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# *EMC Test Report*

## *Application for FCC Grant of Equipment Authorization*
## *Class III Permissive Change*

## *FCC Part 15, Subpart E*

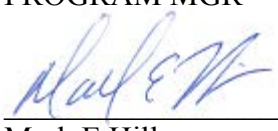
## *Model: BGW210-700 ARRIS DSL Wireless Residential Gateway*

| | |
|---|---|
| FCC ID: | PGRBGW210 |
| APPLICANT: | ARRIS<br>310 Providence Mine Road<br>Nevada City, CA 95959 |
| TEST SITE(S): | National Technical Systems - Silicon Valley<br>41039 Boyce Road.<br>Fremont, CA. 94538-2435 |
| IC SITE REGISTRATION #: | 2845B-4, 2845B-7 |
| REPORT DATE: | March 14, 2017 |
| REISSUE DATE: | March 24, 2017 |
| FINAL TEST DATES: | September 28-30, October 3-11, November 3, December 20-27, 2016 and January 5-6, 2017 |
| TOTAL NUMBER OF PAGES: | 209 |

A2LA ACCREDITED
Testing Cert #0214.26

## *VALIDATING SIGNATORIES*

PROGRAM MGR



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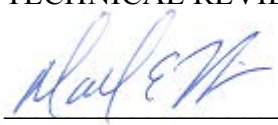

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## REVISION HISTORY

| Rev# | Date | Comments | Modified By |
|---|---|---|---|
| - | March 14, 2017 | First release | |
| 1.0 | March 22, 2017 | Corrected frequency band reference in the limit section. Clarified 11a in UNII1. Clarified spurious emissions performed. Clarified # of Spatial Streams used for spurious emissions. | MEH |

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## SCOPE

An electromagnetic emissions test has been performed on the ARRIS model BGW210-700 ARRIS DSL Wireless Residential Gateway, pursuant to the following rules:

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 - Silicon Valley test procedures:

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

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

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

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

Testing included in this report: (1) increase power for bandedge channels in UNII1, and (2) add operation in the DFS bands. The increase power in UNII1 is done via software change, and evaluation of increased number of spatial streams. Bandedge testing in the DFS bands also included evaluation for spatial streams.

## 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 BGW210-700 ARRIS DSL Wireless Residential Gateway complied with the requirements of the following regulations:

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 BGW210-700 ARRIS DSL Wireless Residential Gateway 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

| FCC Rule Part | | Description | Measured Value / Comments | Limit / Requirement | Result |
|---|---|---|---|---|---|
| 15.407 (a) (1) (ii) | | Output Power (Note 1) | n20: 26.9 dBm (495.4mW)<br>n40: 23.1 dBm (205.4mW)<br>ac80: 24.0 dBm (251mW)<br><br>(Max eirp: 2.21W) | 30 dBm<br>EIRP <= 4W | Complies |
| 15.407 (a) (1) (ii) | | Power Spectral Density | n20: 14.0 dBm/MHz<br>n40: 7.4 dBm/MHz<br>ac80: 5.1 dBm/MHz | 17 dBm/MHz | Complies |
| 15.407(b) (1) / 15.209 | | Spurious Emissions (Note 2) | 53.9 dBµV/m @ 5149.4 MHz (-0.1 dB) | Refer to the limits section (p22) for restricted bands, all others<br>-27 dBm/MHz EIRP | Complies |
| Note 1: No changes were made to the output power for the 11a mode. No testing was performed.<br>Note 2: Spurious emissions (non-bandedge) were not performed. The spurious emissions in the original filing were performed at higher output levels than the final power levels reported here. | | | | | |

### OPERATION IN THE 5.25 – 5.35 GHZ BAND

| FCC Rule Part | | Description | Measured Value / Comments | Limit / Requirement | Result (margin) |
|---|---|---|---|---|---|
| 15.407(a) (2) | | 26dB Bandwidth | >20MHz | N/A – limits output power if < 20MHz | N/A |
| 15.407(a) (2) | | Output Power | a: 21.1dBm (129.8mW)<br>n20: 21.4dBm (137.3mW)<br>n40: 23.7 dBm (232.1mW)<br>ac80: 23.4 dBm (218.9mW)<br><br>(Max eirp: 0.914W) | 24 dBm<br>(250 mW)<br>EIRP <= 1W | Complies |
| 15.407(a) (2) | | Power Spectral Density | a: 10.0 dBm/MHz<br>n20: 10.0 dBm/MHz<br>n40: 8.7 dBm/MHz<br>ac80: 6.6 dBm/MHz | 11 dBm/MHz | Complies |
| 15.407(b) (2) / 15.209 | | Spurious Emissions (Note 1) | 53.8 dBµV/m @ 5350.0 MHz (-0.2 dB) | Refer to the limits section (p22) for restricted bands, all others<br>-27 dBm/MHz EIRP | Complies |
| Note 1: Spurious emissions below 1GHz, and simultaneous transmission with the 2.4GHz radio was not performed, based on the results in the original filing. No spurious emissions below 1GHz or intermodulation products were observed. | | | | | |

***OPERATION IN THE 5.47 – 5.725 GHZ BAND***

| FCC Rule Part | | Description | Measured Value / Comments | Limit / Requirement | Result (margin) |
|---|---|---|---|---|---|
| 15.407(a) (2) | | 26dB Bandwidth | >20MHz | N/A – limits output power if < 20MHz | N/A |
| 15.407(a) (2) | | Output Power | 11a: 20.5dBm (112.2mW)<br>n20: 20.5dBm (112.3mW)<br>n40: 23.8dBm (238.9mW)<br>ac80: 23.9 dBm (247mW)<br><br>(Max eirp: 0.966W) | 24 dBm (250 mW)<br>EIRP <= 1W | Complies |
| 15.407(a) (2) | | Power Spectral Density | 11a: 9.9 dBm/MHz<br>n20: 9.5 dBm/MHz<br>n40: 9.6 dBm/MHz<br>ac80: 8.5 dBm/MHz | 11 dBm/MHz | Complies |
| 15.407(b) (3) / 15.209 | | Spurious Emissions | 53.6 dBµV/m @ 5459.5 MHz (-0.4 dB) | Refer to the limits section (p22) for restricted bands, all others<br>-27 dBm/MHz EIRP | Complies |
| Note 1: Spurious emissions below 1GHz, and simultaneous transmission with the 2.4GHz radio was not performed, based on the results in the original filing. No spurious emissions below 1GHz or intermodulation products were observed. | | | | | |

***REQUIREMENTS FOR ALL U-NII/LELAN BANDS***

| FCC Rule Part | | Description | Measured Value / Comments | Limit / Requirement | Result |
|---|---|---|---|---|---|
| 15.407 | | Modulation | Unchanged from original filing | | |
| 15.31 (m) | | 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) | | Operation in the absence of information to transmit | Unchanged from original filing | | |
| 15.407 (g) | | Frequency Stability | | | |
| 15.407 (h1) | | Transmit Power Control | TCP mechanism is discussed in the Operational Description | The U-NII device shall have the capability to operate with a mean EIRP value lower than 24dBm (250mW) | Complies |
| 15.407 (h2) | | Dynamic frequency Selection (device with radar detection) | Refer to separate test report, reference R103052 | Threshold -62dBm (-64dBm if eirp > 200mW)<br>Channel Availability Check > 60s<br>Channel closing transmission time < 260ms<br>Channel move time < 10s<br>Non occupancy period > 30minutes | Complies |

***GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS***

| FCC Rule Part | RSS Rule part | Description | Measured Value / Comments | Limit / Requirement | Result (margin) |
|---|---|---|---|---|---|
| 15.203 | - | RF Connector | Antennas are internal to the device | Unique or integral antenna required | Complies |
| 15.407 (b) (6) | RSS-Gen Table 3 | AC Conducted Emissions | Unchanged from original filing | | |
| 15.247 (i) 15.407 (f) | RSS 102 | RF Exposure Requirements | Refer to MPE calculations in separate exhibit | Refer to OET 65, FCC Part 1 and RSS 102 | Complies |

***MEASUREMENT UNCERTAINTIES***

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

| Measurement Type | 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 BGW210-700 ARRIS DSL Wireless Residential Gateway is a uDSL Wireless Residential Gateway that is designed to connect to a PSTN Telecommunications network supporting a bonded VDSL2 connection. The electrical rating of the EUT is 12 Volts, 3 Amps DC. It is supplied by an external AC/DC power supply.

The sample was received on September 14, 2016 and tested on September 28-30, October 3-11, November 3, December 20-27, 2016 and January 5-6, 2017. The EUT consisted of the following component(s):

| Company | Model | Description | Serial Number | FCC ID |
|---|---|---|---|---|
| ARRIS | BGW210-700 | uDSL Wireless Residential Gateway | Refer to test data | PGRBGW210 |
| DIRECTV | EPS36R0-16 | AC/DC Adapter | D36HAKM001368 | N/A |

### OTHER EUT DETAILS

2.4GHz radio –802.11bgn (20/40MHz)
Only transmits in 3Tx mode, supports 1 to 3 spatial streams
Beamforming is supported for 11n 20 and 40MHz operation
5GHz radio – 802.11abgn/ac (20/40/80MHz)
Only transmits in 4Tx mode, supports 1 to 4 spatial streams
Beamforming supported for 11n/ac 20, 40, 80MHz operation
Simultaneous transmission of 2.4 and 5GHz supported.

### ANTENNA SYSTEM

2.4GHz – three stamped metal antennas. Two are mounted on the interior of the enclosure and one is mounted directly to the motherboard. Peak Gains: 3.11dBi, 3.665dBi, 3.653dBi.

5GHz – four stamped metal antennas. One is mounted on the interior of the enclosure and three are mounted directly to the motherboard.

### ENCLOSURE

The EUT enclosure measures approximately 25cm by 20cm by 6cm. It is primarily constructed of uncoated plastic.

### 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 |
|---|---|---|---|---|
| | - | None | - | - |

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

| Company | Model | Description | Serial Number | FCC ID |
|---|---|---|---|---|
| Dell | Latitude 1311 | Laptop | - | - |

***EUT INTERFACE PORTS***

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

| Port | Connected To | Cable(s) | | |
|---|---|---|---|---|
| | | Description | Shielded or Unshielded | Length(m) |
| Ethernet 1 | Laptop | RJ45 | Unshielded | 10.0 |
| Ethernet 2,3,4 | Unterminated | RJ45 | Unshielded | 2.0 |
| USB 1,2 | Unterminated | USB | Shielded | 2.0 |
| Broadband | Unterminated | RJ11 | Unshielded | 2.0 |
| Phone Lines 1&2 | Unterminated | RJ11 | Unshielded | 2.0 |
| DC In | Power Supply DC out | 2-wire | Unshielded | 1.0 |
| Power Supply AC in | AC mains | 2-wire | Unshielded | 1.5 |

***EUT OPERATION***

During testing, the EUT was configured to continuously transmit at the maximum output power. Channel, data rate, and mode is detailed in the test results.

For radiated beamforming testing, the EUT was configured to establish a connection with a remote client located behind the measurement antenna and data was streamed from the EUT to the client.

Note, antenna port measurements for beamforming operation were performed using the test mode commands since the rf spectrum emissions are identical to non-beamforming transmissions.

## TEST SITE

### GENERAL INFORMATION

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

| Site | Designation / Registration Numbers | | Location |
|---|---|---|---|
| | FCC | Canada | |
| Chamber 3 | US0027 | 2845B-3 | 41039 Boyce Road<br>Fremont,<br>CA 94538-2435 |
| Chamber 4 | US0027 | 2845B-4 | |
| Chamber 5 | US0027 | 2845B-5 | |
| Chamber 7 | US0027 | 2845B-7 | |

ANSI C63.4 recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement. The test site(s) contain separate areas for radiated and conducted emissions testing. 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 1GHz, and at 1.5m for testing above 1GHz. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor as specified in ANSI C63.4. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

***INSTRUMENT CALIBRATION***

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

## TEST PROCEDURES

### EUT AND CABLE PLACEMENT

The regulations require that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.10, and the worst-case orientation is used for final measurements.

### CONDUCTED EMISSIONS

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

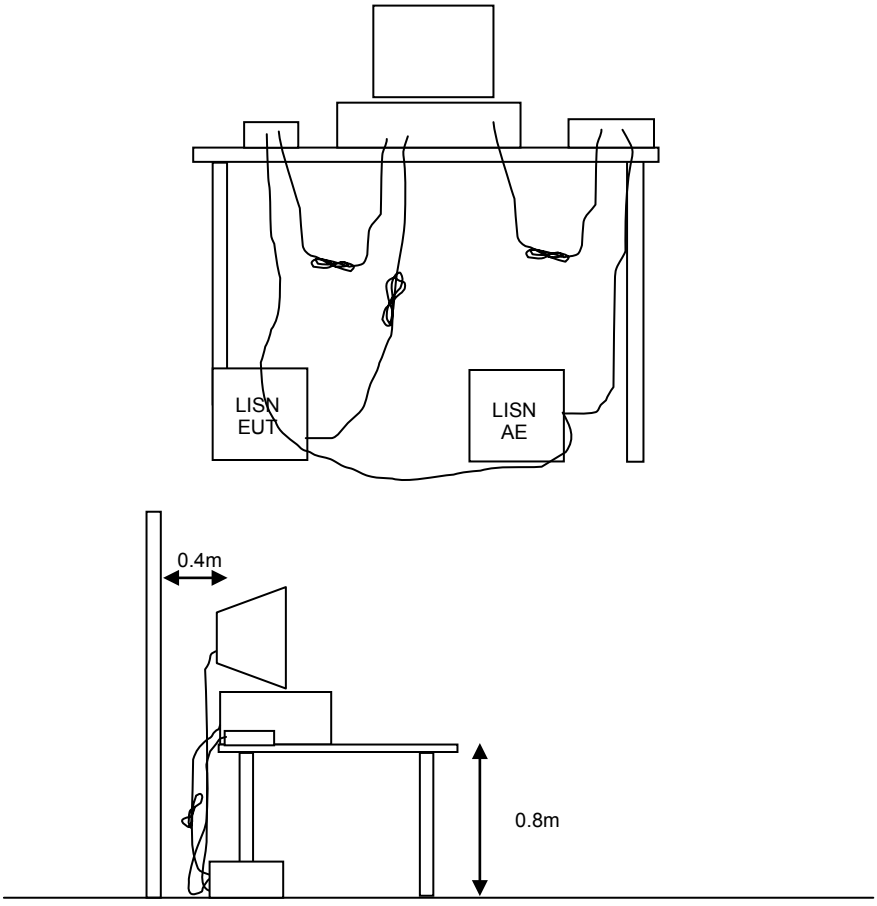



**Figure 1 Typical Conducted Emissions Test Configuration**

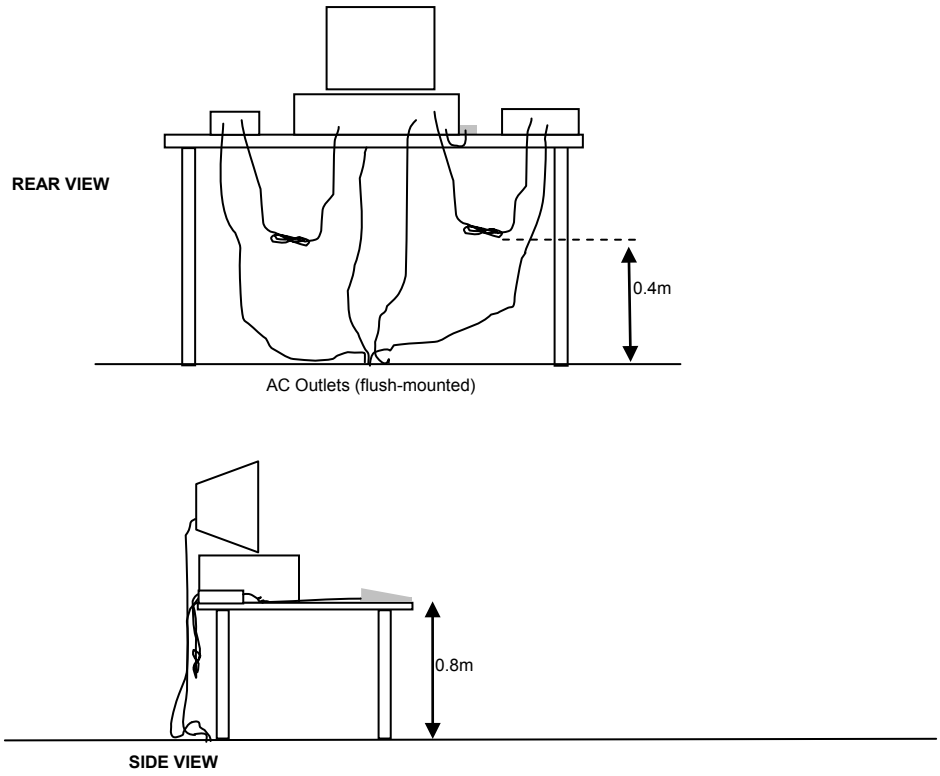
***RADIATED EMISSIONS***

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

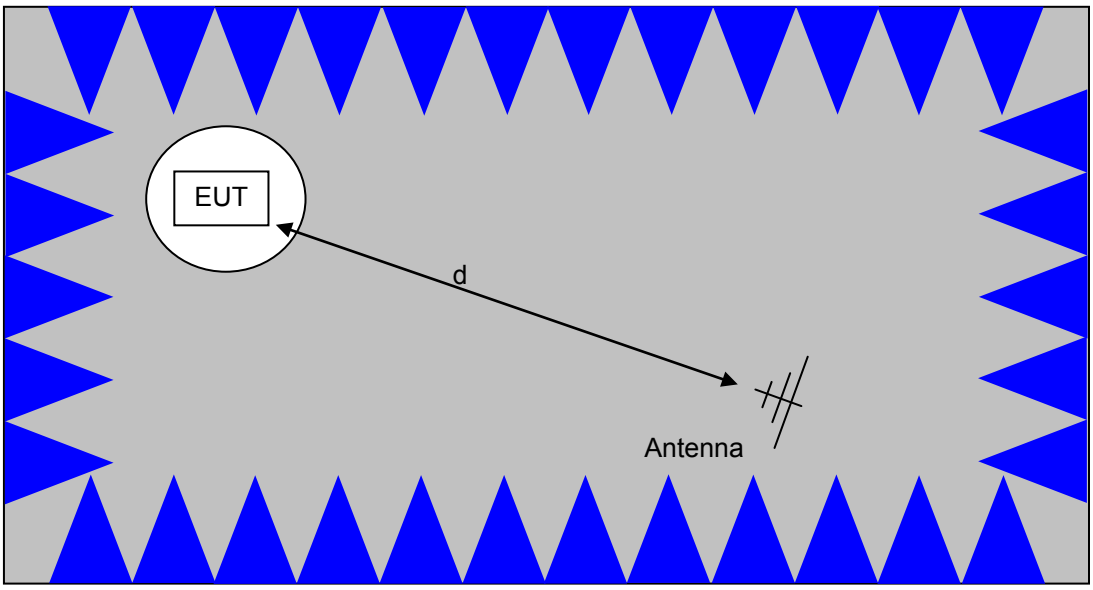
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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

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

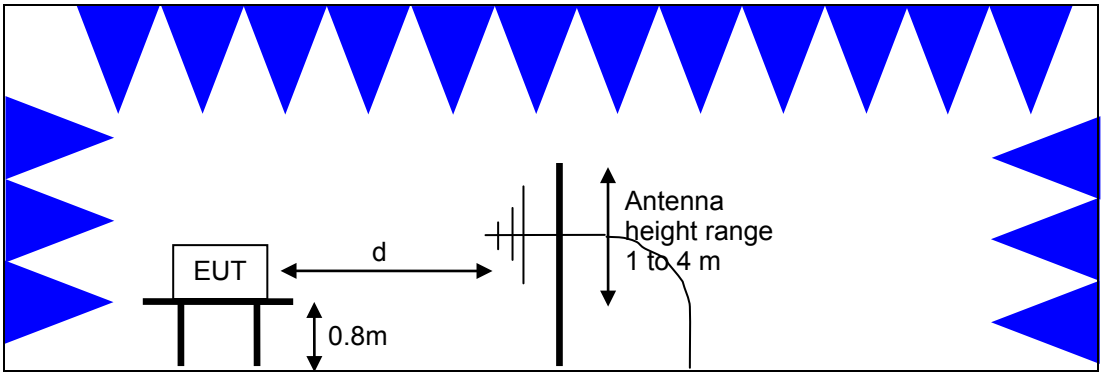



Typical Test Configuration for Radiated Field Strength Measurements




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

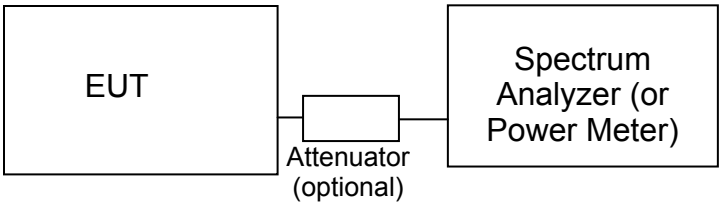
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.




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

***CONDUCTED EMISSIONS FROM ANTENNA PORT***

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




Test Configuration for Antenna Port Measurements

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

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

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

***BANDWIDTH MEASUREMENTS***

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

***SPECIFICATION LIMITS AND SAMPLE CALCULATIONS***

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

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

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

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

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

***GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS***

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

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

***RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS***

The table below shows the limits for the spurious emissions from receivers as detailed in FCC Part 15.109 and RSS GEN Table 2. Note that receivers operating outside of the frequency range 30 MHz – 960 MHz are exempt from the requirements of 15.109 and receivers that are not stand-alone are exempt from the ISED Canada requirements per RSS-GEN.

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

[1] The restricted bands are detailed in FCC 15.205 and RSS-Gen Table 6

### FCC 15.407 (a) OUTPUT POWER LIMITS

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

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

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.

### 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.

### 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

T102846

| Manufacturer | Description | Model | Asset # | Calibrated | Cal Due |
|---|---|---|---|---|---|
| **Radiated Emissions, 1 - 6 GHz, 28-Sep-16** | | | | | |
| NTS | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| EMCO | Antenna, Horn, 1-18GHz | 3115 | 868 | 6/30/2016 | 6/30/2018 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB7 | 1756 | 6/29/2016 | 6/29/2017 |
| **Radiated Spurious Emissions, 1,000 - 40,000 MHz, 30-Sep-16** | | | | | |
| NTS | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| Hewlett Packard | Microwave Preamplifier, 1-26.5GHz | 8449B | 785 | 10/12/2015 | 10/12/2016 |
| EMCO | Antenna, Horn, 1-18GHz | 3115 | 868 | 6/30/2016 | 6/30/2018 |
| Hewlett Packard | Spectrum Analyzer (SA40) Blue 9 kHz - 40 GHz | 8564E (84125C) | 1393 | 3/28/2016 | 3/28/2017 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB7 | 1756 | 6/29/2016 | 6/29/2017 |
| Micro-Tronics | Band Reject Filter, 5150-5350 MHz | BRC50703-02 | 2251 | 9/19/2016 | 9/19/2017 |
| **Radiated Emissions, 1,000 - 40,000 MHz, 30-Sep-16** | | | | | |
| NTS | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| Micro-Tronics | Band Reject Filter, 5470-5725 MHz | BRC50704-02 | 2240 | 9/20/2016 | 9/20/2017 |
| Hewlett Packard | Microwave Preamplifier, 1-26.5GHz | 8449B | 785 | 10/12/2015 | 10/12/2016 |
| EMCO | Antenna, Horn, 1-18GHz | 3115 | 868 | 6/30/2016 | 6/30/2018 |
| Hewlett Packard | Spectrum Analyzer (SA40) Blue 9 kHz - 40 GHz | 8564E (84125C) | 1393 | 3/28/2016 | 3/28/2017 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB7 | 1756 | 6/29/2016 | 6/29/2017 |
| Micro-Tronics | Band Reject Filter, 5150-5350 MHz | BRC50703-02 | 2251 | 9/19/2016 | 9/19/2017 |
| **Radiated Emissions, 1,000 - 40,000 MHz, 03-Oct-16** | | | | | |
| NTS | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| Micro-Tronics | Band Reject Filter, 5470-5725 MHz | BRC50704-02 | 2240 | 9/20/2016 | 9/20/2017 |
| Hewlett Packard | Microwave Preamplifier, 1-26.5GHz | 8449B | 785 | 10/12/2015 | 10/12/2016 |
| EMCO | Antenna, Horn, 1-18GHz | 3115 | 868 | 6/30/2016 | 6/30/2018 |
| Hewlett Packard | Spectrum Analyzer (SA40) Blue 9 kHz - 40 GHz | 8564E (84125C) | 1393 | 3/28/2016 | 3/28/2017 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB7 | 1756 | 6/29/2016 | 6/29/2017 |
| Micro-Tronics | Band Reject Filter, 5150-5350 MHz | BRC50703-02 | 2251 | 9/19/2016 | 9/19/2017 |
| Hewlett Packard | High Pass filter, 8.2 GHz | P/N 84300-80039 | 1152 | 6/28/2016 | 6/28/2017 |
| HP / Miteq | SA40 Head (Blue) | TTA1840-45-5P-HG-S | 1620 | 3/8/2016 | 3/8/2017 |
| Micro-Tronics | Band Reject Filter, 5725-5875 MHz | BRC50705-02 | 1682 | 5/9/2016 | 5/9/2017 |
| A. H. Systems | Red System Horn, 18-40GHz | SAS-574, p/n: 2581 | 2161 | 7/16/2015 | 7/16/2017 |

| Manufacturer | Description | Model | Asset # | Calibrated | Cal Due |
|---|---|---|---|---|---|
| Micro-Tronics | Band Reject Filter, 5470-5725 MHz | BRC50704-02 | 2240 | 9/20/2016 | 9/20/2017 |
| **Radiated Emissions, 1,000 - 18,000 MHz, 04-Oct-16** | | | | | |
| NTS | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| Hewlett Packard | Microwave Preamplifier, 1-26.5GHz | 8449B | 785 | 10/12/2015 | 11/12/2016 |
| EMCO | Antenna, Horn, 1-18GHz | 3115 | 868 | 6/30/2016 | 6/30/2018 |
| Hewlett Packard | High Pass filter, 8.2 GHz | P/N 84300-80039 | 1152 | 6/28/2016 | 6/28/2017 |
| Hewlett Packard | Spectrum Analyzer (SA40) Blue 9 kHz - 40 GHz | 8564E (84125C) | 1393 | 3/28/2016 | 3/28/2017 |
| Micro-Tronics | Band Reject Filter, 5725-5875 MHz | BRC50705-02 | 1682 | 5/9/2016 | 5/9/2017 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB7 | 1756 | 6/29/2016 | 6/29/2017 |
| Micro-Tronics | Band Reject Filter, 5470-5725 MHz | BRC50704-02 | 2240 | 9/20/2016 | 9/20/2017 |
| **Radiated Emissions, 30 - 1,000 MHz, 04-Oct-16** | | | | | |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB7 | 1538 | 12/19/2015 | 12/19/2016 |
| Sunol Sciences | Biconilog, 30-3000 MHz | JB3 | 2197 | 9/9/2015 | 9/9/2017 |
| Com-Power | Preamplifier, 30-1000 MHz | PA-103 | 2465 | 9/16/2016 | 9/16/2017 |
| **Radiated Emissions, 1000 - 40,000 MHz, 04-Oct-16** | | | | | |
| Hewlett Packard | Microwave Preamplifier, 1-26.5GHz | 8449B | 785 | 10/12/2015 | 11/12/2016 |
| EMCO | Antenna, Horn, 1-18GHz | 3115 | 868 | 6/30/2016 | 6/30/2018 |
| Hewlett Packard | High Pass filter, 8.2 GHz | P/N 84300-80039 | 1152 | 6/28/2016 | 6/28/2017 |
| Hewlett Packard | Spectrum Analyzer (SA40) Blue 9 kHz - 40 GHz | 8564E (84125C) | 1393 | 3/28/2016 | 3/28/2017 |
| HP / Miteq | SA40 Head (Blue) | TTA1840-45-5P-HG-S | 1620 | 3/8/2016 | 3/8/2017 |
| Micro-Tronics | Band Reject Filter, 5725-5875 MHz | BRC50705-02 | 1682 | 5/9/2016 | 5/9/2017 |
| A. H. Systems | Red System Horn, 18-40GHz | SAS-574, p/n: 2581 | 2161 | 7/16/2015 | 7/16/2017 |
| Micro-Tronics | Band Reject Filter, 2400-2500 MHz | BRM50702-02 | 2238 | 9/19/2016 | 9/19/2017 |
| Micro-Tronics | Band Reject Filter, 5150-5350 MHz | BRC50703-02 | 2251 | 9/19/2016 | 9/19/2017 |
| **Radio Antenna Port (Power and Spurious Emissions), 06-Oct-16 thru 12-Oct-16** | | | | | |
| NTS | NTS UNII Power Software (rev 3.8) | N/A | 0 | | N/A |
| NTS | NTS Capture Analyzer Software (rev 3.8) | N/A | 0 | | N/A |
| Agilent Technologies | PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX, | E4446A | 2139 | 6/24/2016 | 6/24/2017 |
| **Radio Antenna Port (Power and Spurious Emissions), 04-Nov-16** | | | | | |
| Agilent Technologies | 3Hz -44GHz PSA Spectrum Analyzer | E4446A | 2796 | 5/6/2016 | 5/6/2017 |

T103599

| Manufacturer | Description | Model | Asset # | Calibrated | Cal Due |
|---|---|---|---|---|---|
| **Radiated Spurious Emissions, 1000 - 6,000 MHz, 20-Dec-16 and 22-Dec-16** | | | | | |
| NTS | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Red) | 3115 | 1142 | 9/29/2016 | 9/29/2018 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB7 | 9482 | 10/28/2016 | 10/28/2017 |
| **Band Edge , 27-Dec-16** | | | | | |
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Red) | 3115 | 1142 | 9/29/2016 | 9/29/2018 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB7 | 9482 | 10/28/2016 | 10/28/2017 |
| **Radiated Emissions, 1000 - 6,000 MHz, 04-Jan-17** | | | | | |
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Red) | 3115 | 1142 | 9/29/2016 | 9/29/2018 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-40 GHz | ESIB40 (1088.7490.40) | 2493 | 2/20/2016 | 2/20/2017 |
| **Radiated Spurious Emissions, 1000 - 6,500 MHz, 05-Jan-17** | | | | | |
| NTS | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| NTS | NTS Capture Analyzer Software (rev 3.8) | N/A | 0 | | N/A |
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Red) | 3115 | 1142 | 9/29/2016 | 9/29/2018 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-40 GHz | ESIB40 (1088.7490.40) | 2493 | 2/20/2016 | 2/20/2017 |
| **Radio Antenna Port (Power and Spurious Emissions), 06-Jan-17** | | | | | |
| Rohde & Schwarz | Signal Analyzer 20 Hz - 26.5 GHz | FSQ26 | 2327 | 6/17/2016 | 6/17/2017 |
| Rohde & Schwarz | Open Switch and Control Unit, p/s | OSP120 with B157 | 3000 | 6/16/2016 | 6/16/2017 |

# Appendix B Test Data

T102846 Pages 30 – 115
T103599 Pages 116 – 208

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Product | BGW210-700 | T-Log Number: | T102846 |
| System Configuration: | - | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Emissions Standard(s): | FCC 15.B, 15.247, 15.407 | Class: | B |
| Immunity Standard(s): | - | Environment: | - |

# EMC Test Data

For The

# ARRIS

Product

BGW210-700

Date of Last Test: 12/7/2016

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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: 21.9 °C
Rel. Humidity: 52 %

## Summary of Results

| Run # | Mode | Channel | Target Power | Passing Power Setting | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| 20MHz Bandwith Modes | | | | | | | |
| 2 | a | 60 - 5300MHz | 23 | 23 | Restricted Band Edge at 5350 MHz | 15.209 | 52.7 dBµV/m @ 5350.1 MHz (-1.3 dB) |
| | a | 64 - 5320MHz | 23 | 19 | Restricted Band Edge at 5350 MHz | 15.209 | 53.3 dBµV/m @ 5351.0 MHz (-0.7 dB) |
| 3 | a | 100 - 5500MHz | 23 | 23 | Restricted Band Edge at 5460 MHz | 15.209 | 52.3 dBµV/m @ 5455.6 MHz (-1.7 dB) |
| | a | 100 - 5500MHz | 23 | 23 | Band Edge 5460 - 5470 MHz | 15E | 66.6 dBµV/m @ 5469.8 MHz (-1.7 dB) |
| | a | 136 - 5680MHz | 23 | 23 | Band Edge 5725MHz | 15E | 64.5 dBµV/m @ 5725.2 MHz (-3.8 dB) |
| | a | 140 - 5700MHz | 23 | 20 | Band Edge 5725MHz | 15E | 66.7 dBµV/m @ 5725.2 MHz (-1.6 dB) |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

## Summary of Results

| Run # | Mode | Channel | Target Power | Passing Power Setting | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| 6 | n20 | 64 - 5320MHz | 23 | 21 | Restricted Band Edge at 5350 MHz | 15.209 | 53.1 dBµV/m @ 5351.0 MHz (-0.9 dB) |
| 7 | n20 | 100 - 5500MHz | 23 | 21 | Restricted Band Edge at 5460 MHz | 15.209 | 52.2 dBµV/m @ 5460.0 MHz (-1.8 dB) |
| | n20 | 100 - 5500MHz | 23 | 21 | Band Edge 5460 - 5470 MHz | 15E | 67.5 dBµV/m @ 5460.9 MHz (-0.8 dB) |
| | n20 | 136 - 5680MHz | 23 | 23 | Band Edge 5725MHz | 15E | 65.2 dBµV/m @ 5728.6 MHz (-3.1 dB) |
| | n20 | 140 - 5700MHz | 23 | 20 | Band Edge 5725MHz | 15E | 67.1 dBµV/m @ 5730.5 MHz (-1.2 dB) |
| 40MHz Bandwith Modes | | | | | | | |
| 11 | n40 | 110 - 5550MHz | 23 | 23 | Restricted Band Edge at 5460 MHz | 15.209 | 47.7 dBµV/m @ 5453.0 MHz (-6.3 dB) |
| | n40 | 110 - 5550MHz | 23 | 23 | Band Edge 5460 - 5470 MHz | 15E | 64.9 dBµV/m @ 5467.4 MHz (-3.4 dB) |
| | n40 | 134 - 5670MHz | 23 | 23 | Band Edge 5725MHz | 15E | 66.3 dBµV/m @ 5729.3 MHz (-2.0 dB) |
| 80MHz Bandwith Modes | | | | | | | |
| 16 | ac80 | 122 - 5610MHz | 23 | 23 | Restricted Band Edge at 5460 MHz | 15.209 | 49.3 dBµV/m @ 5458.0 MHz (-4.7 dB) |
| | ac80 | 122 - 5610MHz | 23 | 23 | Band Edge 5460 - 5470 MHz | 15E | 62.0 dBµV/m @ 5460.4 MHz (-6.3 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.

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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) |
|---|---|---|---|---|---|---|---|
| 11a | 6Mbs | 0.89 | Yes | 0.558 | 0.51 | 1.01 | 1792 |
| n20 | MSC0 | 0.99 | Yes | 4.96 | 0 | 0 | 10 |
| n40 | MCS0 | 0.97 | Yes | 2.408 | 0.11 | 0.22 | 415 |
| ac80 | VHT0 | 0.96 | Yes | 1.139 | 0.19 | 0.37 | 878 |

## Sample Notes

Sample S/N: 184795206016480
Driver:
Antenna: 4x4 internal

## 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 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 5: | Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements. |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 9/29/2016
Test Engineer: Rafael Varelas
Test Location: Fremont CH #7

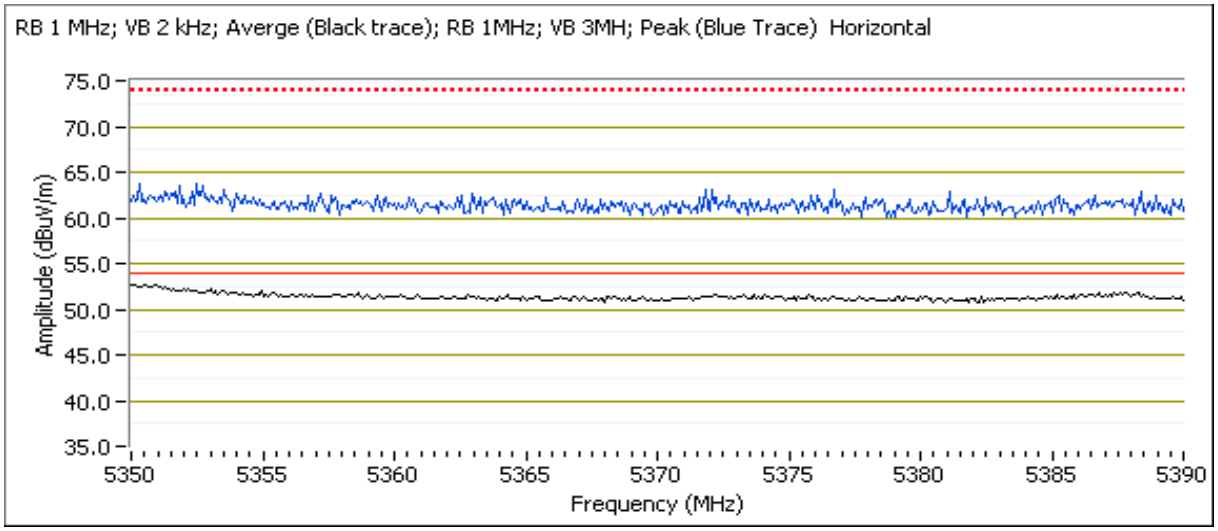
Config. Used: 1
Config Change: None
EUT Voltage: 120V/60Hz

Channel: 60 - 5300MHz
Tx Chain: 4Tx
Mode: a
Data Rate: 6 Mbs

EUT Orientation: Flat
Power setting: 23

*5350 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5350.090 | 52.7 | H | 54.0 | -1.3 | Avg | 360 | 1.2 | POS; RB 1 MHz; VB: 2 kHz |
| 5356.340 | 63.8 | H | 74.0 | -10.2 | PK | 360 | 1.2 | POS; RB 1 MHz; VB: 3 MHz |



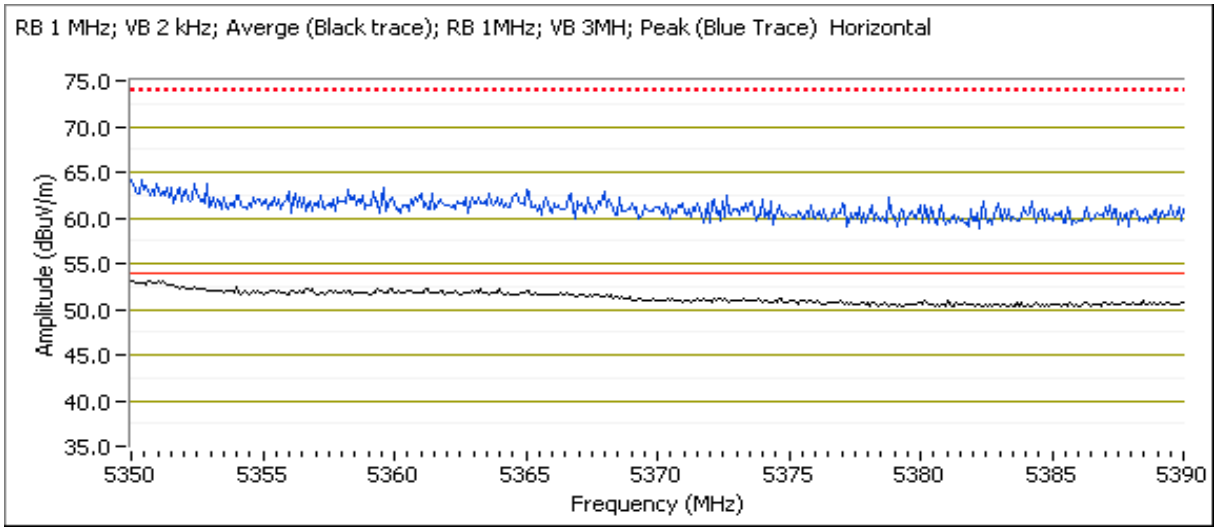
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 64 - 5320MHz
Tx Chain: 4Tx
Mode: a
Data Rate: 6 Mbs

EUT Orientation: Flat
Power setting: 19

*5350 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5350.990 | 53.3 | H | 54.0 | -0.7 | Avg | 360 | 1.2 | POS; RB 1 MHz; VB: 2 kHz |
| 5350.870 | 64.7 | H | 74.0 | -9.3 | PK | 360 | 1.2 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 9/29/2016
Test Engineer: Rafael Varelas
Test Location: Fremont CH #7

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

Channel: 100 - 5500MHz
Tx Chain: 4Tx
Mode: a
Data Rate: 6 Mbs

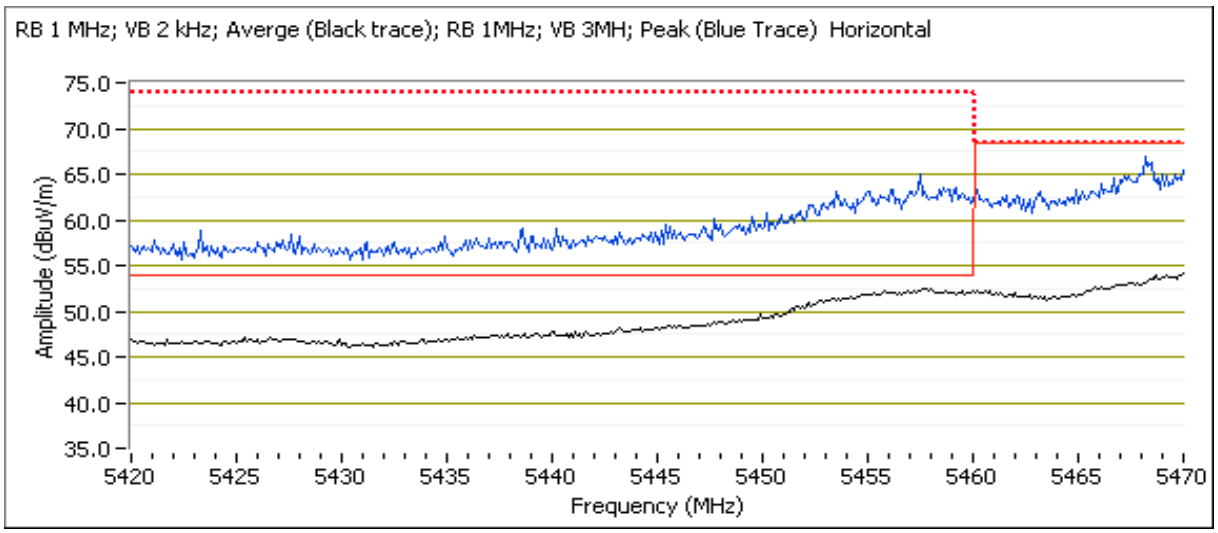
EUT Orientation: Flat
Power setting: 23

*5460 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5455.640 | 52.3 | H | 54.0 | -1.7 | Avg | 0 | 1.5 | POS; RB 1 MHz; VB: 2 kHz |
| 5458.170 | 65.1 | H | 74.0 | -8.9 | PK | 0 | 1.5 | POS; RB 1 MHz; VB: 3 MHz |

*5470 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5469.760 | 66.6 | H | 68.3 | -1.7 | PK | 0 | 1.5 | POS; RB 1 MHz; VB: 3 MHz |



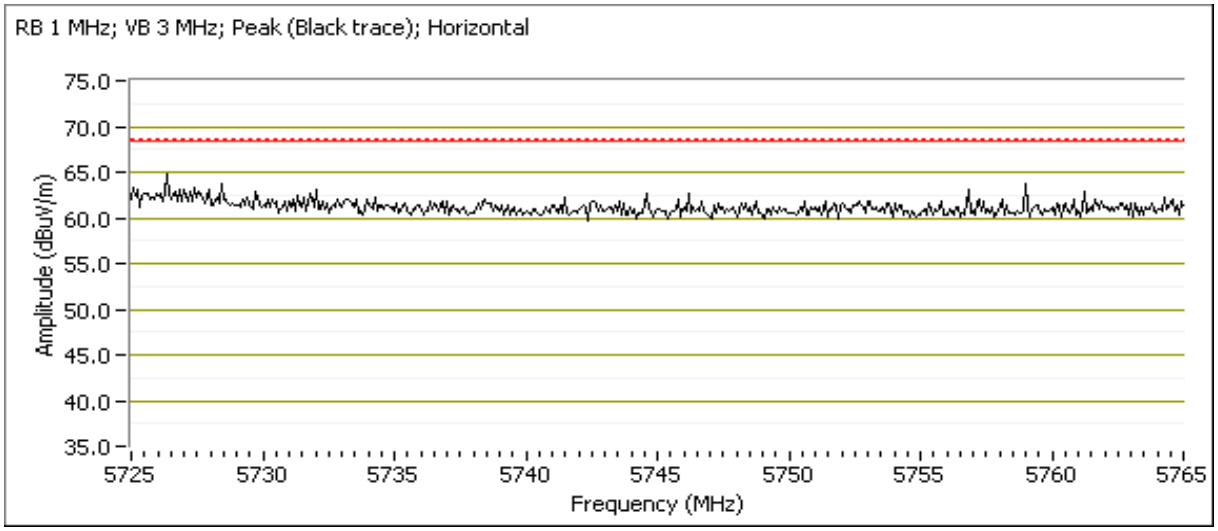
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 136 - 5680MHz
Tx Chain: 4Tx
Mode: a
Data Rate: 6 Mbs

EUT Orientation: Flat
Power setting: 23

*5725 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5725.240 | 64.5 | H | 68.3 | -3.8 | PK | 350 | 1.6 | POS; RB 1 MHz; VB: 3 MHz |



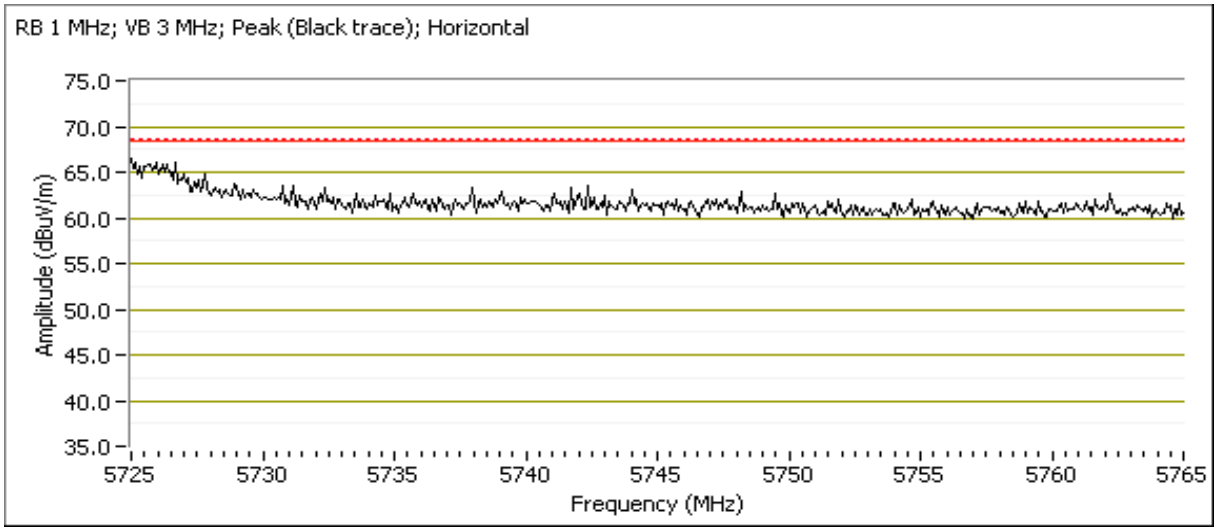
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 140 - 5700MHz
Tx Chain: 4Tx
Mode: a
Data Rate: 6 Mbs

EUT Orientation: Flat
Power setting: 20

*5725 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5725.160 | 66.7 | H | 68.3 | -1.6 | PK | 350 | 1.6 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 9/29/2016
Test Engineer: Rafael Varelas
Test Location: Fremont CH #7

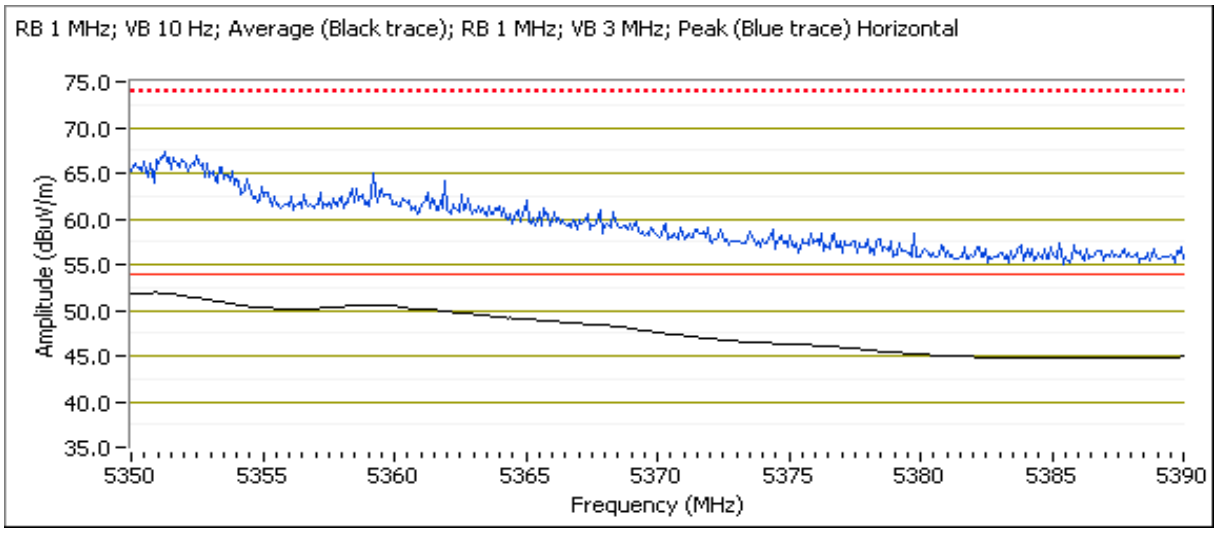
Config. Used: 1
Config Change: None
EUT Voltage: 120V/60Hz

Channel: 64 - 5320MHz
Tx Chain: 4Tx
Mode: n20
Data Rate: MCS0

EUT Orientation: Flat
Power setting: 21

*5350 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5350.960 | 53.1 | H | 54.0 | -0.9 | AVG | 0 | 1.8 | POS; RB 1 MHz; VB: 10 Hz |
| 5351.200 | 67.8 | H | 74.0 | -6.2 | PK | 0 | 1.8 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 9/29/2016
Test Engineer: Rafael Varelas
Test Location: Fremont CH #7

