

**Engineering Test Report No. 1904684-02**

|                                 |                                                                                     |
|---------------------------------|-------------------------------------------------------------------------------------|
| Report Date                     | December 16, 2019                                                                   |
| Manufacturer Name               | Astronics CSC                                                                       |
| Manufacturer Address            | 804 S Northpoint Blvd<br>Waukegan, IL 60087                                         |
| Product Name<br>Brand/Model No. | E71-319-01                                                                          |
| Date Received                   | November 30, 2019                                                                   |
| Test Dates                      | November 30, 2019 to December 11, 2019                                              |
| Specifications                  | FCC 15.407                                                                          |
| Test Facility                   | Elite Electronic Engineering, Inc. 1516 Centre Circle, Downers Grove, IL 60515      |
| Signature                       |    |
| Tested by                       | Javier Cardenas                                                                     |
| Signature                       |  |
| Approved by                     | Raymond J. Klouda<br>Registered Professional Engineer of Illinois – 44894           |

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Elite Electronic Engineering Incorporated certifies that the information contained in this report was obtained under conditions which meet or exceed those specified in the FCC 15.407 test specification(s). The data presented in this test report pertains to the EUT on the test date(s) specified. Any electrical or mechanical modifications made to the EUT subsequent to the specified test date will serve to invalidate the data and void this certification. This report must not be used to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the Federal Government.

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## 1. Report Revision History

| Revision | Date        | Description                                               |
|----------|-------------|-----------------------------------------------------------|
| –        | 18 DEC 2019 | Initial Release of Engineering Test Report No. 1904684-02 |
|          |             |                                                           |

## 2. Introduction

This document presents the results of a series of investigative measurements that were performed on an IFE System (hereinafter referred to as the Equipment Under Test (EUT)). The EUT is a composite system comprising of an Aruba 303 Series Campus Access Point. The intent of these measurements is to ensure continuing compliance of the composite system. The EUT was identified as follows:

| Description         | Part #     | S/N    |
|---------------------|------------|--------|
| Portable IFE System | E71-319-01 | 000007 |

The EUT listed above was used throughout the test series. The EUT was submitted for testing along with the following support equipment:

| Description | Model # | S/N |
|-------------|---------|-----|
| Laptop      | ---     | --- |

## 3. Test Specification(s)

The tests were performed to selected portions of, and in accordance with the FCC 15.407 test specification(s).

|                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Federal Communications Commission "Code of Federal Regulations", Title 47, Part 15, Subpart C                                                                                          |
| ANSI C63.4-2014, "American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" |
| ANSI C63.10-2013, "American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices"                                                                     |

## 4. Laboratory Conditions

The temperature at the time of the test was 21°C and the relative humidity was 18%.

## 5. Summary

The following EMC tests were performed and the results are shown below:

| Test Description                                    | Results  |
|-----------------------------------------------------|----------|
| Radiated Spurious Emissions in the Restricted Bands | Conforms |
| Band-Edge Compliance near the Restricted Band       | Conforms |

## 6. Test Plan

No test plan was provided. Instructions were provided by personnel from Astronics CSC and used in conjunction with the FCC 15.407 regulations.

## 7. Grounding

The EUT was not grounded.

## 8. Firmware/Software

For all tests, the EUT had Ubuntu 16.04 Xenial operating system to support functionality.

## 9. Modifications Made to EUT

No modifications were made to the EUT during the testing.

## 10. Deviations from Specification(s)

No deviations from the specification(s) were made during the testing.

## 11. Modes of Operation

The EMC tests were performed with the EUT operating in one or more of the test modes described below. See the specific test section for the applicable test modes.

### 11.1. Transmitting

This mode was achieved by energizing the EUT. The support equipment software was used to configure the EUT's on board radio into the following modes:

- 802.11a Ch 36, 44, 48, 52, 60, 64, 100, 120, 140, 144, 149, 157, 165
- 802.11n20 Ch 149, 157, 165
- 802.11ac20 Ch 100, 120, 140
- 802.11ac40 Ch 54, 62
- 802.11ac80 Ch 58
- 802.11n20 BF Ch 52, 60, 64

## 12. Test Method

The tests were performed using the referenced methods described in the FCC 15.407 test specification(s). The specific test sections and specification references are called out in the individual test sections.

## 13. Sample Calculations

For Powerline Conducted Emissions:

The resultant voltage level (VL) is a summation in decibels (dB) of the receiver meter reading (MTR) and the cable loss factor (CF).

$$\text{Formula 1: VL (dBuV) = MTR (dBuV) + CF (dB).}$$

For Radiated Emissions:

The resultant field strength (FS) is a summation in decibels (dB) of the receiver meter reading (MTR), the antenna correction factor (AF), and the cable loss factor (CF). If an external preamplifier is used, the total is reduced by its gain (-PA). If a distance correction (DC) is required, it is added to the total.

$$\text{Formula 1: FS (dBuV/m) = MTR (dBuV) + AF (dB/m) + CF (dB) + (- PA (dB)) + DC (dB)}$$

To convert the Field Strength dBuV/m term to uV/m, the dBuV/m is first divided by 20. The Base 10 AntiLog is taken of this quotient. The result is the Field Strength value in uV/m terms.

$$\text{Formula 2: FS (uV/m) = AntiLog [(FS (dBuV/m))/20]}$$

## 14. Statement of Conformity

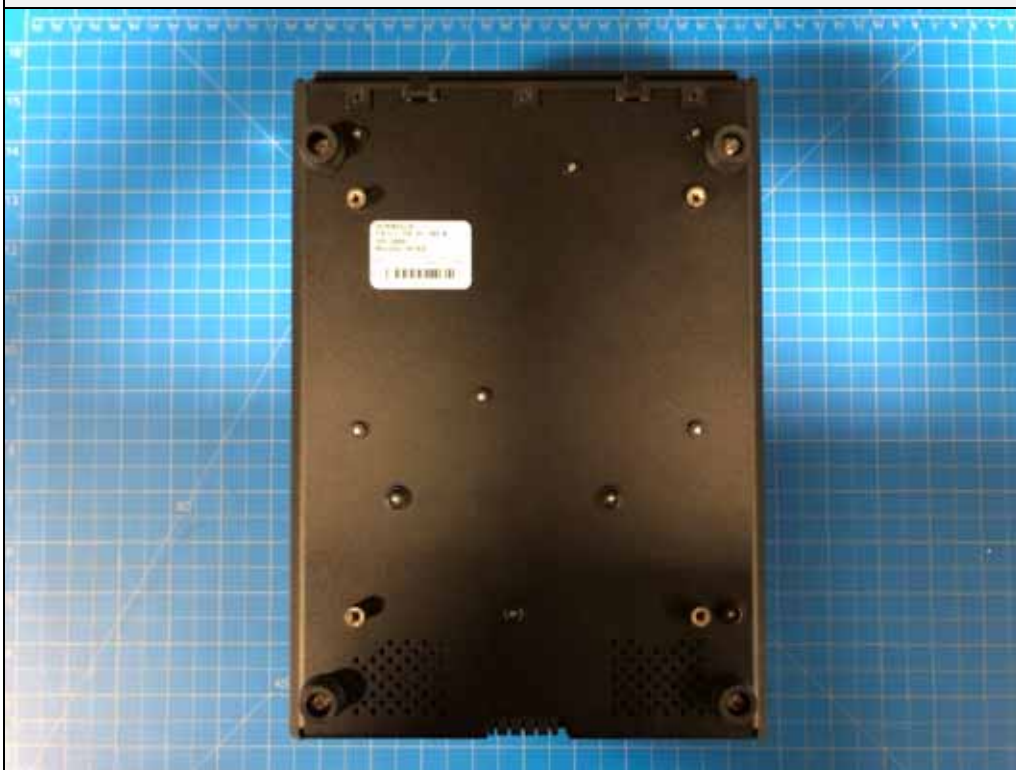
The Astronics CSC IFE System, Model No. E71-319-01, Serial No. 000007 did fully conform to the selected requirements of FCC 15.407.

## 15. Certification

Elite Electronic Engineering Incorporated certifies that the information contained in this report was obtained under conditions which meet or exceed those specified in the FCC 15.407 test specification. The data presented in this test report pertains to the EUT on the test date specified. Any electrical or mechanical modifications made to the EUT subsequent to the specified test date will serve to invalidate the data and void this certification.

16. Photographs of EUT





## 17. Equipment List

| Eq ID | Equipment Description           | Manufacturer       | Model No.                | Serial No.   | Frequency Range | Cal Date  | Due Date  |
|-------|---------------------------------|--------------------|--------------------------|--------------|-----------------|-----------|-----------|
| APW0  | PREAMPLIFIER                    | PLANAR ELECTRONICS | PE2-30-20G20R6G          | PL2926/0646  | 20GHZ-26.5GHZ   | 10/2/2019 | 10/2/2020 |
| APW11 | PREAMPLIFIER                    | PMI                | PE2-35-120-5R0-10-12-SFF | PL11685/1241 | 1GHZ-20GHZ      | 4/8/2019  | 4/8/2020  |
| APW3  | PREAMPLIFIER                    | PLANAR ELECTRONICS | PE2-35-120-5R0-10-12     | PL2924       | 1GHZ-20GHZ      | 4/8/2019  | 4/8/2020  |
| NHG1  | STANDARD GAIN HORN ANTENNA      | NARDA              | 638                      | ---          | 18-26.5GHZ      | NOTE 1    |           |
| NWQ1  | DOUBLE RIDGED WAVEGUIDE ANTENNA | ETS-LINDGREN       | 3117                     | 66655        | 1GHZ-18GHZ      | 4/10/2018 | 4/10/2020 |
| NWQ2  | DOUBLE RIDGED WAVEGUIDE ANTENNA | ETS LINDGREN       | 3117                     | 66659        | 1GHZ-18GHZ      | 3/22/2018 | 3/22/2020 |
| RBG2  | EMI ANALYZER                    | ROHDE & SCHWARZ    | ESW44                    | 101591       | 2HZ-44GHZ       | 2/21/2019 | 2/21/2020 |
| RBG3  | EMI ANALYZER                    | ROHDE & SCHWARZ    | ESW44                    | 101592       | 2HZ-44GHZ       | 2/20/2019 | 2/20/2020 |
| XPQ4  | HIGH PASS FILTER                | K&L MICROWAVE      | 11SH10-4800/X20000-O/O   | 1            | 4.8-20GHZ       | 9/6/2019  | 9/6/2021  |
| XPR0  | HIGH PASS FILTER                | K&L MICROWAVE      | 11SH10-4800/X20000       | 001          | 4.8-20GHZ       | 9/6/2019  | 9/6/2021  |

N/A: Not Applicable

I/O: Initial Only

CNR: Calibration Not Required

NOTE 1: For the purpose of this test, the equipment was calibrated over the specified frequency range, pulse rate, or modulation prior to the test or monitored by a calibrated instrument.

## 18. Radiated Spurious Emissions in the Restricted Bands

|              |               |
|--------------|---------------|
| Manufacturer | Astronics CSC |
| Product      | IFE System    |
| Model        | E71-319-01    |
| Serial No    | 000007        |
| Mode         | Transmitting  |

| Information                     |                                                                                                                                                            |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Size of EUT                     | 26.411cm x 18.098cm x 11.887cm (L x W x H)                                                                                                                 |
| Setup Format                    | Tabletop                                                                                                                                                   |
| Height of Support               | N/A                                                                                                                                                        |
| Type of Test Site               | Semi-anechoic                                                                                                                                              |
| Number of Interconnection Wires | N/A                                                                                                                                                        |
| Type of Interconnection Wires   | N/A                                                                                                                                                        |
| Note                            | The cables were manually maximized during the preliminary emissions sweeps. The cable arrangement which resulted in the worst-case emissions was utilized. |

| Measurement Uncertainty                                                                                               |                                  |
|-----------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Measurement Type                                                                                                      | Expanded Measurement Uncertainty |
| Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1000 MHz) | 4.3                              |
| Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)     | 3.1                              |
| Radiated disturbance (electric field strength on an open area test site or alternative test site) (6 GHz – 18 GHz)    | 3.2                              |
| Radiated disturbance (electric field strength on an open area test site or alternative test site) (18 GHz – 26.5 GHz) | 3.3                              |
| Radiated disturbance (electric field strength on an open area test site or alternative test site) (26.5 GHz – 40 GHz) | 3.4                              |

| Procedures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Radiated measurements were performed in a 32ft. x 20ft. x 14ft. high shielded enclosure. The shielded enclosure prevents emissions from other sources, such as radio and TV stations from interfering with the measurements. All powerlines and signal lines entering the enclosure pass through filters on the enclosure wall. The powerline filters prevent extraneous signals from entering the enclosure on these leads.</p> <p>1) For all emissions in the restricted bands, the following procedure was used:</p> <ol style="list-style-type: none"> <li>The field strengths of all emissions above 1 GHz were measured using a double-ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on a 1.5 meter high non-conductive stand. A peak detector with a resolution bandwidth of 1 MHz was used on the spectrum analyzer.</li> <li>To ensure that maximum or worst case emission levels were measured, the following steps were taken when taking all measurements: <ol style="list-style-type: none"> <li>The EUT was rotated so that all of its sides were exposed to the receiving antenna.</li> <li>Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.</li> </ol> </li> </ol> |

- iii) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings.
- iv) In instances where it was necessary to use a shortened cable between the measuring antenna and the spectrum analyzer. The measuring antenna was not raised or lowered to ensure maximized readings, instead the EUT was rotated through all axis to ensure the maximum readings were recorded for the EUT.
- c) For all radiated emissions measurements above 1 GHz, the peak readings must comply with the 15.35(b) limits. 15.35(b) states that when average radiated emissions measurements are specified, there also is a limit on the peak level of the radiated emissions. The limit on the peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. Therefore, all peak readings above 1 GHz must be no greater than 20 dB above the limits specified in 15.209(a).
- d) Next, for all radiated emissions measurements above 1GHz, an average reading was taken.



