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EMC Test Report

Application for FCC Grant of Equipment Authorization
Canada Certification

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

Model: NVG5XDBAX

IC 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
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TOTAL NUMBER OF PAGES:	182

ACCREDITED
Testing Cert #0214.26

This report and the information contained herein represent the results of testing of only those articles / products identified in this document and selected by the client. The tests were performed to specifications and/or procedures selected by the client. National Technical Systems (NTS) makes no representations expressed or implied that such testing fully demonstrates efficiency, performance, reliability, or any other characteristic of the articles being tested, or similar products. This report should not be relied upon as an endorsement or certification by NTS of the equipment tested, nor does it present any statement whatsoever as to its merchantability or fitness of the test article or similar products, for a particular purpose. This report shall not be reproduced except in full without written approval from NTS.

VALIDATING SIGNATORIES

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REVISION HISTORY

Rev#	Date	Comments	Modified By
-	November 8, 2019	First release	
1	February 28, 2020	Revised report to add ax mode test data	David Guidotti
2	March 12, 2020	Revised report to correct the gain for single chain legacy mode	David Guidotti

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SCOPE

An electromagnetic emissions test has been performed on the Arris model NVG5XDBAX, 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:

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 NVG5XDBAX 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 NVG5XDBAX and therefore apply only to the tested sample. The sample was selected and prepared by Mark Rieger 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 5.15 – 5.25 GHZ BAND – ACCESS POINTS (United States)

FCC Rule Part		Description	Measured Value / Comments	Limit / Requirement	Result
15.407 (a) (1) (ii)		Output Power (n, ac and ax modes use same power)	a: 251.2 mW ac20: 441.8 mW ac40: 470.8 mW ac80: 132.6 mW (Max eirp: 0.8 W)	30 dBm (1 W) EIRP <= 4W	Complies
15.407 (a) (1) (i), (ii) or (iii)		Power Spectral Density	a: 18.2 mW/MHz ac20: 29.7 mW/MHz ac40: 16.0 mW/MHz ac80: 2.4 mW/MHz ax20: 12.5 mW/MHz ax40: 10.0 mW/MHz ax80: 2.0 mW/MHz	14.9 dBm/MHz (30.9 mW/MHz) (reduced due to antenna gain)	Complies
15.407 (a) (1) (i)		EIRP 30° Above Horizon	Not an outdoor device	21 dBm (125 mW)	N/A
15.407(b) (1) / 15.209		Spurious Emissions above 1GHz	53.8 dBuV/m @ 5129.3 MHz (-0.2 dB)	Refer to the limits section (p23) for restricted bands, all others -27 dBm/MHz EIRP	Complies

OPERATION IN THE 5.15 – 5.25 GHZ BAND (Canada)

	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
	RSS-247 6.2.1	Indoor operation only	Refer to user's manual	N/A	Complies
	RSS-247 6.2.1.1	99% Bandwidth	a: 17.5 MHz ac20: 18.4 MHz ac40: 36.3 MHz ac80: 75.9 MHz ax20: 19.6 MHz ax40: 38.0 MHz ax80: 77.2 MHz	N/A – limits output power if < 20MHz	N/A
	RSS-247 6.2.1.1	EIRP Output Power (n, ac and ax modes use same power)	a: 15.3 dBm ac20: 21.1 dBm ac40: 22.8 dBm ac80: 22.9 dBm	23 dBm (200 mW)	Complies
	RSS-247 6.2.1.1	Power Spectral Density	a: 1.5 dBm/MHz ac20: 1.5 dBm/MHz ac40: 1.8 dBm/MHz ac80: 1.8 dBm/MHz ax20: -0.5 mW/MHz ax40: -0.5 mW/MHz ax80: 0.0 mW/MHz	1.9 dBm/MHz (reduced due to antenna gain)	Complies

	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
	RSS-247 6.2.1 (2)	Spurious Emissions above 1GHz	53.8 dBuV/m @ 5129.3 MHz (-0.2 dB)	Refer to the limits section (p23) for restricted bands, all others -27 dBm/MHz EIRP 26 dBc in 5.25-5.35 GHz band	Complies

OPERATION IN THE 5.725 – 5.85 GHZ BAND

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.407(e)	RSS-247 6.2.4.1	Minimum 6dB Bandwidth (ax modes > n/ac modes)	a: 16.3 MHz ac20: 17.6 MHz ac40: 36.3 MHz ac80: 75.8 MHz	>= 500 kHz	Complies
15.407(a) (3)	RSS-247 6.2.4.1	Output Power (multipoint systems) (n, ac and ax modes use same power)	a: 24 dBm ac20: 28.2 dBm ac40: 28.3 dBm ac80: 25.7 dBm EIRP = 1.33 W Note 1	30 dBm (1 W) EIRP <= 4W	Complies
15.407(a) (3)	RSS-247 6.2.4.1	Power Spectral Density	a: 12.8dBm ac20: 16.6dBm ac40: 13.9dBm ac80: 8.1dBm ax20: 14.1dBm ax40: 11.4dBm ax80: 7.9dBm	30 dBm / 500 kHz	Complies
15.407(b) (4) / 15.209	RSS-247 6.2.4.2	Spurious Emissions above 1GHz	68.2 dBuV/m @ 6003.6 MHz (-0.1 dB)	Refer to the limits section (p23) for restricted bands, all others > 1 GHz, -27 dBm/MHz more than 75 MHz from the band edge	Complies
-	RSP-100 RSS-Gen 6.7	Occupied Bandwidth	a: 17.47 MHz ac20: 18.50 MHz ac40: 36.74 MHz ac80: 75.87 MHz ax20: 19.7 MHz ax40: 38.0 MHz ax80: 77.3 MHz	Information only	N/A
Note 1: EIRP calculated using antenna gains as described in the detailed test results for the highest EIRP system.					

REQUIREMENTS FOR ALL U-NII/LELAN BANDS

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.403(s)	RSS-247 6.1	Modulation	Systems uses OFDM techniques	Digital modulation is required	Complies
15.407(b) (6) / 15.209		Spurious Emissions below 1GHz	37.2 dBµV/m @ 105.71 MHz (-6.3 dB)	Refer to page 24	Complies
15.31 (m)	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 a)	Operation in the absence of information to transmit	Operation is discontinued in the absence of information (Operational Description page 1)	Device shall automatically discontinue operation in the absence of information to transmit	Complies
15.407 (g)		Frequency Stability	Frequency stability is better than 25 ppm. Operational Description page 1)	Signal shall remain within the allocated band	Complies
15.407 (h1)	RSS-247 6.2.2.1 6.2.3.1	Transmit Power Control	Device does not operate in either 5470 – 5725 or 5250 – 5350 MHz bands.		N/A
15.407 (h2)	RSS-247 6.3	Dynamic frequency Selection (device with radar detection)	Device does not operate in either 5470 – 5725 or 5250 – 5350 MHz bands.		N/A
	RSS-247 6.4 c)	User manual information	Refer to manual	Warning regarding Tilt angle for EIRP compliance, Indoor use for 5150-5250 MHz band and Radar are primary user of some bands	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	Antennas connected via U.FL connectors	Unique or integral antenna required	Complies
15.407 (b) (6)	RSS-Gen Table 4	AC Conducted Emissions	27.4 dBµV @ 0.509 MHz(-18.6 dB)	Refer to page 22	Complies
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	Refer to manual	Statement for products with detachable antenna	Complies
-	RSS-Gen 8.4	User Manual	Refer to manual	Statement for all products	Complies

MEASUREMENT UNCERTAINTIES

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

Measurement Type	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 NVG5XDBAX 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 July 9, 11, 12, 15, 16, 17, 18, 19, 22, 24, 25, 26, 29, 30 and 31, September 20, October 1 and 10, December 20 through 30, 2019 and February 3 and 4, 2020. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Arris	NVG5XDBAX	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.

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 7	US1031	2845B (Wireless test lab #US0027)	41039 Boyce Road Fremont, CA 94538-2435

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.

CONDUCTED EMISSIONS

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

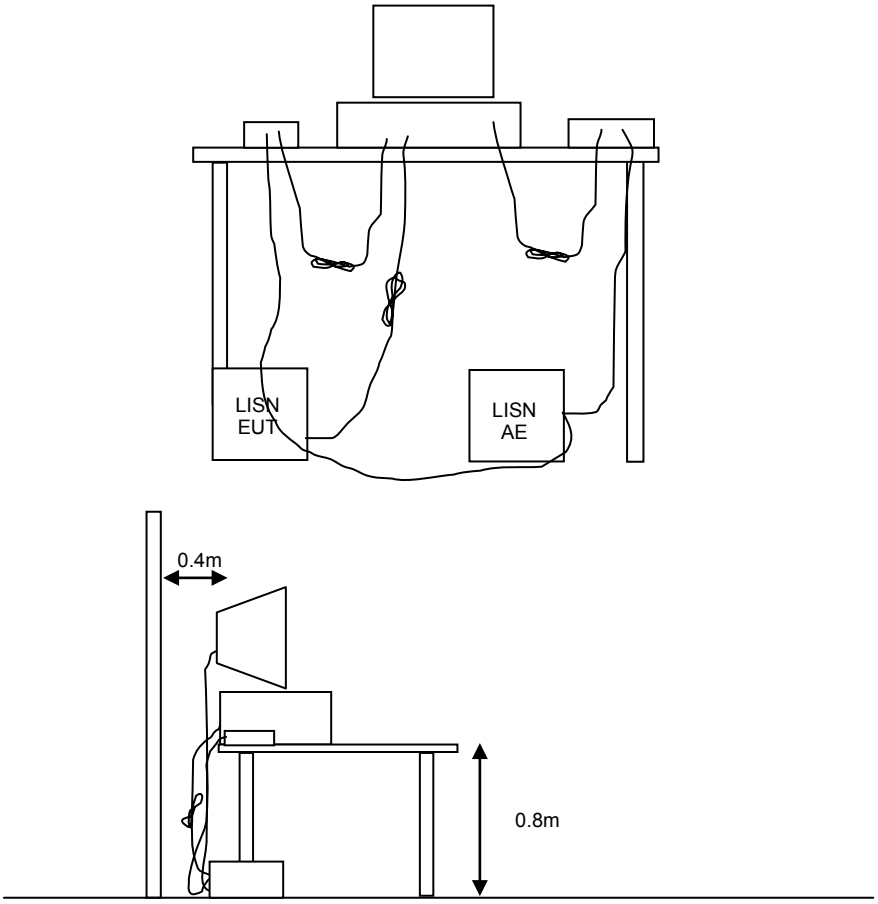


Figure 1 Typical Conducted Emissions Test Configuration

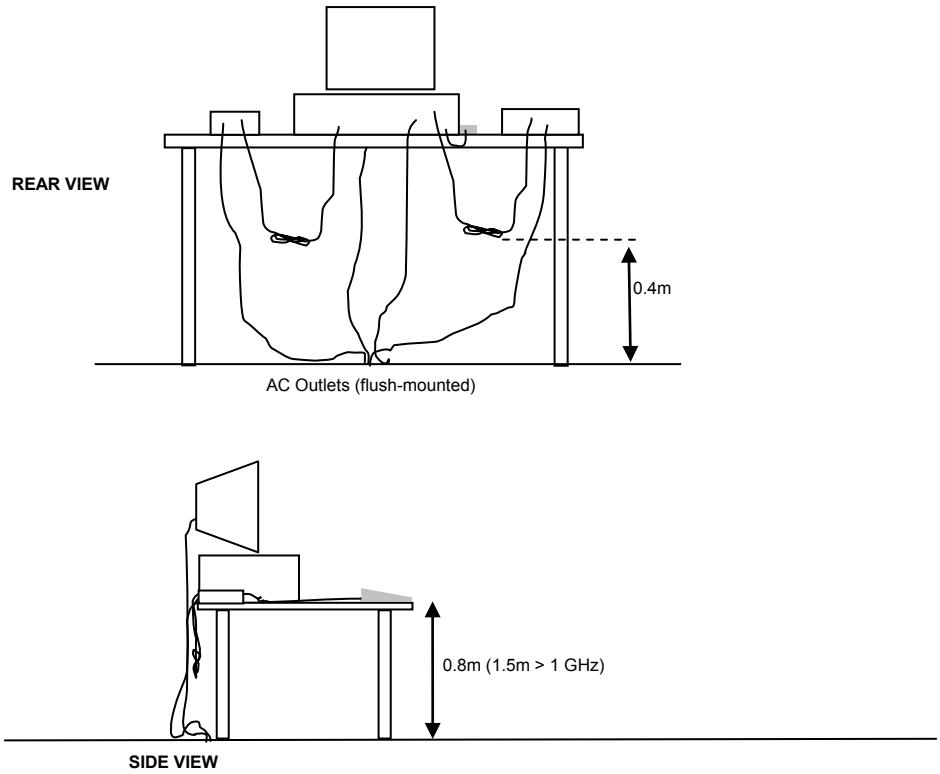
RADIATED EMISSIONS

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

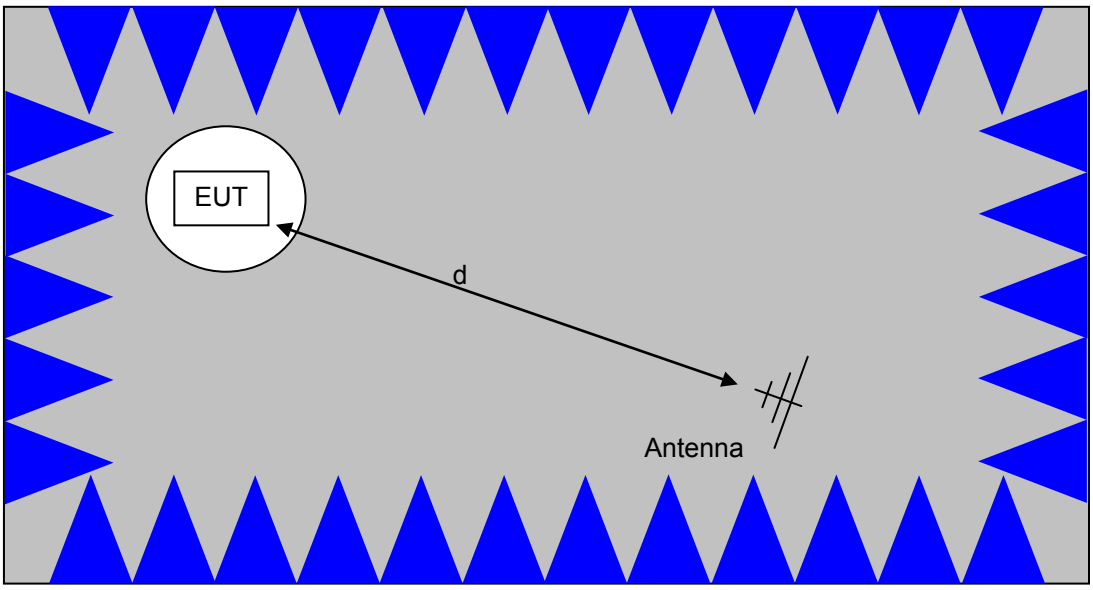
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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

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

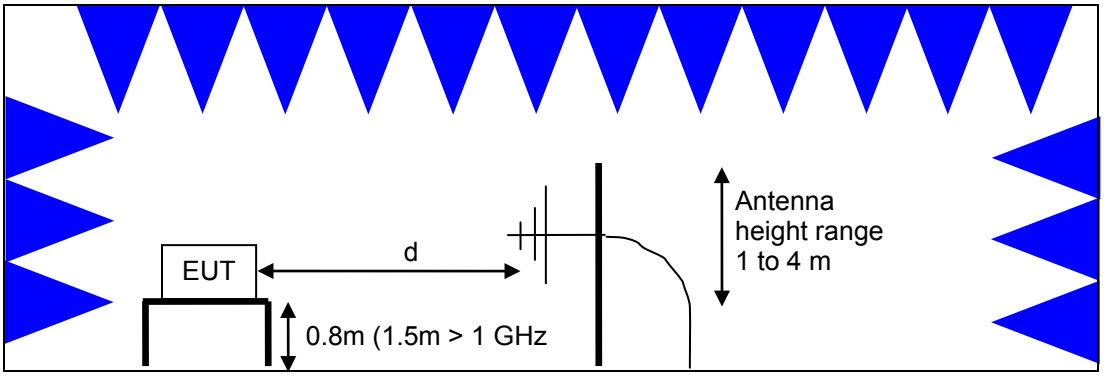


Typical Test Configuration for Radiated Field Strength Measurements



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

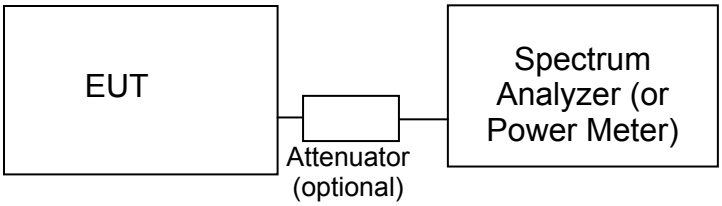
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



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

CONDUCTED EMISSIONS FROM ANTENNA PORT

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



Test Configuration for Antenna Port Measurements

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

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

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

BANDWIDTH MEASUREMENTS

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

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

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

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

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

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

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

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

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

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

[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 – 5825	1 Watt (30 dBm)	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 – 5825 MHz band may use antennas with gains of up to 23dBi without this limitation. If the gain exceeds 23dBi then the output power limit of 1 Watt is reduced by 1dB for every dB the gain exceeds 23dBi.

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 – 5825	1 Watt (30 dBm) 4W eirp	30 dBm/500kHz

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

SPURIOUS 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 bands under the LELAN/UNII rules, the limit within 10MHz of the allocated band is increased to –17dBm/MHz.

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

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

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

$$R_r - S = M$$

where:

R_r = Receiver Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

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

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

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

where:

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
Duty Cycle, 09-Jul-19					
Agilent Technologies	3Hz -44GHz PSA Spectrum Analyzer	E4446A	2796	5/21/2019	5/21/2020
Conducted Emissions - AC Power Ports, 11-Jul-19					
EMCO	LISN, 10 kHz-100 MHz	3825/2	1292	8/16/2018	8/16/2019
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1398	12/26/2018	12/26/2019
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	1538	2/9/2019	2/9/2020
Radiated Emissions, 1,000 - 6,000 MHz, 11-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	1538	2/9/2019	2/9/2020
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

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Micro-Tronics	Band Reject Filter, 5725-5875 MHz	BRC50705-01	2738	7/15/2019	7/15/2020
Radiated Emissions, 12,000 - 18,000 MHz, 18-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
Radiated Emissions, 18,000 - 40,000 MHz, 19-Jul-19					
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
A. H. Systems	System Horn, 18-40GHz	SAS-574, p/n: 2581	2161	7/8/2019	7/8/2021
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, 2400-2500 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
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
Radiated Emissions, 0.03 - 1,000 MHz, 24-Jul-19					
National Technical Systems	NTS EMI Software (rev 2.10)	N/A	0		N/A
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1549	3/11/2019	3/11/2021
Micro-Tronics	Band Reject Filter, 5470-5725 MHz 12GHz	BRC50704-02	1681	3/20/2019	3/20/2020
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
Hewlett Packard	9KHz-1300MHz pre-amp	8447F	2777	12/20/2018	12/20/2019
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	9482	10/13/2018	10/13/2019

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Rhode & Schwarz	Magnetic Loop Antenna, 9 kHz-30 MHz	HFH2-Z2	WC062457	1/5/2018	1/5/2020
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, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	7/18/2019	7/18/2020
Radio Antenna Port (Power and Spurious Emissions), 30-Jul-19					
Agilent Technologies	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	7/18/2019	7/18/2020
Radio Antenna Port (Power and Spurious Emissions), 31-Jul-19					
Agilent Technologies	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	7/18/2019	7/18/2020
Band edge Measurment, 20-Sep-19					
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, 01-Oct-19					
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
Radio Antenna Port (Power and Spurious Emissions), 10-Oct-19					
National Technical Systems	NTS UNII Power Software (rev 4.0)	N/A	WC022700	N/A	
Rohde & Schwarz	Spectrum Analyzer	FSQ26	WC055662	7/4/2019	7/4/2020
Radiated Emissions, 1,000 - 6,000 MHz, 20 through 30-Dec-19					
National Technical Systems	NTS EMI Software (rev 2.10)	N/A	WC022452	N/A	
National Technical Systems	NTS Capture Analyzer Software (rev 4.0)	N/A	WC022706	N/A	
Agilent Technologies	PSA B	E4446A	WC055670	5/21/2019	5/21/2020

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Hewlett Packard	Spectrum Analyzer (Spare SA26) 9 KHz-26.5 GHz, Non-Program	8563E	WC064401	6/12/2019	6/12/2020
EMCO	Antenna, Horn, 1-18 GHz	3115	WC064404	8/9/2018	8/9/2020
Rohde & Schwarz	EMI test receiver	ESI 40	WC068000	3/15/2019	3/15/2020
Radio Antenna Port (Power and Spurious Emissions), 3-4-Feb-2020					
Rohde & Schwarz	Spectrum Analyzer	FSQ26	WC055662	7/4/2019	7/4/2020
Rohde & Schwarz	Open Switch and Control Unit, p/s	OSP 120 with B157	WC064756	7/16/2019	7/16/2020

Appendix B Test Data

TL-101106-RANA Pages 32 – 181

Client:	Arris	PR Number:	PR101106
Product	NVG5XDBAX	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

NVG5XDBAX

Date of Last Test: 3/11/2020

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	-

Conducted Emissions

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

Test Specific Details

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

Date of Test: 7/11/2019
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #7

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

General Test Configuration

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

Ambient Conditions:

Temperature: 22.4 °C
Rel. Humidity: 41 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power,120V/60Hz	15.207	Pass	27.4 dBµV @ 0.509 MHz(-18.6 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

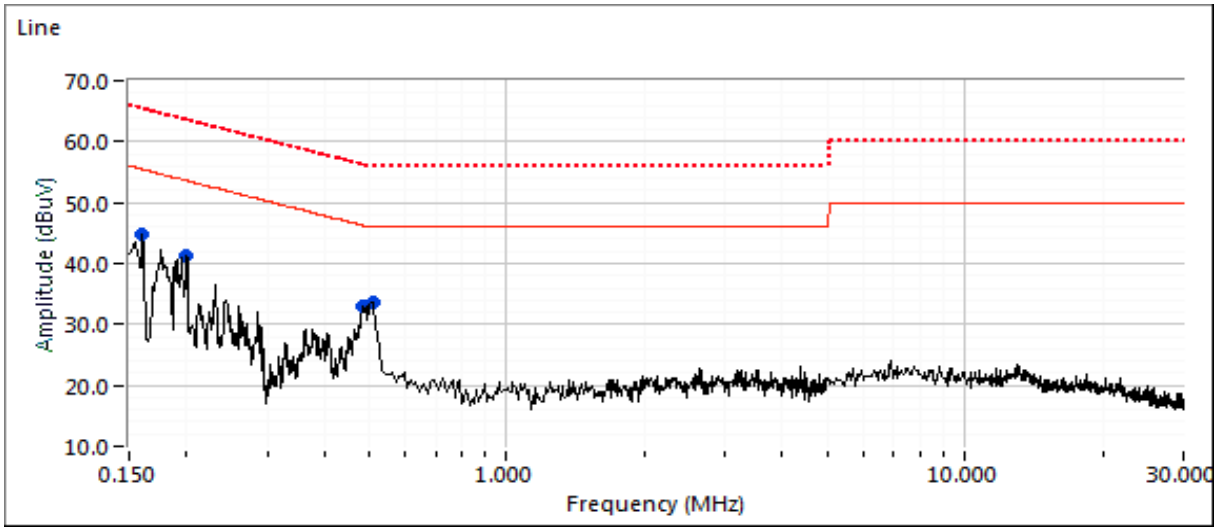
Deviations From The Standard

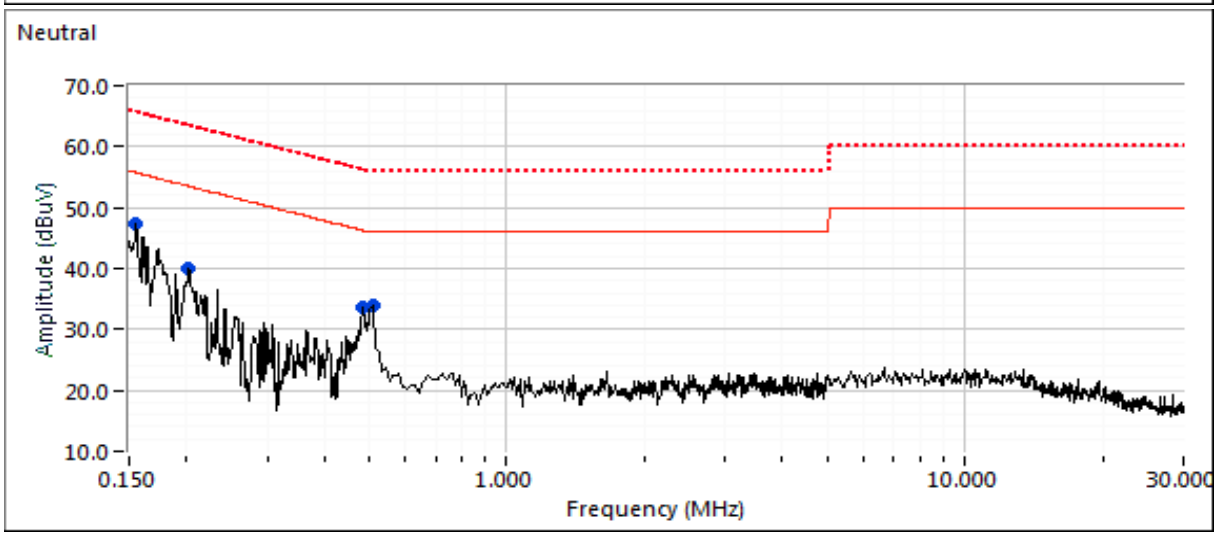
No deviations were made from the requirements of the standard.

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	-

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz
EUT Configured to transmit at 80211b on Channel 1 and 802.11a on Channel 36





EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	-

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

Frequency MHz	Level dBμV	AC Line	15.207 Limit	Margin	Detector QP/Ave	Comments
0.158	44.9	Line 1	55.4	-10.5	Peak	
0.200	41.3	Line 1	53.6	-12.3	Peak	
0.487	32.9	Line 1	46.2	-13.3	Peak	
0.509	33.6	Line 1	46.0	-12.4	Peak	
0.154	47.5	Neutral	55.7	-8.2	Peak	
0.204	39.9	Neutral	53.5	-13.6	Peak	
0.484	33.6	Neutral	46.2	-12.6	Peak	
0.509	33.8	Neutral	46.0	-12.2	Peak	

Final quasi-peak and average readings

Frequency MHz	Level dBμV	AC Line	15.207 Limit	Margin	Detector QP/Ave	Comments
0.509	27.4	Line 1	46.0	-18.6	AVG	AVG (0.10s)
0.509	26.3	Neutral	46.0	-19.7	AVG	AVG (0.10s)
0.154	42.7	Neutral	65.8	-23.1	QP	QP (1.00s)
0.509	32.7	Line 1	56.0	-23.3	QP	QP (1.00s)
0.509	32.4	Neutral	56.0	-23.6	QP	QP (1.00s)
0.158	40.4	Line 1	65.6	-25.2	QP	QP (1.00s)
0.154	28.3	Neutral	55.8	-27.5	AVG	AVG (0.10s)
0.204	35.3	Neutral	63.4	-28.1	QP	QP (1.00s)
0.200	35.0	Line 1	63.6	-28.6	QP	QP (1.00s)
0.204	24.4	Neutral	53.4	-29.0	AVG	AVG (0.10s)
0.200	24.4	Line 1	53.6	-29.2	AVG	AVG (0.10s)
0.158	25.0	Line 1	55.6	-30.6	AVG	AVG (0.10s)

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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.

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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							
1	g / a	1 & 36	26 / 26	26 / 22	Restricted Band Edge at 5150 MHz	15.209	73.9 dBµV/m @ 5145.5 MHz (-0.1 dB)
2	g / a	1 & 149	26 / 26	26 / 26	Band Edge 5725 MHz	15E	63.5 dBµV/m @ 5649.7 MHz (-4.8 dB)
	g / a	11 & 165	26 / 26	26 / 26	Band Edge 5850MHz	15E	62.8 dBµV/m @ 5928.7 MHz (-5.5 dB)
3	ac20	1 & 36	24 / 24	24 / 22	Restricted Band Edge at 5150 MHz	15.209	53.6 dBµV/m @ 5148.2 MHz (-0.4 dB)
4	ac20	1 & 149	24 / 24	24 / 24	Band Edge 5725 MHz	15E	63.2 dBµV/m @ 5624.9 MHz (-5.1 dB)
	ac20	11 & 165	24 / 24	24 / 24	Band Edge 5850MHz	15E	62.3 dBµV/m @ 5954.3 MHz (-6.0 dB)
40MHz Bandwith Modes							
5	ac40	3 & 38	24 / 24	24 / 15.5	Restricted Band Edge at 5150 MHz	15.209	53.5 dBµV/m @ 5149.6 MHz (-0.5 dB)
	ac40	3 & 46	24 / 24	24 / 22.5	Restricted Band Edge at 5150 MHz	15.209	53.7 dBµV/m @ 5136.0 MHz (-0.3 dB)
6	ac40	3 & 151	24 / 24	24 / 24	Band Edge 5725 MHz	15E	66.3 dBµV/m @ 5644.9 MHz (-2.0 dB)
	ac40	9 & 159	24 / 24	24 / 24	Band Edge 5850MHz	15E	64.3 dBµV/m @ 5932.7 MHz (-4.0 dB)
80MHz Bandwith Modes							
7	b / ac80	6 & 42	24 / 24	24 / 16.75	Restricted Band Edge at 5150 MHz	15.209	53.5 dBµV/m @ 5141.6 MHz (-0.5 dB)
8	b / ac80	6 & 155	24 / 24	24 / 21	Band Edge 5725 MHz	15E	67.7 dBµV/m @ 5631.3 MHz (-0.6 dB)
	b / ac80	6 & 155	24 / 24	24 / 21	Band Edge 5850MHz	15E	65.2 dBµV/m @ 5931.1 MHz (-3.1 dB)

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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	pkt duty
11a	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: M11917QW000T
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:	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.

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 Bandedge Measurements, 5150-5250MHz

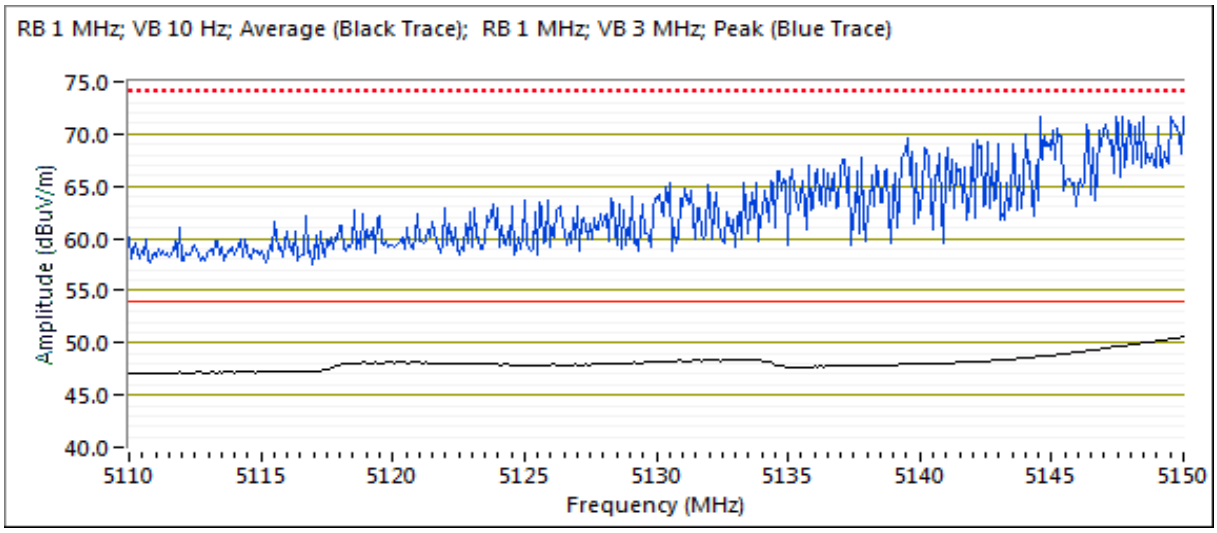
Date of Test: 07/11/19
Test Engineer: Mehran Birgani
Test Location: FT Chamber #7

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

Channel: 36 Mode: a Pwr Setting: 22 (q88)
Tx Chain: 1TX Data Rate: 6

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	
5145.530	73.9	V	74.0	-0.1	PK	208	1.5	RB 1 MHz; VB: 3 MHz
5149.760	48.6	V	54.0	-5.4	AVG	208	1.5	RB 1 MHz; VB: 10 Hz
5148.440	69.5	H	74.0	-4.5	PK	57	1.8	RB 1 MHz; VB: 3 MHz
5149.840	46.1	H	54.0	-7.9	AVG	57	1.8	RB 1 MHz; VB: 10 Hz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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, 5725-5850MHz

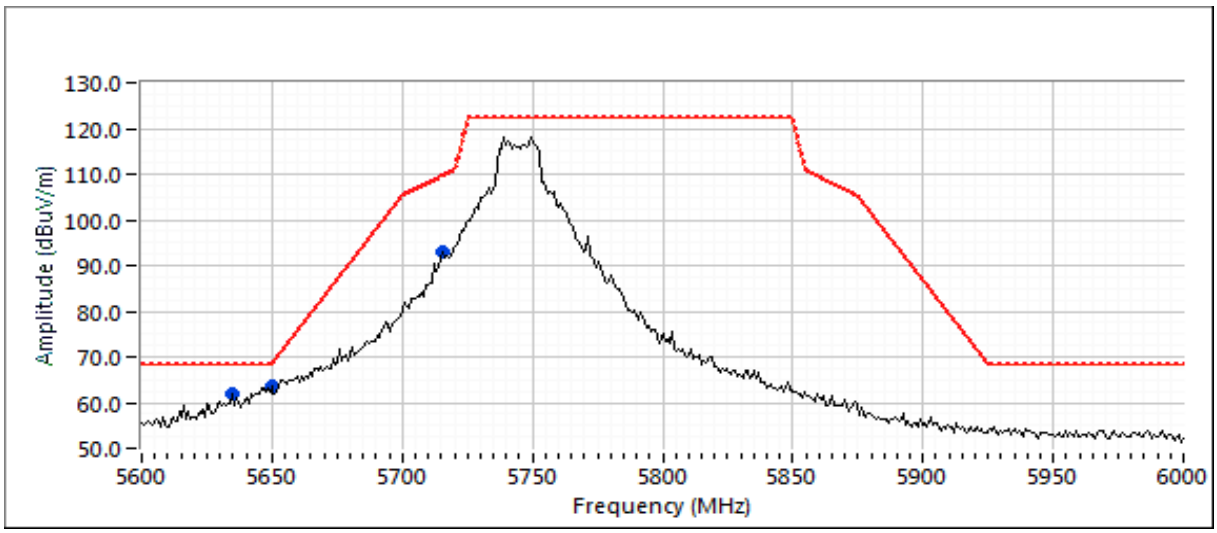
Date of Test: 07/11/19
Test Engineer: Mehran Birgani
Test Location: FT Chamber #7

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

Channel: 149 Mode: a Pwr Setting: 26 (q104)
Tx Chain: 1TX Data Rate: 6

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	
5649.700	63.5	V	68.3	-4.8	Peak	185	2.5	
5634.470	62.1	V	68.3	-6.2	Peak	181	2.0	
5715.430	93.1	V	109.6	-16.5	Peak	184	1.5	



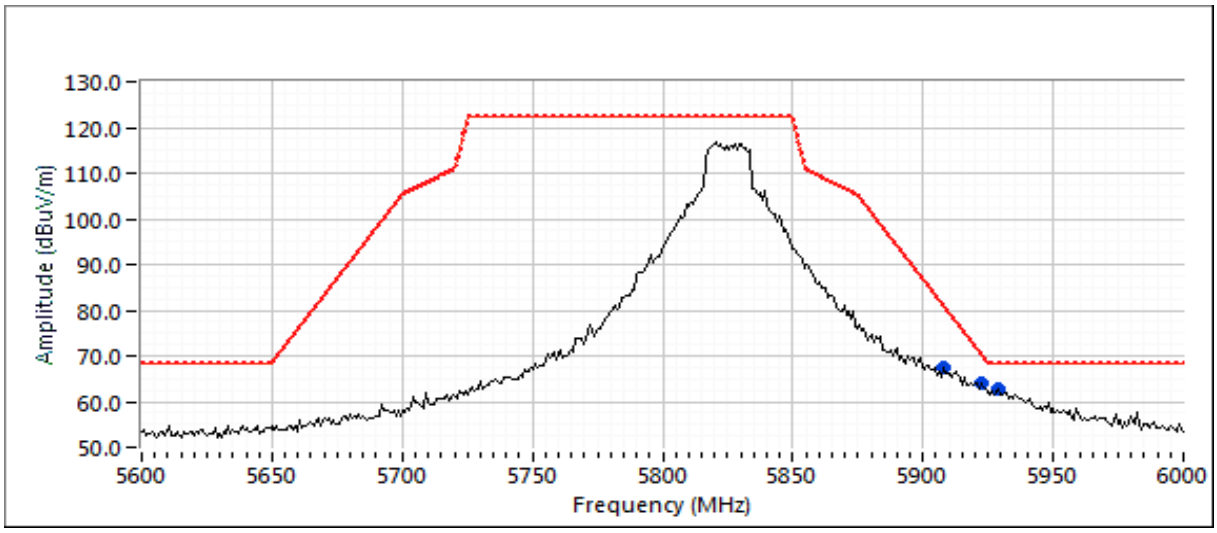
EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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: 165 Mode: a Pwr Setting: 26 (q104)
Tx Chain: 1TX Data Rate: 6

5850 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	
5928.660	62.8	V	68.3	-5.5	Peak	216	1.6	
5922.240	64.1	V	70.3	-6.2	Peak	225	1.9	
5907.820	67.5	V	81.0	-13.5	Peak	172	1.6	



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

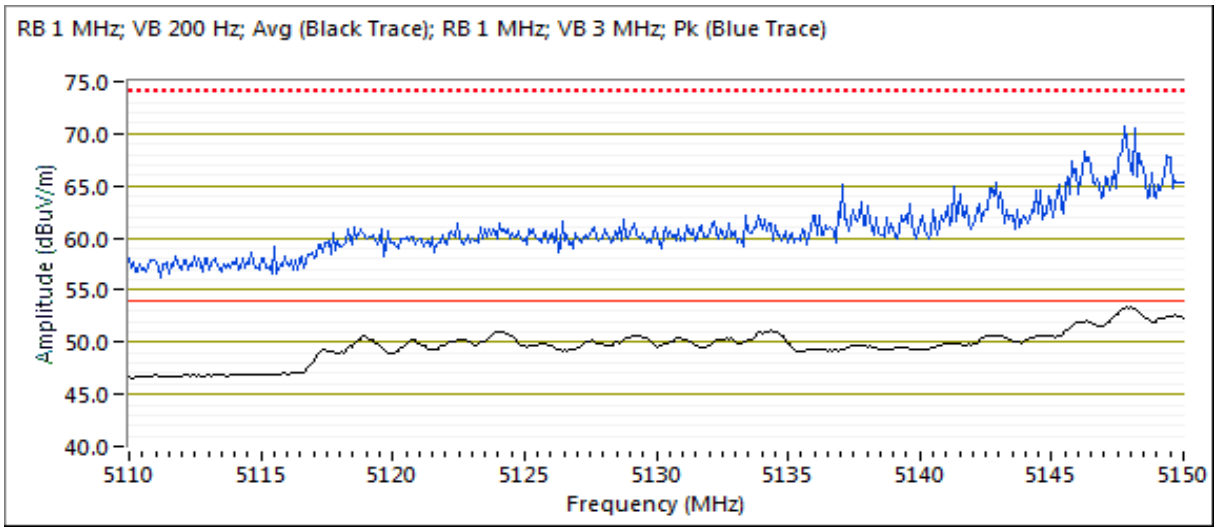
Run #3: Radiated Bandedge Measurements, 5150-5250MHz

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: 36 — Mode: ac20 — Pwr Setting: 22 (q88)
Tx Chain: 4Tx — Data Rate: 6.5

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	
5148.200	53.8	V	54.0	-0.2	Avg	203	1.0	RB 1MHz; VB 200Hz
5148.320	71.4	V	74.0	-2.6	PK	203	1.0	RB 1MHz; VB 3MHz
5149.220	52.1	H	54.0	-1.9	Avg	106	1.5	RB 1MHz; VB 200Hz
5149.220	69.6	H	74.0	-4.4	PK	106	1.5	RB 1MHz; VB 3MHz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

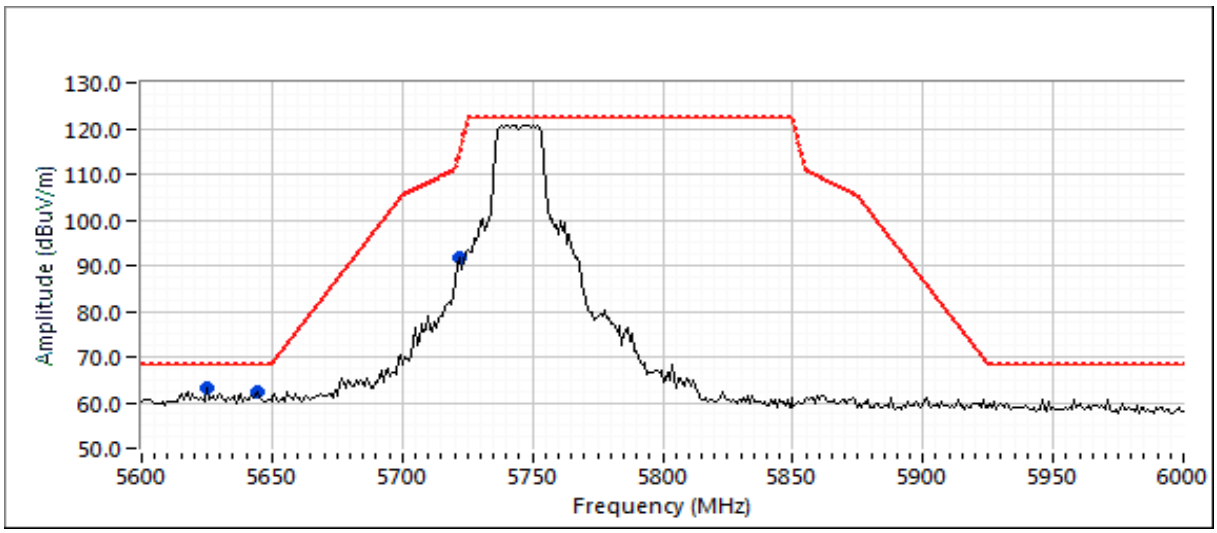
Run #4: Radiated Bandedge Measurements, 5725-5850MHz