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

Channel: 100 - 5500MHz
Tx Chain: 4Tx
Mode: n20
Data Rate: MCS0

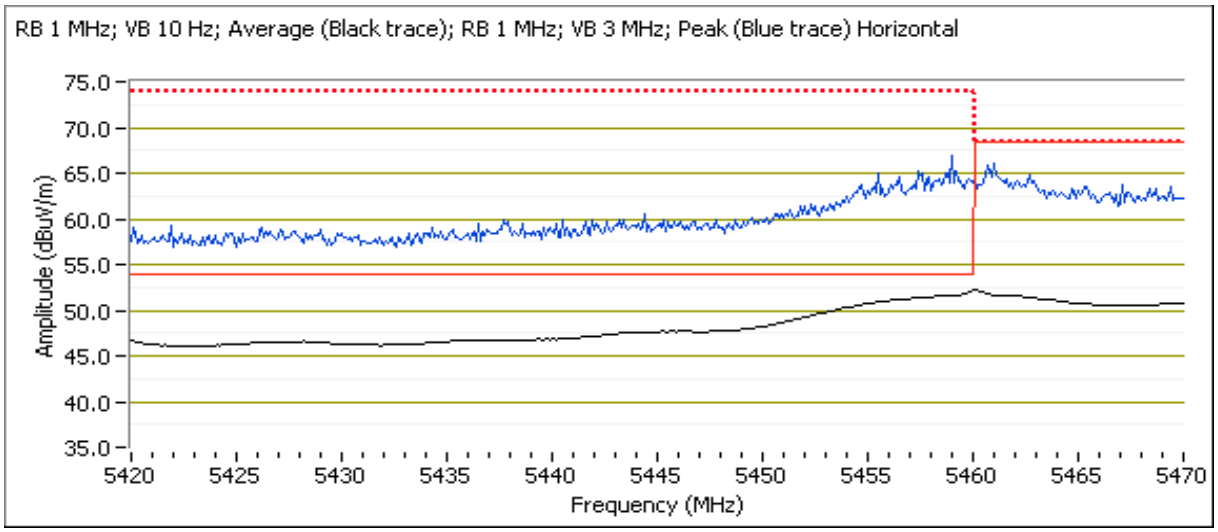
EUT Orientation: Flat
Power setting: 21

*5460 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5460.000 | 52.2 | H | 54.0 | -1.8 | AVG | 154 | 1.7 | POS; RB 1 MHz; VB: 10 Hz |
| 5459.120 | 65.3 | H | 74.0 | -8.7 | PK | 154 | 1.7 | POS; RB 1 MHz; VB: 3 MHz |

*5470 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5460.900 | 67.5 | H | 68.3 | -0.8 | PK | 154 | 1.7 | POS; RB 1 MHz; VB: 3 MHz |



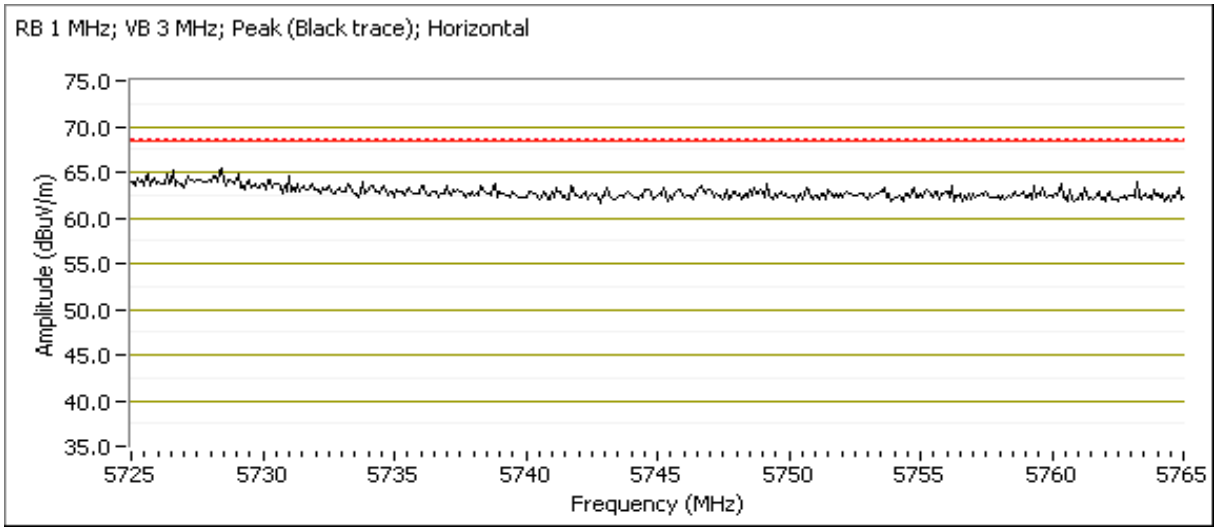
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 136 - 5680MHz
Tx Chain: 4Tx
Mode: n20
Data Rate: MCS0

EUT Orientation: Flat
Power setting: 23

*5725 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5728.610 | 65.2 | H | 68.3 | -3.1 | PK | 360 | 1.6 | POS; RB 1 MHz; VB: 3 MHz |



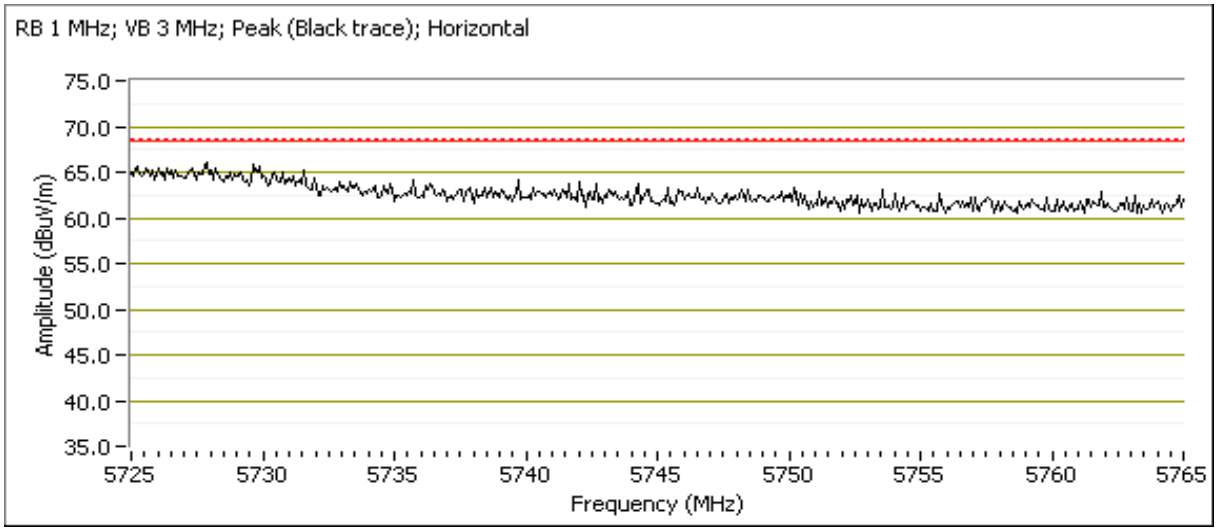
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 140 - 5700MHz
Tx Chain: 4Tx
Mode: n20
Data Rate: MCS0

EUT Orientation: Flat
Power setting: 20

*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 | |
| 5730.450 | 67.1 | H | 68.3 | -1.2 | PK | 360 | 1.6 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 9/29/2016
Test Engineer: Rafael Varelas
Test Location: Fremont CH #7

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

Channel: 110 - 5550MHz
Tx Chain: 4Tx
Mode: n40
Data Rate: MCS0

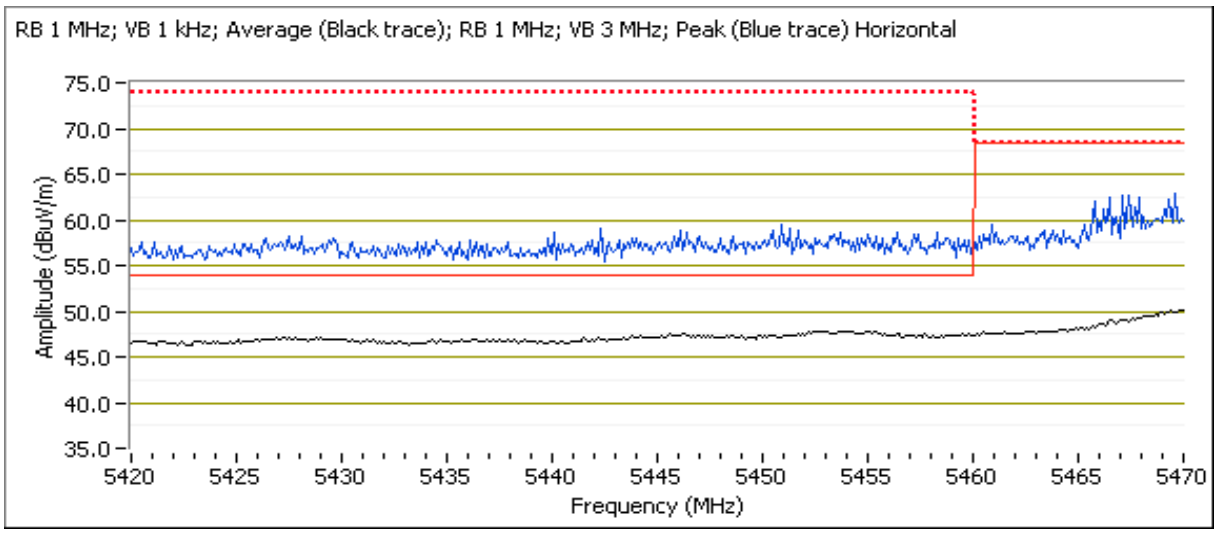
EUT Orientation: Flat
Power setting: 23

*5460 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5452.950 | 47.7 | H | 54.0 | -6.3 | Avg | 158 | 1.7 | POS; RB 1 MHz; VB: 1 kHz |
| 5455.670 | 59.5 | H | 74.0 | -14.5 | PK | 158 | 1.7 | POS; RB 1 MHz; VB: 3 MHz |

*5470 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5467.370 | 64.9 | H | 68.3 | -3.4 | PK | 158 | 1.7 | POS; RB 1 MHz; VB: 3 MHz |



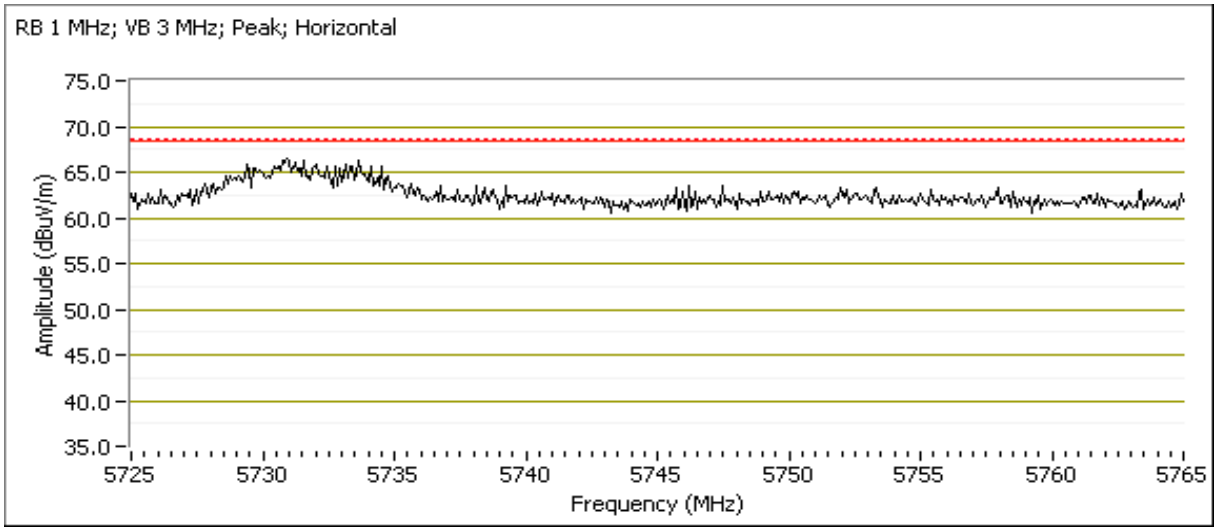
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 134 - 5670MHz
Tx Chain: 4Tx
Mode: n40
Data Rate:

EUT Orientation: Flat
Power setting: 23

*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 | |
| 5729.250 | 66.3 | H | 68.3 | -2.0 | PK | 163 | 1.5 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 9/30/2016 0:00
Test Engineer: John Caizzi & Kevin Wen
Test Location: Chamber 7

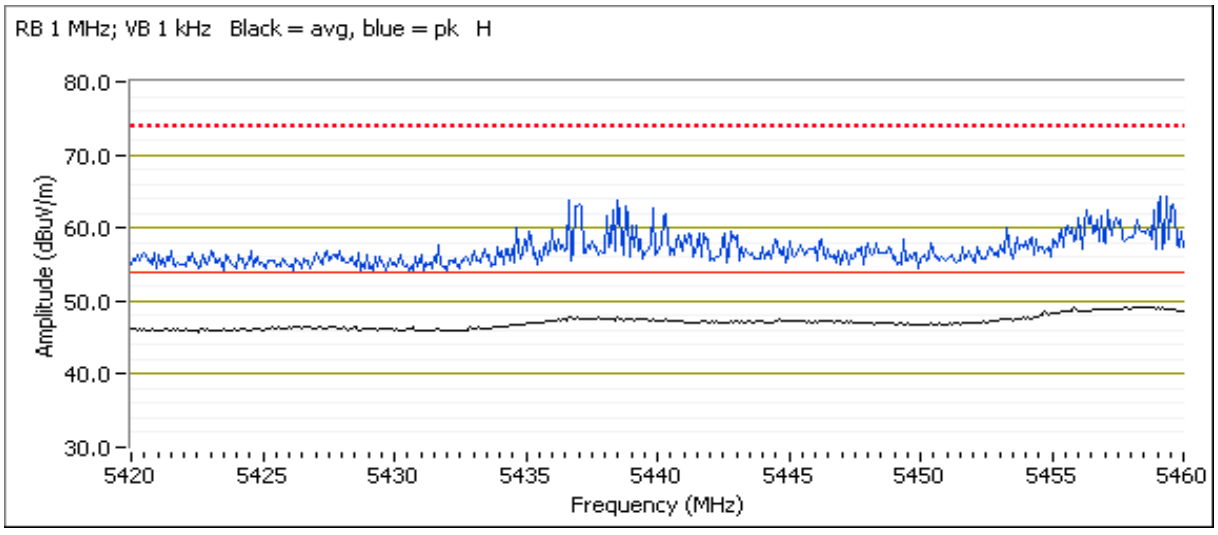
Config. Used: 1
Config Change: none
EUT Voltage: 120V / 60Hz

Channel: 122 - 5610 MHz
Tx Chain: 4Tx
Mode: ac80
Data Rate: MCS0

EUT Orientation: Flat
Power setting: 23

*5460 MHz Band Edge Signal Radiated Field Strength*

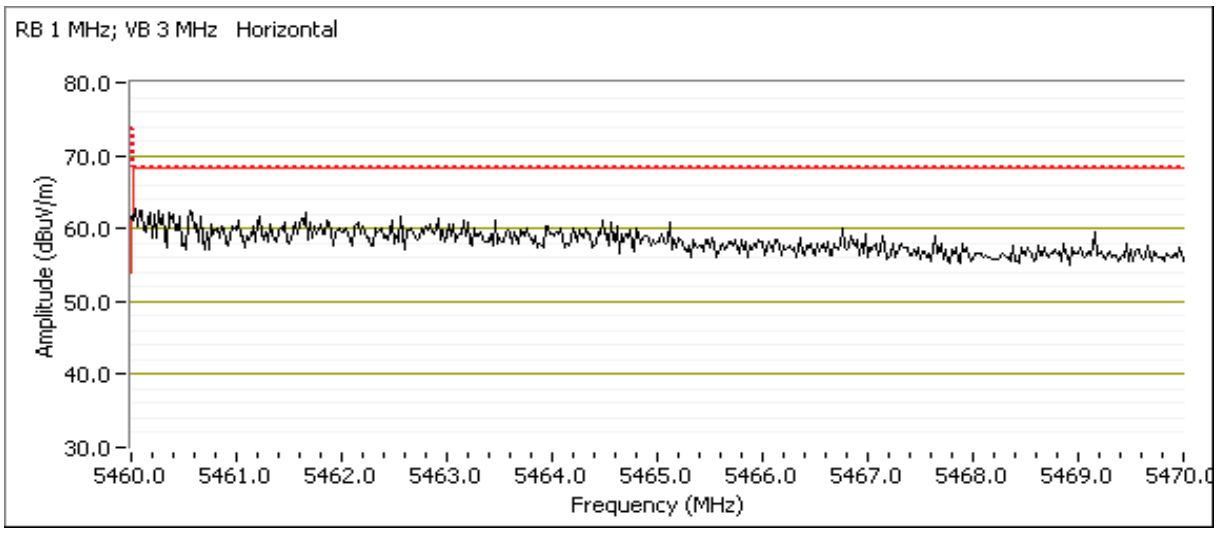
| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5458.000 | 49.3 | H | 54.0 | -4.7 | Avg | 6 | 1.21 | RB 1 MHz, VB 1 kHz, note 3. |
| 5437.230 | 65.3 | H | 74.0 | -8.7 | PK | 6 | 1.21 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

*5470 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5460.440 | 62.0 | H | 68.3 | -6.3 | PK | 360 | 1.21 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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: 22.6 °C
Rel. Humidity: 37 %

## Summary of Results

| Run # | Mode | Channel | Target Power | Passing Power Setting | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| 20MHz Bandwith Modes | | | | | | | |
| 6 | n20 | 60 - 5300MHz | 23 | 23 | Restricted Band Edge at 5350 MHz | 15.209 | 53.1 dBµV/m @ 5350.3 MHz (-0.9 dB) |
| | n20 | 64 - 5320MHz | 23 | 18 | Restricted Band Edge at 5350 MHz | 15.209 | 53.2 dBµV/m @ 5351.9 MHz (-0.8 dB) |
| 7 | n20 | 100 - 5500MHz | 23 | 21 | Restricted Band Edge at 5460 MHz | 15.209 | 52.4 dBµV/m @ 5459.7 MHz (-1.6 dB) |
| | n20 | 100 - 5500MHz | 23 | 21 | Band Edge 5460 - 5470 MHz | 15E | 67.7 dBµV/m @ 5469.1 MHz (-0.6 dB) |
| | n20 | 140 - 5700MHz | 23 | 21 | Band Edge 5725MHz | 15E | 67.4 dBµV/m @ 5737.6 MHz (-0.9 dB) |
| 40MHz Bandwith Modes | | | | | | | |
| 10 | n40 | 54 - 5270MHz | 23 | 23 | Restricted Band Edge at 5350 MHz | 15.209 | 52.5 dBµV/m @ 5351.0 MHz (-1.5 dB) |
| 11 | n40 | 110 - 5550MHz | 23 | 23 | Restricted Band Edge at 5460 MHz | 15.209 | 48.7 dBµV/m @ 5454.5 MHz (-5.3 dB) |
| | n40 | 110 - 5550MHz | 23 | 23 | Band Edge 5460 - 5470 MHz | 15E | 61.6 dBµV/m @ 5461.9 MHz (-6.7 dB) |
| | n40 | 134 - 5670MHz | 23 | 21 | Band Edge 5725MHz | 15E | 67.8 dBµV/m @ 5729.3 MHz (-0.5 dB) |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

## Modifications Made During Testing

No modifications were made to the EUT during testing

## Deviations From The Standard

No deviations were made from the requirements of the standard.

## 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) |
|---|---|---|---|---|---|---|---|
| 11n20 | MCS0 | 83% | NO | 4.17 | 0.79 | 1.58 | 240 |
| 11n40 | MCS0 | 34% | NO | 1.71 | 4.67 | 9.33 | 586 |
| ac80 | VHT0 | 17% | NO | 0.84 | 7.75 | 15.49 | 1190 |

## Sample Notes

Sample S/N: 184795206016480
Driver: -
Antenna: 4x4 internal

## 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 non constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW> 1/T, peak detector, linear average mode, sweep time auto, max hold. Max hold for 50*(1/DC) traces |
| Note 5: | Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements. |

Note - All testing performed using 1SS

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 9/28/2016
Test Engineer: Rafael Varelas
Test Location: Fremont CH #7

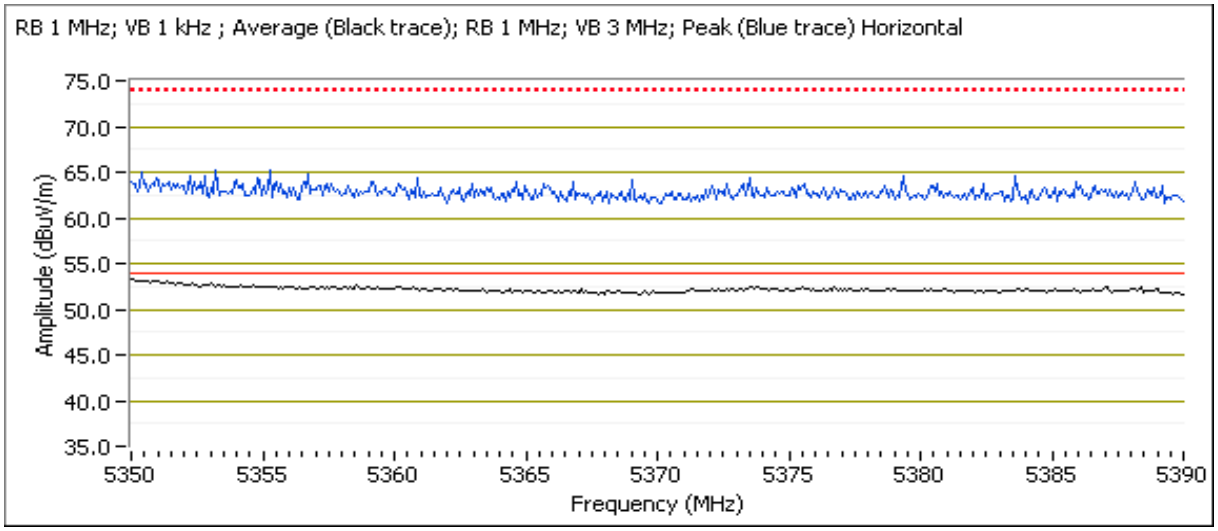
Config. Used: 2
Config Change: None
EUT Voltage: 120V/60Hz

Channel: 60 - 5300MHz
Tx Chain: 4Tx
Mode: n20
Data Rate: MCS0

EUT Orientation: Flat
Power setting: 23

*5350 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5350.320 | 53.1 | H | 54.0 | -0.9 | Avg | 1 | 1.5 | POS; RB 1 MHz; VB: 1 kHz |
| 5351.600 | 64.6 | H | 74.0 | -9.4 | PK | 1 | 1.5 | POS; RB 1 MHz; VB: 3 MHz |



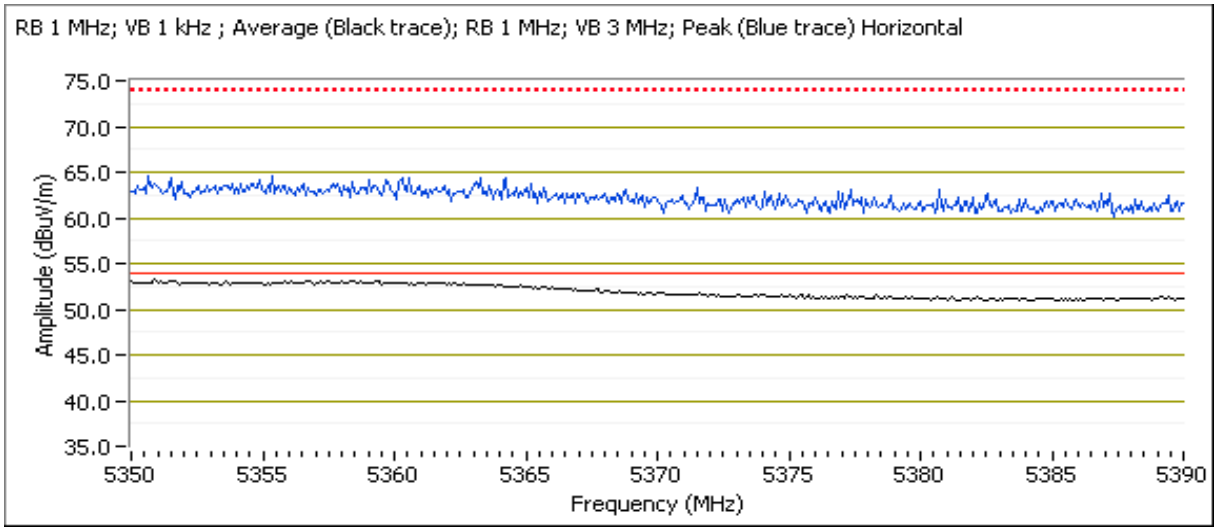
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 64 - 5320MHz
Tx Chain: 4Tx
Mode: n20
Data Rate: MCS0

EUT Orientation: Flat
Power setting: 18

*5350 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5351.920 | 53.2 | H | 54.0 | -0.8 | Avg | 1 | 1.5 | POS; RB 1 MHz; VB: 1 kHz |
| 5351.600 | 65.8 | H | 74.0 | -8.2 | PK | 1 | 1.5 | POS; RB 1 MHz; VB: 3 MHz |
| 5355.210 | 51.2 | V | 54.0 | -2.8 | Avg | 148 | 1.5 | POS; RB 1 MHz; VB: 1 kHz |
| 5359.780 | 63.2 | V | 74.0 | -10.8 | PK | 148 | 1.5 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 9/28/2016
Test Engineer: Rafael Varelas
Test Location: Fremont CH #7

Config. Used: 2
Config Change: None
EUT Voltage: 120V/60Hz

Channel: 100 - 5500MHz
Tx Chain: 4Tx
Mode: n20
Data Rate: MCS0

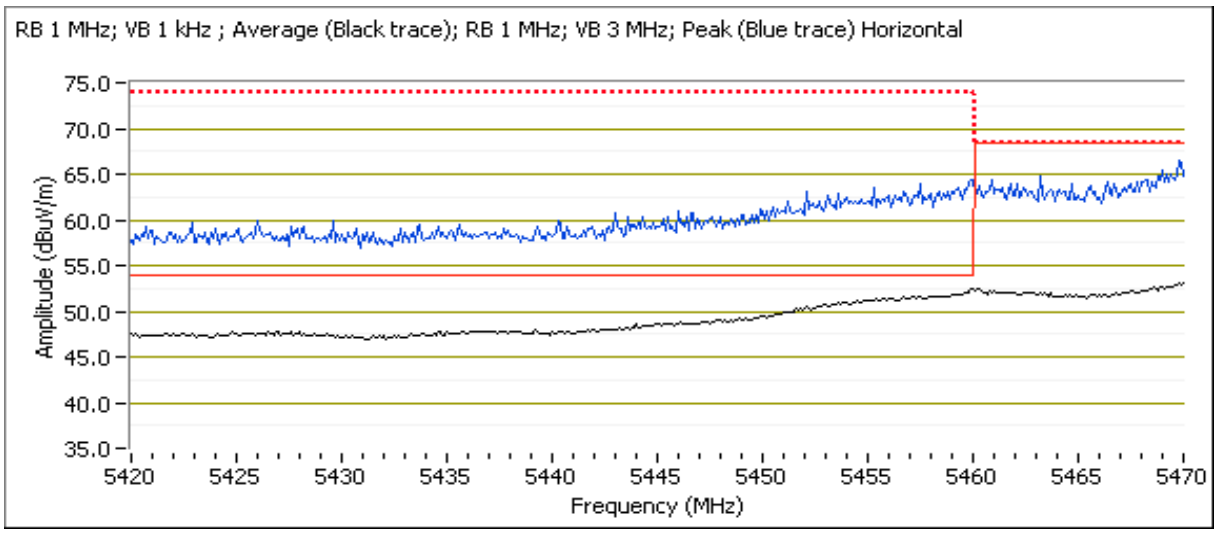
EUT Orientation: Flat
Power setting: 21

*5460 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5459.680 | 52.4 | H | 54.0 | -1.6 | Avg | 164 | 1.5 | POS; RB 1 MHz; VB: 1 kHz |
| 5452.060 | 63.4 | H | 74.0 | -10.6 | PK | 164 | 1.5 | POS; RB 1 MHz; VB: 3 MHz |

*5470 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5469.100 | 67.7 | H | 68.3 | -0.6 | PK | 164 | 1.5 | POS; RB 1 MHz; VB: 3 MHz |



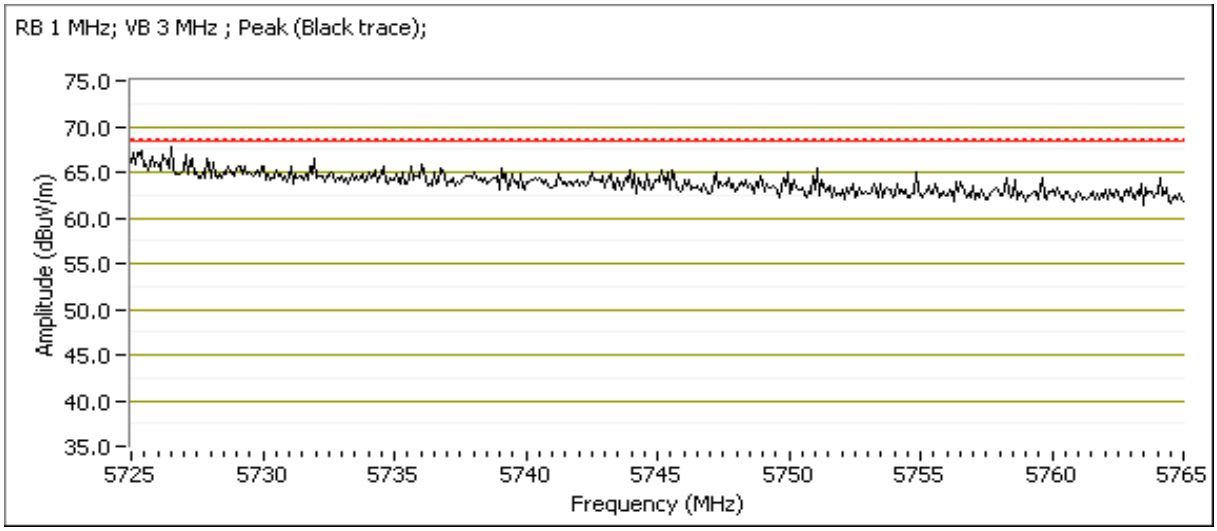
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 140 - 5700MHz
Tx Chain: 4Tx
Mode: n20
Data Rate: MCS0

EUT Orientation: Flat
Power setting: 21

*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 | |
| 5737.580 | 67.4 | H | 68.3 | -0.9 | PK | 138 | 1.4 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 9/28/2016
Test Engineer: Rafael Varelas
Test Location: Fremont CH #7

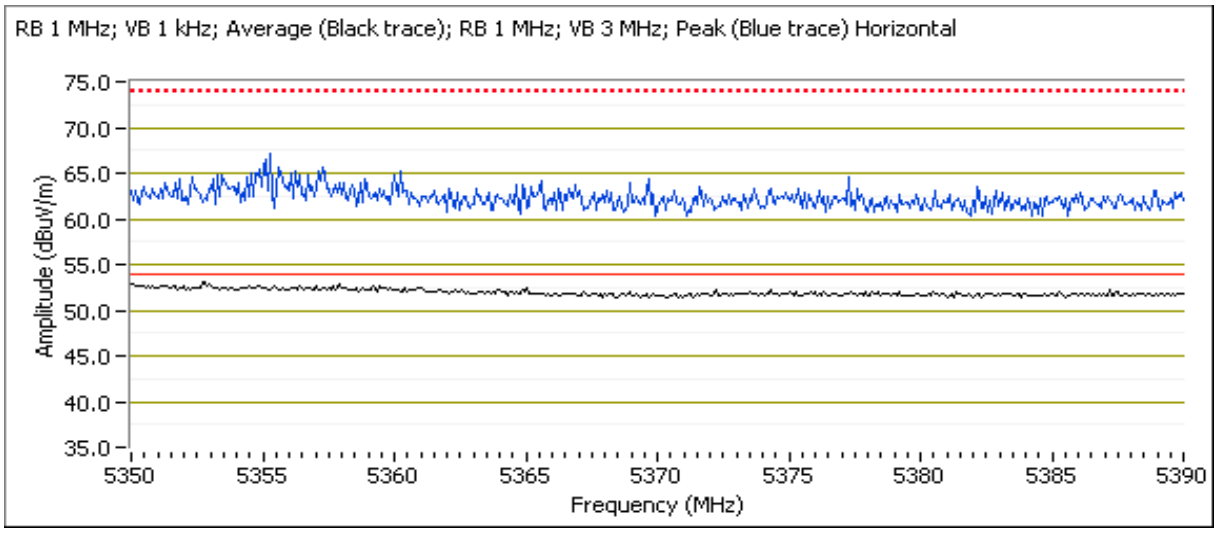
Config. Used: 2
Config Change: None
EUT Voltage: 120V/60Hz

Channel: 54 - 5270MHz
Tx Chain: 4Tx
Mode: n40
Data Rate: MCS0

EUT Orientation: Flat
Power setting: 23

*5350 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5351.040 | 52.5 | H | 54.0 | -1.5 | Avg | 360 | 1.4 | POS; RB 1 MHz; VB: 1 kHz |
| 5358.180 | 66.7 | H | 74.0 | -7.3 | PK | 360 | 1.4 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 9/28/2016
Test Engineer: Rafael Varelas
Test Location: Fremont CH #7

Config. Used: 2
Config Change: None
EUT Voltage: 120V/60Hz

Channel: 110 - 5550MHz
Tx Chain: 4Tx
Mode: n40
Data Rate: MCS0

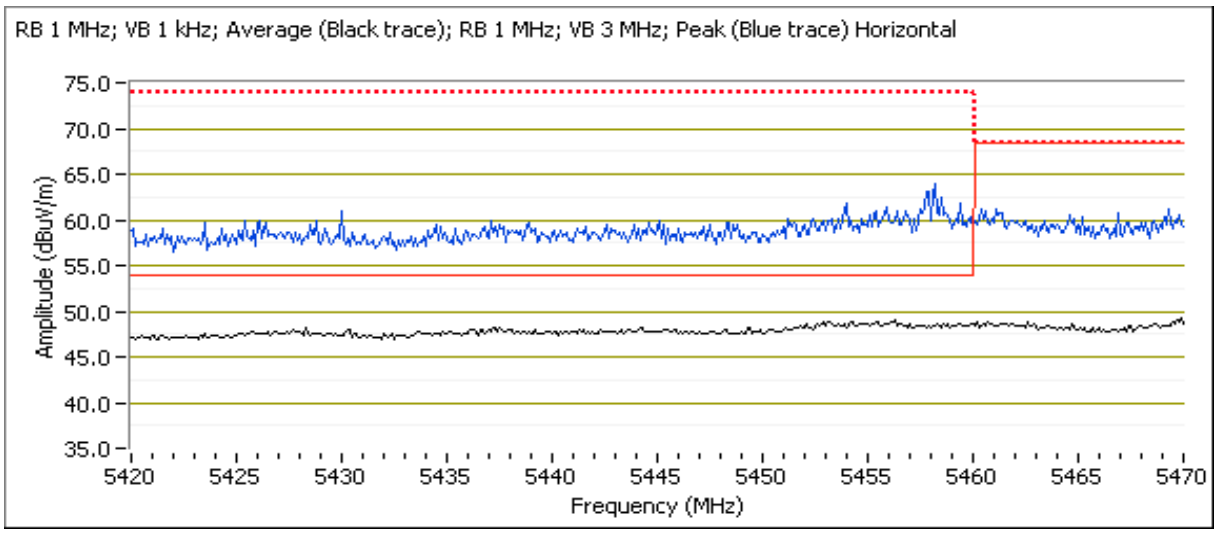
EUT Orientation: Flat
Power setting: 23

*5460 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5454.470 | 48.7 | H | 54.0 | -5.3 | Avg | 360 | 1.1 | POS; RB 1 MHz; VB: 1 kHz |
| 5457.520 | 63.1 | H | 74.0 | -10.9 | PK | 360 | 1.1 | POS; RB 1 MHz; VB: 3 MHz |

*5470 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5461.920 | 61.6 | H | 68.3 | -6.7 | PK | 360 | 1.1 | POS; RB 1 MHz; VB: 3 MHz |



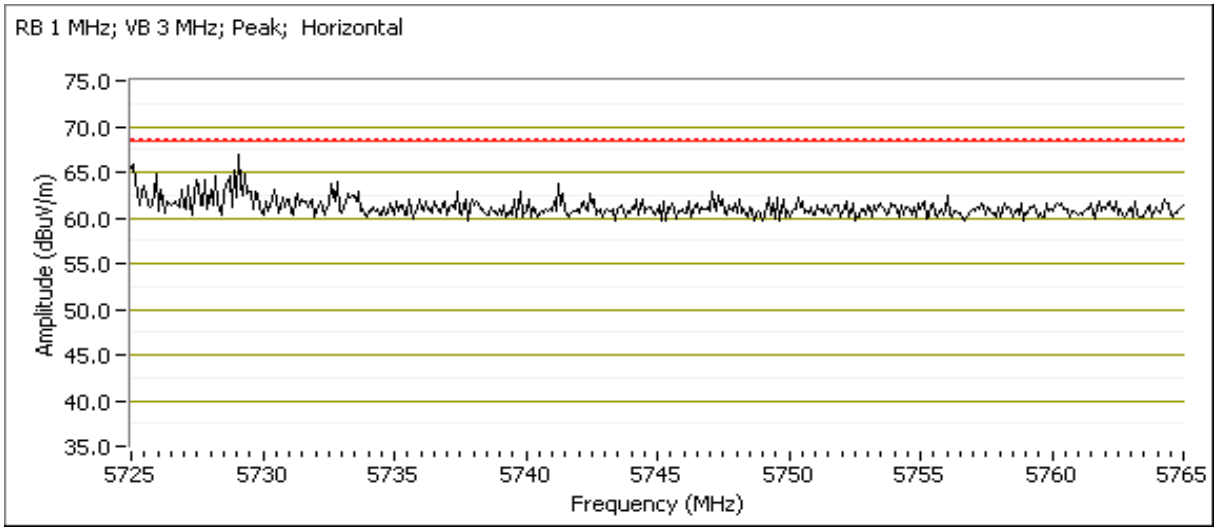
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 134 - 5670MHz
Tx Chain: 4Tx
Mode: n40
Data Rate: MCS0

EUT Orientation: Flat
Power setting: 21

*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 | |
| 5729.330 | 67.8 | H | 68.3 | -0.5 | PK | 5 | 1.0 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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: 9/30/2016, 10/3/2016, 10/4/2016
Test Engineer: John Caizzi, Kevin Wen & Rafael V.
Test Location: Chamber #7

Config. Used: 1
Config Change: none
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: 23.8 °C
Rel. Humidity: 46 %

## Summary of Results

| Run # | Mode | Channel | Target Power | Passing Power Setting | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| Scans on "center" channel in all four OFDM modes to determine the worst case mode. | | | | | | | |
| 3 | a | 60 - 5300MHz | 23 | 23 | Radiated Emissions, 1 - 40 GHz | FCC 15.209 / 15 E | 39.4 dBµV/m @ 21200 MHz(-14.6 dB) |
| | n20 | 60 - 5300MHz | | 23 | | | refer to test run |
| | n40 | 54 - 5270MHz | | 23 | | | refer to test run |
| | ac80 | 58 - 5290MHz | | 23 | | | refer to test run |
| Measurements on low and high channels in worst-case OFDM mode. | | | | | | | |
| 4 | a | 52 - 5260MHz | 23 | 23 | Radiated Emissions, 1 - 40 GHz | FCC 15.209 / 15 E | 49.4 dBµV/m @ 5420.3 MHz (-4.6 dB) |
| | a | 64 - 5320MHz | 23 | 23 | | | 43.5 dBµV/m @ 10905.1MHz(-10.5 dB) |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

## Summary of Results

| Run # | Mode | Channel | Target Power | Passing Power Setting | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| Scans on "center" channel in all four OFDM modes to determine the worst case mode. | | | | | | | |
| 5 | a | 116 - 5580MHz | 23 | 23 | Radiated Emissions, 1 - 40 GHz | FCC 15.209 / 15 E | 63.9 dBµV/m @ 5461.8 MHz (-4.4 dB) |
| | n20 | 116 - 5580MHz | | 23 | | | refer to test run |
| | n40 | 110 - 5550MHz | | 23 | | | refer to test run |
| | ac80 | 106 - 5530MHz | | 23 | | | refer to test run |
| Measurements on low and high channels in worst-case OFDM mode. | | | | | | | |
| 6 | a | 100 - 5500MHz | 23 | 23 | Radiated Emissions, 1 - 40 GHz | FCC 15.209 / 15 E | 44.4 dBµV/m @ 7333.4 MHz (-9.6 dB) |
| | a | 144- 5720MHz | 23 | 23 | | | 47.1 dBµV/m @ 11441.5 MHz (-6.9 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.

## 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) |
|---|---|---|---|---|---|---|---|
| 11a | 6Mbs | 0.89 | Yes | 0.558 | 0.51 | 1.01 | 1792 |
| n20 | MSC0 | 0.99 | Yes | 4.96 | 0 | 0 | 10 |
| n40 | MCS0 | 0.97 | Yes | 2.408 | 0.11 | 0.22 | 415 |
| ac80 | VHT0 | 0.96 | Yes | 1.139 | 0.19 | 0.37 | 878 |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

## Sample Notes

Sample S/N: 184795206016480
Driver:
Antenna: 4x4 internal

## 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: | For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements. |
| 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) |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #3, Radiated Spurious Emissions, 1,000 - 40,000 MHz. Operation in the 5250-5350 MHz Band

Date of Test: 9/30/2016, 10/3/2016 Config. Used: 1

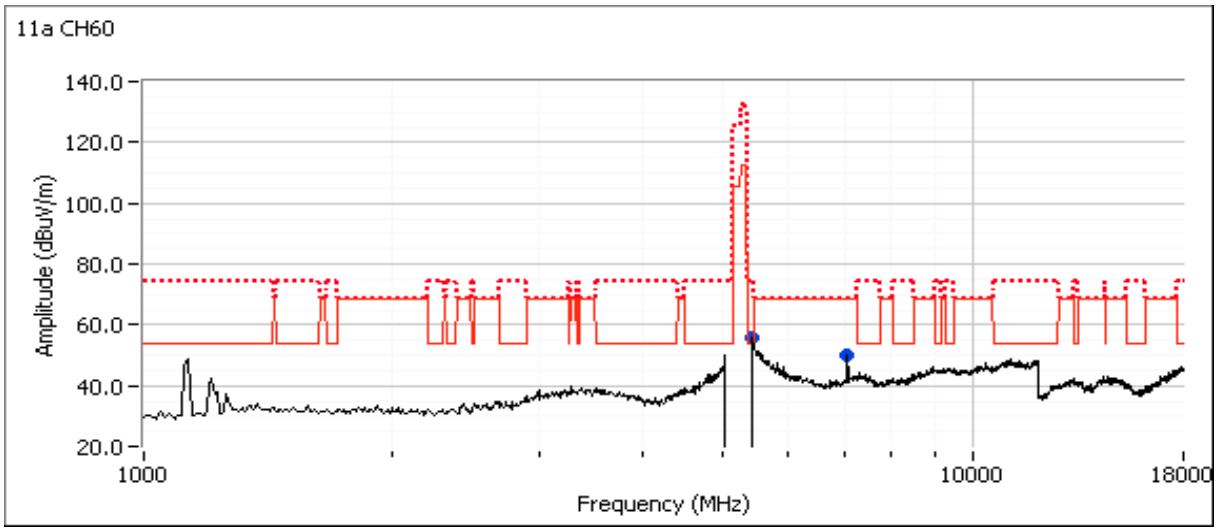
Test Engineer: John Caizzi, Kevin Wen & Rafael V. Config Change: none

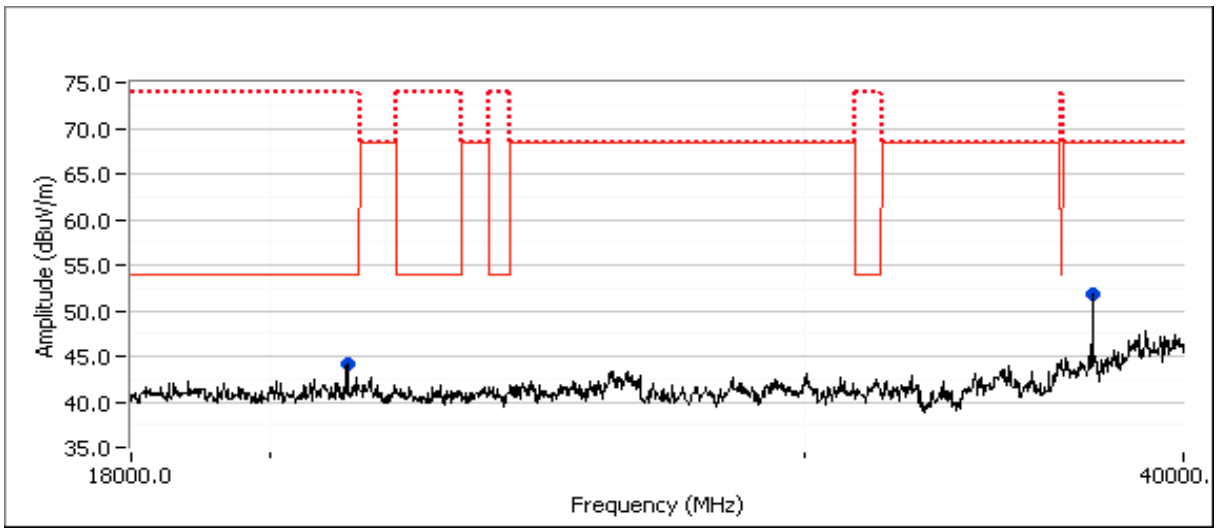
Test Location: Chamber 7 EUT Voltage: 120V/60Hz

Run #3a: Center Channel

Channel: 60 Mode: a

Tx Chain: 4Tx Data Rate: 6Mbps



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

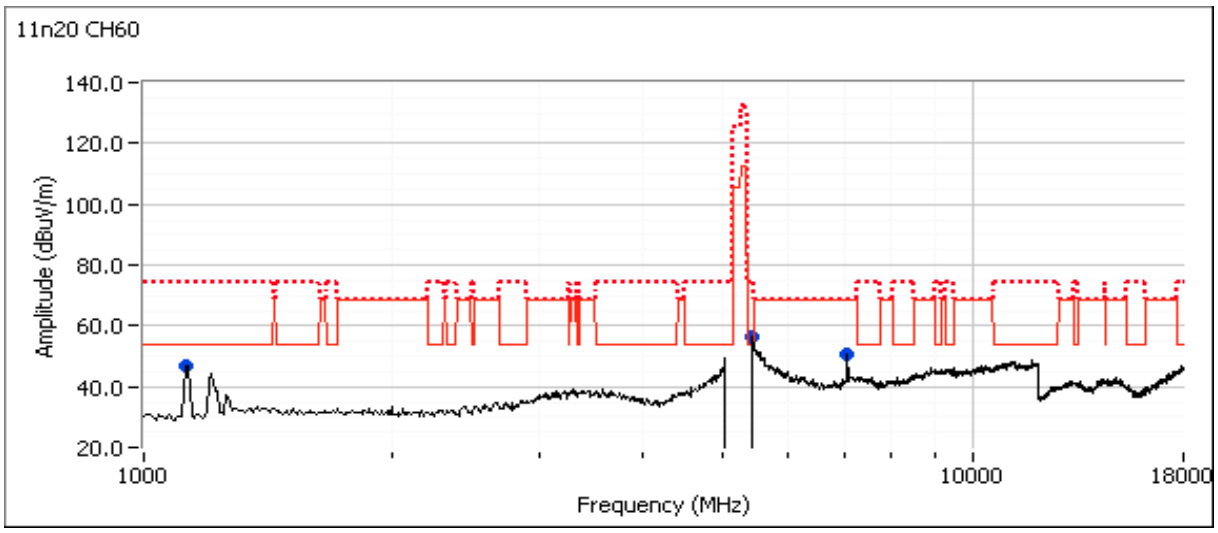
Run #3a: Center Channel

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 21200.040 | 39.4 | V | 54.0 | -14.6 | Avg | 37 | 1.8 | RB 1 MHz;VB 3 kHz;Peak |
| 21200.270 | 50.7 | V | 74.0 | -23.3 | PK | 37 | 1.8 | RB 1 MHz;VB 3 MHz;Peak |
| 7066.710 | 54.8 | H | 68.3 | -13.5 | PK | 172 | 1.5 | RB 1 MHz;VB 3 MHz;Peak |
| 37364.540 | 39.6 | V | 68.3 | -28.7 | Avg | 71 | 1.0 | RB 1 MHz;VB 3 kHz;Peak |
| 37369.070 | 51.3 | V | 68.3 | -17.0 | PK | 71 | 1.0 | RB 1 MHz;VB 3 MHz;Peak |
| 5425.000 | - | H | - | - | Peak | 162 | 2.0 | measured at Band Edge |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #3b: Center Channel