Test Setup for Radiated Spurious Emissions – 1-18GHz Horizontal Antenna Polarization



Test Setup for Radiated Spurious Emissions – 1-18GHz Vertical Antenna Polarization



Test Setup for Radiated Spurious Emissions – 18-40GHz Horizontal Antenna Polarization



Test Setup for Radiated Spurious Emissions – 18-40GHz Vertical Antenna Polarization

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11a Ch36 – 18dBm                   |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 15540.00     | H          | 48.4                       | *       | 9.0                | 40.7                 | -38.3              | 59.8                             | 973.7                           | 5000.0                          | -14.2          |
| 15540.00     | V          | 48.2                       | *       | 9.0                | 40.7                 | -38.3              | 59.6                             | 960.4                           | 5000.0                          | -14.3          |
| 20720.00     | H          | 36.1                       | *       | 2.3                | 40.1                 | -28.7              | 49.9                             | 311.8                           | 5000.0                          | -24.1          |
| 20720.00     | V          | 36.4                       | *       | 2.3                | 40.1                 | -28.7              | 50.1                             | 320.2                           | 5000.0                          | -23.9          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11a Ch36 – 18dBm                      |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 15540.00     | H          | 33.82                      | *       | 9.0                | 40.7                 | -38.3              | 0.0                   | 45.2                                | 182.8                              | 500.0                              | -8.7           |
| 15540.00     | V          | 33.8                       | *       | 9.0                | 40.7                 | -38.3              | 0.0                   | 45.2                                | 181.3                              | 500.0                              | -8.8           |
| 20720.00     | H          | 21.8                       | *       | 2.3                | 40.1                 | -28.7              | 0.0                   | 35.5                                | 59.8                               | 500.0                              | -18.5          |
| 20720.00     | V          | 21.9                       | *       | 2.3                | 40.1                 | -28.7              | 0.0                   | 35.7                                | 60.8                               | 500.0                              | -18.3          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11a Ch44 – 18dBm                   |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 15660.00     | H          | 48.6                       | *       | 9.0                | 41.1                 | -38.2              | 60.5                             | 1053.2                          | 5000.0                          | -13.5          |
| 15660.00     | V          | 48.4                       | *       | 9.0                | 41.1                 | -38.2              | 60.3                             | 1036.4                          | 5000.0                          | -13.7          |
| 20880.00     | H          | 36.1                       | *       | 2.3                | 40.0                 | -28.7              | 49.8                             | 307.3                           | 5000.0                          | -24.2          |
| 20880.00     | V          | 36.3                       | *       | 2.3                | 40.0                 | -28.7              | 50.0                             | 315.1                           | 5000.0                          | -24.0          |
| 31320.00     | H          | 42.7                       | *       | 1.9                | 43.9                 | -36.4              | 52.1                             | 402.7                           | 5000.0                          | -21.9          |
| 31320.00     | V          | 42.9                       | *       | 1.9                | 43.9                 | -36.4              | 52.3                             | 413.5                           | 5000.0                          | -21.6          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11a Ch44 – 18dBm                      |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 15660.00     | H          | 34.40                      | *       | 9.0                | 41.1                 | -38.2              | 0.0                   | 46.3                                | 206.1                              | 500.0                              | -7.7           |
| 15660.00     | V          | 34.3                       | *       | 9.0                | 41.1                 | -38.2              | 0.0                   | 46.1                                | 202.5                              | 500.0                              | -7.8           |
| 20880.00     | H          | 22.0                       | *       | 2.3                | 40.0                 | -28.7              | 0.0                   | 35.7                                | 60.8                               | 500.0                              | -18.3          |
| 20880.00     | V          | 22.0                       | *       | 2.3                | 40.0                 | -28.7              | 0.0                   | 35.7                                | 61.0                               | 500.0                              | -18.3          |
| 31320.00     | H          | 29.6                       | *       | 1.9                | 43.9                 | -36.4              | 0.0                   | 39.1                                | 89.6                               | 500.0                              | -14.9          |
| 31320.00     | V          | 29.8                       | *       | 1.9                | 43.9                 | -36.4              | 0.0                   | 39.3                                | 91.8                               | 500.0                              | -14.7          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11a Ch48 – 18dBm                   |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 15720.00     | H          | 48.4                       | *       | 9.0                | 41.3                 | -38.2              | 60.5                             | 1063.2                          | 5000.0                          | -13.4          |
| 15720.00     | V          | 48.4                       | *       | 9.0                | 41.3                 | -38.2              | 60.5                             | 1058.3                          | 5000.0                          | -13.5          |
| 20960.00     | H          | 36.1                       | *       | 2.3                | 40.0                 | -28.8              | 49.6                             | 302.5                           | 5000.0                          | -24.4          |
| 20960.00     | V          | 36.2                       | *       | 2.3                | 40.0                 | -28.8              | 49.8                             | 308.9                           | 5000.0                          | -24.2          |
| 31440.00     | H          | 42.8                       | *       | 1.9                | 43.9                 | -36.3              | 52.4                             | 415.2                           | 5000.0                          | -21.6          |
| 31440.00     | V          | 43.2                       | *       | 1.9                | 43.9                 | -36.3              | 52.7                             | 432.8                           | 5000.0                          | -21.3          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11a Ch48 – 18dBm                      |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 15720.00     | H          | 34.46                      | *       | 9.0                | 41.3                 | -38.2              | 0.0                   | 46.6                                | 213.4                              | 500.0                              | -7.4           |
| 15720.00     | V          | 34.4                       | *       | 9.0                | 41.3                 | -38.2              | 0.0                   | 46.5                                | 210.7                              | 500.0                              | -7.5           |
| 20960.00     | H          | 21.8                       | *       | 2.3                | 40.0                 | -28.8              | 0.0                   | 35.4                                | 58.9                               | 500.0                              | -18.6          |
| 20960.00     | V          | 22.0                       | *       | 2.3                | 40.0                 | -28.8              | 0.0                   | 35.5                                | 59.9                               | 500.0                              | -18.4          |
| 31440.00     | H          | 29.3                       | *       | 1.9                | 43.9                 | -36.3              | 0.0                   | 38.9                                | 88.1                               | 500.0                              | -15.1          |
| 31440.00     | V          | 29.7                       | *       | 1.9                | 43.9                 | -36.3              | 0.0                   | 39.3                                | 92.0                               | 500.0                              | -14.7          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11a Ch52 – 18dBm                   |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 15780.00     | H          | 48.2                       | *       | 9.0                | 41.5                 | -38.2              | 60.6                             | 1067.6                          | 5000.0                          | -13.4          |
| 15780.00     | V          | 48.0                       | *       | 9.0                | 41.5                 | -38.2              | 60.3                             | 1040.9                          | 5000.0                          | -13.6          |
| 21040.00     | H          | 36.0                       | *       | 2.3                | 40.0                 | -28.8              | 49.5                             | 299.9                           | 5000.0                          | -24.4          |
| 21040.00     | V          | 36.4                       | *       | 2.3                | 40.0                 | -28.8              | 49.9                             | 311.9                           | 5000.0                          | -24.1          |
| 31560.00     | H          | 43.2                       | *       | 1.9                | 43.9                 | -35.9              | 53.2                             | 455.1                           | 5000.0                          | -20.8          |
| 31560.00     | V          | 43.2                       | *       | 1.9                | 43.9                 | -35.9              | 53.1                             | 452.5                           | 5000.0                          | -20.9          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11a Ch52 – 18dBm                      |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 15780.00     | H          | 34.33                      | *       | 9.0                | 41.5                 | -38.2              | 0.0                   | 46.7                                | 216.0                              | 500.0                              | -7.3           |
| 15780.00     | V          | 34.2                       | *       | 9.0                | 41.5                 | -38.2              | 0.0                   | 46.5                                | 211.8                              | 500.0                              | -7.5           |
| 21040.00     | H          | 22.0                       | *       | 2.3                | 40.0                 | -28.8              | 0.0                   | 35.5                                | 59.5                               | 500.0                              | -18.5          |
| 21040.00     | V          | 22.1                       | *       | 2.3                | 40.0                 | -28.8              | 0.0                   | 35.6                                | 60.5                               | 500.0                              | -18.3          |
| 31560.00     | H          | 29.3                       | *       | 1.9                | 43.9                 | -35.9              | 0.0                   | 39.3                                | 92.0                               | 500.0                              | -14.7          |
| 31560.00     | V          | 29.6                       | *       | 1.9                | 43.9                 | -35.9              | 0.0                   | 39.6                                | 95.0                               | 500.0                              | -14.4          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11a Ch60 – 18dBm                   |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 10600.00     | H          | 48.8                       | *       | 7.3                | 37.7                 | -39.0              | 54.9                             | 553.3                           | 5000.0                          | -19.1          |
| 10600.00     | V          | 48.7                       | *       | 7.3                | 37.7                 | -39.0              | 54.8                             | 547.6                           | 5000.0                          | -19.2          |
| 15900.00     | H          | 48.1                       | *       | 9.0                | 41.8                 | -38.1              | 60.8                             | 1099.7                          | 5000.0                          | -13.2          |
| 15900.00     | V          | 48.1                       | *       | 9.0                | 41.8                 | -38.1              | 60.9                             | 1103.5                          | 5000.0                          | -13.1          |
| 21200.00     | H          | 36.9                       | *       | 2.3                | 40.2                 | -28.8              | 50.6                             | 340.1                           | 5000.0                          | -23.3          |
| 21200.00     | V          | 37.3                       | *       | 2.3                | 40.2                 | -28.8              | 51.1                             | 358.2                           | 5000.0                          | -22.9          |
| 31800.00     | H          | 44.1                       | *       | 1.9                | 43.9                 | -36.3              | 53.7                             | 484.8                           | 5000.0                          | -20.3          |
| 31800.00     | V          | 44.5                       | *       | 1.9                | 43.9                 | -36.3              | 54.1                             | 505.9                           | 5000.0                          | -19.9          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11a Ch60 – 18dBm                      |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 10600.00     | H          | 34.0                       | *       | 7.3                | 37.7                 | -39.0              | 0.0                   | 40.1                                | 101.2                              | 500.0                              | -13.9          |
| 10600.00     | V          | 34.0                       | *       | 7.3                | 37.7                 | -39.0              | 0.0                   | 40.0                                | 100.6                              | 500.0                              | -13.9          |
| 15900.00     | H          | 34.14                      | *       | 9.0                | 41.8                 | -38.1              | 0.0                   | 46.9                                | 220.2                              | 500.0                              | -7.1           |
| 15900.00     | V          | 34.2                       | *       | 9.0                | 41.8                 | -38.1              | 0.0                   | 46.9                                | 221.7                              | 500.0                              | -7.1           |
| 21200.00     | H          | 22.4                       | *       | 2.3                | 40.2                 | -28.8              | 0.0                   | 36.1                                | 63.9                               | 500.0                              | -17.9          |
| 21200.00     | V          | 22.5                       | *       | 2.3                | 40.2                 | -28.8              | 0.0                   | 36.2                                | 64.6                               | 500.0                              | -17.8          |
| 31800.00     | H          | 29.8                       | *       | 1.9                | 43.9                 | -36.3              | 0.0                   | 39.3                                | 92.7                               | 500.0                              | -14.6          |
| 31800.00     | V          | 29.8                       | *       | 1.9                | 43.9                 | -36.3              | 0.0                   | 39.4                                | 93.2                               | 500.0                              | -14.6          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11a Ch64 – 18dBm                   |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 10640.00     | H          | 48.6                       | *       | 7.3                | 37.7                 | -39.0              | 54.7                             | 544.8                           | 5000.0                          | -19.3          |
| 10640.00     | V          | 48.1                       | *       | 7.3                | 37.7                 | -39.0              | 54.2                             | 512.5                           | 5000.0                          | -19.8          |
| 15960.00     | H          | 48.9                       | *       | 9.0                | 41.9                 | -38.1              | 61.7                             | 1211.5                          | 5000.0                          | -12.3          |
| 15960.00     | V          | 48.0                       | *       | 9.0                | 41.9                 | -38.1              | 60.8                             | 1094.8                          | 5000.0                          | -13.2          |
| 21280.00     | H          | 36.8                       | *       | 2.3                | 40.3                 | -28.9              | 50.5                             | 335.8                           | 5000.0                          | -23.5          |
| 21280.00     | V          | 37.3                       | *       | 2.3                | 40.3                 | -28.9              | 51.0                             | 354.8                           | 5000.0                          | -23.0          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11a Ch64 – 18dBm                      |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 10640.00     | H          | 34.4                       | *       | 7.3                | 37.7                 | -39.0              | 0.0                   | 40.5                                | 105.6                              | 500.0                              | -13.5          |
| 10640.00     | V          | 34.3                       | *       | 7.3                | 37.7                 | -39.0              | 0.0                   | 40.4                                | 104.6                              | 500.0                              | -13.6          |
| 15960.00     | H          | 34.32                      | *       | 9.0                | 41.9                 | -38.1              | 0.0                   | 47.1                                | 226.9                              | 500.0                              | -6.9           |
| 15960.00     | V          | 34.0                       | *       | 9.0                | 41.9                 | -38.1              | 0.0                   | 46.8                                | 219.2                              | 500.0                              | -7.2           |
| 21280.00     | H          | 22.1                       | *       | 2.3                | 40.3                 | -28.9              | 0.0                   | 35.9                                | 62.2                               | 500.0                              | -18.1          |
| 21280.00     | V          | 22.2                       | *       | 2.3                | 40.3                 | -28.9              | 0.0                   | 36.0                                | 62.8                               | 500.0                              | -18.0          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11a Ch100 – 18dBm                  |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 11000.00     | H          | 48.1                       | *       | 7.5                | 37.9                 | -39.0              | 54.5                             | 530.4                           | 5000.0                          | -19.5          |
| 11000.00     | V          | 48.3                       | *       | 7.5                | 37.9                 | -39.0              | 54.7                             | 542.1                           | 5000.0                          | -19.3          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11a Ch100 – 18dBm                     |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 11000.00     | H          | 34.2                       | *       | 7.5                | 37.9                 | -39.0              | 0.0                   | 40.6                                | 106.8                              | 500.0                              | -13.4          |
| 11000.00     | V          | 34.3                       | *       | 7.5                | 37.9                 | -39.0              | 0.0                   | 40.6                                | 107.4                              | 500.0                              | -13.4          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11a Ch120 – 18dBm                  |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 11200.00     | H          | 48.2                       | *       | 7.6                | 38.0                 | -39.0              | 54.8                             | 547.6                           | 5000.0                          | -19.2          |
| 11200.00     | V          | 47.9                       | *       | 7.6                | 38.0                 | -39.0              | 54.5                             | 528.4                           | 5000.0                          | -19.5          |
| 22400.00     | H          | 37.1                       | *       | 2.2                | 40.6                 | -29.5              | 50.4                             | 332.3                           | 5000.0                          | -23.5          |
| 22400.00     | V          | 37.3                       | *       | 2.2                | 40.6                 | -29.5              | 50.6                             | 337.7                           | 5000.0                          | -23.4          |
| 39200.00     | H          | 43.2                       | *       | 2.2                | 44.2                 | -34.6              | 55.0                             | 564.3                           | 5000.0                          | -18.9          |
| 39200.00     | V          | 44.1                       | *       | 2.2                | 44.2                 | -34.6              | 55.9                             | 620.9                           | 5000.0                          | -18.1          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11a Ch120 – 18dBm                     |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 11200.00     | H          | 33.9                       | *       | 7.6                | 38.0                 | -39.0              | 0.0                   | 40.5                                | 106.2                              | 500.0                              | -13.5          |
| 11200.00     | V          | 33.9                       | *       | 7.6                | 38.0                 | -39.0              | 0.0                   | 40.5                                | 106.2                              | 500.0                              | -13.5          |
| 22400.00     | H          | 22.7                       | *       | 2.2                | 40.6                 | -29.5              | 0.0                   | 36.0                                | 63.1                               | 500.0                              | -18.0          |
| 22400.00     | V          | 22.9                       | *       | 2.2                | 40.6                 | -29.5              | 0.0                   | 36.2                                | 64.8                               | 500.0                              | -17.7          |
| 39200.00     | H          | 29.5                       | *       | 2.2                | 44.2                 | -34.6              | 0.0                   | 41.3                                | 116.4                              | 500.0                              | -12.7          |
| 39200.00     | V          | 29.6                       | *       | 2.2                | 44.2                 | -34.6              | 0.0                   | 41.4                                | 118.0                              | 500.0                              | -12.5          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11a Ch140 – 18dBm                  |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 11400.00     | H          | 48.7                       | *       | 7.7                | 38.1                 | -38.9              | 55.5                             | 598.8                           | 5000.0                          | -18.4          |
| 11400.00     | V          | 48.3                       | *       | 7.7                | 38.1                 | -38.9              | 55.2                             | 577.2                           | 5000.0                          | -18.8          |
| 22800.00     | H          | 35.9                       | *       | 2.3                | 40.6                 | -29.4              | 49.4                             | 294.1                           | 5000.0                          | -24.6          |
| 22800.00     | V          | 36.3                       | *       | 2.3                | 40.6                 | -29.4              | 49.7                             | 306.9                           | 5000.0                          | -24.2          |
| 39900.00     | H          | 43.1                       | *       | 2.2                | 44.2                 | -34.3              | 55.2                             | 577.0                           | 5000.0                          | -18.8          |
| 39900.00     | V          | 43.9                       | *       | 2.2                | 44.2                 | -34.3              | 56.0                             | 632.6                           | 5000.0                          | -18.0          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11a Ch140 – 18dBm                     |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 11400.00     | H          | 34.5                       | *       | 7.7                | 38.1                 | -38.9              | 0.0                   | 41.4                                | 117.6                              | 500.0                              | -12.6          |
| 11400.00     | V          | 34.5                       | *       | 7.7                | 38.1                 | -38.9              | 0.0                   | 41.4                                | 117.3                              | 500.0                              | -12.6          |
| 22800.00     | H          | 22.6                       | *       | 2.3                | 40.6                 | -29.4              | 0.0                   | 36.1                                | 63.6                               | 500.0                              | -17.9          |
| 22800.00     | V          | 22.8                       | *       | 2.3                | 40.6                 | -29.4              | 0.0                   | 36.2                                | 64.7                               | 500.0                              | -17.8          |
| 39900.00     | H          | 29.9                       | *       | 2.2                | 44.2                 | -34.3              | 0.0                   | 42.1                                | 127.0                              | 500.0                              | -11.9          |
| 39900.00     | V          | 30.2                       | *       | 2.2                | 44.2                 | -34.3              | 0.0                   | 42.4                                | 131.6                              | 500.0                              | -11.6          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11a Ch144 – 18dBm                  |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 11440.00     | H          | 49.0                       | *       | 7.7                | 38.1                 | -38.9              | 55.9                             | 622.2                           | 5000.0                          | -18.1          |
| 11440.00     | V          | 48.4                       | *       | 7.7                | 38.1                 | -38.9              | 55.4                             | 586.0                           | 5000.0                          | -18.6          |
| 22880.00     | H          | 36.9                       | *       | 2.3                | 40.6                 | -29.7              | 50.0                             | 317.6                           | 5000.0                          | -23.9          |
| 22880.00     | V          | 37.0                       | *       | 2.3                | 40.6                 | -29.7              | 50.1                             | 319.5                           | 5000.0                          | -23.9          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11a Ch144 – 18dBm                     |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 11440.00     | H          | 35.6                       | *       | 7.7                | 38.1                 | -38.9              | 0.0                   | 42.5                                | 132.9                              | 500.0                              | -11.5          |
| 11440.00     | V          | 34.5                       | *       | 7.7                | 38.1                 | -38.9              | 0.0                   | 41.4                                | 118.1                              | 500.0                              | -12.5          |
| 22880.00     | H          | 22.6                       | *       | 2.3                | 40.6                 | -29.7              | 0.0                   | 35.7                                | 60.8                               | 500.0                              | -18.3          |
| 22880.00     | V          | 22.7                       | *       | 2.3                | 40.6                 | -29.7              | 0.0                   | 35.8                                | 62.0                               | 500.0                              | -18.1          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11a Ch149 – 18dBm                  |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 11490.00     | H          | 48.5                       | *       | 7.8                | 38.1                 | -38.9              | 55.4                             | 589.8                           | 5000.0                          | -18.6          |
| 11490.00     | V          | 48.7                       | *       | 7.8                | 38.1                 | -38.9              | 55.7                             | 607.0                           | 5000.0                          | -18.3          |
| 22980.00     | H          | 37.5                       | *       | 2.3                | 40.6                 | -30.1              | 50.3                             | 326.2                           | 5000.0                          | -23.7          |
| 22980.00     | V          | 37.7                       | *       | 2.3                | 40.6                 | -30.1              | 50.4                             | 330.7                           | 5000.0                          | -23.6          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11a Ch149 – 18dBm                     |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 11490.00     | H          | 34.6                       | *       | 7.8                | 38.1                 | -38.9              | 0.0                   | 41.6                                | 119.6                              | 500.0                              | -12.4          |
| 11490.00     | V          | 34.6                       | *       | 7.8                | 38.1                 | -38.9              | 0.0                   | 41.5                                | 119.4                              | 500.0                              | -12.4          |
| 22980.00     | H          | 22.3                       | *       | 2.3                | 40.6                 | -30.1              | 0.0                   | 35.0                                | 56.2                               | 500.0                              | -19.0          |
| 22980.00     | V          | 22.7                       | *       | 2.3                | 40.6                 | -30.1              | 0.0                   | 35.5                                | 59.3                               | 500.0                              | -18.5          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11a Ch157 – 18dBm                  |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 11570.00     | H          | 48.7                       | *       | 7.8                | 38.2                 | -39.0              | 55.8                             | 615.0                           | 5000.0                          | -18.2          |