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: 149 — Mode: ac20 — Pwr Setting: 24 (q96)
Tx Chain: 4Tx — Data Rate: 6.5

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	
5624.850	63.2	V	68.3	-5.1	Peak	222	2.0	
5644.090	62.2	V	68.3	-6.1	Peak	192	2.0	
5721.840	91.8	V	115.1	-23.3	Peak	164	1.5	



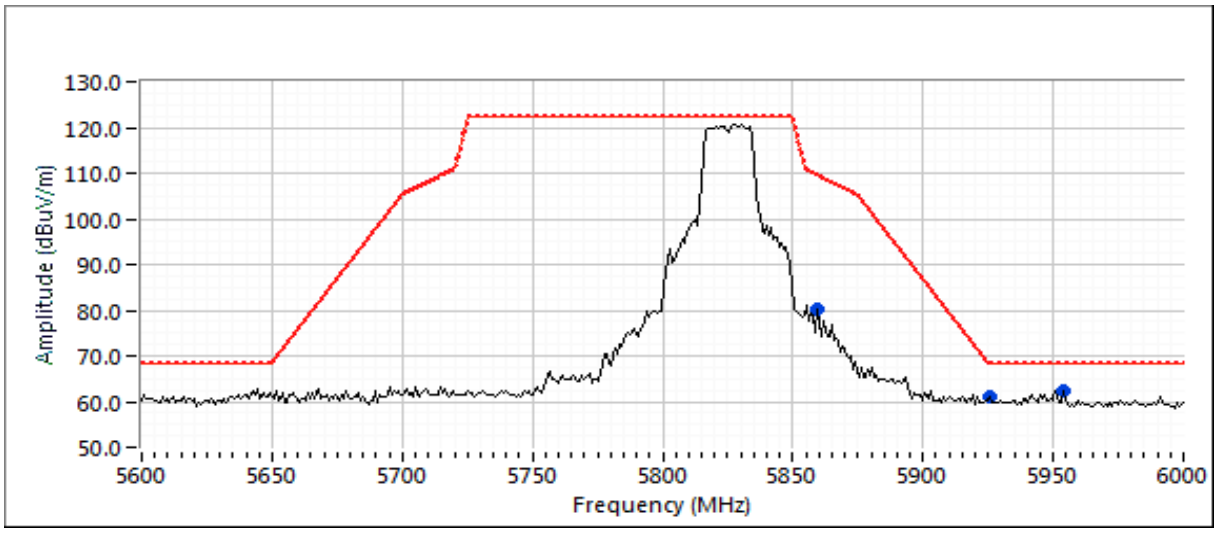
EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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: 165 Mode: ac20 Pwr Setting: 24 (q96)
Tx Chain: 4Tx Data Rate: 6.5

5850 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	
5954.310	62.3	V	68.3	-6.0	Peak	177	1.9	
5859.720	80.1	V	109.6	-29.5	Peak	42	1.9	
5925.450	61.1	V	68.3	-7.2	Peak	173	1.3	



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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, 5150-5250MHz

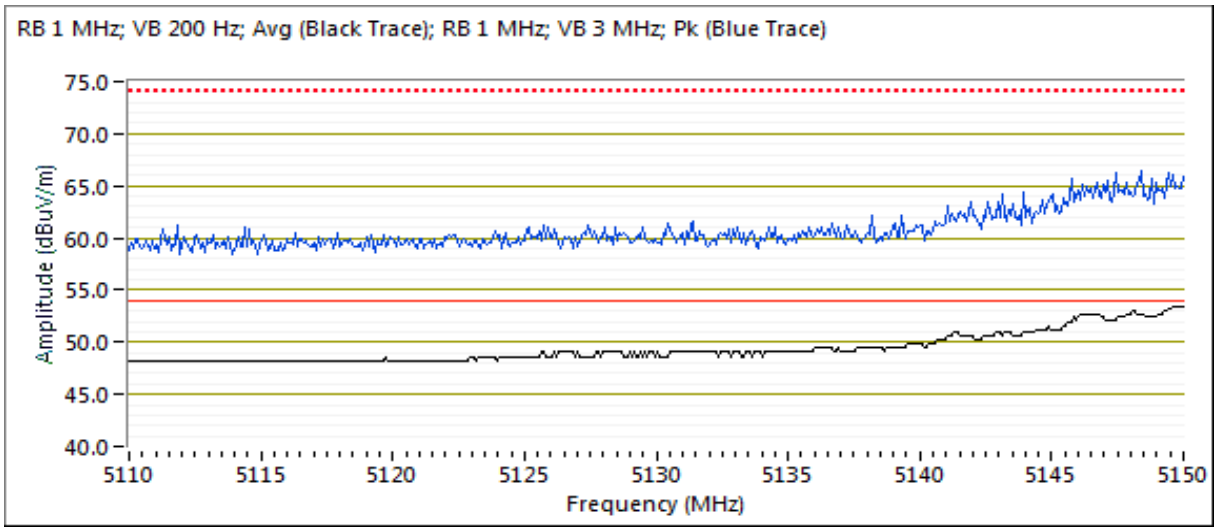
Date of Test: 07/12/19
Test Engineer: Rafael Varelas
Test Location: FT Chamber #5

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

Channel: 38 Mode: ac40 Pwr Setting: 15.5 (q62)
Tx Chain: 4Tx Data Rate: 13.5

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	
5149.600	53.7	V	54.0	-0.3	Avg	213	1.6	RB 1MHz; VB 200Hz
5148.560	66.1	V	74.0	-7.9	PK	213	1.6	RB 1MHz; VB 3MHz
5147.330	50.8	H	54.0	-3.2	Avg	242	1.0	RB 1MHz; VB 200Hz
5142.240	63.9	H	74.0	-10.1	PK	242	1.0	RB 1MHz; VB 3MHz



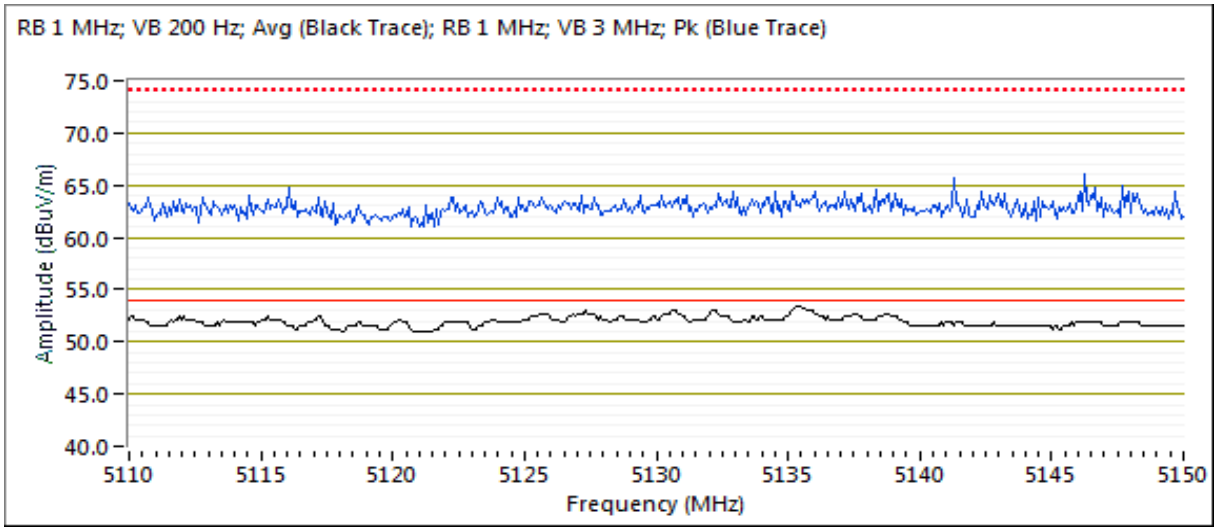
EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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: 46 Mode: ac40 Pwr Setting: 22.5 (q90)
Tx Chain: 4Tx Data Rate: 13.5

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	
5135.960	53.7	V	54.0	-0.3	Avg	211	1.6	RB 1MHz; VB 200Hz
5135.970	66.2	V	74.0	-7.8	PK	211	1.6	RB 1MHz; VB 3MHz
5131.240	51.8	H	54.0	-2.4	Avg	245	1.2	RB 1MHz; VB 200Hz
5147.190	63.2	H	74.0	-10.8	PK	245	1.2	RB 1MHz; VB 3MHz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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, 5725-5850MHz

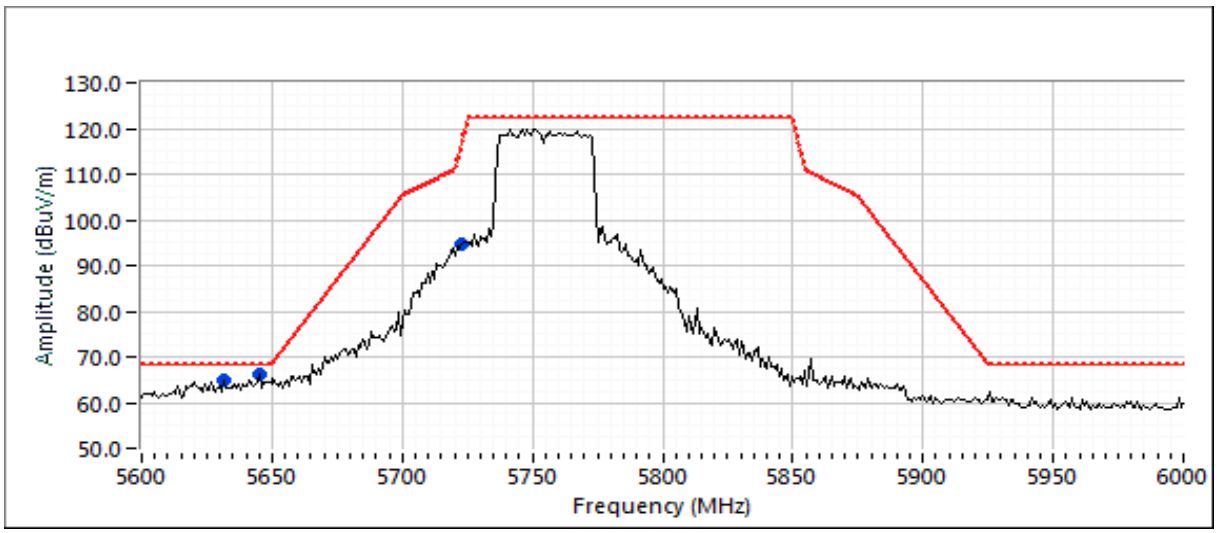
Date of Test: 07/12/19
Test Engineer: Rafael Varelas
Test Location: FT Chamber #5

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

Channel: 151 Mode: ac40 Pwr Setting: 24 (q96)
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	
5644.890	66.3	V	68.3	-2.0	Peak	38	1.3	
5631.260	64.8	V	68.3	-3.5	Peak	183	1.6	
5722.650	94.7	V	116.9	-22.2	Peak	58	1.3	



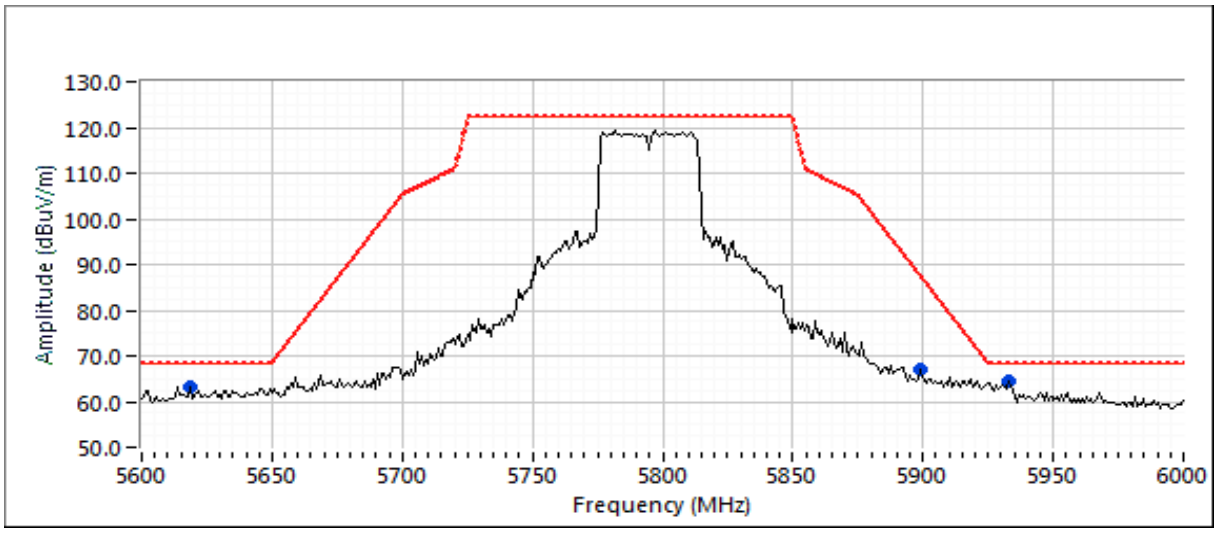
EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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: 159 Mode: ac40 Pwr Setting: 24 (q96)
Tx Chain: 4Tx Data Rate: 13.5

5850 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	
5932.670	64.3	V	68.3	-4.0	Peak	175	1.3	
5618.440	63.0	V	68.3	-5.3	Peak	208	1.9	
5899.000	66.9	V	87.5	-20.6	Peak	231	1.3	



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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, 5150-5250MHz

Date of Test: 07/12/19
Test Engineer: Rafael Varelas
Test Location: FT Chamber #5

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

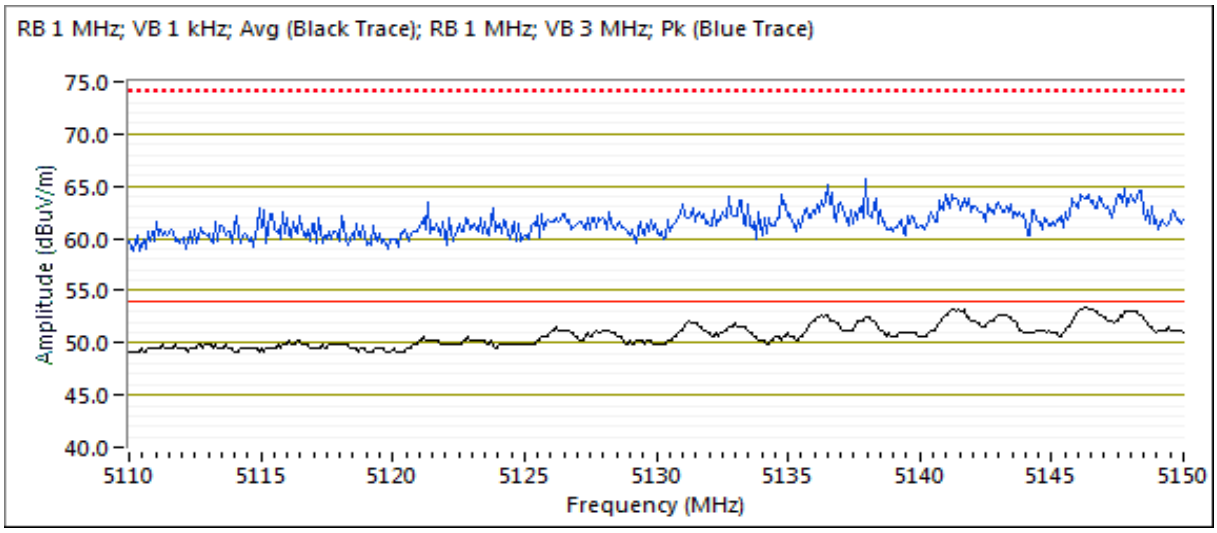
Channel: 42
Tx Chain: 4Tx

Mode: ac80
Data Rate: 58.5

Pwr Setting: 16.75 (q67)

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	
5141.580	53.9	V	54.0	-0.1	Avg	212	1.6	RB 1MHz; VB 1 kHz
5141.180	65.2	V	74.0	-8.8	PK	212	1.6	RB 1 MHz; VB: 3 MHz
5147.440	53.4	H	54.0	-1.0	Avg	237	1.1	RB 1MHz; VB 1 kHz
5141.820	64.1	H	74.0	-9.9	PK	237	1.1	RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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, 5725-5850MHz

Date of Test: 07/12/19
Test Engineer: Rafael Varelas
Test Location: FT Chamber #5

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

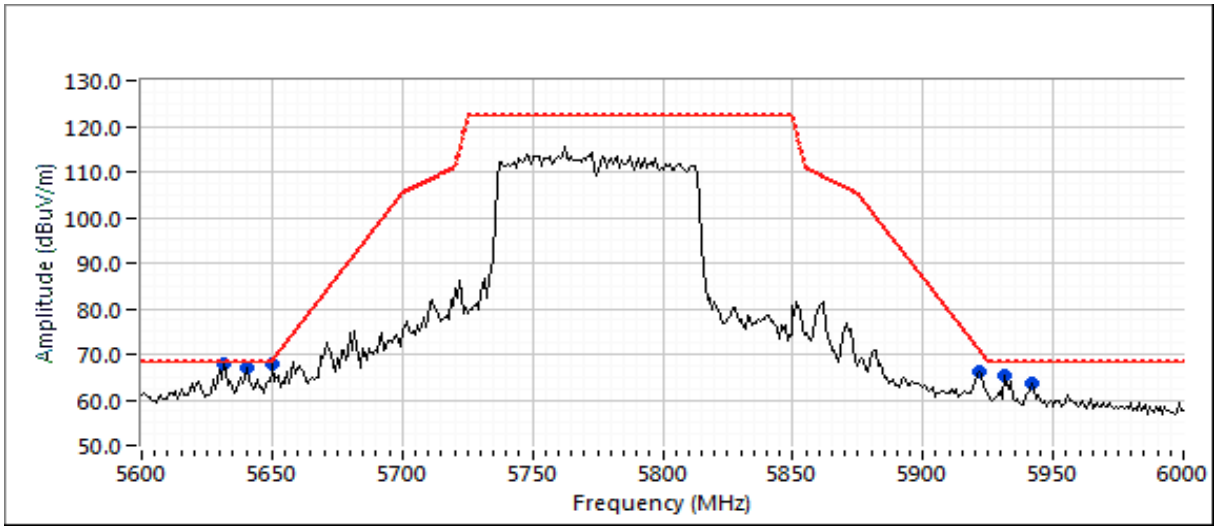
Channel: 155 Mode: ac80 Pwr Setting: 21 (q84)
Tx Chain: 4Tx Data Rate: 58.5

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	
5631.260	67.7	V	68.3	-0.6	Peak	63	1.3	
5640.080	67.1	V	68.3	-1.2	Peak	42	1.3	
5650.500	67.8	V	68.7	-0.9	Peak	181	1.3	

5850 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	
5931.060	65.2	V	68.3	-3.1	Peak	50	1.6	
5921.440	66.3	V	70.9	-4.6	Peak	205	1.0	
5941.480	63.7	V	68.3	-4.6	Peak	211	1.0	



Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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: 21.8 °C
Rel. Humidity: 43 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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							
5	ax20	1 & 36	24 / 21.75		Restricted Band Edge at 5150 MHz	15.209	53.8 dBµV/m @ 5148.0 MHz (-0.2 dB)
8	ax20	1 & 149	24 / 24		Band Edge 5725 MHz	15E	62.8 dBµV/m @ 5622.4 MHz (-5.5 dB)
	ax20	11 & 165	24 / 24		Band Edge 5850MHz	15E	62.1 dBµV/m @ 5948.7 MHz (-6.2 dB)
40MHz Bandwith Modes							
9	ax40	3 & 38	24 / 15.5		Restricted Band Edge at 5150 MHz	15.209	47.3 dBµV/m @ 5147.6 MHz (-6.7 dB)
	ac40	3 & 46	24 / 22.5		Restricted Band Edge at 5150 MHz	15.209	51.0 dBµV/m @ 5137.8 MHz (-3.0 dB)
12	ax40	3 & 151	24 / 24		Band Edge 5725 MHz	15E	67.1 dBµV/m @ 5654.5 MHz (-4.5 dB)
	ax40	9 & 159	24 / 24		Band Edge 5850MHz	15E	63.9 dBµV/m @ 5933.5 MHz (-4.4 dB)
80MHz Bandwith Modes							
13	b / ax80	1 & 42	24 / 16.75		Restricted Band Edge at 5150 MHz	15.209	71.6 dBµV/m @ 5143.0 MHz (-2.4 dB)
16	b / ax80	1 & 155	24 / 21		Band Edge 5725 MHz	15E	67.0 dBµV/m @ 5650.5 MHz (-1.7 dB)
	b / ax80	11 & 155	24 / 21		Band Edge 5850MHz	15E	64.3 dBµV/m @ 5931.9 MHz (-4.0 dB)

Sample Notes

Sample S/N: M11917QW000T

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 ANSI C63.10
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 voltage average, auto sweep time, max hold 50 traces. (method VB-A of 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	pkt duty
ax20		99.0%	Yes	4.11	0.0	0.0	10	4324	-1
ax40		99.0%	Yes	4.16	0.0	0.0	10	8811	-1
ax80		96.8%	Yes	1.20	0.1	0.3	833	5159	-1

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).
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 ANSI C63.10)
Note 3:	Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear voltage average, auto sweep,max hold 50*1/DC traces (method VB-A of ANSI C63.10)
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 adjusted by Pwr correction factor (method AD of ANSI C63.10)
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.

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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, 5150-5250MHz

Date of Test: 12/20/19 — Config. Used: 1

Test Engineer: Rafael Varelas — Config Change: -

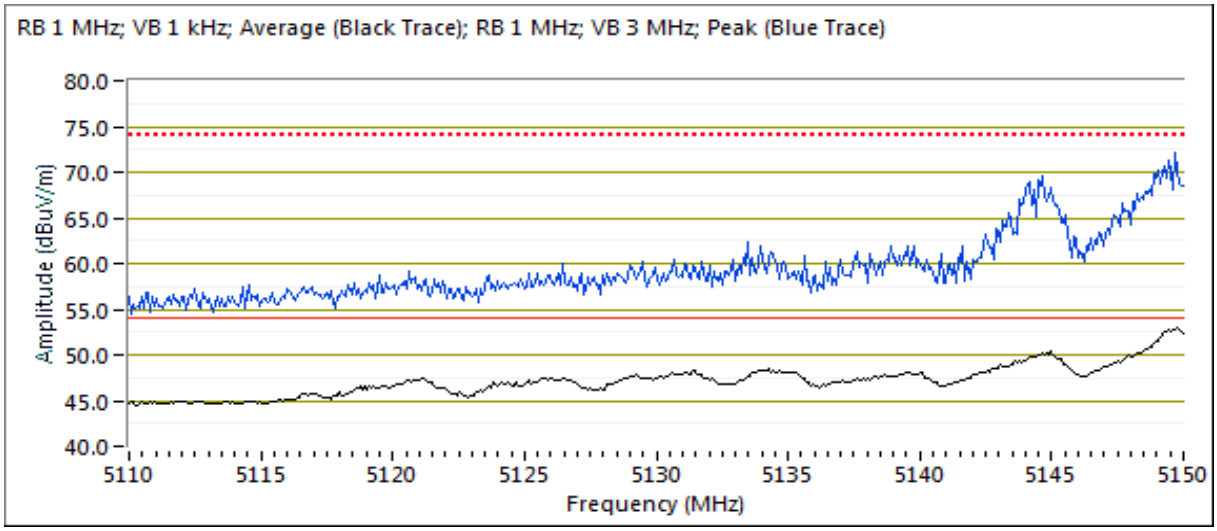
Test Location: FT Chamber #7 — EUT Voltage: 120V/ 60Hz

Channel: 1 & 36 — Mode: ax20 — Pwr Setting: q96 & q87

Tx Chain: All chains — Data Rate:

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	
5147.970	53.8	V	54.0	-0.2	AVG	233	1.9	RB 1 MHz; VB: 10 Hz
5147.910	72.5	V	74.0	-1.5	PK	233	1.9	RB 1 MHz; VB: 3 MHz
5149.600	53.4	H	54.0	-0.6	AVG	253	1.8	RB 1 MHz; VB: 10 Hz
5149.820	72.0	H	74.0	-2.0	PK	253	1.8	RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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, 5725-5850MHz

Date of Test: 12/20/19 — Config. Used: 1

Test Engineer: Rafael Varelas — Config Change: -

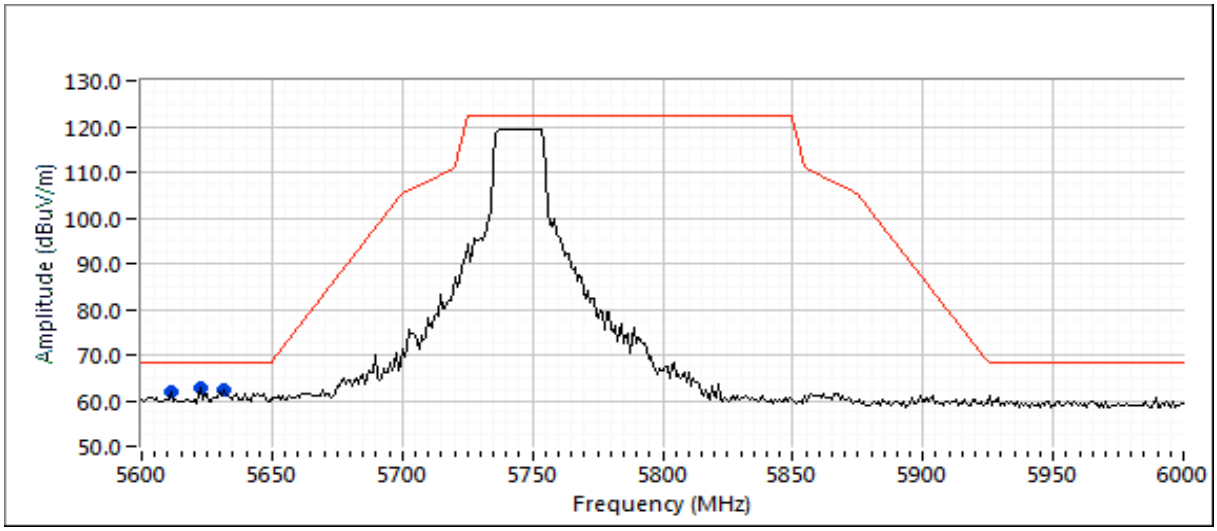
Test Location: FT Chamber #7 — EUT Voltage: 120V/ 60Hz

Channel: 1 & 149 — Mode: ax20 — Pwr Setting: q96 & q96

Tx Chain: All chains — Data Rate:

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	
5622.440	62.8	V	68.3	-5.5	PK	188	1.5	RB 1 MHz; VB: 3 MHz
5611.220	62.0	V	68.3	-6.3	PK	183	2.0	RB 1 MHz; VB: 3 MHz
5631.260	62.2	V	68.3	-6.1	PK	58	2.0	RB 1 MHz; VB: 3 MHz



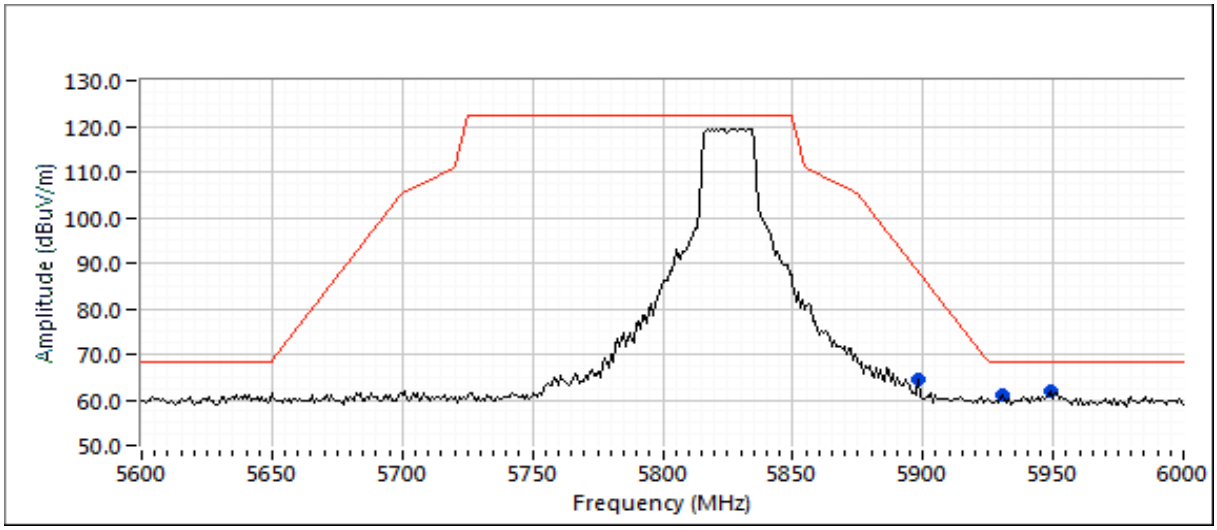
EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 & 165 Mode: ax20 Pwr Setting: q96 & q96
Tx Chain: All chains Data Rate:

5850 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	
5948.700	62.1	V	68.3	-6.2	PK	210	2.0	RB 1 MHz; VB: 3 MHz
5898.200	64.5	V	88.1	-23.6	PK	181	2.0	RB 1 MHz; VB: 3 MHz
5930.260	61.1	V	68.3	-7.2	PK	207	2.0	RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

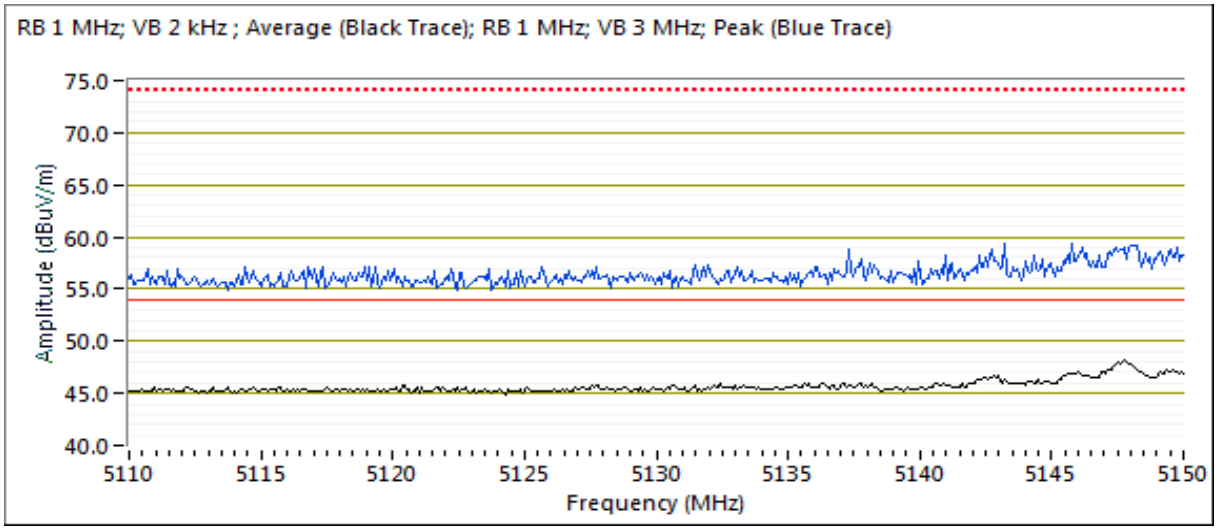
Run #9: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 12/20/19 — Config. Used: 1
Test Engineer: M. Birgani — Config Change: -
Test Location: Chamber #7 — EUT Voltage: 120V/ 60Hz

Channel: 3 & 38 — Mode: ax40 — Pwr Setting: q96 & q62
Tx Chain: All chains — Data Rate:

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	
5147.560	47.3	V	54.0	-6.7	AVG	232	1.9	RB 1 MHz; VB: 10 Hz
5149.560	46.7	H	54.0	-7.3	AVG	256	1.9	RB 1 MHz; VB: 10 Hz
5148.190	60.0	V	74.0	-14.0	PK	232	1.9	RB 1 MHz; VB: 3 MHz
5148.500	60.0	H	74.0	-14.0	PK	256	1.9	RB 1 MHz; VB: 3 MHz



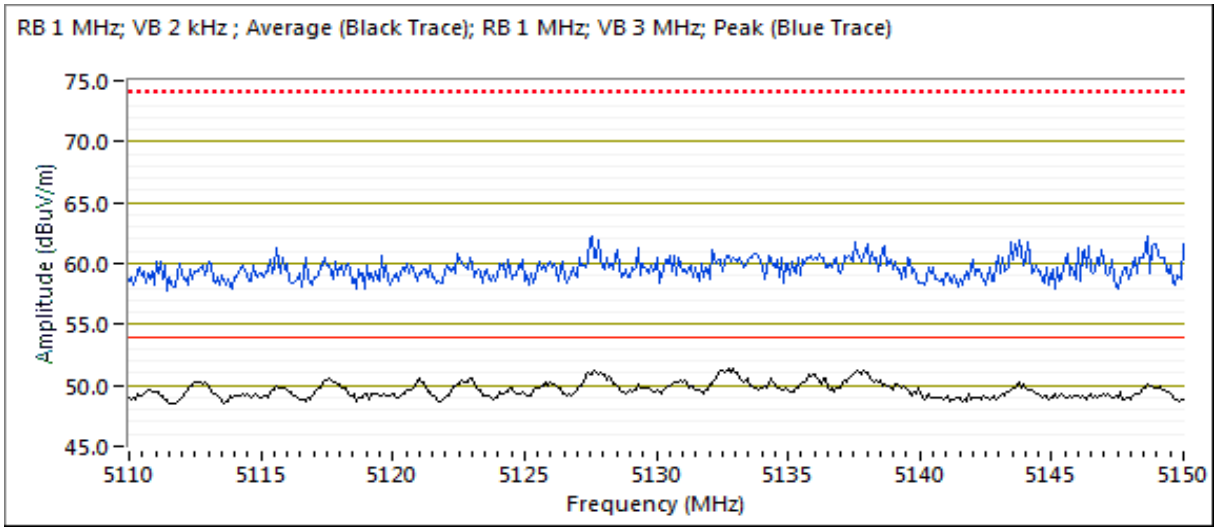
EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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: 3 & 46 Mode: ax40 Pwr Setting: q96 & q90
Tx Chain: All chains Data Rate:

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	
5137.820	51.0	V	54.0	-3.0	AVG	200	1.6	RB 1 MHz; VB: 10 Hz
5116.410	48.3	H	54.0	-5.7	AVG	240	1.6	RB 1 MHz; VB: 10 Hz
5149.200	64.1	V	74.0	-9.9	PK	200	1.6	RB 1 MHz; VB: 3 MHz
5145.190	62.3	H	74.0	-11.7	PK	240	1.6	RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 #12: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 12/20/19 — Config. Used: 1

Test Engineer: M. Birgani — Config Change: -

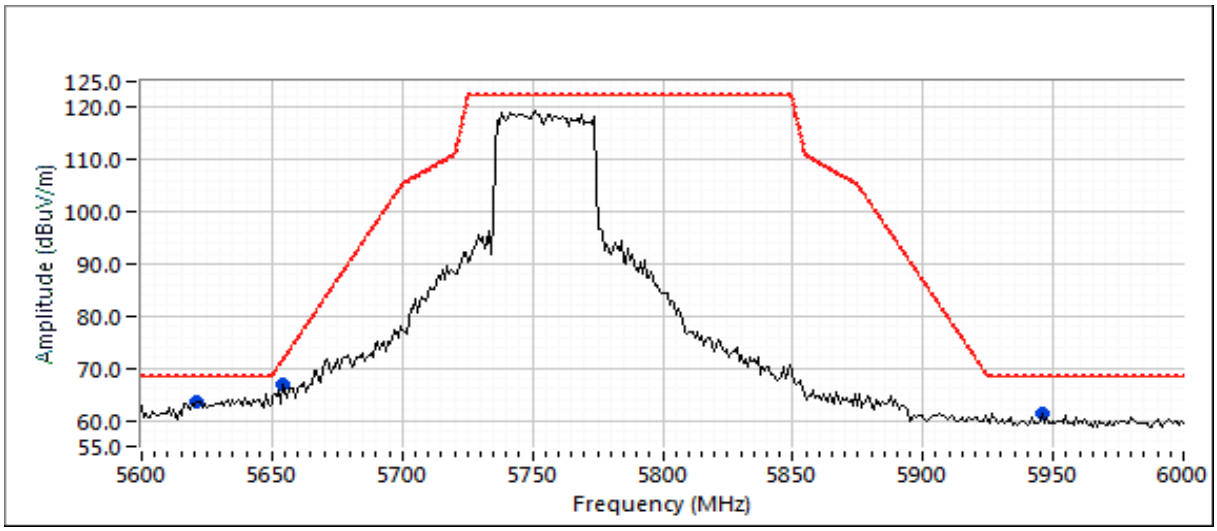
Test Location: Chamber #7 — EUT Voltage: 120V/ 60Hz

Channel: 3 & 151 — Mode: ax40 — Pwr Setting: q96 & q96

Tx Chain: All chains — Data Rate:

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	
5654.510	67.1	V	71.6	-4.5	PK	192	2.0	RB 1 MHz; VB: 3 MHz
5620.840	63.5	H	68.3	-4.8	PK	78	2.0	RB 1 MHz; VB: 3 MHz
5945.490	61.3	V	68.3	-7.0	PK	353	1.5	RB 1 MHz; VB: 3 MHz



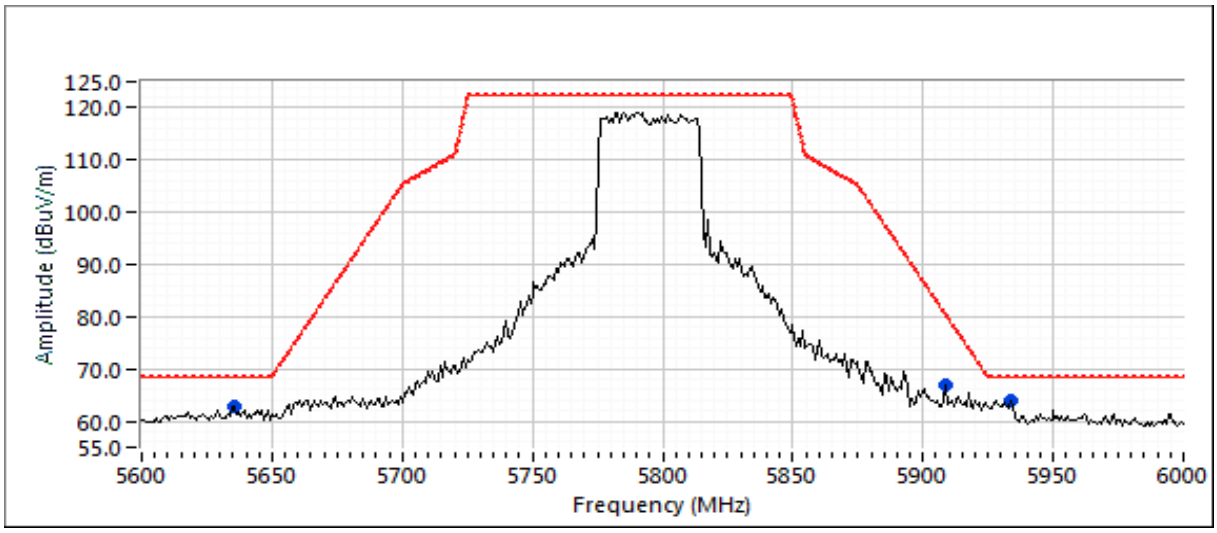
EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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: 159 Mode: ax40 Pwr Setting:
Tx Chain: Data Rate:

5850 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	
5933.470	63.9	V	68.3	-4.4	PK	191	2.0	RB 1 MHz; VB: 3 MHz
5635.270	62.9	V	68.3	-5.4	PK	190	1.5	RB 1 MHz; VB: 3 MHz
5908.620	66.9	V	80.4	-13.5	PK	195	2.0	RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 #13: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 12/20/19 — Config. Used: 1

Test Engineer: M. Birgani — Config Change: -

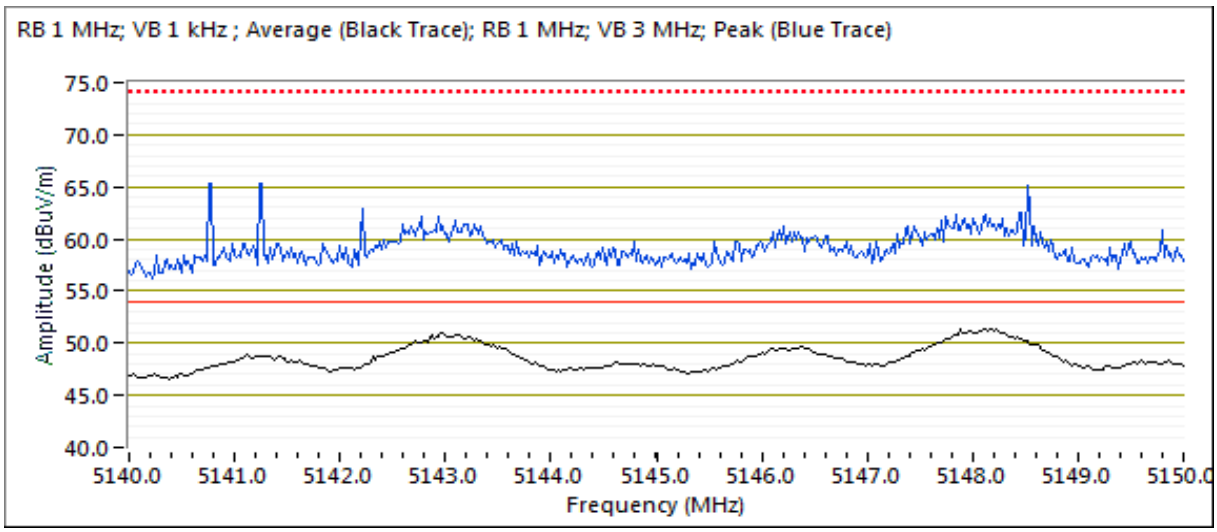
Test Location: Chamber #7 — EUT Voltage: 120V/ 60Hz

Channel: 1 & 42 — Mode: b & ax80 — Pwr Setting: q96 & q67

Tx Chain: All chains — Data Rate:

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	
5142.990	71.6	V	74.0	-2.4	PK	231	1.9	RB 1 MHz; VB: 3 MHz
5148.100	50.8	V	54.0	-3.2	AVG	231	1.9	RB 1 MHz; VB: 1 kHz
5149.680	50.2	H	54.0	-3.8	AVG	226	1.8	RB 1 MHz; VB: 1 kHz
5144.870	67.4	H	74.0	-6.6	PK	226	1.8	RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

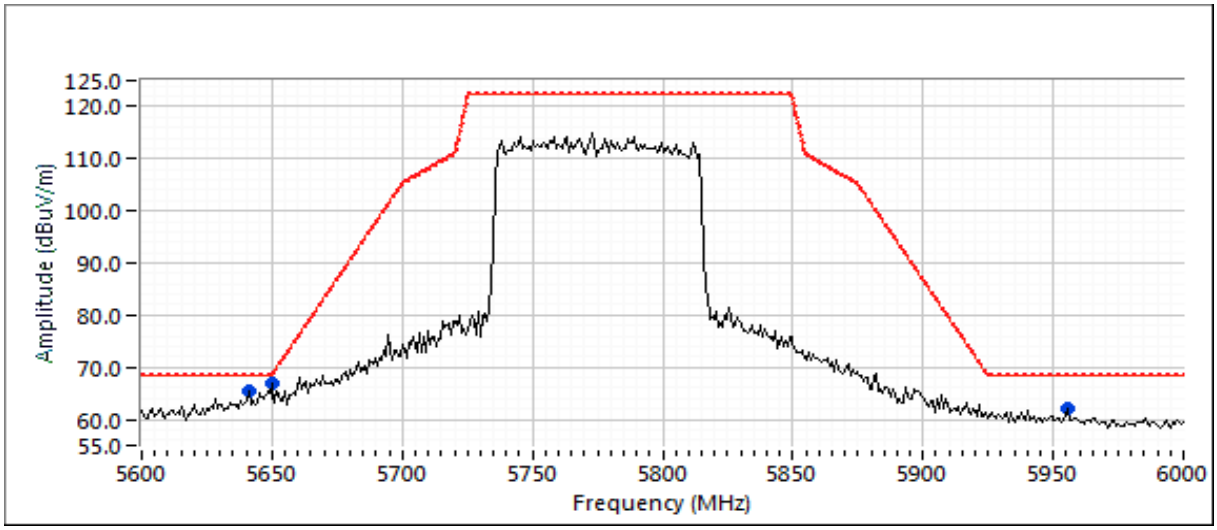
Run #16: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 12/20/19 Config. Used: 1
Test Engineer: M. Birgani Config Change: -
Test Location: Chamber #7 EUT Voltage: 120V/ 60Hz

Channel: 1 & 155 Mode: b & ax80 Pwr Setting: q96 & q84
Tx Chain: All chains Data Rate:

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	
5650.500	67.0	V	68.7	-1.7	PK	226	2.0	RB 1 MHz; VB: 3 MHz
5640.880	65.4	V	68.3	-2.9	PK	206	2.0	RB 1 MHz; VB: 3 MHz
5955.910	62.0	V	68.3	-6.3	PK	48	2.0	RB 1 MHz; VB: 3 MHz



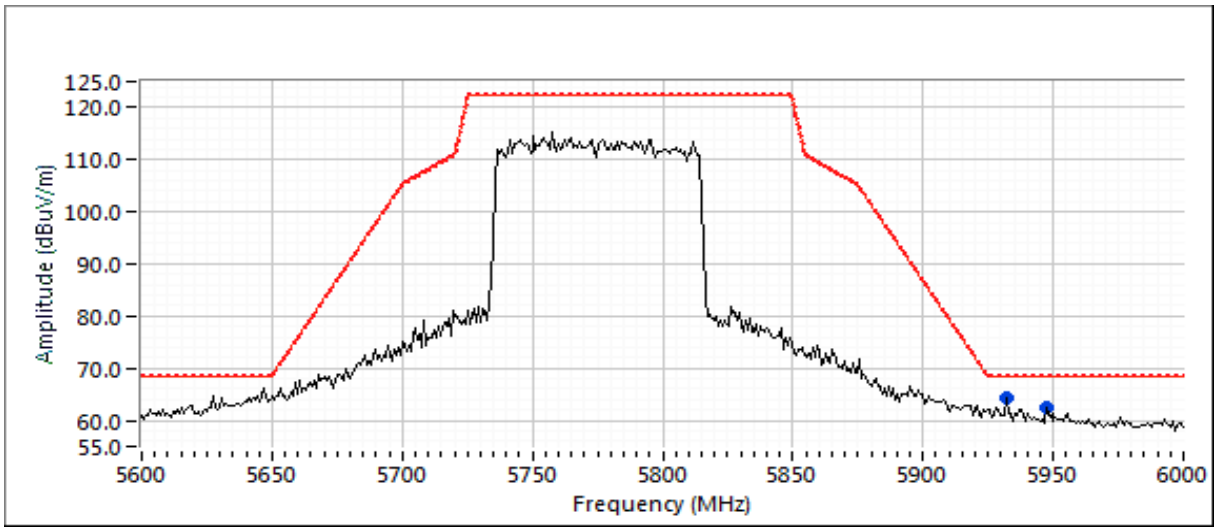
EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 & 155 Mode: b & ax80 Pwr Setting: q96 & q84
Tx Chain: All chains Data Rate:

5850 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	
5931.860	64.3	V	68.3	-4.0	PK	34	2.0	RB 1 MHz; VB: 3 MHz
5947.090	62.4	V	68.3	-5.9	PK	185	2.0	RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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: 22-23 °C
Rel. Humidity: 45-50 %

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.