Channel: 60 Mode: n20
Tx Chain: 4Tx Data Rate: MCS0



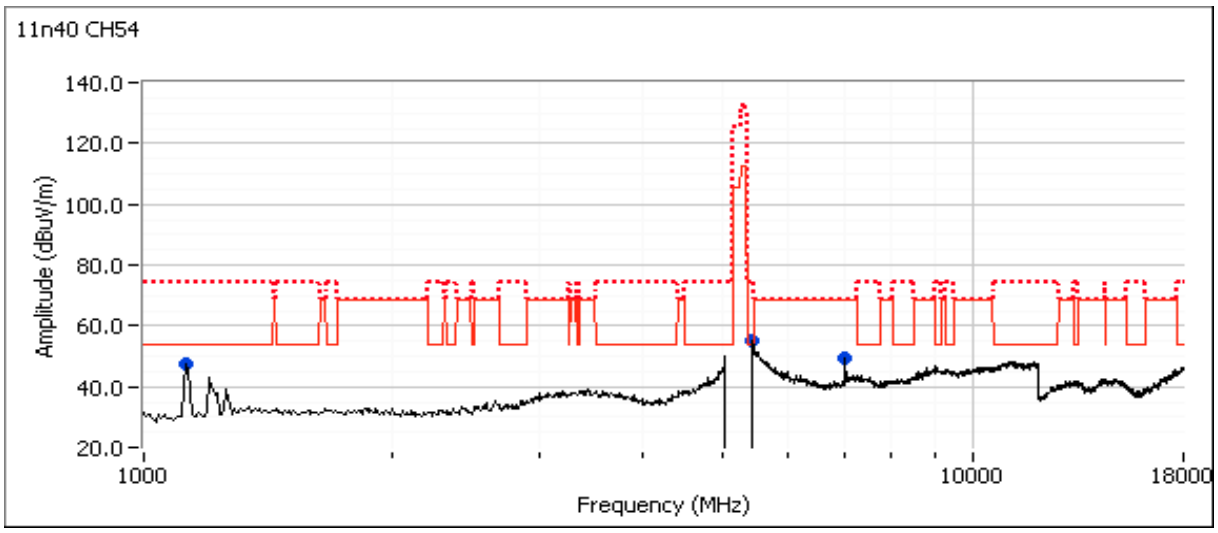

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5350.000 | 52.0 | H | 54.0 | -2.0 | AVG | 0 | 1.3 | POS; RB 1 MHz; VB: 10 Hz, note 4 |
| 5386.310 | 63.6 | H | 74.0 | -10.4 | PK | 0 | 1.3 | POS; RB 1 MHz; VB: 3 MHz, note 4 |
| 1125.000 | 46.9 | H | 54.0 | -7.1 | Peak | 262 | 1.5 | not related to radio |
| 7066.530 | 55.2 | H | 68.3 | -13.1 | PK | 174 | 1.5 | RB 1 MHz;VB 3 MHz;Peak |

| | |
|---|---|
| Note: | Scans made between 18 - 40 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range |
| Note 4: | Measured without bandstop filter with R&S analyzer. Signal is artifact of using filter. |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #3c: Center Channel

Channel: 54 Mode: n40
Tx Chain: 4Tx Data Rate: MCS0



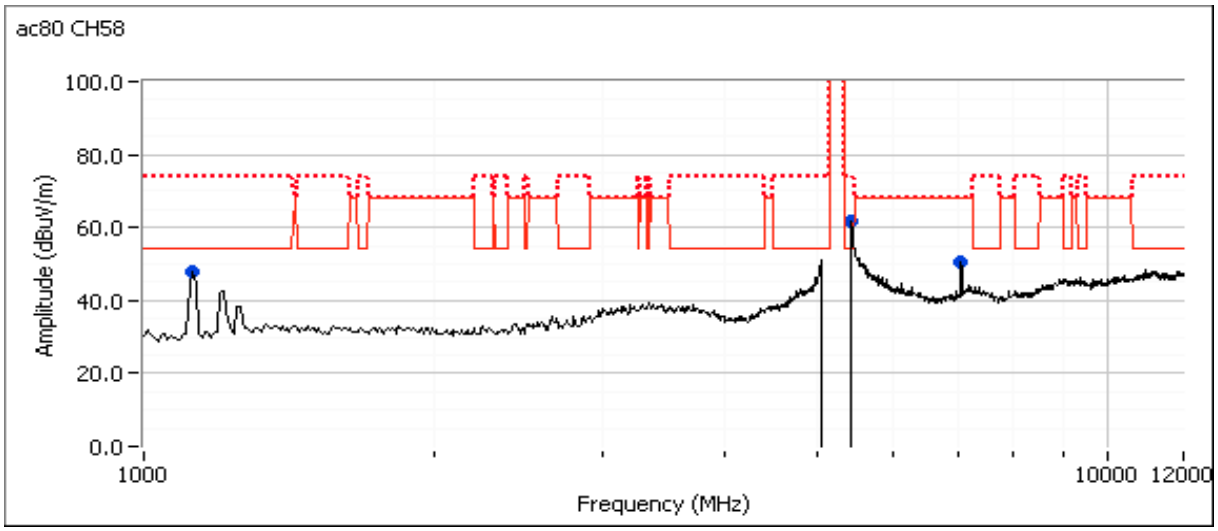

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 7026.780 | 55.2 | H | 68.3 | -13.1 | PK | 176 | 1.7 | RB 1 MHz;VB 3 MHz;Peak |
| 1125.000 | 47.6 | H | 54.0 | -6.4 | Peak | 6 | 1.0 | not related to radio |
| 5433.330 | - | H | - | - | Peak | 49 | 1.0 | measured at Band Edge |

| | |
|---|---|
| Note: | Scans made between 18 - 40 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #3d: Center Channel

Channel: 58 Mode: ac80
Tx Chain: 4Tx Data Rate: VHT0




| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 7053.350 | 54.9 | H | 68.3 | -13.4 | PK | 192 | 1.7 | RB 1 MHz;VB 3 MHz;Peak |
| 1125.000 | 47.8 | H | 54.0 | -6.2 | Peak | 8 | 1.0 | not related to radio |
| 5350.050 | - | H | - | - | Avg | 0 | 1.1 | measured at Band Edge |
| 5366.130 | - | H | - | - | PK | 0 | 1.1 | measured at Band Edge |

| | |
|---|---|
| Note: | Scans made between 18 - 40 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 10/3/2016, 10/4/2016 Config. Used: 1

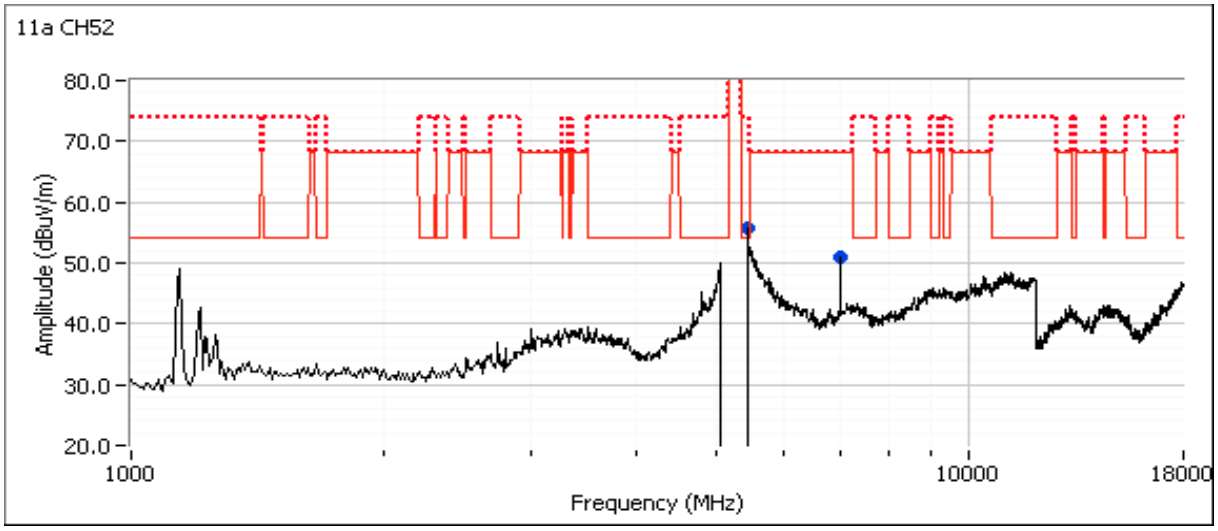
Test Engineer: Rafael V. Config Change: none

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

Run #4a: Low Channel

Channel: 52 Mode: 11a

Tx Chain: 4Tx Data Rate: 6Mbs



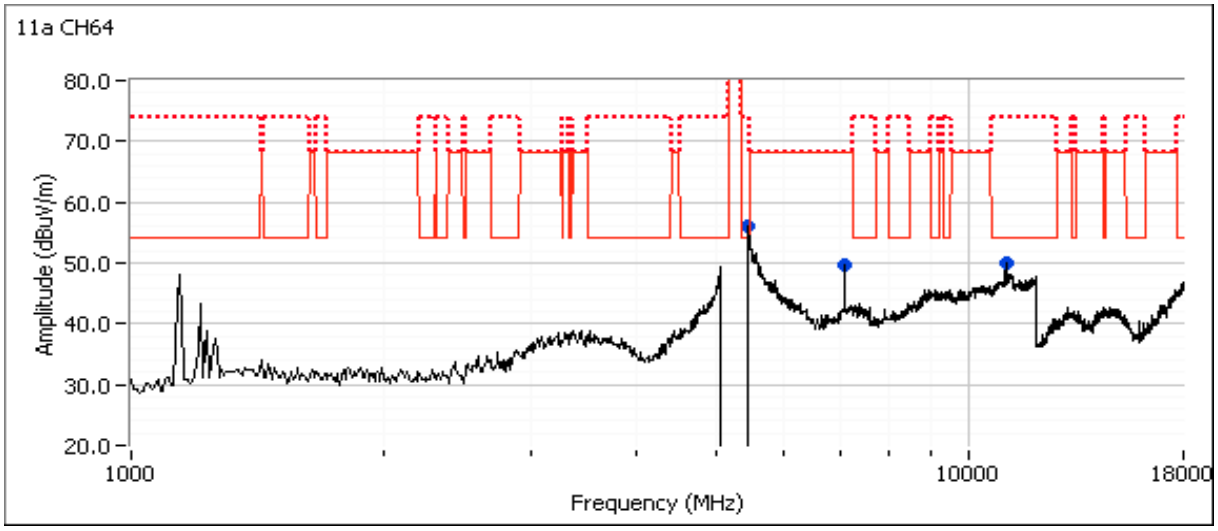

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5420.320 | 49.4 | H | 54.0 | -4.6 | Avg | 360 | 1.6 | POS; RB 1 MHz; VB: 2 kHz, note 4 |
| 5416.570 | 60.2 | H | 74.0 | -13.8 | PK | 360 | 1.6 | POS; RB 1 MHz; VB: 3 MHz, note 4 |
| 7013.290 | 55.3 | H | 68.3 | -13.0 | PK | 197 | 1.6 | RB 1 MHz;VB 3 MHz;Peak |

| | |
|---|---|
| Note 4: | Measured without bandstop filter with R&S analyzer. Signal is artifact of using filter. |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #4b: High Channel

Channel: 64 Mode: 11a
Tx Chain: 4Tx Data Rate: 6Mbs




| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 10905.100 | 43.5 | H | 54.0 | -10.5 | Avg | 300 | 1.0 | RB 1 MHz;VB 3 kHz;Peak, note 3 |
| 10986.130 | 54.7 | H | 74.0 | -19.3 | PK | 300 | 1.0 | RB 1 MHz;VB 3 MHz;Peak |
| 7093.290 | 49.8 | H | 68.3 | -18.5 | Peak | 178 | 1.5 | |
| 5436.820 | - | H | - | - | Peak | 163 | 1.5 | Meausured at Band Edge |

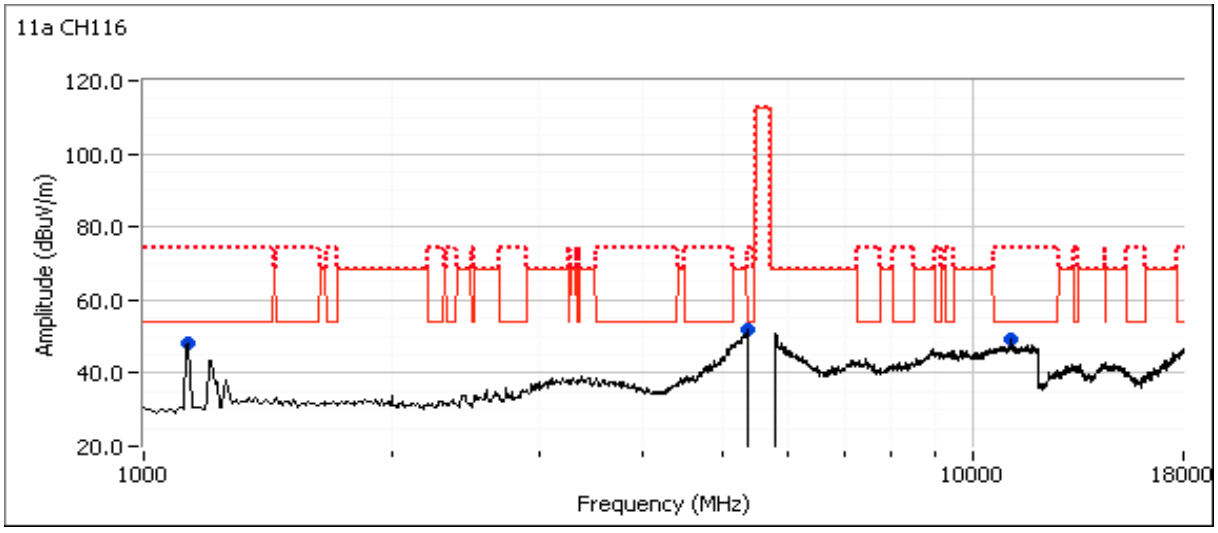
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #5, Radiated Spurious Emissions, 1,000 - 40,000 MHz. Operation in the 5470-5725 MHz Band

Date of Test: 9/30/2016, 10/3/2016 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: None
Test Location: Fremont CH #7 EUT Voltage: 120V/60Hz

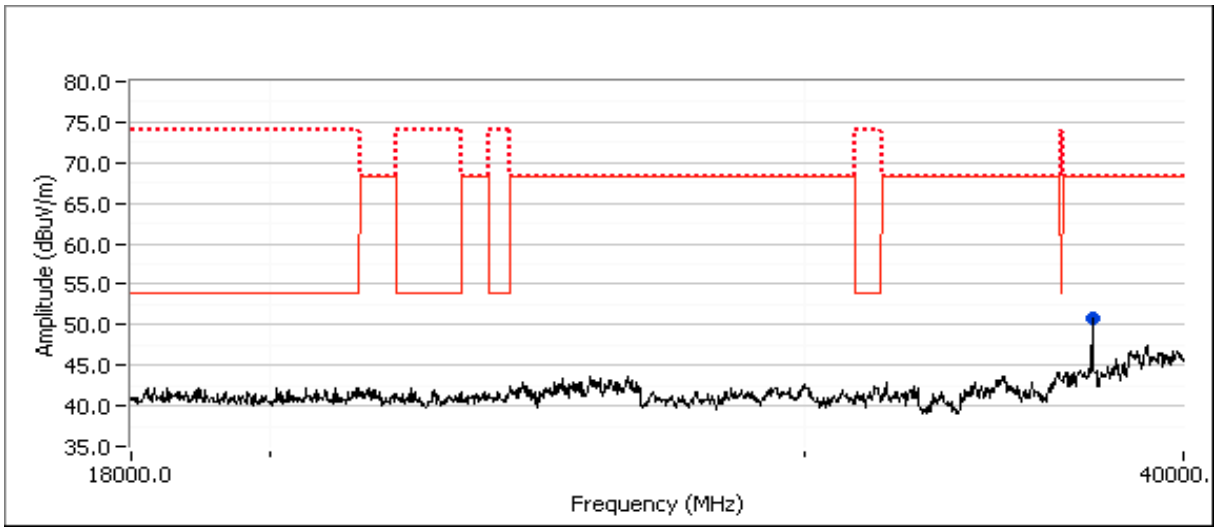
Run #5a: Center Channel

Channel: 116 Mode: a
Tx Chain: 4Tx Data Rate: 6Mbs



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #5a: Center Channel

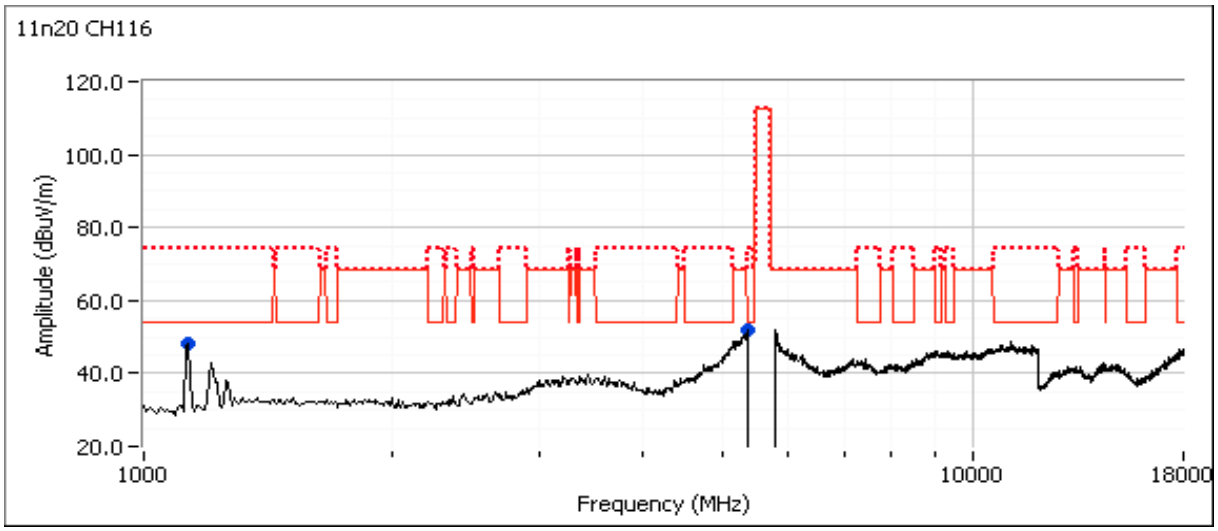



| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5461.780 | 63.9 | H | 68.3 | -4.4 | PK | 165 | 1.1 | POS; RB 1 MHz; VB: 3 MHz |
| 11162.170 | 45.0 | V | 54.0 | -9.0 | Avg | 122 | 2.2 | RB 1 MHz;VB 3 kHz;Peak |
| 11165.270 | 56.4 | V | 74.0 | -17.6 | PK | 122 | 2.2 | RB 1 MHz;VB 3 MHz;Peak |
| 37030.000 | 50.5 | V | 68.3 | -17.8 | PK | 110 | 1.0 | RB 1 MHz;VB 3 MHz;Peak |
| 1133.330 | - | H | - | - | Peak | 5 | 1.0 | not related to radio |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #5b: Center Channel

Channel: 116 Mode: n20
Tx Chain: 4Tx Data Rate: MSC0



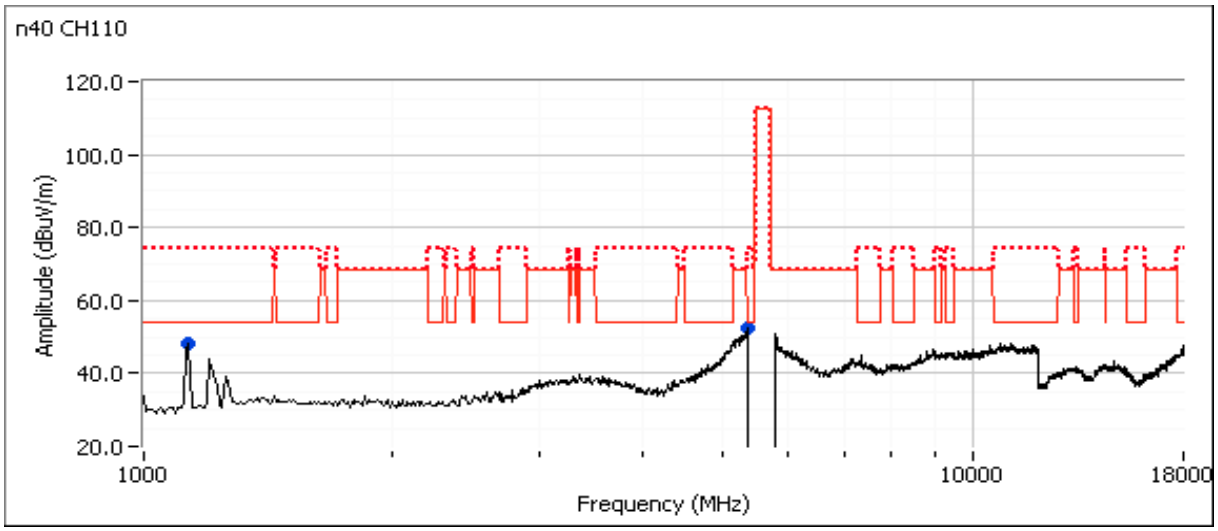

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5458.160 | 51.1 | H | 54.0 | -2.9 | AVG | 164 | 1.6 | POS; RB 1 MHz; VB: 10 Hz |
| 5439.960 | 63.1 | H | 74.0 | -10.9 | PK | 164 | 1.6 | POS; RB 1 MHz; VB: 3 MHz |
| 11162.830 | 43.5 | V | 54.0 | -10.5 | AVG | 178 | 2.2 | RB 1 MHz;VB 10 Hz;Peak |
| 11162.800 | 55.6 | V | 74.0 | -18.4 | PK | 178 | 2.2 | RB 1 MHz;VB 3 MHz;Peak |
| 1133.330 | - | H | - | - | Peak | 2 | 1.0 | not related to radio |

| | |
|---|---|
| Note: | Scans made between 18 - 40 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #5c: Center Channel

Channel: 110 Mode: n40
Tx Chain: 4Tx Data Rate: MCS0



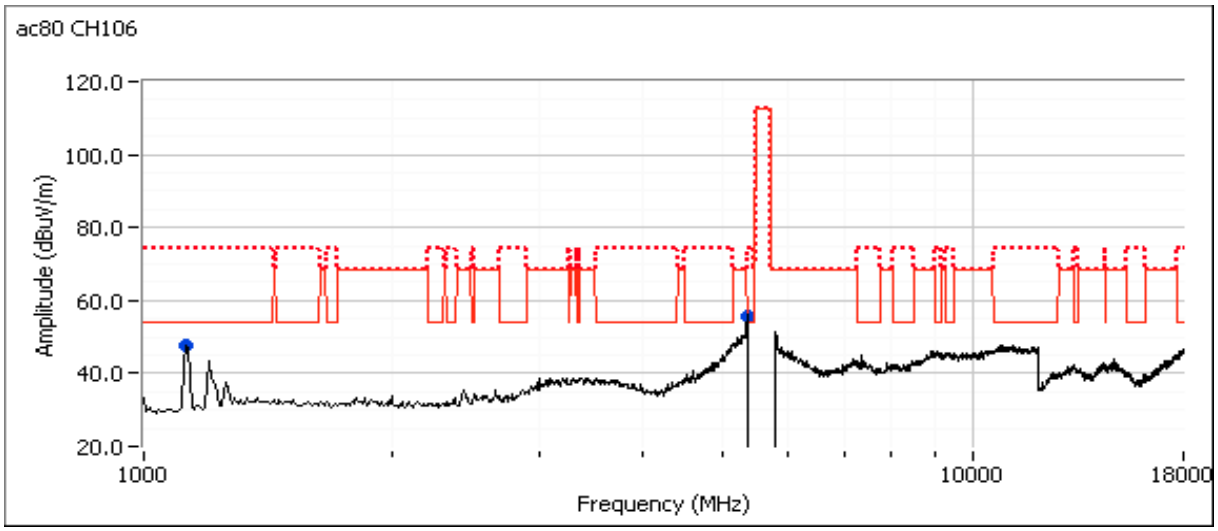

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 1133.330 | - | H | - | - | Peak | 73 | 1.6 | not related to radio |
| 5366.670 | - | H | - | - | Peak | 222 | 1.3 | measured at Band Edge |

| | |
|---|---|
| Note: | Scans made between 18 - 40 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #5d: Center Channel

Channel: 106 Mode: ac80
Tx Chain: 4Tx Data Rate: VHT0




| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 1125.000 | - | V | - | - | Peak | 40 | 1.0 | not related to radio |
| 5358.330 | - | H | - | - | Peak | 98 | 1.6 | measured at Band Edge |

| | |
|---|---|
| Note: | Scans made between 18 - 40 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #6: Radiated Spurious Emissions, 1,000 - 40000 MHz. Operating Mode: Worse case from Run #5

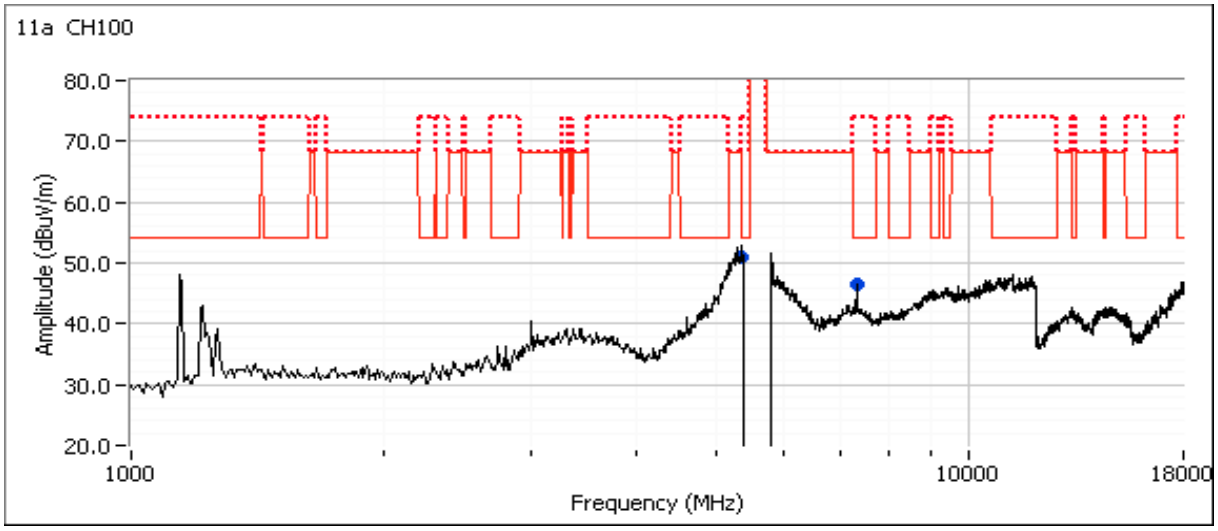
Date of Test: 10/4/2016
Test Engineer: John Caizzi, Kevin Wen
Test Location: Fremont CH #7

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

Run #6a: Low Channel

Channel: 100
Tx Chain: 4Tx

Mode: 11a
Data Rate: 6Mbs

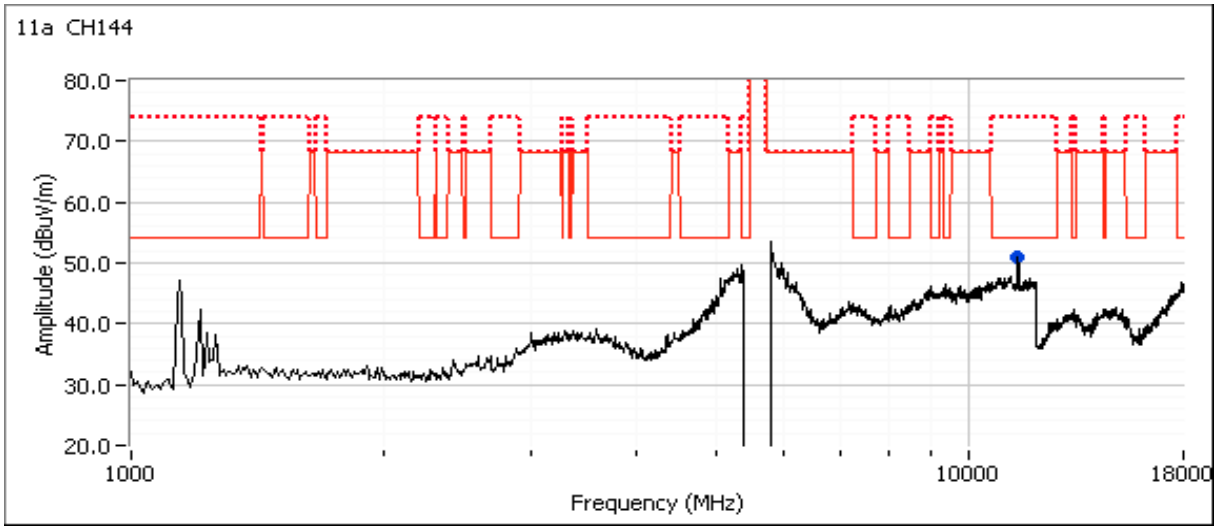



| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 7333.400 | 44.4 | H | 54.0 | -9.6 | Avg | 171 | 1.2 | RB 1 MHz, VB 3 kHz; note 3 |
| 7333.600 | 51.0 | H | 74.0 | -23.0 | PK | 171 | 1.2 | RB 1 MHz, VB 3 MHz |
| 5358.330 | - | H | - | - | Peak | 157 | 1.5 | measured at Band Edge |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #6b: High Channel

Channel: 144 Mode: 11a
Tx Chain: 4Tx Data Rate: 6Mbs




| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 11441.500 | 47.1 | V | 54.0 | -6.9 | Avg | 126 | 2.5 | RB 1 MHz, VB 3 kHz; note 3 |
| 11442.970 | 59.1 | V | 74.0 | -14.9 | PK | 126 | 2.5 | RB 1 MHz, VB 3 MHz |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

# 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.

## Summary of Results

| Run # | Test Performed | Limit | Pass / Fail | Result / Margin |
|---|---|---|---|---|
| 1 | Power, 5250 - 5350MHz | 15.407(a) (2) | Pass | a: 21.1dBm (129.8 mW)<br>n20: 21.4dBm (137.3 mW)<br>n40: 23.1dBm (203.2 mW) |
| 1 | PSD, 5250 - 5350MHz | 15.407(a) (2) | Pass | a: 10.0 dBm/MHz<br>n20: 10.0 dBm/MHz<br>n40: 8.7 dBm/MHz |
| 1 | Max EIRP<br>5250 - 5350MHz | TPC required if EIRP≥ 500mW (27dBm). EIRP ≥ 200mW (23dBm) DFS threshold = -64dBm. | Pass | EIRP = 24.0 dBm (250.0 mW) |
| 1 | 26dB Bandwidth | 15.407<br>(Information only) | - | > 20MHz for all modes |
| 1 | 99% Bandwidth | RSS-247<br>(Information only) | N/A | a: 17.2 MHz<br>n20: 18.2 MHz<br>n40: 37.5 MHz |

## 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: 23.2 °C
Rel. Humidity: 41.5 %

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

## Modifications Made During Testing

No modifications were made to the EUT during testing

## Deviations From The Standard

No deviations were made from the requirements of the standard.

## 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) |
|---|---|---|---|---|---|---|---|
| 11a | 6Mbs | 0.89 | Yes | 0.558 | 0.51 | 1.01 | 1792 |
| n20 | MSC0 | 0.99 | Yes | 4.96 | 0 | 0 | 10 |
| n40 | MCS0 | 0.97 | Yes | 2.408 | 0.11 | 0.22 | 415 |
| ac80 | VHT0 | 0.96 | Yes | 1.139 | 0.19 | 0.37 | 878 |

## Sample Notes

Sample S/N: 184795206016480
Driver:

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 10/6/2016 Config. Used: 1

Test Engineer: Rafael Varelas Config Change: None

Test Location: Fremont Lab 4A EUT Voltage: 120V/60Hz

| | |
|---|---|
| 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 2: | 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, power averaging on and power integration over the OBW. Tthe measurements were adjusted for duty cycle. This is based on 10log(1/x), where x is the duty cycle. (method SA-2 of ANSI C63.10) |
| Note 3: | Measured using the same analyzer settings used for output power. |
| 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 | Refer to antenna spec in operational description | | | | No | Yes | Yes | No | 0.90 | 6.50 |
| 5250-5350 | | | | | No | Yes | Yes | No | 0.90 | 6.90 |
| 5470-5725 | | | | | No | Yes | Yes | No | 1.10 | 7.10 |
| 5725-5825 | | | | | No | Yes | Yes | No | 0.80 | 6.50 |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

For devices that support CDD modes

Min # of spatial streams: 1

Max # of spatial streams: 4

| | |
|---|---|
| Notes: | BF = beamforming mode supported, Multichain Legacy = 802.11 legacy data rates supported for multichain transmissions, CDD = Cyclic Delay Diversity (or Cyclic Shift Diversity) modes supported, Sectorized / Xpol = antennas are sectorized or cross polarized. |
| Notes: | Dir G (PWR) = total gain (Gant + Array Gain) for power calculations; 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:<br>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.<br>Option 2: Antennas are paired for beamforming, and the pairs are configured to use the cyclic delay diversity of 802.11; the array gain associated with beamforming with 2 antennas (3dB), and the array gain associated with CDD with two antennas (3dB for PSD and 0 dB for power) |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5250-5350 MHz Band - FCC

Mode: 11a — Max EIRP (mW): 159.7

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[2] dBm | Total Power[5] mW | Total Power[5] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5260 | 1 | 17 | 23.6 | 89 | 14.2 | 129.8 | 21.1 | 24.0 | 0.130 | Pass |
| | 3 | | | | 14.7 | | | | | |
| | 4 | | | | 14.9 | | | | | |
| | 2 | | | | 14.6 | | | | | |
| 5300 | 1 | 16 | 23.7 | 89 | 13.9 | 114.3 | 20.6 | 24.0 | | Pass |
| | 3 | | | | 14.3 | | | | | |
| | 4 | | | | 14.1 | | | | | |
| | 2 | | | | 13.9 | | | | | |
| 5320 | 1 | 16 | 23.2 | 89 | 14.0 | 112.9 | 20.5 | 24.0 | | Pass |
| | 3 | | | | 14.1 | | | | | |
| | 4 | | | | 13.8 | | | | | |
| | 2 | | | | 14.1 | | | | | |

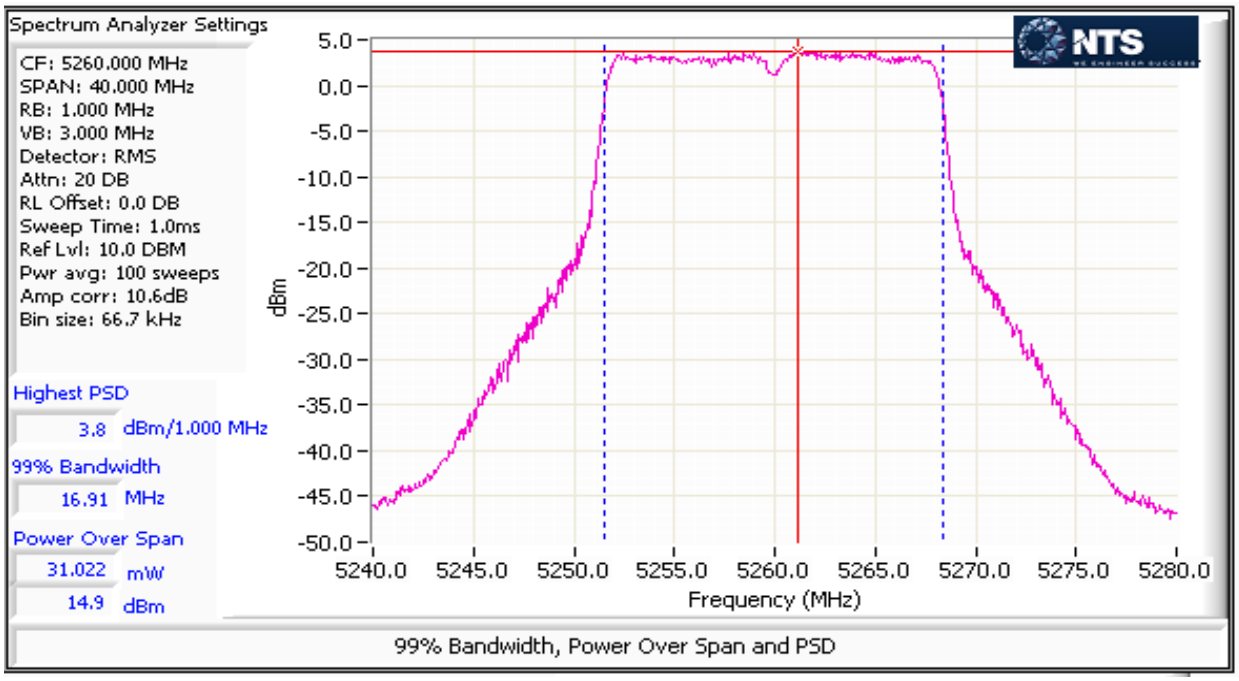
5250-5350 PSD - FCC/IC

Mode: 11a

| Frequency (MHz) | Chain | Software Setting | 99% BW[4] (MHz) | Duty Cycle % | PSD[3] dBm/MHz | Total PSD[5] mW/MHz | Total PSD[5] dBm/MHz | FCC Limit dBm/MHz | IC Limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5260 | 1 | 17 | | 89 | 3.3 | 10.1 | 10.0 | 10.1 | 11.0 | Pass |
| | 3 | | | | 3.5 | | | | | |
| | 4 | | | | 3.8 | | | | | |
| | 2 | | | | 3.4 | | | | | |
| 5300 | 1 | 16 | | 89 | 2.6 | 9.0 | 9.5 | 10.1 | 11.0 | Pass |
| | 3 | | | | 3.3 | | | | | |
| | 4 | | | | 3.2 | | | | | |
| | 2 | | | | 2.9 | | | | | |
| 5320 | 1 | 16 | | 89 | 2.9 | 8.8 | 9.4 | 10.1 | 11.0 | Pass |
| | 3 | | | | 3.1 | | | | | |
| | 4 | | | | 2.7 | | | | | |
| | 2 | | | | 3.0 | | | | | |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5250-5350 MHz Band



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5250-5350 MHz Band - FCC

Mode: n20 Max EIRP (mW): 168.9

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[1] dBm | Total Power[5] mW | Total Power[5] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5260 | 1 | 17 | 24.3 | 99 | 14.7 | 125.9 | 21.0 | 24.0 | 0.137 | Pass |
| | 3 | | | | 15.2 | | | | | |
| | 4 | | | | 15.2 | | | | | |
| | 2 | | | | 14.8 | | | | | |
| 5300 | 1 | 17 | 26.5 | 99 | 15.4 | 137.3 | 21.4 | 24.0 | | Pass |
| | 3 | | | | 15.0 | | | | | |
| | 4 | | | | 15.7 | | | | | |
| | 2 | | | | 15.3 | | | | | |
| 5320 | 1 | 17 | 23.5 | 99 | 15.1 | 136.5 | 21.4 | 24.0 | | Pass |
| | 3 | | | | 15.7 | | | | | |
| | 4 | | | | 15.2 | | | | | |
| | 2 | | | | 15.3 | | | | | |

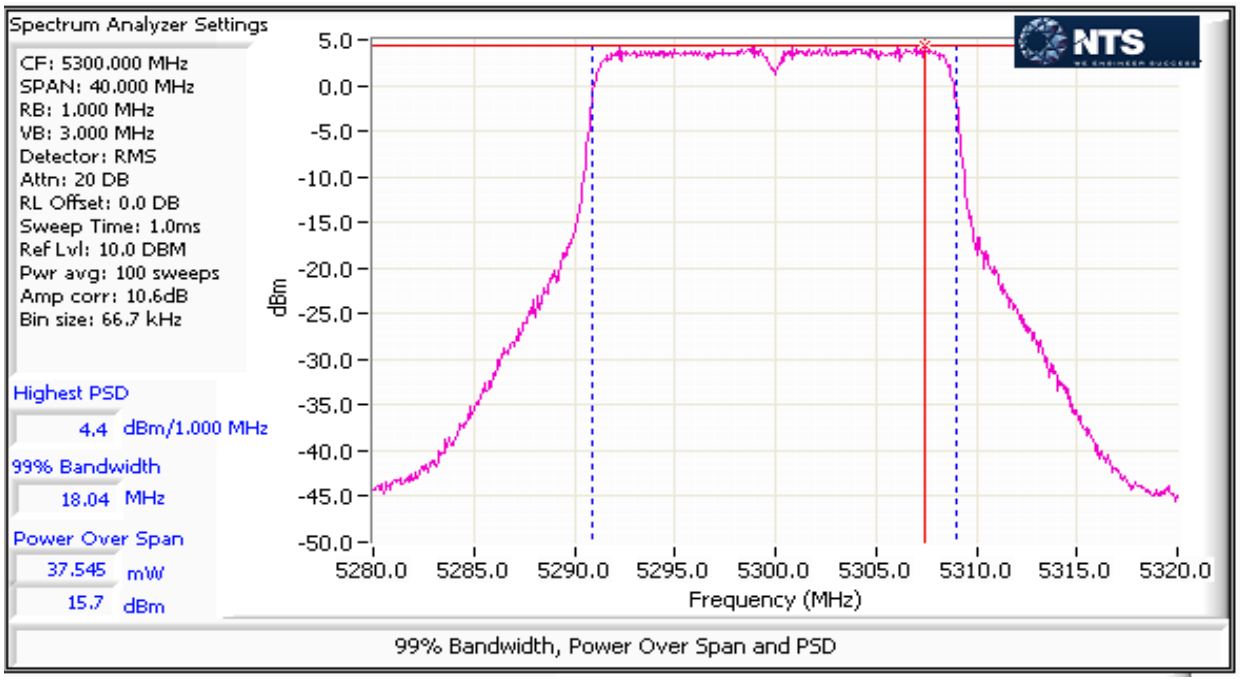
5250-5350 PSD - FCC/IC

Mode: n20

| Frequency (MHz) | Chain | Software Setting | 99% BW[4] (MHz) | Duty Cycle % | PSD[3] dBm/MHz | Total PSD[5] mW/MHz | Total PSD[5] dBm/MHz | FCC Limit dBm/MHz | IC Limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5260 | 1 | 17 | | 99 | 3.4 | 9.0 | 9.5 | 10.1 | 11.0 | Pass |
| | 3 | | | | 3.6 | | | | | |
| | 4 | | | | 3.7 | | | | | |
| | 2 | | | | 3.3 | | | | | |
| 5300 | 1 | 17 | | 99 | 4.0 | 10.1 | 10.0 | 10.1 | 11.0 | Pass |
| | 3 | | | | 3.6 | | | | | |
| | 4 | | | | 4.4 | | | | | |
| | 2 | | | | 4.0 | | | | | |
| 5320 | 1 | 17 | | 99 | 3.7 | 9.8 | 9.9 | 10.1 | 11.0 | Pass |
| | 3 | | | | 4.3 | | | | | |
| | 4 | | | | 3.7 | | | | | |
| | 2 | | | | 3.8 | | | | | |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5250-5350 MHz Band



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5250-5350 MHz Band - FCC

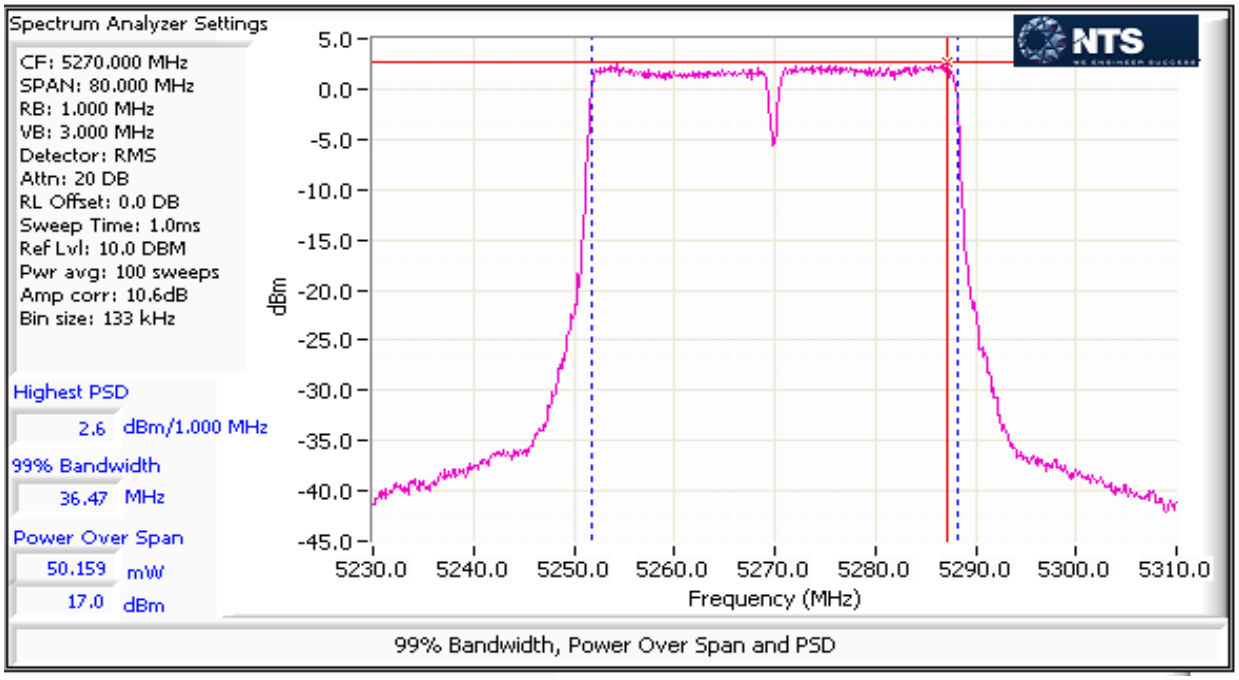
Mode: n40 Max EIRP (mW): 250.0

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[2] dBm | Total Power[5] mW | Total Power[5] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5270 | 1 | 19 | 64.7 | 97 | 16.9 | 203.2 | 23.1 | 24.0 | 0.203 | Pass |
| | 3 | | | | 16.8 | | | | | |
| | 4 | | | | 17.0 | | | | | |
| | 2 | | | | 17.0 | | | | | |

MIMO Device 5250-5350 PSD - FCC/IC

Mode: n40

| Frequency (MHz) | Chain | Software Setting | 99% BW[4] (MHz) | Duty Cycle % | PSD[3] dBm/MHz | Total PSD[5] mW/MHz | Total PSD[5] dBm/MHz | FCC Limit dBm/MHz | IC Limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5270 | 1 | 19 | | 97 | 2.6 | 7.4 | 8.7 | 10.1 | 11.0 | Pass |
| | 3 | | | | 2.5 | | | | | |
| | 4 | | | | 2.5 | | | | | |
| | 2 | | | | 2.6 | | | | | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

# 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.

## Summary of Results

| Run # | Test Performed | Limit | Pass / Fail | Result / Margin |
|---|---|---|---|---|
| 1 | Power, 5250 - 5350MHz | 15.407(a) (2) | Pass | n20: 21.4dBm (137.3mW)<br>n40: 22.4dBm (175.3mW) |
| 1 | PSD, 5250 - 5350MHz | 15.407(a) (2) | Pass | n20: 10.0 dBm/MHz<br>n40: 8.4dBm/MHz |
| 1 | Max EIRP<br>5250 - 5350MHz | TPC required if EIRP≥ 500mW (27dBm). EIRP ≥ 200mW (23dBm) DFS threshold = -64dBm. | Pass | EIRP = 29.3dBm (858.6 mW) |
| 1 | 26dB Bandwidth | 15.407<br>(Information only) | - | > 20MHz for all modes |
| 1 | 99% Bandwidth | RSS-247<br>(Information only) | N/A | n20: 18.1 MHz<br>n40: 37.0 MHz<br>ac80: 75.4 MHz |

## 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: 23.0 °C
Rel. Humidity: 45.5 %

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

## Modifications Made During Testing

No modifications were made to the EUT during testing

## Deviations From The Standard

No deviations were made from the requirements of the standard.