| 11570.00     | V          | 48.5                       | *       | 7.8                | 38.2                 | -39.0              | 55.5                             | 595.5                           | 5000.0                          | -18.5          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11a Ch157 – 18dBm                     |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 11570.00     | H          | 34.6                       | *       | 7.8                | 38.2                 | -39.0              | 0.0                   | 41.6                                | 120.6                              | 500.0                              | -12.4          |
| 11570.00     | V          | 34.6                       | *       | 7.8                | 38.2                 | -39.0              | 0.0                   | 41.6                                | 120.3                              | 500.0                              | -12.4          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11a Ch165 – 18dBm                  |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 11650.00     | H          | 49.5                       | *       | 7.8                | 38.4                 | -39.0              | 56.7                             | 681.3                           | 5000.0                          | -17.3          |
| 11650.00     | V          | 48.5                       | *       | 7.8                | 38.4                 | -39.0              | 55.7                             | 609.3                           | 5000.0                          | -18.3          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11a Ch165 – 18dBm                     |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 11650.00     | H          | 34.6                       | *       | 7.8                | 38.4                 | -39.0              | 0.0                   | 41.7                                | 121.8                              | 500.0                              | -12.3          |
| 11650.00     | V          | 34.6                       | *       | 7.8                | 38.4                 | -39.0              | 0.0                   | 41.7                                | 122.1                              | 500.0                              | -12.2          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11n20 Ch149 – 18dBm                |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 11490.00     | H          | 48.4                       | *       | 5.9                | 37.9                 | -39.2              | 53.0                             | 449.0                           | 5000.0                          | -20.9          |
| 11490.00     | V          | 49.7                       | *       | 5.9                | 37.9                 | -39.2              | 54.3                             | 516.7                           | 5000.0                          | -19.7          |
| 22980.00     | H          | 37.6                       | *       | 2.3                | 40.6                 | -30.1              | 50.4                             | 329.5                           | 5000.0                          | -23.6          |
| 22980.00     | V          | 37.7                       | *       | 2.3                | 40.6                 | -30.1              | 50.5                             | 333.4                           | 5000.0                          | -23.5          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11n20 Ch149 – 18dBm                   |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 11490.00     | H          | 33.9                       | *       | 5.9                | 37.9                 | -39.2              | 0.0                   | 38.5                                | 84.5                               | 500.0                              | -15.4          |
| 11490.00     | V          | 34.0                       | *       | 5.9                | 37.9                 | -39.2              | 0.0                   | 38.6                                | 85.3                               | 500.0                              | -15.4          |
| 22980.00     | H          | 22.3                       | *       | 2.3                | 40.6                 | -30.1              | 0.0                   | 35.1                                | 56.7                               | 500.0                              | -18.9          |
| 22980.00     | V          | 22.6                       | *       | 2.3                | 40.6                 | -30.1              | 0.0                   | 35.3                                | 58.2                               | 500.0                              | -18.7          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11n20 Ch157 – 18dBm                |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 11570.00     | H          | 49.3                       | *       | 5.9                | 38.0                 | -39.2              | 54.1                             | 506.1                           | 5000.0                          | -19.9          |
| 11570.00     | V          | 49.4                       | *       | 5.9                | 38.0                 | -39.2              | 54.1                             | 507.9                           | 5000.0                          | -19.9          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11n20 Ch157 – 18dBm                   |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 11570.00     | H          | 34.3                       | *       | 5.9                | 38.0                 | -39.2              | 0.0                   | 39.0                                | 89.4                               | 500.0                              | -15.0          |
| 11570.00     | V          | 34.4                       | *       | 5.9                | 38.0                 | -39.2              | 0.0                   | 39.1                                | 90.3                               | 500.0                              | -14.9          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11n20 Ch165 – 18dBm                |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 11650.00     | H          | 48.4                       | *       | 6.0                | 38.1                 | -39.2              | 53.3                             | 462.7                           | 5000.0                          | -20.7          |
| 11650.00     | V          | 48.8                       | *       | 6.0                | 38.1                 | -39.2              | 53.7                             | 482.2                           | 5000.0                          | -20.3          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11n20 Ch165 – 18dBm                   |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 11650.00     | H          | 34.1                       | *       | 6.0                | 38.1                 | -39.2              | 0.0                   | 39.0                                | 88.7                               | 500.0                              | -15.0          |
| 11650.00     | V          | 34.2                       | *       | 6.0                | 38.1                 | -39.2              | 0.0                   | 39.0                                | 89.5                               | 500.0                              | -14.9          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11ac Ch100 – 18dBm                 |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 11000.00     | H          | 49.9                       | *       | 5.7                | 37.6                 | -39.0              | 54.1                             | 509.8                           | 5000.0                          | -19.8          |
| 11000.00     | V          | 49.5                       | *       | 5.7                | 37.6                 | -39.0              | 53.7                             | 485.7                           | 5000.0                          | -20.3          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11ac Ch100 – 18dBm                    |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 11000.00     | H          | 34.1                       | *       | 5.7                | 37.6                 | -39.0              | 0.0                   | 38.4                                | 83.2                               | 500.0                              | -15.6          |
| 11000.00     | V          | 34.1                       | *       | 5.7                | 37.6                 | -39.0              | 0.0                   | 38.4                                | 82.9                               | 500.0                              | -15.6          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11ac Ch120 – 18dBm                 |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 11200.00     | H          | 48.8                       | *       | 5.8                | 37.7                 | -39.2              | 53.0                             | 447.3                           | 5000.0                          | -21.0          |
| 11200.00     | V          | 48.9                       | *       | 5.8                | 37.7                 | -39.2              | 53.2                             | 455.6                           | 5000.0                          | -20.8          |
| 22400.00     | H          | 36.2                       | *       | 2.2                | 40.6                 | -29.5              | 49.5                             | 297.2                           | 5000.0                          | -24.5          |
| 22400.00     | V          | 36.3                       | *       | 2.2                | 40.6                 | -29.5              | 49.6                             | 302.7                           | 5000.0                          | -24.4          |
| 39200.00     | H          | 42.1                       | *       | 2.2                | 44.2                 | -34.6              | 53.9                             | 495.5                           | 5000.0                          | -20.1          |
| 39200.00     | V          | 42.2                       | *       | 2.2                | 44.2                 | -34.6              | 54.0                             | 498.3                           | 5000.0                          | -20.0          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11ac Ch120 – 18dBm                    |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 11200.00     | H          | 34.2                       | *       | 5.8                | 37.7                 | -39.2              | 0.0                   | 38.4                                | 83.3                               | 500.0                              | -15.6          |
| 11200.00     | V          | 34.2                       | *       | 5.8                | 37.7                 | -39.2              | 0.0                   | 38.5                                | 83.7                               | 500.0                              | -15.5          |
| 22400.00     | H          | 21.3                       | *       | 2.2                | 40.6                 | -29.5              | 0.0                   | 34.6                                | 53.5                               | 500.0                              | -19.4          |
| 22400.00     | V          | 21.3                       | *       | 2.2                | 40.6                 | -29.5              | 0.0                   | 34.7                                | 54.0                               | 500.0                              | -19.3          |
| 39200.00     | H          | 28.8                       | *       | 2.2                | 44.2                 | -34.6              | 0.0                   | 40.6                                | 106.9                              | 500.0                              | -13.4          |
| 39200.00     | V          | 29.0                       | *       | 2.2                | 44.2                 | -34.6              | 0.0                   | 40.8                                | 109.8                              | 500.0                              | -13.2          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11ac Ch140 – 18dBm                 |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 11400.00     | H          | 49.2                       | *       | 5.9                | 37.8                 | -39.2              | 53.7                             | 481.8                           | 5000.0                          | -20.3          |
| 11400.00     | V          | 49.4                       | *       | 5.9                | 37.8                 | -39.2              | 53.9                             | 493.6                           | 5000.0                          | -20.1          |
| 22800.00     | H          | 36.3                       | *       | 2.3                | 40.6                 | -29.4              | 49.7                             | 306.6                           | 5000.0                          | -24.2          |
| 22800.00     | V          | 36.4                       | *       | 2.3                | 40.6                 | -29.4              | 49.8                             | 308.3                           | 5000.0                          | -24.2          |
| 39900.00     | H          | 42.9                       | *       | 2.2                | 44.2                 | -34.3              | 55.1                             | 566.4                           | 5000.0                          | -18.9          |
| 39900.00     | V          | 43.0                       | *       | 2.2                | 44.2                 | -34.3              | 55.1                             | 571.7                           | 5000.0                          | -18.8          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11ac Ch140 – 18dBm                    |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 11400.00     | H          | 33.9                       | *       | 5.9                | 37.8                 | -39.2              | 0.0                   | 38.3                                | 82.3                               | 500.0                              | -15.7          |
| 11400.00     | V          | 34.1                       | *       | 5.9                | 37.8                 | -39.2              | 0.0                   | 38.6                                | 84.9                               | 500.0                              | -15.4          |
| 22800.00     | H          | 22.5                       | *       | 2.3                | 40.6                 | -29.4              | 0.0                   | 35.9                                | 62.7                               | 500.0                              | -18.0          |
| 22800.00     | V          | 22.5                       | *       | 2.3                | 40.6                 | -29.4              | 0.0                   | 36.0                                | 62.8                               | 500.0                              | -18.0          |
| 39900.00     | H          | 30.1                       | *       | 2.2                | 44.2                 | -34.3              | 0.0                   | 42.3                                | 130.5                              | 500.0                              | -11.7          |
| 39900.00     | V          | 30.2                       | *       | 2.2                | 44.2                 | -34.3              | 0.0                   | 42.3                                | 131.0                              | 500.0                              | -11.6          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11ac40 Ch54 – 18dBm                |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 15810.00     | H          | 48.2                       | *       | 6.8                | 40.3                 | -37.6              | 57.7                             | 771.0                           | 5000.0                          | -16.2          |
| 15810.00     | V          | 49.0                       | *       | 6.8                | 40.3                 | -37.6              | 58.5                             | 842.4                           | 5000.0                          | -15.5          |
| 21080.00     | H          | 36.1                       | *       | 2.3                | 40.1                 | -28.9              | 49.7                             | 304.0                           | 5000.0                          | -24.3          |
| 21080.00     | V          | 36.2                       | *       | 2.3                | 40.1                 | -28.9              | 49.8                             | 308.5                           | 5000.0                          | -24.2          |
| 31620.00     | H          | 43.2                       | *       | 1.9                | 43.9                 | -35.7              | 53.3                             | 460.7                           | 5000.0                          | -20.7          |
| 31620.00     | V          | 43.2                       | *       | 1.9                | 43.9                 | -35.7              | 53.3                             | 463.9                           | 5000.0                          | -20.7          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11ac40 Ch54 – 18dBm                   |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 15810.00     | H          | 33.37                      | *       | 6.8                | 40.3                 | -37.6              | 0.0                   | 42.9                                | 140.0                              | 500.0                              | -11.1          |
| 15810.00     | V          | 34.0                       | *       | 6.8                | 40.3                 | -37.6              | 0.0                   | 43.6                                | 150.5                              | 500.0                              | -10.4          |
| 21080.00     | H          | 21.5                       | *       | 2.3                | 40.1                 | -28.9              | 0.0                   | 35.0                                | 56.3                               | 500.0                              | -19.0          |
| 21080.00     | V          | 21.6                       | *       | 2.3                | 40.1                 | -28.9              | 0.0                   | 35.2                                | 57.4                               | 500.0                              | -18.8          |
| 31620.00     | H          | 30.0                       | *       | 1.9                | 43.9                 | -35.7              | 0.0                   | 40.1                                | 101.5                              | 500.0                              | -13.9          |
| 31620.00     | V          | 30.2                       | *       | 1.9                | 43.9                 | -35.7              | 0.0                   | 40.4                                | 104.2                              | 500.0                              | -13.6          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11ac40 Ch62 – 18dBm                |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 10620.00     | H          | 48.8                       | *       | 5.6                | 37.4                 | -39.2              | 52.5                             | 424.0                           | 5000.0                          | -21.4          |
| 10620.00     | V          | 48.9                       | *       | 5.6                | 37.4                 | -39.2              | 52.7                             | 429.4                           | 5000.0                          | -21.3          |
| 15930.00     | H          | 48.7                       | *       | 6.8                | 40.5                 | -37.5              | 58.6                             | 846.9                           | 5000.0                          | -15.4          |
| 15930.00     | V          | 48.6                       | *       | 6.8                | 40.5                 | -37.5              | 58.4                             | 836.2                           | 5000.0                          | -15.5          |
| 21240.00     | H          | 36.4                       | *       | 2.3                | 40.3                 | -28.8              | 50.2                             | 322.2                           | 5000.0                          | -23.8          |
| 21240.00     | V          | 36.6                       | *       | 2.3                | 40.3                 | -28.8              | 50.3                             | 327.0                           | 5000.0                          | -23.7          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11ac40 Ch62 – 18dBm                   |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 10620.00     | H          | 33.9                       | *       | 5.6                | 37.4                 | -39.2              | 0.0                   | 37.6                                | 76.3                               | 500.0                              | -16.3          |
| 10620.00     | V          | 34.4                       | *       | 5.6                | 37.4                 | -39.2              | 0.0                   | 38.1                                | 80.7                               | 500.0                              | -15.8          |
| 15930.00     | H          | 33.40                      | *       | 6.8                | 40.5                 | -37.5              | 0.0                   | 43.3                                | 146.2                              | 500.0                              | -10.7          |
| 15930.00     | V          | 33.4                       | *       | 6.8                | 40.5                 | -37.5              | 0.0                   | 43.2                                | 145.3                              | 500.0                              | -10.7          |
| 21240.00     | H          | 21.1                       | *       | 2.3                | 40.3                 | -28.8              | 0.0                   | 34.8                                | 55.0                               | 500.0                              | -19.2          |
| 21240.00     | V          | 21.1                       | *       | 2.3                | 40.3                 | -28.8              | 0.0                   | 34.9                                | 55.3                               | 500.0                              | -19.1          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11ac80 Ch58 – 18dBm                |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 15870.00     | H          | 48.1                       | *       | 6.8                | 40.4                 | -37.5              | 57.8                             | 780.6                           | 5000.0                          | -16.1          |
| 15870.00     | V          | 48.2                       | *       | 6.8                | 40.4                 | -37.5              | 57.9                             | 784.2                           | 5000.0                          | -16.1          |
| 21160.00     | H          | 36.0                       | *       | 2.3                | 40.2                 | -28.8              | 49.7                             | 305.6                           | 5000.0                          | -24.3          |
| 21160.00     | V          | 36.3                       | *       | 2.3                | 40.2                 | -28.8              | 49.9                             | 314.2                           | 5000.0                          | -24.0          |
| 31740.00     | H          | 43.1                       | *       | 1.9                | 43.9                 | -36.0              | 53.0                             | 444.2                           | 5000.0                          | -21.0          |
| 31740.00     | V          | 43.2                       | *       | 1.9                | 43.9                 | -36.0              | 53.0                             | 446.3                           | 5000.0                          | -21.0          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11ac80 Ch58 – 18dBm                   |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 15870.00     | H          | 33.10                      | *       | 6.8                | 40.4                 | -37.5              | 0.0                   | 42.8                                | 138.3                              | 500.0                              | -11.2          |
| 15870.00     | V          | 33.2                       | *       | 6.8                | 40.4                 | -37.5              | 0.0                   | 42.9                                | 139.8                              | 500.0                              | -11.1          |
| 21160.00     | H          | 21.8                       | *       | 2.3                | 40.2                 | -28.8              | 0.0                   | 35.5                                | 59.3                               | 500.0                              | -18.5          |
| 21160.00     | V          | 21.9                       | *       | 2.3                | 40.2                 | -28.8              | 0.0                   | 35.6                                | 60.3                               | 500.0                              | -18.4          |
| 31740.00     | H          | 30.0                       | *       | 1.9                | 43.9                 | -36.0              | 0.0                   | 39.8                                | 98.0                               | 500.0                              | -14.2          |
| 31740.00     | V          | 30.1                       | *       | 1.9                | 43.9                 | -36.0              | 0.0                   | 39.9                                | 98.9                               | 500.0                              | -14.1          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11n20 BF Ch52 – 18dBm              |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 15780.00     | H          | 48.6                       | *       | 6.8                | 40.2                 | -37.6              | 58.1                             | 804.3                           | 5000.0                          | -15.9          |
| 15780.00     | V          | 48.7                       | *       | 6.8                | 40.2                 | -37.6              | 58.2                             | 815.5                           | 5000.0                          | -15.8          |
| 21040.00     | H          | 36.1                       | *       | 2.3                | 40.0                 | -28.8              | 49.7                             | 304.1                           | 5000.0                          | -24.3          |
| 21040.00     | V          | 36.3                       | *       | 2.3                | 40.0                 | -28.8              | 49.8                             | 309.0                           | 5000.0                          | -24.2          |
| 31560.00     | H          | 43.3                       | *       | 1.9                | 43.9                 | -35.9              | 53.2                             | 457.7                           | 5000.0                          | -20.8          |
| 31560.00     | V          | 43.3                       | *       | 1.9                | 43.9                 | -35.9              | 53.3                             | 460.9                           | 5000.0                          | -20.7          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11n20 BF Ch52 – 18dBm                 |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 15780.00     | H          | 33.82                      | *       | 6.8                | 40.2                 | -37.6              | 0.0                   | 43.3                                | 146.4                              | 500.0                              | -10.7          |
| 15780.00     | V          | 33.9                       | *       | 6.8                | 40.2                 | -37.6              | 0.0                   | 43.4                                | 147.5                              | 500.0                              | -10.6          |
| 21040.00     | H          | 22.1                       | *       | 2.3                | 40.0                 | -28.8              | 0.0                   | 35.6                                | 60.2                               | 500.0                              | -18.4          |
| 21040.00     | V          | 22.2                       | *       | 2.3                | 40.0                 | -28.8              | 0.0                   | 35.7                                | 60.8                               | 500.0                              | -18.3          |
| 31560.00     | H          | 30.0                       | *       | 1.9                | 43.9                 | -35.9              | 0.0                   | 40.0                                | 99.7                               | 500.0                              | -14.0          |
| 31560.00     | V          | 30.8                       | *       | 1.9                | 43.9                 | -35.9              | 0.0                   | 40.7                                | 108.9                              | 500.0                              | -13.2          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11n20 BF Ch60 – 18dBm              |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 10600.00     | H          | 48.5                       | *       | 5.6                | 37.4                 | -39.2              | 52.3                             | 410.7                           | 5000.0                          | -21.7          |
| 10600.00     | V          | 48.6                       | *       | 5.6                | 37.4                 | -39.2              | 52.4                             | 415.0                           | 5000.0                          | -21.6          |
| 15900.00     | H          | 48.8                       | *       | 6.8                | 40.5                 | -37.5              | 58.6                             | 849.3                           | 5000.0                          | -15.4          |
| 15900.00     | V          | 48.9                       | *       | 6.8                | 40.5                 | -37.5              | 58.7                             | 859.2                           | 5000.0                          | -15.3          |
| 21200.00     | H          | 36.5                       | *       | 2.3                | 40.2                 | -28.8              | 50.3                             | 325.9                           | 5000.0                          | -23.7          |
| 21200.00     | V          | 36.4                       | *       | 2.3                | 40.2                 | -28.8              | 50.2                             | 322.6                           | 5000.0                          | -23.8          |
| 31800.00     | H          | 42.5                       | *       | 1.9                | 43.9                 | -36.3              | 52.1                             | 402.3                           | 5000.0                          | -21.9          |
| 31800.00     | V          | 42.6                       | *       | 1.9                | 43.9                 | -36.3              | 52.2                             | 407.5                           | 5000.0                          | -21.8          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11n20 BF Ch60 – 18dBm                 |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 10600.00     | H          | 33.3                       | *       | 5.6                | 37.4                 | -39.2              | 0.0                   | 37.1                                | 71.3                               | 500.0                              | -16.9          |
| 10600.00     | V          | 33.4                       | *       | 5.6                | 37.4                 | -39.2              | 0.0                   | 37.1                                | 71.9                               | 500.0                              | -16.8          |
| 15900.00     | H          | 34.01                      | *       | 6.8                | 40.5                 | -37.5              | 0.0                   | 43.8                                | 155.1                              | 500.0                              | -10.2          |
| 15900.00     | V          | 34.1                       | *       | 6.8                | 40.5                 | -37.5              | 0.0                   | 43.9                                | 156.2                              | 500.0                              | -10.1          |
| 21200.00     | H          | 23.1                       | *       | 2.3                | 40.2                 | -28.8              | 0.0                   | 36.9                                | 69.9                               | 500.0                              | -17.1          |
| 21200.00     | V          | 23.2                       | *       | 2.3                | 40.2                 | -28.8              | 0.0                   | 37.0                                | 70.7                               | 500.0                              | -17.0          |
| 31800.00     | H          | 30.1                       | *       | 1.9                | 43.9                 | -36.3              | 0.0                   | 39.7                                | 97.0                               | 500.0                              | -14.2          |
| 31800.00     | V          | 30.2                       | *       | 1.9                | 43.9                 | -36.3              | 0.0                   | 39.8                                | 97.7                               | 500.0                              | -14.2          |