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

Sample Notes

Sample S/N: M11917QW000T

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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							
5	ac20	36 5180MHz	24 / 22	24 / 21	Restricted Band Edge at 5150 MHz	15.209	72.4 dBµV/m @ 5149.2 MHz (-1.6 dB)
8	ac20	149 5745MHz	24 / 24	24 / 24	Band Edge 5725 MHz	15E	62.5 dBµV/m @ 5617.6 MHz (-5.8 dB)
	ac20	165 5825MHz	24 / 24	24 / 24	Band Edge 5850MHz	15E	62.6 dBµV/m @ 5934.3 MHz (-5.7 dB)
40MHz Bandwith Mode							
9	ac40	38 5190MHz	24 / 15.5	24 / 15.5	Restricted Band Edge at 5150 MHz	15.209	49.4 dBµV/m @ 5149.6 MHz (-4.6 dB)
12	ac40	151 5755MHz	24 / 24	24 / 24	Band Edge 5725 MHz	15E	64.1 dBµV/m @ 5628.1 MHz (-4.2 dB)
	ac40	159 5795MHz	24 / 24	24 / 24	Band Edge 5850MHz	15E	63.7 dBµV/m @ 5927.1 MHz (-4.6 dB)
80MHz Bandwith Mode							
13	ac80	42 5210MHz	24 / 16.75	24 / 16.75	Restricted Band Edge at 5150 MHz	15.209	48.6 dBµV/m @ 5145.3 MHz (-5.4 dB)
16	ac80	155 5775MHz	24 / 21	24 / 21	Band Edge 5725 MHz	15E	64.7 dBµV/m @ 5643.3 MHz (-3.6 dB)
	ac80	155 5775MHz	24 / 21	24 / 21	Band Edge 5850MHz	15E	64.1 dBµV/m @ 5922.2 MHz (-6.2 dB)

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.

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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, 5150-5250MHz

Date of Test: 09/19/19
Test Engineer: M. Birgani
Test Location: Chamber 7

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

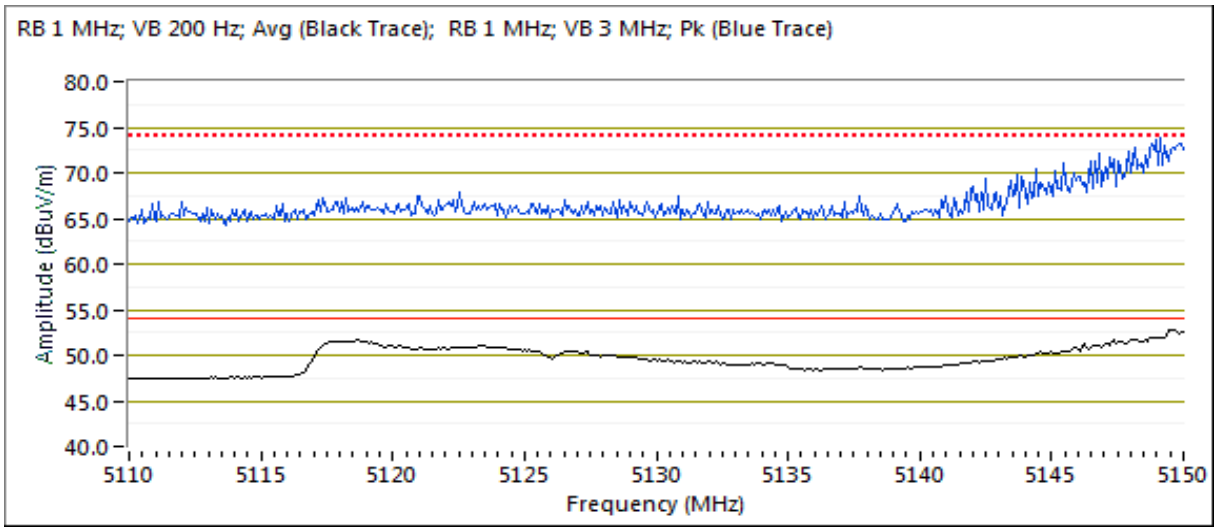
Channel: 36
Tx Chain: All chains

Mode: n20
Data Rate: 6.5 mbps

Pwr Setting: 21 (q84)

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	
5149.240	72.4	V	74.0	-1.6	PK	21	2.1	RB 1 MHz; VB: 3 MHz
5149.930	52.1	V	54.0	-1.9	AVG	21	2.1	RB 1 MHz; VB: 200 Hz
5148.930	70.4	H	74.0	-3.6	PK	73	1.1	RB 1 MHz; VB: 3 MHz
5149.570	49.7	H	54.0	-4.3	AVG	73	1.1	RB 1 MHz; VB: 200 Hz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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, 5725-5850MHz

Date of Test: 09/19/19
Test Engineer: M. Birgani
Test Location: Chamber 7

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

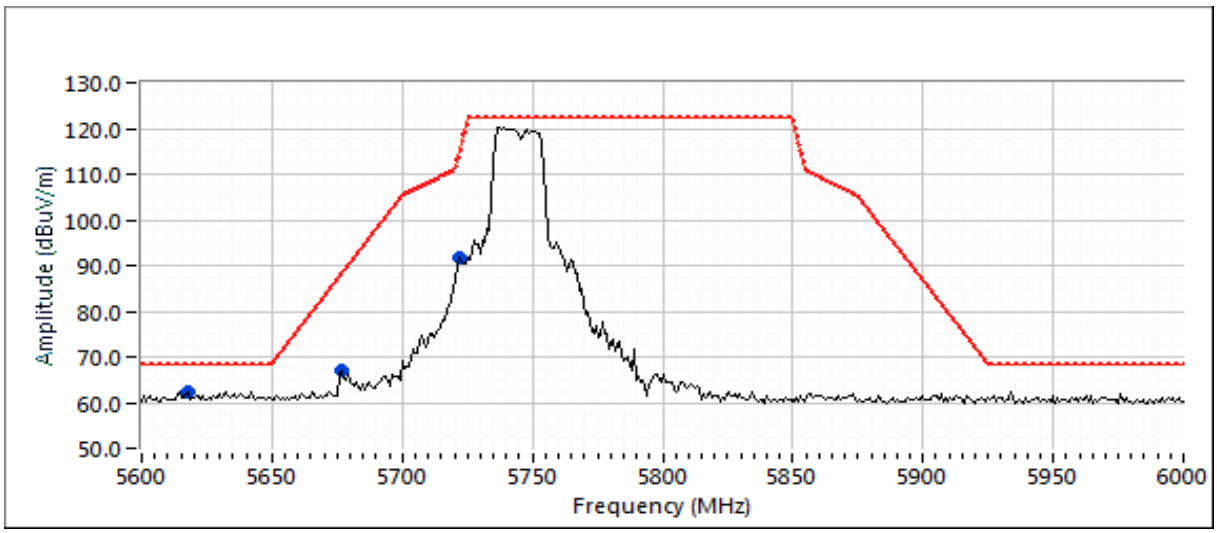
Channel: 149
Tx Chain: 4TX

Mode: n20
Data Rate: 6.5Mbps

Pwr Setting: 24 (q96)

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	
5617.640	62.5	V	68.3	-5.8	PK	227	1.5	RB 1 MHz; VB: 3 MHz
5676.950	67.2	V	88.2	-21.0	PK	181	1.5	RB 1 MHz; VB: 3 MHz
5721.840	91.7	V	115.1	-23.4	PK	221	2.0	RB 1 MHz; VB: 3 MHz



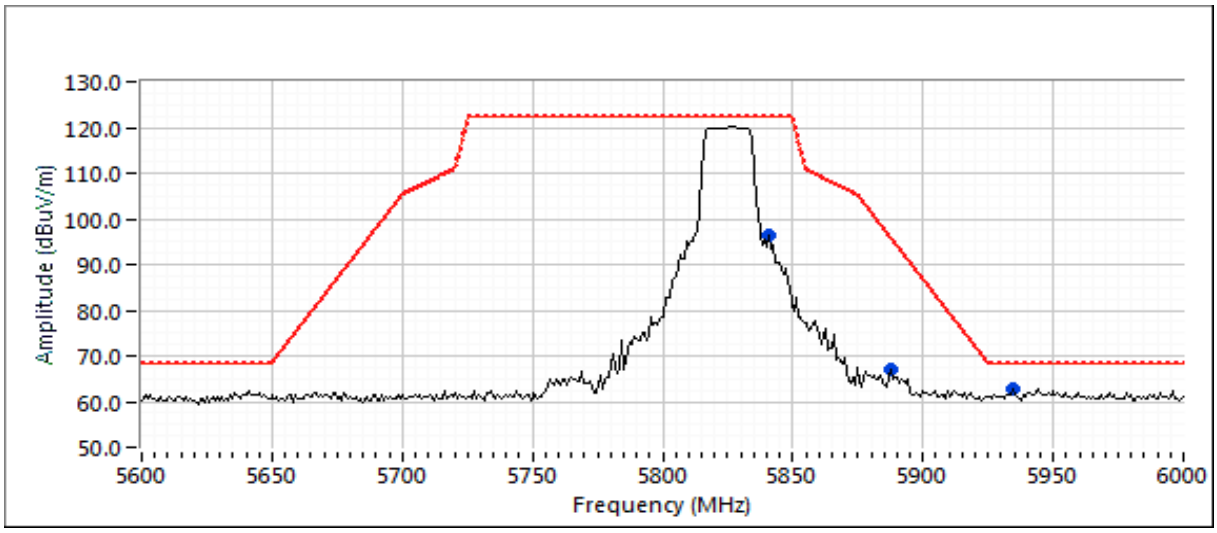
EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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: 165 Mode: n20 Pwr Setting: 24 (q96)
Tx Chain: 4Tx Data Rate: 6.5

5850 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	
5934.270	62.6	V	68.3	-5.7	PK	188	2.0	RB 1 MHz; VB: 3 MHz
5840.480	96.2	V	122.3	-26.1	PK	218	2.0	RB 1 MHz; VB: 3 MHz
5887.780	67.0	V	95.8	-28.8	PK	184	1.5	RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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, 5150-5250MHz

Date of Test: 09/20/19
Test Engineer: M. Birgani
Test Location: Chamber 7

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

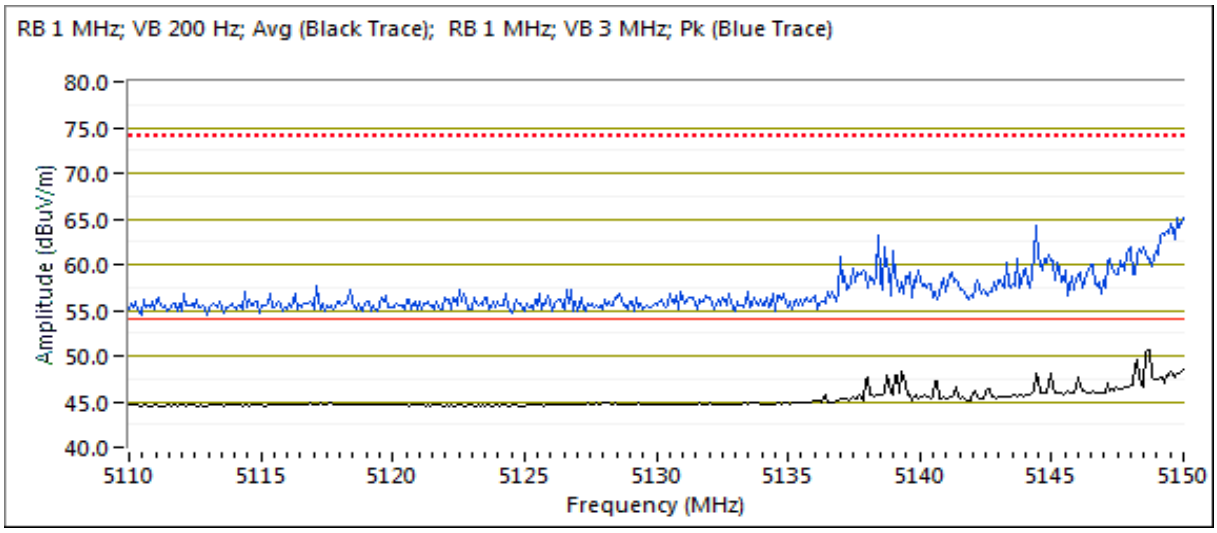
Channel: 38
Tx Chain: 4Tx

Mode: n40
Data Rate: 13.5

Pwr Setting: 15.5 (q62)

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	
5149.570	49.4	V	54.0	-4.6	AVG	351	1.0	RB 1 MHz; VB: 200 Hz
5148.020	69.0	V	74.0	-5.0	PK	351	1.0	RB 1 MHz; VB: 3 MHz
5149.990	47.3	H	54.0	-6.7	AVG	82	1.0	RB 1 MHz; VB: 200 Hz
5147.210	66.6	H	74.0	-7.4	PK	82	1.0	RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

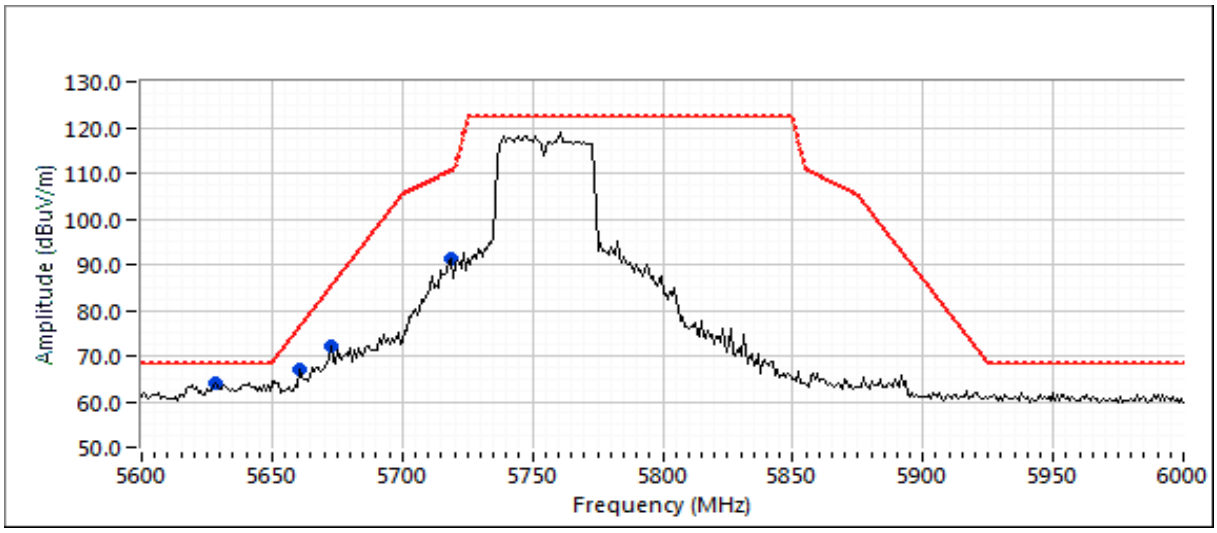
Run #12: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 09/20/19 — Config. Used: 1
Test Engineer: M. Birgani — Config Change: -
Test Location: Chamber 7 — EUT Voltage: 120V/ 60Hz

Channel: 151 — Mode: n40 — Pwr Setting: 24 (q96)
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	
5628.060	64.1	V	68.3	-4.2	PK	196	2.0	RB 1 MHz; VB: 3 MHz
5660.920	66.9	V	76.4	-9.5	PK	31	2.0	RB 1 MHz; VB: 3 MHz
5672.950	72.2	V	85.3	-13.1	PK	223	1.5	RB 1 MHz; VB: 3 MHz
5718.640	91.2	V	110.5	-19.3	PK	357	1.5	RB 1 MHz; VB: 3 MHz



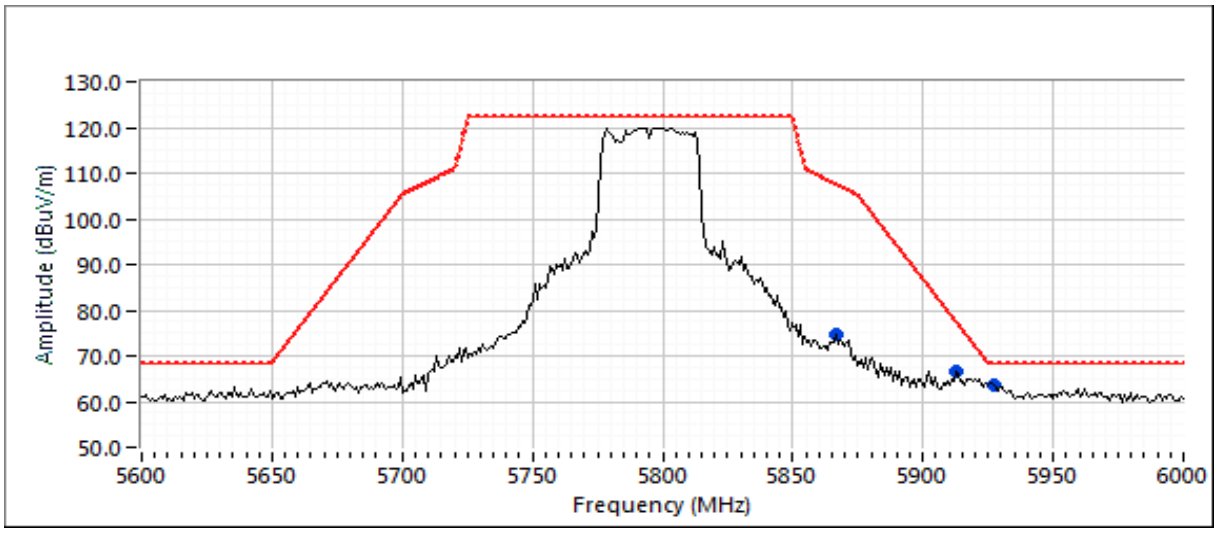
EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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: 159 Mode: n40 Pwr Setting: 24 (q96)
Tx Chain: 4Tx Data Rate: 13.5

5850 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	
5927.050	63.7	V	68.3	-4.6	PK	67	2.0	RB 1 MHz; VB: 3 MHz
5912.630	66.5	V	77.5	-11.0	PK	205	2.0	RB 1 MHz; VB: 3 MHz
5866.930	74.7	V	107.6	-32.9	PK	352	2.0	RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 #13: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 09/20/19
Test Engineer: M. Birgani
Test Location: Chamber 7

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

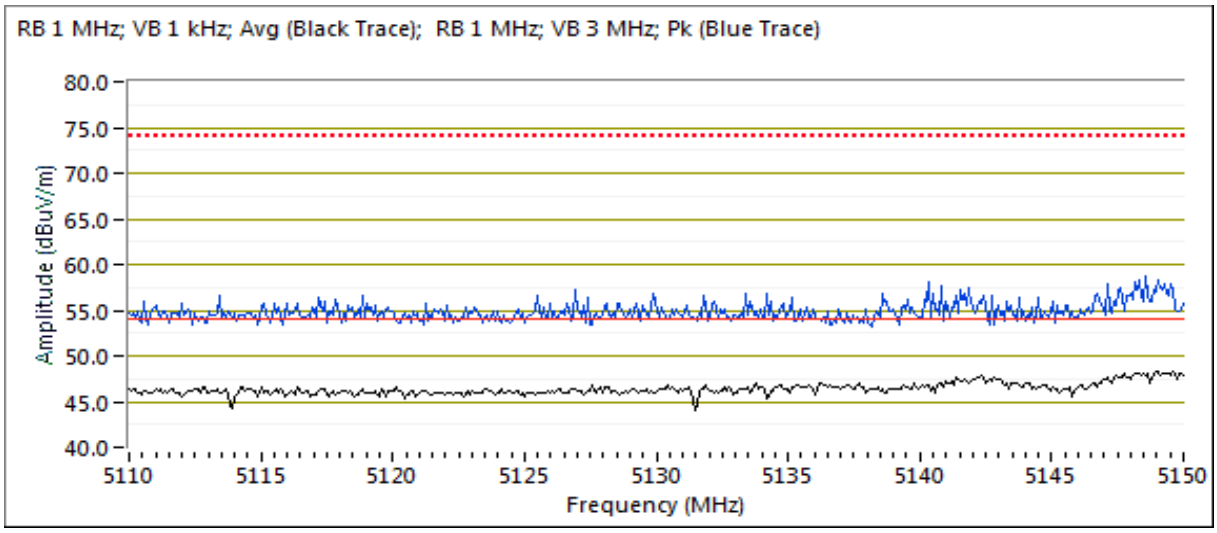
Channel: 42
Tx Chain: 4Tx

Mode: ac80
Data Rate: 58.5

Pwr Setting: 16.75 (q67)

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	
5145.270	48.6	V	54.0	-5.4	AVG	206	1.7	RB 1 MHz; VB: 1 kHz
5145.680	46.0	H	54.0	-8.0	AVG	90	1.3	RB 1 MHz; VB: 1 kHz
5149.220	60.4	V	74.0	-13.6	PK	206	1.7	RB 1 MHz; VB: 3 MHz
5149.340	57.2	H	74.0	-16.8	PK	90	1.3	RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 #16: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 09/20/19 — Config. Used: 1
Test Engineer: M. Birgani — Config Change: -
Test Location: Chamber 7 — EUT Voltage: 120V/ 60Hz

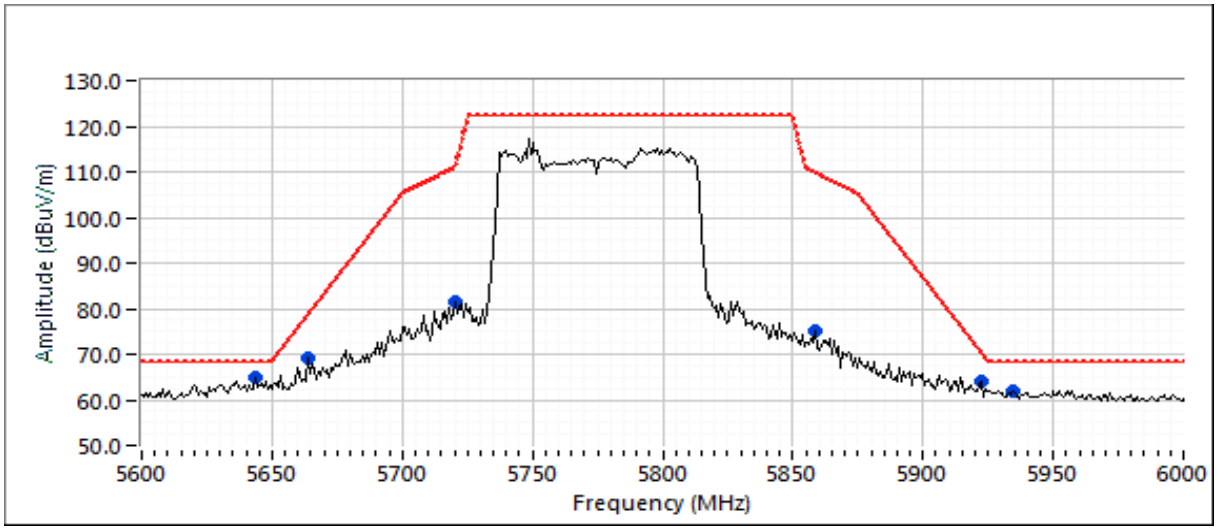
Channel: 155 — Mode: ac80 — Pwr Setting: 21 (q84)
Tx Chain: 4Tx — Data Rate: 58.5

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	
5643.290	64.7	V	68.3	-3.6	PK	34	2.0	RB 1 MHz; VB: 3 MHz
5664.130	69.3	V	78.8	-9.5	PK	194	2.0	RB 1 MHz; VB: 3 MHz
5720.240	81.6	V	111.4	-29.8	PK	196	2.0	RB 1 MHz; VB: 3 MHz

5850 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	
5922.240	64.1	V	70.3	-6.2	PK	214	2.0	RB 1 MHz; VB: 3 MHz
5934.270	62.0	V	68.3	-6.3	PK	38	2.0	RB 1 MHz; VB: 3 MHz
5858.920	75.3	V	109.8	-34.5	PK	182	1.5	RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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: 40-42 %

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.

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	pkt duty
ax20	MCS0	95.8%	Yes	1.47	0.2	0.4	682		
ax40	MCS0	88.0%	Yes	2.84	0.6	1.1	353		
ax80	MCS0	89.3%	Yes	4.07	0.5	1.0	246		

Sample Notes

Sample S/N: M11917QW000T

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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							
5	ax20	1 & 36	24 / 21		Restricted Band Edge at 5150 MHz	15.209	72.9 dBµV/m @ 5148.8 MHz (-1.1 dB)
8	ax20	1 & 149	24 / 24		Band Edge 5725 MHz	15E	63.0 dBµV/m @ 5639.3 MHz (-5.3 dB)
	ax20	11 & 165	24 / 24		Band Edge 5850MHz	15E	61.3 dBµV/m @ 5950.3 MHz (-7.0 dB)
40MHz Bandwith Mode							
9	ax40	3 & 38	24 / 15.5		Restricted Band Edge at 5150 MHz	15.209	49.1 dBµV/m @ 5149.9 MHz (-4.9 dB)
12	ax40	3 & 151	24 / 24		Band Edge 5725 MHz	15E	66.6 dBµV/m @ 5624.1 MHz (-1.7 dB)
	ax40	9 & 159	24 / 24		Band Edge 5850MHz	15E	64.1 dBµV/m @ 5927.9 MHz (-4.2 dB)
80MHz Bandwith Mode							
13	ax20 / ax80	1 & 42	24 / 16.75		Restricted Band Edge at 5150 MHz	15.209	51.6 dBµV/m @ 5147.6 MHz (-2.4 dB)
16	ax20 / ax80	1 & 155	24 / 21		Band Edge 5725 MHz	15E	66.3 dBµV/m @ 5648.1 MHz (-2.0 dB)
	ax20 / ax80	1 & 155	24 / 21		Band Edge 5850MHz	15E	63.3 dBµV/m @ 5939.9 MHz (-5.0 dB)

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.

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

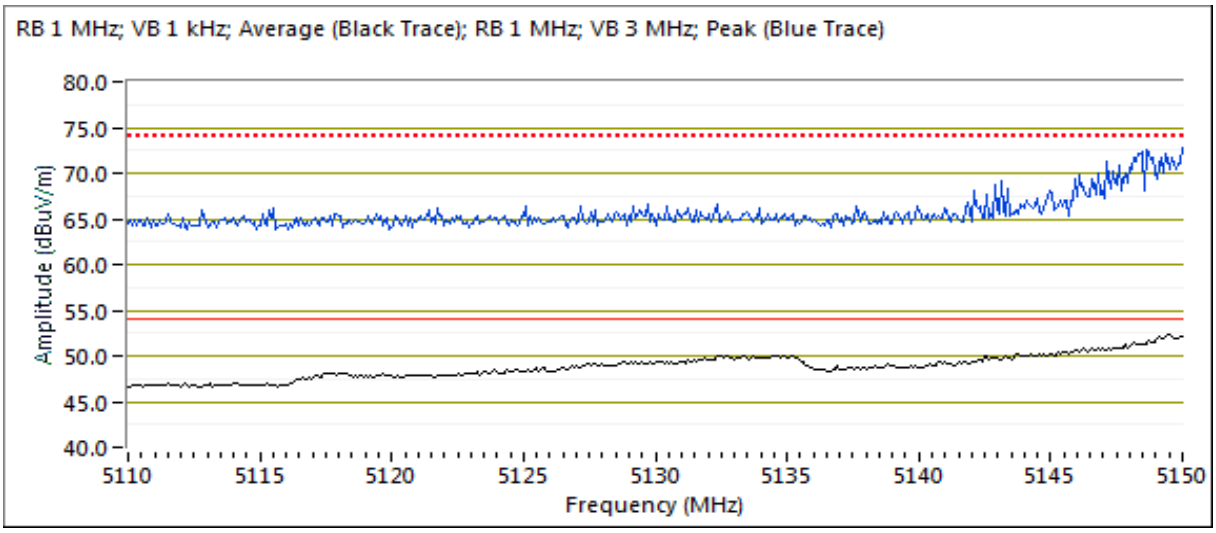
Run #5: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 12/26/19 — Config. Used: 1
Test Engineer: M. Birgani — Config Change: -
Test Location: Fremont Chanber #7 — EUT Voltage: 120V/ 60Hz

Channel: 1 & 36 — Mode: ax20 — Pwr Setting: 24 (q96) & 21 (q84)
Tx Chain: 4TX — Data Rate: 8.6Mbps / 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	
5148.790	72.9	V	74.0	-1.1	PK	16	2.2	RB 1 MHz; VB: 3 MHz
5149.600	52.1	H	54.0	-1.9	AVG	103	2.3	Note 3: RB 1 MHz; VB: 1 kHz
5149.290	51.5	V	54.0	-2.5	AVG	16	2.2	Note 3: RB 1 MHz; VB: 1 kHz
5148.400	71.2	H	74.0	-2.8	PK	103	2.3	RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

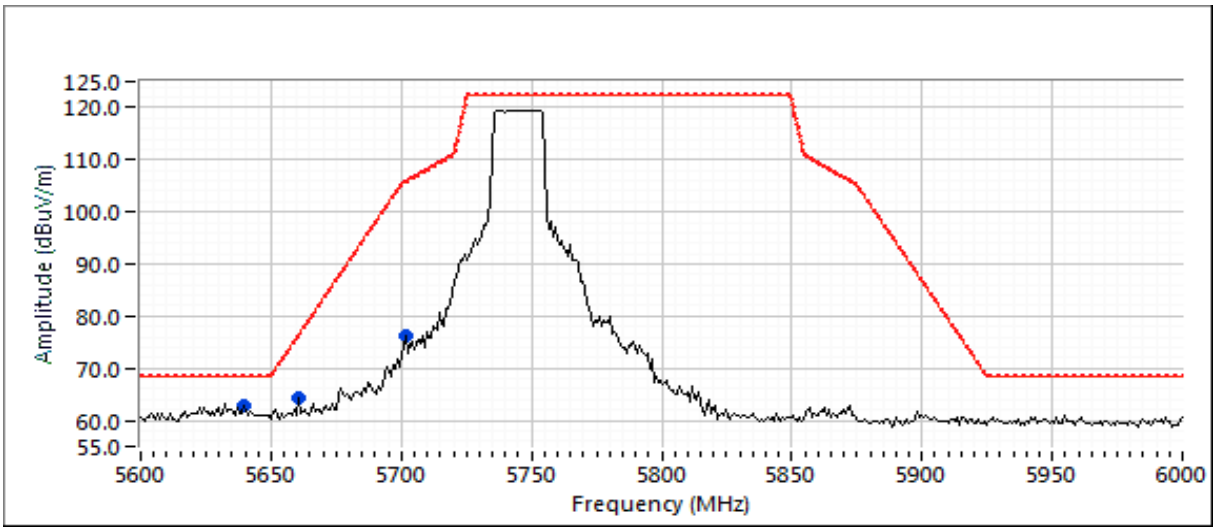
Run #8: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 12/26/19 — Config. Used: 1
Test Engineer: M. Birgani — Config Change: -
Test Location: Fremont Chanber #7 — EUT Voltage: 120V/ 60Hz

Channel: 1 & 149 — Mode: ax20 — Pwr Setting: 24 (q96)
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	
5639.280	63.0	V	68.3	-5.3	PK	182	2.2	RB 1 MHz; VB: 3 MHz
5660.920	64.2	V	76.4	-12.2	PK	189	1.9	RB 1 MHz; VB: 3 MHz
5701.800	76.2	H	105.8	-29.6	PK	80	2.2	RB 1 MHz; VB: 3 MHz



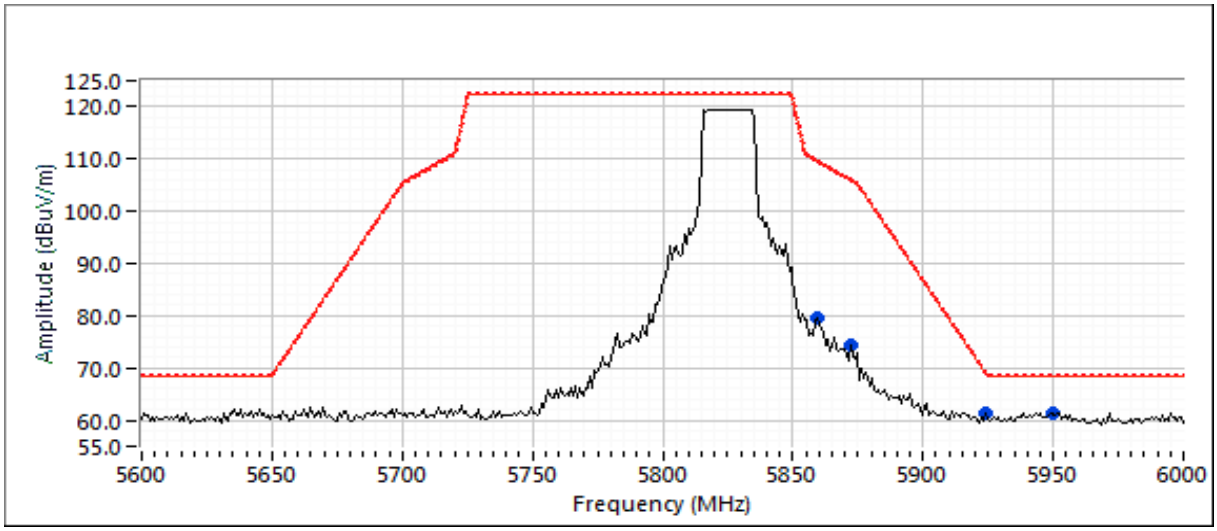
EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 &165 Mode: ax20 Pwr Setting: 24 (q96)
Tx Chain: 4Tx Data Rate: 8.6mbps / chain

5850 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	
5950.300	61.3	V	68.3	-7.0	PK	180	1.9	RB 1 MHz; VB: 3 MHz
5923.850	61.3	V	69.2	-7.9	PK	202	1.9	RB 1 MHz; VB: 3 MHz
5859.720	79.5	V	109.6	-30.1	PK	204	2.5	RB 1 MHz; VB: 3 MHz
5872.540	74.2	V	106.0	-31.8	PK	216	1.6	RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

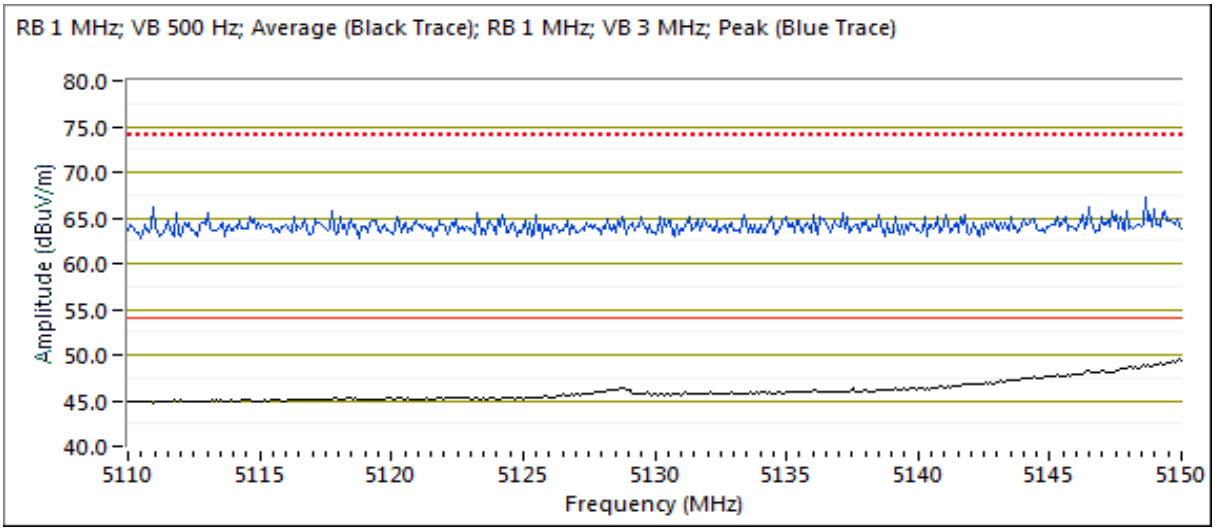
Run #9: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 12/26/19 — Config. Used: 1
Test Engineer: M. Birgani — Config Change: -
Test Location: Fremont Chanber #7 — EUT Voltage: 120V/ 60Hz

Channel: 3 & 38 — Mode: ax40 — Pwr Setting: 24 (q96) & 15.5 (q62)
Tx Chain: 4Tx — Data Rate: 17.2Mbps / 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	
5149.860	49.1	V	54.0	-4.9	AVG	204	1.5	Note 3: RB 1 MHz; VB: 500 Hz
5146.580	68.6	V	74.0	-5.4	PK	204	1.5	RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 #12: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 12/26/19 — Config. Used: 1