## 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) |
|---|---|---|---|---|---|---|---|
| 11a | 6Mbs | 0.89 | Yes | 0.558 | 0.51 | 1.01 | 1792 |
| n20 | MSC0 | 0.99 | Yes | 4.96 | 0 | 0 | 10 |
| n40 | MCS0 | 0.97 | Yes | 2.408 | 0.11 | 0.22 | 415 |
| ac80 | VHT0 | 0.96 | Yes | 1.139 | 0.19 | 0.37 | 878 |

Note - for antenna port measurements, the EUT was operated in the non-TxBF mode

## Sample Notes

Sample S/N: 184795206016480
Driver:

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 10/11/2016 & 11/3/2016 Config. Used: 1

Test Engineer: Rafael Varelas Config Change: None

Test Location: Fremont Lab 4A EUT Voltage: 120V/60Hz

| | |
|---|---|
| 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 2: | 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, power averaging on and power integration over the OBW. Tthe measurements were adjusted for duty cycle. This is based on 10log(1/x), where x is the duty cycle. (method SA-2 of ANSI C63.10) |
| Note 3: | Measured using the same analyzer settings used for output power. |
| 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. |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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 | Refer to antenna spec in operational description | | | | Yes | Yes | Yes | No | 6.50 | 6.50 |
| 5250-5350 | | | | | Yes | Yes | Yes | No | 6.90 | 6.90 |
| 5470-5725 | | | | | Yes | Yes | Yes | No | 7.10 | 7.10 |
| 5725-5825 | | | | | Yes | Yes | Yes | No | 6.50 | 6.50 |

For devices that support CDD modes

Min # of spatial streams: 1

Max # of spatial streams: 4

| | |
|---|---|
| Notes: | BF = beamforming mode supported, Multichain Legacy = 802.11 legacy data rates supported for multichain transmissions, CDD = Cyclic Delay Diversity (or Cyclic Shift Diversity) modes supported, Sectorized / Xpol = antennas are sectorized or cross polarized. |
| Notes: | Dir G (PWR) = total gain (Gant + Array Gain) for power calculations; 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:<br>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.<br>Option 2: Antennas are paired for beamforming, and the pairs are configured to use the cyclic delay diversity of 802.11; the array gain associated with beamforming with 2 antennas (3dB), and the array gain associated with CDD with two antennas (3dB for PSD and 0 dB for power) |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5250-5350 MHz Band - FCC

Mode: n20 Max EIRP (mW): 672.5

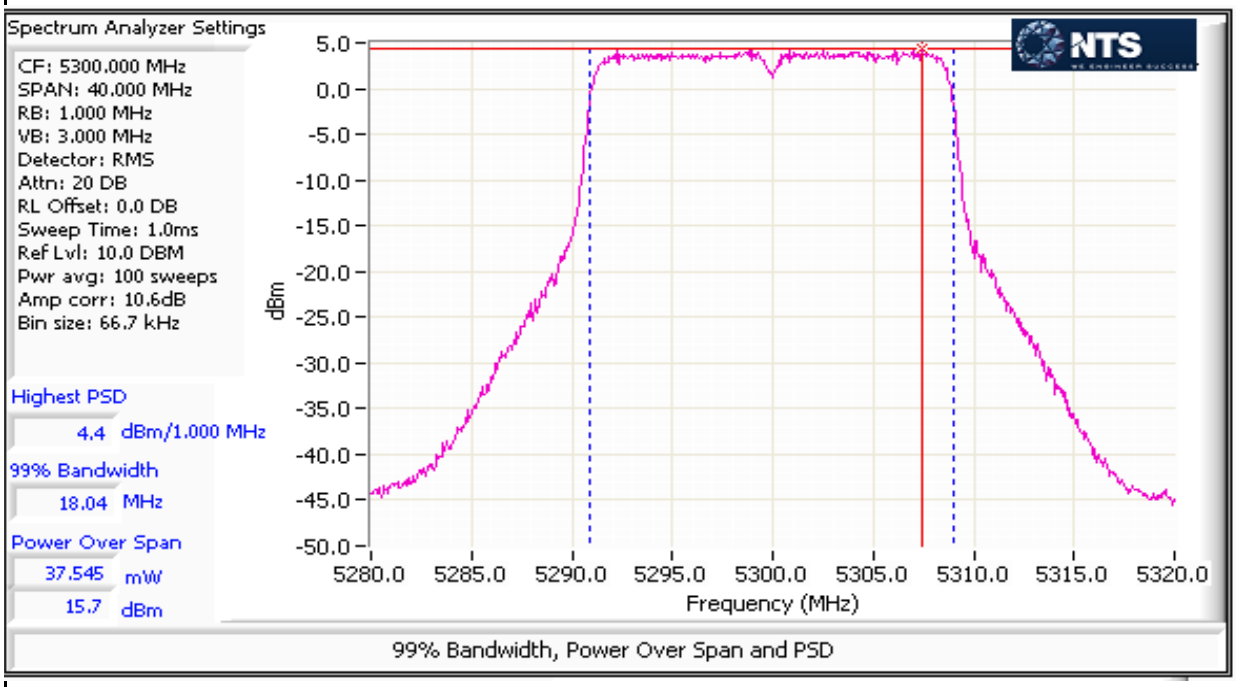
| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power dBm | Total Power[1] mW | Total Power[1] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5260 | 1 | 17 | 24.3 | 99 | 14.7 | 125.9 | 21.0 | 23.1 | 0.137 | Pass |
| | 3 | | | | 15.2 | | | | | |
| | 4 | | | | 15.2 | | | | | |
| | 2 | | | | 14.8 | | | | | |
| 5300 | 1 | 17 | 26.5 | 99 | 15.4 | 137.3 | 21.4 | 23.1 | | Pass |
| | 3 | | | | 15.0 | | | | | |
| | 4 | | | | 15.7 | | | | | |
| | 2 | | | | 15.3 | | | | | |
| 5320 | 1 | 17 | 23.5 | 99 | 15.1 | 136.5 | 21.4 | 23.1 | | Pass |
| | 3 | | | | 15.7 | | | | | |
| | 4 | | | | 15.2 | | | | | |
| | 2 | | | | 15.3 | | | | | |

5250-5350 PSD - FCC/IC

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 | IC Limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5260 | 1 | 17 | | 99 | 3.4 | 9.0 | 9.5 | 10.1 | 11.0 | Pass |
| | 3 | | | | 3.6 | | | | | |
| | 4 | | | | 3.7 | | | | | |
| | 2 | | | | 3.3 | | | | | |
| 5300 | 1 | 17 | | 99 | 4.0 | 10.1 | 10.0 | 10.1 | 11.0 | Pass |
| | 3 | | | | 3.6 | | | | | |
| | 4 | | | | 4.4 | | | | | |
| | 2 | | | | 4.0 | | | | | |
| 5320 | 1 | 17 | | 99 | 3.7 | 9.8 | 9.9 | 10.1 | 11.0 | Pass |
| | 3 | | | | 4.3 | | | | | |
| | 4 | | | | 3.7 | | | | | |
| | 2 | | | | 3.8 | | | | | |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5250-5350 MHz Band - FCC

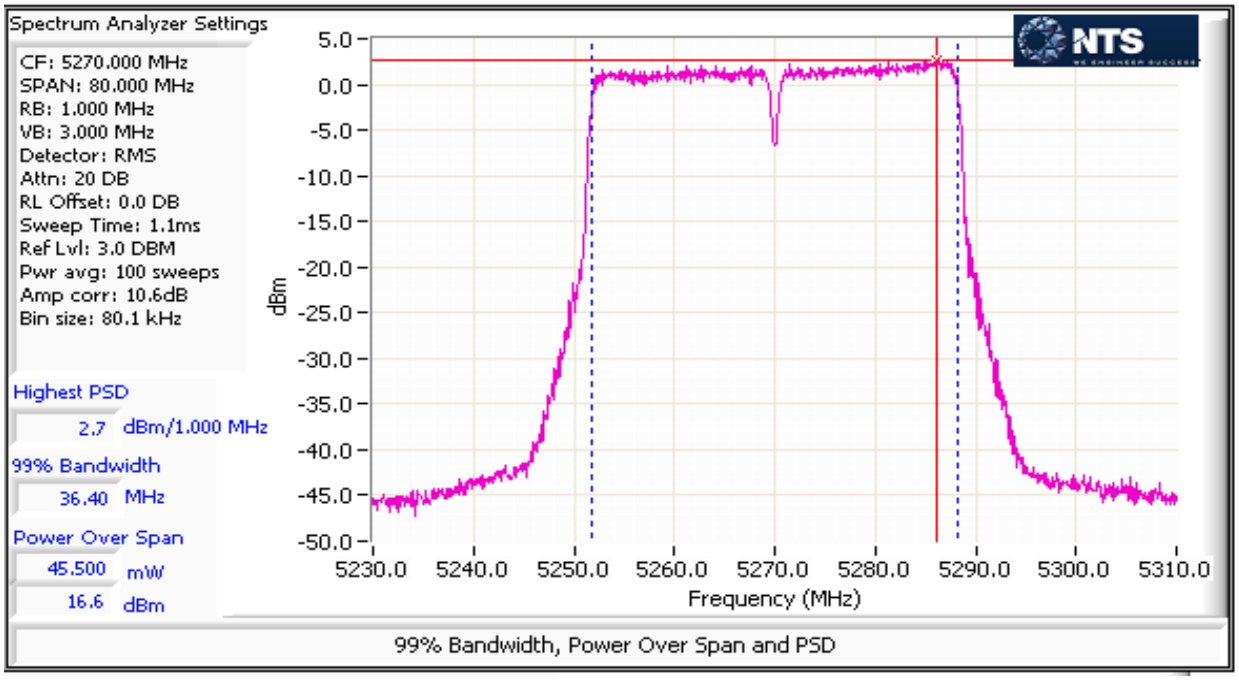
Mode: n40 Max EIRP (mW): 858.6

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power dBm | Total Power[1] mW | Total Power[1] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5270 | 1 | 18 | 44.2 | 97 | 15.9 | 175.3 | 22.4 | 23.1 | 0.175 | Pass |
| | 3 | | | | 16.6 | | | | | |
| | 4 | | | | 16.5 | | | | | |
| | 2 | | | | 16.1 | | | | | |

MIMO Device 5250-5350 PSD - FCC/IC

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 | IC Limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5270 | 1 | 18 | | 97 | 1.9 | 6.9 | 8.4 | 10.1 | 11.0 | Pass |
| | 3 | | | | 2.7 | | | | | |
| | 4 | | | | 2.3 | | | | | |
| | 2 | | | | 2.1 | | | | | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

# 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.

## Summary of Results

| Run # | Test Performed | Limit | Pass / Fail | Result / Margin |
|---|---|---|---|---|
| 1 | Power, 5470 - 5725MHz | 15.407(a) (2) | Pass | 11a: 20.5dBm (112.2mW)<br>n20: 20.5dBm (112.3 mW)<br>n40: 23.8dBm (238.9 mW)<br>ac80: 23.7dBm (234.6 mW) |
| 1 | PSD, 5470 - 5725MHz | 15.407(a) (2) | Pass | 11a: 9.9 dBm/MHz<br>n20: 9.5 dBm/MHz<br>n40: 9.6 dBm/MHz<br>ac80: 7.3 dBm/MHz |
| 1 | Max EIRP<br>5470 - 5725MHz | TPC required if EIRP≥ 500mW (27dBm).<br>EIRP ≥ 200mW (23dBm) DFS threshold | Pass | EIRP = 24.9 dBm (307.8 mW) |
| 1 | 26dB Bandwidth | 15.407<br>(Information only) | - | > 20MHz for all modes |
| 1 | 99% Bandwidth | RSS-247<br>(Information only) | N/A | n20: 18.1 MHz<br>n40: 37.2 MHz<br>ac80: 75.4 MHz |

## 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: 23.5 °C
Rel. Humidity: 44.7 %

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

## Modifications Made During Testing

No modifications were made to the EUT during testing

## Deviations From The Standard

No deviations were made from the requirements of the standard.

## 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) |
|---|---|---|---|---|---|---|---|
| 11a | 6Mbs | 0.89 | Yes | 0.558 | 0.51 | 1.01 | 1792 |
| n20 | MSC0 | 0.99 | Yes | 4.96 | 0 | 0 | 10 |
| n40 | MCS0 | 0.97 | Yes | 2.408 | 0.11 | 0.22 | 415 |
| ac80 | VHT0 | 0.96 | Yes | 1.139 | 0.19 | 0.37 | 878 |

## Sample Notes

Sample S/N: 184795206016480
Driver:

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 10/7/2016, 10/10/2016, 11/3/2016 Config. Used: 1

Test Engineer: Kevin Wen, Rafael Varelas Config Change: None

Test Location: Fremont Lab 4A EUT Voltage: 120V/60Hz

| | |
|---|---|
| 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 2: | 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, power averaging on and power integration over the OBW. Tthe measurements were adjusted for duty cycle. This is based on 10log(1/x), where x is the duty cycle. (method SA-2 of ANSI C63.10) |
| 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. |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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 | Refer to antenna spec in operational description | | | | No | Yes | Yes | No | 0.90 | 6.50 |
| 5250-5350 | | | | | No | Yes | Yes | No | 0.90 | 6.90 |
| 5470-5725 | | | | | No | Yes | Yes | No | 1.10 | 7.10 |
| 5725-5825 | | | | | No | Yes | Yes | No | 0.80 | 6.50 |

For devices that support CDD modes

Min # of spatial streams: 1

Max # of spatial streams: 4

| | |
|---|---|
| Notes: | BF = beamforming mode supported, Multichain Legacy = 802.11 legacy data rates supported for multichain transmissions, CDD = Cyclic Delay Diversity (or Cyclic Shift Diversity) modes supported, Sectorized / Xpol = antennas are sectorized or cross polarized. |
| Notes: | Dir G (PWR) = total gain (Gant + Array Gain) for power calculations; 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:<br>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.<br>Option 2: Antennas are paired for beamforming, and the pairs are configured to use the cyclic delay diversity of 802.11; the array gain associated with beamforming with 2 antennas (3dB), and the array gain associated with CDD with two antennas (3dB for PSD and 0 dB for power) |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5470-5725 MHz Band - FCC

Mode: 11a Max EIRP (mW): 144.5

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power dBm | Total Power mW | Total Power dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5500 | 1 | 17 | 23.7 | 89 | 14.0 | 110.4 | 20.4 | 24.0 | 0.112 | Pass |
| | 3 | | | | 14.0 | | | | | |
| | 4 | | | | 14.0 | | | | | |
| | 2 | | | | 13.6 | | | | | |
| 5580 | 1 | 17 | 23.7 | 89 | 14.0 | 109.2 | 20.4 | 24.0 | | Pass |
| | 3 | | | | 14.1 | | | | | |
| | 4 | | | | 13.8 | | | | | |
| | 2 | | | | 13.5 | | | | | |
| 5700 | 1 | 17 | 23.7 | 89 | 14.1 | 112.2 | 20.5 | 24.0 | | Pass |
| | 3 | | | | 14.5 | | | | | |
| | 4 | | | | 13.2 | | | | | |
| | 2 | | | | 14.0 | | | | | |
| 5720 | 1 | 16 | 17.2 | 89 | 12.1 | 73.5 | 18.7 | 23.4 | | Pass |
| | 3 | | | | 12.5 | | | | | |
| | 4 | | | | 11.7 | | | | | |
| | 2 | | | | 12.2 | | | | | |
| Portion within 5725-5850 MHz band (UNII-3) | | | | | | | | | | |
| 5720 | 1 | 16 | | 89 | 6.3 | 19.2 | 12.8 | 30.0 | 0.0192 | Pass |
| | 3 | | | | 6.8 | | | | | |
| | 4 | | | | 5.3 | | | | | |
| | 2 | | | | 6.7 | | | | | |

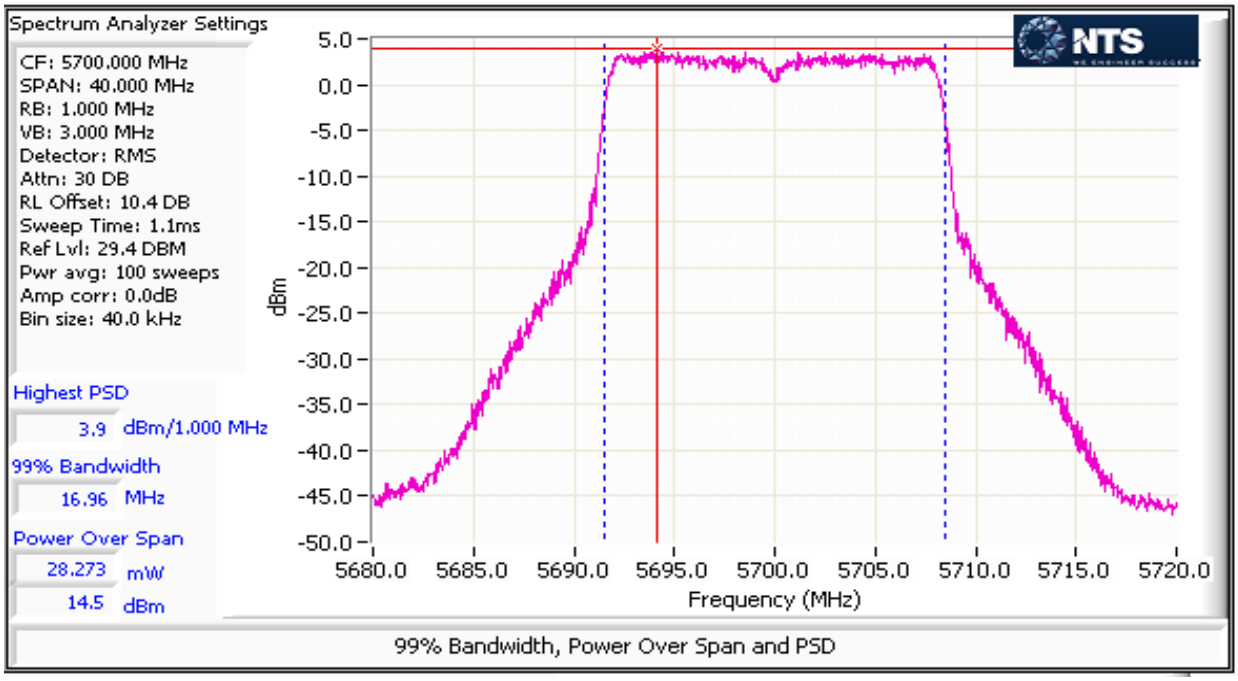
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

5470-5725 PSD - FCC/IC

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 | IC limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5500 | 1 | 17 | | 89 | 3.6 | 9.7 | 9.9 | 9.9 | 11.0 | Pass |
| | 3 | | | | 3.5 | | | | | |
| | 4 | | | | 3.5 | | | | | |
| | 2 | | | | 2.8 | | | | | |
| 5580 | 1 | 17 | | 89 | 3.4 | 9.5 | 9.8 | 9.9 | 11.0 | Pass |
| | 3 | | | | 3.5 | | | | | |
| | 4 | | | | 3.3 | | | | | |
| | 2 | | | | 2.7 | | | | | |
| 5700 | 1 | 17 | | 89 | 3.7 | 9.7 | 9.9 | 9.9 | 11.0 | Pass |
| | 3 | | | | 3.9 | | | | | |
| | 4 | | | | 2.5 | | | | | |
| | 2 | | | | 3.2 | | | | | |
| 5720 | 1 | 16 | | 89 | 2.9 | 7.9 | 9.0 | 9.9 | 11.0 | Pass |
| | 3 | | | | 2.6 | | | | | |
| | 4 | | | | 2.0 | | | | | |
| | 2 | | | | 2.3 | | | | | |
| Portion within 5725-5850 MHz band (UNII-3) | | | | | | | | | | |
| 5720 | 1 | 16 | | 89 | 2.5 | 8.1 | 9.1 | 28.9 | 28.9 | Pass |
| | 3 | | | | 3.2 | | | | | |
| | 4 | | | | 1.7 | | | | | |
| | 2 | | | | 2.8 | | | | | |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5470-5725 MHz Band - FCC

Mode: n20 Max EIRP (mW): 144.7

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power dBm | Total Power mW | Total Power dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5500 | 1 | 17 | 23.8 | 99 | 14.6 | 112.3 | 20.5 | 24.0 | 0.112 | Pass |
| | 3 | | | | 14.8 | | | | | |
| | 4 | | | | 14.3 | | | | | |
| | 2 | | | | 14.2 | | | | | |
| 5580 | 1 | 17 | 23.8 | 99 | 14.0 | 109.2 | 20.4 | 24.0 | | Pass |
| | 3 | | | | 14.8 | | | | | |
| | 4 | | | | 14.4 | | | | | |
| | 2 | | | | 14.2 | | | | | |
| 5700 | 1 | 17 | 23.4 | 99 | 14.2 | 108.1 | 20.3 | 24.0 | | Pass |
| | 3 | | | | 14.7 | | | | | |
| | 4 | | | | 13.7 | | | | | |
| | 2 | | | | 14.6 | | | | | |
| 5720 | 1 | 17 | 25 | 99 | 13.2 | 83.0 | 19.2 | 24.0 | | Pass |
| | 3 | | | | 13.6 | | | | | |
| | 4 | | | | 12.5 | | | | | |
| | 2 | | | | 13.3 | | | | | |
| Portion within 5725-5850 MHz band (UNII-3) | | | | | | | | | | |
| 5720 | 1 | 17 | | 99 | 7.5 | 23.3 | 13.7 | 30.0 | 0.0233 | Pass |
| | 3 | | | | 8.0 | | | | | |
| | 4 | | | | 6.9 | | | | | |
| | 2 | | | | 8.1 | | | | | |

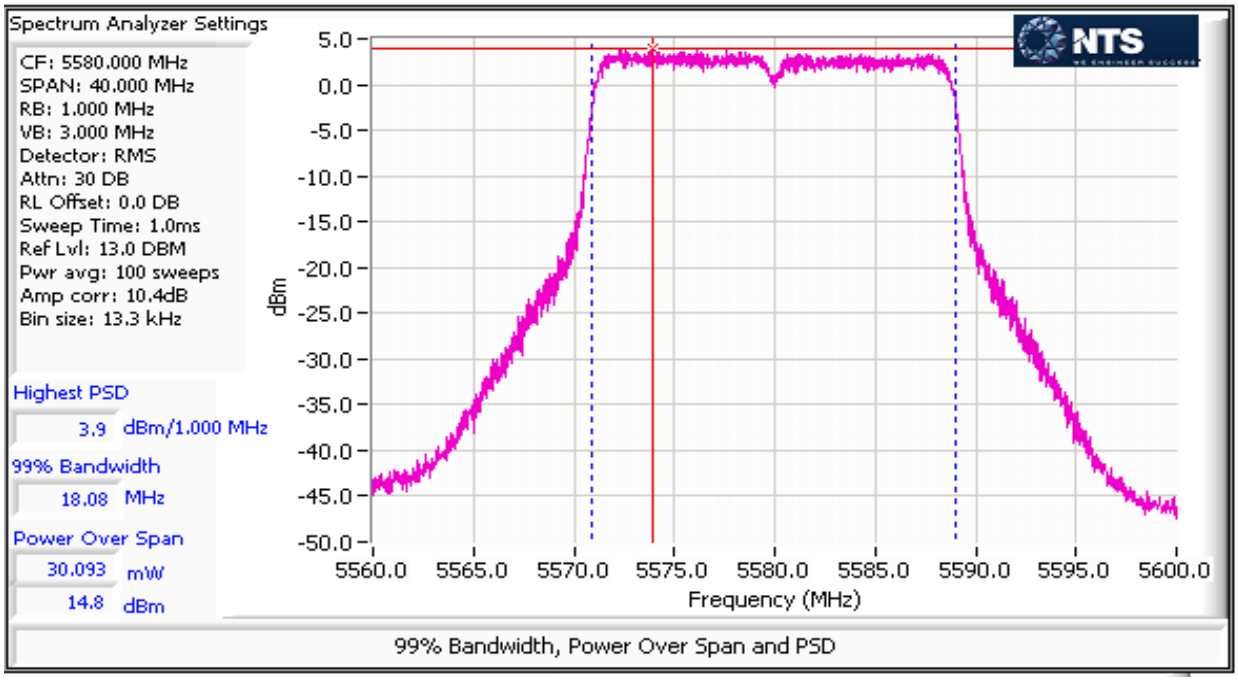
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

5470-5725 PSD - FCC/IC

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 | IC limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5500 | 1 | 17 | | 99 | 3.5 | 9.0 | 9.5 | 9.9 | 11.0 | Pass |
| | 3 | | | | 4.0 | | | | | |
| | 4 | | | | 3.3 | | | | | |
| | 2 | | | | 3.3 | | | | | |
| 5580 | 1 | 17 | | 99 | 3.1 | 9.0 | 9.5 | 9.9 | 11.0 | Pass |
| | 3 | | | | 3.9 | | | | | |
| | 4 | | | | 3.5 | | | | | |
| | 2 | | | | 3.5 | | | | | |
| 5700 | 1 | 17 | | 99 | 3.5 | 8.8 | 9.4 | 9.9 | 11.0 | Pass |
| | 3 | | | | 3.9 | | | | | |
| | 4 | | | | 2.6 | | | | | |
| | 2 | | | | 3.6 | | | | | |
| 5720 | 1 | 17 | | 99 | 3.5 | 8.9 | 9.5 | 9.9 | 11.0 | Pass |
| | 3 | | | | 3.9 | | | | | |
| | 4 | | | | 2.5 | | | | | |
| | 2 | | | | 3.9 | | | | | |
| Portion within 5725-5850 MHz band (UNII-3) | | | | | | | | | | |
| 5720 | 1 | 17 | | 99 | 2.9 | 8.3 | 9.2 | 28.9 | 28.9 | Pass |
| | 3 | | | | 3.5 | | | | | |
| | 4 | | | | 2.3 | | | | | |
| | 2 | | | | 3.8 | | | | | |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5470-5725 MHz Band - FCC

Mode: n40 Max EIRP (mW): 307.8

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[2] dBm | Total Power[4] mW | Total Power[4] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5550 | 1 | 20 | 45.2 | 97 | 17.8 | 238.9 | 23.8 | 24.0 | 0.239 | Pass |
| | 3 | | | | 17.8 | | | | | |
| | 4 | | | | 17.4 | | | | | |
| | 2 | | | | 17.5 | | | | | |
| 5670 | 1 | 20 | 44.0 | 97 | 17.6 | 228.2 | 23.6 | 24.0 | | Pass |
| | 3 | | | | 17.7 | | | | | |
| | 4 | | | | 17.2 | | | | | |
| | 2 | | | | 17.2 | | | | | |
| 5710 | 1 | 19 | 36.7 | 97 | 16.4 | 179.1 | 22.5 | 24.0 | | Pass |
| | 3 | | | | 17.0 | | | | | |
| | 4 | | | | 15.6 | | | | | |
| | 2 | | | | 16.4 | | | | | |

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

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5710 | 1 | 19 | | 97 | 9.6 | 40.5 | 16.1 | 30.0 | 0.0405 | Pass |
| | 3 | | | | 10.3 | | | | | |
| | 4 | | | | 9.0 | | | | | |
| | 2 | | | | 10.6 | | | | | |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device 5470-5725 PSD - FCC/IC

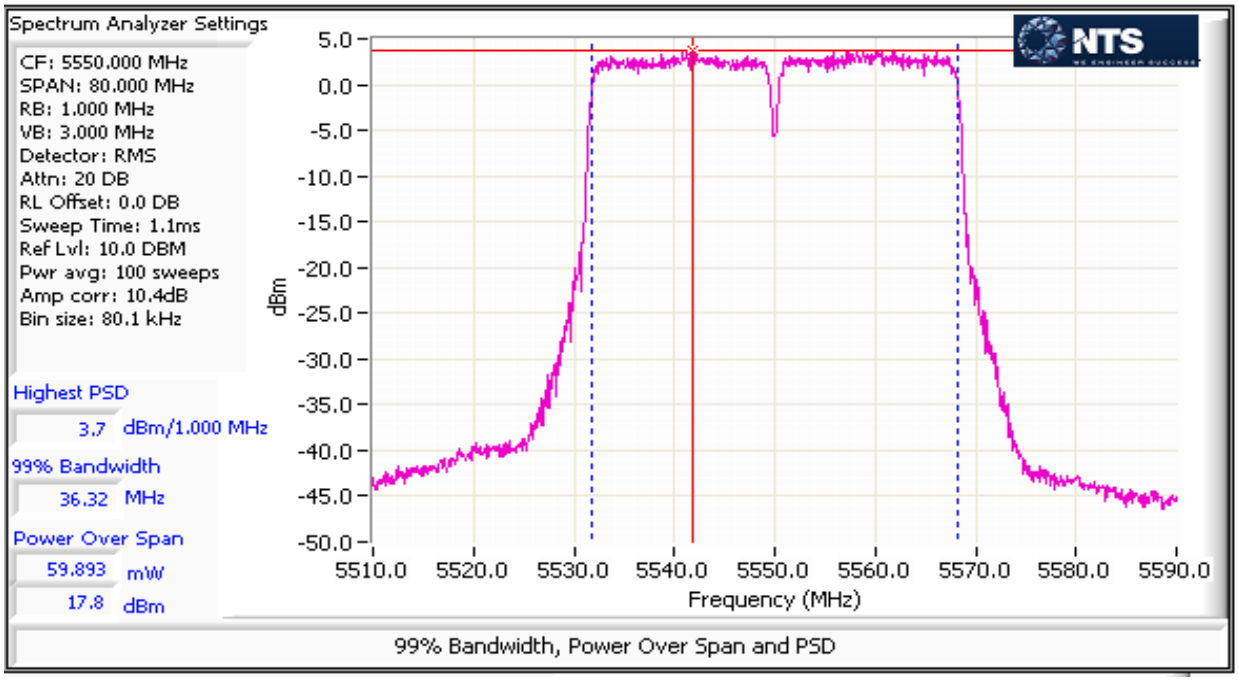
Mode: n40

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | PSD dBm/MHz | Total PSD[4] mW/MHz | Total PSD[4] dBm/MHz | FCC Limit dBm/MHz | IC limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5550 | 1 | 20 | | 97 | 3.7 | 9.1 | 9.6 | 9.9 | 11.0 | Pass |
| | 3 | | | | 3.6 | | | | | |
| | 4 | | | | 3.3 | | | | | |
| | 2 | | | | 3.2 | | | | | |
| 5670 | 1 | 20 | | 97 | 3.7 | 9.0 | 9.5 | 9.9 | 11.0 | Pass |
| | 3 | | | | 3.8 | | | | | |
| | 4 | | | | 2.9 | | | | | |
| | 2 | | | | 3.0 | | | | | |
| 5710 | 1 | 19 | | 97 | 2.7 | 7.7 | 8.9 | 9.9 | 11.0 | Pass |
| | 3 | | | | 3.3 | | | | | |
| | 4 | | | | 1.9 | | | | | |
| | 2 | | | | 2.8 | | | | | |

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

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5710 | 1 | 19 | | 97 | 5.7 | 16.2 | 12.1 | 28.9 | 28.9 | Pass |
| | 3 | | | | 6.3 | | | | | |
| | 4 | | | | 5.3 | | | | | |
| | 2 | | | | 6.4 | | | | | |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5470-5725 MHz Band - FCC

Mode: ac80 Max EIRP (mW): 302.2

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[2] dBm | Total Power[4] mW | Total Power[4] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5610 | 1 | 20 | 83.003 | 96 | 17.6 | 234.6 | 23.7 | 24.0 | 0.235 | Pass |
| | 3 | | | | 17.8 | | | | | |
| | 4 | | | | 17.2 | | | | | |
| | 2 | | | | 17.4 | | | | | |
| 5690 | 1 | 20 | 78.18 | 96 | 17.2 | 217.5 | 23.4 | 24.0 | | Pass |
| | 3 | | | | 17.2 | | | | | |
| | 4 | | | | 17.0 | | | | | |
| | 2 | | | | 17.3 | | | | | |
| Portion within 5725-5850 MHz band (UNII-3) | | | | | | | | | | |
| 5690 | 1 | 20 | | 96 | 3.5 | 10.5 | 10.2 | 30.0 | 0.0105 | Pass |
| | 3 | | | | 3.8 | | | | | |
| | 4 | | | | 4.0 | | | | | |
| | 2 | | | | 4.6 | | | | | |

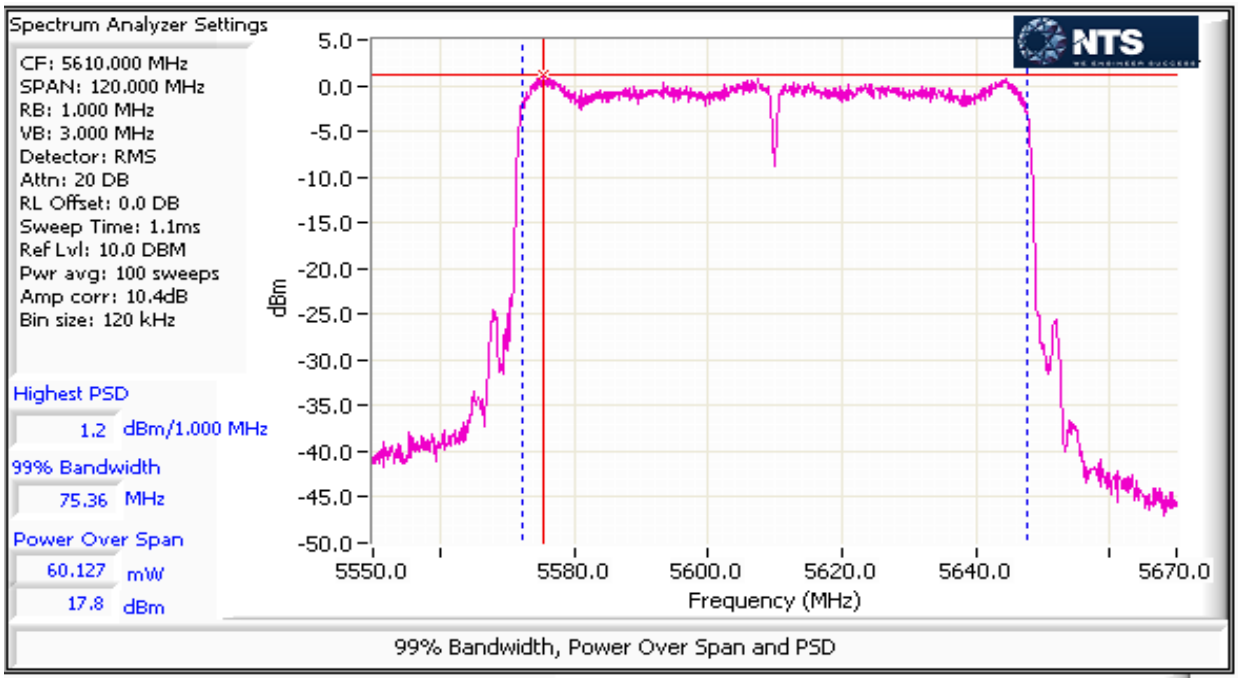
5470-5725 PSD - FCC/IC

Mode: ac80

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | PSD dBm/MHz | Total PSD[4] mW/MHz | Total PSD[4] dBm/MHz | FCC Limit dBm/MHz | IC limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5610 | 1 | 20 | | 96 | 0.8 | 5.2 | 7.2 | 9.9 | - | Pass |
| | 3 | | | | 1.2 | | | | | |
| | 4 | | | | 0.7 | | | | | |
| | 2 | | | | 1.0 | | | | | |
| 5690 | 1 | 20 | | 96 | 1.3 | 5.4 | 7.3 | 9.9 | 11.0 | Pass |
| | 3 | | | | 1.1 | | | | | |
| | 4 | | | | 0.9 | | | | | |
| | 2 | | | | 1.2 | | | | | |
| Portion within 5725-5850 MHz band (UNII-3) | | | | | | | | | | |
| 5690 | 1 | 20 | | 96 | 0.7 | 5.4 | 7.3 | 28.9 | 28.9 | Pass |
| | 3 | | | | 0.6 | | | | | |
| | 4 | | | | 1.1 | | | | | |
| | 2 | | | | 2.0 | | | | | |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5470-5725 MHz Band



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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.

## Summary of Results

| Run # | Test Performed | Limit | Pass / Fail | Result / Margin |
|---|---|---|---|---|
| 1 | Power, 5470 - 5725MHz | 15.407(a) (2) | Pass | n20: 20.5dBm (112.3mW)<br>n40: 22.6dBm (182.4mW)<br>ac80: 21.7dBm (148.9mW) |
| 1 | PSD, 5470 - 5725MHz | 15.407(a) (2) | Pass | n20: 9.5 dBm/MHz<br>n40: 8.9 dBm/MHz<br>ac80: 5.4 dBm/MHz |
| 1 | Max EIRP<br>5470 - 5725MHz | TPC required if EIRP≥ 500mW (27dBm).<br>EIRP ≥ 200mW (23dBm) DFS threshold | Pass | EIRP = 29.7 dBm (935.5 mW) |
| 1 | 26dB Bandwidth | 15.407<br>(Information only) | - | > 20MHz for all modes |
| 1 | 99% Bandwidth | RSS-247<br>(Information only) | N/A | n20: 18.1 MHz<br>n40: 36.4 MHz<br>ac80: 83.5 MHz |

## 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: | 22.9 °C |
| Rel. Humidity: | 40 % |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

## Modifications Made During Testing

No modifications were made to the EUT during testing

## Deviations From The Standard

No deviations were made from the requirements of the standard.

## 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) |
|---|---|---|---|---|---|---|---|
| 11a | 6Mbs | 0.89 | Yes | 0.558 | 0.51 | 1.01 | 1792 |
| n20 | MSC0 | 0.99 | Yes | 4.96 | 0 | 0 | 10 |
| n40 | MCS0 | 0.97 | Yes | 2.408 | 0.11 | 0.22 | 415 |
| ac80 | VHT0 | 0.96 | Yes | 1.139 | 0.19 | 0.37 | 878 |

Note - for antenna port measurements, the EUT was operated in the non-TxBF mode

## Sample Notes

Sample S/N: 184795206016480
Driver:

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 10/12/2016 0:00 Config. Used: 1

Test Engineer: Kevin Wen Config Change: None

Test Location: Fremont Lab 4A EUT Voltage: 120V/60Hz

| | |
|---|---|
| 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 2: | 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 , power averaging on and power integration over the OBW. Tthe measurements were adjusted by correcting for duty cycle. This is based on 10log(1/x), where x is the duty cycle. (method SA-2 of ANSI C63.10) |
| Note 3: | Measured using the same analyzer settings used for output power. |
| 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 | Refer to antenna spec in operational description | | | | Yes | Yes | Yes | No | 6.50 | 6.50 |
| 5250-5350 | | | | | Yes | Yes | Yes | No | 6.90 | 6.90 |
| 5470-5725 | | | | | Yes | Yes | Yes | No | 7.10 | 7.10 |
| 5725-5825 | | | | | Yes | Yes | Yes | No | 6.50 | 6.50 |

For devices that support CDD modes

Min # of spatial streams: 1

Max # of spatial streams: 4

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5470-5725 MHz Band - FCC

Mode: n20 Max EIRP (mW): 575.9

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power dBm | Total Power mW | Total Power dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5500 | 1 | 17 | 23.8 | 99 | 14.6 | 112.3 | 20.5 | 22.9 | 0.112 | Pass |
| | 3 | | | | 14.8 | | | | | |
| | 4 | | | | 14.3 | | | | | |
| | 2 | | | | 14.2 | | | | | |
| 5580 | 1 | 17 | 23.8 | 99 | 14.0 | 109.2 | 20.4 | 22.9 | | Pass |
| | 3 | | | | 14.8 | | | | | |
| | 4 | | | | 14.4 | | | | | |
| | 2 | | | | 14.2 | | | | | |
| 5700 | 1 | 17 | 23.4 | 99 | 14.2 | 108.1 | 20.3 | 22.9 | | Pass |
| | 3 | | | | 14.7 | | | | | |
| | 4 | | | | 13.7 | | | | | |
| | 2 | | | | 14.6 | | | | | |
| 5720 | 1 | 17 | 25 | 99 | 13.2 | 83.0 | 19.2 | 22.9 | | Pass |
| | 3 | | | | 13.6 | | | | | |
| | 4 | | | | 12.5 | | | | | |
| | 2 | | | | 13.3 | | | | | |

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

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5720 | 1 | 17 | | 99 | 7.5 | 23.3 | 13.7 | 28.9 | 0.0233 | Pass |
| | 3 | | | | 8.0 | | | | | |
| | 4 | | | | 6.9 | | | | | |
| | 2 | | | | 8.1 | | | | | |

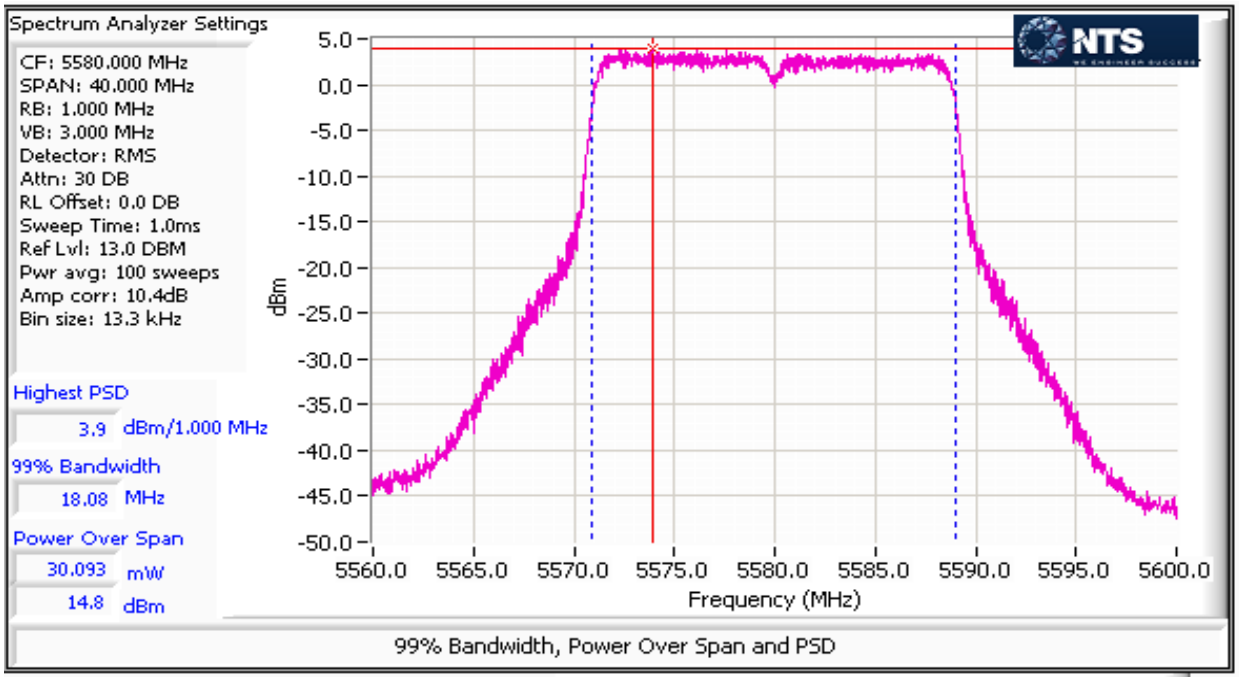
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

5470-5725 PSD - FCC/IC

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 | IC limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5500 | 1 | 17 | | 99 | 3.5 | 9.0 | 9.5 | 9.9 | 11.0 | Pass |
| | 3 | | | | 4.0 | | | | | |
| | 4 | | | | 3.3 | | | | | |
| | 2 | | | | 3.3 | | | | | |
| 5580 | 1 | 17 | | 99 | 3.1 | 9.0 | 9.5 | 9.9 | 11.0 | Pass |
| | 3 | | | | 3.9 | | | | | |
| | 4 | | | | 3.5 | | | | | |
| | 2 | | | | 3.5 | | | | | |
| 5700 | 1 | 17 | | 99 | 3.5 | 8.7 | 9.4 | 9.9 | 11.0 | Pass |
| | 3 | | | | 3.7 | | | | | |
| | 4 | | | | 2.6 | | | | | |
| | 2 | | | | 3.6 | | | | | |
| 5720 | 1 | 17 | | 99 | 3.5 | 8.9 | 9.5 | 9.9 | 11.0 | Pass |
| | 3 | | | | 3.9 | | | | | |
| | 4 | | | | 2.5 | | | | | |
| | 2 | | | | 3.9 | | | | | |
| Portion within 5725-5850 MHz band (UNII-3) | | | | | | | | | | |
| 5720 | 1 | 17 | | 99 | 2.9 | 8.3 | 9.2 | 28.9 | 28.9 | Pass |
| | 3 | | | | 3.5 | | | | | |
| | 4 | | | | 2.3 | | | | | |
| | 2 | | | | 3.8 | | | | | |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5470-5725 MHz Band - FCC

Mode: n40 Max EIRP (mW): 935.5

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power dBm | Total Power mW | Total Power dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5550 | 1 | 19 | 45.2 | 97 | 16.5 | 182.4 | 22.6 | 22.9 | 0.182 | Pass |
| | 3 | | | | 16.8 | | | | | |
| | 4 | | | | 16.1 | | | | | |
| | 2 | | | | 16.4 | | | | | |
| 5670 | 1 | 19 | 44.0 | 97 | 16.3 | 173.2 | 22.4 | 22.9 | | Pass |
| | 3 | | | | 16.4 | | | | | |
| | 4 | | | | 15.8 | | | | | |
| | 2 | | | | 16.4 | | | | | |
| 5710 | 1 | 19 | 36.7 | 97 | 16.4 | 179.1 | 22.5 | 22.9 | | Pass |
| | 3 | | | | 17.0 | | | | | |
| | 4 | | | | 15.6 | | | | | |
| | 2 | | | | 16.4 | | | | | |

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

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5710 | 1 | 19 | | 97 | 9.6 | 40.5 | 16.1 | 28.9 | 0.0405 | Pass |
| | 3 | | | | 10.3 | | | | | |
| | 4 | | | | 9.0 | | | | | |
| | 2 | | | | 10.6 | | | | | |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device 5470-5725 PSD - FCC/IC

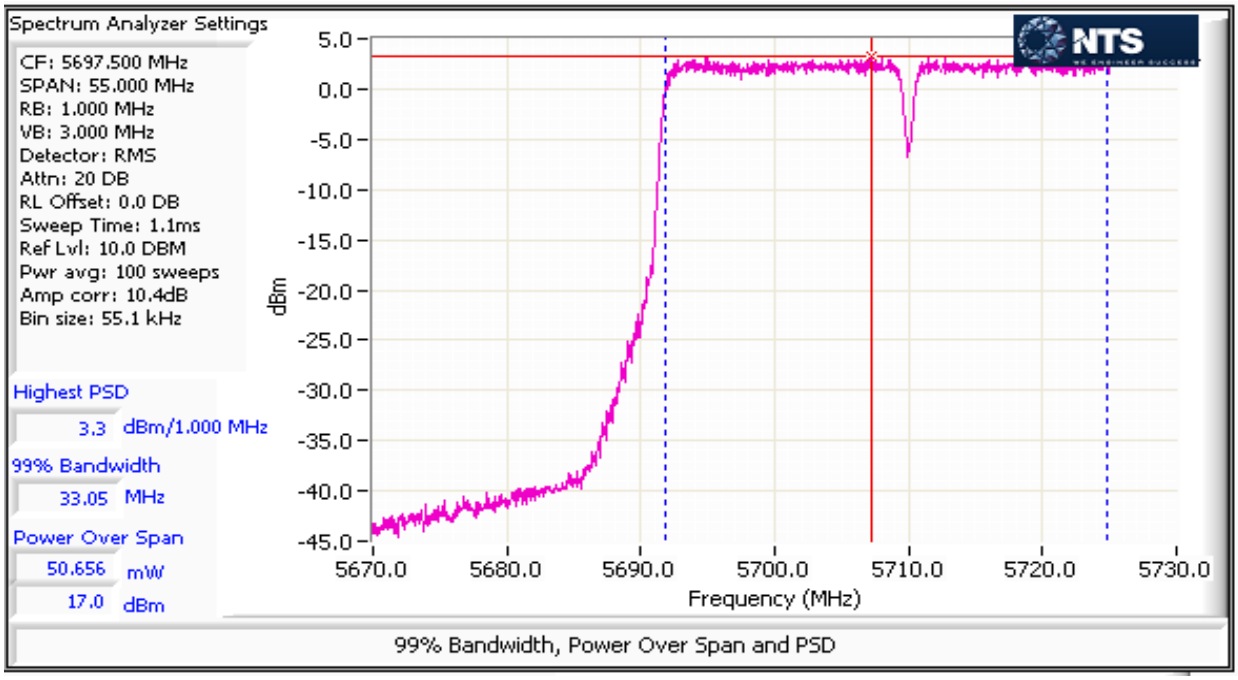
Mode: n40

| 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 | IC limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5550 | 1 | 19 | | 97 | 2.1 | 6.9 | 8.4 | 9.9 | 11.0 | Pass |
| | 3 | | | | 2.5 | | | | | |
| | 4 | | | | 2.0 | | | | | |
| | 2 | | | | 2.2 | | | | | |
| 5670 | 1 | 19 | | 97 | 2.2 | 6.8 | 8.3 | 9.9 | 11.0 | Pass |
| | 3 | | | | 2.4 | | | | | |
| | 4 | | | | 1.7 | | | | | |
| | 2 | | | | 2.3 | | | | | |
| 5710 | 1 | 19 | | 97 | 2.7 | 7.7 | 8.9 | 9.9 | 11.0 | Pass |
| | 3 | | | | 3.3 | | | | | |
| | 4 | | | | 1.9 | | | | | |
| | 2 | | | | 2.8 | | | | | |

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

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5710 | 1 | 19 | | 97 | 5.7 | 16.2 | 12.1 | 28.9 | 28.9 | Pass |
| | 3 | | | | 6.3 | | | | | |
| | 4 | | | | 5.3 | | | | | |
| | 2 | | | | 6.4 | | | | | |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5470-5725 MHz Band - FCC

Mode: ac80 Max EIRP (mW): 763.7

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[1] dBm | Total Power mW | Total Power dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5610 | 1 | 19 | 83.00 | 96 | 15.1 | 145.6 | 21.6 | 22.9 | 0.149 | Pass |
| | 3 | | | | 15.8 | | | | | |
| | 4 | | | | 15.3 | | | | | |
| | 2 | | | | 15.5 | | | | | |
| 5690 | 1 | 19 | 78.18 | 96 | 15.6 | 148.9 | 21.7 | 22.9 | | Pass |
| | 3 | | | | 15.5 | | | | | |
| | 4 | | | | 15.8 | | | | | |
| | 2 | | | | 15.2 | | | | | |
| Portion within 5725-5850 MHz band (UNII-3) | | | | | | | | | | |
| 5690 | 1 | 19 | | 96 | 2.1 | 7.2 | 8.6 | 28.9 | 0.0072 | Pass |
| | 3 | | | | 2.2 | | | | | |
| | 4 | | | | 2.4 | | | | | |
| | 2 | | | | 2.7 | | | | | |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

5470-5725 PSD - FCC/IC

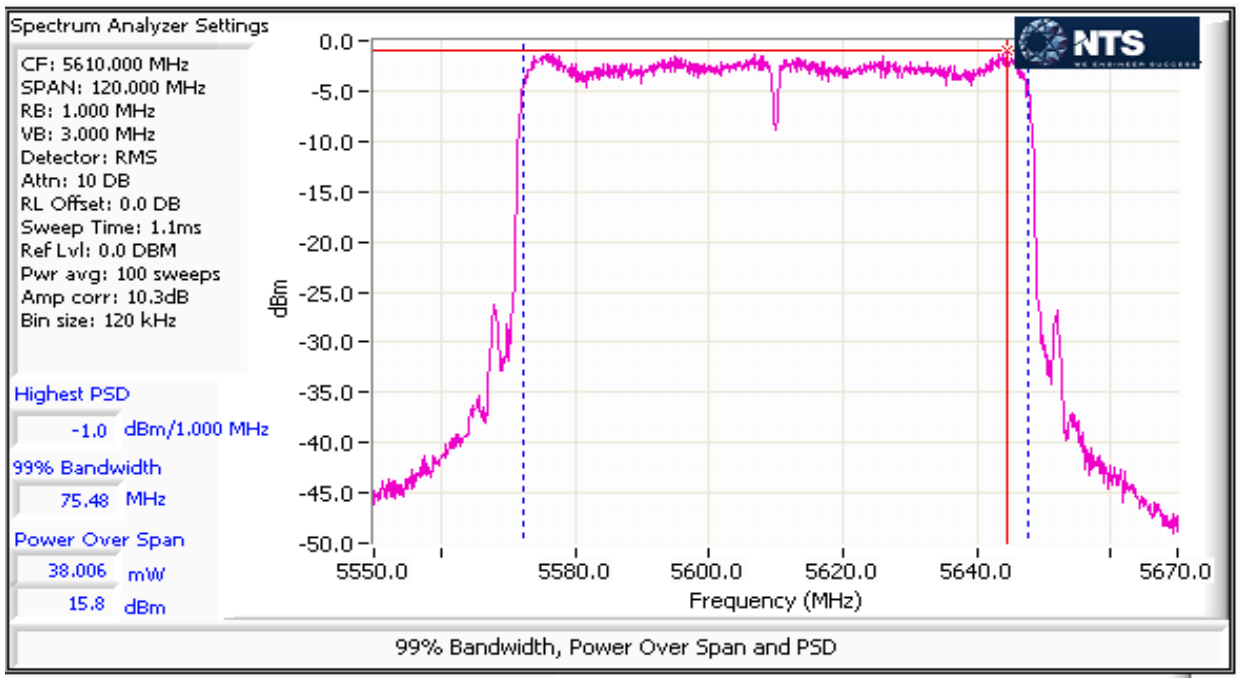
Mode: ac80

| 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 | IC limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5610 | 1 | 19 | | 96 | -0.8 | 3.3 | 5.2 | 9.9 | - | Pass |
| | 3 | | | | -1.0 | | | | | |
| | 4 | | | | -1.4 | | | | | |
| | 2 | | | | -1.1 | | | | | |
| 5690 | 1 | 19 | | 96 | -0.7 | 3.5 | 5.4 | 9.9 | - | Pass |
| | 3 | | | | -0.7 | | | | | |
| | 4 | | | | -0.5 | | | | | |
| | 2 | | | | -1.0 | | | | | |

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

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5690 | 1 | 19 | | 96 | -0.5 | 3.9 | 5.9 | 28.9 | - | Pass |
| | 3 | | | | -0.1 | | | | | |
| | 4 | | | | -0.5 | | | | | |
| | 2 | | | | -0.2 | | | | | |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T102846 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Product | BGW210-700 | T-Log Number: | T103599 |
| System Configuration: | - | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Emissions Standard(s): | FCC 15.B, 15.247, 15.407 | Class: | B |
| Immunity Standard(s): | - | Environment: | - |

# EMC Test Data

For The

# ARRIS

Product

BGW210-700

Date of Last Test: 1/6/2017

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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 engineering evaluation testing of the EUT with respect to the specification listed above.

