850 MHz band (UNII-3)										
5690	1	18.0		96.0	1.3	6.0	7.8	30.0	0.006	Pass
	3				1.7					
	4				1.3					
	2				1.9					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5470-5725 MHz Band - FCC

Mode: ac80 w/ BF — Max EIRP (mW): 925.1

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5530	1	16.5	81.9	96.0	15.0	127.7	21.1	21.4	0.128	Pass
	3				14.3					
	4				15.2					
	2				14.9					
5610	1	16.0	81.3	96.0	14.8	121.8	20.9	21.4		Pass
	3				14.2					
	4				14.9					
	2				14.7					
Portion within 5475-5725 MHz band (UNII-2C)										
5690	1	16.0	76.1	96.0	14.6	115.6	20.6	21.4		Pass
	3				14.1					
	4				14.7					
	2				14.3					
Portion within 5725-5850 MHz band (UNII-3)										
5690	1	16.0		96.0	0.2	4.4	6.4	27.2	0.0044	Pass
	3				-0.1					
	4				0.8					
	2				0.1					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5470-5725 MHz Band - ISED

Mode: ac80 w/ BF — Max EIRP (mW): 925.1

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	ISED Limit dBm	Max Power (W)	Result
5530	1	16.5	77.6	96.0	15.0	127.7	21.1	21.4	0.128	Pass
	3				14.3					
	4				15.2					
	2				14.9					
Portion within 5470-5725 MHz band (UNII-2C)										
5690	1	16.0	73.4	96.0	14.6	115.6	20.6	21.4		Pass
	3				14.1					
	4				14.7					
	2				14.3					
Portion within 5725-5850 MHz band (UNII-3)										
5690	1	16.0		96.0	0.2	4.4	6.4	27.2	0.0044	Pass
	3				-0.1					
	4				0.8					
	2				0.1					

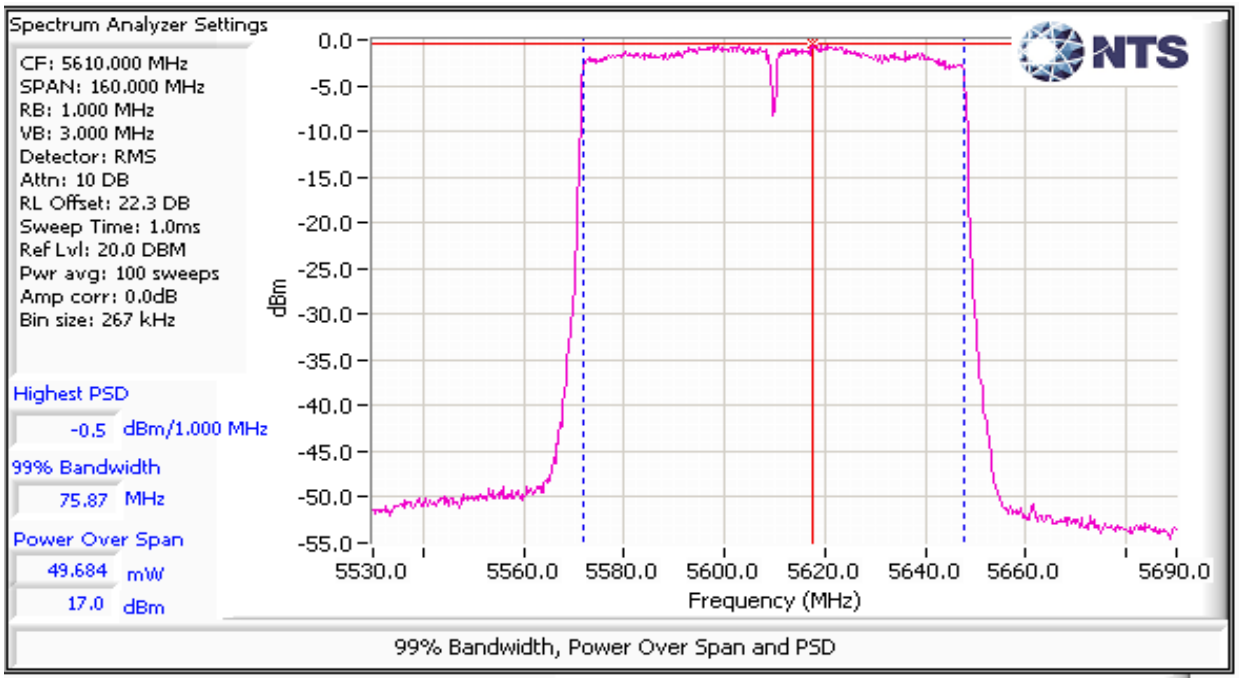
Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device 5470-5725 PSD - FCC/ISED Note: 5610 MHz channel not used for Canada