Test Engineer: M. Birgani — Config Change: -

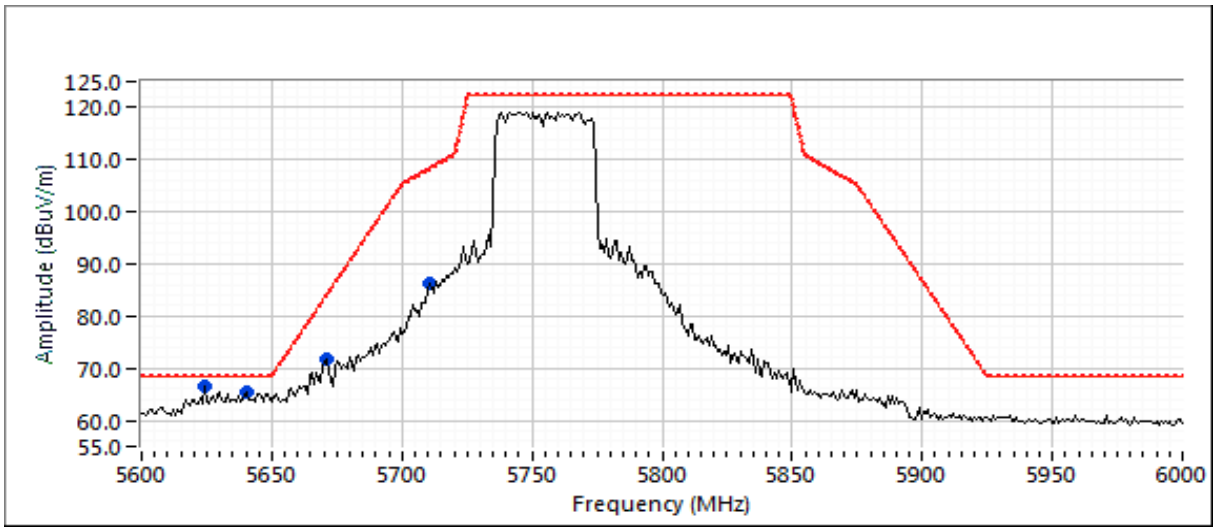
Test Location: Fremont Chanber #7 — EUT Voltage: 120V/ 60Hz

Channel: 3 & 151 — Mode: ax40 — Pwr Setting: 24 (q96)

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	
5624.050	66.6	V	68.3	-1.7	PK	187	1.9	RB 1 MHz; VB: 3 MHz
5640.080	65.6	V	68.3	-2.7	PK	187	1.9	RB 1 MHz; VB: 3 MHz
5671.340	71.7	V	84.1	-12.4	PK	22	1.6	RB 1 MHz; VB: 3 MHz
5710.620	86.2	V	108.3	-22.1	PK	180	1.6	RB 1 MHz; VB: 3 MHz



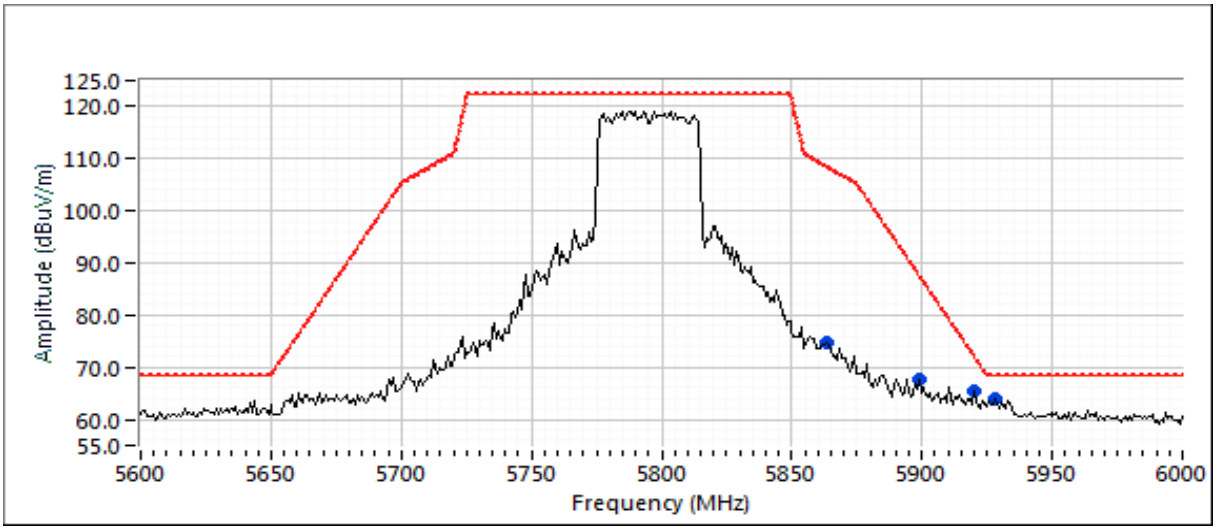
EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 & 159 Mode: ax40 Pwr Setting: 24 (q96)
Tx Chain: 4Tx Data Rate: 17.2mbps / chain

5850 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	
5927.860	64.1	V	68.3	-4.2	PK	188	1.9	RB 1 MHz; VB: 3 MHz
5919.840	65.5	V	72.1	-6.6	PK	188	1.6	RB 1 MHz; VB: 3 MHz
5899.000	67.6	V	87.5	-19.9	PK	61	1.9	RB 1 MHz; VB: 3 MHz
5863.730	74.6	V	108.5	-33.9	PK	187	1.0	RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 #13: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 12/26/19 — Config. Used: 1

Test Engineer: M. Birgani — Config Change: -

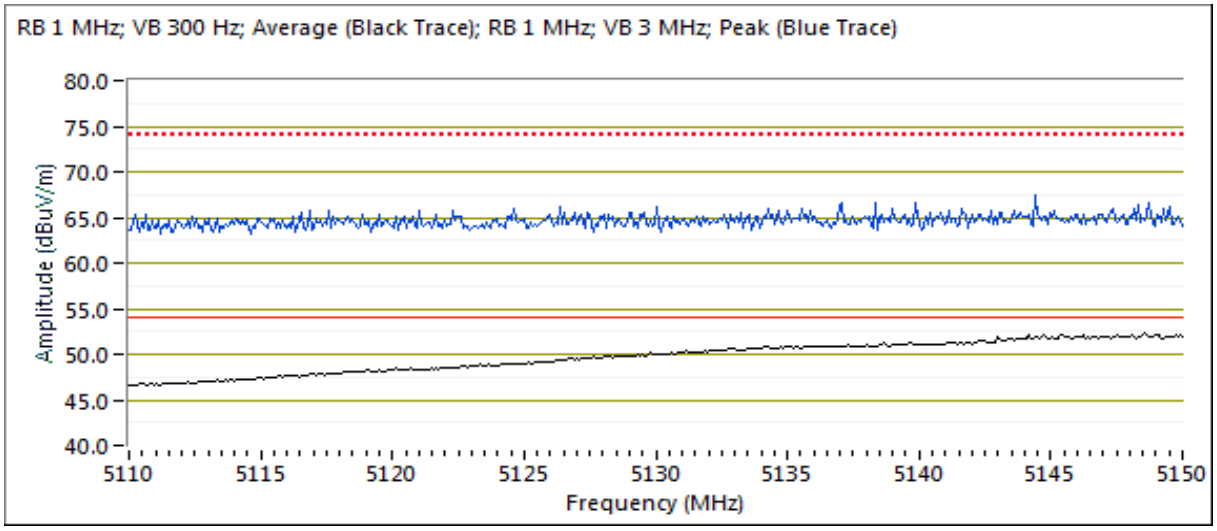
Test Location: Fremont Chanber #7 — EUT Voltage: 120V/ 60Hz

Channel: 1 & 42 — Mode: ax20 & ax80 — Pwr Setting: 24 (q96) & 16.75 (q67)

Tx Chain: 4Tx — Data Rate: 36mbps / 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	
5147.600	51.6	V	54.0	-2.4	AVG	206	1.5	Note 3: RB 1 MHz; VB: 300 Hz
5141.700	67.7	V	74.0	-6.3	PK	206	1.5	RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 #16: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 12/26/19 — Config. Used: 1
Test Engineer: M. Birgani — Config Change: -
Test Location: Fremont Chanber #7 — EUT Voltage: 120V/ 60Hz

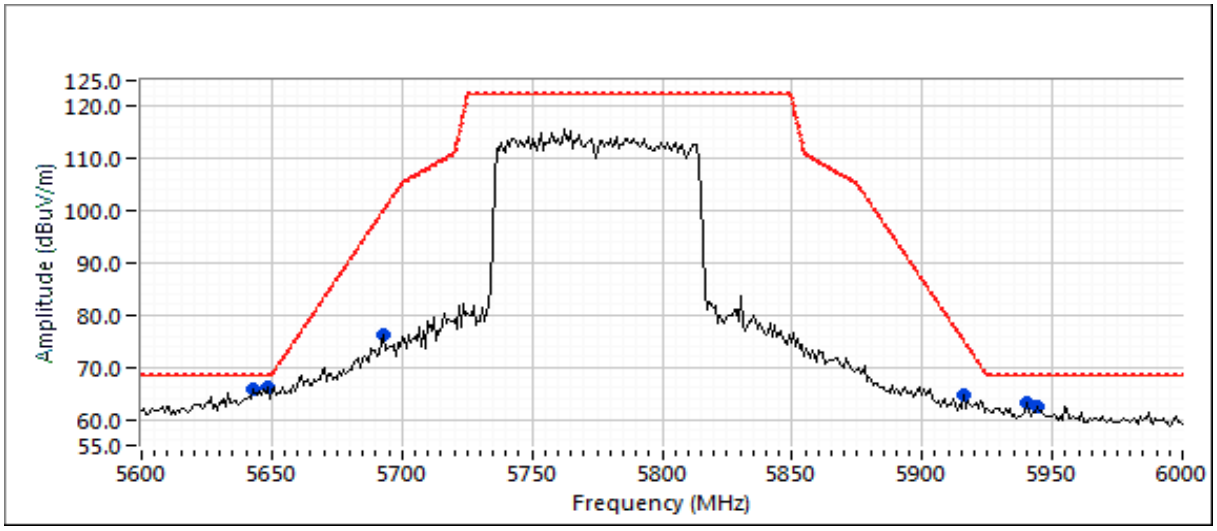
Channel: 1 & 155 — Mode: ax20 & ax80 — Pwr Setting: 24 (q96) & 21 (q84)
Tx Chain: 4Tx — Data Rate: 36mbps / chain

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	
5648.100	66.3	V	68.3	-2.0	PK	206	1.9	RB 1 MHz; VB: 3 MHz
5642.480	65.9	V	68.3	-2.4	PK	31	1.6	RB 1 MHz; VB: 3 MHz
5692.990	76.1	V	100.1	-24.0	PK	188	1.6	RB 1 MHz; VB: 3 MHz

5850 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	
5939.880	63.3	V	68.3	-5.0	PK	202	2.5	RB 1 MHz; VB: 3 MHz
5943.890	62.5	V	68.3	-5.8	PK	259	1.9	RB 1 MHz; VB: 3 MHz
5915.830	64.7	V	75.1	-10.4	PK	206	1.9	RB 1 MHz; VB: 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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: 22-25 °C
Rel. Humidity: 39-43 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 four OFDM modes to determine the worst case mode.							
1	g / a	6 & 40	26 / 26	26 / 26	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.6 dBµV/m @ 5149.9 MHz (-1.4 dB)
	ac20	6 & 40	24 / 24	24 / 23	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.8 dBµV/m @ 5148.8 MHz (-0.2 dB)
	ac40	6 & 46	24 / 24	24 / 24	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.8 dBµV/m @ 5353.7 MHz (-1.2 dB)
	b/ac80	6 & 42	24 / 24	22.25 / 23	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.8 dBµV/m @ 5350.1 MHz (-0.2 dB)
Measurements on low and high channels in worst-case OFDM mode.							
2	ac20	1 & 36	24 / 22	24 / 22	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.2 dBµV/m @ 4813.8 MHz (-0.8 dB)
	ac20	11 & 48	24 / 24	23 / 24	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.4 dBµV/m @ 4924.0 MHz (-0.6 dB)
Scans on "center" channel in all four OFDM modes to determine the worst case mode.							
3	g / a	6 & 157	26 / 26	26 / 26	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	65.2 dBµV/m @ 17350.3 MHz (-3.1 dB)
	ac20	6 & 157	24 / 24	24 / 24	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	50.7 dBµV/m @ 4878.7 MHz (-3.3 dB)
	ac40	6 & 159	24 / 24	24 / 24	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	50.6 dBµV/m @ 2483.6 MHz (-3.4 dB)
	b / ac80	6 & 155	24 / 24	22 / 24	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	68.2 dBµV/m @ 6003.6 MHz (-0.1 dB)
Measurements on low and high channels in worst-case OFDM mode.							
4	b / ac20	1 & 149	26 / 24	18.25 / 24	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.5 dBµV/m @ 4824.1 MHz (-0.5 dB)
	b / ac20	11 & 165	26 / 24	16.25 / 24	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.4 dBµV/m @ 4924.0 MHz (-0.6 dB)
Measurements on low and high channels in g mode.							
5	g / ac40	1 & 38	26 / 24	26 / 24	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.7 dBµV/m @ 4815.5 MHz (-1.3 dB)
	g / a	11 & 48	26 / 26	26 / 25	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.8 dBµV/m @ 4924.0 MHz (-0.2 dB)

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)

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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	pkt duty
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	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

Sample Notes

Sample S/N: M11917QW000T
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:	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.

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 5150-5250 MHz Band

Date of Test: 07/16/19 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: None
Test Location: FT Chamber #5 EUT Voltage: 120V/60Hz

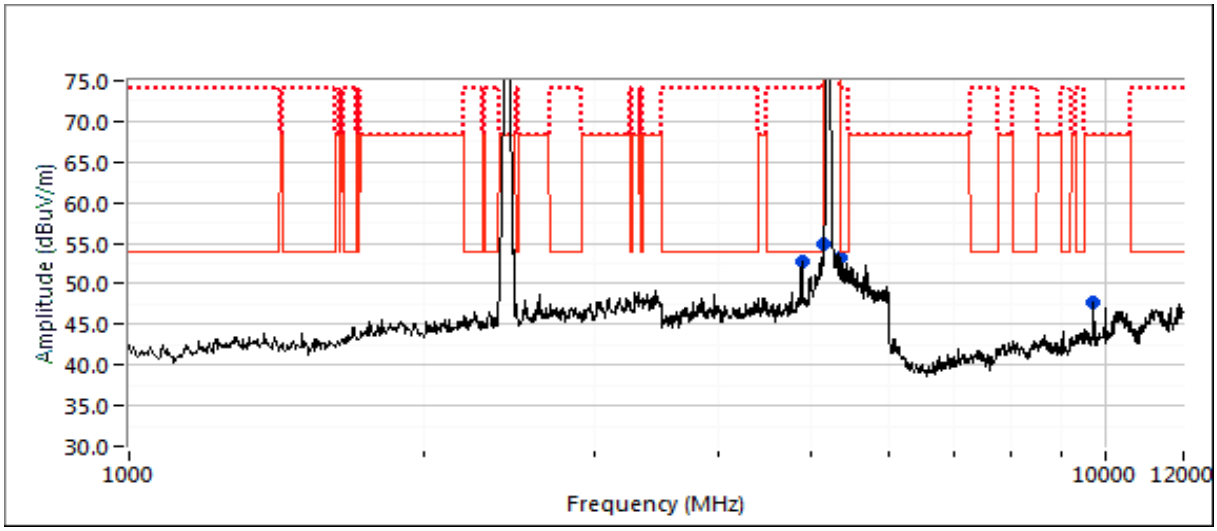
Run #1a: Center Channel

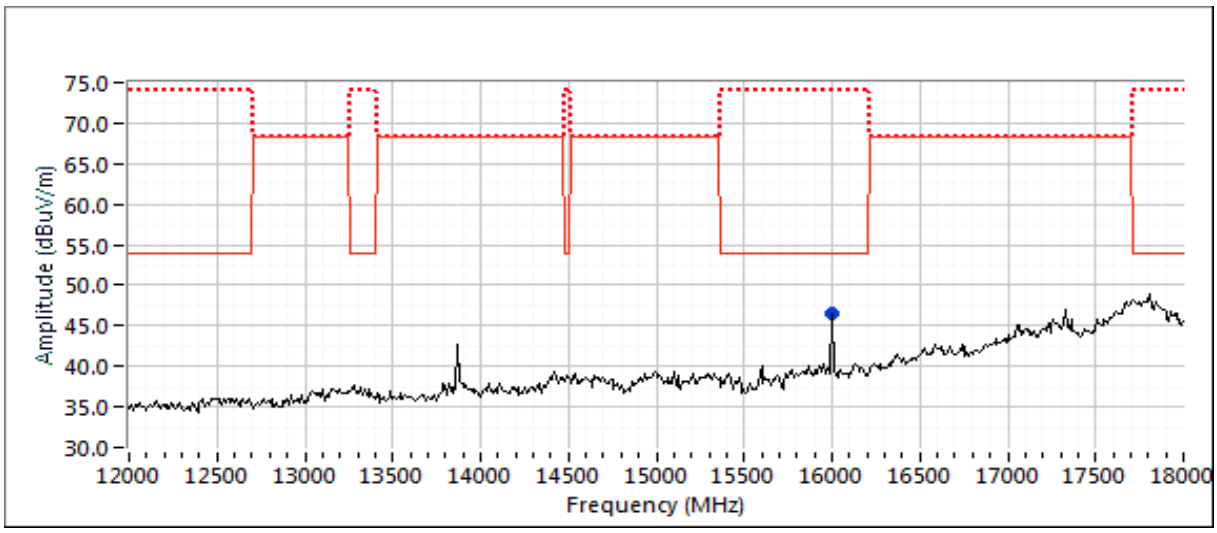
Channel: 6 & 40 Mode: g & a Pwr Setting: 26 (q104)
Tx Chain: 1Tx Data Rate: 6.0 Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
5149.900	52.6	V	54.0	-1.4	AVG	205	1.6	RB 1 MHz;VB 10 Hz;Peak
5135.000	53.8	V	74.0	-20.2	PK	205	1.6	RB 1 MHz;VB 3 MHz;Peak
5355.530	49.3	V	54.0	-4.7	AVG	210	1.6	RB 1 MHz;VB 10 Hz;Peak
5350.000	53.1	V	74.0	-20.9	PK	210	1.6	RB 1 MHz;VB 3 MHz;Peak
4879.320	48.5	V	54.0	-5.5	AVG	127	1.6	RB 1 MHz;VB 10 Hz;Peak
4872.350	52.1	V	74.0	-21.9	PK	127	1.6	RB 1 MHz;VB 3 MHz;Peak
9710.000	53.9	H	68.3	-14.4	PK	269	2.0	RB 1 MHz;VB 3 MHz;Peak
16000.200	46.6	H	54.0	-7.4	AVG	*263*	*1.5*	Note 3; RB 1 MHz;VB 300 Hz
16000.170	52.1	H	74.0	-21.9	PK	*263*	*1.5*	RB 1 MHz;VB 3 MHz
20000.320	42.1	H	54.0	-11.9	AVG	17	1.4	RB 1 MHz;VB 10 Hz;Peak
20000.230	49.7	H	74.0	-24.3	PK	17	1.4	RB 1 MHz;VB 3 MHz;Peak
20799.940	47.2	H	54.0	-6.8	AVG	45	1.1	RB 1 MHz;VB 10 Hz;Peak
20799.960	52.9	H	74.0	-21.1	PK	45	1.1	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).

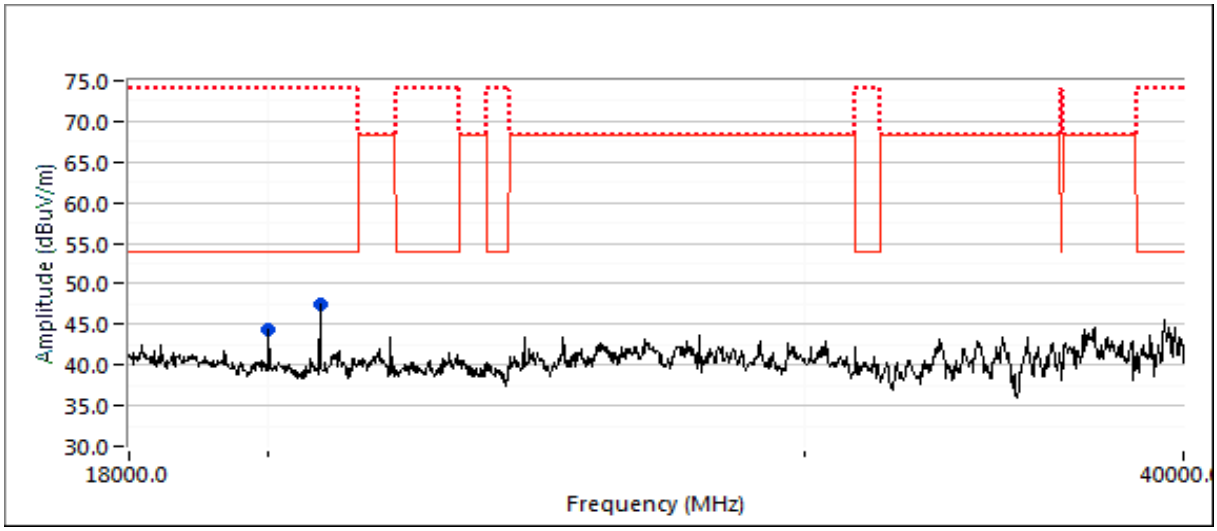
Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A





EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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



EMC Test Data

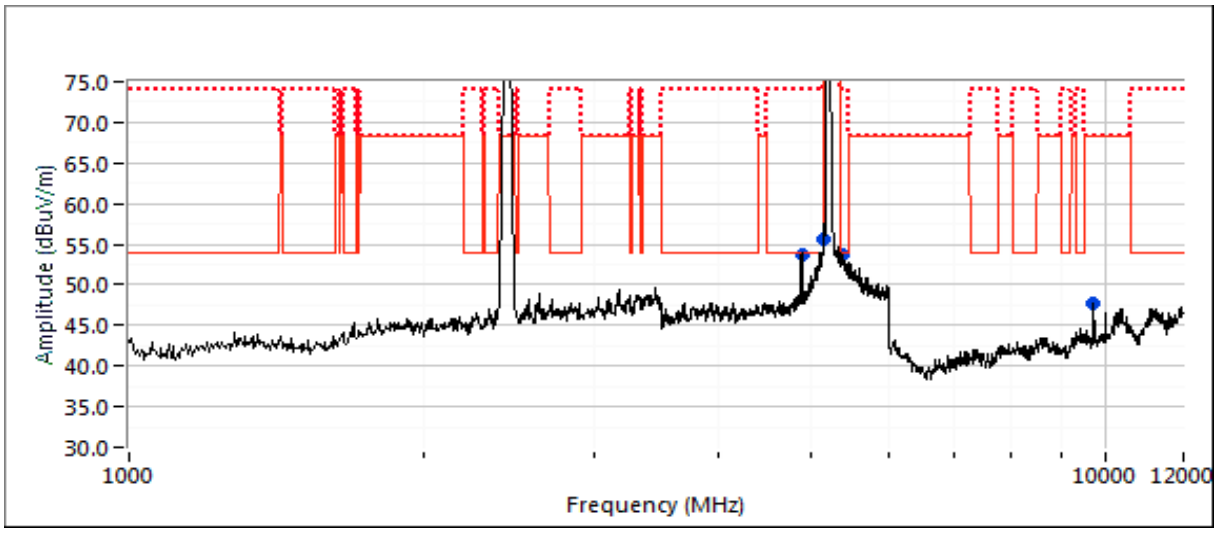
Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #1b: Center Channel

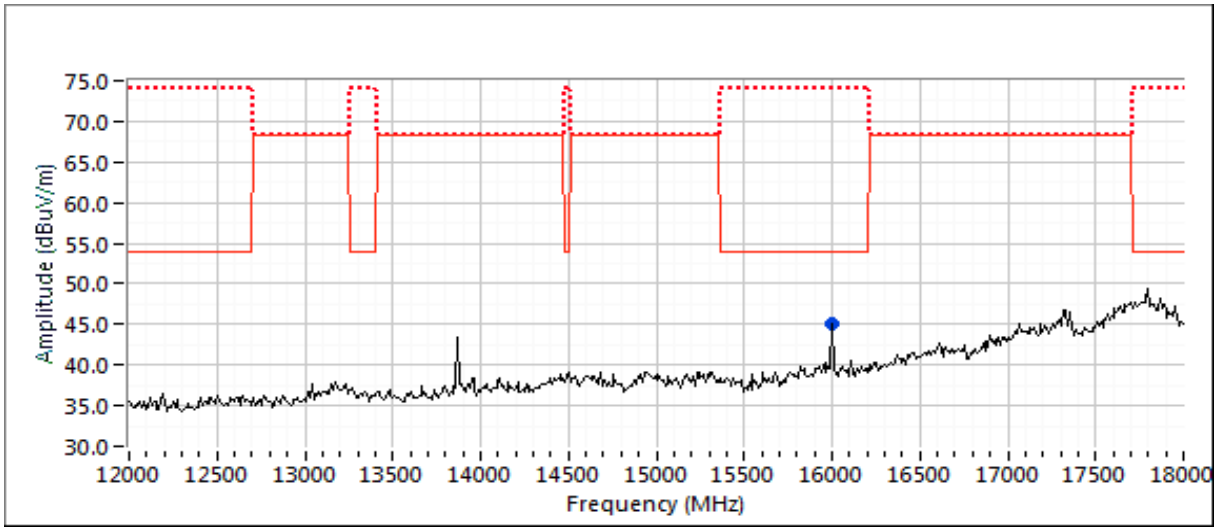
Channel: 6 & 40 Mode: ac20 Pwr Setting: 24 (q96) & 23 (q92)
Tx Chain: 4Tx Data Rate: 6.5 Mbps

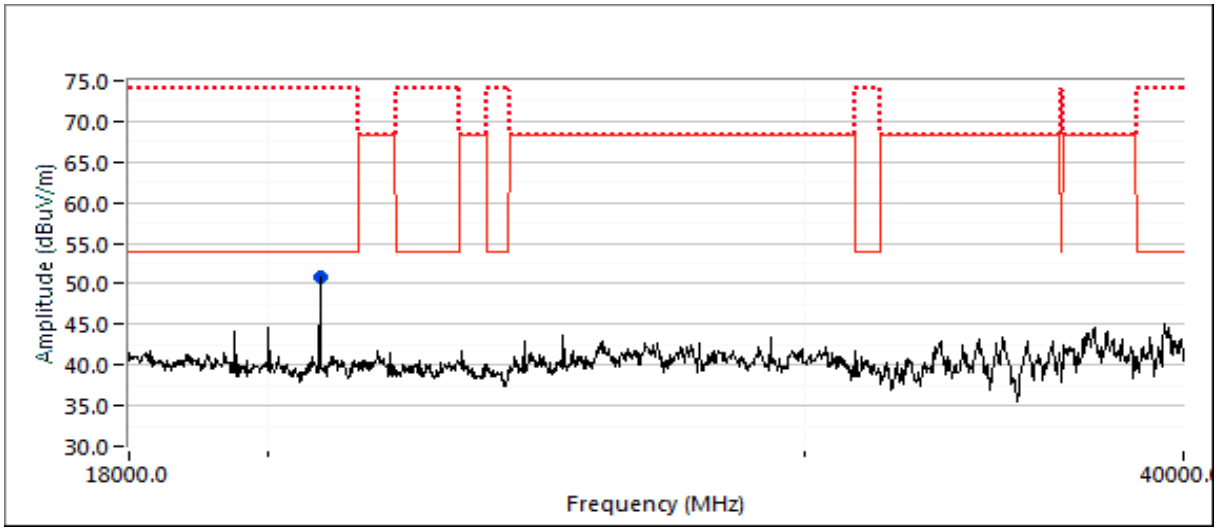
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
5148.750	53.8	V	54.0	-0.2	AVG	208	1.6	RB 1 MHz;VB 300 Hz;Peak
5149.170	65.4	V	74.0	-8.6	PK	208	1.6	RB 1 MHz;VB 3 MHz;Peak
5357.750	51.0	V	54.0	-3.0	AVG	185	1.7	RB 1 MHz;VB 300 Hz;Peak
5358.210	63.1	V	74.0	-10.9	PK	185	1.7	RB 1 MHz;VB 3 MHz;Peak
4883.670	49.0	V	54.0	-5.0	AVG	117	1.7	RB 1 MHz;VB 300 Hz;Peak
4883.740	63.3	V	74.0	-10.7	PK	117	1.7	RB 1 MHz;VB 3 MHz;Peak
9710.000	54.1	H	68.3	-14.2	PK	228	2.0	RB 1 MHz;VB 3 MHz;Peak
16000.200	45.3	H	54.0	-8.7	AVG	319	1.5	Note 3; RB 1 MHz;VB 300 Hz
16000.170	51.2	H	74.0	-22.8	PK	319	1.5	RB 1 MHz;VB 3 MHz
20799.950	49.1	H	54.0	-4.9	AVG	178	1.2	RB 1 MHz;VB 300 Hz;Peak
20799.900	54.0	H	74.0	-20.0	PK	178	1.2	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:	NVG5XDBAX	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





EMC Test Data

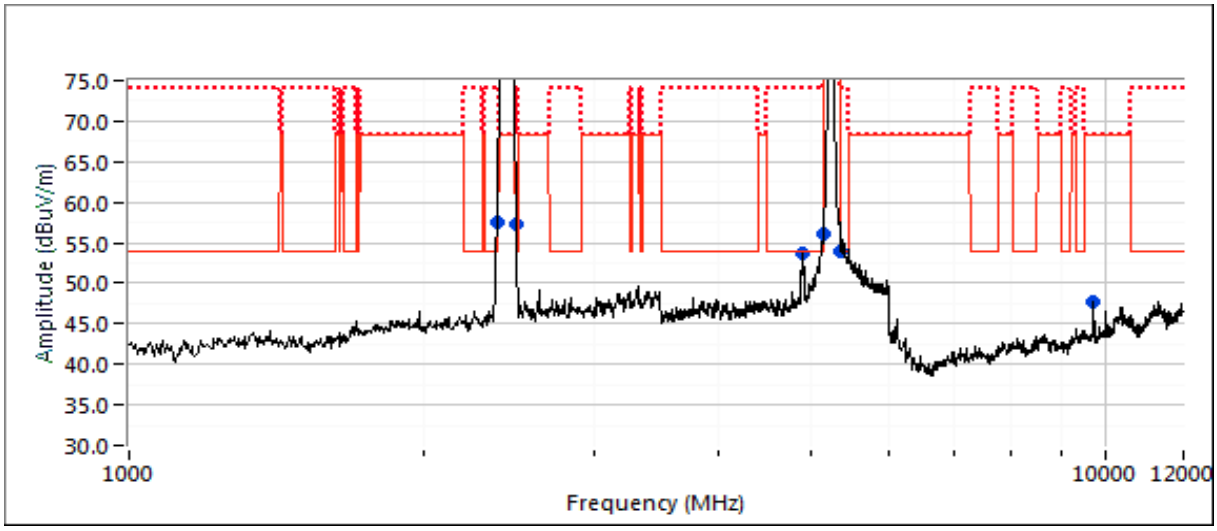
Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #1c: Center Channel

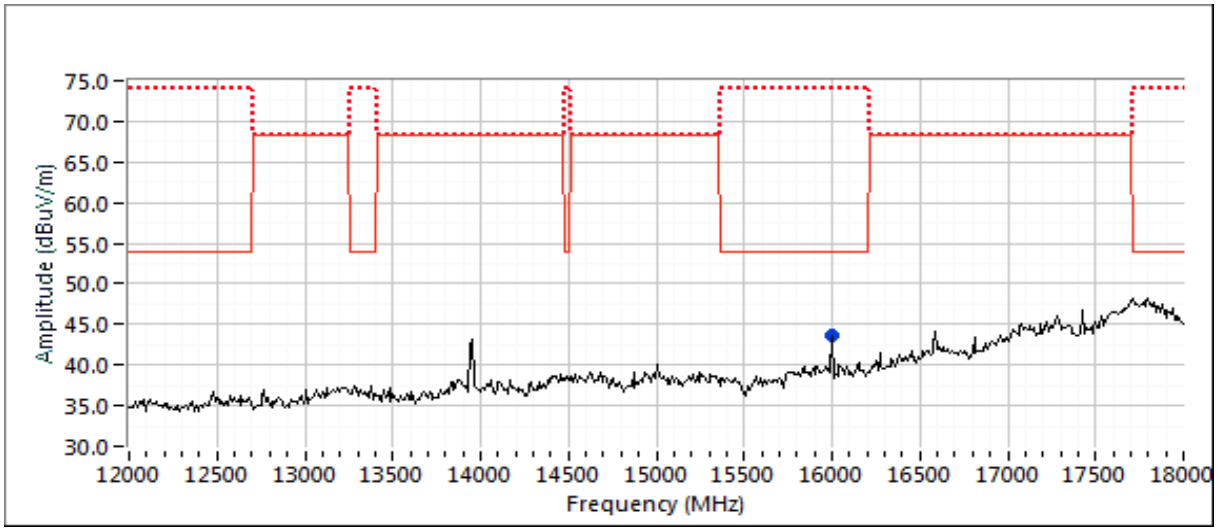
Channel: 6 & 46 Mode: ac40 Pwr Setting: 24 (q96)
Tx Chain: 4Tx Data Rate: 6.5, 13.5 Mbps

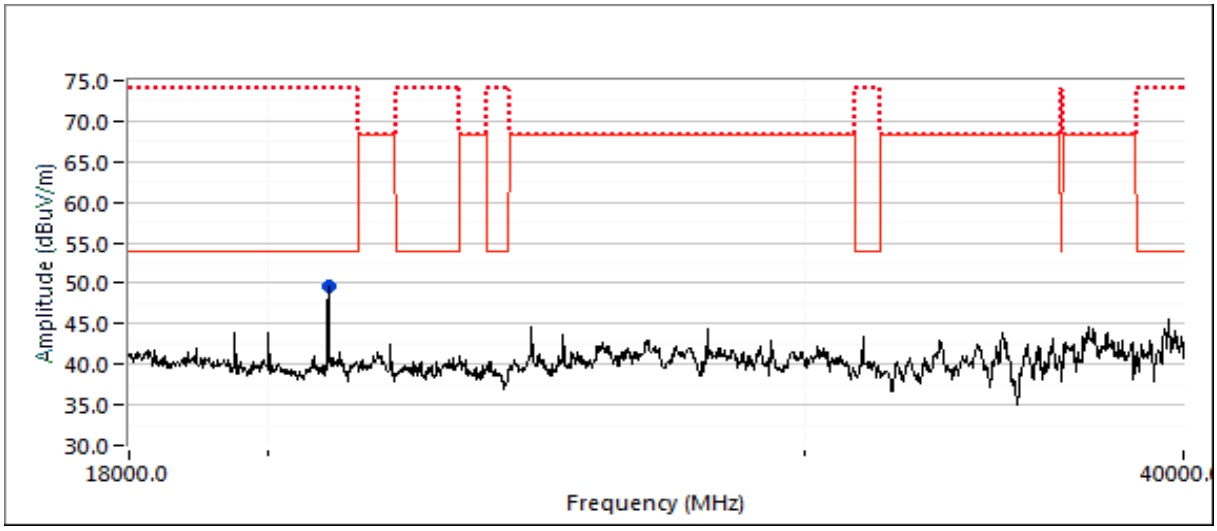
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
5353.650	52.8	V	54.0	-1.2	AVG	352	1.9	Note 3; RB 1 MHz;VB 300 Hz
5351.500	64.4	V	74.0	-9.6	PK	352	1.9	RB 1 MHz;VB 3 MHz
2390.000	50.7	H	54.0	-3.3	AVG	110	1.5	Note 3; RB 1 MHz;VB 300 Hz
2390.000	68.3	H	74.0	-5.7	PK	110	1.5	RB 1 MHz;VB 3 MHz
2484.000	49.9	H	54.0	-4.1	AVG	103	1.5	Note 3; RB 1 MHz;VB 300 Hz
2484.640	69.1	H	74.0	-4.9	PK	103	1.5	RB 1 MHz;VB 3 MHz
5128.200	51.8	V	54.0	-2.2	AVG	89	1.6	Note 3; RB 1 MHz;VB 300 Hz
5146.800	70.0	V	74.0	-4.0	PK	89	1.6	RB 1 MHz;VB 3 MHz
4898.920	47.6	V	54.0	-6.4	AVG	312	2.0	Note 3; RB 1 MHz;VB 300 Hz
4897.710	61.2	V	74.0	-12.8	PK	312	2.0	RB 1 MHz;VB 3 MHz
9710.000	54.1	H	68.3	-14.2	PK	282	1.5	RB 1 MHz;VB 3 MHz
16000.200	44.7	H	54.0	-9.3	AVG	231	1.5	Note 3; RB 1 MHz;VB 300 Hz
16000.170	51.0	H	74.0	-23.0	PK	231	1.5	RB 1 MHz;VB 3 MHz
20919.910	49.3	H	54.0	-4.7	AVG	158	1.4	RB 1 MHz;VB 300 Hz;Peak
20919.790	54.1	H	74.0	-19.9	PK	158	1.4	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:	NVG5XDBAX	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





EMC Test Data

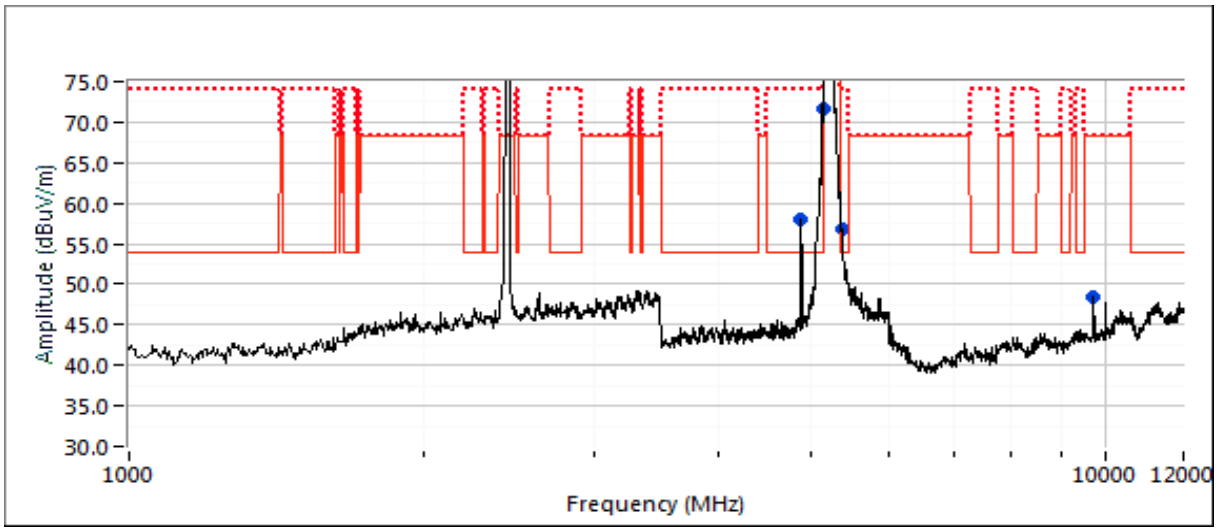
Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #1d: Center Channel

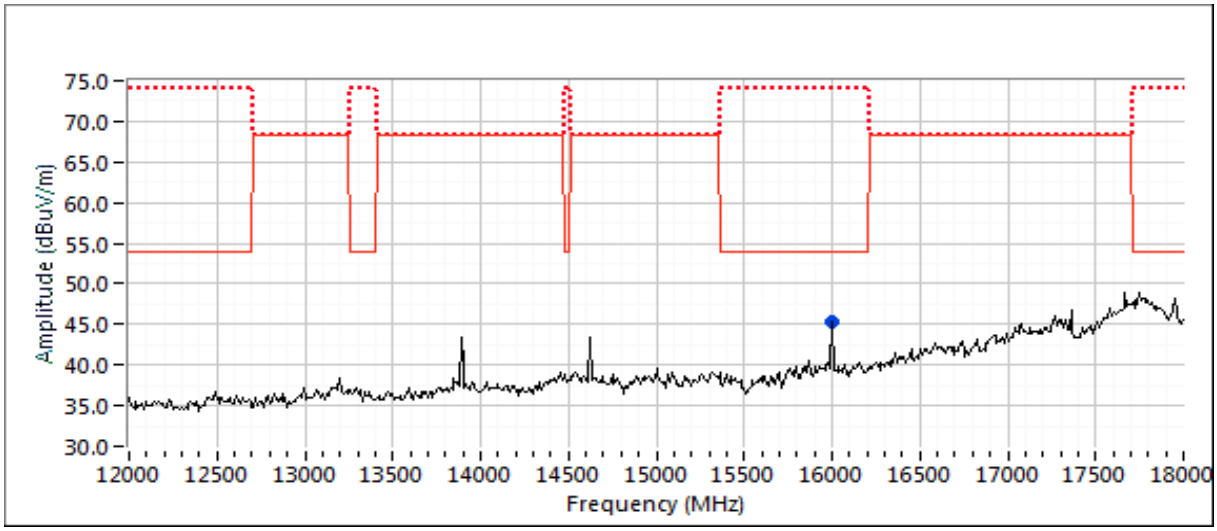
Channel: 6 & 42 Mode: b & ac80 Pwr Setting: 22.25 (q89) & 23 (q92)
Tx Chain: 1Tx & 4Tx Data Rate: 1 & 29.3 Mbps