Date of Test: 01/04/17
Test Engineer: John Caizzi
Test Location: Fremont 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: 22.3 °C
Rel. Humidity: 40 %

## Summary of Results

| Run # | Mode | Channel | # of SS | Passing Pwr Setting | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| 80MHz Bandwith Modes | | | | | | | |
| 1 | ac20 | 36 - 5180MHz | 1 | 22 | Restricted Band Edge at 5150 MHz | 15.209 | 53.0 dBµV/m @ 5149.0 MHz (-1.0 dB) |
| | | | 4 | 22 | | | 53.1 dBµV/m @ 5149.9 MHz (-0.9 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.

## 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)

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

| | Mode | Data Rate | Duty Cycle (x) | Constant DC? | T (ms) | Pwr Cor Factor* | Lin Volt Cor Factor** | Min VBW for FS (Hz) | |
|---|---|---|---|---|---|---|---|---|---|
| 1SS | ac20 | MCS0 | 0.99 | Yes | 9.89 | 0.00 | 0.00 | 10 | |
| 4SS | ac20 | MCS0 | 0.96 | Yes | 2.49 | 0.18 | 0.36 | 402 | 52.137643 |

## Sample Notes

Sample S/N: 184795206016304
Driver: d21
Antenna: internal 4x4

## 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 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 5: | Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements. |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #1: Radiated Bandedge Measurements, 5150-5250MHz

Channel: 36 - 5180 MHz
Mode: ac 20

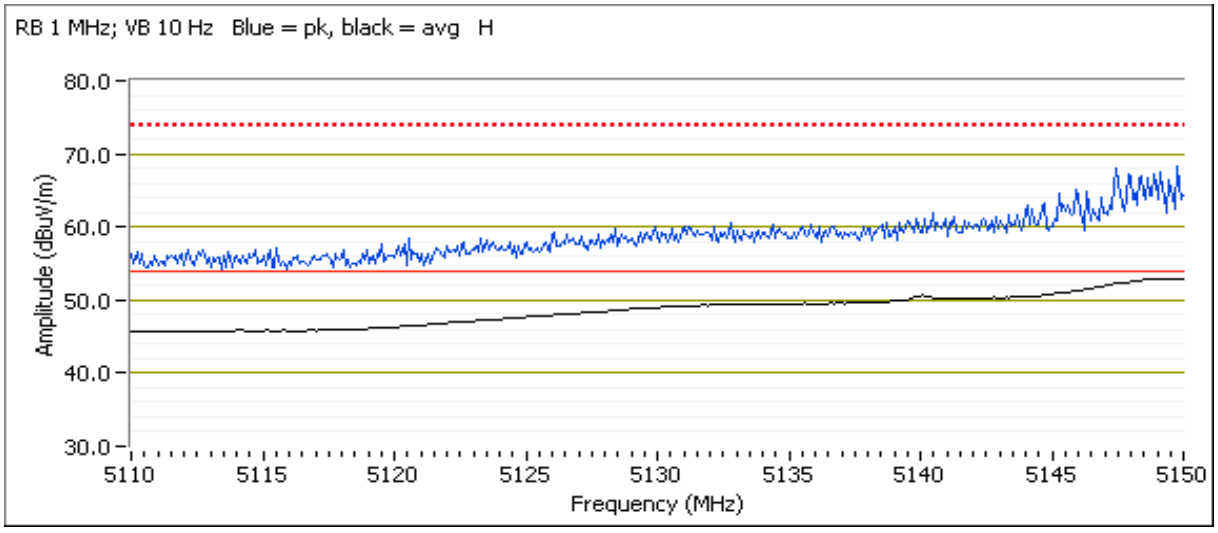
EUT Orientation: Flat
Data Rate: VHT0

Tx Chain: 4Tx
# of SS: 1

Power setting: 22

*5150 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5149.040 | 53.0 | H | 54.0 | -1.0 | AVG | 0 | 1.30 | |
| 5148.320 | 69.4 | H | 74.0 | -4.6 | PK | 0 | 1.30 | |

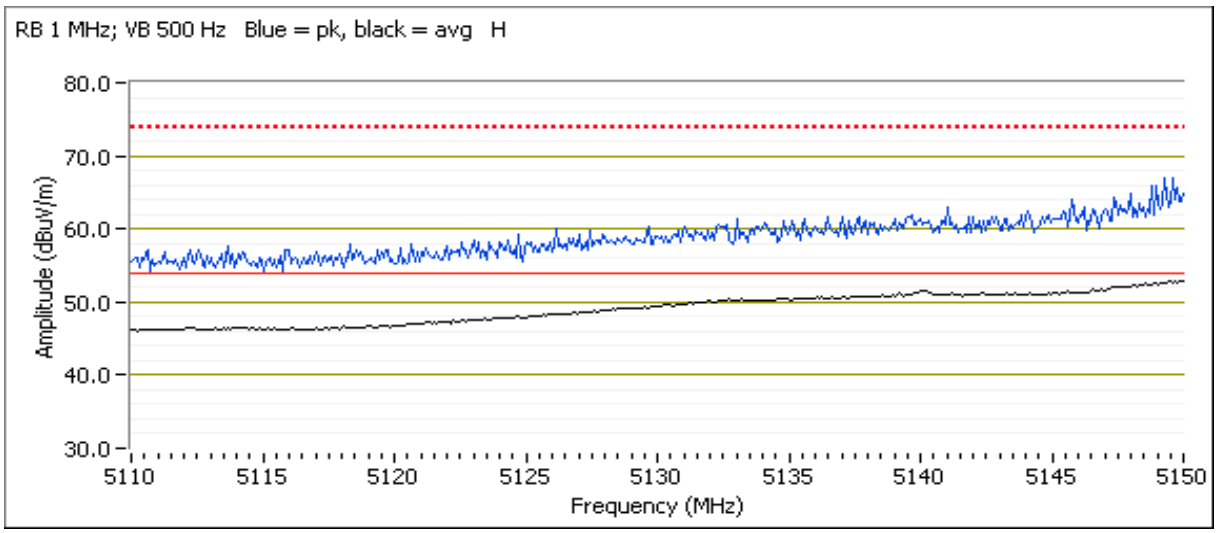


| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Tx Chain: 4Tx Power setting: 22
# of SS: 4

*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 | |
| 5149.920 | 53.1 | H | 54.0 | -0.9 | Avg | 357 | 1.29 | VB: 500 Hz, note 3. |
| 5148.800 | 66.0 | H | 74.0 | -8.0 | PK | 357 | 1.29 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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: 12/20/16
Test Engineer: M. Birgani
Test Location: Fremont Chamber #4

Config. Used: -
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: 22.3 °C
Rel. Humidity: 40 %

## Summary of Results

| Run # | Mode | Channel | # of SS | Passing Pwr Setting | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| 2 | ac40 | 38 - 5190MHz | 1 | 17 | Restricted Band Edge at 5150 MHz | 15.209 | 53.5 dBµV/m @ 5148.5 MHz (-0.5 dB) |
| | | | 3 | 17 | | | 53.8 dBµV/m @ 5150.0 MHz (-0.2 dB) |
| | | | 4 | 17 | | | 53.9 dBµV/m @ 5149.8 MHz (-0.1 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.

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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) |
|---|---|---|---|---|---|---|---|---|
| 1SS | ac40 | MCS0 | 0.99 | Yes | 5.29 | 0.00 | 0.00 | 10 |
| 3SS | ac40 | MCS0 | 0.98 | Yes | 1.65 | 0.10 | 0.20 | 10 |
| 4SS | ac40 | MCS0 | 0.96 | Yes | 1.25 | 0.16 | 0.33 | 803 |

## Sample Notes

Sample S/N: 184795206016304
Driver: d21
Antenna: internal 4x4

## 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 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 5: | Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements. |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #2: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 12/20/16
Test Engineer: M. Birgani
Test Location: FT Chamber #4

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

Channel: 38 - 5180 MHz
Mode: ac 40

EUT Orientation: Flat
Data Rate: VHT0

Tx Chain: 4Tx Power setting: 17
# of SS: 1 (spatial mapping on - using BF config = 0)
*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 | |
| 5148.480 | 53.5 | H | 54.0 | -0.5 | AVG | 93 | 1.5 | POS; RB 1 MHz; VB: 300 Hz |
| 5148.520 | 68.2 | H | 74.0 | -5.8 | PK | 93 | 1.5 | POS; RB 1 MHz; VB: 3 MHz |

Tx Chain: 4Tx Power setting: 17
# of SS: 3 (spatial mapping on - using BF config = 2)
*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 | |
| 5150.000 | 53.8 | H | 54.0 | -0.2 | AVG | 354 | 1.4 | POS; RB 1 MHz; VB: 1 kHz |
| 5148.160 | 65.9 | H | 74.0 | -8.1 | PK | 354 | 1.4 | POS; RB 1 MHz; VB: 3 MHz |

Tx Chain: 4Tx Power setting: 17
# of SS: 4 (spatial mapping on - using BF config = 2)
*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 | |
| 5149.760 | 53.9 | H | 54.0 | -0.1 | AVG | 357 | 1.5 | POS; RB 1 MHz; VB: 1 kHz |
| 5149.920 | 66.5 | H | 74.0 | -7.5 | PK | 357 | 1.5 | POS; RB 1 MHz; VB: 3 MHz |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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: 12/20/2016 0:00
Test Engineer: John Caizzi
Test Location: Fremont Chamber #4

Config. Used: -
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: 22.3 °C
Rel. Humidity: 40 %

## Summary of Results

| Run # | Mode | Channel | # of SS | Passing Pwr Setting | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| 80MHz Bandwith Modes | | | | | | | |
| 13 | ac80 | 42 - 5210MHz | 1 | 17 | Restricted Band Edge at 5150 MHz | 15.209 | 53.9 dBµV/m @ 5148.8 MHz (-0.1 dB) |
| | | | 4 | 18 | | | 53.9 dBµV/m @ 5147.6 MHz (-0.1 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.

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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) |
|---|---|---|---|---|---|---|---|---|
| 1SS | ac80 | VHT0 | 0.96 | Yes | 2.214 | 0.19 | 0.39 | 452 |
| 2SS | ac80 | VHT0 | 0.97 | Yes | 2.236 | 0.11 | 0.23 | 447 |
| 3SS | ac80 | VHT0 | 0.92 | Yes | 0.784 | 0.37 | 0.73 | 1276 |
| 4SS | ac80 | VHT0 | 0.89 | Yes | 0.551 | 0.51 | 1.01 | 1815 |

## Sample Notes

Sample S/N: 184795206016304
Driver: d21
Antenna: internal 4x4

## 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 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 5: | Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements. |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #13: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 12/20/2016 0:00
Test Engineer: John Caizzi
Test Location: FT Chamber #4

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

Channel: 42 - 5210 MHz
Tx Chain: 4Tx
Mode: ac 80
# of SS: 1

EUT Orientation: Flat
Power setting: 17, spatial mapping off
Data Rate: VHT0

*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 | |
| 5148.800 | 53.9 | H | 54.0 | -0.1 | Avg | 355 | 1.00 | POS; RB 1 MHz; VB: 500 Hz |
| 5148.400 | 68.3 | H | 74.0 | -5.7 | PK | 355 | 1.00 | |

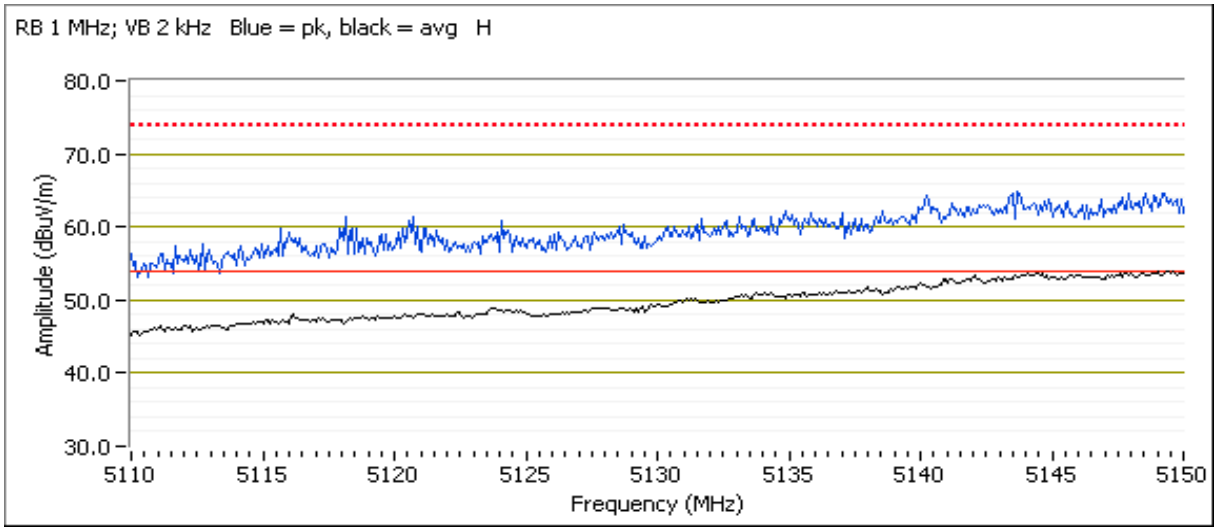
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 42 - 5210 MHz
Tx Chain: 4Tx
Mode: ac 80
# of SS: 4

EUT Orientation: Flat
Power setting: 18, spatial mapping off
Data Rate: VHT0

*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 | 53.9 | H | 54.0 | -0.1 | Avg | 350 | 1.24 | POS; RB 1 MHz; VB: 2 kHz |
| 5149.360 | 65.3 | H | 74.0 | -8.7 | PK | 350 | 1.24 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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 °C
Rel. Humidity: 45 %

## Modifications Made During Testing

No modifications were made to the EUT during testing

## Deviations From The Standard

No deviations were made from the requirements of the standard.

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

## Summary of Results

| Run # | Mode | Channel | Spatial Streams | Passing Power Setting | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| 80MHz Bandwith Modes | | | | | | | |
| 1 | ac 80 | 42 - 5210MHz | 1SS | 16 | Restricted Band Edge at 5150 MHz | 15.209 | 53.2 dBµV/m @ 5148.7 MHz (-0.8 dB) |
| | | | 2SS | 17 | | | 53.8 dBµV/m @ 5149.6 MHz (-0.2 dB) |
| | | | 3SS | 18 | | | 54.0 dBµV/m @ 5147.4 MHz (0.0 dB) |
| | | | 4SS | 18 | | | 53.3 dBµV/m @ 5149.5 MHz (-0.7 dB) |
| 40MHz Bandwith Modes | | | | | | | |
| 2 | ac 40 | 38 - 5190MHz | 1SS | 16 | Restricted Band Edge at 5150 MHz | 15.209 | 53.6 dBµV/m @ 5149.7 MHz (-0.4 dB) |
| | | | 2SS | 18 | | | 53.6 dBµV/m @ 5149.7 MHz (-0.4 dB) |
| | | | 3SS | 18 | | | 53.5 dBµV/m @ 5149.9 MHz (-0.5 dB) |
| | | | 4SS | 18 | | | 53.9 dBµV/m @ 5149.5 MHz (-0.1 dB) |
| 20MHz Bandwith Modes | | | | | | | |
| 3 | ac 20 | 36 - 5180MHz | 1SS | 21 | Restricted Band Edge at 5150 MHz | 15.209 | 53.9 dBµV/m @ 5149.4 MHz (-0.1 dB) |
| | | | 4SS | 22 | | | 53.6 dBµV/m @ 5149.7 MHz (-0.4 dB) |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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) |
|---|---|---|---|---|---|---|---|---|
| | Mode | Data Rate | Duty Cycle (x) | Constant DC? | T (ms) | Pwr Cor Factor* | Lin Volt Cor Factor** | Min VBW for FS (Hz) |
| 1SS | ac20 | MCS0 | 0.90 | No | 0.37 | 0.46 | 0.92 | 2732 |
| 2SS | ac20 | MCS0 | 0.93 | No | 0.34 | 0.32 | 0.63 | 2985 |
| 3SS | ac20 | MCS0 | 0.94 | No | 0.34 | 0.27 | 0.54 | 2941 |
| 4SS | ac20 | MCS0 | 0.94 | No | 0.335 | 0.27 | 0.54 | 2985 |
| 1SS | ac40 | MCS0 | 0.79 | No | 0.844 | 1.0 | 2.0 | 1185 |
| 2SS | ac40 | MCS0 | 0.89 | No | 0.366 | 0.5 | 1.0 | 2732 |
| 3SS | ac40 | MCS0 | 0.95 | No | 0.348 | 0.2 | 0.4 | 2874 |
| 4SS | ac40 | MCS0 | 0.71 | No | 0.68 | 1.5 | 3.0 | 1471 |
| 1SS | ac80 | VHT0 | 0.92 | No | 1.16 | 0.3 | 0.7 | 862 |
| 2SS | ac80 | VHT0 | 0.70 | No | 0.31 | 1.5 | 3.0 | 3226 |
| 3SS | ac80 | VHT0 | 0.82 | No | 0.49 | 0.9 | 1.8 | 2041 |
| 4SS | ac80 | VHT0 | 0.82 | No | 0.54 | 0.9 | 1.7 | 1852 |

## Sample Notes

Sample S/N: 184795206016304
Driver: d21
Antenna: internal 4x4

## 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 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 5: | Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements. |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #1: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 1/5/2017
Test Engineer: John Caizzi
Test Location: Chamber 7

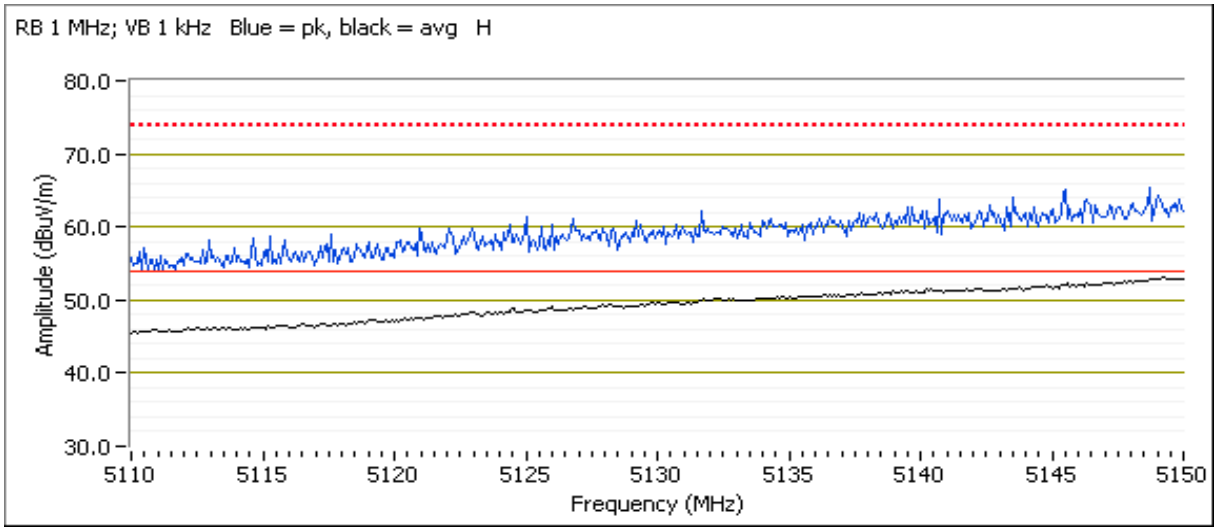
Config. Used: 2
Config Change: none
EUT Voltage: 120V / 60Hz

Channel: 42 - 5210 MHz
Tx Chain: 4Tx
Mode: ac 80
Streams: 1SS

EUT Orientation: Flat
Power setting: 16
Data Rate: VHT0

*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 | |
| 5148.720 | 53.2 | H | 54.0 | -0.8 | Avg | 358 | 1.28 | VB: 1 kHz, note 3. |
| 5148.640 | 65.0 | H | 74.0 | -9.0 | PK | 358 | 1.28 | |



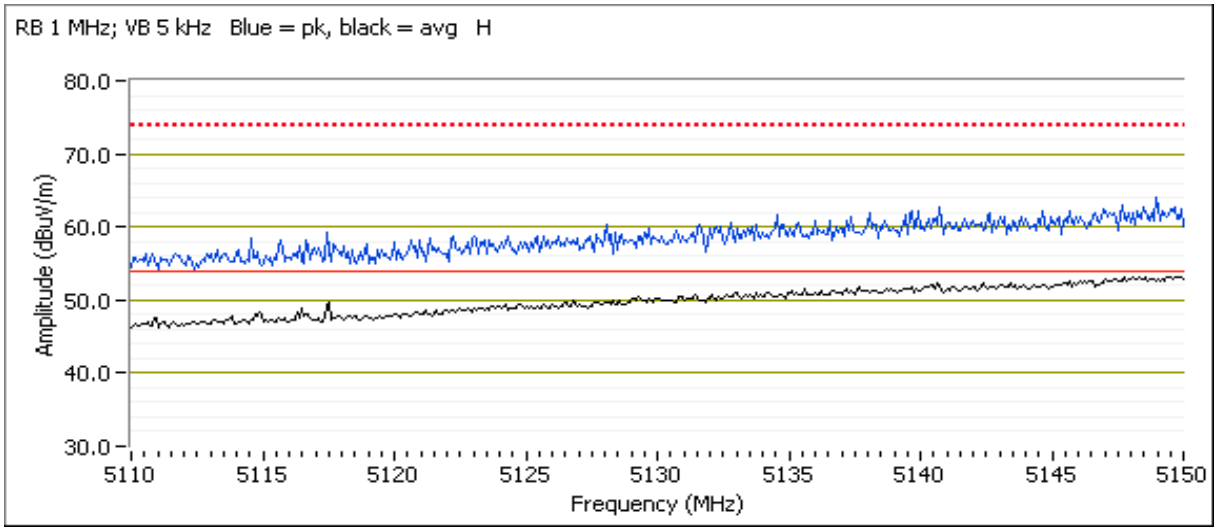
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 42 - 5210 MHz
Tx Chain: 4Tx
Mode: ac 80
Streams: 2SS

EUT Orientation: Flat
Power setting: 17
Data Rate: MCS 0

*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 | |
| 5149.560 | 53.8 | H | 54.0 | -0.2 | Avg | 0 | 1.38 | VB: 5 kHz, note 3. |
| 5148.280 | 64.8 | H | 74.0 | -9.2 | PK | 0 | 1.38 | |



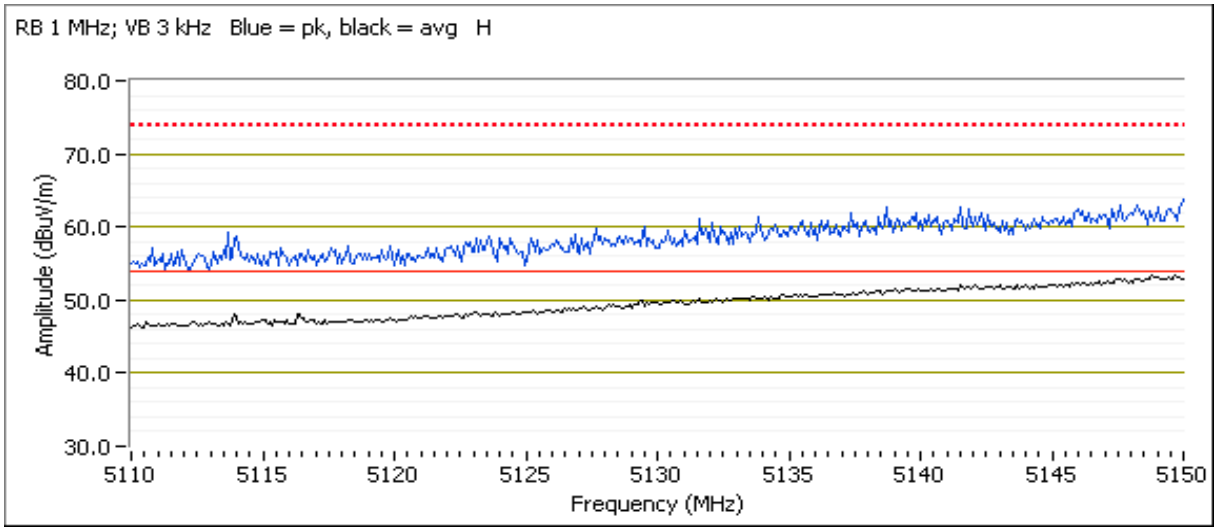
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 42 - 5210 MHz
Tx Chain: 4Tx
Mode: ac 80
Streams: 3SS

EUT Orientation: Flat
Power setting: 18
Data Rate: MCS 0

*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 | |
| 5147.350 | 54.0 | H | 54.0 | 0.0 | Avg | 356 | 1.48 | VB: 3 kHz, note 3. |
| 5148.720 | 64.5 | H | 74.0 | -9.5 | PK | 356 | 1.48 | |



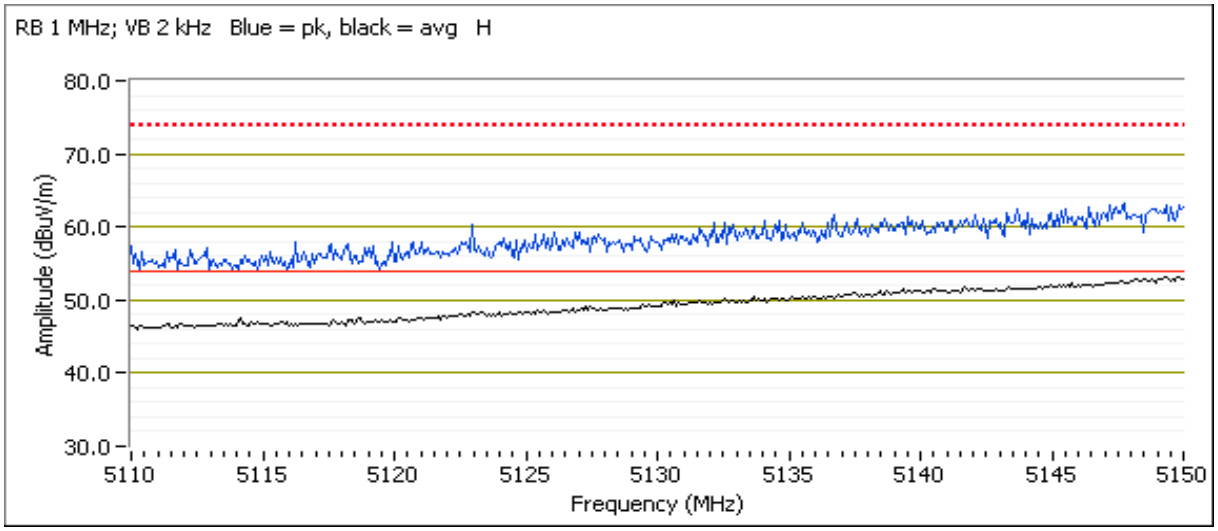
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 42 - 5210 MHz
Tx Chain: 4Tx
Mode: ac 80
Streams: 4SS

EUT Orientation: Flat
Power setting: 18
Data Rate: MCS 0

*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 | |
| 5149.520 | 53.3 | H | 54.0 | -0.7 | Avg | 357 | 1.49 | VB: 2 kHz, note 3. |
| 5147.520 | 63.7 | H | 74.0 | -10.3 | PK | 357 | 1.49 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #2: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 1/5/2017
Test Engineer: John Caizzi
Test Location: Chamber 7

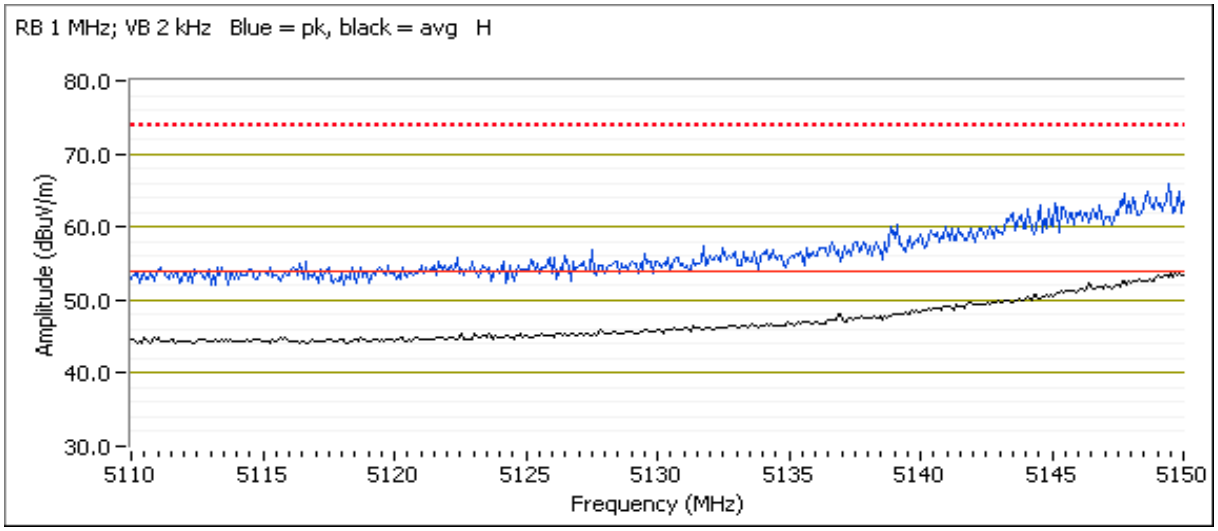
Config. Used: 2
Config Change: none
EUT Voltage: 120V / 60Hz

Channel: 38 - 5190 MHz
Tx Chain: 4Tx
Mode: ac 40
Streams: 1SS

EUT Orientation: Flat
Power setting: 16
Data Rate: MCS 0

*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 | |
| 5149.680 | 53.6 | H | 54.0 | -0.4 | Avg | 357 | 1.31 | VB: 2 kHz, note 3. |
| 5148.960 | 65.4 | H | 74.0 | -8.6 | PK | 357 | 1.31 | |



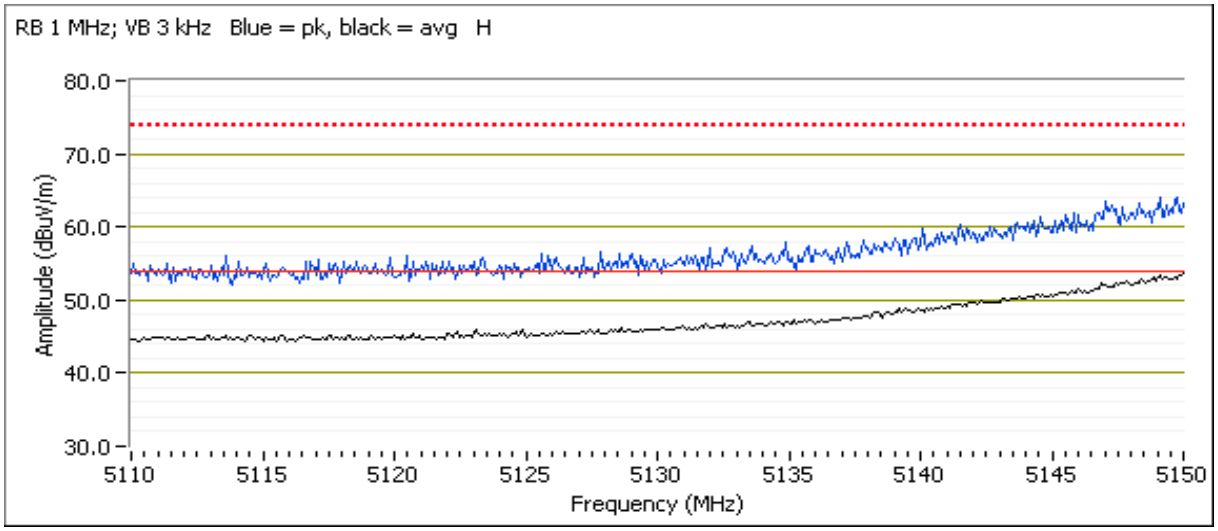
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 38 - 5190 MHz
Tx Chain: 4Tx
Mode: ac 40
Streams: 2SS

EUT Orientation: Flat
Power setting: 18
Data Rate: MCS 0

*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 | |
| 5149.640 | 53.6 | H | 54.0 | -0.4 | ?? | 355 | 1.30 | VB: 3 kHz, note 3. |
| 5149.780 | 65.4 | H | 74.0 | -8.6 | PK | 355 | 1.30 | |



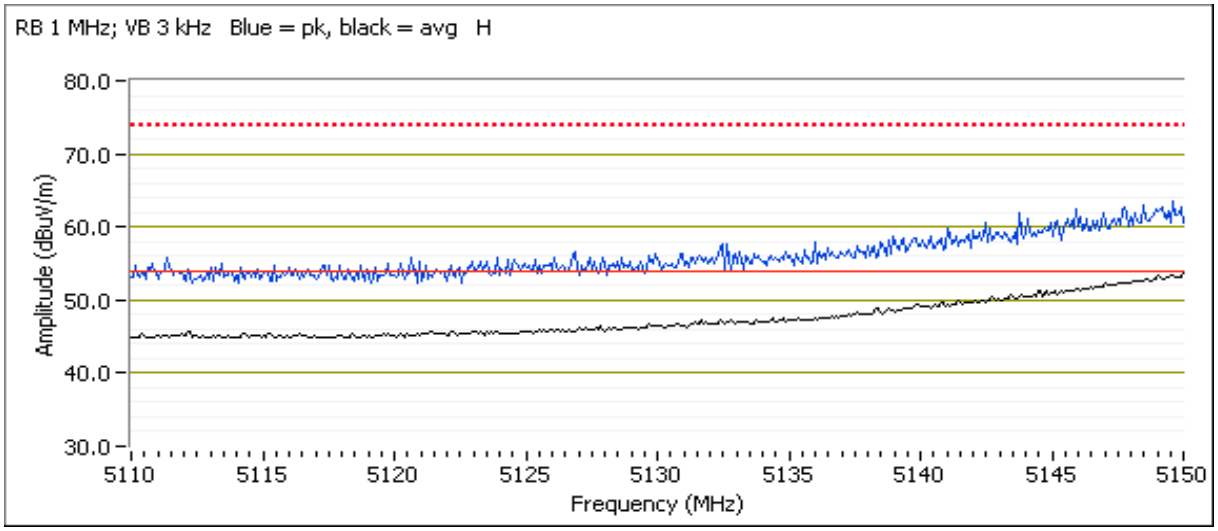
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 38 - 5190 MHz
Tx Chain: 4Tx
Mode: ac 40
Streams: 3SS

EUT Orientation: Flat
Power setting: 18
Data Rate: MCS 0

*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 | |
| 5149.920 | 53.5 | H | 54.0 | -0.5 | Avg | 356 | 1.31 | VB: 3 kHz, note 3. |
| 5146.430 | 64.8 | H | 74.0 | -9.2 | PK | 356 | 1.31 | |



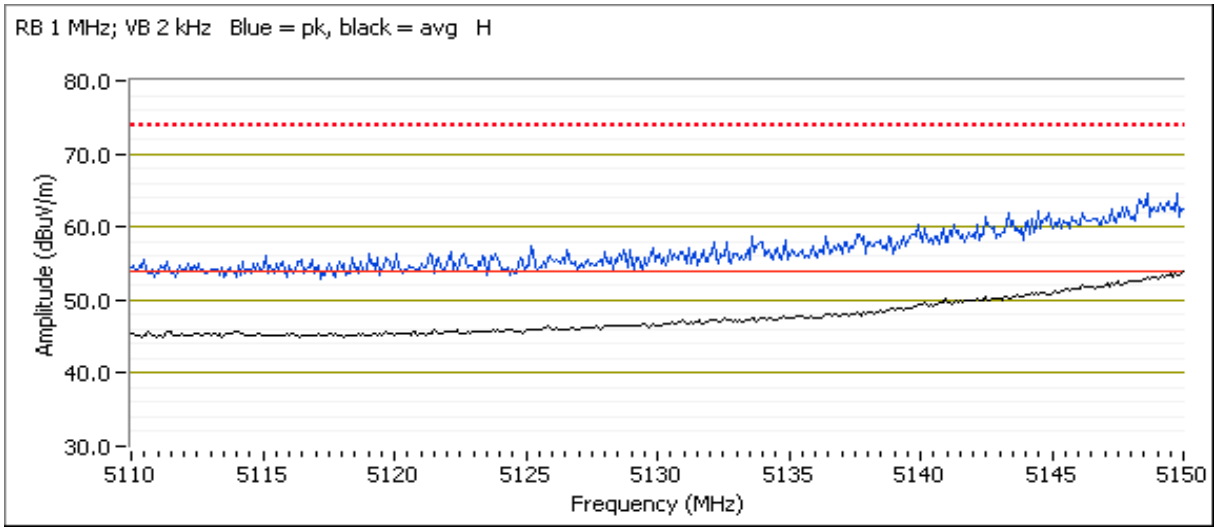
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 38 - 5190 MHz
Tx Chain: 4Tx
Mode: ac 40
Streams: 4SS

EUT Orientation: Flat
Power setting: 18
Data Rate: MCS 0

*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 | |
| 5149.460 | 53.9 | H | 54.0 | -0.1 | Avg | 356 | 1.29 | VB: 2 kHz, note 3. |
| 5149.980 | 67.3 | H | 74.0 | -6.7 | PK | 356 | 1.29 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 1/5/2017
Test Engineer: John Caizzi
Test Location: Chamber 7

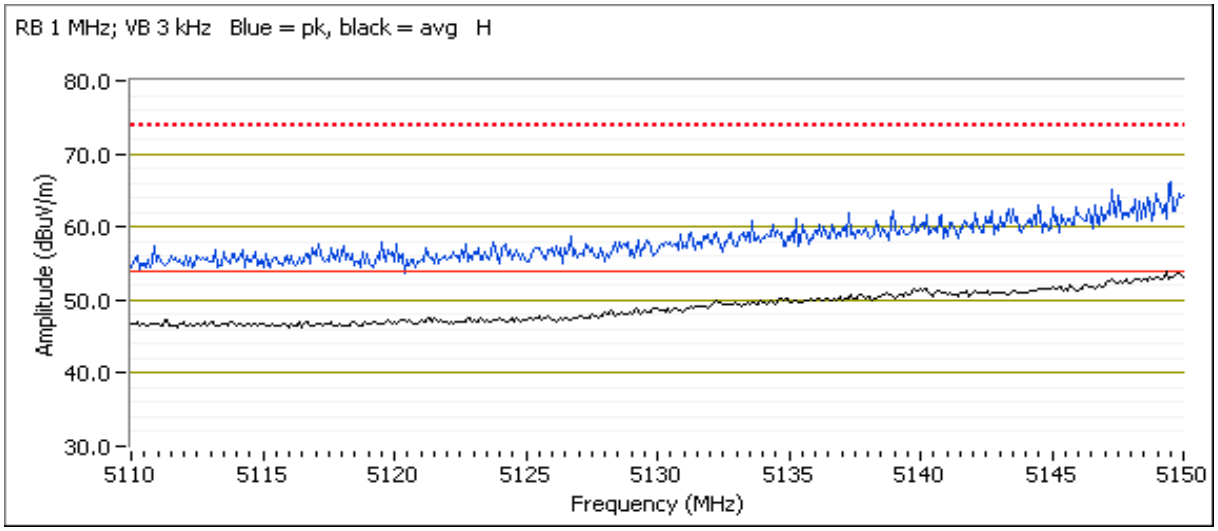
Config. Used: 2
Config Change: none
EUT Voltage: 120V / 60Hz

Channel: 36 - 5180 MHz
Tx Chain: 4Tx
Mode: ac 20
Streams: 1SS

EUT Orientation: Flat
Power setting: 21
Data Rate: MCS 0

*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 | |
| 5149.360 | 53.9 | H | 54.0 | -0.1 | Avg | 18 | 1.28 | VB: 3 kHz, note 3. |
| 5148.960 | 66.2 | H | 74.0 | -7.8 | PK | 18 | 1.28 | |



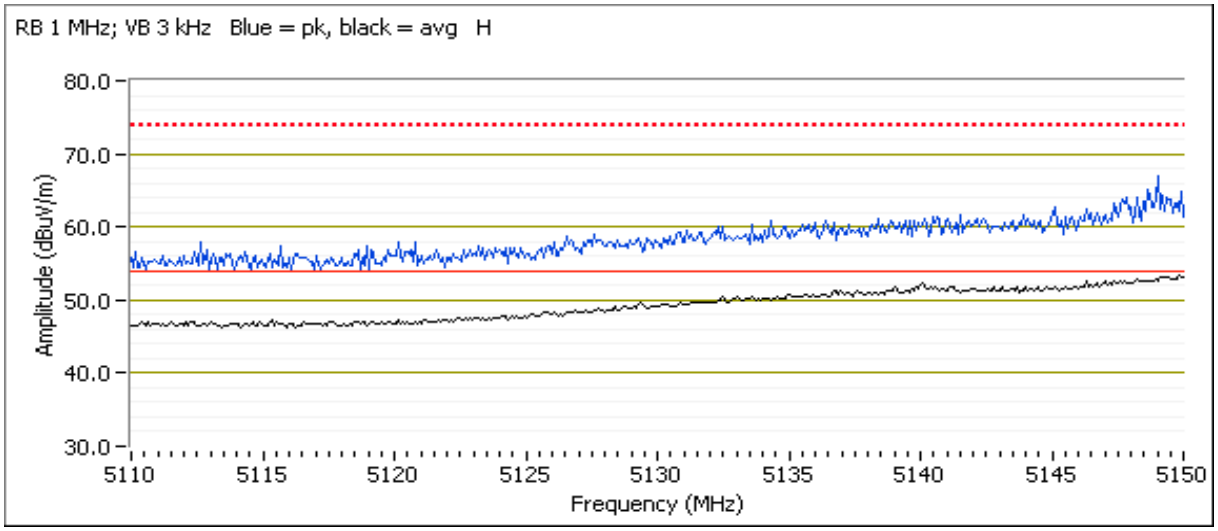
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 36 - 5180 MHz
Tx Chain: 4Tx
Mode: ac 20
Streams: 4SS

EUT Orientation: Flat
Power setting: 22
Data Rate: MCS 0

*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 | |
| 5149.740 | 53.6 | H | 54.0 | -0.4 | Avg | 356 | 1.30 | VB: 3 kHz, note 3. |
| 5149.300 | 67.0 | H | 74.0 | -7.0 | PK | 356 | 1.30 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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: 20 °C
Rel. Humidity: 30 %

## Summary of Results

| Run # | Mode | Channel | NSS | Passing Power Setting | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| 40MHz Bandwith Modes | | | | | | | |
| 1 | ac 40 | 62 - 5310MHz | 1SS | 18 | Restricted Band Edge at 5350 MHz | 15.209 | 53.8 dBµV/m @ 5350.0 MHz (-0.2 dB) |
| | | | 4SS | 18 | | | 53.7 dBµV/m @ 5351.0 MHz (-0.3 dB) |
| 2 | ac 40 | 102 - 5510MHz | 1SS | 20 | Restricted Band Edge at 5460 MHz | 15.209 | 53.3 dBµV/m @ 5460.0 MHz (-0.7 dB) |
| | | | | 17 | Band Edge 5460 - 5470 MHz | 15E | 67.6 dBµV/m @ 5469.7 MHz (-0.7 dB) |
| | | | 3SS | 17 | Restricted Band Edge at 5460 MHz | 15.209 | 50.5 dBµV/m @ 5460.0 MHz (-3.7 dB) |
| | | | | | Band Edge 5460 - 5470 MHz | 15E | 67.2 dBµV/m @ 5467.6 MHz (-1.1 dB) |
| | | | 4SS | 18 | Restricted Band Edge at 5460 MHz | 15.209 | 51.4 dBµV/m @ 5459.5 MHz (-2.6 dB) |
| | | | | | Band Edge 5460 - 5470 MHz | 15E | 67.4 dBµV/m @ 5468.2 MHz (-0.9 dB) |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

| Run # | Mode | Channel | NSS | Passing Power Setting | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| 80MHz Bandwith Modes | | | | | | | |
| 3 | ac80 | 58 - 5290MHz | 1SS | 17 | Restricted Band Edge at 5350 MHz | 15.209 | 53.3 dBµV/m @ 5350.1 MHz (-0.7 dB) |
| | | | 2SS | 19 | | | 51.4 dBµV/m @ 5350.6 MHz (-2.6 dB) |
| | | | 4SS | 20 | | | 53.7 dBµV/m @ 5350.2 MHz (-0.3 dB) |
| 4 | ac80 | 106 - 5530MHz | 1SS | 16 | Restricted Band Edge at 5460 MHz | 15.209 | 53.1 dBµV/m @ 5459.0 MHz (-0.9 dB) |
| | | | | | Band Edge 5460 - 5470 MHz | 15E | 66.2 dBµV/m @ 5466.6 MHz (-2.1 dB) |
| | | | 3SS | 17 | Restricted Band Edge at 5460 MHz | 15.209 | 52.9 dBµV/m @ 5460.0 MHz (-1.1 dB) |
| | | | | | Band Edge 5460 - 5470 MHz | 15E | 65.3 dBµV/m @ 5469.4 MHz (-3.0 dB) |
| | | | 4SS | 18 | Restricted Band Edge at 5460 MHz | 15.209 | 53.0 dBµV/m @ 5459.4 MHz (-1.0 dB) |
| | | | | | Band Edge 5460 - 5470 MHz | 15E | 65.6 dBµV/m @ 5467.3 MHz (-2.7 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.