Mode: ac80

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	ISED Limit dBm/MHz	Result
5530	1	18.0		96.0	-1.0	3.4	5.3	8.4	11.0	Pass
	3				-0.8					
	4				-1.1					
	2				-0.6					
5610	1	18.0		96.0	-0.9	3.5	5.4	8.4	-	Pass
	3				-0.5					
	4				-1.0					
	2				-0.7					
Portion within 5475-5725 MHz band (UNII-2C)										
5690	1	18.0		96.0	-1.3	3.0	4.8	8.4	11.0	Pass
	3				-1.2					
	4				-1.8					
	2				-1.2					
Portion within 5725-5850 MHz band (UNII-3)										
5690	1	18.0		96.0	-3.0	2.2	3.4	27.2	27.2	Pass
	3				-2.7					
	4				-3.0					
	2				-2.6					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5470-5725 MHz Band - FCC Only

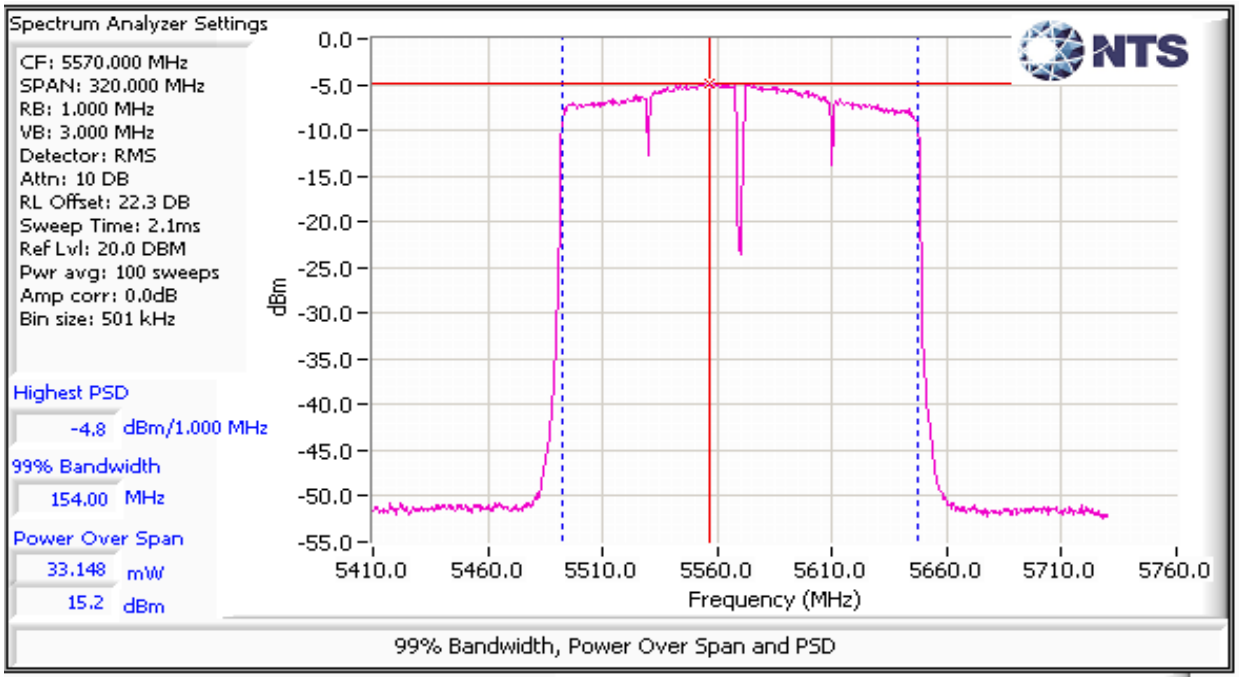
Mode: ac160 Max EIRP (mW): 243.8

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5570	1	17	164.3	95.6	14.7	134.0	21.3	24.0	0.134	Pass
	3				15.2					
	4				15.1					
	2				15.2					

MIMO Device 5470-5725 PSD - FCC only

Mode: ac160

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz		Result
5570	1	17		95.6	-5.5	1.3	1.1	8.4	-	Pass
	3				-5.1					
	4				-5.1					
	2				-4.8					



Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device - 5470-5725 MHz Band - FCC Only

Mode: ac160 w/ BF

Max EIRP (mW): 970.7

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5570	1	17	164.3	95.6	14.7	134.0	21.3	21.4	0.134	Pass
	3				15.2					
	4				15.1					
	2				15.2					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

RSS-247 (LELAN) and FCC 15.407(UNII)
Antenna Port Measurements
Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

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

General Test Configuration

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

Ambient Conditions:

Temperature: 20-22 °C