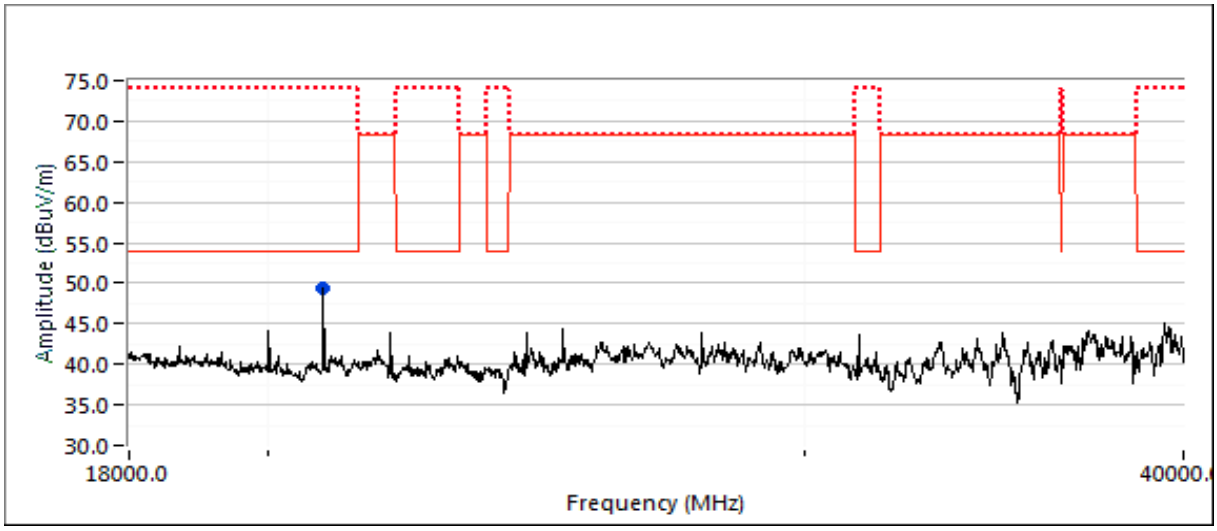
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
5350.080	53.8	V	54.0	-0.2	AVG	351	1.8	Note 3; RB 1 MHz;VB 1 kHz
5355.600	69.2	V	74.0	-4.8	PK	351	1.8	RB 1 MHz;VB 3 MHz
4874.060	53.6	V	54.0	-0.4	AVG	124	2.0	RB 1 MHz;VB 10 Hz
4873.840	60.5	V	74.0	-13.5	PK	124	2.0	RB 1 MHz;VB 3 MHz
5137.500	71.6	V	54.0	17.6	Peak	203	1.5	Refer to Bandedge test data
9710.000	54.7	H	68.3	-13.6	PK	272	1.5	RB 1 MHz;VB 3 MHz
16000.190	42.6	H	54.0	-11.4	AVG	262	1.5	RB 1 MHz;VB 10 Hz
16000.120	51.6	H	74.0	-22.4	PK	262	1.5	RB 1 MHz;VB 3 MHz
20839.920	49.7	H	54.0	-4.3	AVG	164	1.2	RB 1 MHz;VB 1 kHz;Peak
20839.880	54.4	H	74.0	-19.6	PK	164	1.2	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:	NVG5XDBAX	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





EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

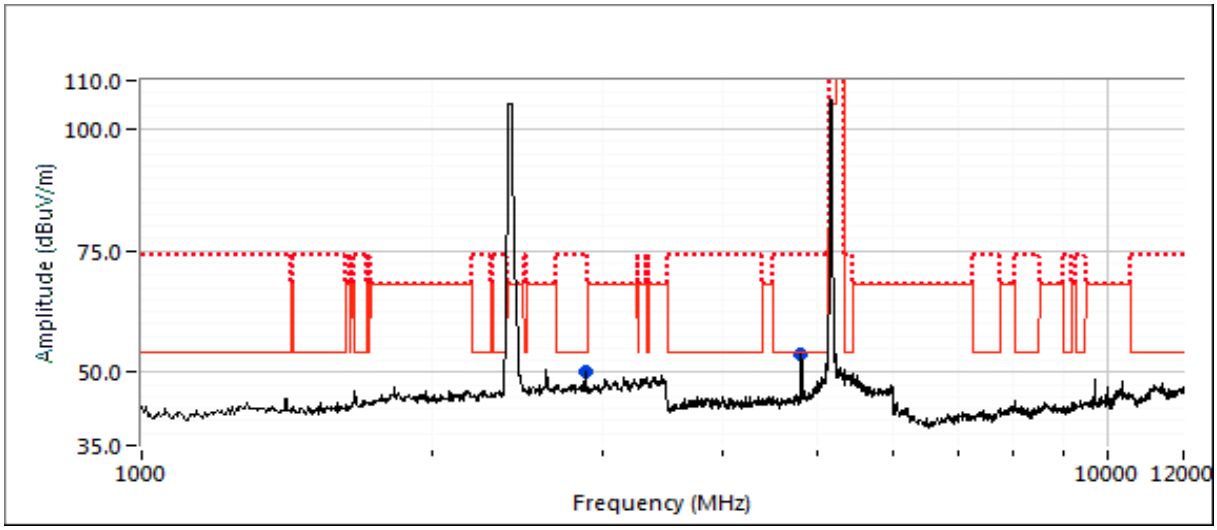
Date of Test: 07/16/19 — Config. Used: 1
Test Engineer: M. Birgani — Config Change: -
Test Location: Chamber #5 — EUT Voltage: 120V/ 60Hz

Run #2a: Low Channel

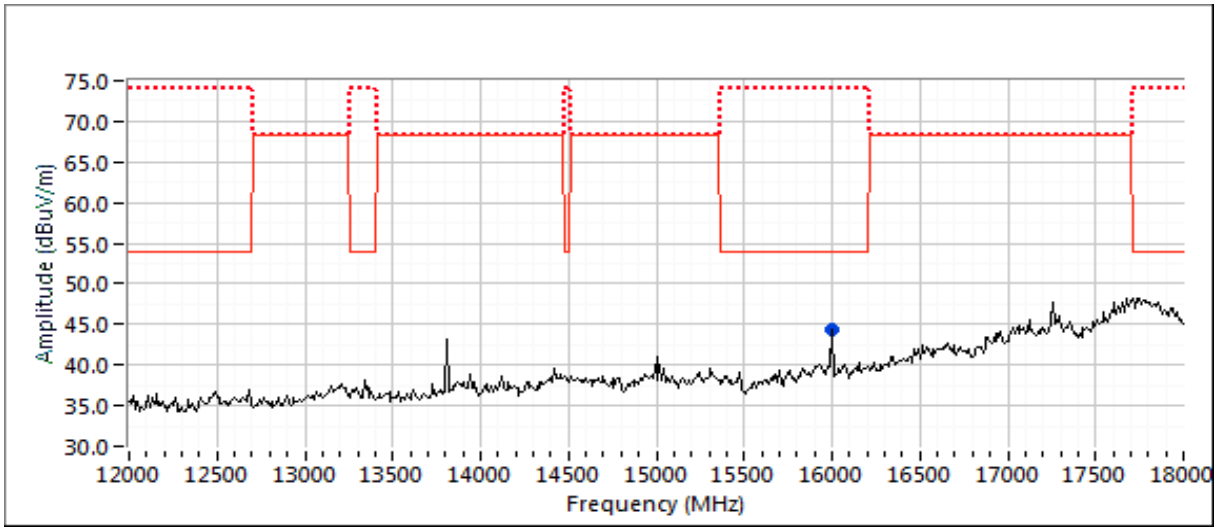
Channel: 1 & 36 — Mode: ac20 — Pwr Setting: 24 (q96) & 22 (q88)
Tx Chain: 4TX — Data Rate: 6.5 Mbps

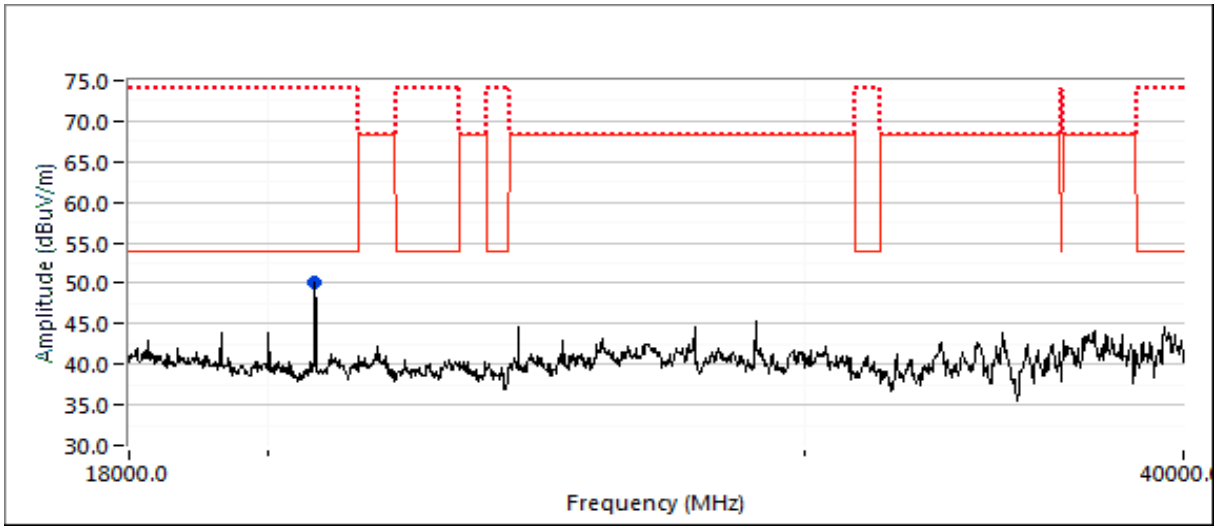
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
4813.810	53.2	V	54.0	-0.8	AVG	331	1.6	Note 3; RB 1 MHz;VB 300 Hz
4813.640	68.3	V	74.0	-5.7	PK	331	1.6	RB 1 MHz;VB 3 MHz
9709.620	54.9	H	68.3	-13.4	PK	275	1.5	RB 1 MHz;VB 3 MHz
2874.880	42.3	H	54.0	-11.7	AVG	206	1.0	RB 1 MHz;VB 10 Hz
2874.980	54.4	H	74.0	-19.6	PK	206	1.0	RB 1 MHz;VB 3 MHz
16000.230	44.7	H	54.0	-9.3	AVG	265	1.5	Note 3; RB 1 MHz;VB 300 Hz
16000.000	52.7	H	74.0	-21.3	PK	265	1.5	RB 1 MHz;VB 3 MHz
20719.890	50.0	H	54.0	-4.0	AVG	161	1.3	RB 1 MHz;VB 300 Hz;Peak
20720.030	54.2	H	74.0	-19.8	PK	161	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:	NVG5XDBAX	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





EMC Test Data

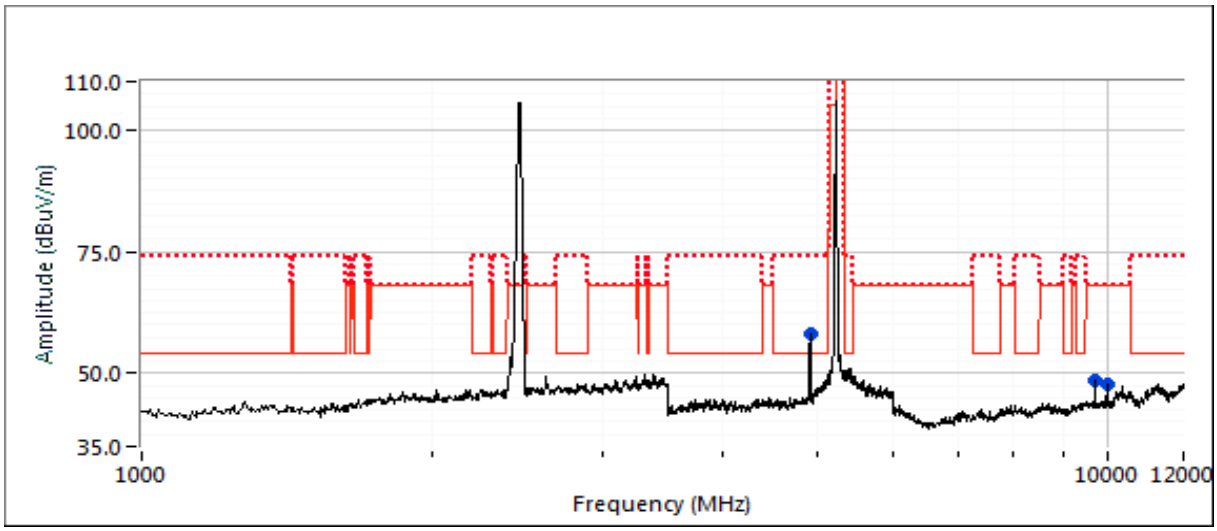
Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #2b: High Channel

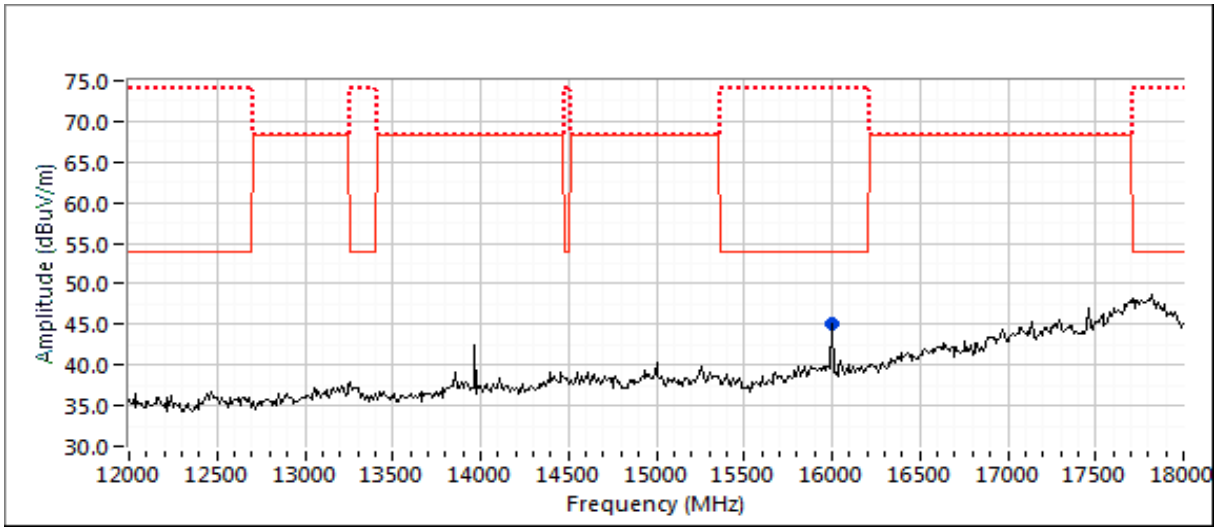
Channel: 11 & 48 Mode: ac20 Pwr Setting: 23 (q92) & 24 (q96)
Tx Chain: 4TX Data Rate: 6.5 Mbps

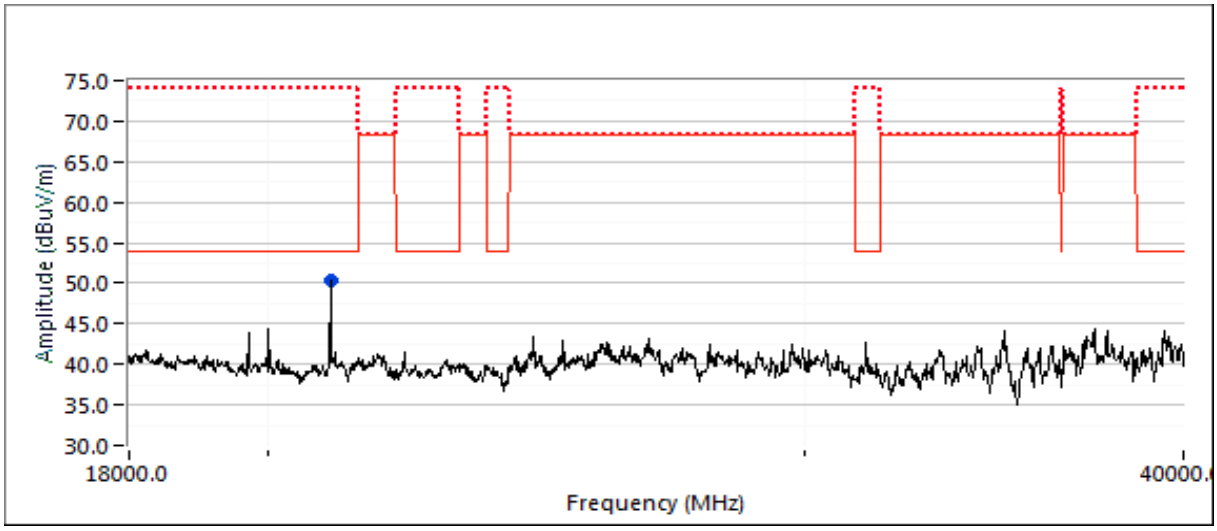
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
4924.010	53.4	V	54.0	-0.6	AVG	137	2.0	Note 3; RB 1 MHz;VB 300 Hz
4923.010	66.6	V	74.0	-7.4	PK	137	2.0	RB 1 MHz;VB 3 MHz
9710.000	54.9	H	68.3	-13.4	PK	286	1.5	RB 1 MHz;VB 3 MHz
10000.000	54.1	H	68.3	-14.2	PK	146	1.5	RB 1 MHz;VB 3 MHz
16000.230	44.8	H	54.0	-9.2	AVG	321	1.5	Note 3; RB 1 MHz;VB 300 Hz
16000.000	52.3	H	74.0	-21.7	PK	321	1.5	RB 1 MHz;VB 3 MHz
20959.920	50.2	H	54.0	-3.8	AVG	153	1.4	RB 1 MHz;VB 300 Hz;Peak
20959.960	54.4	H	74.0	-19.6	PK	153	1.4	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:	NVG5XDBAX	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





EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 5725-5850 MHz Band

Date of Test: 7/16 & 7/17/2019 Config. Used: 1
Test Engineer: M. Birgani / R. Varelas Config Change: -
Test Location: Chamber #5 EUT Voltage: 120V/ 60Hz

Run #3a: Center Channel

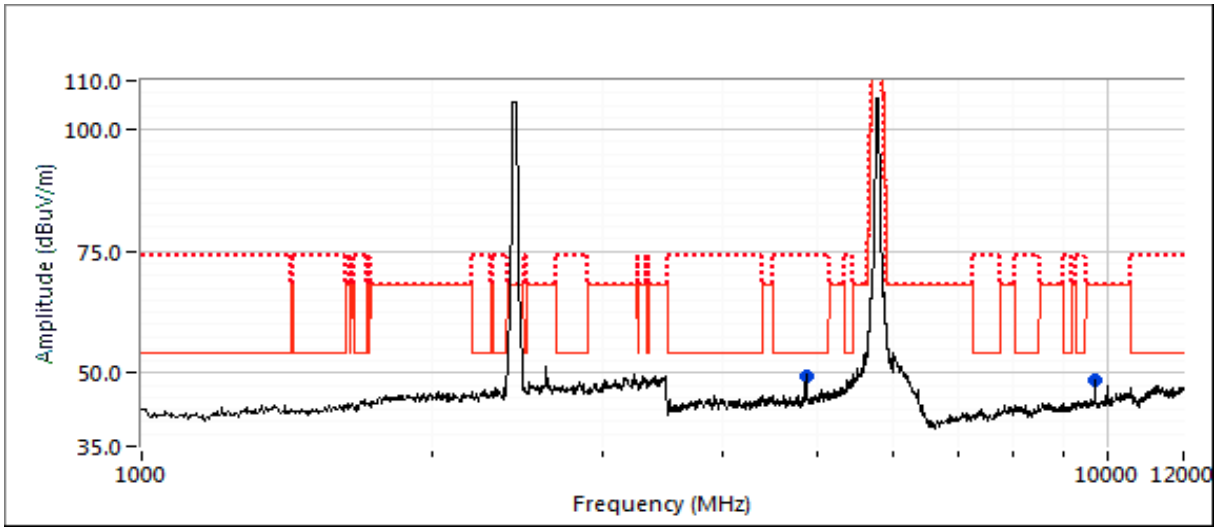
Channel: 6 & 157 Mode: g /a Pwr Setting: 26 (q104) & 26 (q104)
Tx Chain: 1TX Data Rate: 6.0 Mbps

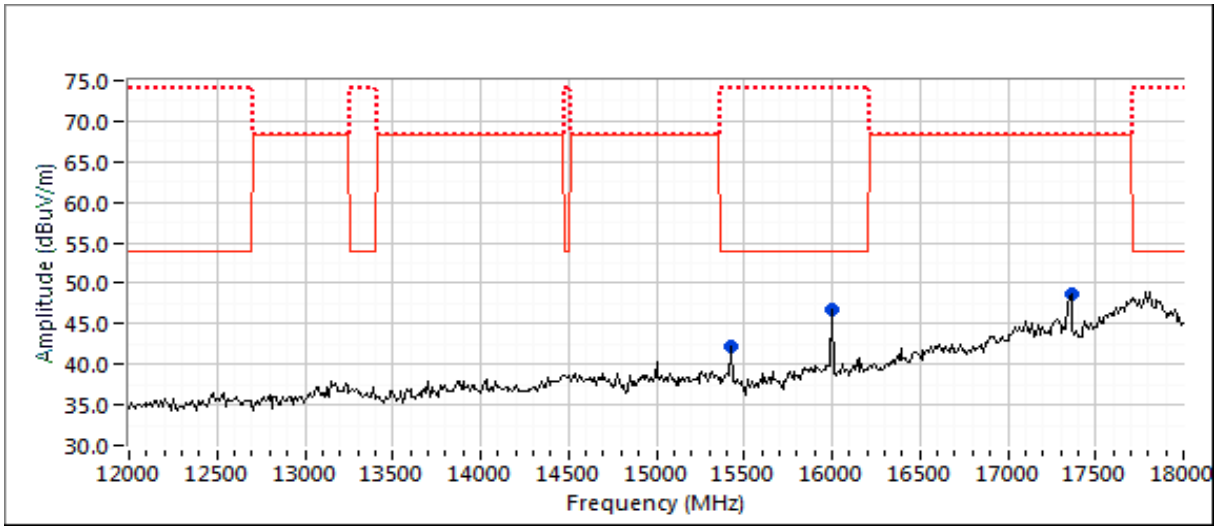
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
17350.330	65.2	H	68.3	-3.1	PK	157	1.0	RB 1 MHz;VB 3 MHz;Peak
4880.870	45.3	V	54.0	-8.7	AVG	325	2.0	RB 1 MHz;VB 10 Hz
4883.670	60.8	V	74.0	-13.2	PK	325	2.0	RB 1 MHz;VB 3 MHz
9710.000	54.7	H	68.3	-13.6	PK	294	1.5	RB 1 MHz;VB 3 MHz
15426.640	46.7	H	54.0	-7.3	AVG	149	1.0	RB 1 MHz;VB 10 Hz;Peak
15426.220	59.0	H	74.0	-15.0	PK	149	1.0	RB 1 MHz;VB 3 MHz;Peak
16000.240	47.8	H	54.0	-6.2	AVG	300	1.0	RB 1 MHz;VB 10 Hz;Peak
15999.690	59.4	H	74.0	-14.6	PK	300	1.0	RB 1 MHz;VB 3 MHz;Peak
19283.290	48.6	H	54.0	-5.4	AVG	138	1.5	RB 1 MHz;VB 300 Hz;Peak
19283.180	54.1	H	74.0	-19.9	PK	138	1.5	RB 1 MHz;VB 3 MHz;Peak
23138.790	59.4	V	68.3	-8.9	PK	123	1.6	RB 1 MHz;VB 3 MHz;Peak
28924.740	58.7	H	68.3	-9.6	PK	139	1.9	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).

EMC Test Data

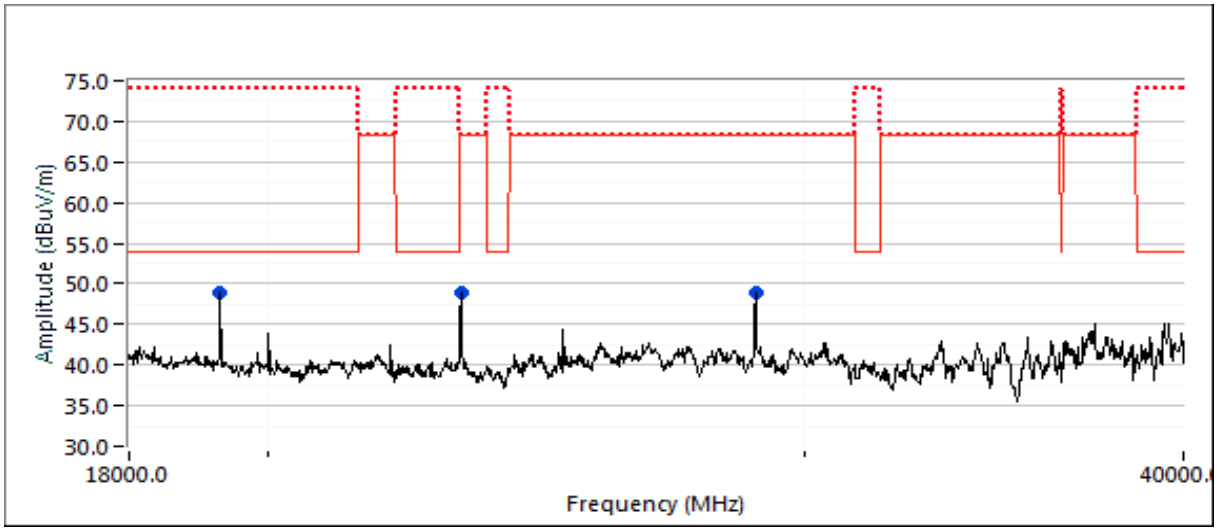
Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A





EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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



EMC Test Data

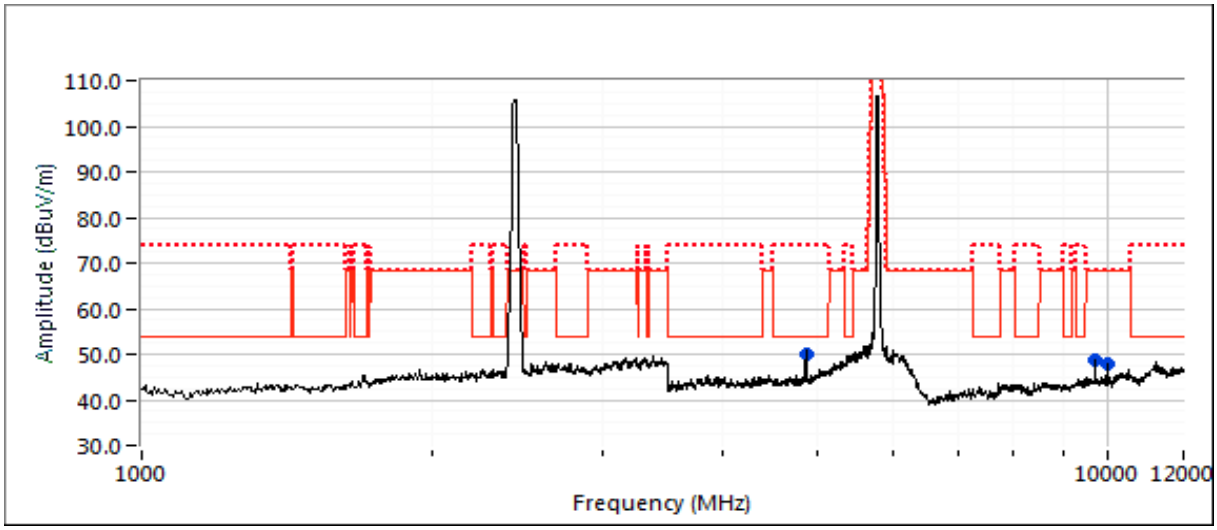
Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #3b: Center Channel

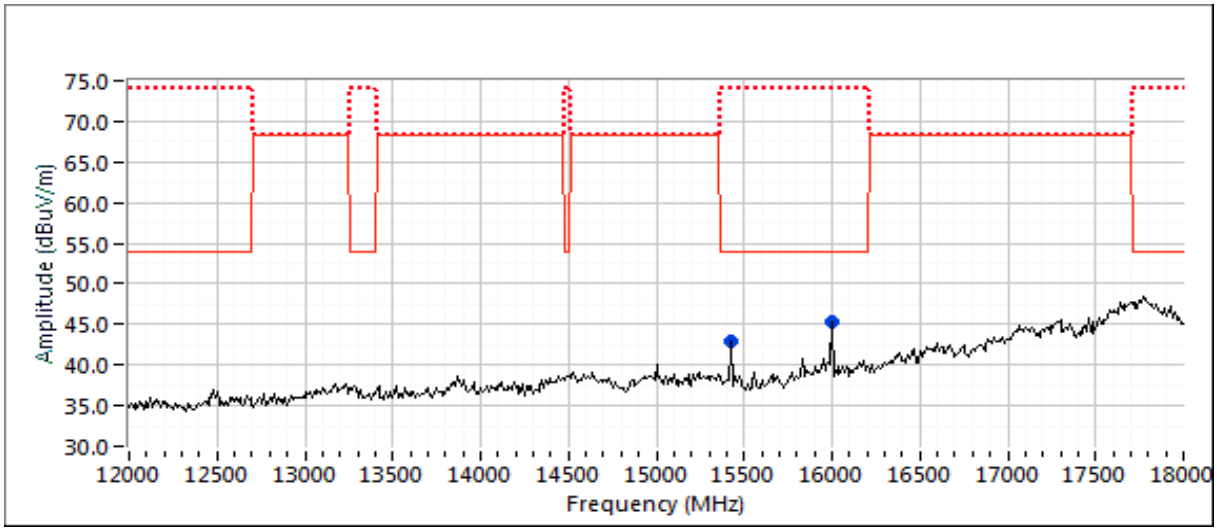
Channel: 6 & 157 Mode: ac20 Pwr Setting: 24 (q96) & 24 (q96)
Tx Chain: 4TX Data Rate: 6.5 Mbps

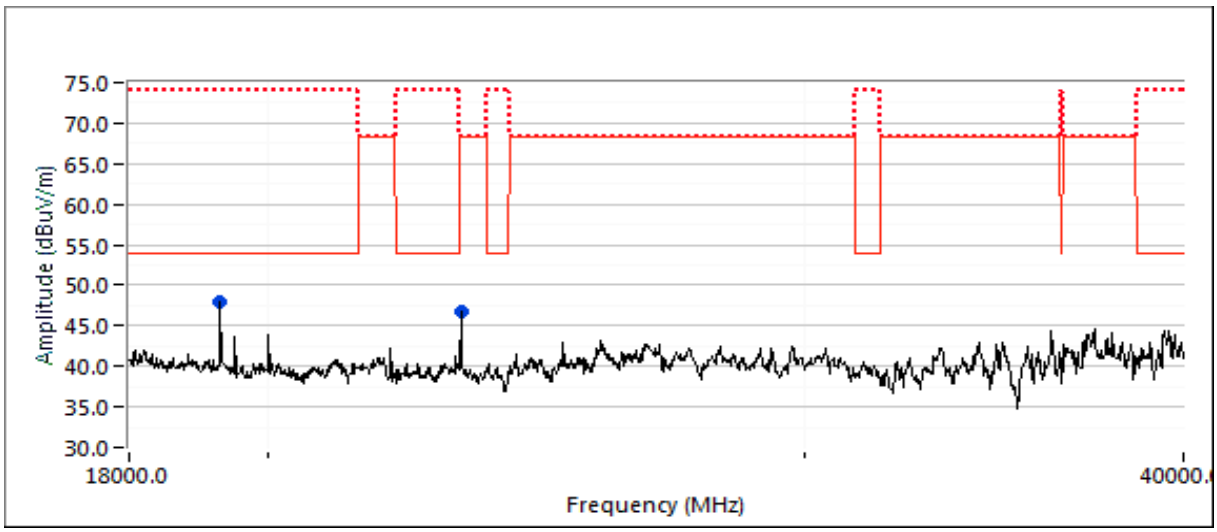
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
4878.730	50.7	V	54.0	-3.3	AVG	154	2.0	Note 3; RB 1 MHz;VB 300 Hz
4878.130	64.6	V	74.0	-9.4	PK	154	2.0	RB 1 MHz;VB 3 MHz;Peak
9710.000	55.1	H	68.3	-13.2	PK	274	2.0	RB 1 MHz;VB 3 MHz;Peak
10000.000	54.3	H	68.3	-14.0	PK	347	2.0	RB 1 MHz;VB 3 MHz;Peak
16000.130	47.8	H	54.0	-6.2	AVG	202	1.0	RB 1 MHz;VB 300 Hz;Peak
16000.180	59.2	H	74.0	-14.8	PK	202	1.0	RB 1 MHz;VB 3 MHz;Peak
15426.620	47.0	H	54.0	-7.0	AVG	147	1.0	RB 1 MHz;VB 300 Hz;Peak
15426.730	58.3	H	74.0	-15.7	PK	147	1.0	RB 1 MHz;VB 3 MHz;Peak
19283.310	46.0	H	54.0	-8.0	AVG	48	1.1	RB 1 MHz;VB 300 Hz;Peak
19283.440	52.6	H	74.0	-21.4	PK	48	1.1	RB 1 MHz;VB 3 MHz;Peak
23139.910	50.1	H	68.3	-18.2	PK	305	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:	NVG5XDBAX	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





EMC Test Data

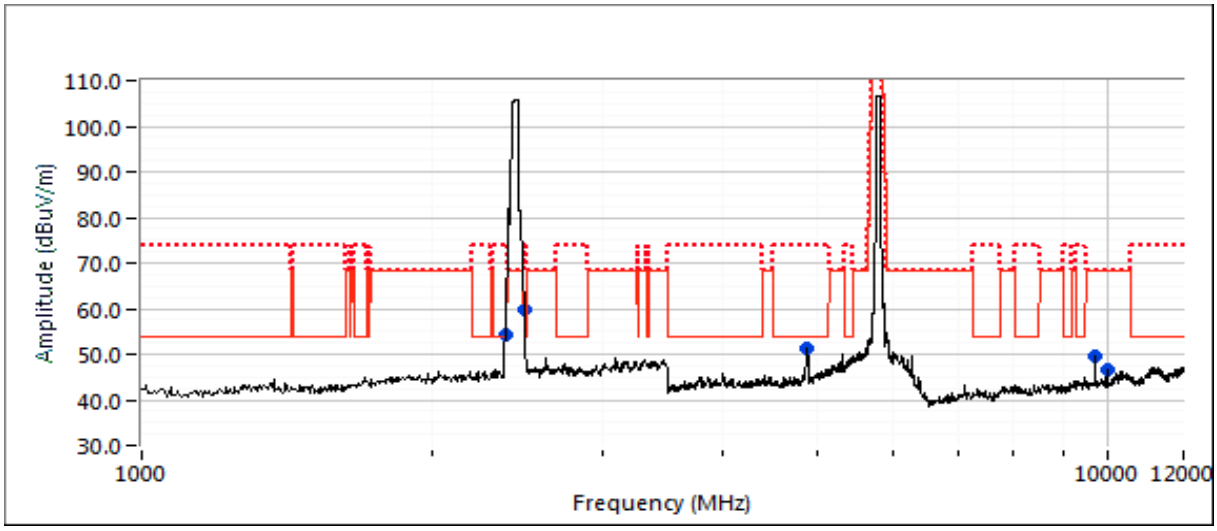
Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #3c: Center Channel

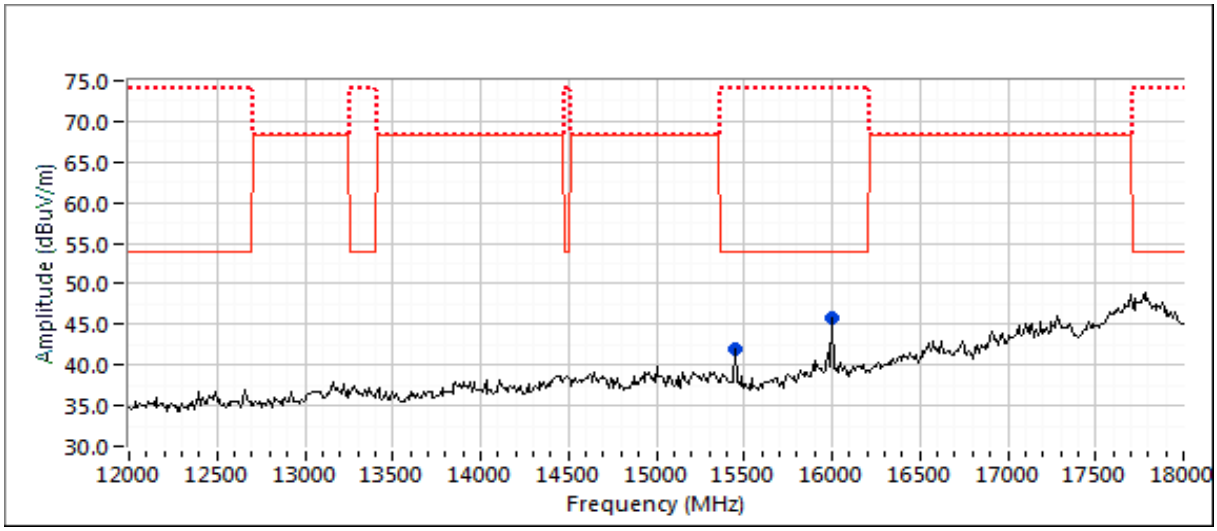
Channel: 6 & 159 Mode: ac40 Pwr Setting: 24 (q96) & 24 (q96)
Tx Chain: 4Tx Data Rate: 13.5 Mbps

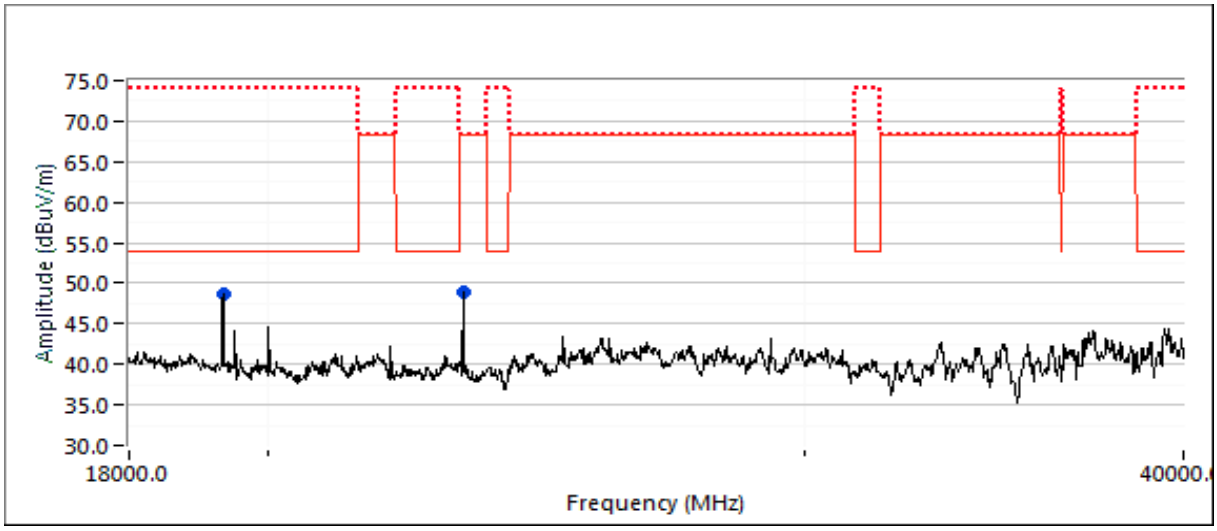
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
2483.610	50.6	H	54.0	-3.4	AVG	106	1.6	RB 1 MHz;VB 10 Hz;Peak AVG 100
2484.340	68.7	H	74.0	-5.3	PK	106	1.6	RB 1 MHz;VB 3 MHz;Peak
2389.990	48.9	H	54.0	-5.1	AVG	99	1.5	RB 1 MHz;VB 10 Hz;Peak AVG 100
2389.740	68.2	H	74.0	-5.8	PK	99	1.5	RB 1 MHz;VB 3 MHz;Peak
4890.020	49.2	V	54.0	-4.8	AVG	153	1.7	RB 1 MHz;VB 300 Hz;Peak
4890.330	63.8	V	74.0	-10.2	PK	153	1.7	RB 1 MHz;VB 3 MHz;Peak
9706.000	55.8	H	68.3	-12.5	PK	281	1.3	RB 1 MHz;VB 3 MHz;Peak
9999.880	54.5	H	68.3	-13.8	PK	127	1.0	RB 1 MHz;VB 3 MHz;Peak
16000.180	47.7	H	54.0	-6.3	AVG	321	1.0	RB 1 MHz;VB 300 Hz;Peak
16000.250	59.3	H	74.0	-14.7	PK	321	1.0	RB 1 MHz;VB 3 MHz;Peak
15453.270	46.8	H	54.0	-7.2	AVG	151	1.0	RB 1 MHz;VB 300 Hz;Peak
15452.980	58.5	H	74.0	-15.5	PK	151	1.0	RB 1 MHz;VB 3 MHz;Peak
19316.600	47.9	H	54.0	-6.1	AVG	138	1.4	RB 1 MHz;VB 300 Hz;Peak
19316.540	53.3	H	74.0	-20.7	PK	138	1.4	RB 1 MHz;VB 3 MHz;Peak
23179.660	52.7	H	68.3	-15.6	PK	156	2.0	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:	NVG5XDBAX	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





EMC Test Data

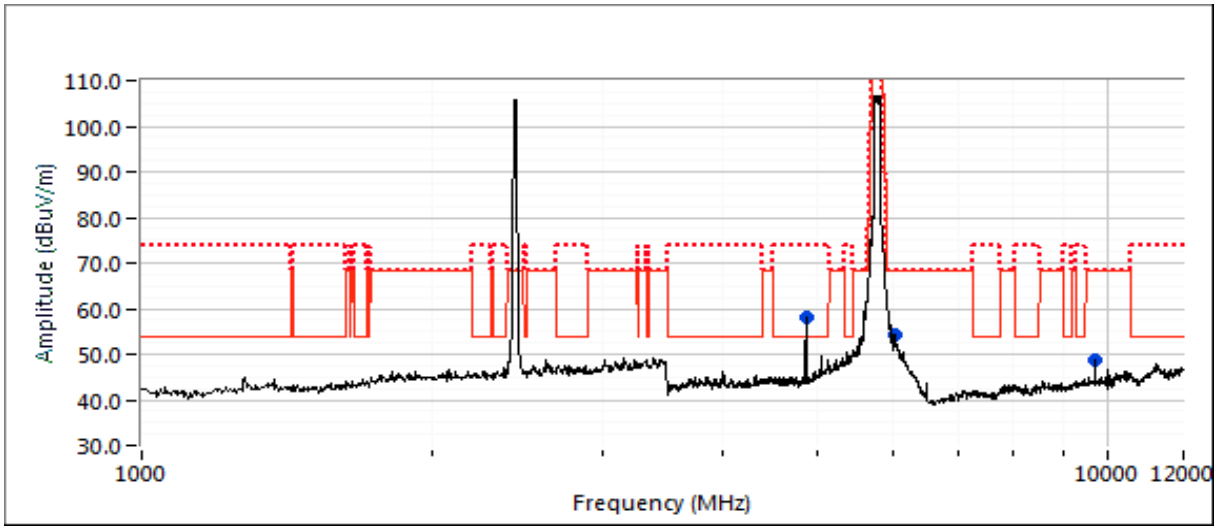
Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #3d: Center Channel