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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) | |
|---|---|---|---|---|---|---|---|---|---|
| 1SS | ac40 | MCS0 | 0.99 | Yes | 5.29 | 0.00 | 0.0 | 10 | |
| 2SS | ac40 | MCS0 | 0.99 | Yes | 4.79 | 0.00 | 0.0 | 10 | |
| 3SS | ac40 | MCS0 | 0.98 | Yes | 1.65 | 0.10 | 0.2 | 10 | |
| 4SS | ac40 | MCS0 | 0.96 | Yes | 1.25 | 0.16 | 0.3 | 803 | |
| 1SS | ac80 | VHT0 | 0.96 | Yes | 2.214 | 0.19 | 0.4 | 452 | |
| 2SS | ac80 | VHT0 | 0.97 | Yes | 2.236 | 0.11 | 0.2 | 447 | |
| 3SS | ac80 | VHT0 | 0.92 | Yes | 0.784 | 0.37 | 0.7 | 1276 | 54.347826 |
| 4SS | ac80 | VHT0 | 0.89 | Yes | 0.551 | 0.51 | 1.0 | 1815 | |

## Sample Notes

Sample S/N: 184795206016304
Driver: d21
Antenna: internal 4x4

## 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 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 5: | Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements. |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #1: Radiated Bandedge Measurements, 5250-5350 MHz

Date of Test: 12/22/2016
Test Engineer: John Caizzi
Test Location: Chamber 4

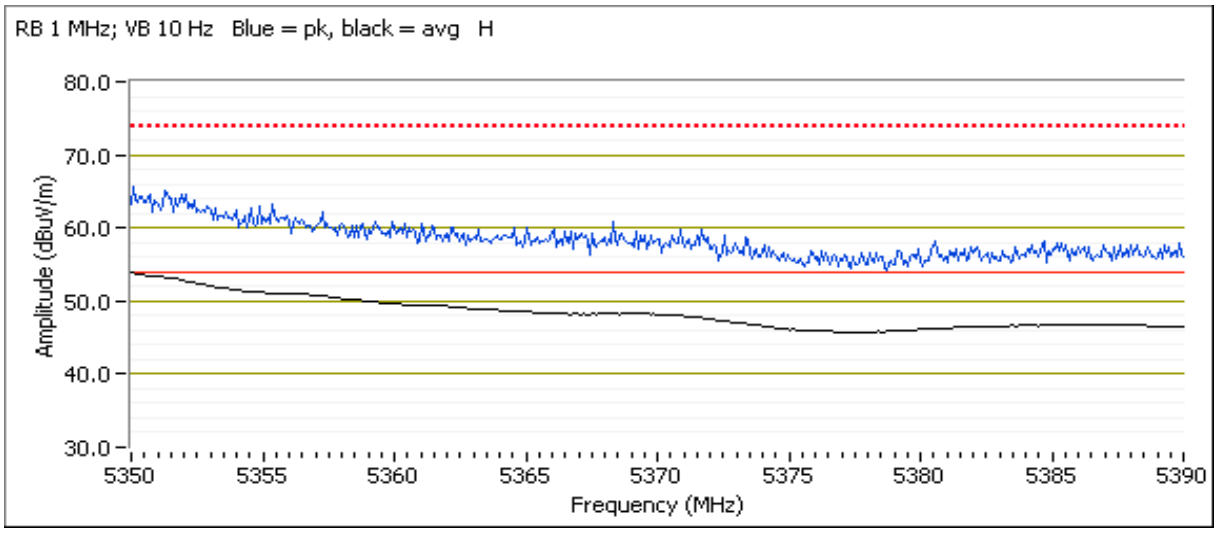
Config. Used: 1
Config Change: none
EUT Voltage: 120V / 60Hz

Channel: 62 - 5310 MHz
Tx Chain: 4Tx
Mode: ac40
Streams: 1SS

EUT Orientation: Flat
Power setting: 18
Data Rate: MCS 0

*5350 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5350.000 | 53.8 | H | 54.0 | -0.2 | AVG | 344 | 1.39 | |
| 5351.200 | 66.6 | H | 74.0 | -7.4 | PK | 344 | 1.39 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

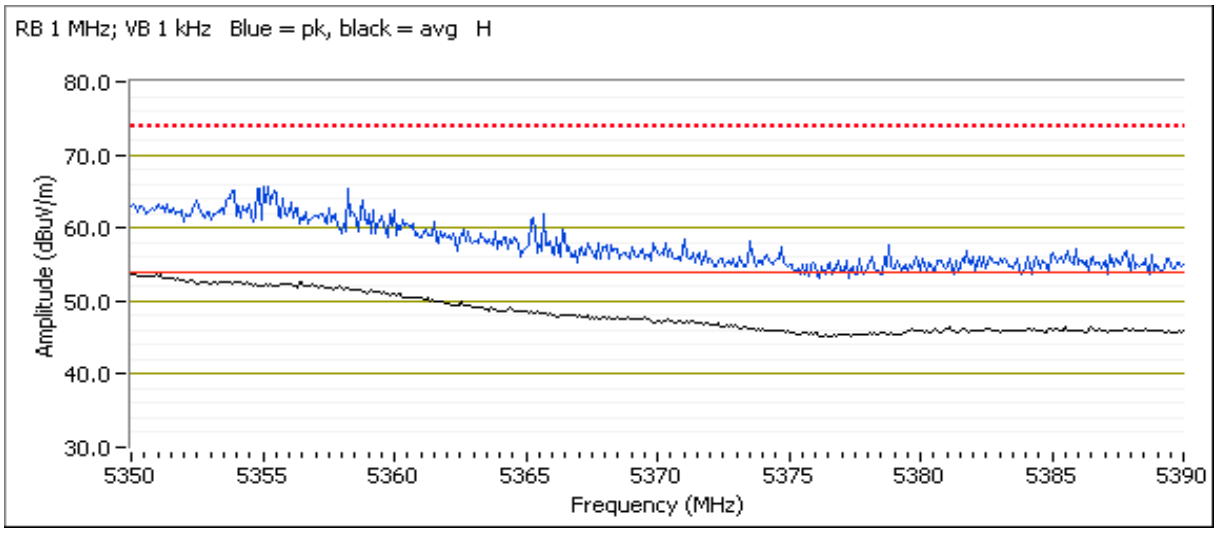
Run #1: Radiated Bandedge Measurements, 5250-5350 MHz

Channel: 62 - 5310 MHz
Tx Chain: 4Tx
Mode: ac40
Streams: 4SS

EUT Orientation: Flat
Power setting: 18
Data Rate: MCS 0

*5350 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5350.960 | 53.7 | H | 54.0 | -0.3 | Avg | 78 | 1.39 | VB: 1 kHz, note 3. |
| 5354.010 | 67.1 | H | 74.0 | -6.9 | PK | 78 | 1.39 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #2: Radiated Bandedge Measurements, 5470-5725 MHz

Date of Test: 1/5/2017
Test Engineer: John Caizzi
Test Location: Chamber 4

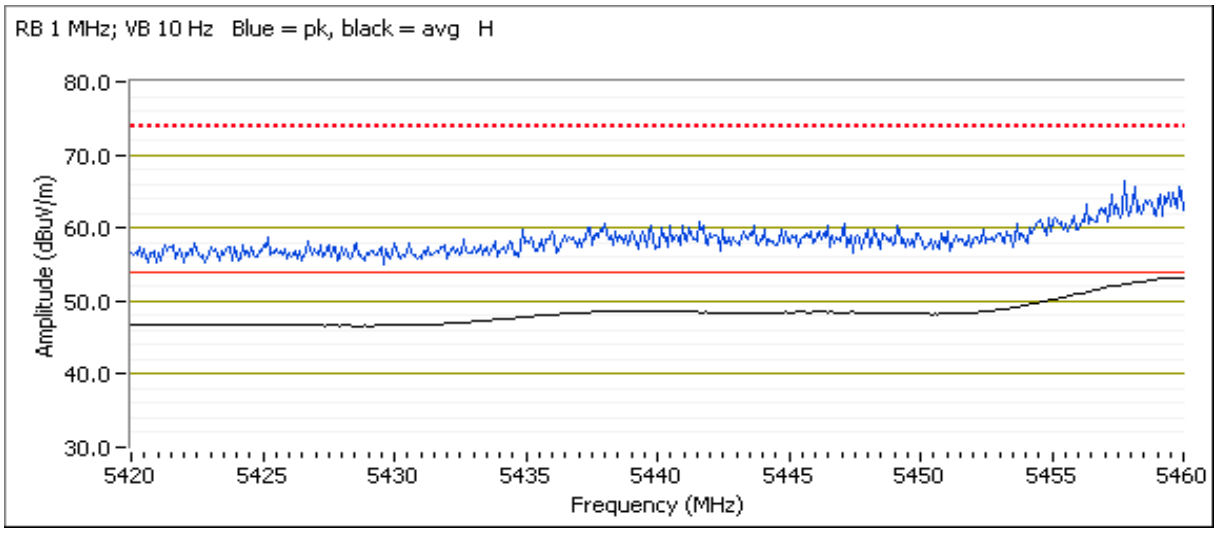
Config. Used: 1
Config Change: none
EUT Voltage: 120V / 60Hz

Channel: 102 - 5510 MHz
Tx Chain: 4Tx
Mode: ac40
Streams: 1SS

EUT Orientation: Flat
Power setting: 20
Data Rate: MCS 0

*5460 MHz Band Edge Signal Radiated Field Strength*

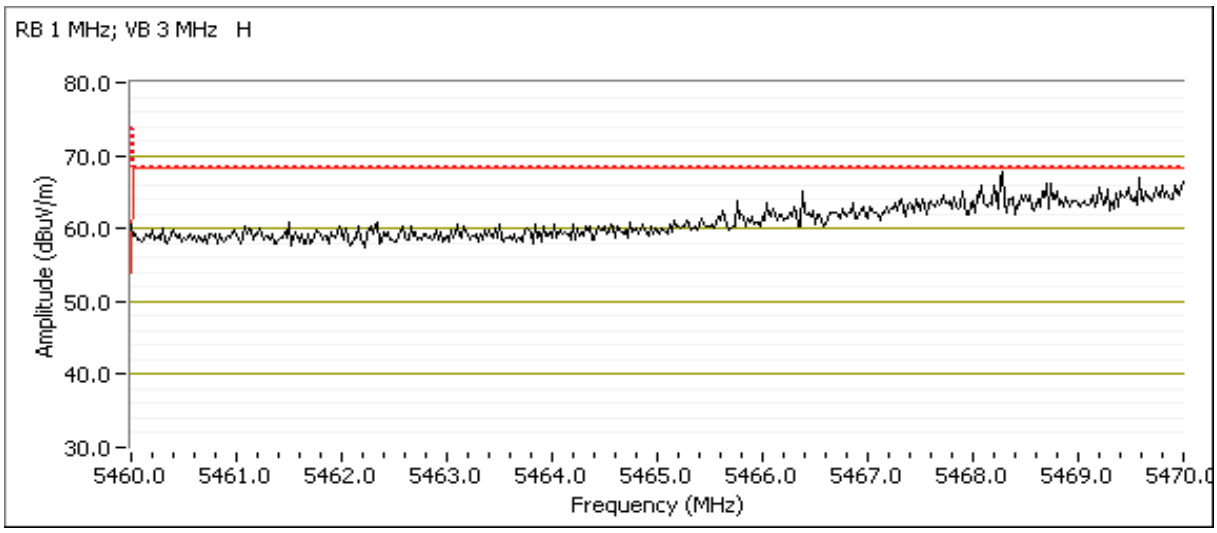
| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5460.000 | 53.3 | H | 54.0 | -0.7 | AVG | 3 | 1.43 | Setting = 20 |
| 5459.040 | 65.6 | H | 74.0 | -8.4 | PK | 3 | 1.43 | Setting = 20 |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

*5470 MHz Band Edge Signal Radiated Field Strength, remeasured 1/5/17.*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5469.680 | 67.6 | H | 68.3 | -0.7 | PK | 158 | 1.49 | Setting = 17 |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

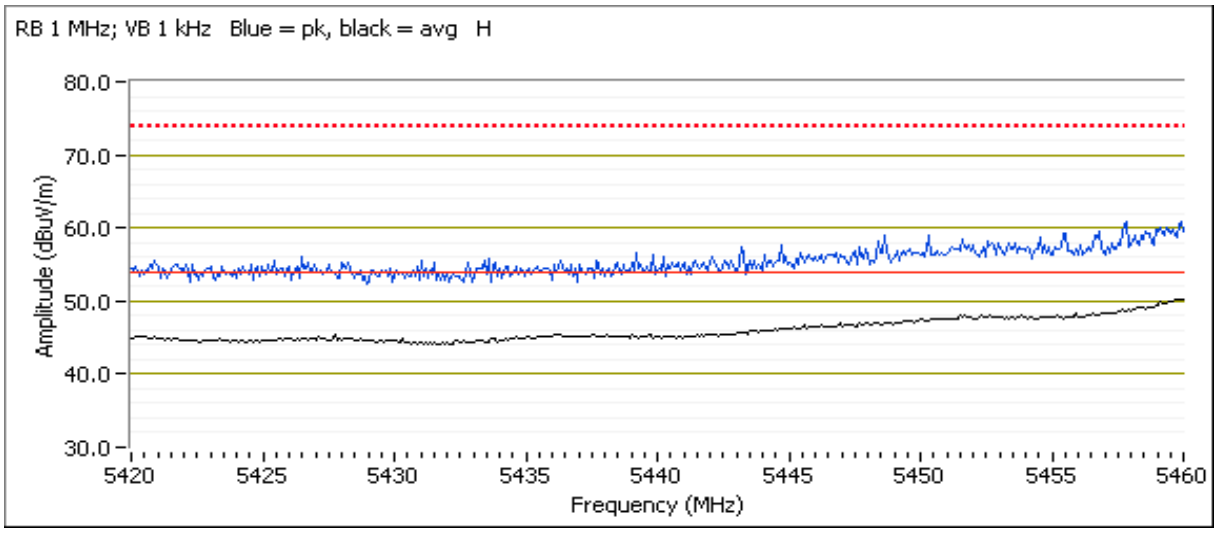
Run #2: Radiated Bandedge Measurements, 5470-5725 MHz

Channel: 102 - 5510 MHz
Tx Chain: 4Tx
Mode: ac40
Streams: 3SS

EUT Orientation: Flat
Power setting: 17
Data Rate: MCS 0

*5460 MHz Band Edge Signal Radiated Field Strength*

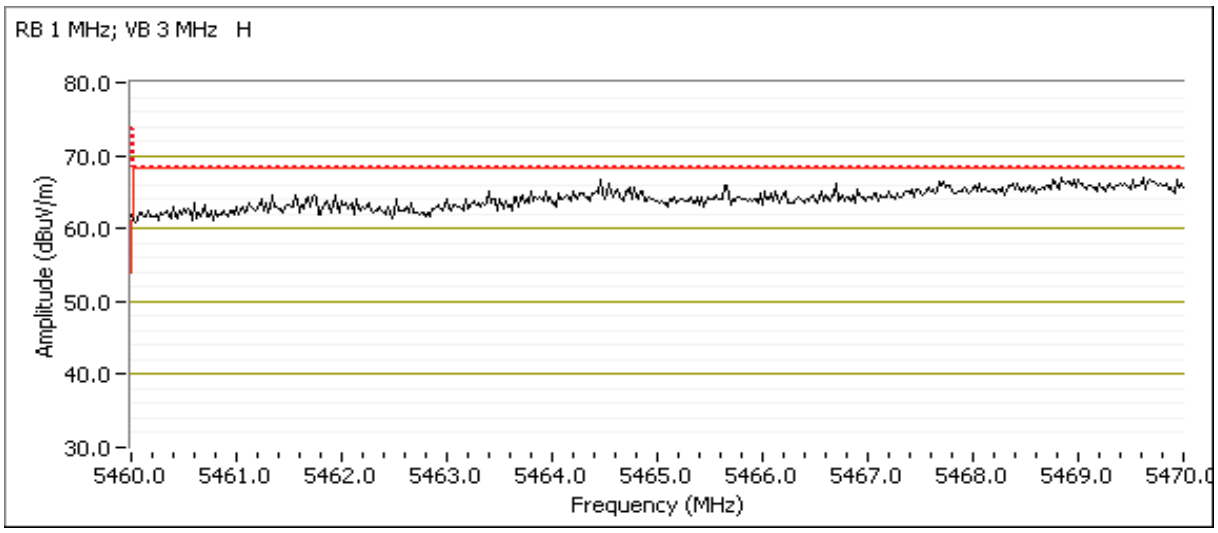
| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5460.000 | 50.5 | H | 54.0 | -3.7 | Avg | 359 | 1.48 | VB: 1 kHz, note 3. |
| 5456.950 | 61.1 | H | 74.0 | -12.9 | PK | 359 | 1.48 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

*5470 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5467.620 | 67.2 | H | 68.3 | -1.1 | PK | 359 | 1.35 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

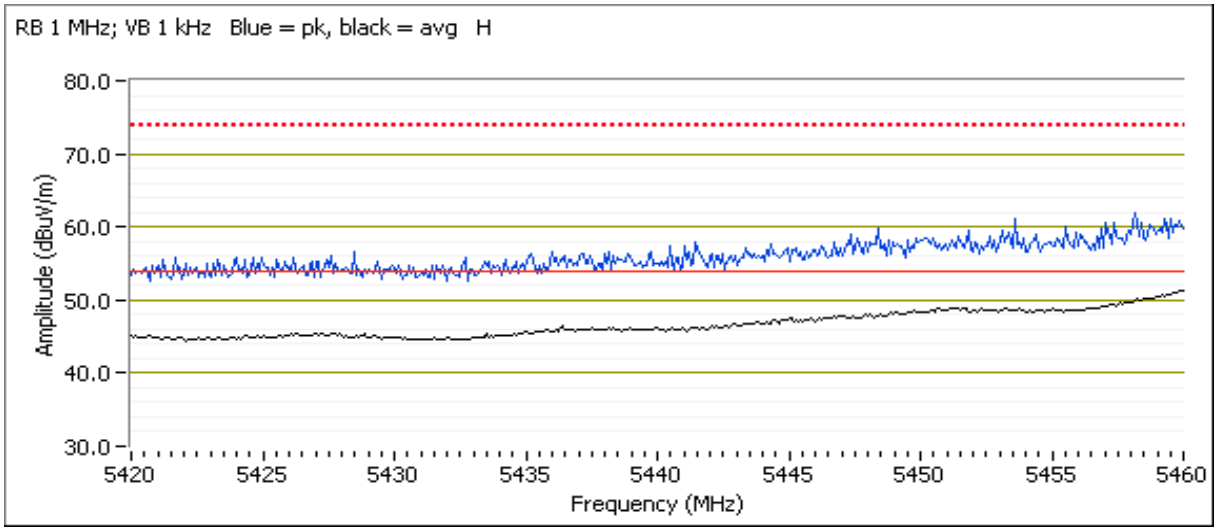
Run #2: Radiated Bandedge Measurements, 5470-5725 MHz

Channel: 102 - 5510 MHz
Tx Chain: 4Tx
Mode: ac40
Streams: 4SS

EUT Orientation: Flat
Power setting: 18
Data Rate: MCS 0

*5460 MHz Band Edge Signal Radiated Field Strength*

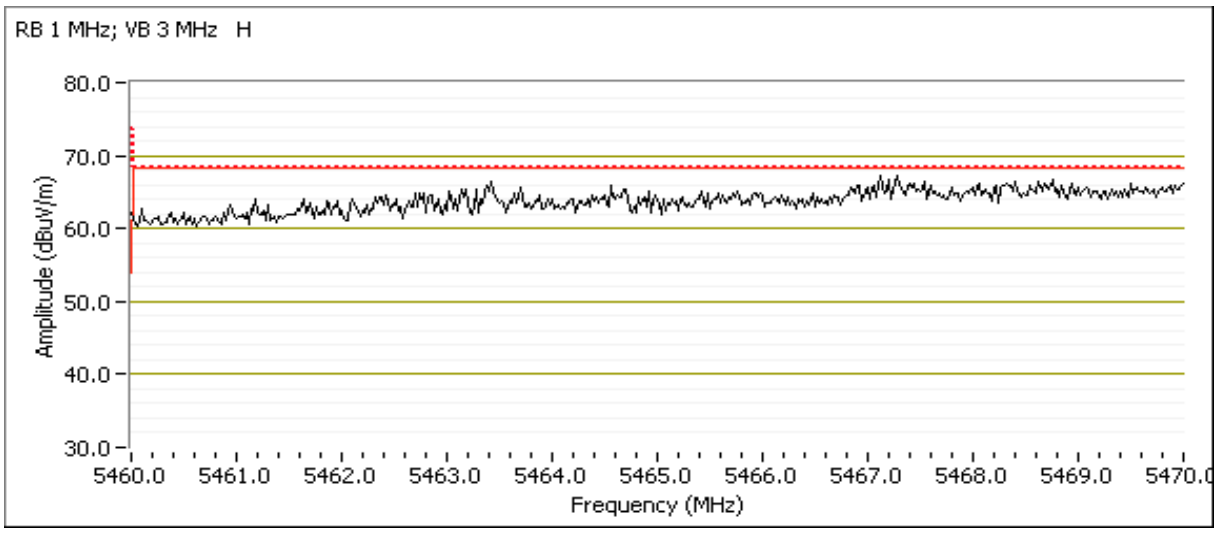
| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5459.520 | 51.4 | H | 54.0 | -2.6 | Avg | 2 | 1.37 | VB: 1 kHz, note 3. |
| 5457.840 | 61.8 | H | 74.0 | -12.2 | PK | 2 | 1.37 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

*5470 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5468.240 | 67.4 | H | 68.3 | -0.9 | PK | 1 | 1.35 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #3: Radiated Bandedge Measurements, 5250-5350 MHz

Date of Test: 1/4/2017
Test Engineer: Rafael Varelas
Test Location: Chamber 7

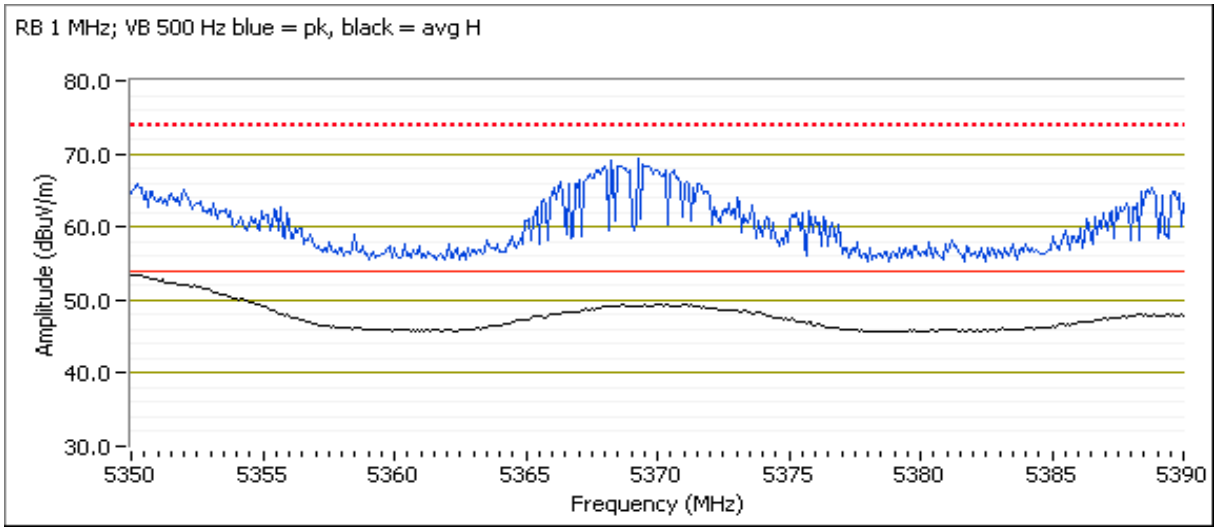
Config. Used: 1
Config Change: none
EUT Voltage: 120V / 60Hz

Channel: 58 - 5290MHz
Tx Chain: 4Tx
Mode: ac80
Streams: 1SS

EUT Orientation: Flat
Power setting: 17
Data Rate: MCS 0

*5350 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5350.120 | 53.3 | H | 54.0 | -0.7 | Avg | 165 | 1.7 | VB: 500 Hz, note 3 |
| 5352.710 | 65.7 | H | 74.0 | -8.3 | PK | 165 | 1.7 | POS; RB 1 MHz; VB: 3 MHz |



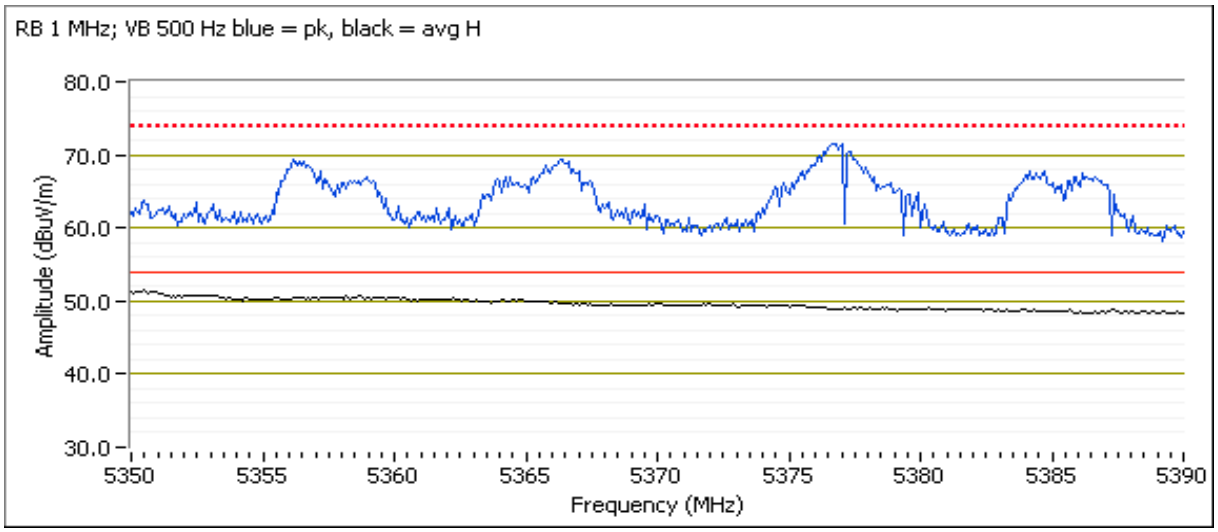
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 58 - 5290MHz
Tx Chain: 4Tx
Mode: ac80
Streams: 2SS

EUT Orientation: Flat
Power setting: 19
Data Rate: MCS 0

*5350 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5350.640 | 51.4 | H | 54.0 | -2.6 | Avg | 77 | 1.3 | POS; RB 1 MHz; VB: 500 Hz |
| 5376.930 | 71.3 | H | 74.0 | -2.7 | PK | 77 | 1.3 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Date of Test: 1/4/2017
Test Engineer: Rafael Varelas
Test Location: Chamber 7

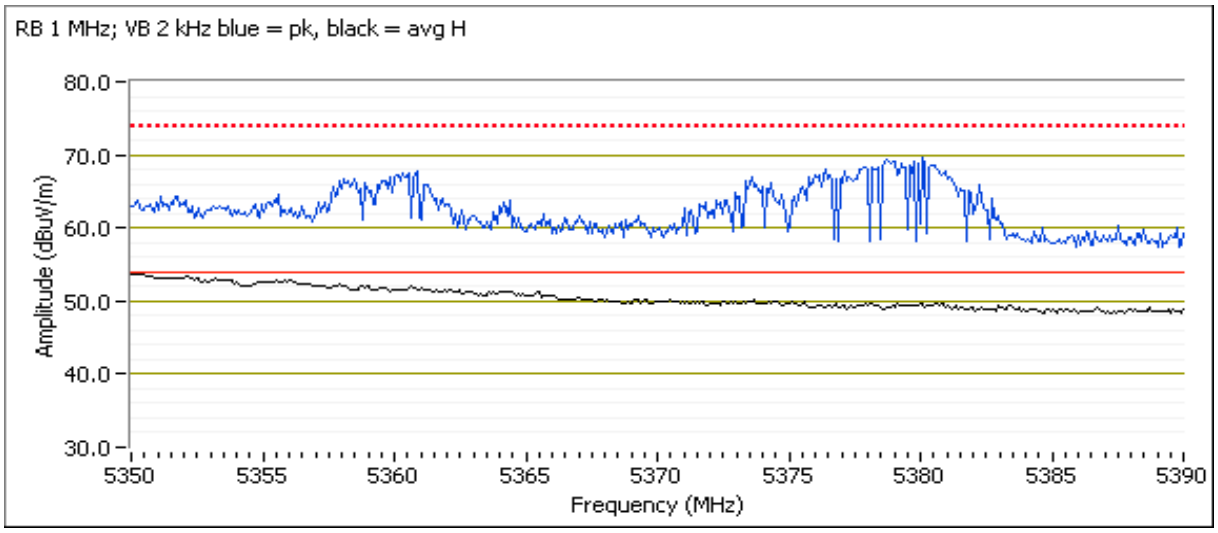
Config. Used: 1
Config Change: none
EUT Voltage: 120V / 60Hz

Channel: 58 - 5290MHz
Tx Chain: 4Tx
Mode: ac80
Streams: 4SS

EUT Orientation: Flat
Power setting: 20
Data Rate: MCS 0

*5350 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5350.240 | 53.7 | H | 54.0 | -0.3 | Avg | 36 | 1.0 | POS; RB 1 MHz; VB: 2 kHz |
| 5379.660 | 68.9 | H | 74.0 | -5.1 | PK | 36 | 1.0 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #4: Radiated Bandedge Measurements, 5470-5725 MHz

Date of Test: 12/27/2016
Test Engineer: John Caizzi
Test Location: Chamber 4

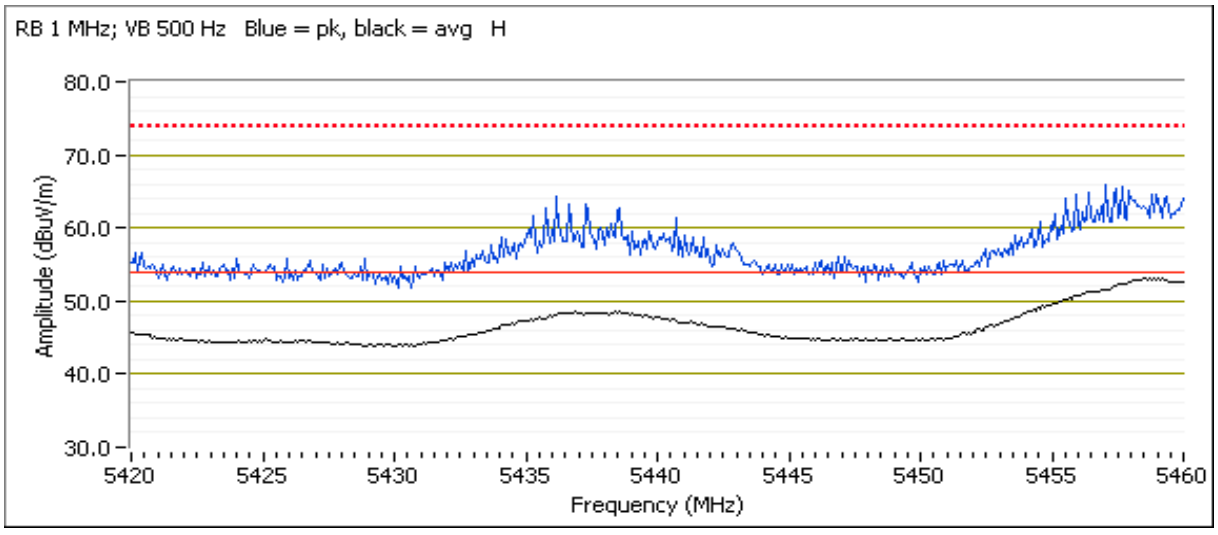
Config. Used: 1
Config Change: none
EUT Voltage: 120V / 60Hz

Channel: 106 - 5530 MHz
Tx Chain: 4Tx
Mode: ac80
Streams: 1SS

EUT Orientation: Flat
Power setting: 16
Data Rate: MCS 0

*5460 MHz Band Edge Signal Radiated Field Strength*

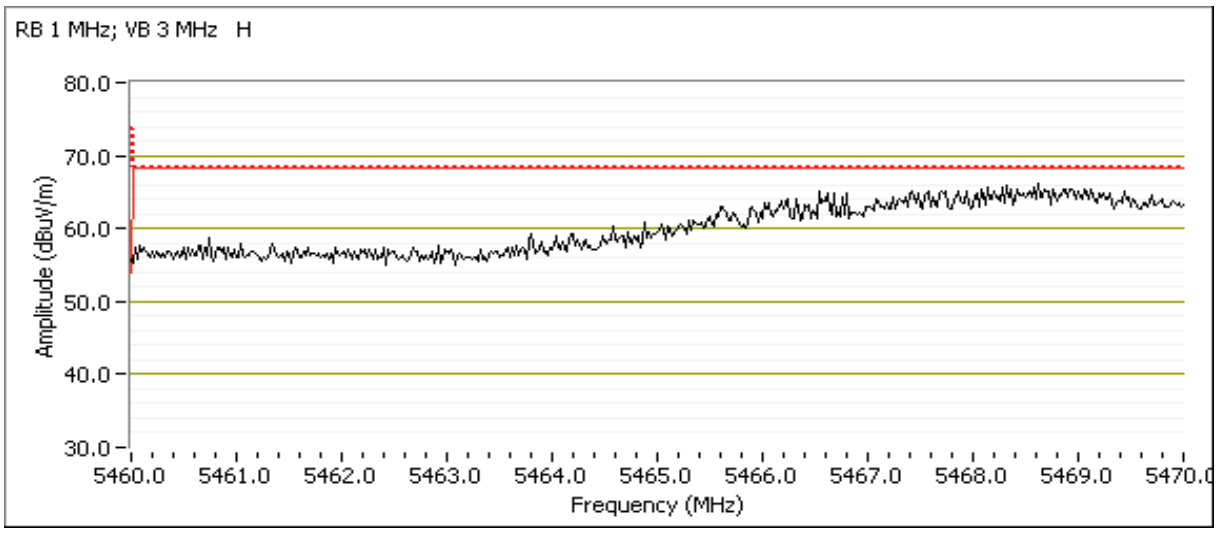
| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5458.960 | 53.1 | H | 54.0 | -0.9 | Avg | 360 | 1.28 | VB: 500 Hz, note 3. |
| 5457.270 | 66.3 | H | 74.0 | -7.7 | PK | 360 | 1.28 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

*5470 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5466.630 | 66.2 | H | 68.3 | -2.1 | PK | 159 | 1.45 | |



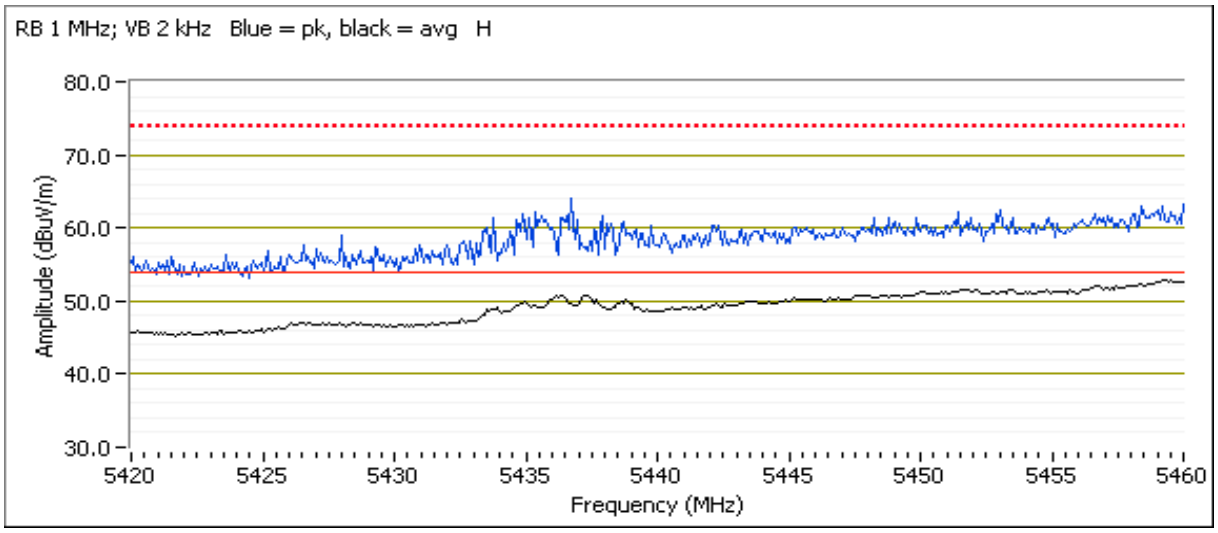
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 106 - 5530 MHz
Tx Chain: 4Tx
Mode: ac80
Streams: 3SS

EUT Orientation: Flat
Power setting: 17
Data Rate: MCS 0

*5460 MHz Band Edge Signal Radiated Field Strength*

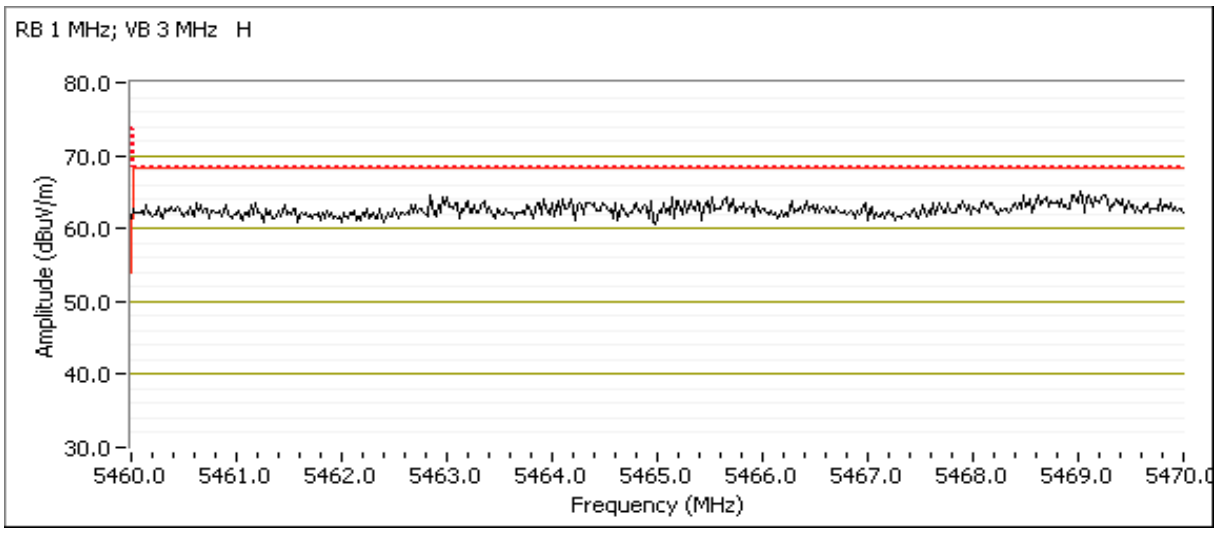
| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5460.000 | 52.9 | H | 54.0 | -1.1 | Avg | 0 | 1.07 | VB: 2 kHz, note 3. |
| 5458.480 | 64.3 | H | 74.0 | -9.7 | PK | 0 | 1.07 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

*5470 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5469.440 | 65.3 | H | 68.3 | -3.0 | PK | 354 | 1.07 | |



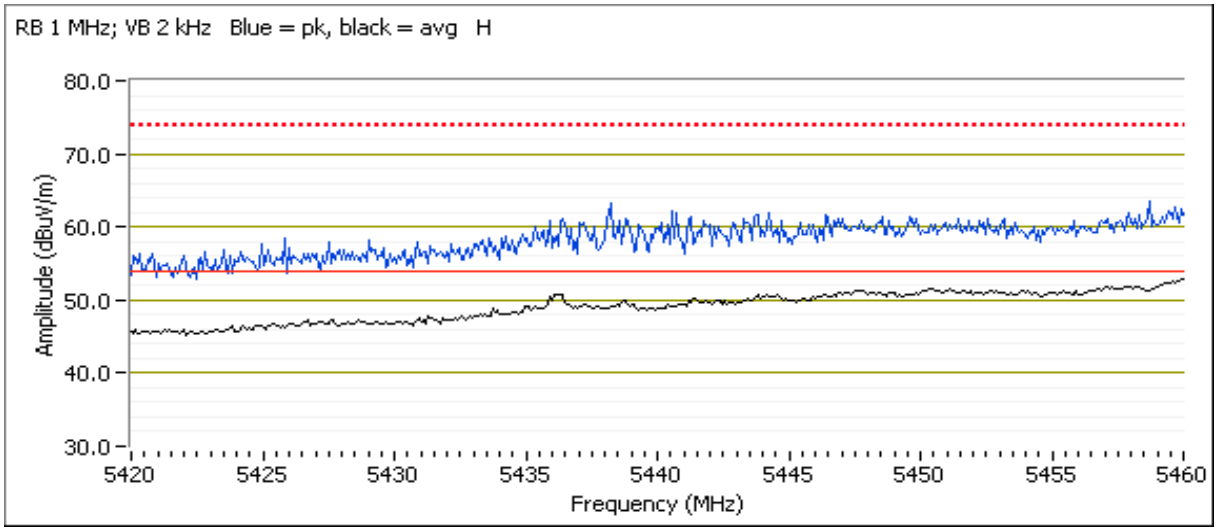
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 106 - 5530 MHz
Tx Chain: 4Tx
Mode: ac80
Streams: 4SS

EUT Orientation: Flat
Power setting: 18
Data Rate: MCS 0

*5460 MHz Band Edge Signal Radiated Field Strength*

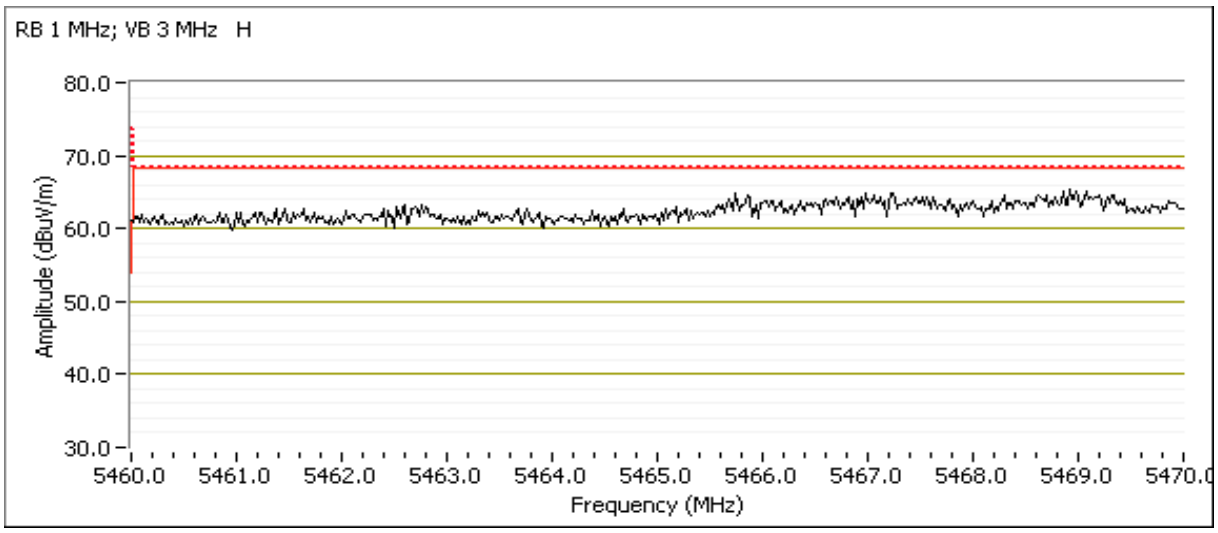
| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5459.360 | 53.0 | H | 54.0 | -1.0 | Avg | 0 | 1.06 | VB: 2 kHz, note 3. |
| 5447.330 | 63.6 | H | 74.0 | -10.4 | PK | 0 | 1.06 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

*5470 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5467.310 | 65.6 | H | 68.3 | -2.7 | PK | 11 | 1.06 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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: 15-18 °C
Rel. Humidity: 30-35 %

## Modifications Made During Testing

No modifications were made to the EUT during testing

## Deviations From The Standard

No deviations were made from the requirements of the standard.

## Summary of Results

| Run # | Mode | Channel | NSS | Passing Power Setting | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| 40MHz Bandwith Modes | | | | | | | |
| 1 | ac40 | 62 - 5310MHz | 1SS | 18 | Restricted Band Edge at 5350 MHz | 15.209 | 53.2 dBµV/m @ 5350.1 MHz (-0.8 dB) |
| | | | 4SS | 19 | | | 53.7 dBµV/m @ 5351.0 MHz (-0.3 dB) |
| 2 | | 102 - 5510MHz | 1SS | 17 | Restricted Band Edge at 5460 MHz | 15.209 | 50.7 dBµV/m @ 5459.8 MHz (-3.3 dB) |
| | | | | 17 | Band Edge 5460 - 5470 MHz | 15E | 67.3 dBµV/m @ 5469.4 MHz (-1.0 dB) |
| | | | 4SS | 18 | Restricted Band Edge at 5460 MHz | 15.209 | 50.5 dBµV/m @ 5458.5 MHz (-3.5 dB) |
| | | | | 18 | Band Edge 5460 - 5470 MHz | 15E | 66.2 dBµV/m @ 5468.0 MHz (-2.1 dB) |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

## Summary of Results

| Run # | Mode | Channel | NSS | Passing Power Setting | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| 80MHz Bandwith Modes | | | | | | | |
| 3 | ac80 | 58 - 5290MHz | 1SS | 16 | Restricted Band Edge at 5350 MHz | 15.209 | 53.3 dBµV/m @ 5350.0 MHz (-0.7 dB) |
| | ac80 | 58 - 5290MHz | 2SS | 16 | Restricted Band Edge at 5350 MHz | 15.209 | 53.7 dBµV/m @ 5350.5 MHz (-0.3 dB) |
| | ac80 | 58 - 5290MHz | 3SS | 17 | Restricted Band Edge at 5350 MHz | 15.209 | 53.3 dBµV/m @ 5350.2 MHz (-0.7 dB) |
| | ac80 | 58 - 5290MHz | 4SS | 19 | Restricted Band Edge at 5350 MHz | 15.209 | 53.5 dBµV/m @ 5350.4 MHz (-0.5 dB) |
| 4 | ac80 | 106 - 5530MHz | 1SS | 15 | Restricted Band Edge at 5460 MHz | 15.209 | 53.4 dBµV/m @ 5459.6 MHz (-0.6 dB) |
| | ac80 | 106 - 5530MHz | 1SS | 15 | Band Edge 5460 - 5470 MHz | 15E | 67.6 dBµV/m @ 5468.7 MHz (-0.7 dB) |
| | ac80 | 106 - 5530MHz | 2SS | 17 | Restricted Band Edge at 5460 MHz | 15.209 | 53.0 dBµV/m @ 5459.7 MHz (-1.0 dB) |
| | ac80 | 106 - 5530MHz | 2SS | 17 | Band Edge 5460 - 5470 MHz | 15E | 66.4 dBµV/m @ 5467.9 MHz (-1.9 dB) |
| | ac80 | 106 - 5530MHz | 3SS | 18 | Restricted Band Edge at 5460 MHz | 15.209 | 53.6 dBµV/m @ 5459.9 MHz (-0.4 dB) |
| | ac80 | 106 - 5530MHz | 3SS | 18 | Band Edge 5460 - 5470 MHz | 15E | 66.1 dBµV/m @ 5468.3 MHz (-2.2 dB) |
| | ac80 | 106 - 5530MHz | 4SS | 21 | Restricted Band Edge at 5460 MHz | 15.209 | 53.6 dBµV/m @ 5459.5 MHz (-0.4 dB) |
| | ac80 | 106 - 5530MHz | 4SS | 21 | Band Edge 5460 - 5470 MHz | 15E | 66.1 dBµV/m @ 5467.1 MHz (-2.2 dB) |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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) |
|---|---|---|---|---|---|---|---|---|
| 1SS | ac40 | MCS0 | 0.79 | No | 0.844 | 1.0 | 2.0 | 1185 |
| 4SS | ac40 | MCS0 | 0.71 | No | 0.68 | 1.5 | 3 | 1471 |
| 1SS | ac80 | VHT0 | 0.92 | No | 1.16 | 0.3 | 0.7 | 862 |
| 2SS | ac80 | VHT0 | 0.70 | No | 0.31 | 1.5 | 3.0 | 3226 |
| 3SS | ac80 | VHT0 | 0.82 | No | 0.49 | 0.9 | 1.8 | 2041 |
| 4SS | ac80 | VHT0 | 0.82 | No | 0.54 | 0.9 | 1.7 | 1852 |

## Sample Notes

Sample S/N: 184795206016304
Driver: d21
Antenna: internal 4x4

## 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 3: | Emission has non-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 5: | Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements. |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #1: Radiated Bandedge Measurements, 5250-5350MHz

Date of Test: 01/04/17
Test Engineer: John Caizzi
Test Location: Chamber 7

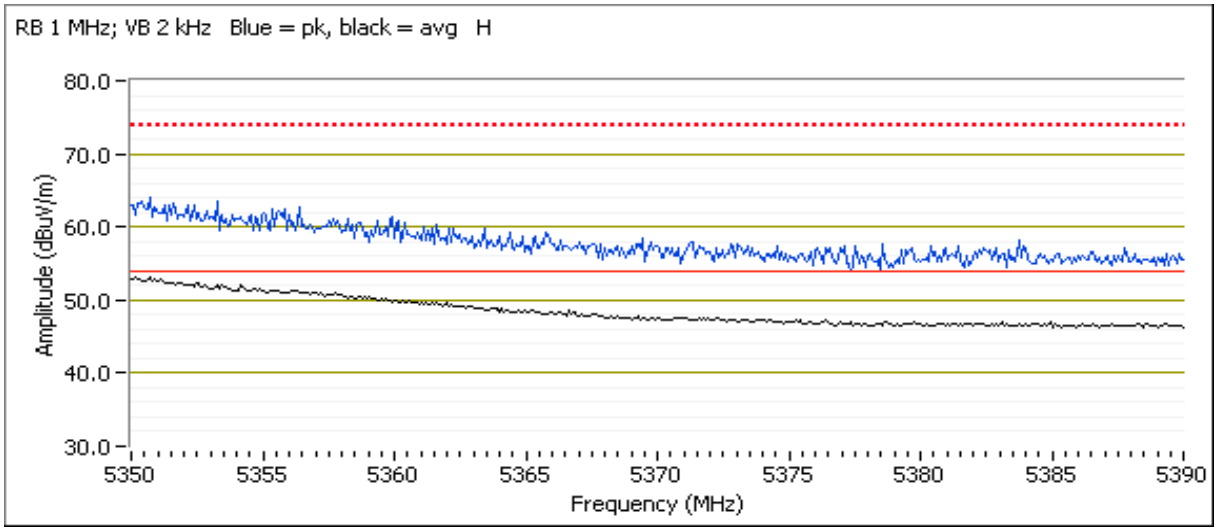
Config. Used: 2
Config Change: none
EUT Voltage: 120V / 60Hz

Channel: 62 - 5310 MHz
Tx Chain: 4Tx
Mode: n40
Steams: 1SS

EUT Orientation: Flat
Power setting: 18
Data Rate: MCS 0

*5350 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5350.080 | 53.2 | H | 54.0 | -0.8 | Avg | 360 | 1.49 | VB: 2 kHz, note 3. |
| 5350.880 | 64.1 | H | 74.0 | -9.9 | PK | 360 | 1.49 | |



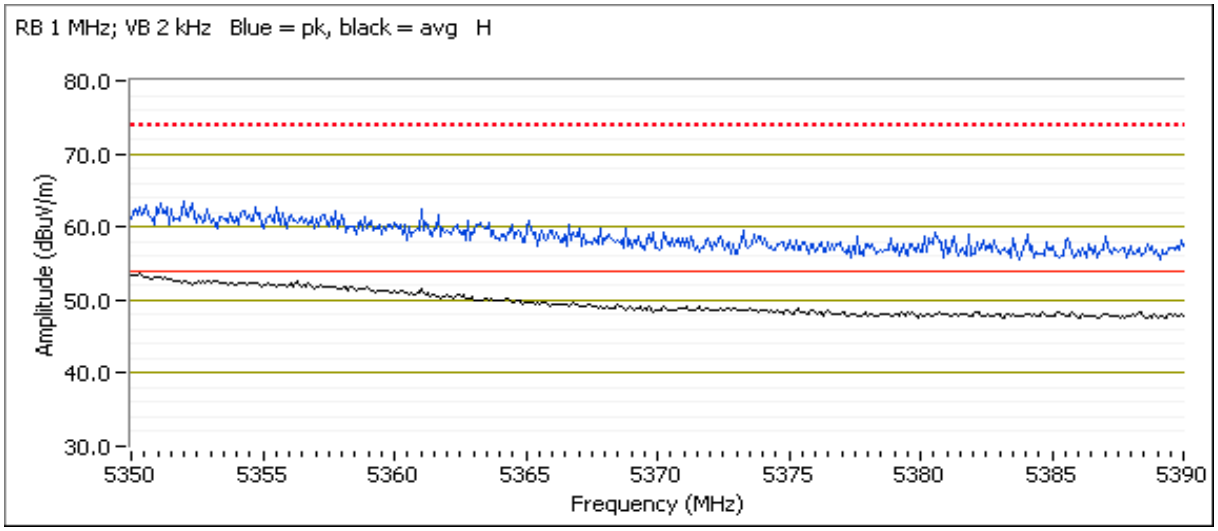
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 62 - 5310 MHz
Tx Chain: 4Tx
Mode: n40
Steams: 4SS

EUT Orientation: Flat
Power setting: 19
Data Rate: MCS 0

*5350 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5350.960 | 53.7 | H | 54.0 | -0.3 | Avg | 0 | 1.49 | VB: 2 kHz, note 3. |
| 5355.690 | 65.3 | H | 74.0 | -8.7 | PK | 0 | 1.49 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #2: Radiated Bandedge Measurements, 5470-5725MHz