|      |                                        |
|------|----------------------------------------|
| Test | Spurious Emissions – Peak Measurements |
| Mode | 802.11n20 BF Ch64 – 18dBm              |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 10640.00     | H          | 48.7                       | *       | 7.3                | 37.7                 | -39.0              | 54.9                             | 553.0                           | 5000.0                          | -19.1          |
| 10640.00     | V          | 48.9                       | *       | 7.3                | 37.7                 | -39.0              | 55.0                             | 560.7                           | 5000.0                          | -19.0          |
| 15960.00     | H          | 48.5                       | *       | 9.0                | 41.9                 | -38.1              | 61.3                             | 1163.7                          | 5000.0                          | -12.7          |
| 15960.00     | V          | 48.6                       | *       | 9.0                | 41.9                 | -38.1              | 61.4                             | 1179.9                          | 5000.0                          | -12.5          |
| 21280.00     | H          | 36.7                       | *       | 2.3                | 40.3                 | -28.9              | 50.5                             | 333.8                           | 5000.0                          | -23.5          |
| 21280.00     | V          | 37.0                       | *       | 2.3                | 40.3                 | -28.9              | 50.7                             | 343.2                           | 5000.0                          | -23.3          |

|      |                                           |
|------|-------------------------------------------|
| Test | Spurious Emissions – Average Measurements |
| Mode | 802.11n20 BF Ch64 – 18dBm                 |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 10640.00     | H          | 34.6                       | *       | 7.3                | 37.7                 | -39.0              | 0.0                   | 40.7                                | 108.3                              | 500.0                              | -13.3          |
| 10640.00     | V          | 34.6                       | *       | 7.3                | 37.7                 | -39.0              | 0.0                   | 40.7                                | 108.1                              | 500.0                              | -13.3          |
| 15960.00     | H          | 34.35                      | *       | 9.0                | 41.9                 | -38.1              | 0.0                   | 47.1                                | 227.7                              | 500.0                              | -6.8           |
| 15960.00     | V          | 34.4                       | *       | 9.0                | 41.9                 | -38.1              | 0.0                   | 47.2                                | 228.5                              | 500.0                              | -6.8           |
| 21280.00     | H          | 21.6                       | *       | 2.3                | 40.3                 | -28.9              | 0.0                   | 35.3                                | 58.1                               | 500.0                              | -18.7          |
| 21280.00     | V          | 22.1                       | *       | 2.3                | 40.3                 | -28.9              | 0.0                   | 35.8                                | 61.5                               | 500.0                              | -18.2          |