Rel. Humidity: 42-45 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	PSD, 5470 - 5725MHz	15.407(a) (1), (2), (3) RSS-247 6.2		ax20: 6.8 mW/MHz ax40: 6.3 mW/MHz ax80: 5.2 mW/MHz ax160: 1.3 mW/MHz
1	99% Bandwidth	RSS-247 (Information only)	N/A	ax20: 19.7 MHz ax40: 38.0 MHz ax80: 77.3 MHz ax160: 155.7 MHz

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Procedure Comments:

Measurements performed in accordance with ANSI C63.10

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)	Packet
ac20	6.5	97.6%	Yes	5.27	0.1	0.2	190	4324
ac40	13.5	97.3%	Yes	5.24	0.1	0.2	191	8811
ac80	29.3	96.0%	Yes	1.43	0.2	0.4	698	5159
ac160	58.5	95.6%	Yes	1.44	0.2	0.4	695	10443

Sample Notes

Sample S/N: M11917QW000T

Date of Test: 3/24 & 3/26/2020
Test Engineer: M. Birgani
Test Location: Fremont EMC Lab #3

Config. Used: 1
Config Change: None
EUT Voltage: 3.3Vdc

Antenna chain information: Chain 1: Blue Chain 2: White
Chain 3: Gray Chain 4: Black

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

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

Measurement Specific Notes:

Note 1:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector). Per KDB 789033 2) c) (i), compliance can be demonstrated by meeting the average and peak limits of 15.209, as an alternative.
Note 2:	Emission has a duty cycle ≥ 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces (method AD of KDB 789033)
Note 3:	Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear averaging, auto sweep,max hold 50*1/DC traces (method VB of KDB 789033)
Note 4:	Emission has a duty cycle < 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100*1/DC traces, measurement corrected by Pwr correction factor (method AD of KDB 789033)
Note 5:	Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements.