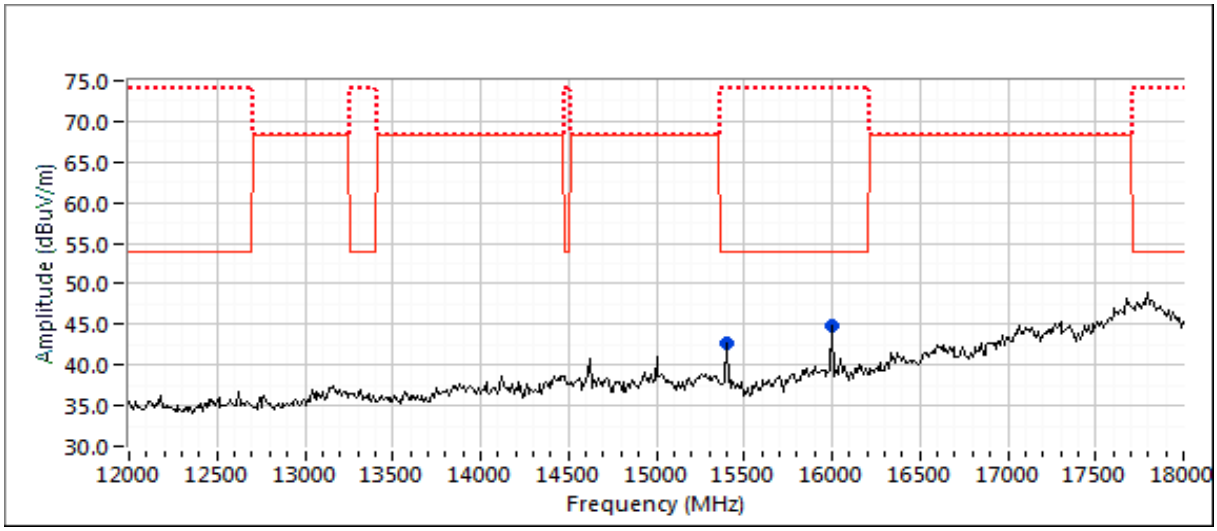
Channel: 6 & 155 Mode: b & ac80 Pwr Setting: 22 (q88) & 24 (q96)
Tx Chain: 1Tx & 4Tx Data Rate: 1 & 29.3 Mbps

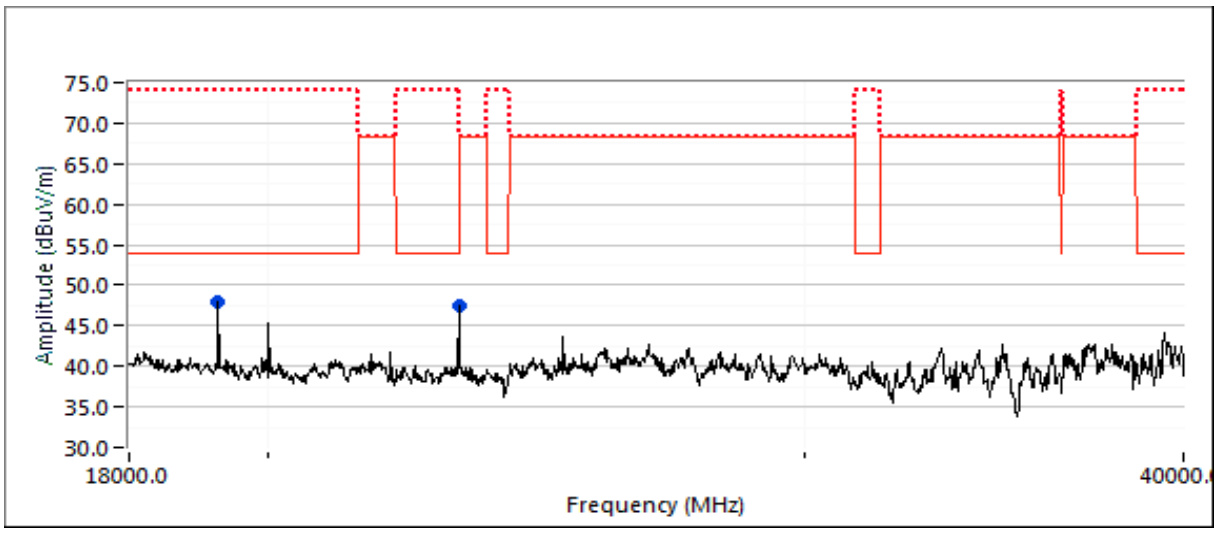
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
6003.640	68.2	V	68.3	-0.1	PK	24	1.7	RB 1 MHz;VB 3 MHz;Peak
9711.830	54.0	V	68.3	-14.3	PK	251	1.0	RB 1 MHz;VB 3 MHz;Peak
4874.010	53.9	V	54.0	-0.1	AVG	197	1.6	RB 1 MHz;VB 10 Hz;Peak
4873.870	60.3	V	74.0	-13.7	PK	197	1.6	RB 1 MHz;VB 3 MHz;Peak
15399.890	46.6	H	54.0	-7.4	AVG	324	1.4	RB 1 MHz;VB 1 kHz;Peak
15400.200	58.5	H	74.0	-15.5	PK	324	1.4	RB 1 MHz;VB 3 MHz;Peak
16000.230	48.0	H	54.0	-6.0	AVG	326	1.0	RB 1 MHz;VB 1 kHz;Peak
16000.030	59.3	H	74.0	-14.7	PK	326	1.0	RB 1 MHz;VB 3 MHz;Peak
19249.950	48.3	H	54.0	-5.7	AVG	134	1.6	RB 1 MHz;VB 1 kHz;Peak
19250.020	53.6	H	74.0	-20.4	PK	134	1.6	RB 1 MHz;VB 3 MHz;Peak
23099.930	52.6	H	74.0	-21.4	PK	134	1.8	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:	NVG5XDBAX	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





EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 #7

Date of Test: 07/17/19 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: -
Test Location: Chamber #5 EUT Voltage: 120V/60Hz

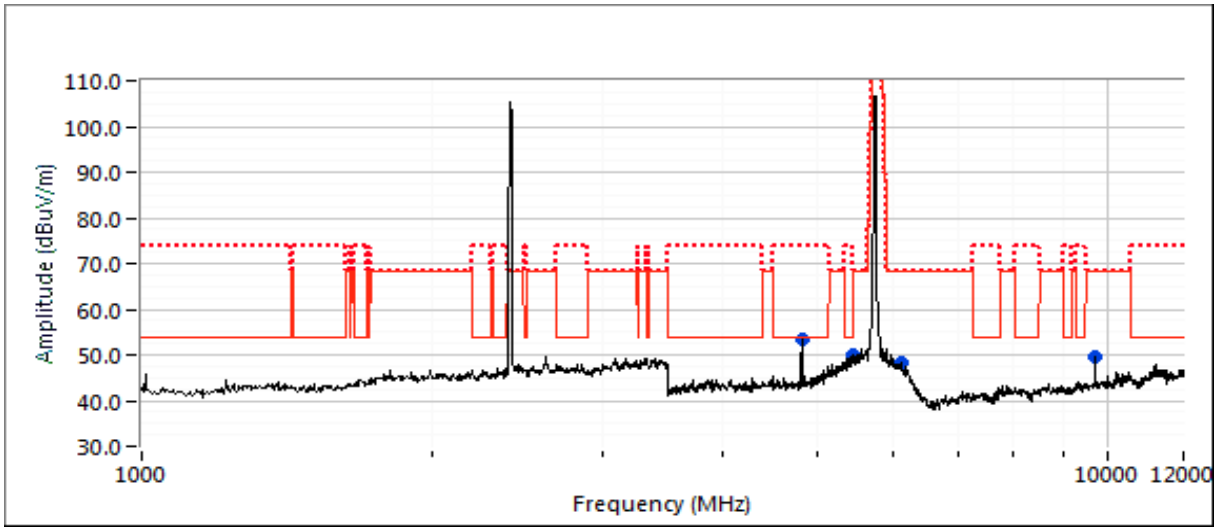
Run #4a: Low Channel

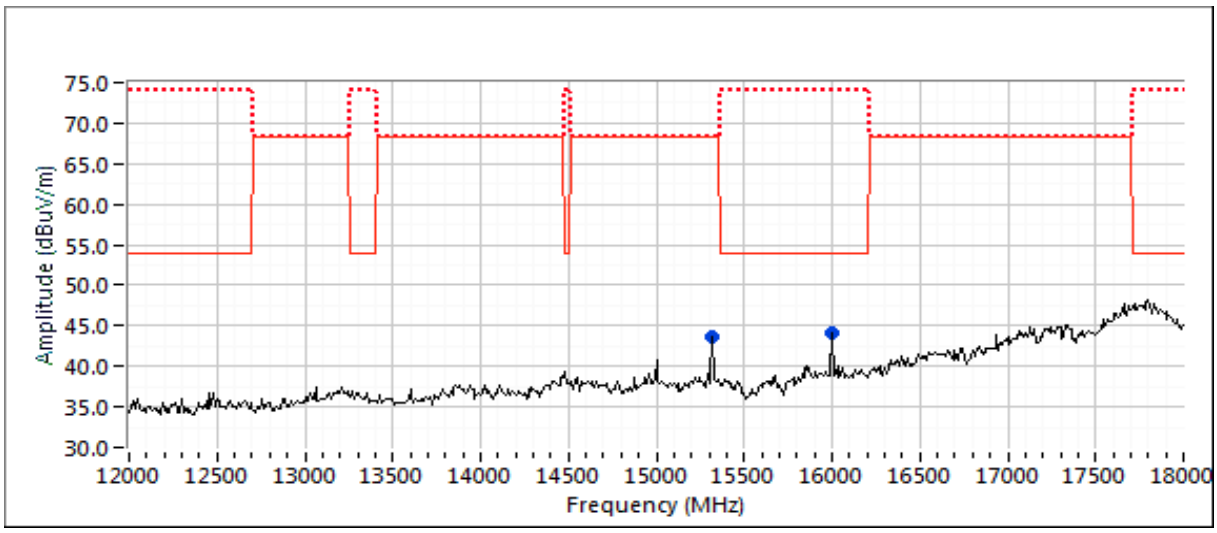
Channel: 1 & 149 Mode: b & ac20 Pwr Setting: 18.25 (q73) & 24 (q96)
Tx Chain: 1Tx & 4Tx Data Rate: 1 & 6.5 Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
4824.100	53.5	V	54.0	-0.5	AVG	162	1.7	RB 1 MHz;VB 10 Hz;Peak
4824.190	59.9	V	74.0	-14.1	PK	162	1.7	RB 1 MHz;VB 3 MHz;Peak
5445.730	50.1	V	54.0	-3.9	AVG	17	1.6	RB 1 MHz;VB 300 Hz;Peak
5446.030	62.6	V	74.0	-11.4	PK	17	1.6	RB 1 MHz;VB 3 MHz;Peak
6003.520	58.6	H	68.3	-9.7	PK	80	1.0	RB 1 MHz;VB 3 MHz;Peak
9709.890	55.0	H	68.3	-13.3	PK	273	1.5	RB 1 MHz;VB 3 MHz;Peak
15320.300	58.3	H	68.3	-10.0	PK	138	1.0	RB 1 MHz;VB 3 MHz;Peak
16000.110	47.6	H	54.0	-6.4	AVG	300	1.0	RB 1 MHz;VB 300 Hz;Peak
16000.290	58.8	H	74.0	-15.2	PK	300	1.0	RB 1 MHz;VB 3 MHz;Peak
19149.890	46.2	H	54.0	-7.8	AVG	46	1.2	RB 1 MHz;VB 300 Hz;Peak
19149.940	52.7	H	74.0	-21.3	PK	46	1.2	RB 1 MHz;VB 3 MHz;Peak
22979.730	52.5	H	74.0	-21.5	PK	118	1.4	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).

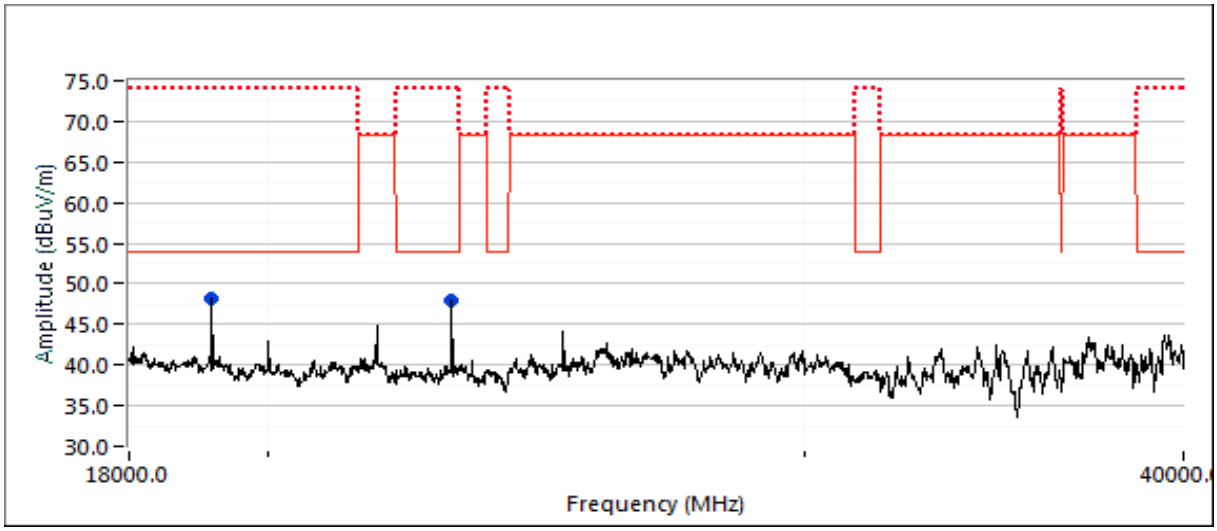
Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A





EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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



EMC Test Data

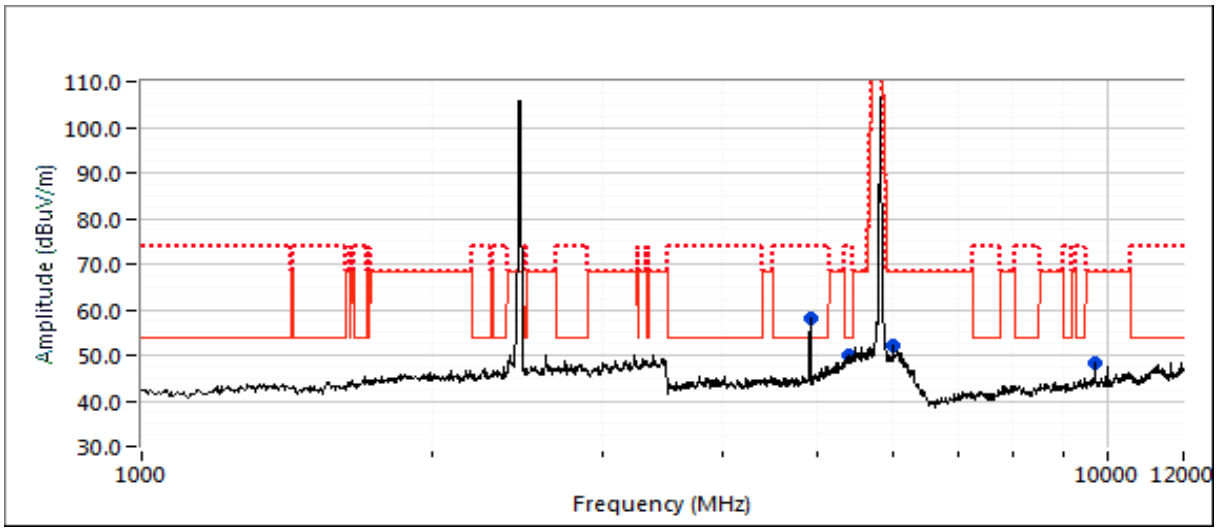
Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #4b: High Channel

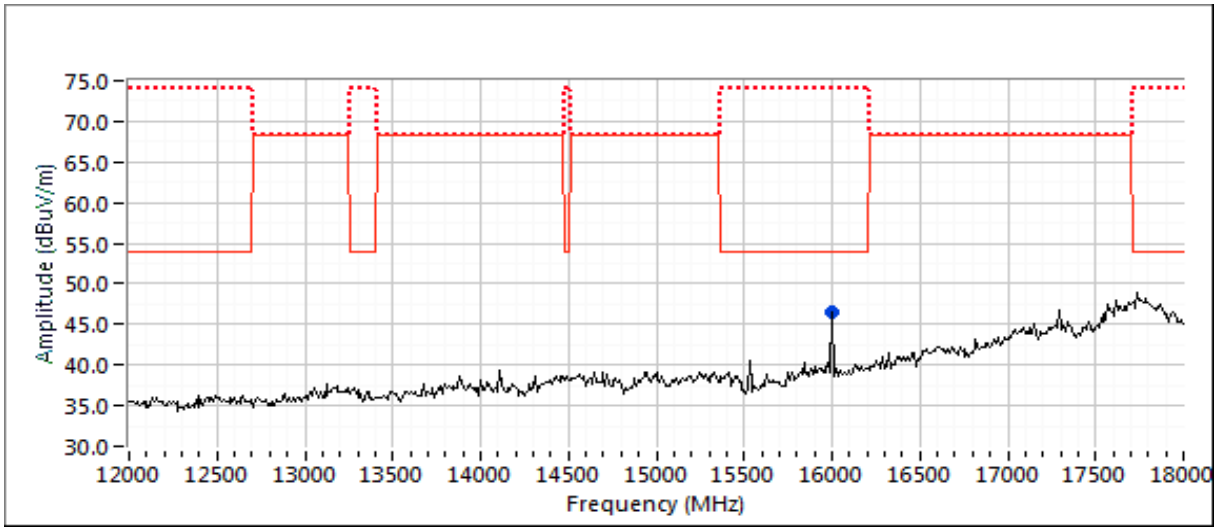
Channel: 11 & 165 Mode: b & ac20 Pwr Setting: 16.25 (q65) & 24 (q96)
Tx Chain: 1Tx & 4Tx Data Rate: 1 & 6.5 Mbps

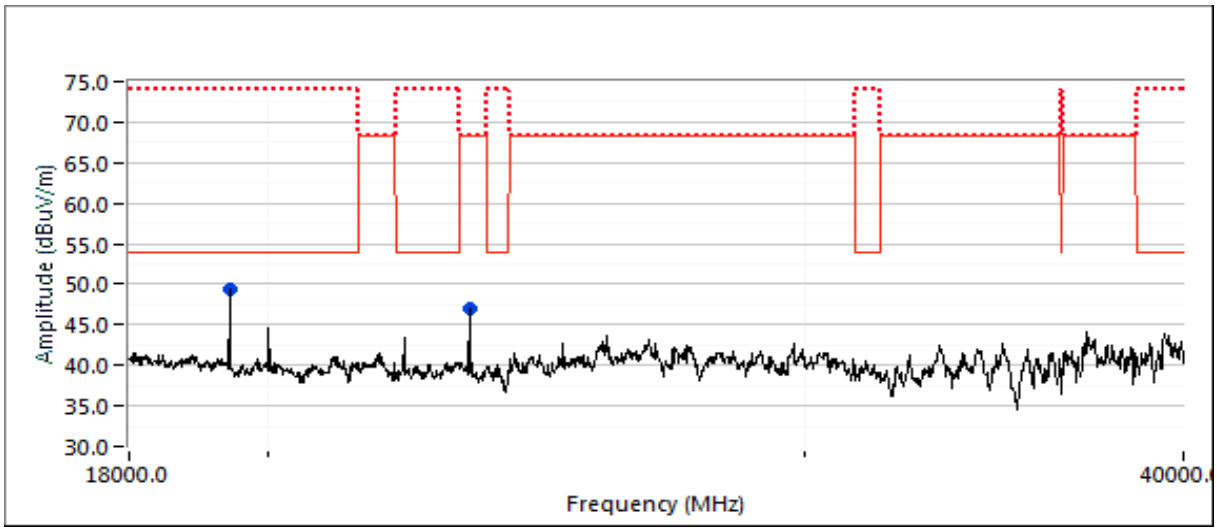
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
4924.040	53.4	V	54.0	-0.6	AVG	128	1.4	RB 1 MHz;VB 10 Hz;Peak
4923.980	59.9	V	74.0	-14.1	PK	128	1.4	RB 1 MHz;VB 3 MHz;Peak
6002.180	60.4	H	68.3	-7.9	PK	81	1.0	RB 1 MHz;VB 3 MHz;Peak
9712.680	53.6	H	68.3	-14.7	PK	333	1.0	RB 1 MHz;VB 3 MHz;Peak
5392.400	49.1	V	54.0	-4.9	AVG	17	2.1	RB 1 MHz;VB 300 Hz;Peak
5394.400	61.9	V	74.0	-12.1	PK	17	2.1	RB 1 MHz;VB 3 MHz;Peak
16000.300	48.3	H	54.0	-5.7	AVG	266	1.0	RB 1 MHz;VB 300 Hz;Peak
15999.910	59.1	H	74.0	-14.9	PK	266	1.0	RB 1 MHz;VB 3 MHz;Peak
19416.520	48.3	H	54.0	-5.7	AVG	130	1.4	RB 1 MHz;VB 300 Hz;Peak
19416.730	53.0	H	74.0	-21.0	PK	130	1.4	RB 1 MHz;VB 3 MHz;Peak
23300.170	52.1	H	68.3	-16.2	PK	156	1.9	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:	NVG5XDBAX	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





EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

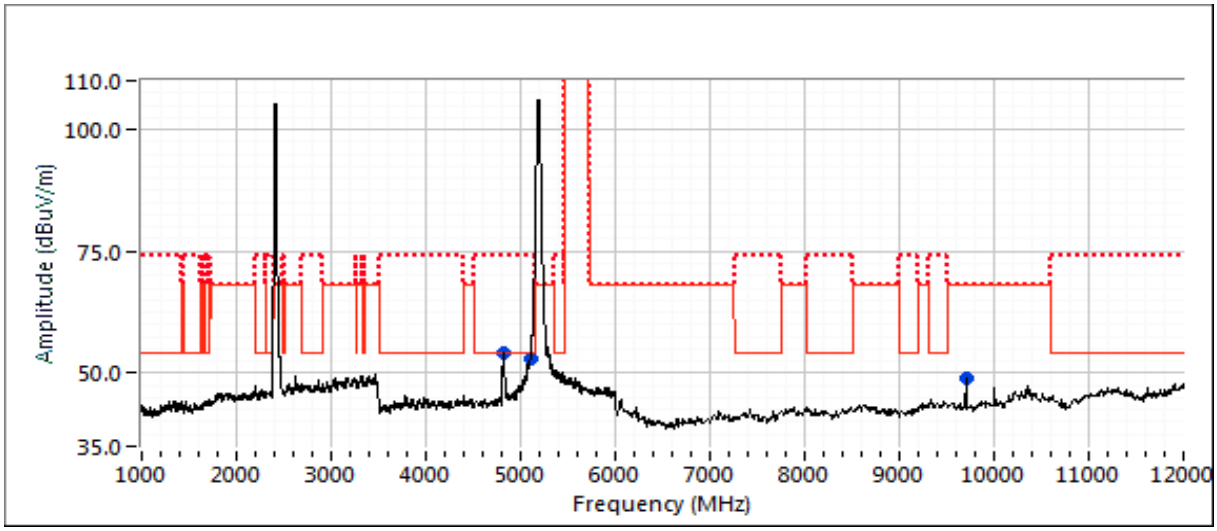
Run #5: Radiated Spurious Emissions, 1,000 - 40,000 MHz

Date of Test: 07/22/19 — Config. Used: 1
Test Engineer: M. Birgani / R. Varelas — Config Change: -
Test Location: Chamber #5 — EUT Voltage: 120V/ 60Hz

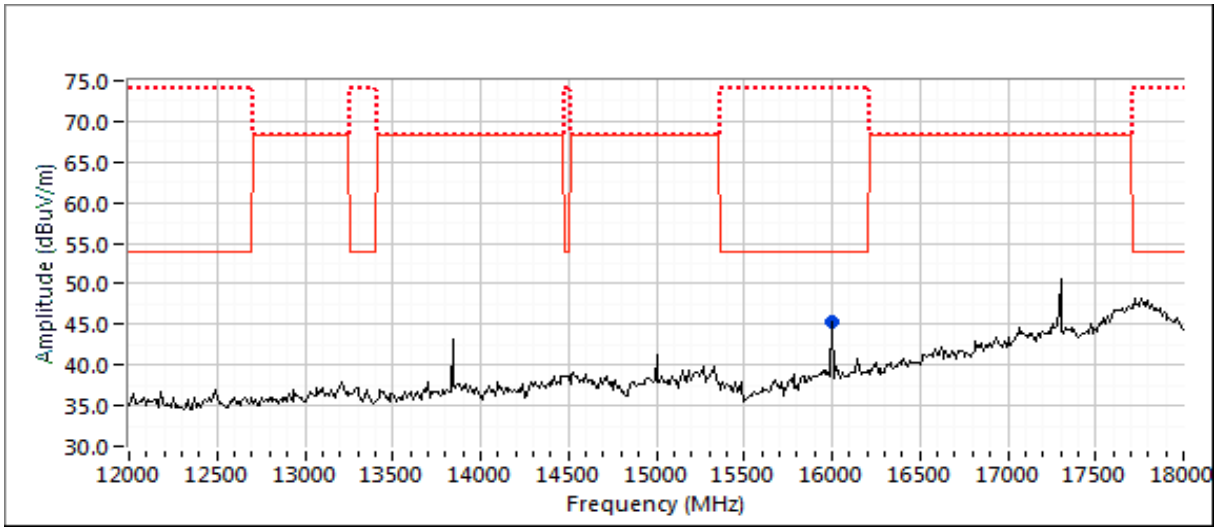
Run #5a: Low Channel

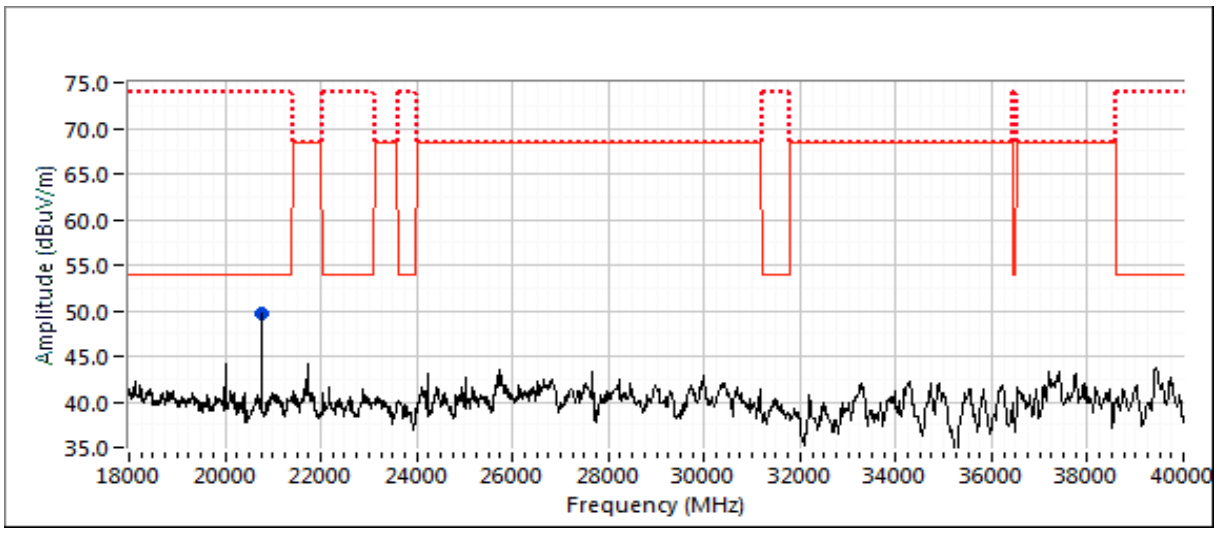
Channel: 1 & 38 — Mode: g & ac40 — Pwr Setting: 26 (q104) & 24 (q96)
Tx Chain: 1Tx & 4Tx — Data Rate: 6 & 13.5 Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
4815.520	52.7	V	54.0	-1.3	AVG	143	1.7	RB 1 MHz;VB 10 Hz
20759.890	49.7	H	54.0	-4.3	AVG	156	1.3	Note 3; RB 1 MHz;VB 300 Hz
4817.890	66.7	V	74.0	-7.3	PK	143	1.7	RB 1 MHz;VB 3 MHz
9705.760	55.1	H	68.3	-13.2	PK	286	1.4	RB 1 MHz;VB 3 MHz
16000.160	39.1	H	54.0	-14.9	AVG	258	1.4	RB 1 MHz;VB 10 Hz
20759.800	54.3	H	74.0	-19.7	PK	156	1.3	RB 1 MHz;VB 3 MHz
16000.300	49.0	H	74.0	-25.0	PK	258	1.4	RB 1 MHz;VB 3 MHz
5104.170	53.0	V	54.0	-1.0	Peak	198	1.6	Refer to BE test data



Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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





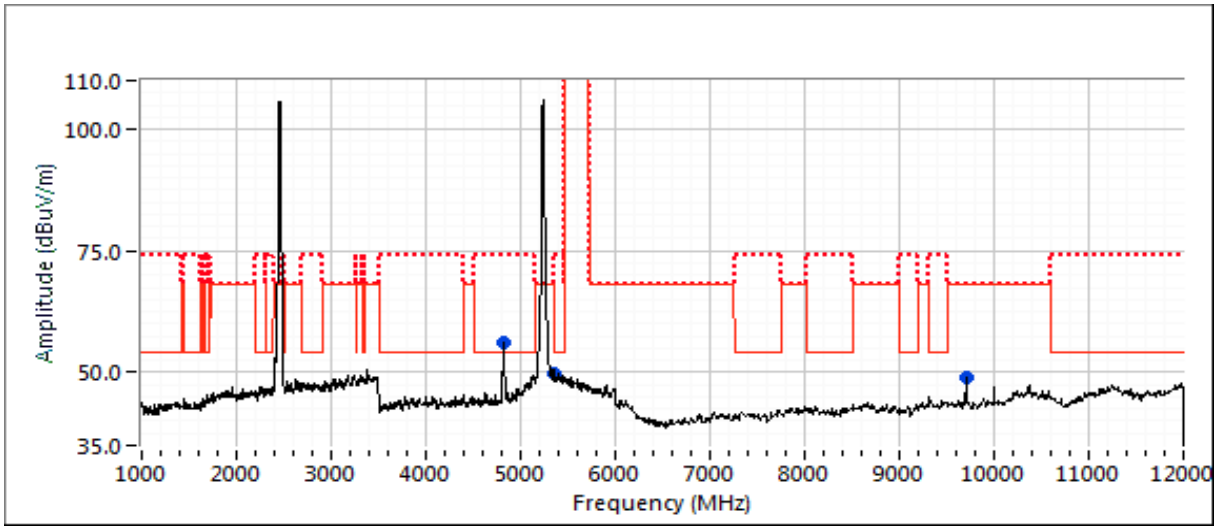
EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

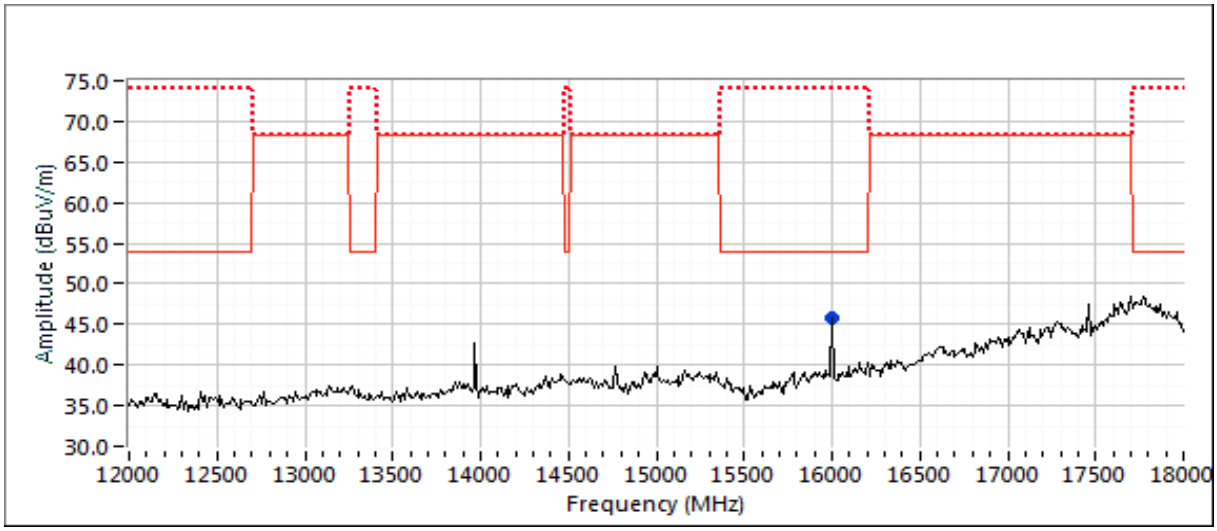
Run #5b: High Channel

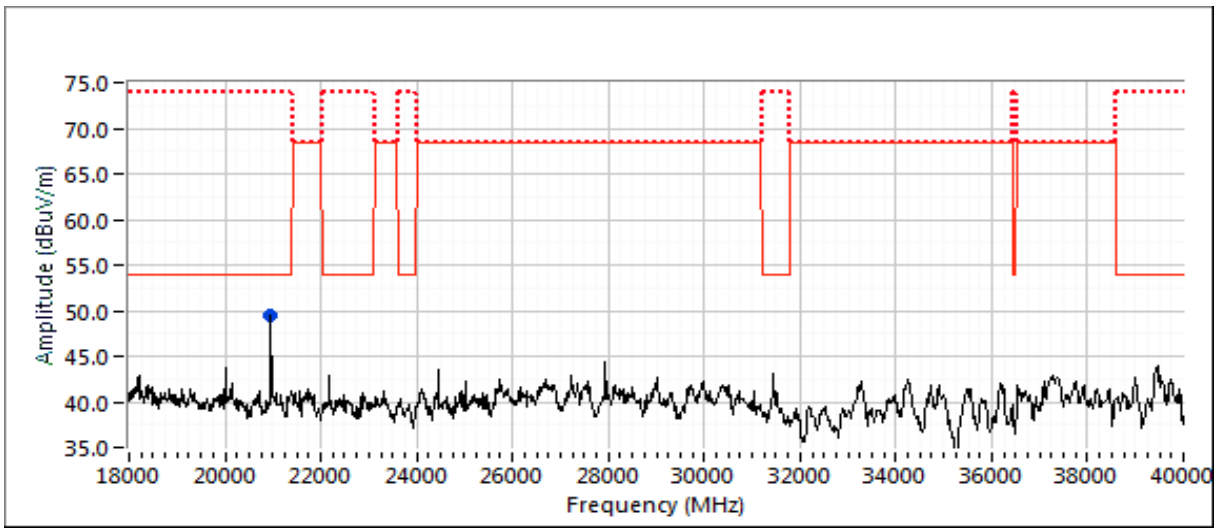
Channel: 11 & 48 Mode: g & a Pwr Setting: 26 (q104) & 25 (q100)
Tx Chain: 1Tx Data Rate: 6.0 Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
4924.010	53.8	V	54.0	-0.2	AVG	320	1.6	RB 1 MHz;VB 10 Hz;Peak
5353.650	51.2	V	54.0	-2.8	AVG	77	1.5	RB 1 MHz;VB 10 Hz;Peak
4925.070	66.9	V	74.0	-7.1	PK	320	1.6	RB 1 MHz;VB 3 MHz;Peak
20959.930	46.9	H	54.0	-7.1	AVG	41	1.3	RB 1 MHz;VB 10 Hz
16000.240	43.6	V	54.0	-10.4	AVG	272	1.6	RB 1 MHz;VB 10 Hz
5358.280	63.2	V	74.0	-10.8	PK	77	1.5	RB 1 MHz;VB 3 MHz;Peak
9705.620	55.2	H	68.3	-13.1	PK	273	1.4	RB 1 MHz;VB 3 MHz;Peak
20959.930	52.8	H	74.0	-21.2	PK	41	1.3	RB 1 MHz;VB 3 MHz
16000.350	51.4	V	74.0	-22.6	PK	272	1.6	RB 1 MHz;VB 3 MHz



Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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





EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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: 9/25-27/2019
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.

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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.							
1	ac20	6 & 40	24 / 23	24 / 23	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.4 dBµV/m @ 5138.1 MHz (-0.6 dB)
	ac40	6 & 46	24 / 24	24 / 18	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.8 dBµV/m @ 5129.3 MHz (-0.2 dB)
	ac80	6 & 42	24 / 24	24 / 22	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.6 dBµV/m @ 5350.5 MHz (-0.4 dB)
Measurements on low and high channels in worst-case OFDM mode.							
2	ac40	3 & 46	24 / 22	24 / 22	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.7 dBµV/m @ 20719.9 MHz (-1.3 dB)
	ac20	9 & 48	24 / 24	23 / 24	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.2 dBµV/m @ 20959.9 MHz (-1.8 dB)
Scans on "center" channel in all four OFDM modes to determine the worst case mode.							
3	ac20	6 & 157	24 / 24	24 / 24	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	50.9 dBµV/m @ 19283.2 MHz (-3.1 dB)
	ac40	6 & 159	24 / 24	24 / 24	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	50.9 dBµV/m @ 19316.6 MHz (-3.1 dB)
	ac80	6 & 155	24 / 24	22 / 24	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	50.3 dBµV/m @ 19249.8 MHz (-3.7 dB)
Measurements on low and high channels in worst-case OFDM mode.							
4	ac20	1 & 149	24 / 24	24 / 24	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	48.3 dBµV/m @ 19150.0 MHz (-5.7 dB)
	ac20	11 & 165	24 / 24	22 / 24	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	51.1 dBµV/m @ 19416.6 MHz (-2.9 dB)

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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).

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 5150-5250 MHz Band

Run #1a: Center Channel

Channel: 6 & 40 Mode: ac20 Pwr Setting: 24 (q96) & 23 (q92)
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	
5138.100	53.4	V	54.0	-0.6	AVG	198	1.4	AVG; RB 1 MHz; VB: 300 Hz
5358.920	49.7	V	54.0	-4.3	AVG	185	1.8	AVG; RB 1 MHz; VB: 300 Hz
20799.830	49.1	H	54.0	-4.9	AVG	160	1.1	RB 1 MHz;VB 300 Hz
5143.930	69.1	V	74.0	-4.9	PK	198	1.4	POS; RB 1 MHz; VB: 3 MHz
16000.130	45.5	H	54.0	-8.5	AVG	261	1.6	RB 1 MHz;VB 300 Hz;Peak
5358.820	62.6	V	74.0	-11.4	PK	185	1.8	POS; RB 1 MHz; VB: 3 MHz
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
20800.020	55.2	H	74.0	-18.8	PK	160	1.1	RB 1 MHz;VB 3 MHz

Run #1b: Center Channel

Channel: 6 & 46 Mode: ac40 Pwr Setting: 24 (q96) & 18 (q72)
Tx Chain: 4Tx Data Rate: 6.5, 13.5 Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5129.300	53.8	V	54.0	-0.2	AVG	190	2.0	AVG; RB 1 MHz; VB: 300 Hz
5353.400	50.5	V	54.0	-3.5	AVG	190	2.0	AVG; RB 1 MHz; VB: 300 Hz
20919.920	48.6	H	54.0	-5.4	AVG	51	1.1	RB 1 MHz;VB 300 Hz
5126.990	67.5	V	74.0	-6.5	PK	190	2.0	POS; RB 1 MHz; VB: 3 MHz
16000.130	45.5	H	54.0	-8.5	AVG	261	1.6	RB 1 MHz;VB 300 Hz;Peak
5353.770	63.4	V	74.0	-10.6	PK	190	2.0	POS; RB 1 MHz; VB: 3 MHz
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
20919.910	54.9	H	74.0	-19.1	PK	51	1.1	RB 1 MHz;VB 3 MHz

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 & 42 Mode: b & ac80 Pwr Setting: 22.25 (q89) & 22 (q88)
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	
5350.470	53.6	V	54.0	-0.4	AVG	186	1.7	AVG; RB 1 MHz; VB: 1 kHz
20839.850	51.9	H	54.0	-2.1	AVG	161	1.4	RB 1 MHz;VB 1 kHz
5351.540	69.5	V	74.0	-4.5	PK	186	1.7	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
9706.480	54.5	H	68.3	-13.8	PK	268	1.5	RB 1 MHz;VB 3 MHz;Peak
20839.810	55.9	H	74.0	-18.1	PK	161	1.4	RB 1 MHz;VB 3 MHz
16000.330	55.7	H	74.0	-18.3	PK	261	1.6	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).