Date of Test: 01/04/17
Test Engineer: Rafael Varelas
Test Location: Chamber 7

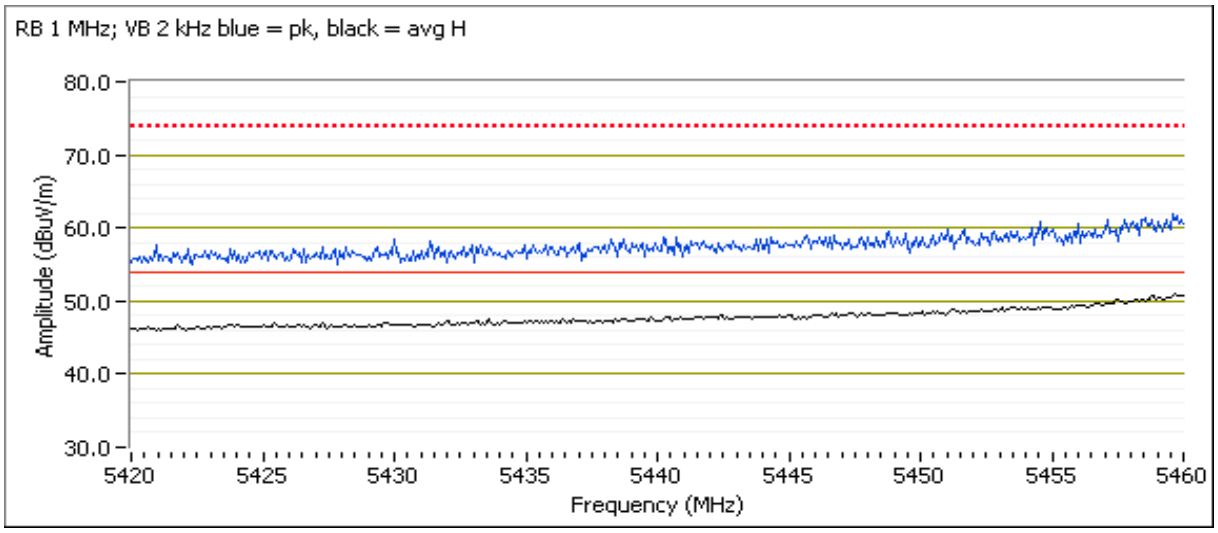
Config. Used: 2
Config Change: none
EUT Voltage: 120V / 60Hz

Channel: 102 - 5510 MHz
Tx Chain: 4Tx
Mode: n40
Steams: 1SS

EUT Orientation: Flat
Power setting: 17
Data Rate: MCS 0

*5460 MHz Band Edge Signal Radiated Field Strength*

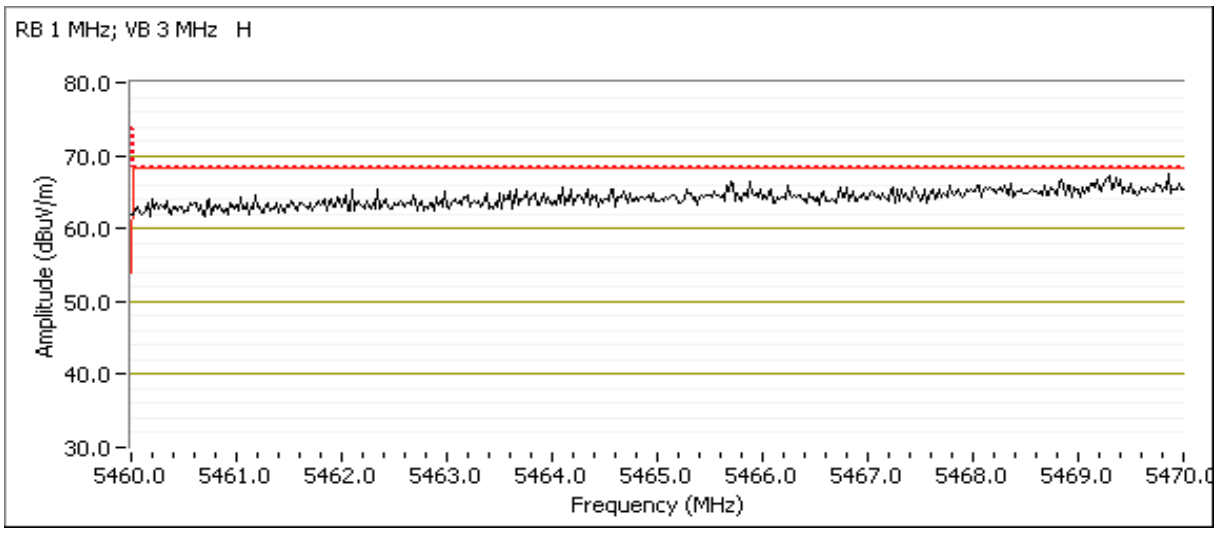
| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5459.760 | 50.7 | H | 54.0 | -3.3 | Avg | 42 | 1.1 | POS; RB 1 MHz; VB: 2 kHz |
| 5459.280 | 61.6 | H | 74.0 | -12.4 | PK | 42 | 1.1 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

*5470 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5469.440 | 67.3 | H | 68.3 | -1.0 | PK | 42 | 1.1 | POS; RB 1 MHz; VB: 3 MHz |



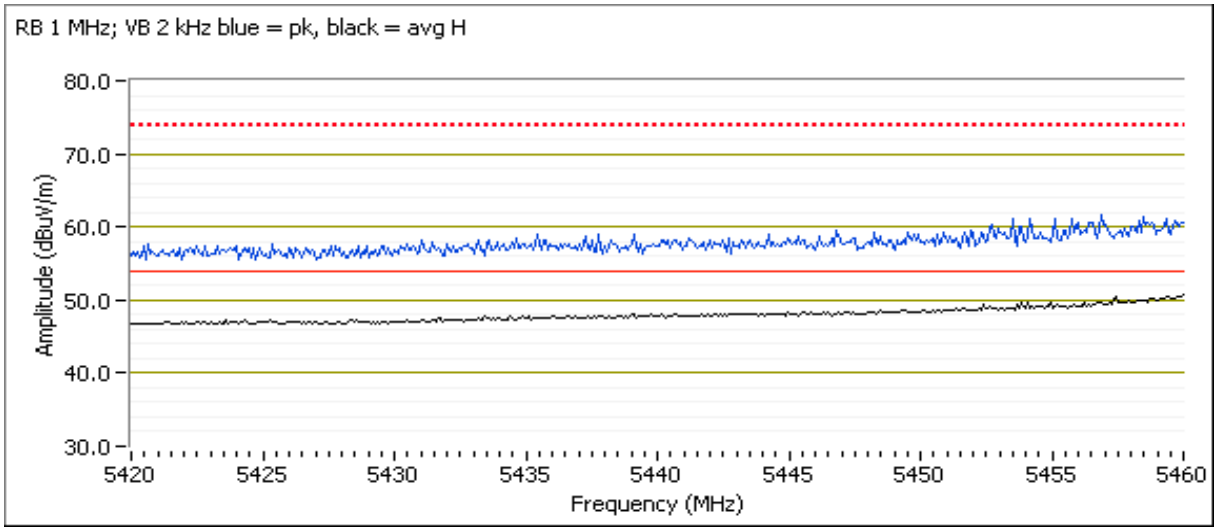
| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Channel: 102 - 5510 MHz
Tx Chain: 4Tx
Mode: n40
Steams: 4SS

EUT Orientation: Flat
Power setting: 18
Data Rate: MCS 0

*5460 MHz Band Edge Signal Radiated Field Strength*

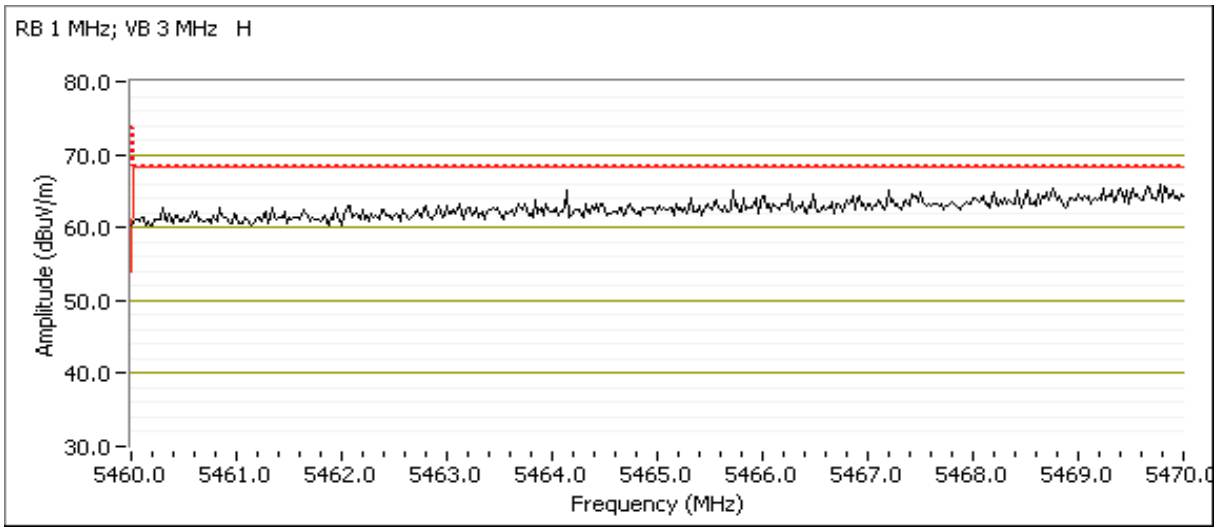
| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5458.520 | 50.5 | H | 54.0 | -3.5 | Avg | 355 | 1.6 | POS; RB 1 MHz; VB: 2 kHz |
| 5458.540 | 63.2 | H | 74.0 | -10.8 | PK | 355 | 1.6 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

*5470 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5468.040 | 66.2 | H | 68.3 | -2.1 | PK | 355 | 1.6 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #3: Radiated Bandedge Measurements, 5250-5350 MHz

Date of Test: 01/04/17
Test Engineer: John Caizzi
Test Location: Chamber 7

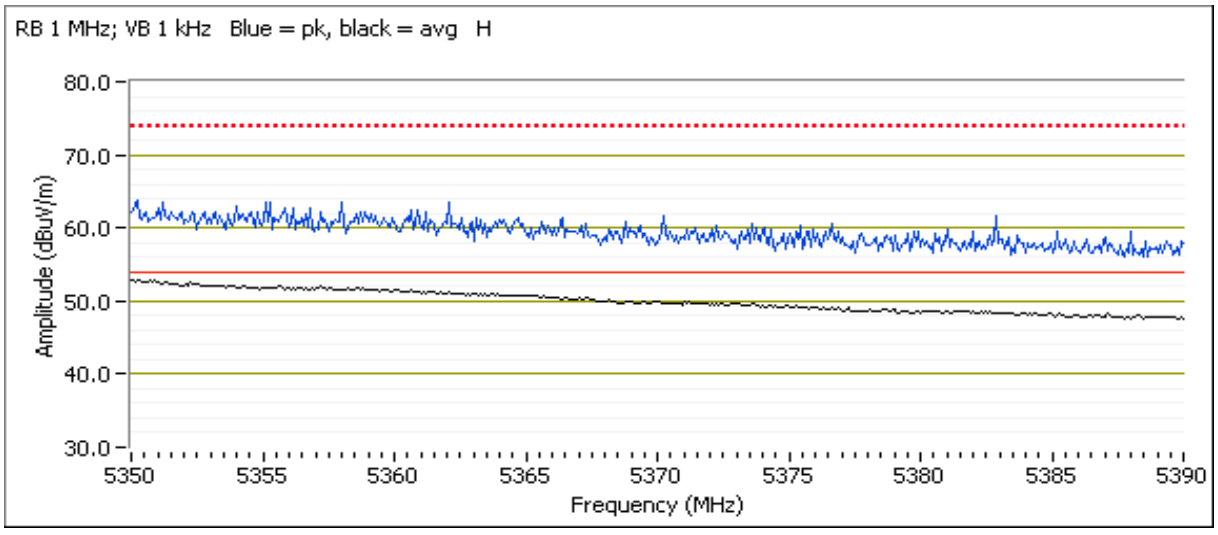
Config. Used: 2
Config Change: none
EUT Voltage: 120V / 60Hz

Channel: 58 - 5290MHz
Tx Chain: 4Tx
Mode: ac80
Steams: 1SS

EUT Orientation: Flat
Power setting: 16
Data Rate: MCS 0

*5350 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5350.000 | 53.3 | H | 54.0 | -0.7 | Avg | 161 | 1.72 | VB: 1 kHz, note 3. |
| 5350.000 | 63.7 | H | 74.0 | -10.3 | PK | 161 | 1.72 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Date of Test: 12/27/16
Test Engineer: Mehran Birgani
Test Location: Chamber 4

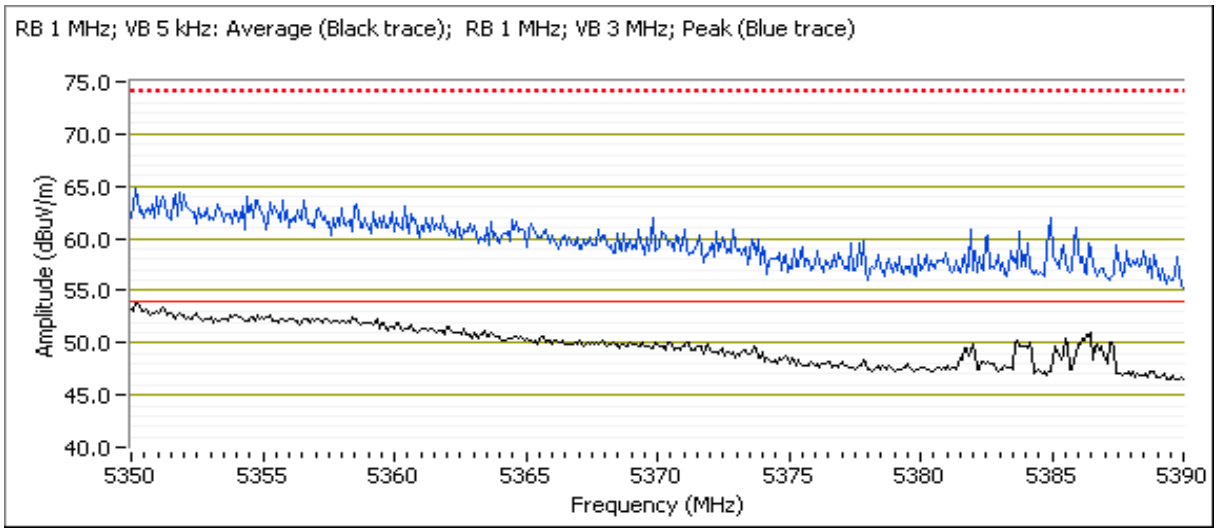
Config. Used: 2
Config Change: none
EUT Voltage: 120V / 60Hz

Channel: 58 - 5290MHz
Tx Chain: 4Tx
Mode: ac80
Steams: 2SS

EUT Orientation: Flat
Power setting: 16
Data Rate: MCS 0

*5350 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5350.540 | 53.7 | H | 54.0 | -0.3 | AVG | 2 | 1.2 | POS; RB 1 MHz; VB: 5 kHz; note 3 |
| 5357.940 | 65.1 | H | 74.0 | -8.9 | PK | 2 | 1.2 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Date of Test: 12/27/16
Test Engineer: Mehran Birgani
Test Location: Chamber 4

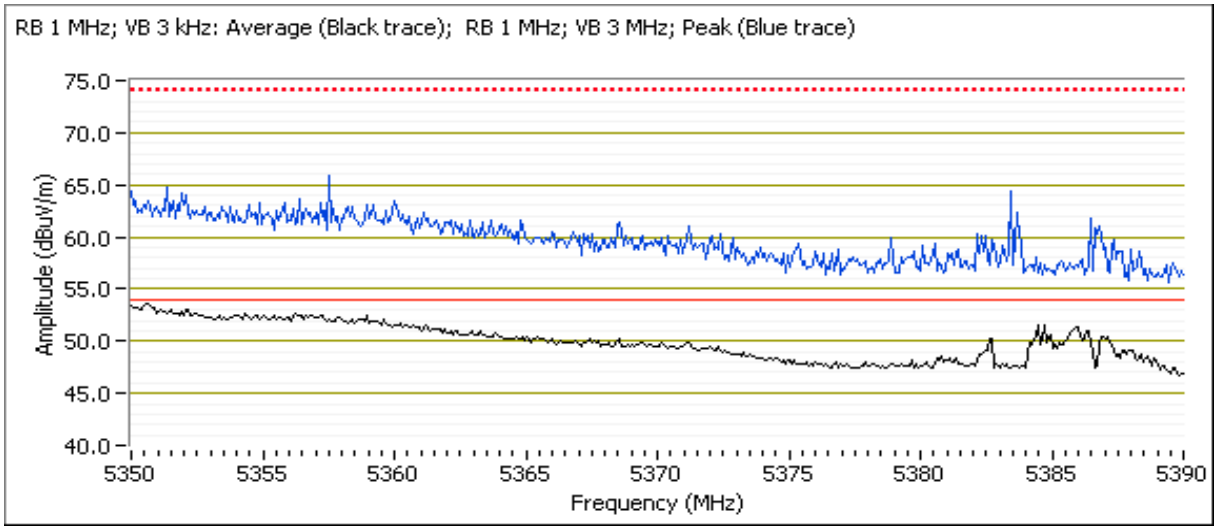
Config. Used: 2
Config Change: none
EUT Voltage: 120V / 60Hz

Channel: 58 - 5290MHz
Tx Chain: 4Tx
Mode: ac80
Steams: 3SS

EUT Orientation: Flat
Power setting: 17
Data Rate: MCS 0

*5350 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5350.160 | 53.3 | H | 54.0 | -0.7 | AVG | 1 | 1.2 | POS; RB 1 MHz; VB: 3 kHz; note 3 |
| 5351.290 | 65.7 | H | 74.0 | -8.3 | PK | 1 | 1.2 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Date of Test: 01/04/17
Test Engineer: John Caizzi
Test Location: Chamber 7

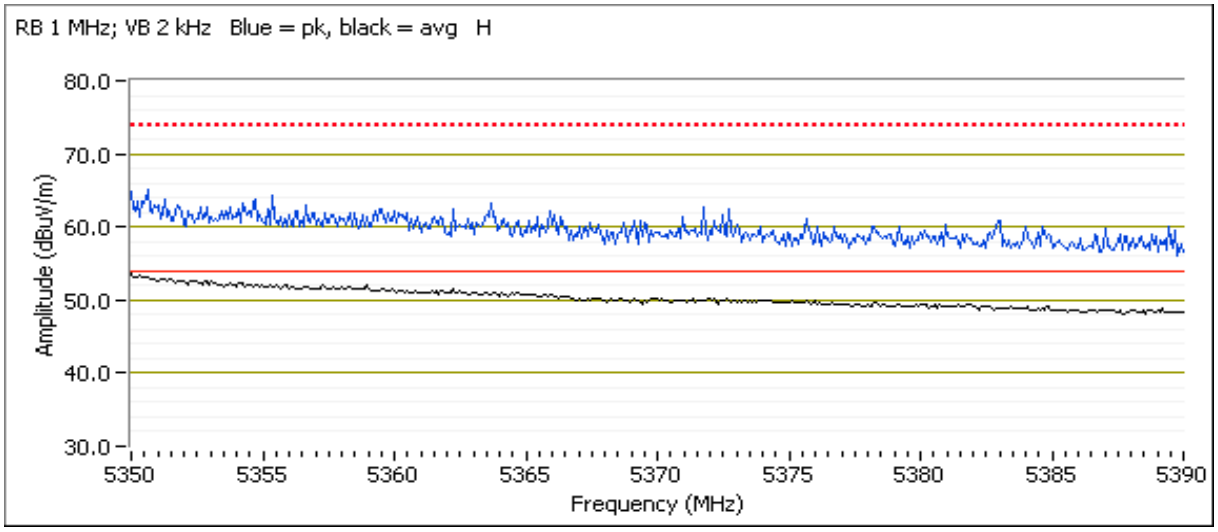
Config. Used: 2
Config Change: none
EUT Voltage: 120V / 60Hz

Channel: 58 - 5290MHz
Tx Chain: 4Tx
Mode: ac80
Steams: 4SS

EUT Orientation: Flat
Power setting: 19
Data Rate: MCS 0

*5350 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5350.400 | 53.5 | H | 54.0 | -0.5 | Avg | 159 | 1.60 | VB: 2 kHz, note 3. |
| 5350.560 | 69.3 | H | 74.0 | -4.7 | PK | 159 | 1.60 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Run #4: Radiated Bandedge Measurements, 5470-5725MHz

Date of Test: 12/27/16
Test Engineer: Mehran Birgani
Test Location: Chamber 4

Config. Used: 2
Config Change: none
EUT Voltage: 120V / 60Hz

Channel: 106 - 5530 MHz
Tx Chain: 4Tx
Mode: ac80
Steams: 1SS

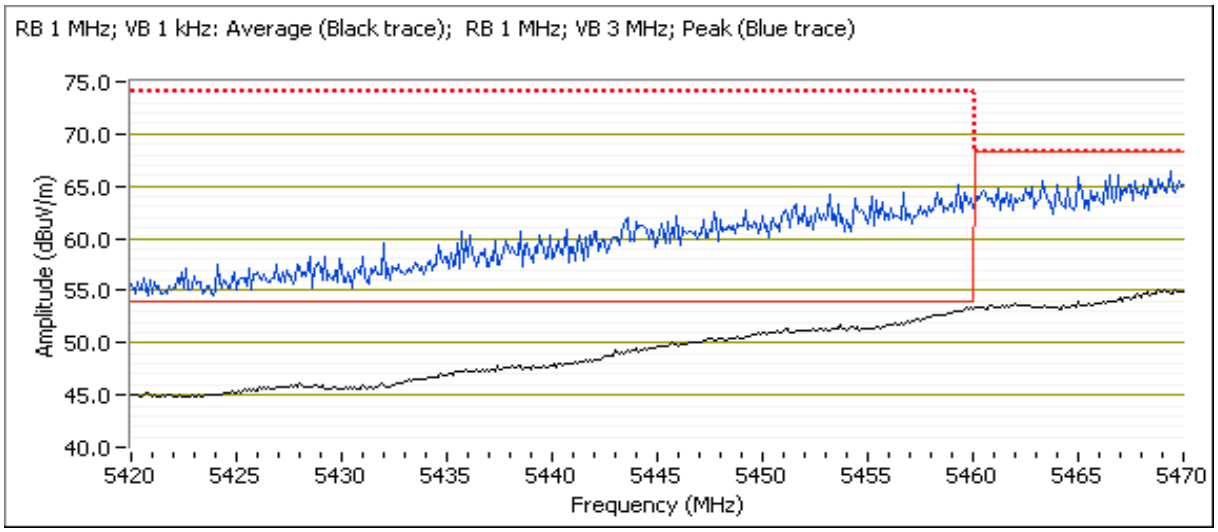
EUT Orientation: Flat
Power setting: 15
Data Rate: MCS 0

*5460 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5459.560 | 53.4 | H | 54.0 | -0.6 | AVG | 155 | 1.4 | POS; RB 1 MHz; VB: 1 kHz |
| 5458.770 | 66.9 | H | 74.0 | -7.1 | PK | 155 | 1.4 | POS; RB 1 MHz; VB: 3 MHz |

*5470 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5468.680 | 67.6 | H | 68.3 | -0.7 | PK | 155 | 1.4 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Date of Test: 12/27/16
Test Engineer: Mehran Birgani
Test Location: Chamber 4

Config. Used: 2
Config Change: none
EUT Voltage: 120V / 60Hz

Channel: 106 - 5530 MHz
Tx Chain: 4Tx
Mode: ac80
Steams: 2SS

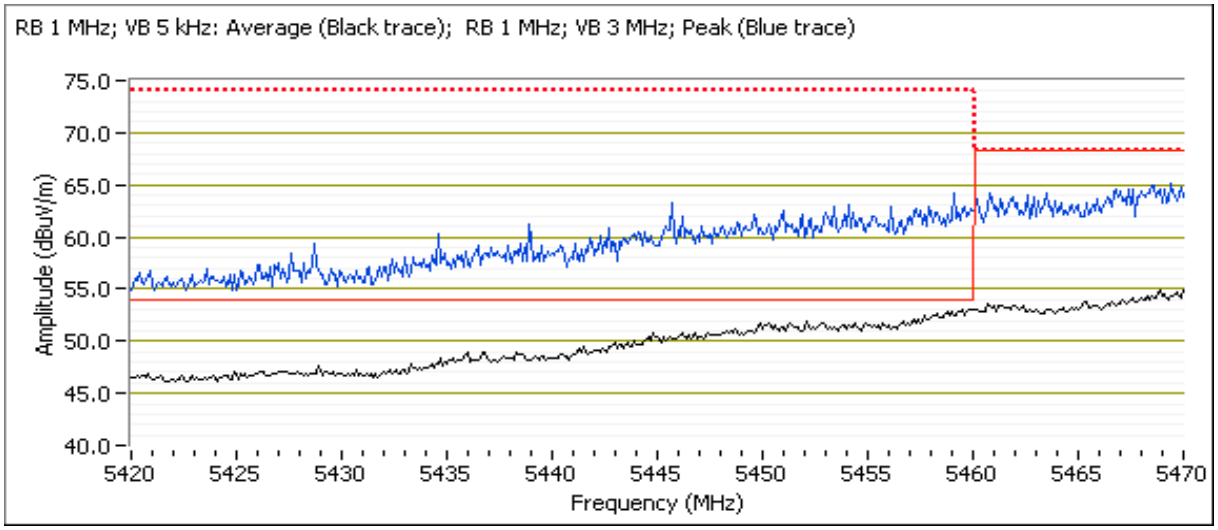
EUT Orientation: Flat
Power setting: 17
Data Rate: MCS 0

*5460 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5459.730 | 53.0 | H | 54.0 | -1.0 | AVG | 153 | 1.4 | POS; RB 1 MHz; VB: 5 kHz |
| 5457.500 | 64.5 | H | 74.0 | -9.5 | PK | 153 | 1.4 | POS; RB 1 MHz; VB: 3 MHz |

*5470 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5467.900 | 66.4 | H | 68.3 | -1.9 | PK | 153 | 1.4 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Date of Test: 12/27/16
Test Engineer: Mehran Birgani
Test Location: Chamber 4

Config. Used: 2
Config Change: none
EUT Voltage: 120V / 60Hz

Channel: 106 - 5530 MHz
Tx Chain: 4Tx
Mode: ac80
Steams: 3SS

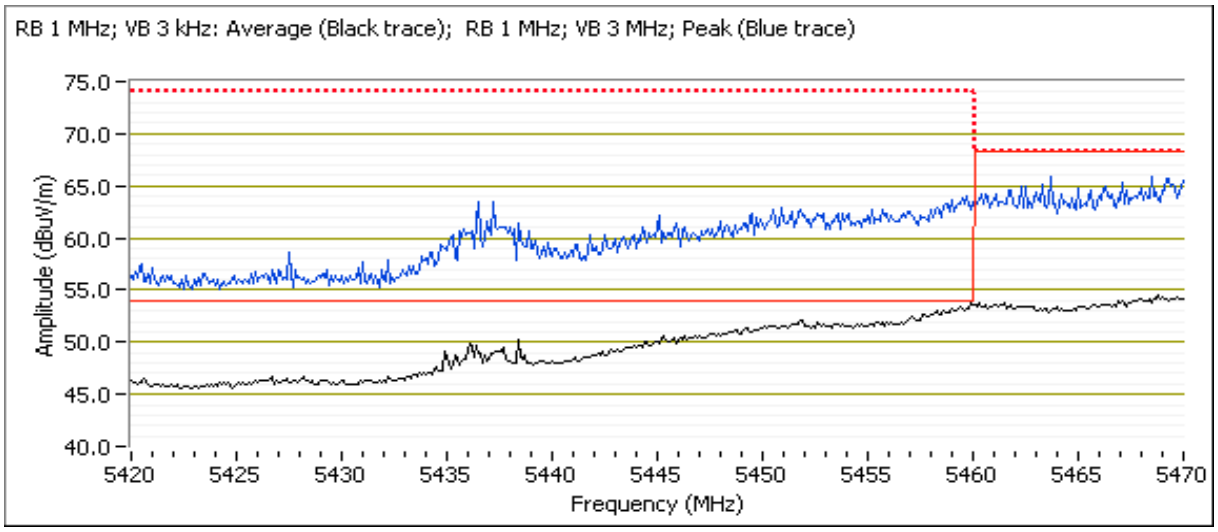
EUT Orientation: Flat
Power setting: 18
Data Rate: MCS 0

*5460 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5459.900 | 53.6 | H | 54.0 | -0.4 | AVG | 357 | 1.4 | POS; RB 1 MHz; VB: 3 kHz; note 3 |
| 5458.850 | 65.6 | H | 74.0 | -8.4 | PK | 357 | 1.4 | POS; RB 1 MHz; VB: 3 MHz |

*5470 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5468.320 | 66.1 | H | 68.3 | -2.2 | PK | 357 | 1.4 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Date of Test: 01/03/17
Test Engineer: John Caizzi
Test Location: Chamber 7

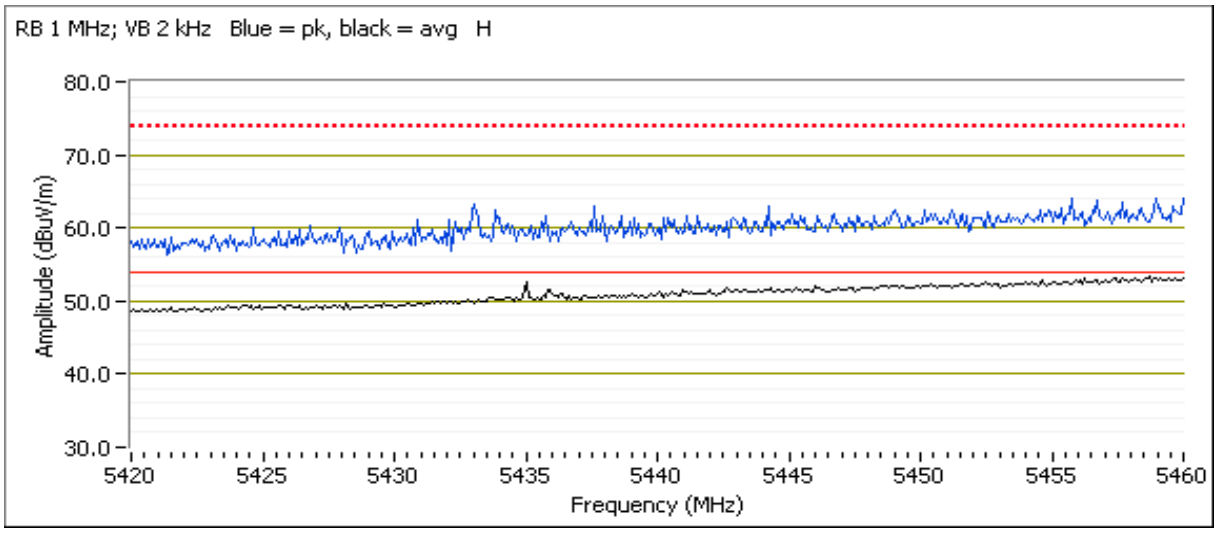
Config. Used: 2
Config Change: none
EUT Voltage: 120V / 60Hz

Channel: 106 - 5530 MHz
Tx Chain: 4Tx
Mode: ac80
Steams: 4SS

EUT Orientation: Flat
Power setting: 21
Data Rate: MCS 0

*5460 MHz Band Edge Signal Radiated Field Strength*

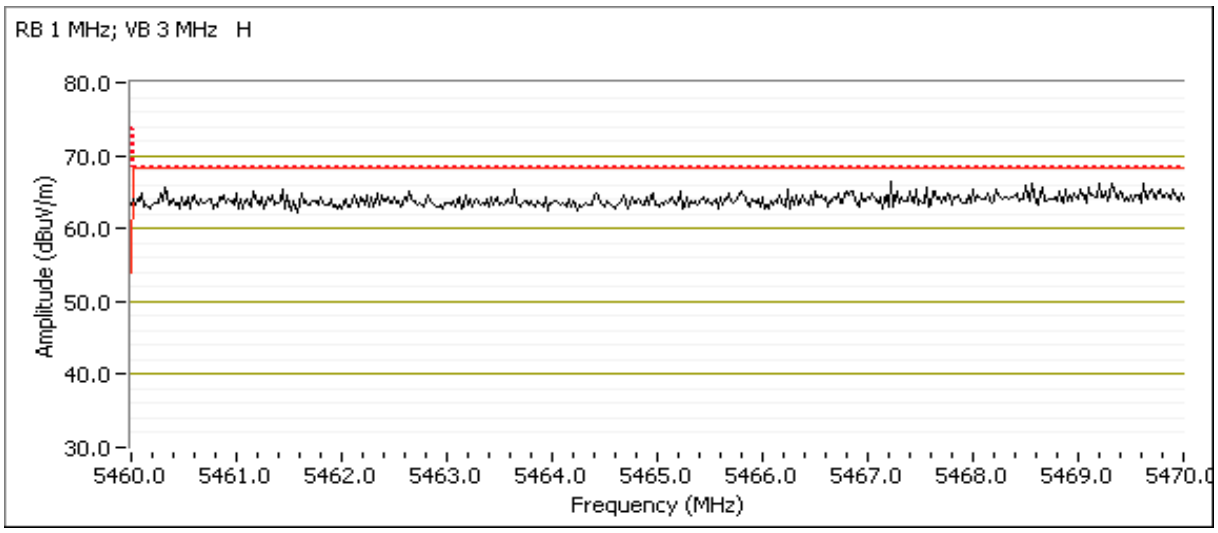
| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5459.530 | 53.6 | H | 54.0 | -0.4 | Avg | 355 | 1.47 | VB: 2 kHz, note 3. |
| 5454.220 | 65.4 | H | 74.0 | -8.6 | PK | 355 | 1.47 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

*5470 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | 15.E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5467.110 | 66.1 | H | 68.3 | -2.2 | PK | 72 | 1.52 | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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.

### Summary of Results

| Run # | Test Performed | Limit | Pass / Fail | Result / Margin |
|---|---|---|---|---|
| 1 | Power, 5150 - 5250MHz | 15.407(a) (1) (ii) | Pass | n20: 26.9 dBm (495.4mW)<br>n40: 22.7 dBm (184.1mW)<br>ac80: 24.0 dBm (251mW) |
| 1 | PSD, 5150 - 5250MHz | 15.407(a) (1) (ii) | Pass | n20: 14.0 dBm/MHz<br>n40: 7.4 dBm/MHz<br>ac80: 5.1 dBm/MHz |
| 1 | 99% Bandwidth | RSS-247<br>(Information only) | N/A | n20: 18.6 MHz<br>n40: 36.8 MHz<br>ac80: 75.8 MHz |

### 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: 23.9 °C
Rel. Humidity: 41.2 %

### Modifications Made During Testing

No modifications were made to the EUT during testing

### Deviations From The Standard

No deviations were made from the requirements of the standard.

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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) |
|---|---|---|---|---|---|---|---|---|
| 1SS | ac20 | MCS0 | 0.99 | Yes | 9.89 | 0.00 | 0.00 | 10 |
| 4SS | ac20 | MCS0 | 0.96 | Yes | 2.49 | 0.18 | 0.36 | 402 |
| 1SS | ac40 | MCS0 | 0.99 | Yes | 5.29 | 0.00 | 0.00 | 10 |
| 3SS | ac40 | MCS0 | 0.98 | Yes | 1.65 | 0.10 | 0.20 | 10 |
| 4SS | ac40 | MCS0 | 0.96 | Yes | 1.25 | 0.16 | 0.33 | 803 |
| 1SS | ac80 | VHT0 | 0.96 | Yes | 2.214 | 0.19 | 0.39 | 452 |
| 2SS | ac80 | VHT0 | 0.97 | Yes | 2.236 | 0.11 | 0.23 | 447 |
| 3SS | ac80 | VHT0 | 0.92 | Yes | 0.784 | 0.37 | 0.73 | 1276 |
| 4SS | ac80 | VHT0 | 0.89 | Yes | 0.551 | 0.51 | 1.01 | 1815 |

## Sample Notes

Sample S/N: 184795206016304
Driver: d21
Antenna: 4x4 internal

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 1/6/2017 0:00
Test Engineer: J. Caizzi / R. Varelas
Test Location: FT Lab #4B

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

| | |
|---|---|
| Note 1: | Power measurements performed using a gated averge power meter. |
| Note 1: | PSD measurements - Duty Cycle ≥ 98%. 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%). |
| Note 2: | PSD measurements - Duty Cycle < 98%. RBW=1MHz, VB=3 MHz, Span > OBW, # of points in sweep ≥ 2*span/RBW, RMS detector, trace average 100 traces, power averaging on. The measurements were adjusted by correcting for duty cycle. (method SA-2 of ANSI C63.10) |
| Note 5: | 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 6: | 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. |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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 | Refer to antenna spec in operational description | | | | No | Yes | Yes | No | 0.90 | 6.50 |
| 5250-5350 | | | | | No | Yes | Yes | No | 0.90 | 6.90 |
| 5470-5725 | | | | | No | Yes | Yes | No | 1.10 | 7.10 |
| 5725-5825 | | | | | No | Yes | Yes | No | 0.80 | 6.50 |

For devices that support CDD modes

Min # of spatial streams: 1

Max # of spatial streams: 4

| | |
|---|---|
| Notes: | BF = beamforming mode supported, Multichain Legacy = 802.11 legacy data rates supported for multichain transmissions, CDD = Cyclic Delay Diversity (or Cyclic Shift Diversity) modes supported, Sectorized / Xpol = antennas are sectorized or cross polarized. |
| Notes: | Dir G (PWR) = total gain (Gant + Array Gain) for power calculations; 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 taken from antenna spec in operational description. As the device operates using CDD, the Dir G (PWR) used the "Uncorrelated" value provided; PSD used the "Correlated". This is per KDB 662911 F)2)f). |
| Notes: | For systems with Beamforming and CDD, choose one the following options:<br>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.<br>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) |

| 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 | - |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5150-5250 MHz Band - FCC, 4SS

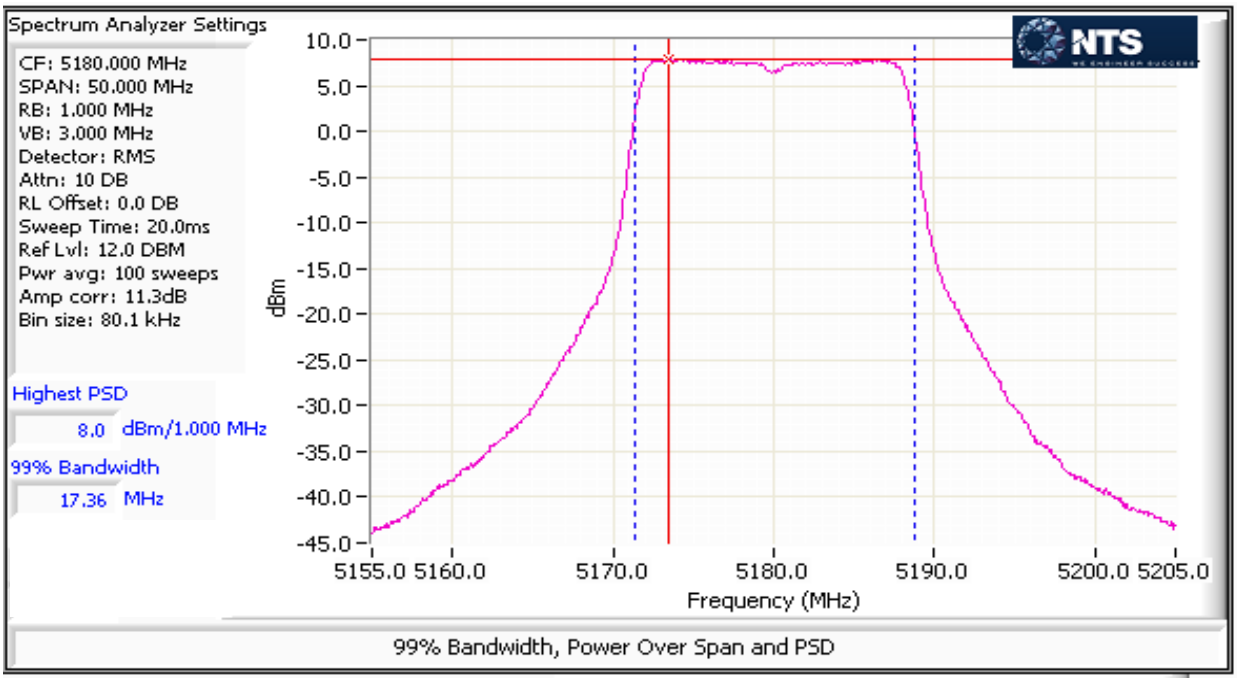
Mode: ac 20 Max EIRP (mW): 609.5

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[2] dBm | Total Power[6] mW | Total Power[6] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5180 | 1 | 22 | | - | 20.8 | 495.4 | 26.9 | 30.0 | 0.495 | Pass |
| | 3 | | | | 21.1 | | | | | |
| | 4 | | | | 20.7 | | | | | |
| | 2 | | | | 21.1 | | | | | |

5150-5250 PSD - FCC, 4SS

Mode: ac 20

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | PSD[3] dBm/MHz | Total PSD[6] mW/MHz | Total PSD[6] dBm/MHz | FCC Limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|
| 5180 | 1 | 22 | | 95.9 | 7.7 | 24.9 | 14.0 | 16.5 | Pass |
| | 3 | | | | 8.0 | | | | |
| | 4 | | | | 7.6 | | | | |
| | 2 | | | | 7.7 | | | | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5150-5250 MHz Band - FCC, 4SS

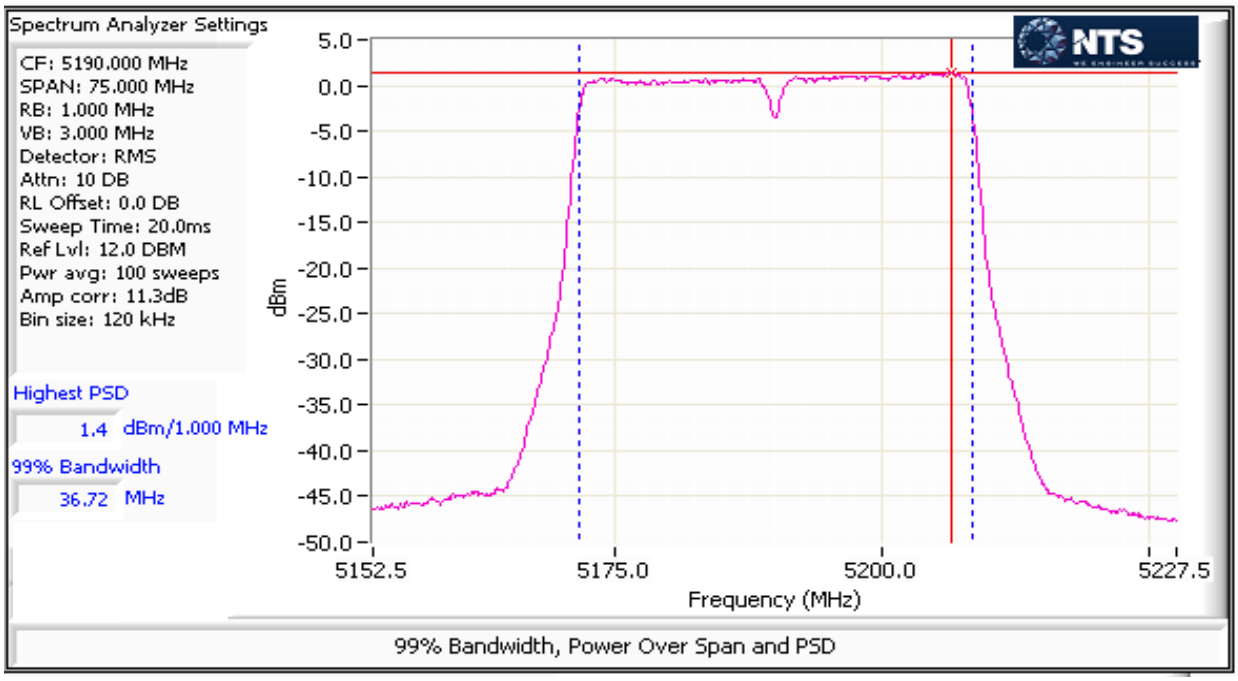
Mode: ac 40 Max EIRP (mW): 226.5

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[1] dBm | Total Power[6] mW | Total Power[6] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5190 | 1 | 17 | | - | 16.8 | 184.1 | 22.7 | 30.0 | 0.184 | Pass |
| | 3 | | | | 16.7 | | | | | |
| | 4 | | | | 16.3 | | | | | |
| | 2 | | | | 16.7 | | | | | |

5150-5250 PSD - FCC, 4SS

Mode: ac 40

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | PSD[3] dBm/MHz | Total PSD[6] mW/MHz | Total PSD[6] dBm/MHz | FCC Limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|
| 5190 | 1 | 18 | | 96.3 | 0.9 | 5.5 | 7.4 | 16.5 | Pass |
| | 3 | | | | 1.4 | | | | |
| | 4 | | | | 1.3 | | | | |
| | 2 | | | | 1.3 | | | | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5150-5250 MHz Band - FCC, 4SS

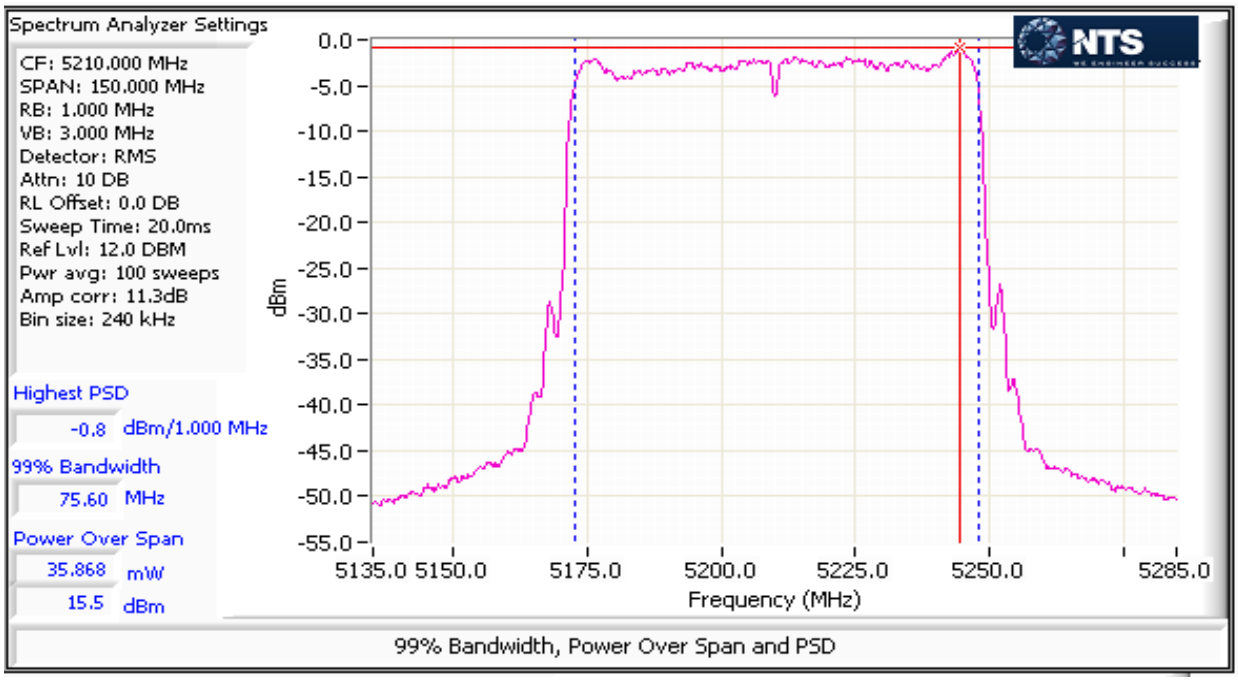
Mode: ac 80 Max EIRP (mW): 308.8

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[2] dBm | Total Power[6] mW | Total Power[6] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5210 | 1 | 18 | | - | 18.2 | 251.0 | 24.0 | 30.0 | 0.251 | Pass |
| | 3 | | | | 17.9 | | | | | |
| | 4 | | | | 17.9 | | | | | |
| | 2 | | | | 17.9 | | | | | |

5150-5250 PSD - FCC, 4SS

Mode: ac 80

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | PSD[3] dBm/MHz | Total PSD[6] mW/MHz | Total PSD[6] dBm/MHz | FCC Limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|
| 5210 | 1 | 18 | | 89.0 | -1.6 | 3.2 | 5.1 | 16.5 | Pass |
| | 3 | | | | -0.8 | | | | |
| | 4 | | | | -1.8 | | | | |
| | 2 | | | | -1.8 | | | | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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.

### Summary of Results

| Run # | Test Performed | Limit | Pass / Fail | Result / Margin |
|---|---|---|---|---|
| 1 | Power, 5150 - 5250MHz | 15.407(a) (1) (ii) | Pass | n20: 26.9 dBm (495.4mW)<br>n40: 23.1 dBm (205.4mW)<br>ac80: 24.0 dBm (251mW) |
| 1 | PSD, 5150 - 5250MHz | 15.407(a) (1) (ii) | Pass | n20: 14.0 dBm/MHz<br>n40: 7.4 dBm/MHz<br>ac80: 5.1 dBm/MHz |
| 1 | 99% Bandwidth | RSS-247<br>(Information only) | N/A | n20: 17.4 MHz<br>n40: 36.7 MHz<br>ac80: 75.6 MHz |

### 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: 23.9 °C
Rel. Humidity: 41.2 %

### Modifications Made During Testing

No modifications were made to the EUT during testing

### Deviations From The Standard

No deviations were made from the requirements of the standard.

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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) |
|---|---|---|---|---|---|---|---|---|
| 1SS | ac20 | MCS0 | 0.99 | Yes | 9.89 | 0.00 | 0.00 | 10 |
| 4SS | ac20 | MCS0 | 0.96 | Yes | 2.49 | 0.18 | 0.36 | 402 |
| 1SS | ac40 | MCS0 | 0.99 | Yes | 5.29 | 0.00 | 0.00 | 10 |
| 3SS | ac40 | MCS0 | 0.98 | Yes | 1.65 | 0.10 | 0.20 | 10 |
| 4SS | ac40 | MCS0 | 0.96 | Yes | 1.25 | 0.16 | 0.33 | 803 |
| 1SS | ac80 | VHT0 | 0.96 | Yes | 2.214 | 0.19 | 0.39 | 452 |
| 2SS | ac80 | VHT0 | 0.97 | Yes | 2.236 | 0.11 | 0.23 | 447 |
| 3SS | ac80 | VHT0 | 0.92 | Yes | 0.784 | 0.37 | 0.73 | 1276 |
| 4SS | ac80 | VHT0 | 0.89 | Yes | 0.551 | 0.51 | 1.01 | 1815 |

Note - for antenna port measurements, the EUT was operated in the non-TxBF mode

## Sample Notes

Sample S/N: 184795206016304
Driver: d21
Antenna: 4x4 internal

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 1/5/2017 0:00
Test Engineer: M. Birgani / R. Varelas
Test Location: FT Lab #4B

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

| | |
|---|---|
| Note 1: | Power measurements performed using a gated averge power meter. |
| Note 1: | PSD measurements - Duty Cycle ≥ 98%. 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%). |
| Note 2: | PSD measurements - Duty Cycle < 98%. RBW=1MHz, VB=3 MHz, Span > OBW, # of points in sweep ≥ 2*span/RBW, RMS detector, trace average 100 traces, power averaging on. The measurements were adjusted by correcting for duty cycle. (method SA-2 of ANSI C63.10) |
| Note 5: | 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 6: | 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. |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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 | Refer to antenna spec in operational description | | | | Yes | | Yes | No | 6.50 | 6.50 |
| 5250-5350 | | | | | Yes | | Yes | No | 6.90 | 6.90 |
| 5470-5725 | | | | | Yes | | Yes | No | 7.10 | 7.10 |
| 5725-5825 | | | | | Yes | | Yes | No | 6.50 | 6.50 |

For devices that support CDD modes

Min # of spatial streams: 1

Max # of spatial streams: 4

| | |
|---|---|
| Notes: | BF = beamforming mode supported, Multichain Legacy = 802.11 legacy data rates supported for multichain transmissions, CDD = Cyclic Delay Diversity (or Cyclic Shift Diversity) modes supported, Sectorized / Xpol = antennas are sectorized or cross polarized. |
| Notes: | Dir G (PWR) = total gain (Gant + Array Gain) for power calculations; 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 taken from antenna spec in operational description. As the device operates using CDD, the Dir G (PWR) used the "Uncorrelated" value provided; PSD used the "Correlated". This is per KDB 662911 F)2)f). |
| Notes: | For systems with Beamforming and CDD, choose one the following options:<br>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.<br>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) |

| 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 | - |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

Power measurements performed at the highest power setting from the bandedge measurements for any number of SS.