## 19. Band-Edge Compliance near the Restricted Band

|              |               |
|--------------|---------------|
| Manufacturer | Astronics CSC |
| Product      | IFE System    |
| Model        | E71-319-01    |
| Serial No    | 000007        |
| Mode         | Transmitting  |

| Information                     |                                                                                          |
|---------------------------------|------------------------------------------------------------------------------------------|
| Size of EUT                     | 26.411cm x 18.098cm x 11.887cm (L x W x H)                                               |
| Setup Format                    | Tabletop                                                                                 |
| Height of Support               | N/A                                                                                      |
| Type of Test Site               | Semi-anechoic chamber                                                                    |
| Type of Antennas Used           | Below 1GHz: Bilog (or equivalent)<br>Above 1GHz: Double-ridged waveguide (or equivalent) |
| Number of Interconnection Wires | 1                                                                                        |
| Type of Interconnection Wires   | Ethernet                                                                                 |
| Notes                           |                                                                                          |

| Measurement Uncertainty                                                                                               |                                  |
|-----------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Measurement Type                                                                                                      | Expanded Measurement Uncertainty |
| Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1000 MHz) | 4.3                              |
| Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)     | 3.1                              |
| Radiated disturbance (electric field strength on an open area test site or alternative test site) (6 GHz – 18 GHz)    | 3.2                              |
| Radiated disturbance (electric field strength on an open area test site or alternative test site) (18 GHz – 26.5 GHz) | 3.3                              |
| Radiated disturbance (electric field strength on an open area test site or alternative test site) (26.5 GHz – 40 GHz) | 3.4                              |

| Procedures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> <li>1) The EUT was set to transmit continuously at the channel closest to the band-edge near a restricted band.</li> <li>2) A double ridged waveguide was placed 3 meters away from the EUT. The antenna was connected to the input of a spectrum analyzer.</li> <li>3) The center frequency of the analyzer was set to the high band-edge</li> <li>4) The resolution bandwidth was set to 1MHz.</li> <li>5) To ensure that the maximum or worst case emission level was measured, the following steps were taken: <ol style="list-style-type: none"> <li>a. The EUT was rotated so that all of its sides were exposed to the receiving antenna.</li> <li>b. Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.</li> <li>c. The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to maximize the readings.</li> </ol> </li> <li>6) The highest measured peak reading was recorded.</li> <li>7) The highest measured average reading was recorded.</li> </ol> |

|      |                                                                   |
|------|-------------------------------------------------------------------|
| Test | Band-Edge Compliance near the Restricted Band – Peak Measurements |
| Mode | 802.11n40 Ch38 – 18dBm                                            |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 5150.00      | H          | 26.8                       | *       | 3.8                | 34.4                 | 0.0                | 65.0                             | 1773.2                          | 5000.0                          | -9.0           |
| 5150.00      | V          | 29.0                       | *       | 3.8                | 34.4                 | 0.0                | 67.2                             | 2289.6                          | 5000.0                          | -6.8           |

|      |                                                                      |
|------|----------------------------------------------------------------------|
| Test | Band-Edge Compliance near the Restricted Band – Average Measurements |
| Mode | 802.11n40 Ch38 – 18dBm                                               |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 5150.00      | H          | 11.1                       | *       | 3.8                | 34.4                 | 0.0                | 0.0                   | 49.3                                | 290.9                              | 500.0                              | -4.7           |
| 5150.00      | V          | 11.1                       | *       | 3.8                | 34.4                 | 0.0                | 0.0                   | 49.3                                | 292.9                              | 500.0                              | -4.6           |

|      |                                                                   |
|------|-------------------------------------------------------------------|
| Test | Band-Edge Compliance near the Restricted Band – Peak Measurements |
| Mode | 802.11ac20 Ch36 – 18dBm                                           |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 5150.00      | H          | 26.3                       | *       | 3.8                | 34.4                 | 0.0                | 64.6                             | 1689.5                          | 5000.0                          | -9.4           |
| 5150.00      | V          | 26.4                       | *       | 3.8                | 34.4                 | 0.0                | 64.6                             | 1691.4                          | 5000.0                          | -9.4           |

|      |                                                                      |
|------|----------------------------------------------------------------------|
| Test | Band-Edge Compliance near the Restricted Band – Average Measurements |
| Mode | 802.11ac20 Ch36 – 18dBm                                              |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 5150.00      | H          | 9.3                        | *       | 3.8                | 34.4                 | 0.0                | 0.0                   | 47.5                                | 237.8                              | 500.0                              | -6.5           |
| 5150.00      | V          | 9.4                        | *       | 3.8                | 34.4                 | 0.0                | 0.0                   | 47.6                                | 239.2                              | 500.0                              | -6.4           |

|      |                                                                   |
|------|-------------------------------------------------------------------|
| Test | Band-Edge Compliance near the Restricted Band – Peak Measurements |
| Mode | 802.11ac20 Ch64 – 18dBm                                           |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 5350.00      | H          | 24.3                       | *       | 5.1                | 34.6                 | 0.0                | 64.0                             | 1593.5                          | 5000.0                          | -9.9           |
| 5350.00      | V          | 25.0                       | *       | 5.1                | 34.6                 | 0.0                | 64.7                             | 1727.3                          | 5000.0                          | -9.2           |

|      |                                                                      |
|------|----------------------------------------------------------------------|
| Test | Band-Edge Compliance near the Restricted Band – Average Measurements |
| Mode | 802.11ac20 Ch64 – 18dBm                                              |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 5350.00      | H          | 9.1                        | *       | 5.1                | 34.6                 | 0.0                | 0.0                   | 48.8                                | 276.0                              | 500.0                              | -5.2           |
| 5350.00      | V          | 9.0                        | *       | 5.1                | 34.6                 | 0.0                | 0.0                   | 48.8                                | 274.4                              | 500.0                              | -5.2           |

|      |                                                                   |
|------|-------------------------------------------------------------------|
| Test | Band-Edge Compliance near the Restricted Band – Peak Measurements |
| Mode | 802.11ac20 Ch100 – 18dBm                                          |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 5460.00      | H          | 25.9                       | *       | 3.9                | 34.6                 | 0.0                | 64.4                             | 1666.2                          | 5000.0                          | -9.5           |
| 5460.00      | V          | 26.7                       | *       | 3.9                | 34.6                 | 0.0                | 65.2                             | 1818.5                          | 5000.0                          | -8.8           |

|      |                                                                      |
|------|----------------------------------------------------------------------|
| Test | Band-Edge Compliance near the Restricted Band – Average Measurements |
| Mode | 802.11ac20 Ch100 – 18dBm                                             |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 5460.00      | H          | 9.2                        | *       | 3.9                | 34.6                 | 0.0                | 0.0                   | 47.8                                | 244.5                              | 500.0                              | -6.2           |
| 5460.00      | V          | 10.2                       | *       | 3.9                | 34.6                 | 0.0                | 0.0                   | 48.8                                | 274.3                              | 500.0                              | -5.2           |

|      |                                                                   |
|------|-------------------------------------------------------------------|
| Test | Band-Edge Compliance near the Restricted Band – Peak Measurements |
| Mode | 802.11ac20 Ch140 – 18dBm                                          |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 5725.00      | H          | 25.5                       | *       | 4.0                | 34.6                 | 0.0                | 64.1                             | 1610.6                          | 5000.0                          | -9.8           |
| 5725.00      | V          | 26.1                       | *       | 4.0                | 34.6                 | 0.0                | 64.8                             | 1729.8                          | 5000.0                          | -9.2           |

|      |                                                                      |
|------|----------------------------------------------------------------------|
| Test | Band-Edge Compliance near the Restricted Band – Average Measurements |
| Mode | 802.11ac20 Ch140 – 18dBm                                             |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 5725.00      | H          | 10.2                       | *       | 4.0                | 34.6                 | 0.0                | 0.0                   | 48.9                                | 278.9                              | 500.0                              | -5.1           |
| 5725.00      | V          | 10.3                       | *       | 4.0                | 34.6                 | 0.0                | 0.0                   | 49.0                                | 281.2                              | 500.0                              | -5.0           |

|      |                                                                   |
|------|-------------------------------------------------------------------|
| Test | Band-Edge Compliance near the Restricted Band – Peak Measurements |
| Mode | 802.11ac40 Ch38 – 18dBm                                           |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 5150.00      | H          | 26.8                       |         | 3.8                | 34.4                 | 0.0                | 65.0                             | 1777.3                          | 5000.0                          | -9.0           |
| 5150.00      | V          | 28.1                       |         | 3.8                | 34.4                 | 0.0                | 66.3                             | 2059.5                          | 5000.0                          | -7.7           |

|      |                                                                      |
|------|----------------------------------------------------------------------|
| Test | Band-Edge Compliance near the Restricted Band – Average Measurements |
| Mode | 802.11ac40 Ch38 – 18dBm                                              |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 5150.00      | H          | 9.6                        |         | 3.8                | 34.4                 | 0.0                | 0.0                   | 47.8                                | 245.9                              | 500.0                              | -6.2           |
| 5150.00      | V          | 9.8                        |         | 3.8                | 34.4                 | 0.0                | 0.0                   | 48.0                                | 250.2                              | 500.0                              | -6.0           |

|      |                                                                   |
|------|-------------------------------------------------------------------|
| Test | Band-Edge Compliance near the Restricted Band – Peak Measurements |
| Mode | 802.11ac40 Ch62 – 18dBm                                           |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 5350.00      | H          | 29.6                       |         | 3.9                | 34.7                 | 0.0                | 68.3                             | 2587.9                          | 5000.0                          | -5.7           |
| 5350.00      | V          | 30.8                       |         | 3.9                | 34.7                 | 0.0                | 69.4                             | 2947.4                          | 5000.0                          | -4.6           |

|      |                                                                      |
|------|----------------------------------------------------------------------|
| Test | Band-Edge Compliance near the Restricted Band – Average Measurements |
| Mode | 802.11ac40 Ch62 – 18dBm                                              |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 5350.00      | H          | 10.0                       |         | 3.9                | 34.7                 | 0.0                | 0.0                   | 48.6                                | 270.4                              | 500.0                              | -5.3           |
| 5350.00      | V          | 14.2                       |         | 3.9                | 34.7                 | 0.0                | 0.0                   | 52.9                                | 439.5                              | 500.0                              | -1.1           |

|      |                                                                   |
|------|-------------------------------------------------------------------|
| Test | Band-Edge Compliance near the Restricted Band – Peak Measurements |
| Mode | 802.11ac80 Ch58 – 18dBm                                           |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 5350.00      | H          | 29.7                       |         | 3.9                | 34.7                 | 0.0                | 68.3                             | 2593.8                          | 5000.0                          | -5.7           |
| 5350.00      | V          | 31.0                       |         | 3.9                | 34.7                 | 0.0                | 69.6                             | 3023.0                          | 5000.0                          | -4.4           |

|      |                                                                      |
|------|----------------------------------------------------------------------|
| Test | Band-Edge Compliance near the Restricted Band – Average Measurements |
| Mode | 802.11ac80 Ch58 – 18dBm                                              |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 5350.00      | H          | 13.1                       |         | 3.9                | 34.7                 | 0.0                | 0.0                   | 51.7                                | 386.3                              | 500.0                              | -2.2           |
| 5350.00      | V          | 14.9                       |         | 3.9                | 34.7                 | 0.0                | 0.0                   | 53.5                                | 473.1                              | 500.0                              | -0.5           |

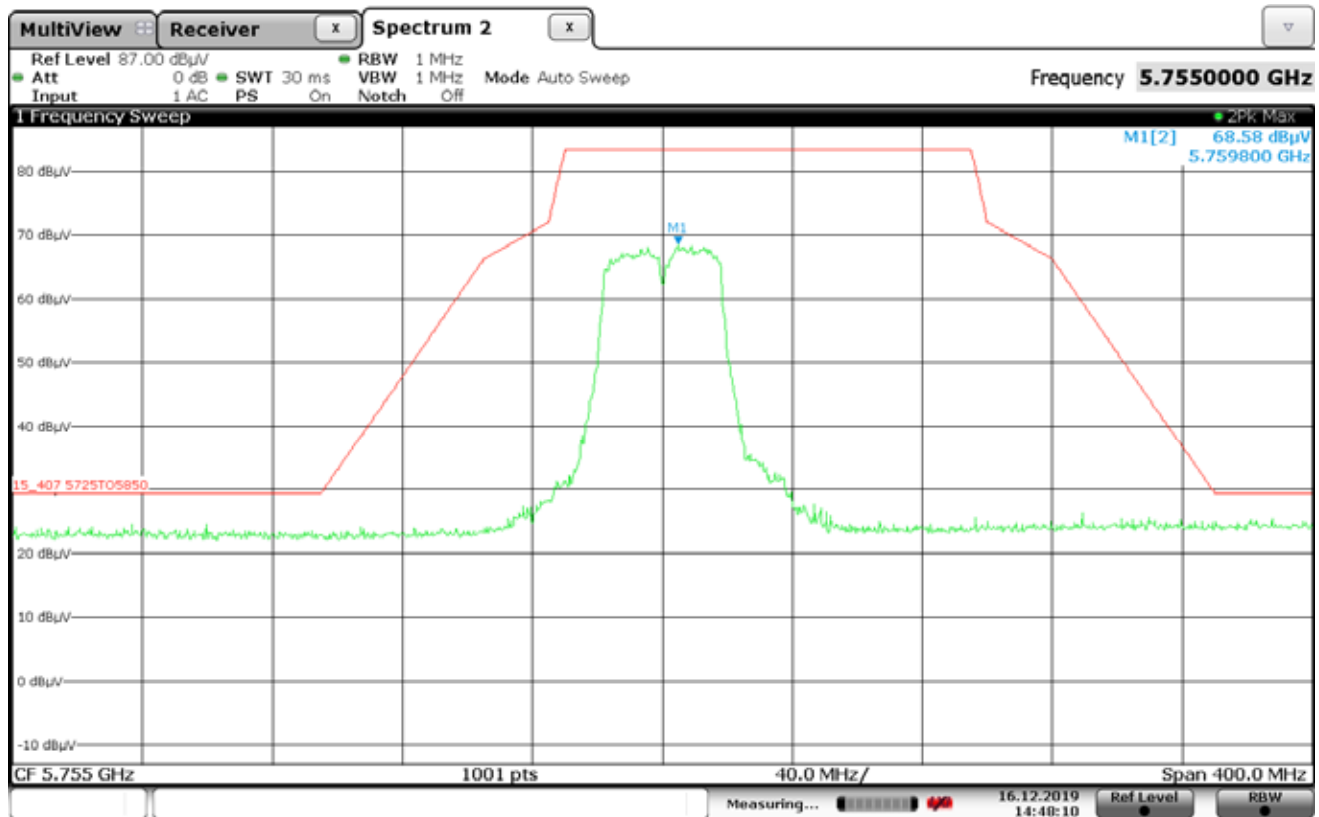
|      |                                                                   |
|------|-------------------------------------------------------------------|
| Test | Band-Edge Compliance near the Restricted Band – Peak Measurements |
| Mode | 802.11ac80 Ch106 – 18dBm                                          |

| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Peak<br>Total<br>dBuV/m<br>at 3m | Peak<br>Total<br>uV/m<br>at 3 m | Peak<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|----------------------------------|---------------------------------|---------------------------------|----------------|
| 5460.00      | H          | 25.5                       | *       | 3.9                | 34.6                 | 0.0                | 64.0                             | 1583.9                          | 5000.0                          | -10.0          |
| 5460.00      | V          | 27.9                       |         | 3.9                | 34.6                 | 0.0                | 66.4                             | 2095.2                          | 5000.0                          | -7.6           |

|      |                                                                      |
|------|----------------------------------------------------------------------|
| Test | Band-Edge Compliance near the Restricted Band – Average Measurements |
| Mode | 802.11ac80 Ch106 – 18dBm                                             |