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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: 3 & 46 Mode: ac40 Pwr Setting: 24 (q96) & 22 (q88)
Tx Chain: 4TX Data Rate: 13.5 Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
20719.920	52.7	H	54.0	-1.3	AVG	160	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
20719.850	57.6	H	74.0	-16.4	PK	160	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: 9 & 48 Mode: ac20 Pwr Setting: 23 (q92) & 24 (q96)
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	
20959.880	52.2	H	54.0	-1.8	AVG	159	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
10000.220	54.0	H	68.3	-14.3	PK	145	1.6	RB 1 MHz;VB 3 MHz;Peak
20960.020	58.2	H	74.0	-15.8	PK	159	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

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 5725-5850 MHz Band

Run #3a: Center Channel

Channel: 6 & 157 Mode: ac20 Pwr Setting: 24 (q96) & 24 (q96)
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	
19283.240	50.9	H	54.0	-3.1	AVG	138	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
15426.630	45.3	H	54.0	-8.7	AVG	129	1.6	RB 1 MHz;VB 300 Hz;Peak
23139.710	55.1	H	68.3	-13.2	PK	136	1.3	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
19283.240	56.7	H	74.0	-17.3	PK	138	1.4	RB 1 MHz;VB 3 MHz;Peak
15426.440	55.8	H	74.0	-18.2	PK	129	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

Run #3b: Center Channel

Channel: 6 & 159 Mode: ac40 Pwr Setting: 24 (q96) & 24 (q96)
Tx Chain: 4Tx Data Rate: 13.5 Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/AVG	degrees	meters	
19316.610	50.9	H	54.0	-3.1	AVG	136	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
15453.250	44.8	H	54.0	-9.2	AVG	129	1.6	RB 1 MHz;VB 300 Hz;Peak
23179.970	56.4	H	68.3	-11.9	PK	104	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
10000.220	54.0	H	68.3	-14.3	PK	145	1.6	RB 1 MHz;VB 3 MHz;Peak
19316.530	56.3	H	74.0	-17.7	PK	136	1.4	RB 1 MHz;VB 3 MHz;Peak
15453.390	55.9	H	74.0	-18.1	PK	129	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

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 & 155 Mode: b & ac80 Pwr Setting: 22 (q88) & 24 (q96)
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	
19249.810	50.3	H	54.0	-3.7	AVG	136	1.6	RB 1 MHz;VB 1 kHz;Peak
6000.880	64.0	V	68.3	-4.3	PK	360	2.1	POS; RB 1 MHz; VB: 3 MHz
23099.850	49.0	H	54.0	-5.0	AVG	126	1.6	RB 1 MHz;VB 1 kHz;Peak
15399.920	46.9	H	54.0	-7.1	AVG	146	1.6	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
15399.680	58.1	H	74.0	-15.9	PK	146	1.6	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
23099.770	55.5	H	74.0	-18.5	PK	126	1.6	RB 1 MHz;VB 3 MHz;Peak
19249.900	55.4	H	74.0	-18.6	PK	136	1.6	RB 1 MHz;VB 3 MHz;Peak

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 & 149 Mode: b & ac20 Pwr Setting: 18.25 (q73) & 24 (q96)
Tx Chain: 1Tx & 4Tx Data Rate: 1 & 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	
19149.960	48.3	H	54.0	-5.7	AVG	51	1.2	RB 1 MHz;VB 300 Hz;Peak
5443.830	47.5	V	54.0	-6.5	AVG	25	2.1	AVG; RB 1 MHz; VB: 300 Hz
6007.680	61.7	H	68.3	-6.6	PK	246	2.1	POS; RB 1 MHz; VB: 3 MHz
22979.900	46.0	H	54.0	-8.0	AVG	64	1.2	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
15320.300	59.2	H	68.3	-9.1	PK	152	1.6	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
5444.010	59.8	V	74.0	-14.2	PK	25	2.1	POS; RB 1 MHz; VB: 3 MHz
16000.090	55.6	H	74.0	-18.4	PK	261	1.6	RB 1 MHz;VB 3 MHz;Peak
19149.650	54.8	H	74.0	-19.2	PK	51	1.2	RB 1 MHz;VB 3 MHz;Peak
22979.750	54.6	H	74.0	-19.4	PK	64	1.2	RB 1 MHz;VB 3 MHz;Peak

Run #4b: High Channel

Channel: 11 & 165 Mode: b & ac20 Pwr Setting: 16.25 (q65) & 24 (q96)
Tx Chain: 1Tx & 4Tx Data Rate: 1 & 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	
19416.620	51.1	H	54.0	-2.9	AVG	137	1.4	RB 1 MHz;VB 300 Hz;Peak
5393.910	48.1	V	54.0	-5.9	AVG	28	1.6	POS; RB 1 MHz; VB: 300 Hz
16000.130	45.5	H	54.0	-8.5	AVG	261	1.6	RB 1 MHz;VB 300 Hz;Peak
5393.630	61.6	V	74.0	-12.4	PK	28	1.6	POS; RB 1 MHz; VB: 3 MHz
23299.980	55.5	H	68.3	-12.8	PK	135	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
19416.370	56.5	H	74.0	-17.5	PK	137	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

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	-

Radiated Emissions

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

Test Specific Details

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

Date of Test:	7/24/2019	Config. Used:	1
Test Engineer:	M. Birgani	Config Change:	-
Test Location:	Fremont Chamber #5	Host EUT Voltage:	110V/ 60Hz

General Test Configuration

The EUT and any local support equipment were located on the turntable for radiated emissions testing. Any remote support equipment was located outside the semi-anechoic chamber. Any cables running to remote support equipment were routed through metal conduit and when possible passed through a ferrite clamp upon exiting the chamber.

Radiated emissions tests above 1 GHz to FCC Part 15 were performed with floor absorbers in place in accordance with the test methods of ANSI C63.4 and CISPR 16-1-4.

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

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

Ambient Conditions:

Temperature:	22-25 °C
Rel. Humidity:	39-43 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	-

Summary of Results

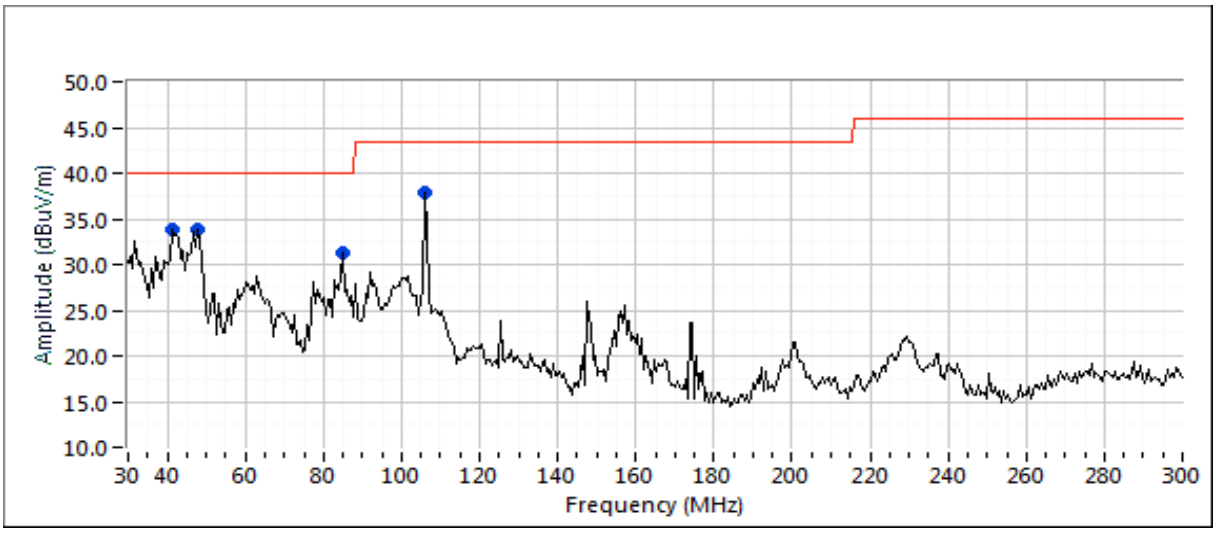
Run #	Test Performed	Limit	Result	Margin
1a	Radiated Spurious Emissions 30 - 1000 MHz, WiFi	15.209	PASS	36.8 dBµV/m @ 105.66 MHz (Margin: -6.7 dB)
1b			PASS	37.2 dBµV/m @ 105.71 MHz (Margin: -6.3 dB)
2	Radiated Emissions 30 - 1000 MHz, Maximized	15.209	PASS	37.2 dBµV/m @ 105.71 MHz (Margin: -6.3 dB)
3	30 kHz - 30 MHz	15.209	PASS	All signals were more than 40dB below the limit.

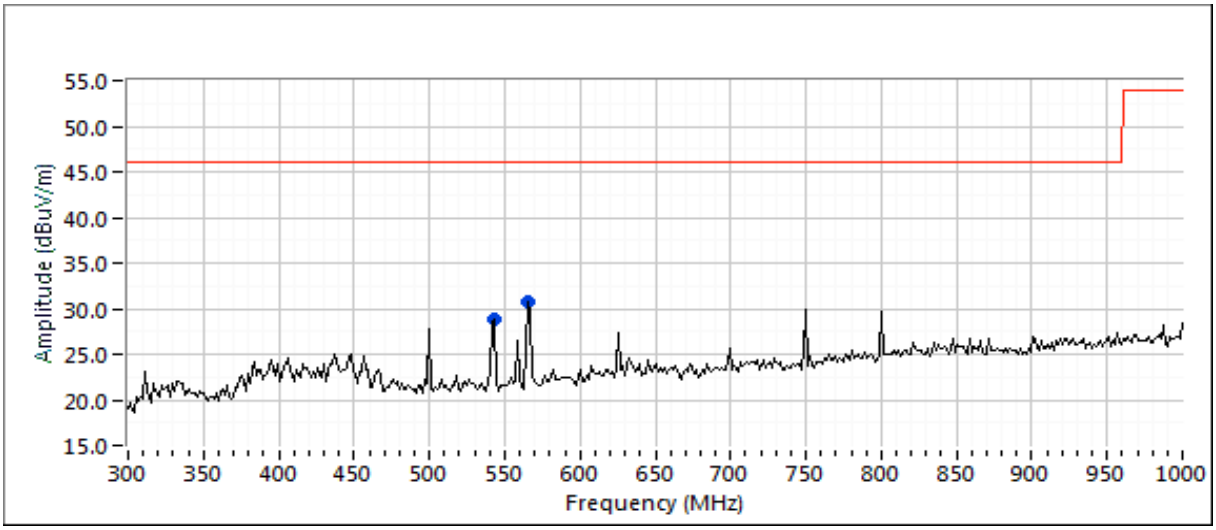
Test Parameters for Preliminary Scan(s)			
Frequency Range (MHz)	Prescan Distance (meters)	Limit Distance (meters)	Extrapolation Factor (dB, applied to data)
30 - 1000	3	3	0.0
0.009 - 0.490 MHz	3	300	-80.0
0.490 - 30 MHz	3	30	-40.0

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	-

Run #1a: Preliminary Radiated Emissions, 30 - 1000 MHz (802.11ac20 on Channels 6 and 100)





EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	-

Run #1a: Preliminary Radiated Emissions, 30 - 1000 MHz (802.11ac20 on Channels 6 and 100)

Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
105.664	37.8	V	43.5	-5.7	Peak	181	2.5	
47.645	33.8	V	40.0	-6.2	Peak	197	1.0	
42.821	33.8	V	40.0	-6.2	Peak	57	1.0	
83.693	31.2	V	40.0	-8.8	Peak	294	1.0	
564.128	30.8	V	46.0	-15.2	Peak	184	1.0	
540.387	28.9	V	46.0	-17.1	Peak	178	1.0	

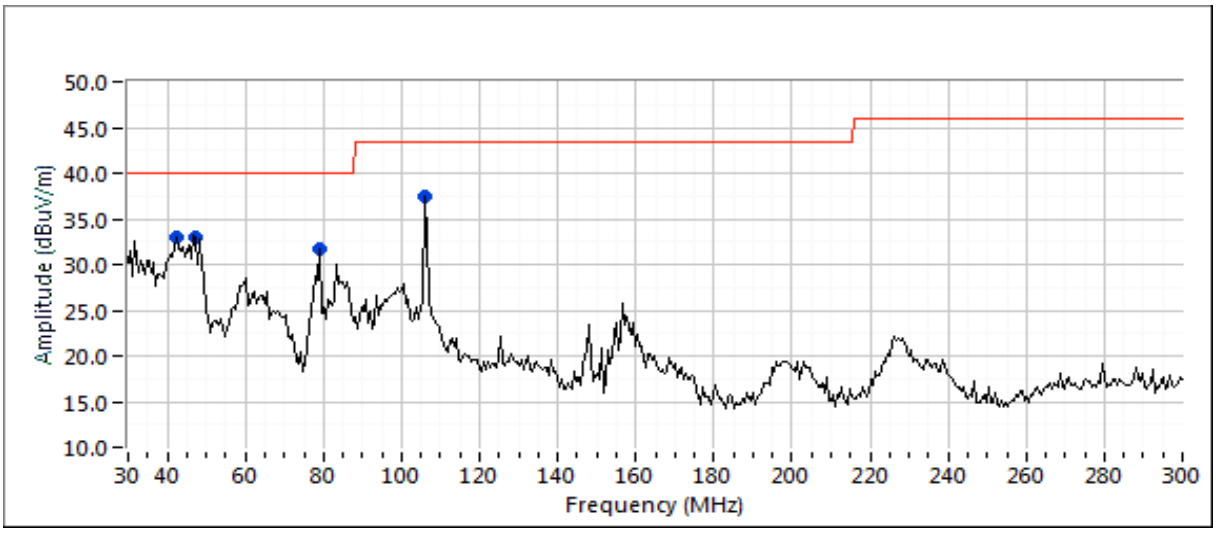
Preliminary quasi-peak readings (no manipulation of EUT interface cables)

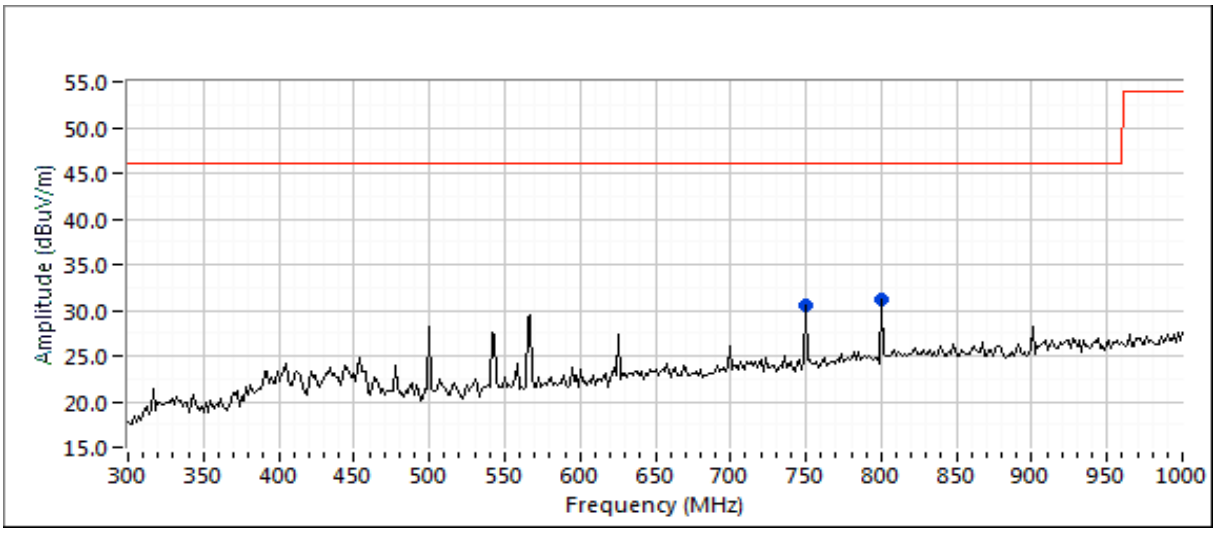
Frequency	Level	Pol	15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
105.664	36.8	V	43.5	-6.7	QP	179	2.5	QP (1.00s)
47.645	27.0	V	40.0	-13.0	QP	197	1.0	QP (1.00s)
42.821	24.6	V	40.0	-15.4	QP	60	1.0	QP (1.00s)
564.128	28.5	V	46.0	-17.5	QP	184	1.0	QP (1.00s)
83.693	21.6	V	40.0	-18.4	QP	298	1.0	QP (1.00s)
540.387	25.5	V	46.0	-20.5	QP	178	1.0	QP (1.00s)

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	-

Run #1b: Preliminary Radiated Emissions, 30 - 1000 MHz (80211b on Channel 1 and 802.11a on Channel 36)





EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	-

Run #1b: Preliminary Radiated Emissions, 30 - 1000 MHz (80211b on Channel 1 and 802.11a on Channel 36)

Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
105.710	37.4	V	43.5	-6.1	Peak	204	2.0	
45.903	33.0	V	40.0	-7.0	Peak	225	1.5	
43.169	32.9	V	40.0	-7.1	Peak	278	1.0	
78.702	31.6	V	40.0	-8.4	Peak	291	1.0	
800.730	31.2	H	46.0	-14.8	Peak	94	2.0	
750.023	30.6	H	46.0	-15.4	Peak	64	1.5	

Preliminary quasi-peak readings (no manipulation of EUT interface cables)

Frequency	Level	Pol	15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
105.710	37.2	V	43.5	-6.3	QP	208	2.0	QP (1.00s)
43.169	25.6	V	40.0	-14.4	QP	280	1.0	QP (1.00s)
45.903	24.2	V	40.0	-15.8	QP	229	1.5	QP (1.00s)
750.023	29.3	H	46.0	-16.7	QP	69	1.5	QP (1.00s)
78.702	20.8	V	40.0	-19.2	QP	294	1.0	QP (1.00s)
800.730	21.7	H	46.0	-24.3	QP	96	2.0	QP (1.00s)

Run #2: Maximized Readings From Run #1

Maximized quasi-peak readings (includes manipulation of EUT interface cables)

Frequency	Level	Pol	15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
105.710	37.2	V	43.5	-6.3	QP	208	2.0	QP (1.00s)
43.169	25.6	V	40.0	-14.4	QP	280	1.0	QP (1.00s)
45.903	24.2	V	40.0	-15.8	QP	229	1.5	QP (1.00s)
750.023	29.3	H	46.0	-16.7	QP	69	1.5	QP (1.00s)
78.702	20.8	V	40.0	-19.2	QP	294	1.0	QP (1.00s)
800.730	21.7	H	46.0	-24.3	QP	96	2.0	QP (1.00s)

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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: 22-24 °C
Rel. Humidity: 40-43 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5150 - 5250MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 251.2 mW ac20: 441.8 mW ac40: 470.8 mW ac80: 132.6 mW
1	PSD, 5150 - 5250MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 18.2 mW/MHz ac20: 29.7 mW/MHz ac40: 16.0 mW/MHz ac80: 2.4 mW/MHz
1	99% Bandwidth	RSS-247 (Information only)	N/A	a: 17.5 MHz ac20: 18.4 MHz ac40: 36.3 MHz ac80: 75.9 MHz
2	Antenna Conducted - Out of Band Spurious	15.407(b) -27dBm/MHz		All emissions below the -27dBm/MHz limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 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

Sample Notes

Sample S/N: M11917QW000T

Antenna Gain Information

Freq	Antenna Gain (dBi) / Chain				BF	MultiChain Legacy	CDD	Sectorized / Xpol	Dir G (PWR)	Dir G (PSD)
	1	2	3	4						
5150-5250	4.1	4.9	4.9	4.9	Yes	Yes	Yes	Yes	2.3	8.1

For devices that support CDD modes

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

Chain 1 = Blue antenna cable
Chain 2 = White antenna cable
Chain 3 = Grey 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)

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

Date of Test: 7/26/2019 0:00 Config. Used: 1
Test Engineer: R. Varelas Config Change: None
Test Location: Fremont EMC Lab #3 EUT Voltage: 3.3Vdc

Note 1A:	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 1B:	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:	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.

FCC UNII-1 Limits

		Pwr	PSD
	Outdoor AP	30	17
X	Indoor AP	30	17
	Station (e.g. Client)	24	11
	Outdoor AP (>30° Elv.)	21	-

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 - 5150-5250 MHz Band - FCC

Mode: 11a Antenna Gain: 4.8 dBi Ant 1 Max EIRP (mW): 758.6

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
5180	1	22		99		112.2	20.5	30.0	0.251	Pass
	3									
	4				20.5					
	2									
5200	1	26		99		251.2	24.0	30.0		Pass
	3									
	4				24.0					
	2									
5240	1	26		99		251.2	24.0	30.0		Pass
	3									
	4				24.0					
	2									

MIMO Device - 5150-5250 MHz Band - ISED

Mode: 11a Antenna Gain: 4.8 dBi Ant 1 Max EIRP (mW): 60.3

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
5180	1	14	17.5	99		13.0	17.8	22.4	0.020	Pass
	3									
	4				13.0					
	2									
5200	1	14	17.4	99		12.7	17.5	22.4		Pass
	3									
	4				12.7					
	2									
5240	1	14	17.4	99		12.8	17.6	22.4		Pass
	3									
	4				12.8					
	2									

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

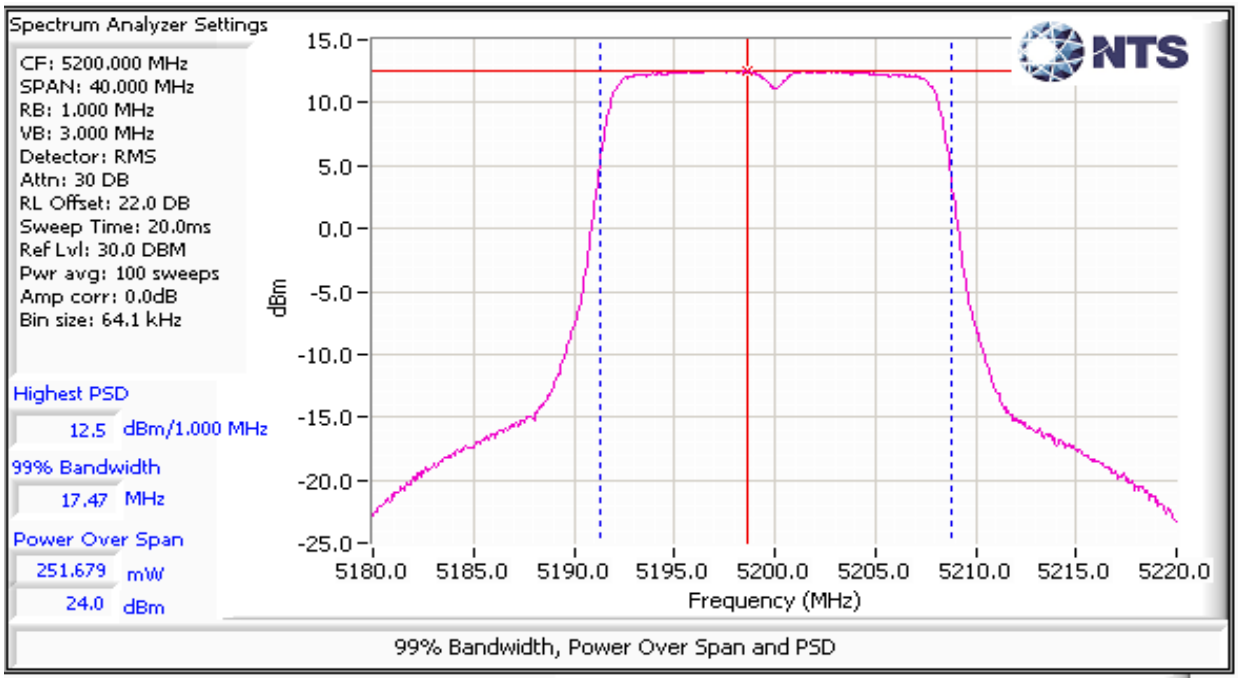
5150-5250 PSD - FCC
Mode: 11a

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	Result
5180	1	22		99		7.9	9.0	14.9	Pass
	3								
	4				9.0				
	2								
5200	1	26		99		17.8	12.5	14.9	Pass
	3								
	4				12.5				
	2								
5240	1	26		99		18.2	12.6	14.9	Pass
	3								
	4				12.6				
	2								

5150-5250 PSD - 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	ISED Limit dBm/MHz	Result
5180	1	14		99		1.4	1.5	1.9	Pass
	3								
	4				1.6				
	2								
5200	1	14		99		1.3	1.1	1.9	Pass
	3								
	4				1.3				
	2								
5240	1	14		99		1.4	1.5	1.9	Pass
	3								
	4				1.4				
	2								

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 - 5150-5250 MHz Band - FCC

Mode: ac20 Max EIRP (mW): 750.3

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
5180	1	22		98.0	20.1	441.8	26.5	30.0	0.442	Pass
	3				20.6					
	4				20.3					
	2				20.7					
5200	1	22		98.0	19.7	430.2	26.3	30.0		Pass
	3				20.5					
	4				20.3					
	2				20.7					
5240	1	22		98.0	19.7	417.6	26.2	30.0		Pass
	3				20.2					
	4				20.2					
	2				20.6					

MIMO Device - 5150-5250 MHz Band - ISED

Mode: ac20 Max EIRP (mW): 33.9

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
5180	1	6.5	18.4	98.0	6.8	13.0	15.3	22.6	0.020	Pass
	3				7.5					
	4				6.8					
	2				6.9					
5200	1	6.5	18.4	98.0	6.7	12.9	15.2	22.6		Pass
	3				7.3					
	4				6.7					
	2				6.7					
5240	1	6.5	18.4	98.0	6.8	12.8	15.1	22.6		Pass
	3				7.2					
	4				6.6					
	2				6.6					

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 - 5150-5250 MHz Band - FCC

Mode: ac20 w/ BF — Max EIRP (mW): 2777.6

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
5180	1	21		98.0	19.6	362.7	25.6	27.9	0.430	Pass
	3				18.4					
	4				20.1					
	2				20.0					
5200	1	22		98.0	19.7	430.2	26.3	27.9		Pass
	3				20.5					
	4				20.3					
	2				20.7					
5240	1	22		98.0	19.7	417.6	26.2	27.9		Pass
	3				20.2					
	4				20.2					
	2				20.6					

MIMO Device - 5150-5250 MHz Band - ISED

Mode: ac20 w/ BF — Max EIRP (mW): 128.8

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
5180	1	6.5	19.7	98	6.8	13.0	21.1	22.9	0.020	Pass
	3				7.5					
	4				6.8					
	2				6.9					
5200	1	6.5	18.4	98	6.7	12.9	21.0	22.6		Pass
	3				7.3					
	4				6.7					
	2				6.7					
5240	1	6.5	18.4	98	6.8	12.8	20.9	22.6		Pass
	3				7.2					
	4				6.6					
	2				6.6					

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

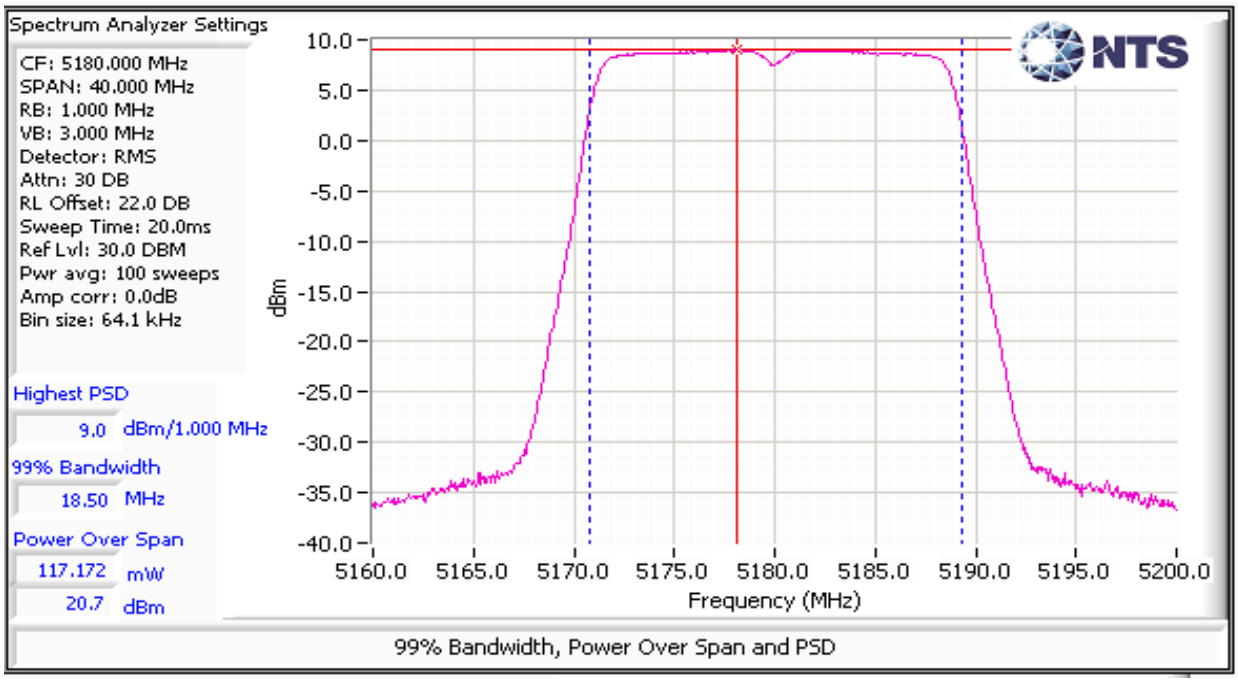
5150-5250 PSD - FCC
Mode: ac20

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	Result
5180	1	22		98	8.3	29.7	14.7	14.9	Pass
	3				8.9				
	4				8.6				
	2				9.0				
5200	1	22		98	7.9	28.8	14.6	14.9	Pass
	3				8.7				
	4				8.6				
	2				9.0				
5240	1	22		98	8.0	27.9	14.5	14.9	Pass
	3				8.4				
	4				8.4				
	2				8.9				

5150-5250 PSD - 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	ISED Limit dBm/MHz	Result
5180	1	6.5		98	-4.9	1.4	1.5	1.9	Pass
	3				-4.2				
	4				-4.9				
	2				-4.8				
5200	1	6.5		98	-5.0	1.3	1.1	1.9	Pass
	3				-4.4				
	4				-5.0				
	2				-5.0				
5240	1	6.5		98	-4.9	1.3	1.1	1.9	Pass
	3				-4.6				
	4				-5.2				
	2				-5.2				

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

5150-5250 PSD - FCC n20 mode tested to demonstrate PSD is almost the same as for ac20 mode

Mode: n20

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
5180	1	22		98	8.1	28.2	14.5	14.9	Pass
	3				8.7				
	4				8.4				
	2				8.7				
5200	1	22		98	7.9	27.9	14.5	14.9	Pass
	3				8.5				
	4				8.4				
	2				8.9				
5240	1	22		98	7.9	26.9	14.3	14.9	Pass
	3				8.3				
	4				8.2				
	2				8.7				

5150-5250 PSD - ISED

Mode: n20

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
5180	1	6.5		98	-4.9	1.3	1.1	1.9	Pass
	3				-4.4				
	4				-5.1				
	2				-4.6				
5200	1	6.5		98	-5.1	1.3	1.1	1.9	Pass
	3				-4.6				
	4				-5.4				
	2				-4.7				
5240	1	6.5		98	-5.3	1.3	1.1	1.9	Pass
	3				-4.8				
	4				-5.5				
	2				-4.6				

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 - 5150-5250 MHz Band - FCC

Mode: ac40 Max EIRP (mW): 799.5

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
5190	1	15.5		97	13.8	106.7	20.3	30.0	0.471	Pass
	3				14.3					
	4				14.3					
	2				14.1					
5230	1	22.5		97	20.6	470.8	26.7	30.0		Pass
	3				20.5					
	4				20.6					
	2				20.6					

MIMO Device - 5150-5250 MHz Band - ISED

Mode: ac40 Max EIRP (mW): 72.4

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
5190	1	11.0	36.3	97	9.9	16.3	18.6	23.0	0.043	Pass
	3				10.3					
	4				10.1					
	2				10.3					
5230	1	11.0	36.3	97	10.1	16.3	18.6	23.0		Pass
	3				10.3					
	4				9.7					
	2				10.4					

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 - 5150-5250 MHz Band - FCC

Mode: ac40 w/BF — Max EIRP (mW): 1202.2

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
5190	1	15.5		97	13.8	106.7	20.3	27.9	0.186	Pass
	3				14.3					
	4				14.3					
	2				14.1					
5230	1	18.0		97	16.7	186.2	22.7	27.9		Pass
	3				15.1					
	4				17.2					
	2				16.9					

MIMO Device - 5150-5250 MHz Band - ISED

Mode: ac40 w/BF — Max EIRP (mW): 190.5

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
5190	1	9.0	38.0	97	8.9	14.7	22.8	23.0	0.030	Pass
	3				7.2					
	4				8.7					
	2				9.1					
5230	1	9.0	38.0	97	9.0	14.7	22.8	23.0		Pass
	3				7.1					
	4				8.7					
	2				9.1					

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

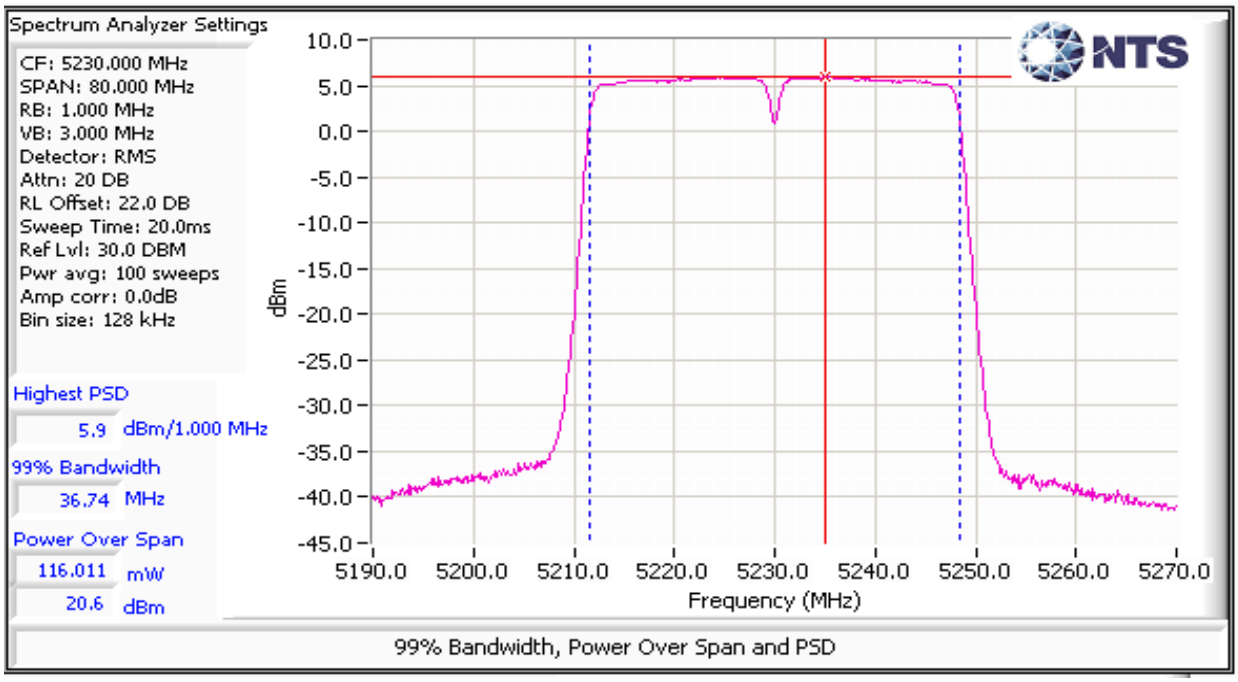
5150-5250 PSD - FCC
Mode: ac40

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	Result
5190	1	15.5		97	-0.8	3.7	5.7	14.9	Pass
	3				-0.4				
	4				-0.4				
	2				-0.5				
5230	1	22.5		97	5.8	16.0	12.0	14.9	Pass
	3				5.9				
	4				5.9				
	2				5.9				

5150-5250 PSD - 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	ISED Limit dBm/MHz	Result
5190	1	11.0		97	-4.7	1.5	1.8	1.9	Pass
	3				-4.3				
	4				-4.5				
	2				-4.2				
5230	1	11.0		97	-4.6	1.5	1.8	1.9	Pass
	3				-4.1				
	4				-4.8				
	2				-4.0				

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

5150-5250 PSD - FCC n40 mode tested to demonstrate PSD is almost the same as for ac40 mode

Mode: n40

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
5190	1	15.5		97	-0.9	3.6	5.6	14.9	Pass
	3				-0.6				
	4				-0.7				
	2				-0.4				
5230	1	22.5		97	5.6	15.6	11.9	14.9	Pass
	3				5.6				
	4				5.8				
	2				6.1				

5150-5250 PSD - ISED

Mode: n40

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
5190	1	11.0		97	-4.6	1.5	1.8	1.9	Pass
	3				-4.2				
	4				-4.7				
	2				-4.1				
5230	1	11.0		97	-4.9	1.4	1.5	1.9	Pass
	3				-4.3				
	4				-5.0				
	2				-4.2				

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 - 5150-5250 MHz Band - FCC

Mode: ac80 — Max EIRP (mW): 225.2

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
5210	1	16.75		96	14.8	132.6	21.2	30.0	0.133	Pass
	3				15.2					
	4				14.9					
	2				15.2					

MIMO Device - 5150-5250 MHz Band - ISED

Mode: ac80 — Max EIRP (mW): 141.3

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
5210	1	14.5	75.9	96	12.8	19.2	21.5	23.0	0.083	Pass
	3				13.2					
	4				12.8					
	2				13.1					

MIMO Device - 5150-5250 MHz Band - FCC

Mode: ac80 w/ BF — Max EIRP (mW): 856.1

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
5210	1	16.75		96	14.8	132.6	21.2	27.9	0.133	Pass
	3				15.2					
	4				14.9					
	2				15.2					

MIMO Device - 5150-5250 MHz Band - ISED

Mode: ac80 w/ BF — Max EIRP (mW): 195.0

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
5210	1	9.0	77.3	96	9.0	14.8	22.9	23.0	0.030	Pass
	3				7.5					
	4				8.6					
	2				9.0					

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

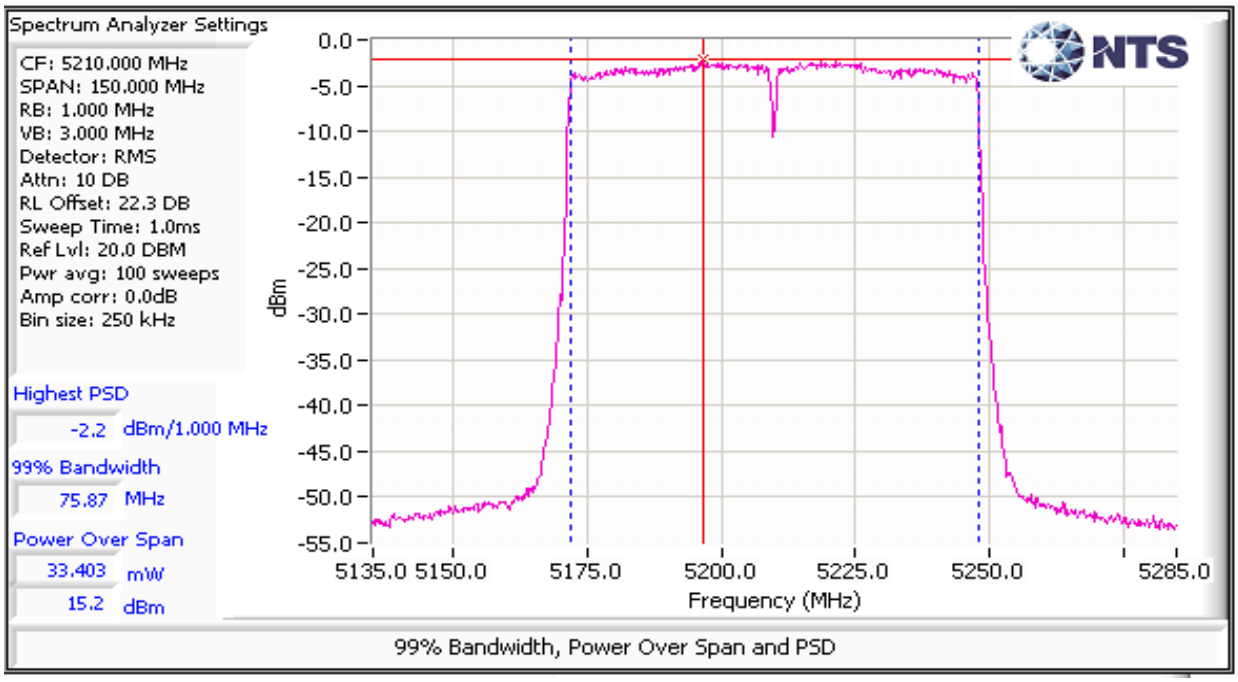
5150-5250 PSD - FCC
Mode: ac80

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	Result
5210	1	16.75		96	-2.7	2.4	3.8	14.9	Pass
	3				-2.4				
	4				-2.5				
	2				-2.2				

5150-5250 PSD - 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	ISED Limit dBm/MHz	Result
5210	1	14.5		96	-4.8	1.5	1.8	1.9	Pass
	3				-4.4				
	4				-4.3				
	2				-4.5				

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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: 20-21 °C
Rel. Humidity: 34-35 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	PSD, 5150 - 5250MHz	15.407(a) (1), (2), (3)	Pass	ax20: 12.5 mW/MHz ax40: 10.0 mW/MHz ax80: 2.0 mW/MHz
1	PSD, 5150 - 5250MHz	RSS-247 6.2	Pass	ax20: -0.5 mW/MHz ax40: -0.5 mW/MHz ax80: 0.0 mW/MHz
1	99% Bandwidth	RSS-247 (Information only)	N/A	ax20: 19.6 MHz ax40: 38.0 MHz ax80: 77.2 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.

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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
ax20		99.0%	Yes	4.11	0.0	0.0	10	4324
ax40		99.0%	Yes	4.16	0.0	0.0	10	8811
ax80		96.8%	Yes	1.20	0.1	0.3	833	5159

Sample Notes

Sample S/N: M11917QW000T

Date of Test: 02/03/20
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

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 (PWR)	Dir G (PSD)
	1	2	3	4						
5150-5250	4.1	4.9	4.9	4.9	Yes	Yes	Yes	Yes	2.3	8.1

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)

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

FCC UNII-1 Power Limits

		Pwr	PSD
	Outdoor AP	30	17
X	Indoor AP	30	17
	Station (e.g. Client)	24	11
	Outdoor AP (>30° Elv.)	21	-

5150-5250 PSD - FCC Mode: ax20

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD[2] dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	Result
5180	1	21.75		99	6.2	16.6	12.2	14.9	Pass
	3				6.6				
	4				6.1				
	2				5.8				
5200	1	22		99	6.4	17.8	12.5	14.9	Pass
	3				6.9				
	4				6.5				
	2				6.1				
5240	1	22		99	6.2	17.2	12.4	14.9	Pass
	3				6.7				
	4				6.5				
	2				5.9				

5150-5250 PSD - IC Mode: ax20

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD[2] dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	IC Limit dBm/MHz	Result
5180	1	6.5	19.6	99	-6.4	0.9	-0.5	1.9	Pass
	3				-6.0				
	4				-7.1				
	2				-7.0				
5200	1	6.5	19.6	99	-6.9	0.8	-1.0	1.9	Pass
	3				-6.2				
	4				-7.3				
	2				-7.2				
5240	1	6.5	19.6	99	-7.1	0.8	-1.0	1.9	Pass
	3				-6.3				
	4				-7.1				
	2				-7.2				

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 - 5150-5250 MHz Band - FCC Mode: ax40

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	PSD[2] dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	Result
5190	1	15.5		99	-2.9	2.1	3.2	14.9	Pass
	3				-2.4				
	4				-2.7				
	2				-3.2				
5230	1	22.5		99	4.4	9.9	10.0	14.9	Pass
	3				4.0				
	4				4.0				
	2				3.3				

MIMO Device - 5150-5250 MHz Band - ISED Mode: ax40

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD[2] dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	ISED Limit dBm/MHz	Result
5190	1	11	37.9	99	-6.1	0.9	-0.5	1.9	Pass
	3				-6.3				
	4				-6.9				
	2				-6.8				
5230	1	11	38.0	99	-6.0	0.9	-0.5	1.9	Pass
	3				-5.9				
	4				-6.5				
	2				-6.8				

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 - 5150-5250 MHz Band - FCC Mode: ax80

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	PSD[2] dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	Result
5210	1	16.75		96.8	-3.8	1.6	2.0	14.9	Pass
	3				-3.8				
	4				-4.0				
	2				-4.7				

MIMO Device - 5150-5250 MHz Band - ISED Mode: ax80

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD[2] dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	ISED Limit dBm/MHz	Result
5210	1	14.5	77.2	96.8	-5.6	1.0	0.0	1.9	Pass
	3				-5.8				
	4				-6.1				
	2				-6.5				

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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.