Antenna Gain Information

Freq	Antenna Gain (dBi) / Chain				BF	MultiChain Legacy	CDD	Sectorized / Xpol	Dir G (PWR)	Dir G (PSD)
	1	2	3	4						
5470-5725	4.6	4.9	5.6	5	Yes	Yes	Yes	Yes	2.6	8.6

For devices that support CDD modes
Min # of spatial streams:
Max # of spatial streams:

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; GA (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.
Notes:	For systems with Beamforming and CDD, choose one the following options: Option 1: Delays are optimized for beamforming, rather than being selected from cyclic delay table of 802.11; Array gains calculated based on beamforming criteria. Option 2: Antennas are paired for beamforming, and the pairs are configured to use the cyclic delay diversity of 802.11; the array gain associated with beamforming with 2 antennas (3dB), and the array gain associated with CDD with two antennas (3dB for PSD and 0 dB for power)

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5470-5725 PSD - FCC/ISED

Mode: ax20

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[2] mW/MHz	Total PSD[2] dBm/MHz	FCC Limit dBm/MHz	IC limit dBm/MHz	Result
5500	1	15.5	19.7	97.6	2.2	6.8	8.3	8.4	11.0	Pass
	3				2.0					
	4				2.3					
	2				2.3					
5580	1	15.5	19.7	97.6	2.1	6.5	8.1	8.4	11.0	Pass
	3				1.8					
	4				2.1					
	2				2.0					
5700	1	15.5	19.7	97.6	2.5	6.8	8.3	8.4	11.0	Pass
	3				2.1					
	4				2.1					
	2				2.1					
5720	1	15.5	14.9	97.6	2.4	6.7	8.3	8.4	11.0	Pass
	3				2.0					
	4				2.0					
	2				2.0					

Portion within 5725-5850 MHz band (UNII-3)

5720	1	15.5	5.3	97.6	2.4	6.5	8.1	27.4	27.4	Pass
	3				1.9					
	4				1.8					
	2				1.9					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

MIMO Device 5470-5725 PSD - FCC/ISED

Mode: ax40

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[2] mW/MHz	Total PSD[2] dBm/MHz	FCC Limit dBm/MHz	IC limit dBm/MHz	Result
5510	1	18	38.0	97.3	1.8	6.3	8.0	8.4	11.0	Pass
	3				2.0					
	4				1.8					
	2				1.7					
5550	1	18	38.0	97.3	1.4	5.8	7.6	8.4	11.0	Pass
	3				1.7					
	4				1.5					
	2				1.5					
5670	1	18	38.0	97.3	1.9	6.2	7.9	8.4	11.0	Pass
	3				1.6					
	4				1.7					
	2				1.8					
5710	1	18	33.9	97.3	2.0	6.0	7.8	8.4	11.0	Pass
	3				1.4					
	4				1.5					
	2				1.5					

Portion within 5725-5850 MHz band (UNII-3)

5710	1	18	4.7	97.3	1.0	5.0	7.0	27.4	27.4	Pass
	3				0.8					
	4				0.7					
	2				0.9					

Client:	Arris	PR Number:	PR101106
Model:	NVG5X8AX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

5470-5725 PSD - FCC/ISED Note: 5610 MHz channel not used for Canada
Mode: ax80

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[2] mW/MHz	Total PSD[2] dBm/MHz	FCC Limit dBm/MHz	IC limit dBm/MHz	Result
5530	1	18	77.3	96.0	-1.2	3.3	5.2	8.4	11.0	Pass
	3				-0.8					
	4				-1.0					
	2				-1.1					
5610	1	18	77.3	96.0	-1.0	3.2	5.1	8.4	-	Pass
	3				-1.1					
	4				-1.0					
	2				-1.3					
5690	1	18	73.4	96.0	-1.1	3.2	5.1	8.4	11.0	Pass
	3				-0.9					
	4				-1.2					
	2				-1.3					
Portion within 5725-5850 MHz band (UNII-3)										
5690	1	18	4.8	96.0	-2.8	2.5	4.0	27.4	27.4	Pass
	3				-2.5					
	4				-2.8					
	2				-1.3					

5470-5725 PSD - FCC Only
Mode: ax160

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[2] mW/MHz	Total PSD[2] dBm/MHz	FCC Limit dBm/MHz		Result
5570	1	17	155.7	95.6	-5.0	1.3	1.1	8.4		Pass
	3				-4.8					
	4				-4.8					
	2				-5.2					

End of Report

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