MIMO Device - 5150-5250 MHz Band - FCC, 4SS

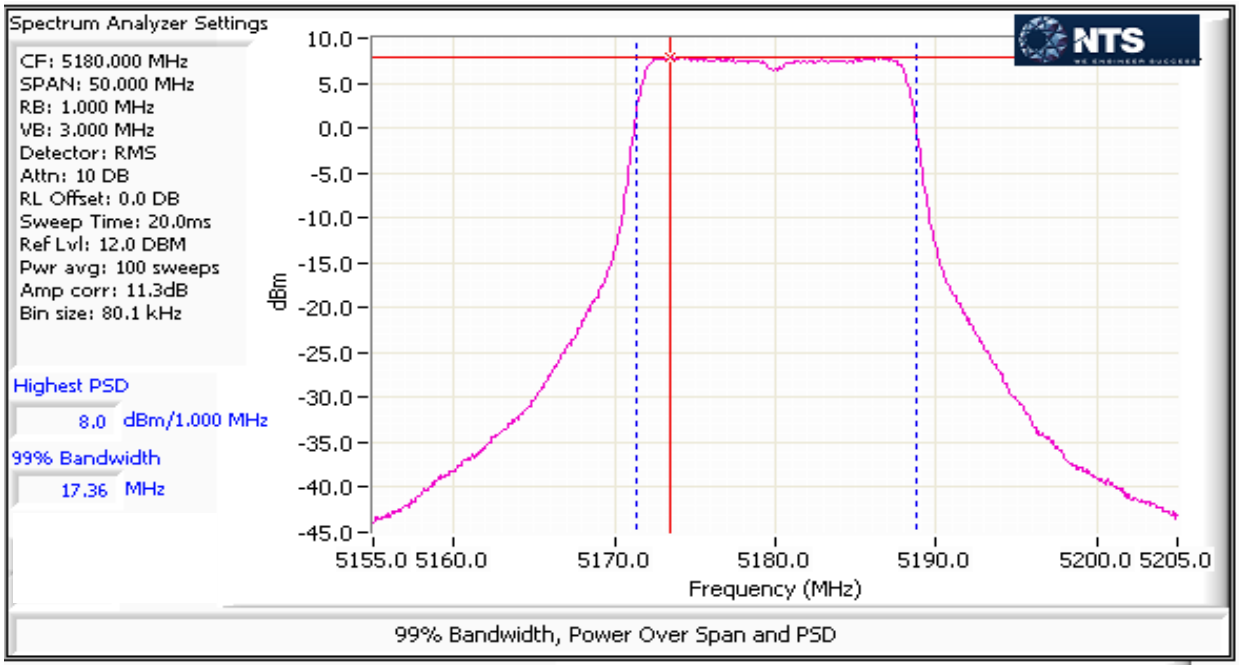
Mode: ac 20 Max EIRP (mW): 2212.9

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[2] dBm | Total Power[6] mW | Total Power[6] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5180 | 1 | 22 | | - | 20.8 | 495.4 | 26.9 | 29.5 | 0.495 | Pass |
| | 3 | | | | 21.1 | | | | | |
| | 4 | | | | 20.7 | | | | | |
| | 2 | | | | 21.1 | | | | | |

5150-5250 PSD - FCC, 4SS

Mode: ac 20

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | PSD[3] dBm/MHz | Total PSD[6] mW/MHz | Total PSD[6] dBm/MHz | FCC Limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|
| 5180 | 1 | 22 | | 95.9 | 7.7 | 24.9 | 14.0 | 16.5 | Pass |
| | 3 | | | | 8.0 | | | | |
| | 4 | | | | 7.6 | | | | |
| | 2 | | | | 7.7 | | | | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5150-5250 MHz Band - FCC, 4SS

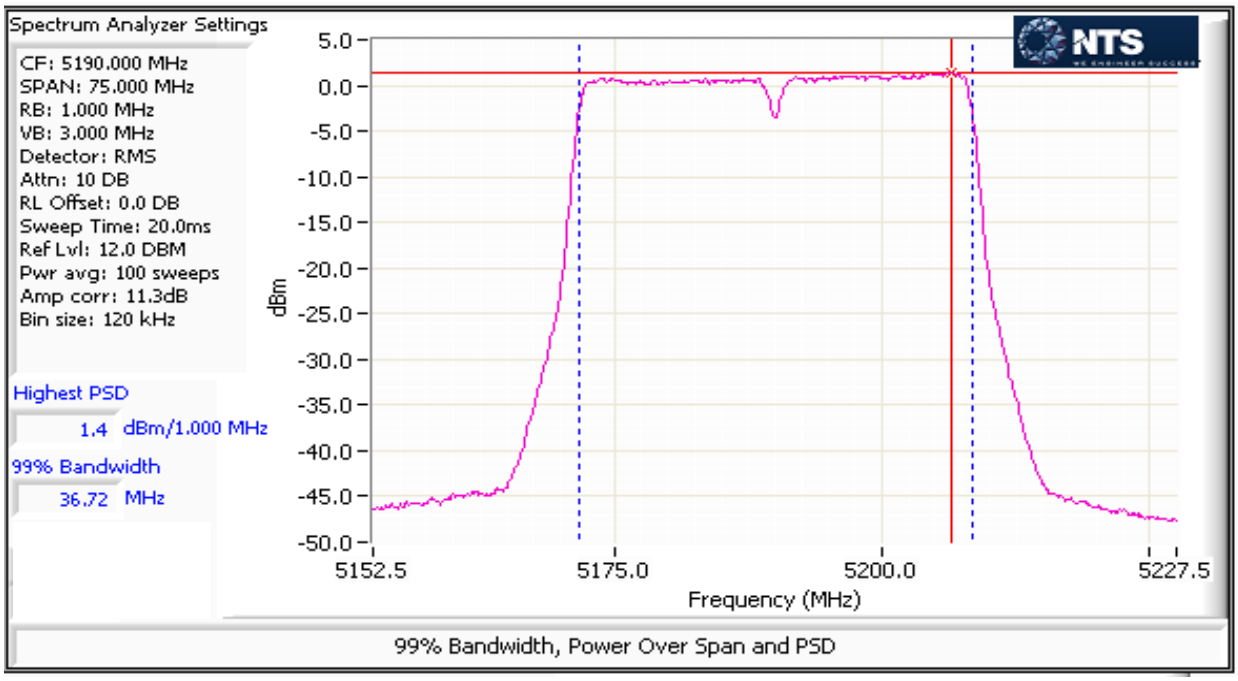
Mode: ac 40 Max EIRP (mW): 917.5

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[1] dBm | Total Power[6] mW | Total Power[6] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5190 | 1 | 18 | | - | 17.3 | 205.4 | 23.1 | 29.5 | 0.205 | Pass |
| | 3 | | | | 17.2 | | | | | |
| | 4 | | | | 16.7 | | | | | |
| | 2 | | | | 17.2 | | | | | |

5150-5250 PSD - FCC, 4SS

Mode: ac 40

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | PSD[3] dBm/MHz | Total PSD[6] mW/MHz | Total PSD[6] dBm/MHz | FCC Limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|
| 5190 | 1 | 18 | | 96.3 | 0.9 | 5.5 | 7.4 | 16.5 | Pass |
| | 3 | | | | 1.4 | | | | |
| | 4 | | | | 1.3 | | | | |
| | 2 | | | | 1.3 | | | | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5150-5250 MHz Band - FCC, 4SS

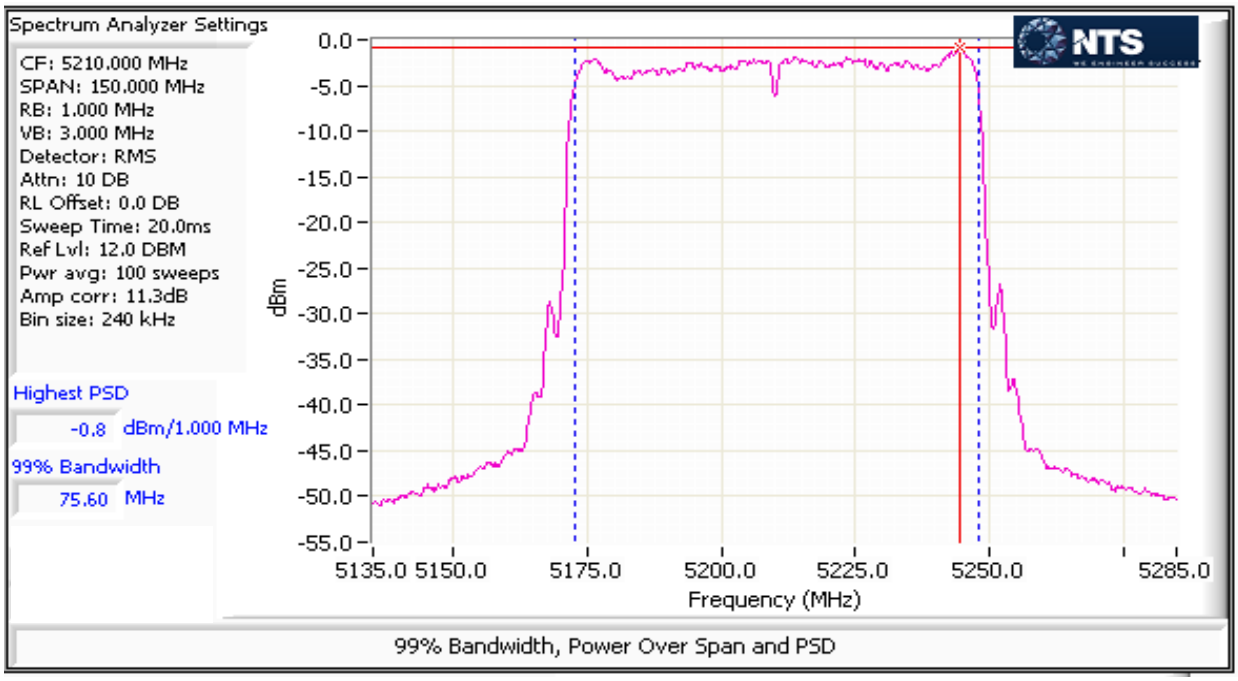
Mode: ac 80 Max EIRP (mW): 1121.2

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[2] dBm | Total Power[6] mW | Total Power[6] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5210 | 1 | 18 | | - | 18.2 | 251.0 | 24.0 | 29.5 | 0.251 | Pass |
| | 3 | | | | 17.9 | | | | | |
| | 4 | | | | 17.9 | | | | | |
| | 2 | | | | 17.9 | | | | | |

5150-5250 PSD - FCC, 4SS

Mode: ac 80

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | PSD[3] dBm/MHz | Total PSD[6] mW/MHz | Total PSD[6] dBm/MHz | FCC Limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|
| 5210 | 1 | 18 | | 89.0 | -1.6 | 3.2 | 5.1 | 16.5 | Pass |
| | 3 | | | | -0.8 | | | | |
| | 4 | | | | -1.8 | | | | |
| | 2 | | | | -1.8 | | | | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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.

### Summary of Results

| Run # | Test Performed | Limit | Pass / Fail | Result / Margin |
|---|---|---|---|---|
| 1 | Power, 5250 - 5350MHz | 15.407 (a)(2) | Pass | n40: 23.7 dBm (232.1mW)<br>ac80: 23.4 dBm (218.9mW) |
| 1 | PSD 5250 - 5350MHz | 15.407 (a)(2) | Pass | n40: 8.1 dBm/MHz<br>ac80: 6.6 dBm/MHz |
| 1 | Power, 5470 - 5725MHz | 15.407 (a)(2) | Pass | n40: 23.6 dBm (229.1 mW)<br>ac80: 23.9 dBm (247 mW) |
| 1 | PSD, 5470 - 5725MHz | 15.407 (a)(2) | Pass | n40: 7.9 dBm/MHz<br>ac80: 8.5 dBm/MHz |
| 1 | 99% Bandwidth | RSS-247<br>(Information only) | N/A | n40: 36.8 MHz<br>ac80: 75.8 MHz |

### 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: 23.9 °C
Rel. Humidity: 41.2 %

### Modifications Made During Testing

No modifications were made to the EUT during testing

### Deviations From The Standard

No deviations were made from the requirements of the standard.

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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) |
|---|---|---|---|---|---|---|---|---|
| 1SS | ac20 | MCS0 | 0.99 | Yes | 9.89 | 0.00 | 0.00 | 10 |
| 4SS | ac20 | MCS0 | 0.96 | Yes | 2.49 | 0.18 | 0.36 | 402 |
| 1SS | ac40 | MCS0 | 0.99 | Yes | 5.29 | 0.00 | 0.00 | 10 |
| 3SS | ac40 | MCS0 | 0.98 | Yes | 1.65 | 0.10 | 0.20 | 10 |
| 4SS | ac40 | MCS0 | 0.96 | Yes | 1.25 | 0.16 | 0.33 | 803 |
| 1SS | ac80 | VHT0 | 0.96 | Yes | 2.214 | 0.19 | 0.39 | 452 |
| 2SS | ac80 | VHT0 | 0.97 | Yes | 2.236 | 0.11 | 0.23 | 447 |
| 3SS | ac80 | VHT0 | 0.92 | Yes | 0.784 | 0.37 | 0.73 | 1276 |
| 4SS | ac80 | VHT0 | 0.89 | Yes | 0.551 | 0.51 | 1.01 | 1815 |

## Sample Notes

Sample S/N: 184795206016304
Driver: d21
Antenna: 4x4 internal

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 1/6/2017 0:00
Test Engineer: J. Caizzi / R. Varelas
Test Location: FT Lab #4B

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

| | |
|---|---|
| Note 1: | Power measurements performed using a gated averge power meter. |
| Note 1: | PSD measurements - Duty Cycle ≥ 98%. 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%). |
| Note 2: | PSD measurements - Duty Cycle < 98%. RBW=1MHz, VB=3 MHz, Span > OBW, # of points in sweep ≥ 2*span/RBW, RMS detector, trace average 100 traces, power averaging on. The measurements were adjusted by correcting for duty cycle. (method SA-2 of ANSI C63.10) |
| Note 5: | 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 6: | 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. |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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 | Refer to antenna spec in operational description | | | | No | Yes | Yes | No | 0.90 | 6.50 |
| 5250-5350 | | | | | No | Yes | Yes | No | 0.90 | 6.90 |
| 5470-5725 | | | | | No | Yes | Yes | No | 1.10 | 7.10 |
| 5725-5825 | | | | | No | Yes | Yes | No | 0.80 | 6.50 |

For devices that support CDD modes

Min # of spatial streams: 1

Max # of spatial streams: 4

| | |
|---|---|
| Notes: | BF = beamforming mode supported, Multichain Legacy = 802.11 legacy data rates supported for multichain transmissions, CDD = Cyclic Delay Diversity (or Cyclic Shift Diversity) modes supported, Sectorized / Xpol = antennas are sectorized or cross polarized. |
| Notes: | Dir G (PWR) = total gain (Gant + Array Gain) for power calculations; 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 taken from antenna spec in operational description. As the device operates using CDD, the Dir G (PWR) used the "Uncorrelated" value provided; PSD used the "Correlated". This is per KDB 662911 F)2)f). |
| Notes: | For systems with Beamforming and CDD, choose one the following options:<br>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.<br>Option 2: Antennas are paired for beamforming, and the pairs are configured to use the cyclic delay diversity of 802.11; the array gain associated with beamforming with 2 antennas (3dB), and the array gain associated with CDD with two antennas (3dB for PSD and 0 dB for power) |

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5250-5350 MHz Band - FCC, 4SS

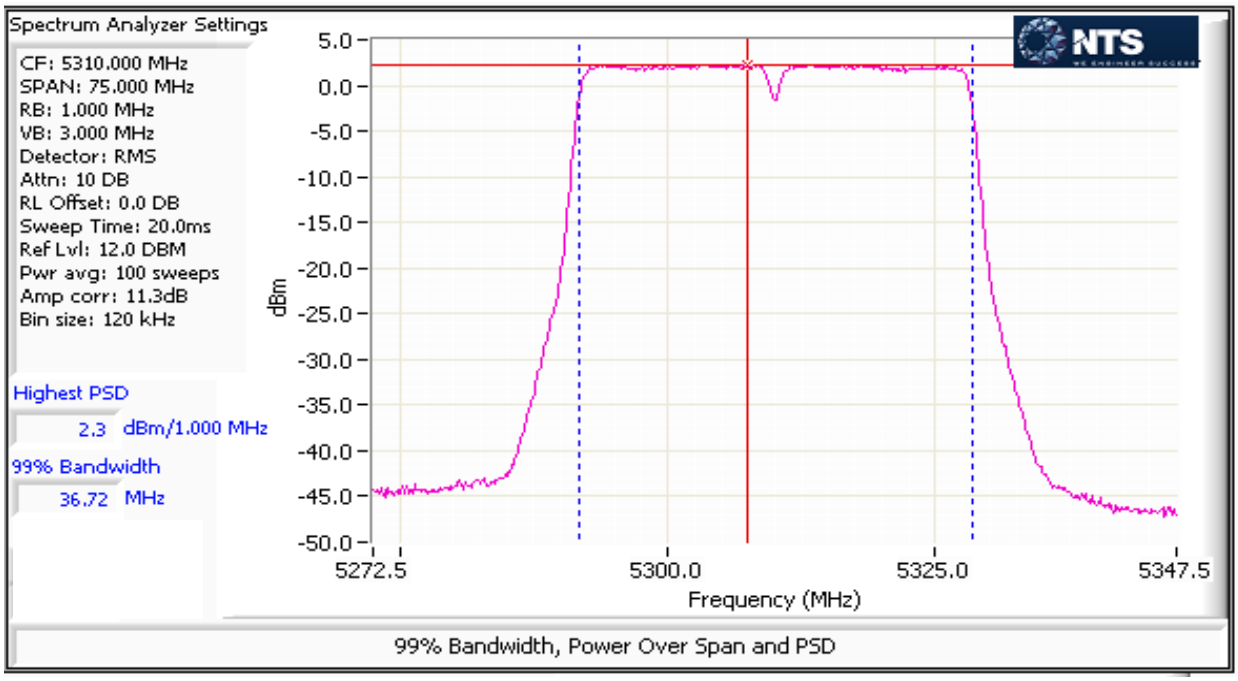
Mode: ac 40 Max EIRP (mW): 285.5

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[1] dBm | Total Power[6] mW | Total Power[6] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5310 | 1 | 18 | 43.9 | - | 18.1 | 232.1 | 23.7 | 24.0 | 0.232 | Pass |
| | 3 | | | | 17.6 | | | | | |
| | 4 | | | | 17.6 | | | | | |
| | 2 | | | | 17.2 | | | | | |

5250-5350 PSD - FCC, 4SS

Mode: ac 40

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | PSD[3] dBm/MHz | Total PSD[6] mW/MHz | Total PSD[6] dBm/MHz | FCC Limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|
| 5310 | 1 | 19 | 36.8 | 96.3 | 2.3 | 6.5 | 8.1 | 10.1 | Pass |
| | 3 | | | | 2.1 | | | | |
| | 4 | | | | 1.7 | | | | |
| | 2 | | | | 1.7 | | | | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5470-5725 MHz Band - FCC, 4SS

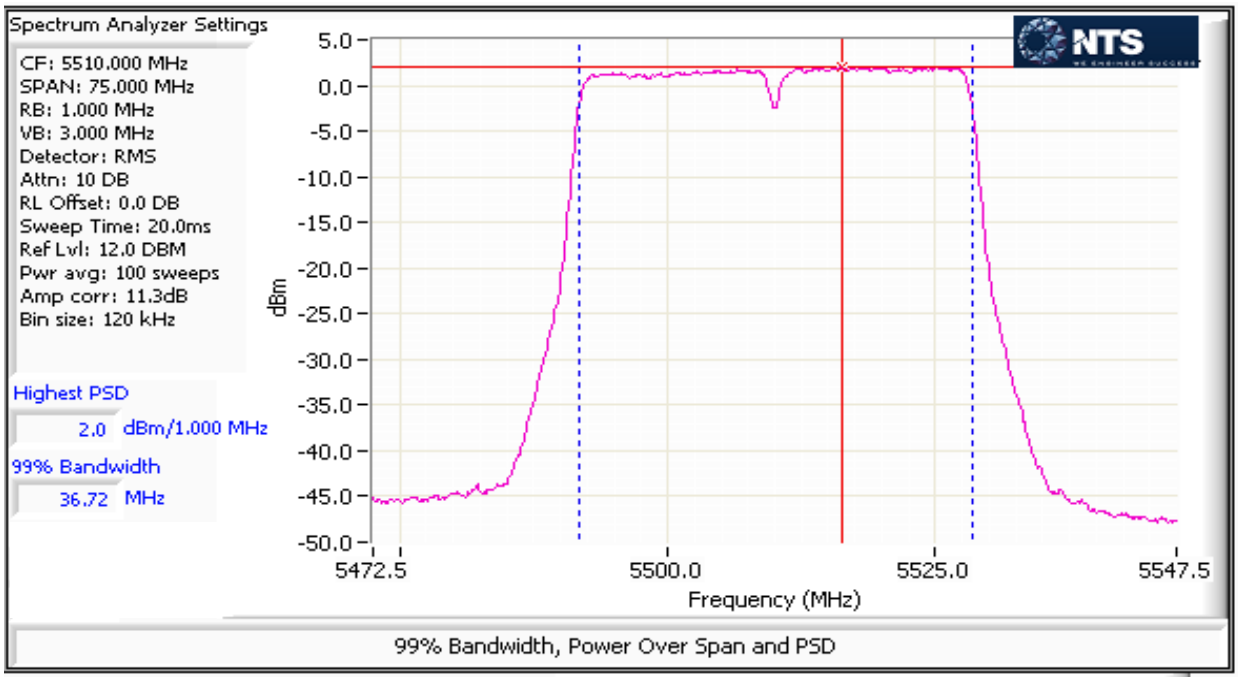
Mode: ac 40 Max EIRP (mW): 295.1

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[1] dBm | Total Power[6] mW | Total Power[6] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5510 | 1 | 18 | 44.1 | - | 17.9 | 229.1 | 23.6 | 24.0 | 0.229 | Pass |
| | 3 | | | | 17.6 | | | | | |
| | 4 | | | | 17.5 | | | | | |
| | 2 | | | | 17.3 | | | | | |

5470-5725 PSD - FCC, 4SS

Mode: ac 40

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | PSD[3] dBm/MHz | Total PSD[6] mW/MHz | Total PSD[6] dBm/MHz | FCC Limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|
| 5510 | 1 | 18 | 36.7 | 96.3 | 2.0 | 6.1 | 7.9 | 9.9 | Pass |
| | 3 | | | | 1.9 | | | | |
| | 4 | | | | 1.3 | | | | |
| | 2 | | | | 1.5 | | | | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5250-5350 MHz Band - FCC, 4SS

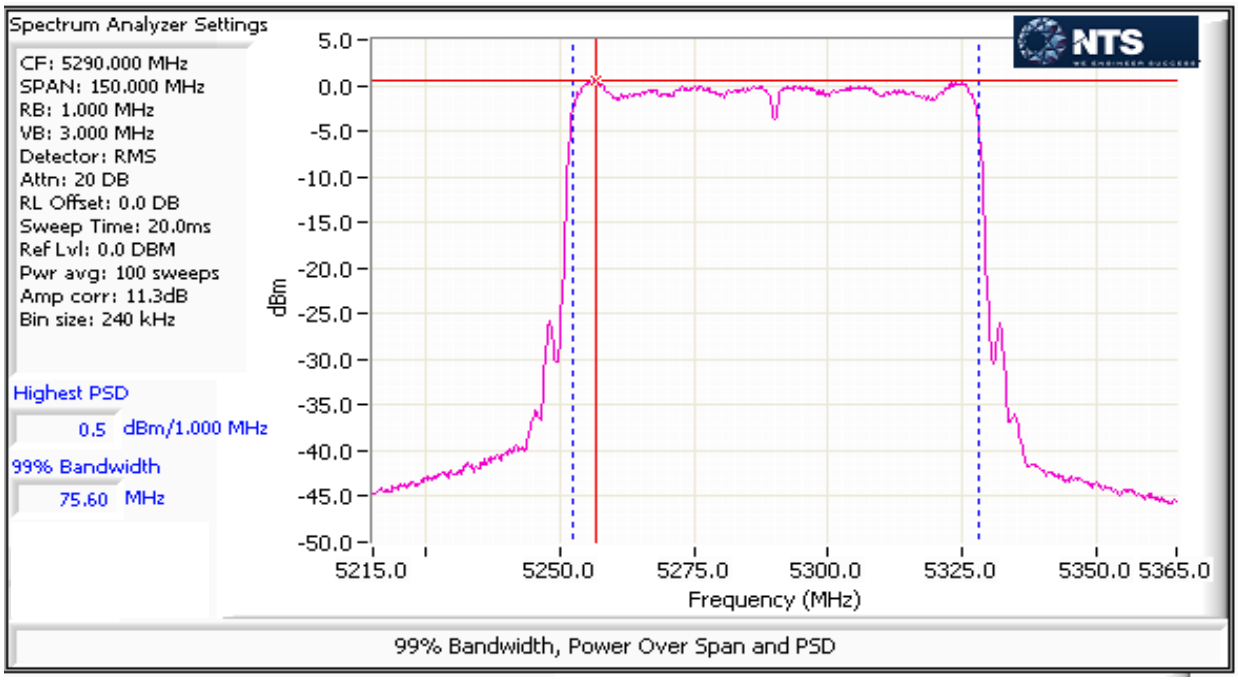
Mode: ac 80 Max EIRP (mW): 269.3

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[2] dBm | Total Power[6] mW | Total Power[6] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5290 | 1 | 18 | 82.4 | - | 17.7 | 218.9 | 23.4 | 24.0 | 0.219 | Pass |
| | 3 | | | | 17.5 | | | | | |
| | 4 | | | | 17.2 | | | | | |
| | 2 | | | | 17.1 | | | | | |

5250-5350 PSD - FCC, 4SS

Mode: ac 80

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | PSD[3] dBm/MHz | Total PSD[6] mW/MHz | Total PSD[6] dBm/MHz | FCC Limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|
| 5290 | 1 | 20 | | 89.0 | 0.5 | 4.6 | 6.6 | 10.1 | Pass |
| | 3 | | | | 0.1 | | | | |
| | 4 | | | | 0.1 | | | | |
| | 2 | | | | -0.5 | | | | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5470-5725 MHz Band - FCC, 4SS

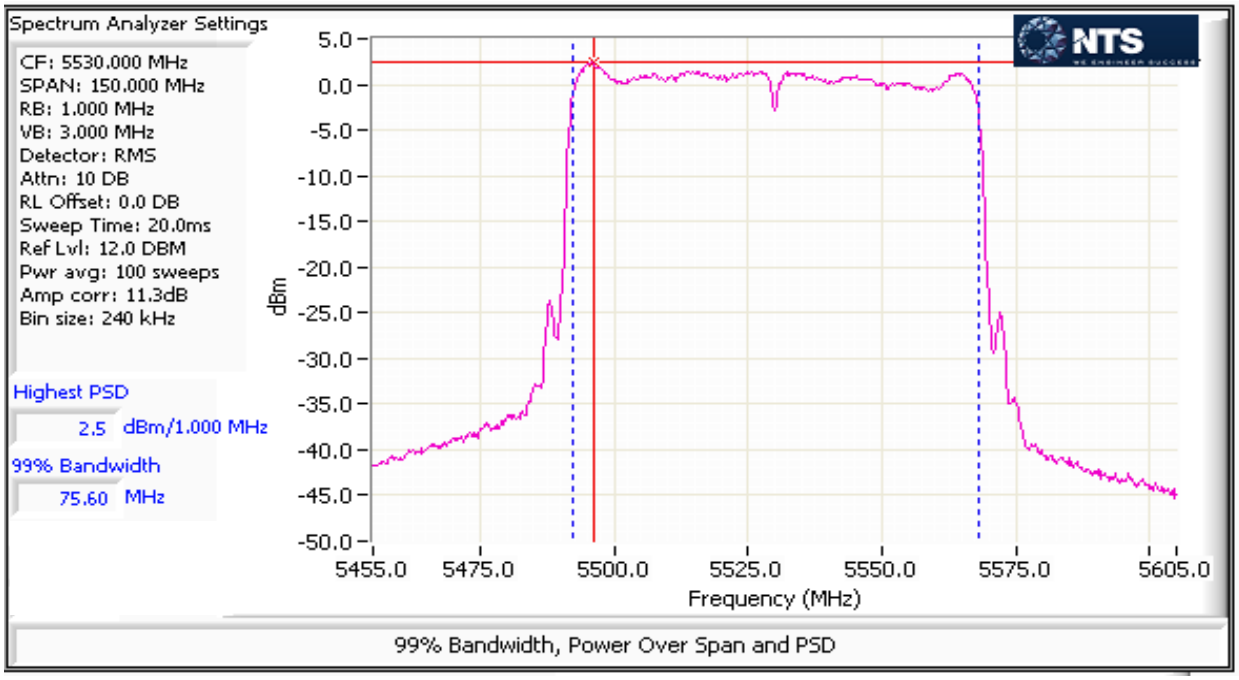
Mode: ac 80 Max EIRP (mW): 318.2

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[2] dBm | Total Power[6] mW | Total Power[6] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5530 | 1 | 18 | 82.4 | - | 18.1 | 247.0 | 23.9 | 24.0 | 0.247 | Pass |
| | 3 | | | | 18.0 | | | | | |
| | 4 | | | | 18.0 | | | | | |
| | 2 | | | | 17.5 | | | | | |

5470-5725 PSD - FCC, 4SS

Mode: ac 80

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | PSD[3] dBm/MHz | Total PSD[6] mW/MHz | Total PSD[6] dBm/MHz | FCC Limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|
| 5530 | 1 | 21 | 75.6 | 89.0 | 1.9 | 7.0 | 8.5 | 9.9 | Pass |
| | 3 | | | | 2.5 | | | | |
| | 4 | | | | 1.7 | | | | |
| | 2 | | | | 1.4 | | | | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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.

### Summary of Results

| Run # | Test Performed | Limit | Pass / Fail | Result / Margin |
|---|---|---|---|---|
| 1 | Power, 5250 - 5350MHz | 15.407 (a)(2) | Pass | n40: 22.7 dBm (186.6 mW)<br>ac80: 22.4 dBm (173.1 mW) |
| 1 | PSD, 5250 - 5350MHz | 15.407 (a)(2) | Pass | n40: 8.1 dBm/MHz<br>ac80: 6.6 dBm/MHz |
| 1 | Power, 5470 - 5725MHz | 15.407 (a)(2) | Pass | n40: 22.7 dBm (188.3 mW)<br>ac80: 22.0 dBm (157.6 mW) |
| 1 | PSD, 5470 - 5725MHz | 15.407 (a)(2) | Pass | n40: 7.9 dBm/MHz<br>ac80: 8.5 dBm/MHz |
| 1 | 99% Bandwidth | RSS-247<br>(Information only) | N/A | n20: 18.6 MHz<br>n40: 36.8 MHz<br>ac80: 75.8 MHz |

### 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: 23.9 °C
Rel. Humidity: 41.2 %

### Modifications Made During Testing

No modifications were made to the EUT during testing

### Deviations From The Standard

No deviations were made from the requirements of the standard.

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | 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) |
|---|---|---|---|---|---|---|---|---|
| 1SS | ac20 | MCS0 | 0.99 | Yes | 9.89 | 0.00 | 0.00 | 10 |
| 4SS | ac20 | MCS0 | 0.96 | Yes | 2.49 | 0.18 | 0.36 | 402 |
| 1SS | ac40 | MCS0 | 0.99 | Yes | 5.29 | 0.00 | 0.00 | 10 |
| 3SS | ac40 | MCS0 | 0.98 | Yes | 1.65 | 0.10 | 0.20 | 10 |
| 4SS | ac40 | MCS0 | 0.96 | Yes | 1.25 | 0.16 | 0.33 | 803 |
| 1SS | ac80 | VHT0 | 0.96 | Yes | 2.214 | 0.19 | 0.39 | 452 |
| 2SS | ac80 | VHT0 | 0.97 | Yes | 2.236 | 0.11 | 0.23 | 447 |
| 3SS | ac80 | VHT0 | 0.92 | Yes | 0.784 | 0.37 | 0.73 | 1276 |
| 4SS | ac80 | VHT0 | 0.89 | Yes | 0.551 | 0.51 | 1.01 | 1815 |

Note - for antenna port measurements, the EUT was operated in the non-TxBF mode

## Sample Notes

Sample S/N: 184795206016304
Driver: d21
Antenna: 4x4 internal

| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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

Date of Test: 1/5/2017 0:00
Test Engineer: M. Birgani / R. Varelas
Test Location: FT Lab #4B

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

| | |
|---|---|
| Note 1: | Power measurements performed using a gated averge power meter. |
| Note 2: | PSD measurements - Duty Cycle ≥ 98%. 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%). |
| Note 2: | PSD measurements - Duty Cycle < 98%. RBW=1MHz, VB=3 MHz, Span > OBW, # of points in sweep ≥ 2*span/RBW, RMS detector, trace average 100 traces, power averaging on. The measurements were adjusted by correcting for duty cycle. (method SA-2 of ANSI C63.10) |
| Note 5: | 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 6: | 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. |

| | | | |
|---|---|---|---|
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| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

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 | Refer to antenna spec in operational description | | | | Yes | | Yes | No | 6.50 | 6.50 |
| 5250-5350 | | | | | Yes | | Yes | No | 6.90 | 6.90 |
| 5470-5725 | | | | | Yes | | Yes | No | 7.10 | 7.10 |
| 5725-5825 | | | | | Yes | | Yes | No | 6.50 | 6.50 |

For devices that support CDD modes

Min # of spatial streams: 1

Max # of spatial streams: 4

| | |
|---|---|
| Notes: | BF = beamforming mode supported, Multichain Legacy = 802.11 legacy data rates supported for multichain transmissions, CDD = Cyclic Delay Diversity (or Cyclic Shift Diversity) modes supported, Sectorized / Xpol = antennas are sectorized or cross polarized. |
| Notes: | Dir G (PWR) = total gain (Gant + Array Gain) for power calculations; 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 taken from antenna spec in operational description. As the device operates using CDD, the Dir G (PWR) used the "Uncorrelated" value provided; PSD used the "Correlated". This is per KDB 662911 F)2)f). |
| Notes: | For systems with Beamforming and CDD, choose one the following options:<br>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.<br>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) |

| 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 | - |

| | | | |
|---|---|---|---|
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| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5250-5350 MHz Band - FCC, 4SS

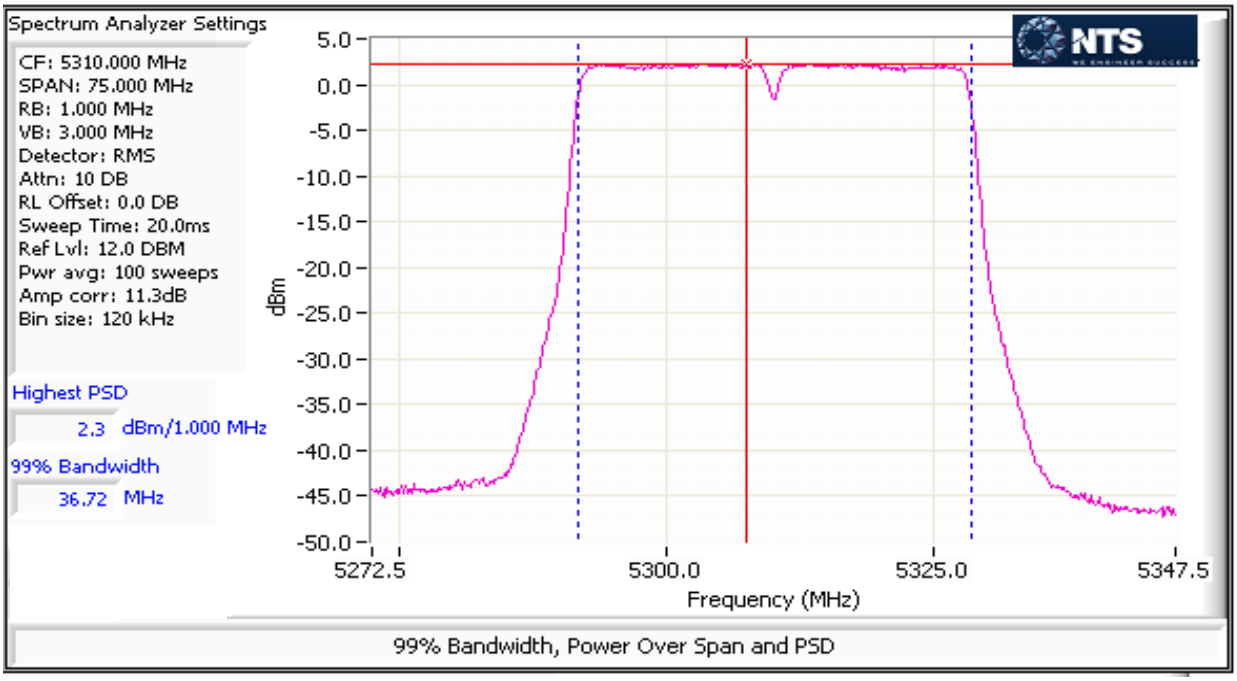
Mode: ac 40 Max EIRP (mW): 913.9

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[1] dBm | Total Power[6] mW | Total Power[6] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5310 | 1 | 17 | 43.9 | - | 17.1 | 186.6 | 22.7 | 23.1 | 0.187 | Pass |
| | 3 | | | | 16.9 | | | | | |
| | 4 | | | | 16.5 | | | | | |
| | 2 | | | | 16.2 | | | | | |

5250-5350 PSD - FCC, 4SS

Mode: ac 40

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | PSD[3] dBm/MHz | Total PSD[6] mW/MHz | Total PSD[6] dBm/MHz | FCC Limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|
| 5310 | 1 | 19 | 36.8 | 96.3 | 2.3 | 6.5 | 8.1 | 10.1 | Pass |
| | 3 | | | | 2.1 | | | | |
| | 4 | | | | 1.7 | | | | |
| | 2 | | | | 1.7 | | | | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5470-5725 MHz Band - FCC, 4SS

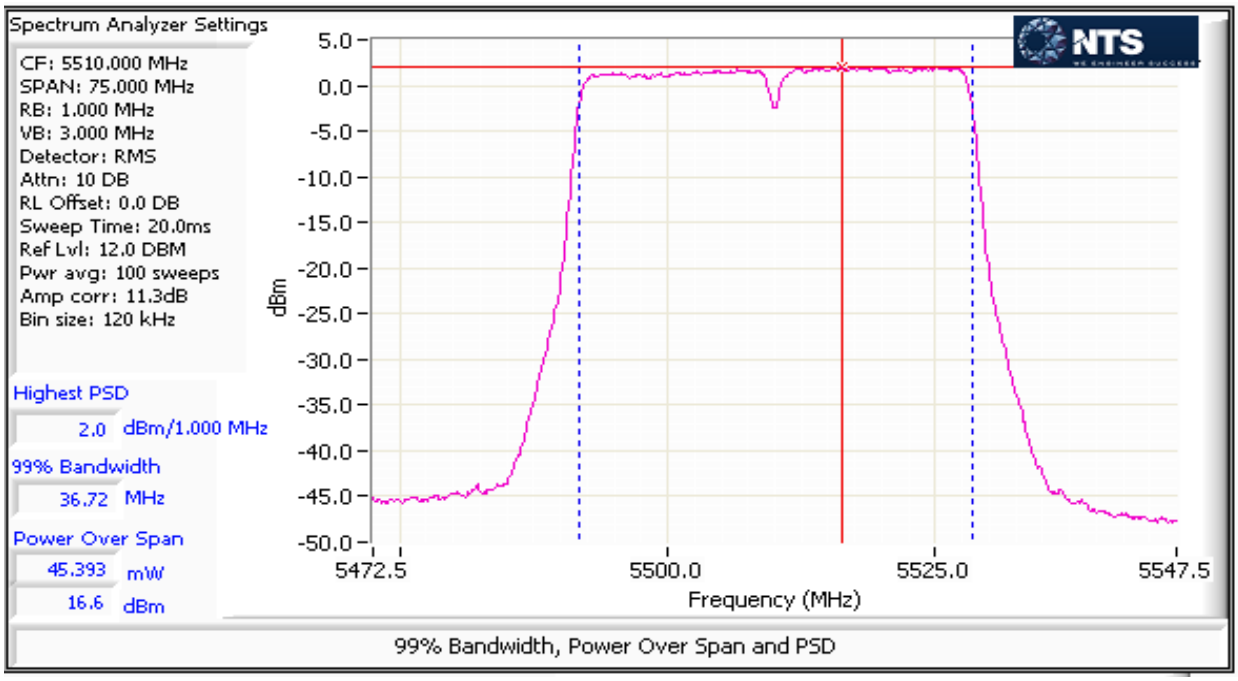
Mode: ac 40 Max EIRP (mW): 965.7

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[1] dBm | Total Power[6] mW | Total Power[6] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5510 | 1 | 17 | 44.1 | - | 16.7 | 188.3 | 22.7 | 22.9 | 0.188 | Pass |
| | 3 | | | | 16.5 | | | | | |
| | 4 | | | | 16.8 | | | | | |
| | 2 | | | | 16.9 | | | | | |

5470-5725 PSD - FCC, 4SS

Mode: ac 40

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | PSD[3] dBm/MHz | Total PSD[6] mW/MHz | Total PSD[6] dBm/MHz | FCC Limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|
| 5510 | 1 | 18 | 36.7 | 96.3 | 2.0 | 6.1 | 7.9 | 9.9 | Pass |
| | 3 | | | | 1.9 | | | | |
| | 4 | | | | 1.3 | | | | |
| | 2 | | | | 1.5 | | | | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5250-5350 MHz Band - FCC, 4SS

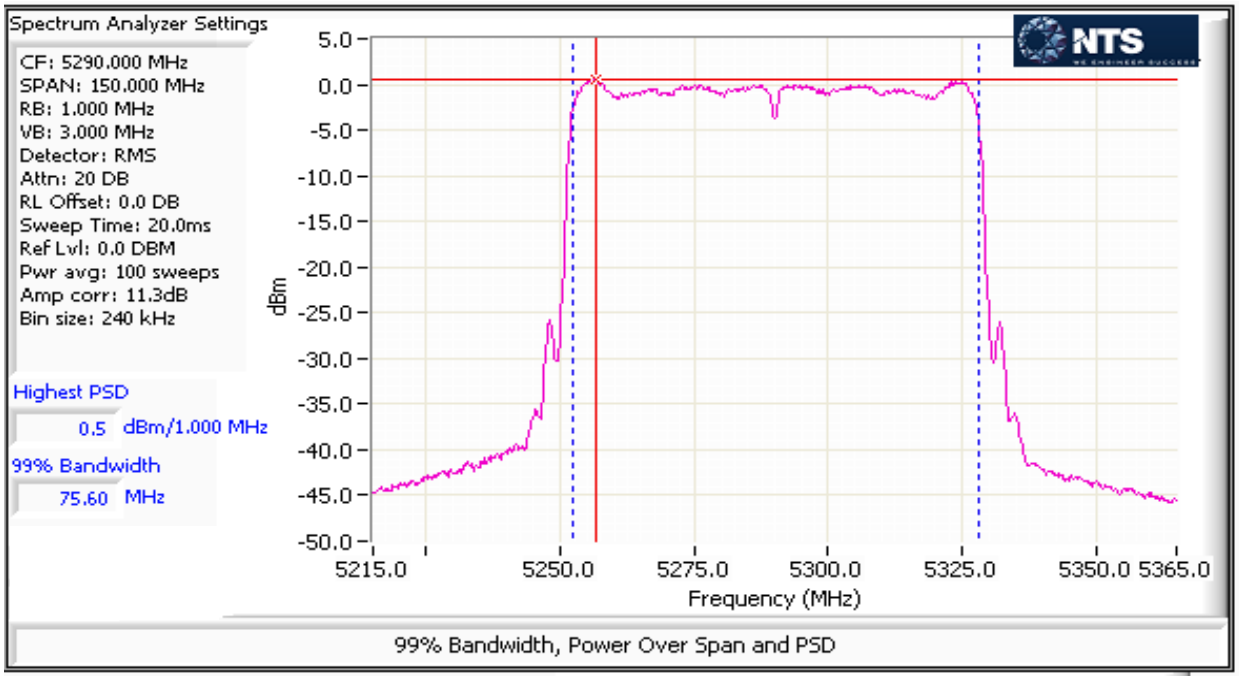
Mode: ac 80 Max EIRP (mW): 847.8

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[2] dBm | Total Power[6] mW | Total Power[6] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5290 | 1 | 17 | 82.4 | - | 16.9 | 173.1 | 22.4 | 23.1 | 0.173 | Pass |
| | 3 | | | | 16.1 | | | | | |
| | 4 | | | | 16.2 | | | | | |
| | 2 | | | | 16.2 | | | | | |

5250-5350 PSD - FCC, 4SS

Mode: ac 80

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | PSD[3] dBm/MHz | Total PSD[6] mW/MHz | Total PSD[6] dBm/MHz | FCC Limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|
| 5290 | 1 | 20 | 75.6 | 89.0 | 0.5 | 4.6 | 6.6 | 10.1 | Pass |
| | 3 | | | | 0.1 | | | | |
| | 4 | | | | 0.1 | | | | |
| | 2 | | | | -0.5 | | | | |



| | | | |
|---|---|---|---|
| Client: | ARRIS | Job Number: | JD102271 |
| Model: | BGW210-700 | T-Log Number: | T103599 |
| | | Project Manager: | Irene Rademacher |
| Contact: | Mark Rieger | Project Coordinator: | - |
| Standard: | FCC 15.B, 15.247, 15.407 | Class: | N/A |

MIMO Device - 5470-5725 MHz Band - FCC, 4SS

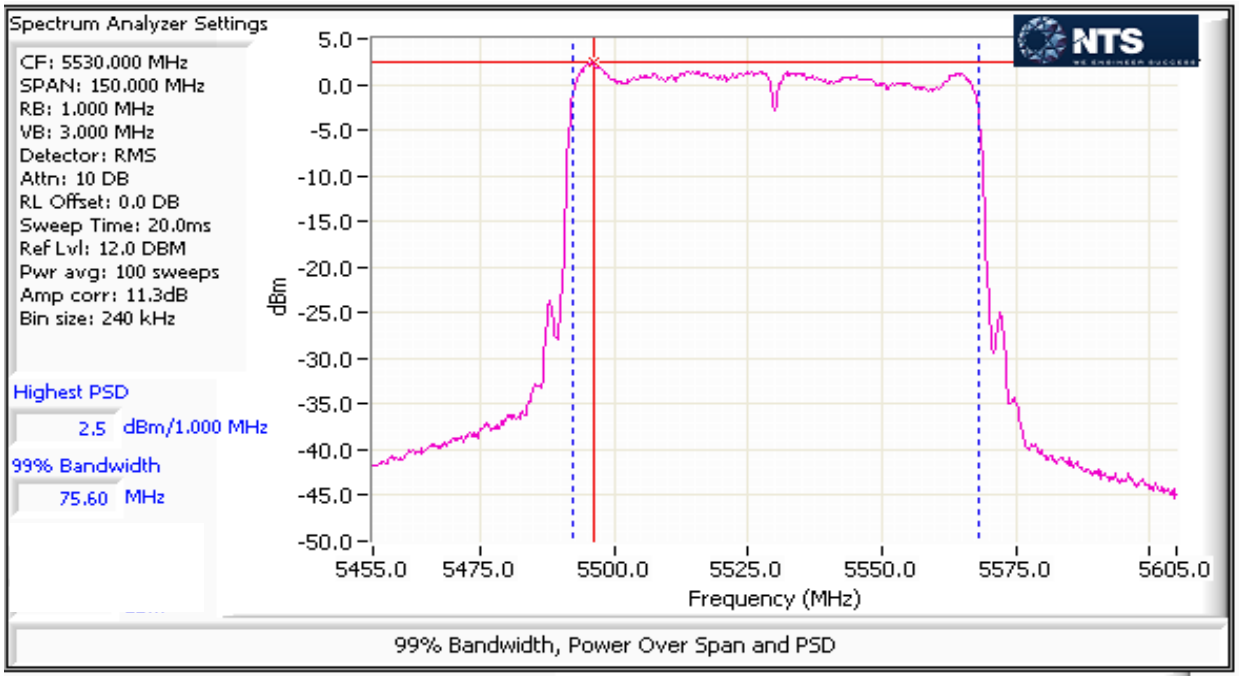
Mode: ac 80 Max EIRP (mW): 808.3

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power[2] dBm | Total Power[6] mW | Total Power[6] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5530 | 1 | 16 | 82.4 | - | 16.2 | 157.6 | 22.0 | 22.9 | 0.158 | Pass |
| | 3 | | | | 16.1 | | | | | |
| | 4 | | | | 15.7 | | | | | |
| | 2 | | | | 15.8 | | | | | |

5470-5725 PSD - FCC, 4SS

Mode: ac 80

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | PSD[3] dBm/MHz | Total PSD[6] mW/MHz | Total PSD[6] dBm/MHz | FCC Limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|
| 5530 | 1 | 21 | 75.6 | 89.0 | 1.9 | 7.0 | 8.5 | 9.9 | Pass |
| | 3 | | | | 2.5 | | | | |
| | 4 | | | | 1.7 | | | | |
| | 2 | | | | 1.4 | | | | |



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