Date of Test: 7/29-31/19; 10/10/19
Test Engineer: R. Varelas; M. Birgani
Test Location: Lab #3

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

Sample Notes

Sample S/N: M11917QW000T
Driver:

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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, 5725 - 5850MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 251.2 mW ac20: 657.9 mW ac40: 683.1 mW ac80: 369.5 mW
1	PSD, 5725 - 5850MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 19.1 mW/MHz ac20: 46.1 mW/MHz ac40: 24.7 mW/MHz ac80: 6.5 mW/MHz
1	Minimum 6dB Bandwidth	15.407(e) RSS-247 6.2.4.1	Pass	a: 16.3 MHz ac20: 17.6 MHz ac40: 36.3 MHz ac80: 75.8 MHz
2	99% Bandwidth	RSS-GEN (Information only)	N/A	a: 17.2 MHz ac20: 18.1 MHz ac40: 36.5 MHz ac80: 75.9 MHz
3	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

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 (PWR)	Dir G (PSD)
	1	2	3	4						
5725-5825	4.5	5.8	5.7	5.5	Yes	Yes	Yes	Yes	2.9	8.8

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)

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 - 5725-5850 MHz Band - FCC/ISED

Mode: 11a Antenna Gain: 4.4 dBi Ant 1 Max EIRP (mW): 691.9

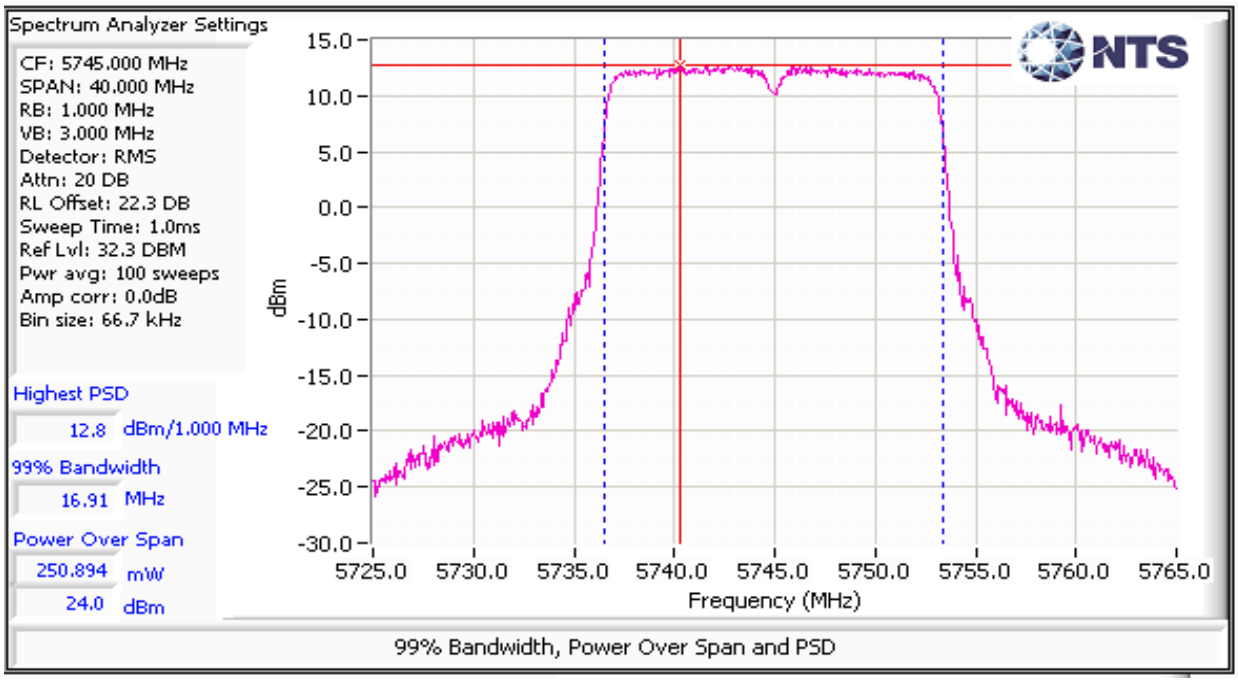
Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	Limit dBm	Max Power (W)	Result
5745	3	26.0	16.9	99.0	24.0	251.2	24.0	30.0	0.251	Pass
5785	3	26.0	17.0	99.0	23.8	239.9	23.8	30.0		Pass
5825	3	26.0	17.2	99.0	23.3	213.8	23.3	30.0		Pass

5725-5850 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/500kHz	ISED Limit dBm/500kHz	Result
5745	3	26.0		99.0	12.8	19.1	12.8	27.2	27.2	Pass
5785	3	26.0		99.0	12.4	17.4	12.4	27.2	27.2	Pass
5825	3	26.0		99.0	12.2	16.6	12.2	27.2	27.2	Pass

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 - 5725-5850 MHz Band - FCC/ISED

Mode: ac20 Max EIRP (mW): 1282.8

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5745	1	24	18.1	97.6	21.8	653.9	28.2	30.0	0.658	Pass
	3				22.1					
	4				21.9					
	2				22.3					
5785	1	24	18.1	97.6	21.8	657.9	28.2	30.0		Pass
	3				22.0					
	4				22.0					
	2				22.4					
5825	1	24	18.1	97.6	21.4	618.9	27.9	30.0		Pass
	3				21.5					
	4				21.9					
	2				22.3					

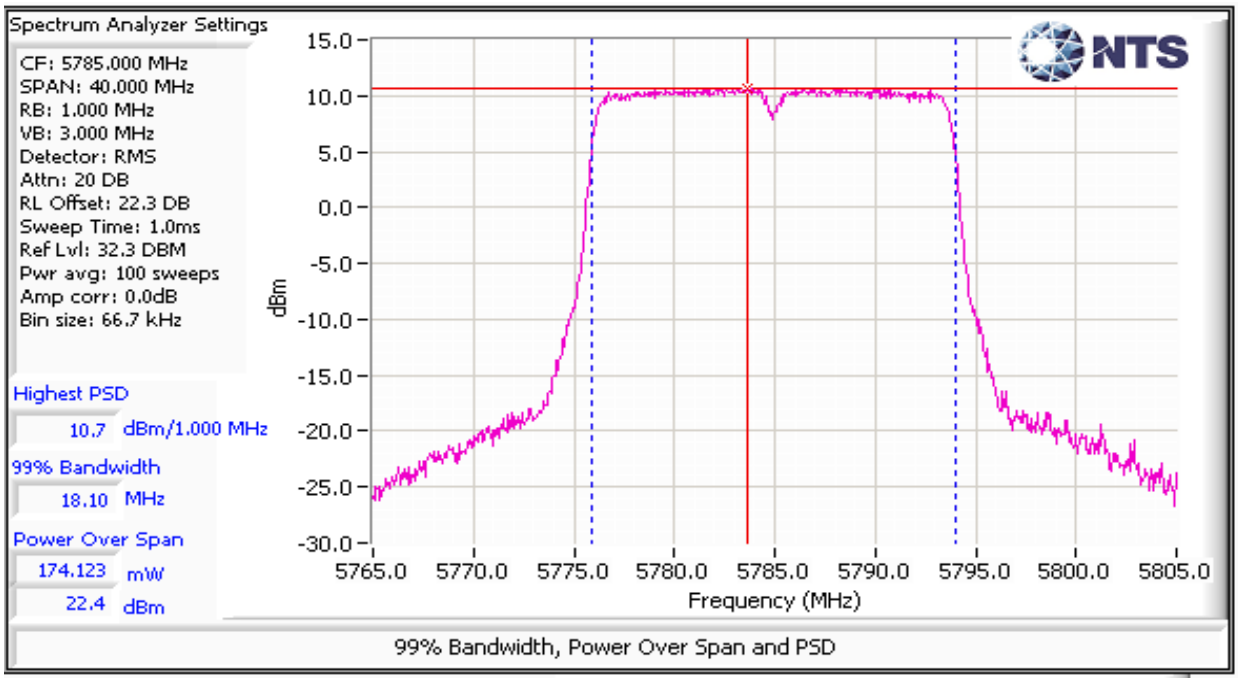
5725-5850 PSD - FCC/ISED

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
5745	1	24		97.6	10.2	46.1	16.6	27.2	27.2	Pass
	3				10.7					
	4				10.3					
	2				10.8					
5785	1	24		97.6	10.4	46.0	16.6	27.2	27.2	Pass
	3				10.5					
	4				10.4					
	2				10.7					
5825	1	24		97.6	9.9	44.6	16.5	27.2	27.2	Pass
	3				10.1					
	4				10.5					
	2				10.9					

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 - 5725-5850 MHz Band - FCC/ISED

Mode: ac20 w/ BF — Max EIRP (mW): 3562.3

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5745	1	22	19.6	97.6	20.5	469.6	26.7	27.2	0.470	Pass
	3				20.0					
	4				21.0					
	2				20.8					
5785	1	22	19.7	97.6	20.2	435.6	26.4	27.2		Pass
	3				19.7					
	4				20.7					
	2				20.4					
5825	1	22	19.6	97.6	20.2	442.8	26.5	27.2		Pass
	3				19.9					
	4				20.7					
	2				20.5					

MIMO Device - 5725-5850 MHz Band - FCC/ISED

Mode: ac40 — Max EIRP (mW): 1331.9

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5755	1	24	36.5	97.3	22.1	682.9	28.3	30.0	0.683	Pass
	3				22.0					
	4				22.2					
	2				22.5					
5795	1	24	36.3	97.3	22.0	683.1	28.3	30.0		Pass
	3				22.0					
	4				22.3					
	2				22.5					

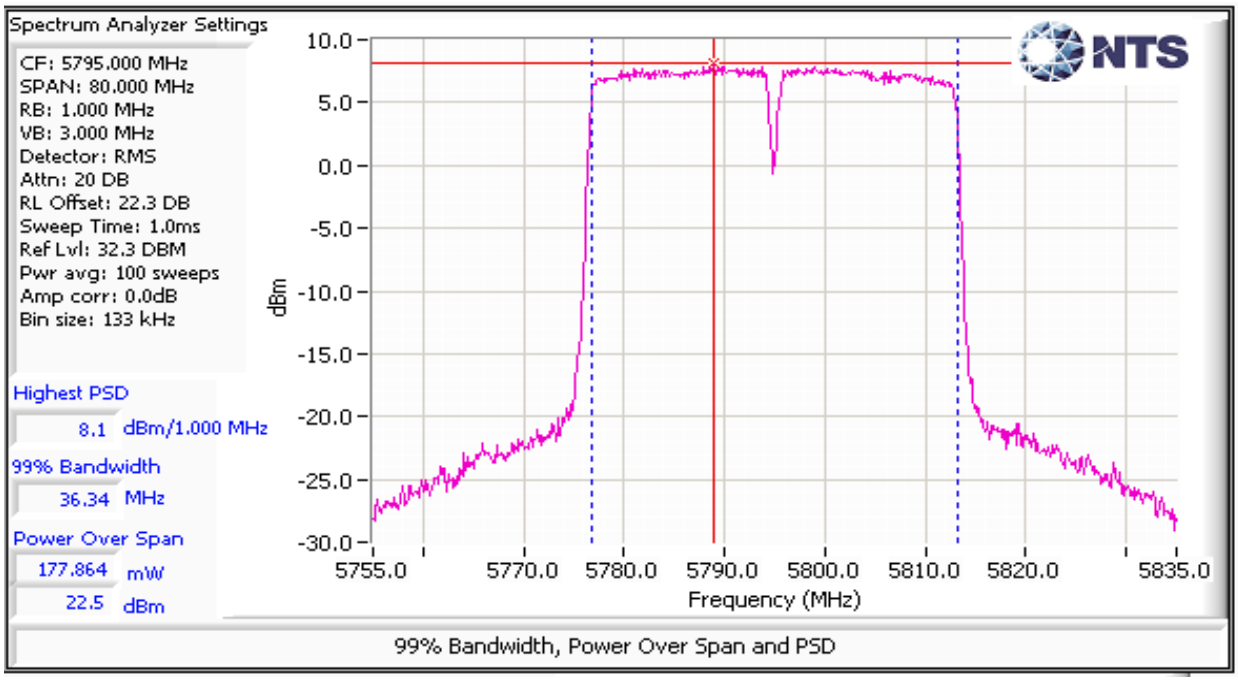
EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 5725-5850 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
5755	1	24		97.3	7.6	24.0	13.8	27.2	27.2	Pass
	3				7.4					
	4				7.7					
	2				7.9					
5795	1	24		97.3	7.6	24.7	13.9	27.2	27.2	Pass
	3				7.5					
	4				7.9					
	2				8.1					



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 - 5725-5850 MHz Band - FCC/ISED

Mode: ac40 w/ BF

Max EIRP (mW): 3320.3

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5755	1	22	38.0	97.3	20.4	437.7	26.4	27.2	0.438	Pass
	3				19.5					
	4				20.7					
	2				20.4					
5795	1	22	38.0	97.3	20.5	428.0	26.3	27.2		Pass
	3				19.4					
	4				20.6					
	2				20.1					

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 - 5725-5850 MHz Band - FCC/ISED

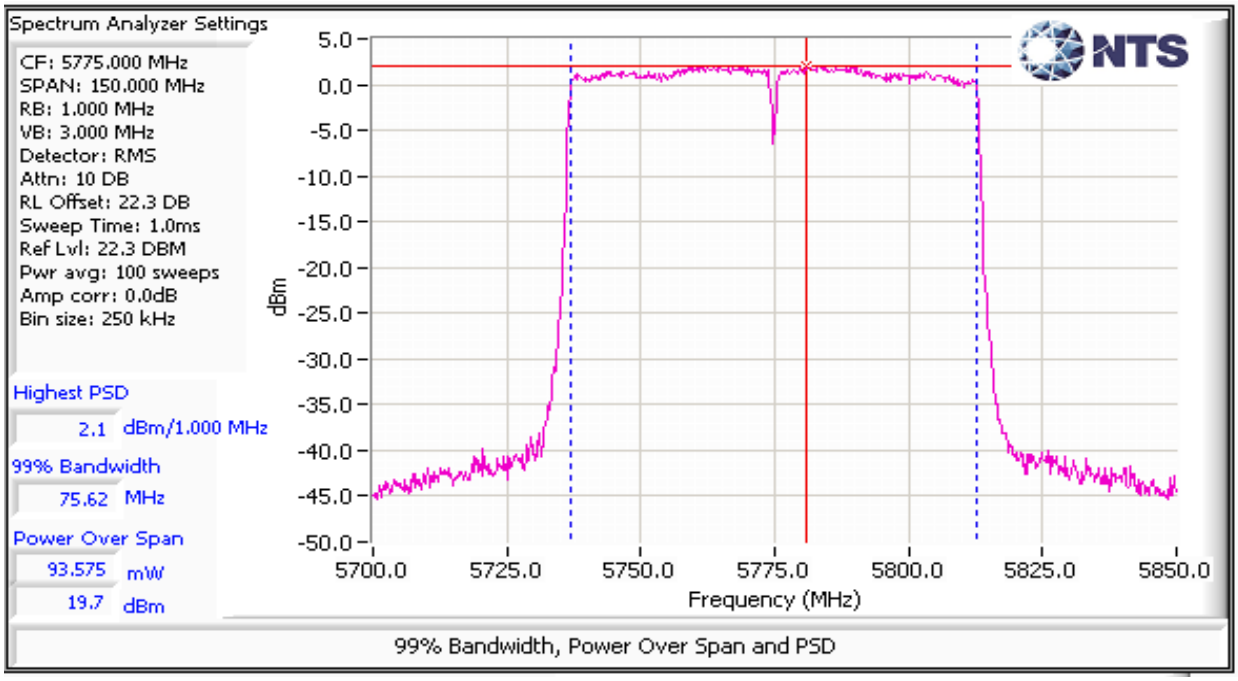
Mode: ac80 Max EIRP (mW): 720.5

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5775	1	21	75.6	96.0	19.2	369.5	25.7	30.0	0.370	Pass
	3				19.5					
	4				19.5					
	2				19.7					

MIMO Device 5725-5850 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
5775	1	21		96.0	1.7	6.5	8.1	27.2	27.2	Pass
	3				1.9					
	4				1.9					
	2				2.1					



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 - 5725-5850 MHz Band - FCC/ISED

Mode: ac80 w/ BF

Max EIRP (mW): 2802.9

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5775	1	21	75.9	96.0	19.2	369.5	25.7	27.2	0.370	Pass
	3				19.5					
	4				19.5					
	2				19.7					

EMC Test Data

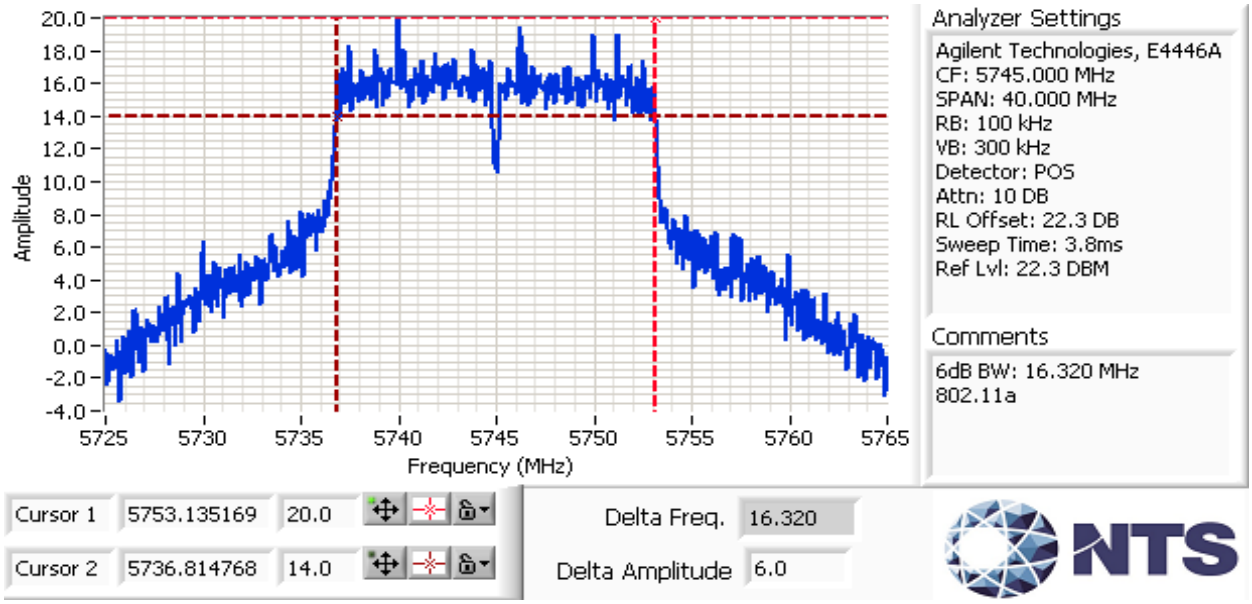
Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #2: Signal Bandwidth

Mode: a

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (kHz)	
		6dB	99%	6dB	99%
26	5745	16.3		100	
26	5785	16.4		100	
26	5825	16.3		100	

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



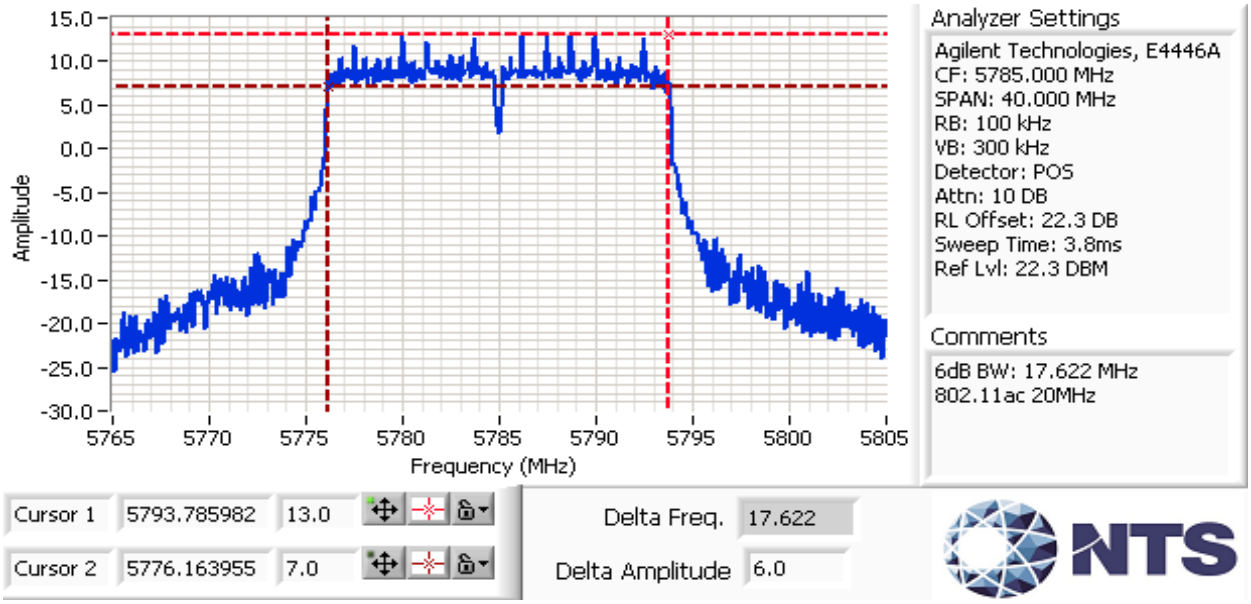
EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

Mode: ac20

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (kHz)	
		6dB	99%	6dB	99%
24	5745	17.6		100	
24	5785	17.6		100	
24	5825	17.6		100	

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



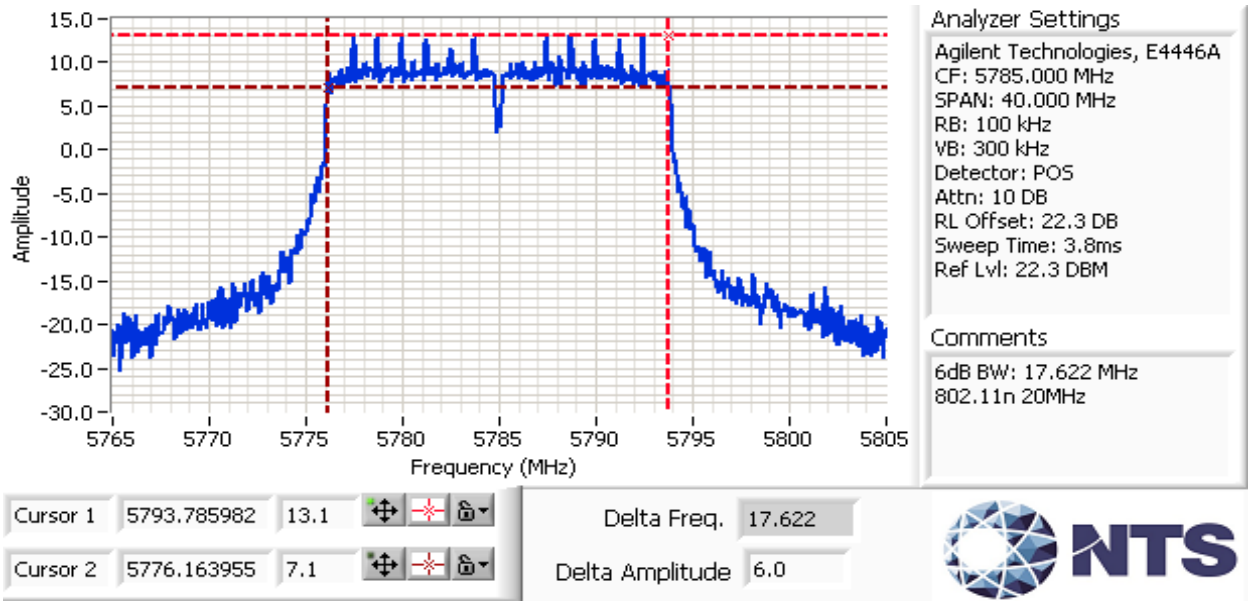
EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

Mode: n20

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (kHz)	
		6dB	99%	6dB	99%
24	5745	17.6		100	
24	5785	17.6		100	
24	5825	17.6		100	

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



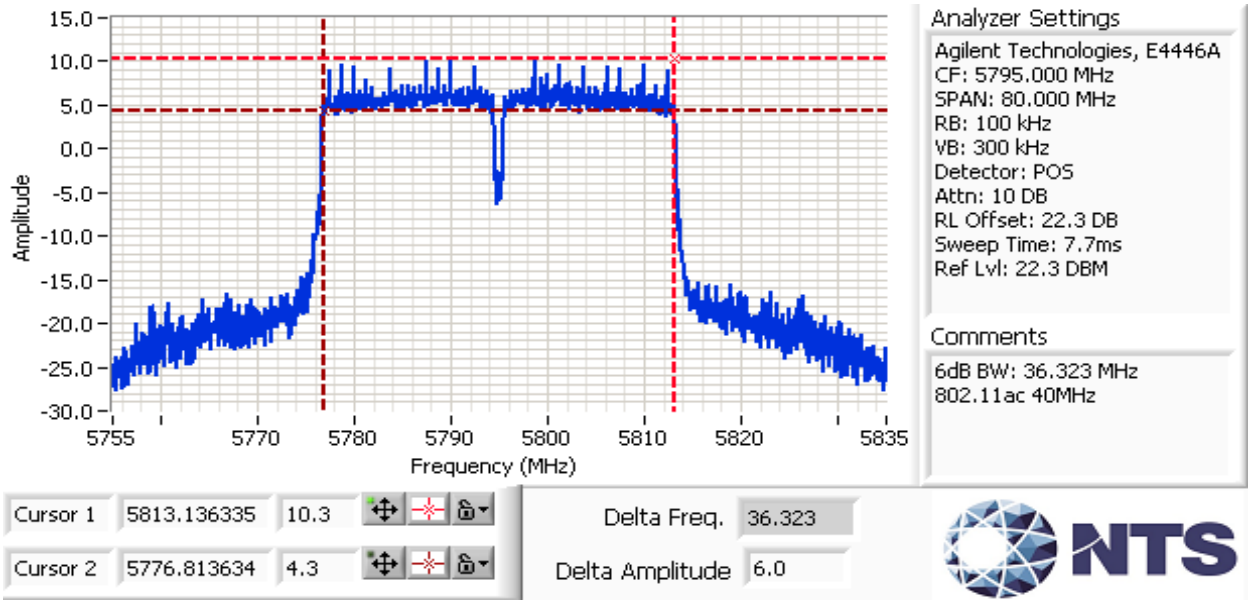
EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

Mode: ac40

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (kHz)	
		6dB	99%	6dB	99%
24	5755	36.3		100	
24	5795	36.3		100	

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



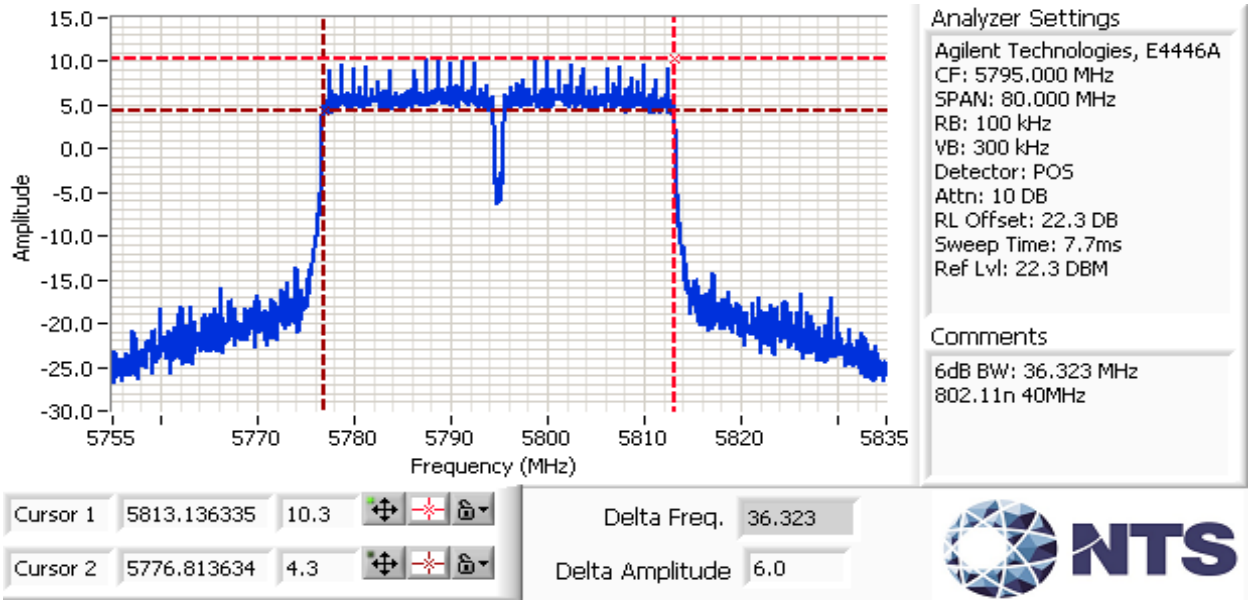
EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

Mode: n40

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (kHz)	
		6dB	99%	6dB	99%
24	5755	36.3		100	
24	5795	36.3		100	

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



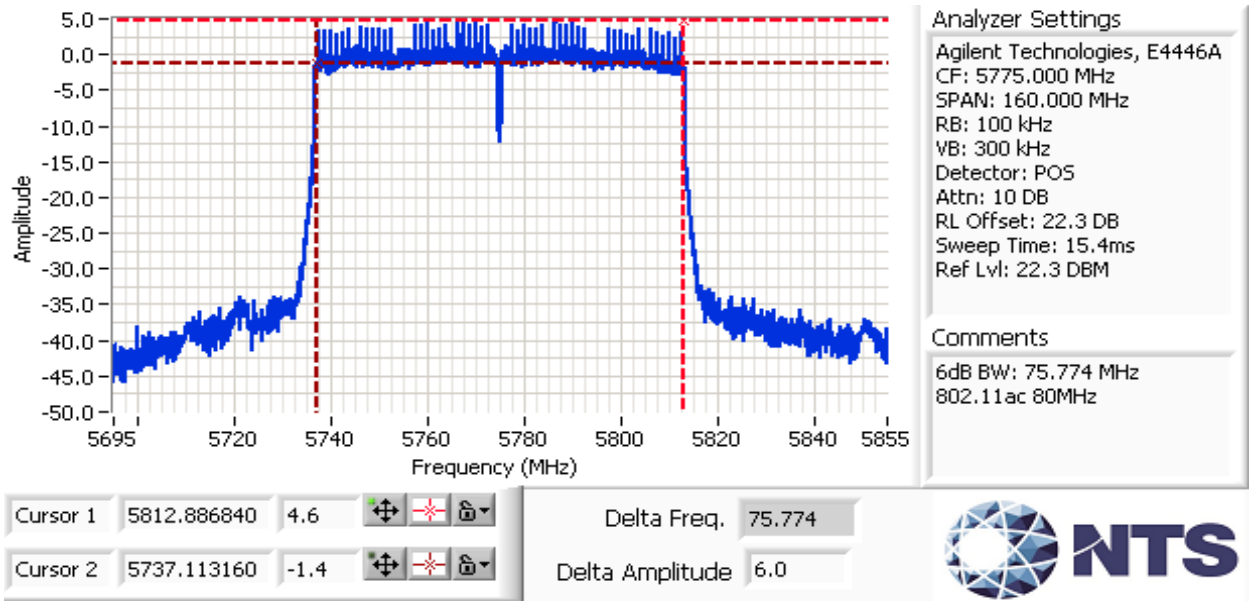
EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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

Mode: ac80

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (kHz)	
		6dB	99%	6dB	99%
21	5775	75.8		100	

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



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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: 20-21 °C
Rel. Humidity: 34-36 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	PSD, 5725 - 5850MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	ax20: 14.1 dBm/MHz ax40: 11.4 dBm/MHz ax80: 7.9 dBm/MHz
1	99% Bandwidth	RSS-GEN (Information only)	N/A	ax20: 19.7 MHz ax40: 38.0 MHz ax80: 77.3 MHz
2	Minimum 6dB Bandwidth	15.247(a)	PASS	18.8 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.

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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
ax20	8	99.0%	Yes	4.11	0.0	0.0	10	4324
ax40	16	99.0%	Yes	4.16	0.0	0.0	10	8811
ax80	34	96.8%	Yes	1.20	0.1	0.3	833	5159

Sample Notes

Sample S/N: M11917QW000T

Date of Test: 02/04/20
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

Sample Notes

Sample S/N: M11917QW000T

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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:	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 (PWR)	Dir G (PSD)
	1	2	3	4						
5725-5825	4.5	5.8	5.7	5.5	Yes	Yes	Yes	Yes	2.9	8.8

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)

EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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 5725-5850 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
5745	1	24	19.7	99	8.4	25.9	14.1	27.2	27.2	Pass
	3				8.4					
	4				8.0					
	2				7.6					
5785	1	24	19.7	99	8.2	25.7	14.1	27.2	27.2	Pass
	3				8.5					
	4				7.9					
	2				7.7					
5825	1	24	19.7	99	8.0	24.4	13.9	27.2	27.2	Pass
	3				8.2					
	4				7.5					
	2				7.7					

MIMO Device 5725-5850 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
5755	1	24	38.0	99	5.7	13.7	11.4	27.2	27.2	Pass
	3				5.4					
	4				5.4					
	2				4.9					
5795	1	24	38.0	99	5.7	13.4	11.3	27.2	27.2	Pass
	3				5.3					
	4				5.2					
	2				4.8					

MIMO Device 5725-5850 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
5775	1	21	77.3	96.8	2.1	6.2	7.9	27.2	27.2	Pass
	3				2.0					
	4				1.6					
	2				1.2					

EMC Test Data

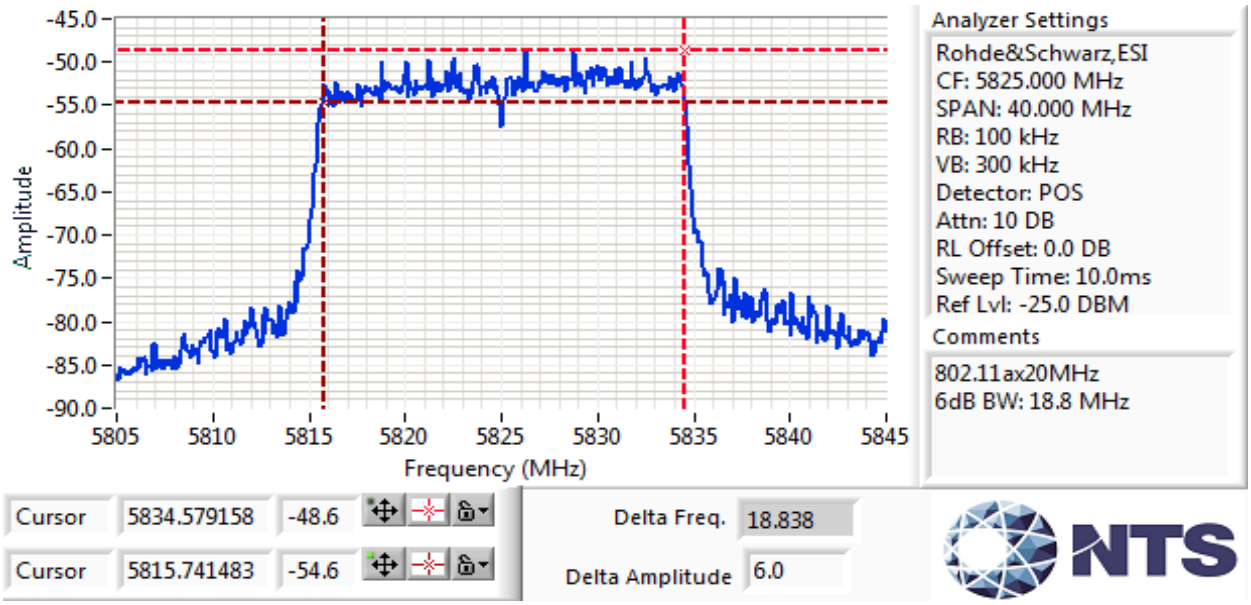
Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	T-Log Number:	TL-101106-RANA
		Project Manager:	Deepa Shetty
Contact:	Mark Rieger	Project Engineer:	David Bare
Standard:	FCC Part 15, RSS-247	Class:	N/A

Run #2: Signal Bandwidth

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

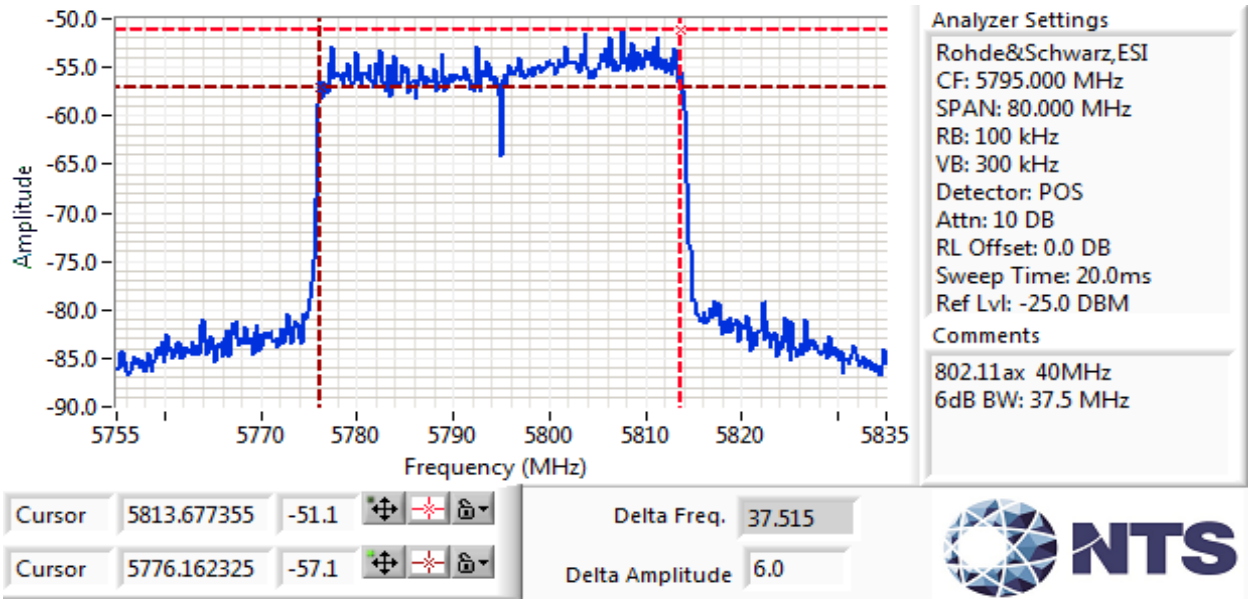
Mode: ax20

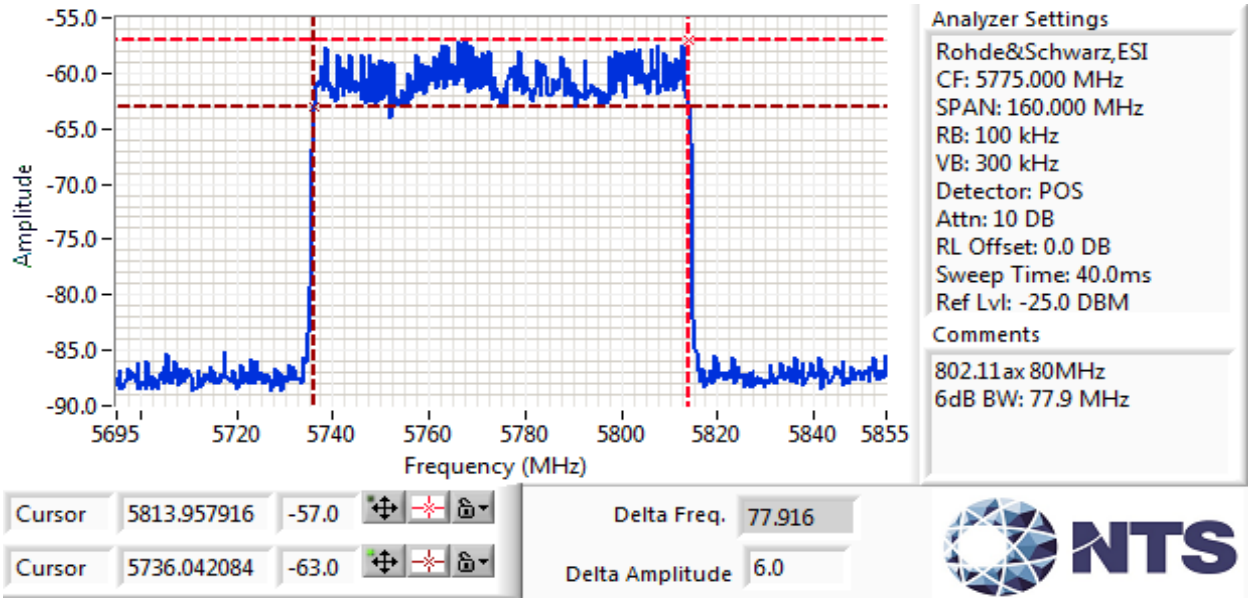
Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
		6dB		6dB	
24	5745	19.0		0.1	
24	5785	18.9		0.1	
24	5825	18.8		0.1	
24	5755	37.7		0.1	
24	5795	37.5		0.1	
21	5775	77.9		0.1	



EMC Test Data

Client:	Arris	PR Number:	PR101106
Model:	NVG5XDBAX	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





End of Report

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