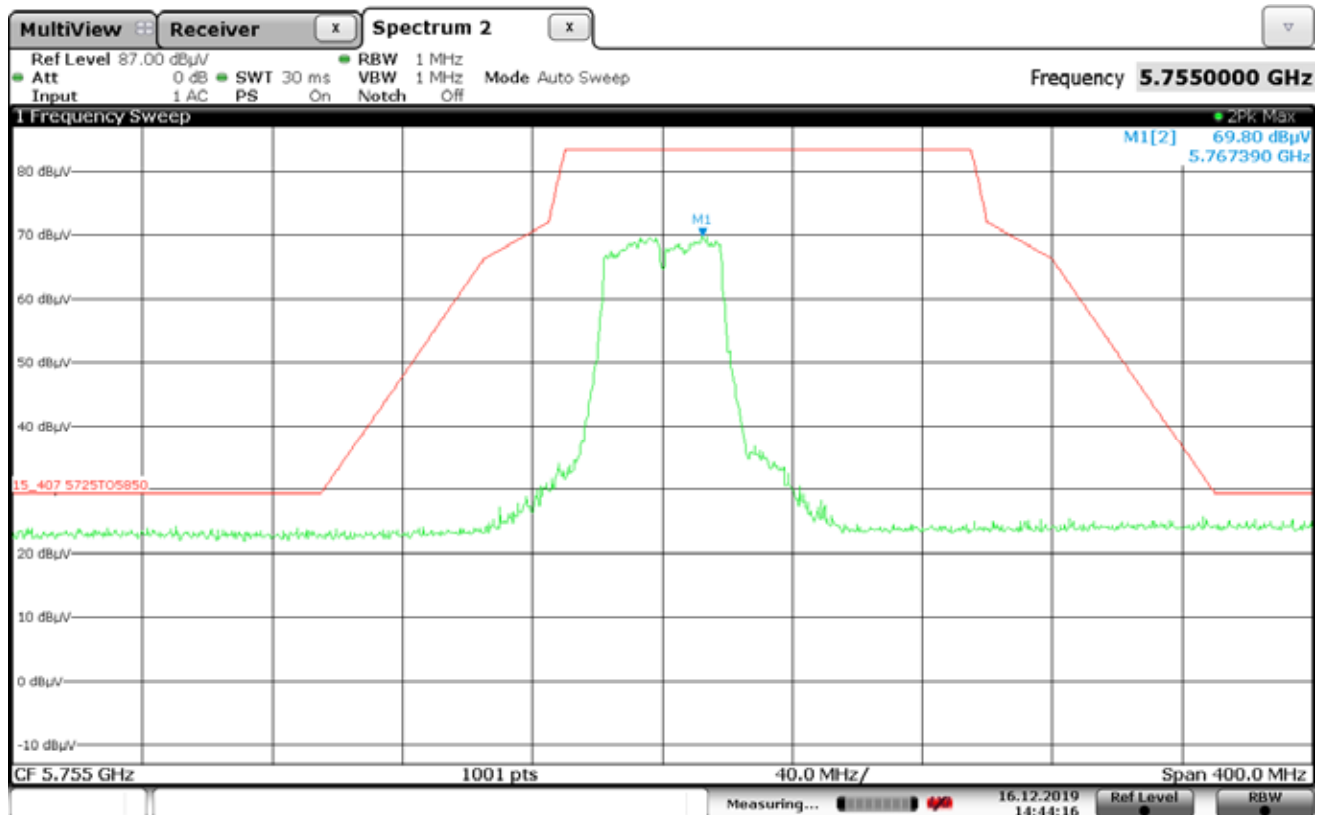
| Freq.<br>MHz | Ant<br>Pol | Meter<br>Reading<br>(dBuV) | Ambient | CBL<br>Fac<br>(dB) | Ant<br>Fac<br>(dB/m) | Pre<br>Amp<br>(dB) | Duty<br>Cycle<br>(dB) | Average<br>Total<br>dBuV/m<br>at 3m | Average<br>Total<br>uV/m<br>at 3 m | Average<br>Limit<br>uV/m<br>at 3 m | Margin<br>(dB) |
|--------------|------------|----------------------------|---------|--------------------|----------------------|--------------------|-----------------------|-------------------------------------|------------------------------------|------------------------------------|----------------|
| 5460.00      | H          | 9.6                        | *       | 3.9                | 34.6                 | 0.0                | 0.0                   | 48.2                                | 255.7                              | 500.0                              | -5.8           |
| 5460.00      | V          | 9.9                        |         | 3.9                | 34.6                 | 0.0                | 0.0                   | 48.4                                | 264.1                              | 500.0                              | -5.5           |

|       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test  | Band-Edge - Horizontal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Mode  | 802.11ac40 Ch151 – 18dBm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Notes | From 5725-5850MHz the mask line sits at a meter reading of 83.3dBμV which is matched to an EIRP of 27dBm. In the ranges of 5720-5725MHz and 5850-5855MHz the line drops linearly to a meter reading of 71.9dBμV which represents an EIRP of 15.6dBm. In the ranges of 5700-5720MHz and 5855-5875MHz the line drops linearly to a meter reading of 66.3dBμV which represents an EIRP of 10dBm. In the ranges of 5650-5700MHz and 5875-5925MHz the line drops linearly to a meter reading of 29.3dBμV which represents an EIRP of -27dBm. Outside the frequency ranges aforementioned the mask line sits on a meter reading of 29.3dBμV. |



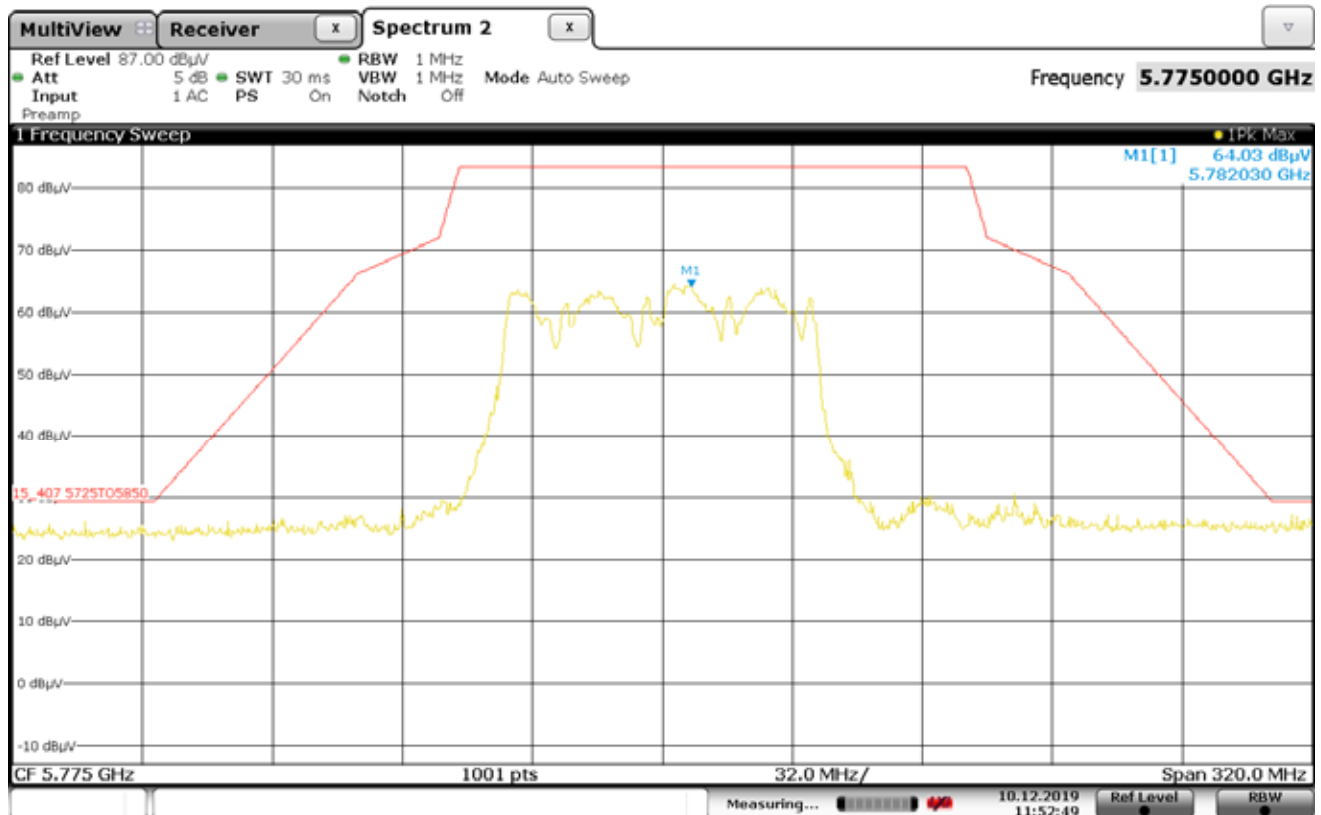
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|       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test  | Band-Edge - Vertical                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Mode  | 802.11ac40 Ch151 – 18dBm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Notes | From 5725-5850MHz the mask line sits at a meter reading of 83.3dBμV which is matched to an EIRP of 27dBm. In the ranges of 5720-5725MHz and 5850-5855MHz the line drops linearly to a meter reading of 71.9dBμV which represents an EIRP of 15.6dBm. In the ranges of 5700-5720MHz and 5855-5875MHz the line drops linearly to a meter reading of 66.3dBμV which represents an EIRP of 10dBm. In the ranges of 5650-5700MHz and 5875-5925MHz the line drops linearly to a meter reading of 29.3dBμV which represents an EIRP of -27dBm. Outside the frequency ranges aforementioned the mask line sits on a meter reading of 29.3dBμV. |



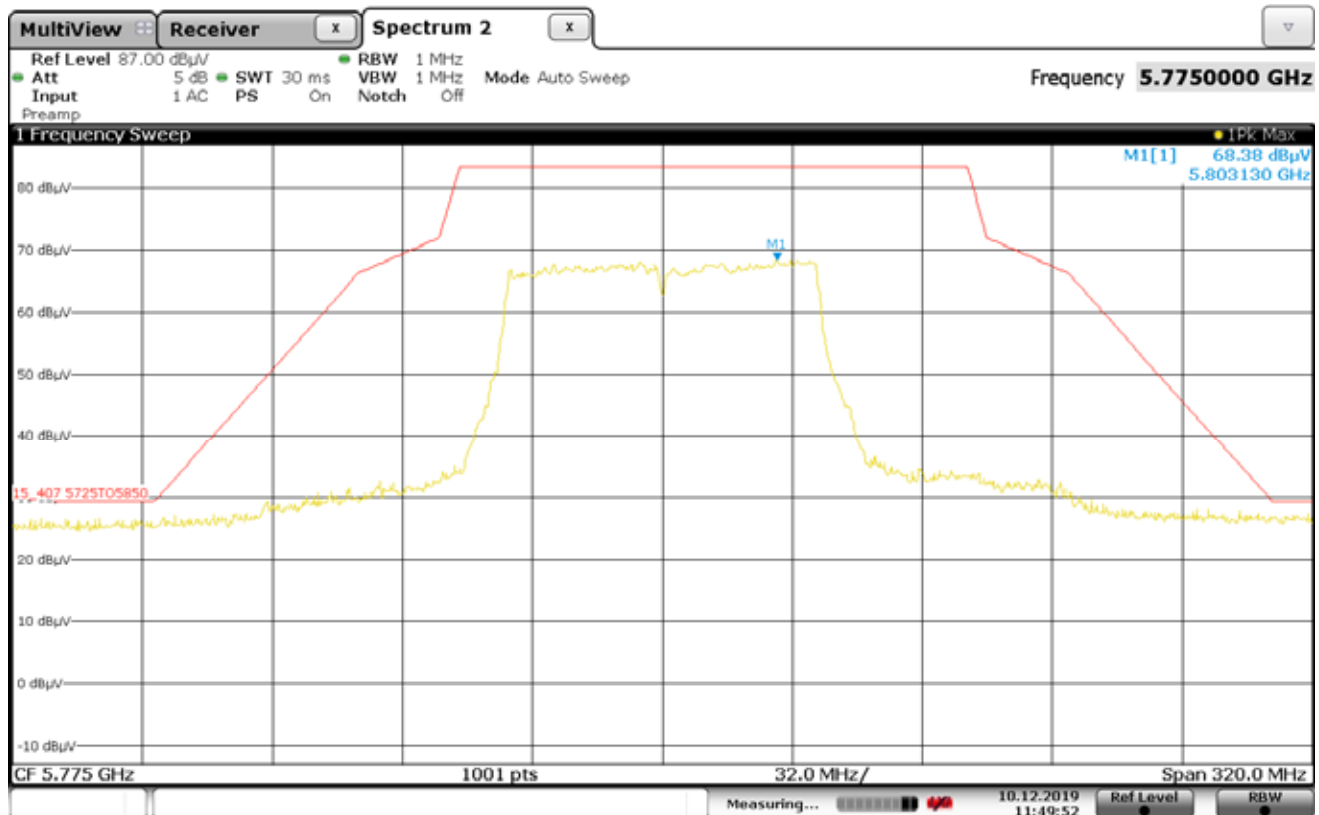
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|       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test  | Band-Edge - Horizontal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Mode  | 802.11ac80 Ch155 – 18dBm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Notes | From 5725-5850MHz the mask line sits at a meter reading of 83.3dBμV which is matched to an EIRP of 27dBm. In the ranges of 5720-5725MHz and 5850-5855MHz the line drops linearly to a meter reading of 71.9dBμV which represents an EIRP of 15.6dBm. In the ranges of 5700-5720MHz and 5855-5875MHz the line drops linearly to a meter reading of 66.3dBμV which represents an EIRP of 10dBm. In the ranges of 5650-5700MHz and 5875-5925MHz the line drops linearly to a meter reading of 29.3dBμV which represents an EIRP of -27dBm. Outside the frequency ranges aforementioned the mask line sits on a meter reading of 29.3dBμV. |



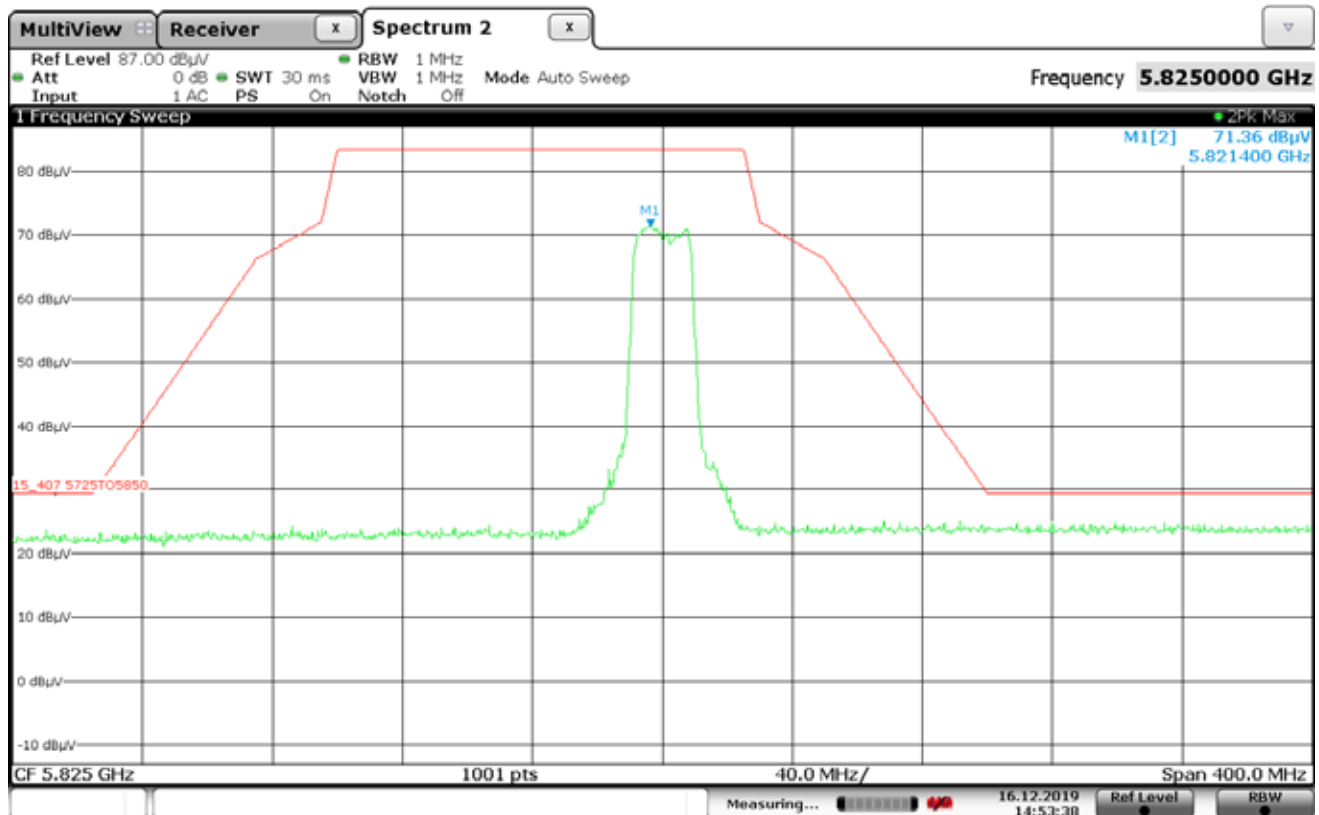
Date: 10.DEC.2019 11:52:50

|       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test  | Band-Edge - Vertical                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Mode  | 802.11ac80 Ch155 – 18dBm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Notes | From 5725-5850MHz the mask line sits at a meter reading of 83.3dBμV which is matched to an EIRP of 27dBm. In the ranges of 5720-5725MHz and 5850-5855MHz the line drops linearly to a meter reading of 71.9dBμV which represents an EIRP of 15.6dBm. In the ranges of 5700-5720MHz and 5855-5875MHz the line drops linearly to a meter reading of 66.3dBμV which represents an EIRP of 10dBm. In the ranges of 5650-5700MHz and 5875-5925MHz the line drops linearly to a meter reading of 29.3dBμV which represents an EIRP of -27dBm. Outside the frequency ranges aforementioned the mask line sits on a meter reading of 29.3dBμV. |



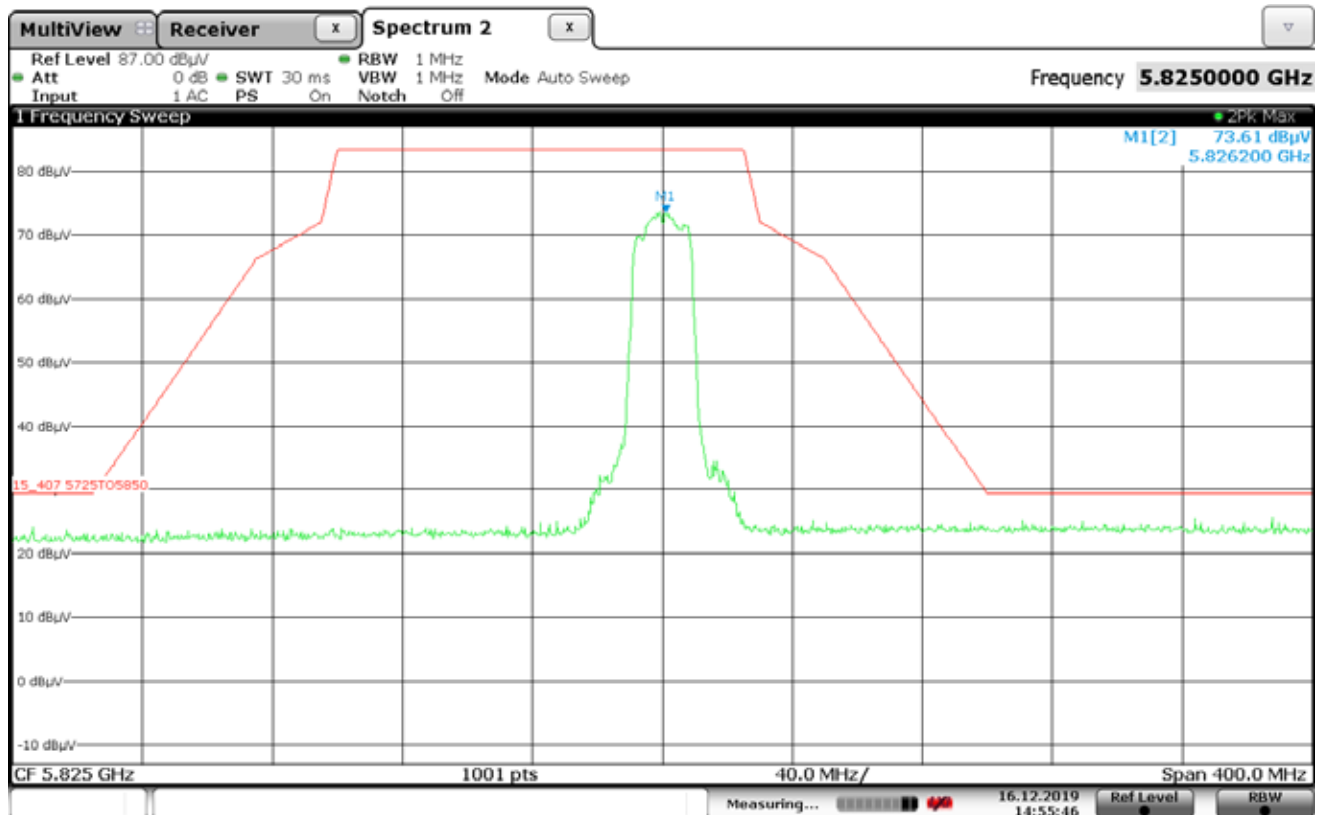
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|       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test  | Band-Edge - Horizontal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Mode  | 802.11ac20 Ch165 – 18dBm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Notes | From 5725-5850MHz the mask line sits at a meter reading of 83.3dBμV which is matched to an EIRP of 27dBm. In the ranges of 5720-5725MHz and 5850-5855MHz the line drops linearly to a meter reading of 71.9dBμV which represents an EIRP of 15.6dBm. In the ranges of 5700-5720MHz and 5855-5875MHz the line drops linearly to a meter reading of 66.3dBμV which represents an EIRP of 10dBm. In the ranges of 5650-5700MHz and 5875-5925MHz the line drops linearly to a meter reading of 29.3dBμV which represents an EIRP of -27dBm. Outside the frequency ranges aforementioned the mask line sits on a meter reading of 29.3dBμV. |



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|       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test  | Band-Edge - Vertical                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Mode  | 802.11ac20 Ch165 – 18dBm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Notes | From 5725-5850MHz the mask line sits at a meter reading of 83.3dBμV which is matched to an EIRP of 27dBm. In the ranges of 5720-5725MHz and 5850-5855MHz the line drops linearly to a meter reading of 71.9dBμV which represents an EIRP of 15.6dBm. In the ranges of 5700-5720MHz and 5855-5875MHz the line drops linearly to a meter reading of 66.3dBμV which represents an EIRP of 10dBm. In the ranges of 5650-5700MHz and 5875-5925MHz the line drops linearly to a meter reading of 29.3dBμV which represents an EIRP of -27dBm. Outside the frequency ranges aforementioned the mask line sits on a meter reading of 29.3dBμV. |



Date: 16.DEC.2019 14:55:46

## 20. Scope of Accreditation


SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

ELITE ELECTRONIC ENGINEERING, INC.  
1516 Centre Circle  
Downers Grove, IL 60515  
Robert Bugielski (QA Manager) Phone: 630 495 9770 ext. 168  
Email: [rbugielski@elitetest.com](mailto:rbugielski@elitetest.com)  
Craig Fanning (EMC Lab Manager) Phone: 630 495 9770 ext. 112  
Email: [cfanning@elitetest.com](mailto:cfanning@elitetest.com)  
Stanley Dolecki (Automotive Team Leader) Phone: 630 495 9770 ext. 103  
Email: [sdolecki@elitetest.com](mailto:sdolecki@elitetest.com)  
Website: [www.elitetest.com](http://www.elitetest.com)

## ELECTRICAL

Valid to: June 30, 2021

Certificate Number: 1786.01

In recognition of the successful completion of the A2LA Accreditation Program evaluation process, accreditation is granted to this laboratory to perform the following automotive electromagnetic compatibility and other electrical tests:

Test Technology:
Test Method(s) <sup>1</sup>:
*Transient Immunity*

ISO 7637-2 (including emissions); ISO 7637-3;  
ISO 16750-2:2012, Sections 4.6.3 and 4.6.4;  
CS-11979, Section 6.4; CS.00054, Section 5.9;  
EMC-CS-2009.1 (CI220); FMC1278 (CI220, CI221, CI222);  
GMW 3097, Section 3.5;  
SAE J1113-11; SAE J1113-12

*Electrostatic Discharge (ESD)*

ISO 10605 (2001, 2008);  
CS-11979 Section 7.0; CS.00054, Section 5.10;  
EMC-CS-2009.1 (CI 280); FMC1278 (CI280); SAE J1113-13;  
GMW 3097 Section 3.6

*Conducted Emissions*

CISPR 25 (2002, 2008), Sections 6.2 and 6.3;  
CISPR 25 (2016), Sections 6.3 and 6.4;  
CS-11979, Section 5.1; CS.00054, Sections 5.6.1 and 5.6.2;  
GMW 3097, Section 3.3.2;  
EMC-CS-2009.1 (CE 420); FMC1278 (CE420, CE421)

*Radiated Emissions Anechoic*

CISPR 25 (2002, 2008), Section 6.4;  
CISPR 25 (2016), Section 6.5;  
CS-11979, Section 5.3; CS.00054, Section 5.6.3;  
GMW 3097, Section 3.3.1;  
EMC-CS-2009.1 (RE 310); FMC1278 (RE310)

*Vehicle Radiated Emissions*

CISPR 12; ICES-002

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**Test Technology:**
**Test Method(s) <sup>1</sup>:**
*Bulk Current Injection (BCI)*

ISO 11452-4;  
CS-11979, Section 6.1; CS.00054, Section 5.8.1;  
GMW 3097, Section 3.4.1;  
SAE J1113-4;  
EMC-CS-2009.1 (RI112); FMC1278 (RI112)

*Bulk Current Injections (BCI)  
(Closed Loop Method)*

ISO 11452-4; SAE J1113-4

*Radiated Immunity Anechoic  
(Including Radar Pulse)*

ISO 11452-2; ISO 11452-5;  
CS-11979, Section 6.2; CS.00054, Section 5.8.2;  
GMW 3097, Section 3.4.2;  
EMC-CS-2009.1 (RI114); FMC1278 (RI114); SAE J1113-21

*Radiated Immunity Magnetic Field*

ISO 11452-8

*Radiated Immunity Reverb*

ISO/IEC 61000-4-21;  
GMW 3097, Section 3.4.3;  
EMC-CS-2009.1 (RI114); FMC1278 (RI114);  
ISO 11452-11

*Radiated Immunity  
(Portable Transmitters)*

ISO 11452-9;  
EMC-CS-2009.1 (RI115); FMC1278 (RI115)

*Vehicle Radiated Immunity (ALSE)*

ISO 11451-2

*Electrical Loads*

ISO 16750-2, Sections 4.2, 4.3, 4.4, 4.5, 4.6, 4.7,  
4.8, 4.9, 4.11, and 4.12

*Dielectric Withstand Voltage*

MIL-STD-202, Method 301;  
EIA-364-20D

*Insulation Resistance*

MIL-STD-202, Method 302;  
SAE/USCAR-2, Revision 6, Section 5.5.1;  
EIA-364-21D

*Contact Resistance*

MIL-STD-202, Method 307;  
SAE/USCAR-2, Revision 6, Section 5.3.1;  
EIA/ECA-364-23C;  
USCAR21-3 Section 4.5.3

*DC Resistance*

MIL-STD-202, Method 303

*Contact Chatter*

MIL-STD-202, Method 310;  
SAE/USCAR-2, Revision 6, Section 5.1.9

*Voltage Drop*

SAE/USCAR-2, Revision 6, Section 5.3.2;  
USCAR21-3 Section 4.5.6

**Test Technology:**
**Emissions**

Radiated and Conducted  
(3m Semi-anechoic chamber,  
up to 40 GHz)

**Test Method(s) <sup>1</sup>:**

47 CFR, FCC Part 15 B (using ANSI C63.4:2014);  
47 CFR, FCC Part 18 (using FCC MP-5:1986);  
ICES-001; ICES-003; ICES-005;  
IEC/CISPR 11, Ed. 4.1 (2004-06); AS/NZS CISPR 11 (2004);  
IEC/CISPR 11 Ed 5 (2009-05) + A1 (2010);  
KN 11 (2008-5) with RRL Notice No. 2008-3 (May 20, 2008);  
CISPR 11; EN 55011; KN 11; CNS 13803 (1997, 2003);  
CISPR 14-1; EN 55014-1; AS/NZS CISPR 14.1; KN 14-1;  
IEC/CISPR 22 (1997); EN 55022 (1998) + A1(2000);  
EN 55022 (1998) + A1(2000) + A2(2003); EN 55022 (2006);  
IEC/CISPR 22 (2008-09); AS/NZS CISPR 22 (2004);  
AS/NZS CISPR 22, 3rd Edition (2006); KN 22 (up to 6 GHz);  
CNS 13438 (up to 6 GHz); VCCI V-3 (up to 6 GHz);  
CISPR 32; EN 55032; KN 32

Current Harmonics

IEC 61000-3-2; EN 61000-3-2; KN 61000-3-2

Flicker and Fluctuations

IEC 61000-3-3; EN 61000-3-3; KN 61000-3-3

**Immunity**

Electrostatic Discharge

IEC 61000-4-2, Ed. 1.2 (2001);  
IEC 61000-4-2 (1995) + A1(1998) + A2(2000);  
EN 61000-4-2 (1995); EN 61000-4-2 (2009-05);  
KN 61000-4-2 (2008-5); RRL Notice No. 2008-4 (May 20, 2008);  
IEC 61000-4-2; EN 61000-4-2; KN 61000-4-2;  
IEEE C37.90.3 2001

Radiated Immunity

IEC 61000-4-3 (1995) + A1(1998) + A2(2000);  
IEC 61000-4-3, Ed. 3.0 (2006-02);  
IEC 61000-4-3, Ed. 3.2 (2010);  
KN 61000-4-3 (2008-5); RRL Notice No. 2008-4 (May 20, 2008);  
IEC 61000-4-3; EN 61000-4-3; KN 61000-4-3;  
IEEE C37.90.2 2004

Electrical Fast Transient/Burst

IEC 61000-4-4, Ed. 2.0 (2004-07); IEC 61000-4-4, Ed. 2.1 (2011);  
IEC 61000-4-4 (1995) + A1(2000) + A2(2001);  
KN 61000-4-4 (2008-5); RRL Notice No. 2008-5 (May 20, 2008);  
IEC 61000-4-4; EN 61000-4-4; KN 61000-4-4

Surge

IEC 61000-4-5 (1995) + A1(2000);  
IEC 61000-4-5, Ed 1.1 (2005-11);  
EN 61000-4-5 (1995) + A1(2001);  
KN 61000-4-5 (2008-5); RRL Notice No. 2008-4 (May 20, 2008);  
IEC 61000-4-5; EN 61000-4-5; KN 61000-4-5;  
IEEE C37.90.1 2012

**Test Technology:**
**Test Method(s) <sup>1</sup>:**
**Immunity (cont'd)**
**Conducted Immunity**

IEC 61000-4-6 (1996) + A1(2000);  
IEC 61000-4-6, Ed 2.0 (2006-05);  
IEC 61000-4-6 Ed. 3.0 (2008);  
KN 61000-4-6 (2008-5); RRL Notice No. 2008-4 (May 20, 2008);  
EN 61000-4-6 (1996) + A1(2001); IEC 61000-4-6; EN 61000-4-6;  
KN 61000-4-6

**Power Frequency Magnetic Field Immunity**

IEC 61000-4-8 (1993) + A1(2000); IEC 61000-4-8 (2009);  
EN 61000-4-8 (1994) + A1(2000);  
KN 61000-4-8 (2008-5); RRL Notice No. 2008-4 (May 20, 2008);  
IEC 61000-4-8; EN 61000-4-8; KN 61000-4-8

**Voltage Dips, Short Interrupts, and Line Voltage Variations**

IEC 61000-4-11, Ed. 2 (2004-03);  
KN 61000-4-11 (2008-5);  
RRL Notice No. 2008-4 (May 20, 2008);  
IEC 61000-4-11; EN 61000-4-11; KN 61000-4-11

**Ring Wave**

IEC 61000-4-12, Ed. 2 (2006-09);  
EN 61000-4-12:2006;  
IEC 61000-4-12; EN 61000-4-12; KN 61000-4-12

**Generic and Product Specific EMC Standards**

IEC/EN 61000-6-1; AS/NZS 61000-6-1; KN 61000-6-1;  
IEC/EN 61000-6-2; AS/NZS 61000-6-2; KN 61000-6-2;  
IEC/EN 61000-6-3; AS/NZS 61000-6-3; KN 61000-6-3;  
IEC/EN 61000-6-4; AS/NZS 61000-6-4; KN 61000-6-4;  
EN 50130-4; IEC 61326-1;  
IEC/CISPR 14-2; EN 55014-2; AS/NZS CISPR 14.2; KN 14-2;  
IEC/CISPR 24; AS/NZS CISPR 24; EN 55024; KN 24;  
IEC 60601-1-2; JIS T0601-1-2

***TxRx EMC Requirements***

EN 301 489-1; EN 301 489-3; EN 301 489-9; EN 301 489-17;  
EN 301 489-19; EN 301 489-52;

***European Radio Test Standards***

ETSI EN 300 086-1; ETSI EN 300 086-2;  
ETSI EN 300 113-1; ETSI EN 300 113-2;  
ETSI EN 300 220-1; ETSI EN 300 220-2;  
ETSI EN 300 330-1; ETSI EN 300 330-2;  
ETSI EN 300 440-1; ETSI EN 300 440-2;  
ETSI EN 300 422-1; ETSI EN 300 422-2;  
ETSI EN 300 328; ETSI EN 301 893;  
ETSI EN 301 511; ETSI EN 301 908-1;  
ETSI EN 908-2; ETSI EN 908-13;  
ETSI EN 301 413;  
ETSI EN 302 502

**Test Technology:**
**Test Method(s) <sup>1</sup>:**
**Canadian Radio Tests**

RSS-102 (RF Exposure Evaluation only); RSS-111; RSS-112; RSS-117; RSS-119; RSS-123; RSS-125; RSS-127; RSS-130; RSS-131; RSS-132; RSS-133; RSS-134; RSS-135; RSS-137; RSS-139; RSS-140; RSS-141; RSS-142; RSS-170; RSS-181; RSS-182; RSS-191; RSS-192; RSS-194; RSS-195; RSS-196; RSS-197; RSS-199; RSS-210; RSS-211; RSS-213; RSS-215; RSS-216; RSS-220; RSS-222; RSS-236; RSS-238; RSS-243; RSS-244; RSS-246; RSS-247; RSS-251; RSS-252; RSS-287; RSS-288; RSS-310; RSS-GEN

**Mexico Radio Tests**

IFT-008; NOM-208-SCFI

**Japan Radio Tests**

Radio Law No. 131, Ordinance of MPT No. 37, 1981, MIC Notification No. 88:2004, Table No. 22-11; ARIB STD-T66, Regulation 18

**Taiwan Radio Tests**

LP-0002

**Australia/New Zealand Radio Tests**

AS/NZS 4268; Radiocommunications (Short Range Devices) Standard (2014)

**Hong Kong Radio Tests**

HKCA 1039 Issue 6; HKCA 1042; HKCA 1033 Issue 7; HKCA 1061; HKCA 1008; HKCA 1043; HKCA 1057; HKCA 1073

**Korean Radio Test Standards**

KN 301 489-1; KN 301 489-3; KN 301 489-9; KN 301 489-17; KN 301 489-52

**Unlicensed Radio Frequency Devices  
(3 Meter Semi-Anechoic Room)**

47 CFR FCC Part 15C, 15D, 15E, 15F, 15G, 15H (using ANSI C63.10:2013, ANSI C63.17:2013 and FCC KDB 905462 D02 (v02))

**Licensed Radio Service Equipment**

47 CFR FCC Parts 20, 22, 24, 25, 27, 30, 73, 74, 80, 87, 90, 95, 96, 97, 101; ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015;

**Electrical Measurements and  
Simulation**
**AC Voltage / Current**

(1mV to 5kV) 60 Hz

(0.1V to 250V) up to 500 MHz

(1μA to 150A) 60 Hz

**DC Voltage / Current**

(1mV to 15-kV) / (1μA to 10A)

**Power Factor / Efficiency / Crest Factor**

(Power to 30kW)

**Resistance**

(1mΩ to 4000MΩ)

**Surge**

(Up to 10 kV / 5 kA) (Combination Wave and Ring Wave)

FAA AC 150/5345-10H

FAA AC 150/5345-43J

FAA AC 150/5345-44K

FAA AC 150/5345-46E

FAA AC 150/5345-47C

FAA EB 67D

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On the following products and materials:

Telecommunications Terminal Equipment (TTE), Radio Equipment, Network Equipment, Information Technology Equipment (ITE), Automotive Electronic Equipment, Automotive Hybrid Electronic Devices, Maritime Navigation and Radio Communication Equipment and Systems, Vehicles, Boats and Internal Combustion Engine Driven Devices, Automotive, Aviation, and General Lighting Products, Medical Electrical Equipment, Motors, Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment, Household Appliances, Electric Tools, Low-voltage Switchgear and Control gear, Programmable Controllers, Electrical Equipment for Measurement, Control and Laboratory Use, Base Materials, Power and Data Transmission Cables and Connectors

<sup>1</sup> When the date, revision or edition of a test method standard is not identified on the scope of accreditation, the laboratory is expected to be using the current version within one year of the date of publication, per part C., Section 1 of A2LA R101 - *General Requirements - Accreditation of ISO-IEC 17025 Laboratories*.

Testing Activities Performed in Support of FCC Declaration of Conformity and Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1<sup>2</sup>

| Rule Subpart/Technology                                  | Test Method              | Maximum Frequency (MHz) |
|----------------------------------------------------------|--------------------------|-------------------------|
| <u>Unintentional Radiators</u>                           |                          |                         |
| Part 15B                                                 | ANSI C63.4:2014          | 40000                   |
| <u>Industrial, Scientific, and Medical Equipment</u>     |                          |                         |
| Part 18                                                  | FCC MP-5 (February 1986) | 40000                   |
| <u>Intentional Radiators</u>                             |                          |                         |
| Part 15C                                                 | ANSI C63.10:2013         | 40000                   |
| <u>Unlicensed Personal Communication Systems Devices</u> |                          |                         |
| Part 15D                                                 | ANSI C63.17:2013         | 40000                   |
| <u>U-NII without DFS Intentional Radiators</u>           |                          |                         |
| Part 15E                                                 | ANSI C63.10:2013         | 40000                   |
| <u>U-NII with DFS Intentional Radiators</u>              |                          |                         |
| Part 15E                                                 | FCC KDB 905462 D02 (v02) | 40000                   |
| <u>UWB Intentional Radiators</u>                         |                          |                         |
| Part 15F                                                 | ANSI C63.10:2013         | 40000                   |
| <u>BPL Intentional Radiators</u>                         |                          |                         |
| Part 15G                                                 | ANSI C63.10:2013         | 40000                   |
| <u>White Space Device Intentional Radiators</u>          |                          |                         |
| Part 15H                                                 | ANSI C63.10:2013         | 40000                   |

Testing Activities Performed in Support of FCC Declaration of Conformity and Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1<sup>2</sup>

| Rule Subpart/Technology                                                                                                                                    | Test Method                                         | Maximum Frequency (MHz) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-------------------------|
| <u>Commercial Mobile Services (FCC Licensed Radio Service Equipment)</u><br>Parts 22 (cellular), 24, 25 (below 3 GHz), and 27                              | ANSI/TIA-603-E; TIA-102.CAAA-E;<br>ANSI C63.26:2015 | 40000                   |
| <u>General Mobile Radio Services (FCC Licensed Radio Service Equipment)</u><br>Parts 22 (non-cellular), 90 (below 3 GHz), 95, 97, and 101 (below 3 GHz)    | ANSI/TIA-603-E; TIA-102.CAAA-E;<br>ANSI C63.26:2015 | 40000                   |
| <u>Citizens Broadband Radio Services (FCC Licensed Radio Service Equipment)</u><br>Part 96                                                                 | ANSI/TIA-603-E; TIA-102.CAAA-E;<br>ANSI C63.26:2015 | 40000                   |
| <u>Maritime and Aviation Radio Services</u><br>Parts 80 and 87                                                                                             | ANSI/TIA-603-E; ANSI C63.26:2015                    | 40000                   |
| <u>Microwave and Millimeter Bands Radio Services</u><br>Parts 25, 30, 74, 90 (above 3 GHz), 97 (above 3 GHz), and 101                                      | ANSI/TIA-603-E; TIA-102.CAAA-E;<br>ANSI C63.26:2015 | 40000                   |
| <u>Broadcast Radio Services</u><br>Parts 73 and 74 (below 3 GHz)                                                                                           | ANSI/TIA-603-E; TIA-102.CAAA-E;<br>ANSI C63.26:2015 | 40000                   |
| <u>Signal Boosters</u><br>Part 20 (Wideband Consumer Signal Boosters, Provider-specific signal boosters, and Industrial Signal Boosters)<br>Section 90.219 | ANSI C63.26:2015                                    | 40000                   |

<sup>2</sup>Accreditation does not imply acceptance to the FCC equipment authorization program. Please see the FCC website (<https://apps.fcc.gov/oetcf/cas/>) for a listing of FCC approved laboratories.



## Accredited Laboratory

A2LA has accredited

**ELITE ELECTRONIC ENGINEERING INC.**

Downers Grove, IL

for technical competence in the field of

**Electrical Testing**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 8<sup>th</sup> day of August 2019.

A handwritten signature in blue ink, likely of the Vice President of Accreditation Services.

Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 1786.01  
Valid to June 30, 2021

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.