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# Limited test report

## 451748-1TRFWL

Date of issue: February 10, 2022

Applicant:

Fujitsu Network Communications

Product:

Dual Band RU for North America

Model:

DB 5G RU

Model variant:

N/A

FCC ID:

CFD5GRUDB

Specifications:

- FCC 47 CFR Part 27

  Miscellaneous Wireless Communications Services

## Lab and test locations

| | |
|---|---|
| Company name | Nemko USA Inc. |
| Address | 2210 Faraday Ave, Suite 150 |
| City | Carlsbad |
| Province | California |
| Postal code | 92008 |
| Country | USA |
| Telephone | +1 760 444 3500 |
| Website | www.nemko.com |

| | |
|---|---|
| Tested by | Martha Espinoza, Wireless Test Engineer |
| Reviewed by | James Cunningham, EMC/MIL/WL Supervisor |
| Review date | February 10, 2022 |
| Reviewer signature |  |

## Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.
This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko USA's ISO/IEC 17025 accreditation.
This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

## Copyright notification

# Table of contents

# **Section 1.** Report summary

## 1.1 Applicant and manufacturer

| | |
|---|---|
| Company name | Fujitsu Networks Communications, Inc. |
| Address | 2801 Telecom Parkway |
| City | Richardson |
| Province/State | TX |
| Postal/Zip code | 75082 |
| Country | United States of America |

## 1.2 Test specifications

| | |
|---|---|
| FCC 47 CFR Part 27 | Miscellaneous Wireless Communications Services |

## 1.3 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was completed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See “Summary of test results” for full details.

## 1.4 Exclusions

None

## 1.5 Test report revision history

| Revision # | Details of changes made to test report |
|---|---|
| 451748-1TRFWL | Original report issued |

# **Section 2.** Summary of test results

## 2.1 FCC Part 27 test results

| Part | Test description | Verdict |
|---|---|---|
| §2.1033(c)(4) | Modulation type | Pass |
| §2.1049(h) | 99% Occupied bandwidth | Pass |
| §27.50(h)(j) | Frequency ranges | Pass |
| §27.50(d)(2)(ii) | Output power at RF antenna connector | Pass |
| §27.50(d)(5) | Peak to average power ratio | Pass |
| §27.53(h)(1) | Conducted spurious emissions | Pass |
| §27.53(h)(1) | Radiated spurious emissions | Pass |
| §27.53(h)(3) | 26 dB Occupied bandwidth | Pass |
| §27.54 | Frequency stability | Not tested[1] |

[1]Note: Methodology and test result for frequency stability test are described in the report 443812-1TRFWL Section 8.7, Page 65.

This testing covers the addition of a 15 MHz bandwidth option for the 1995 - 2020 MHz band (Band n70) and the 2110 – 2200 MHz (Band n66) band.

# **Section 3.** Equipment under test (EUT) details

## 3.1 Sample information

| | |
|---|---|
| Receipt date | January 21, 2022 |
| Nemko sample ID number | NEx: 451748 |

## 3.2 EUT information

| | |
|---|---|
| Product name | Dual Band RU for North America |
| Model | DB 5G RU |
| Model variant | N/A |
| Serial number | 10016 |

## 3.3 Technical information

| | |
|---|---|
| Frequency band | 1995 - 2020 MHz (Band n70) and 2110 – 2200 MHz (Band n66) |
| Frequency Min (MHz) | 2117.5 MHz (Band 66); 2002.5 MHz (Band 70) |
| Frequency Max (MHz) | 2192.5 MHz (Band 66); 2012.5 MHz (Band 70) |
| RF power Min (W), Conducted | 61.801 Watts or 47.91 dBm (Port B); 247.172 Watts or 53.93 dBm (Total power across all ports); Band n66 |
| RF power Max (W), Conducted | 64.714 Watts or 48.11 dBm (Port B); 258.821 Watts or 54.13 dBm (Total power across all ports); Band n66 |
| RF power Min (W), Conducted | 42.266 Watts or 46.26 dBm (Port B); 169.044 Watts or 52.28 dBm (Total power across all ports); Band n70 |
| RF power Max (W), Conducted | 44.258 Watts or 46.46 dBm (Port B); 177.010 Watts or 52.48 dBm (Total power across all ports); Band n70 |
| Field strength, Units @ distance | 54.24 dBµV/m @ 3m (23594.733333 MHz); Band n66 |
| Field strength, Units @ distance | 52.09 dBµV/m @ 3m (13760.733333 MHz); Band n70 |
| Measured BW (kHz) (26 dB) | 15.29015 MHz (15 MHz OBW Declared); Band n66 |
| Measured BW (kHz) (26 dB) | 15.28358 MHz (15 MHz OBW Declared); Band n70 |
| Type of modulation | QPSK; 16QAM; 64QAM; 256QAM |
| Transmitter spurious, Units @ distance | 3 Meters |
| Power requirements | -48 VDC |
| Antenna information | The EUT is professionally installed. |

## 3.4 Product description and theory of operation

The radio unit (RU) is one of the components to configure the 5G RAN mobile communication system. The RU has two band frequencies: band n66 and band n70. Four antenna ports are shared across the frequency bands.

## 3.5 EUT exercise details

A laptop computer was used to send test commands to EUT to force it to transmit the appropriate signal. Unit transmit the selected signal at full power: 60 Watts in band n66 and 40 Watts in band n70. The maximum power is only available in one band at the time due the maximum power supported by unit is 80 Watts. The unit was tested using a conducted port. The antenna installation shall be done by professionals, and they are not within the scope of the tests evaluated on this document.

## 3.6 EUT setup diagram

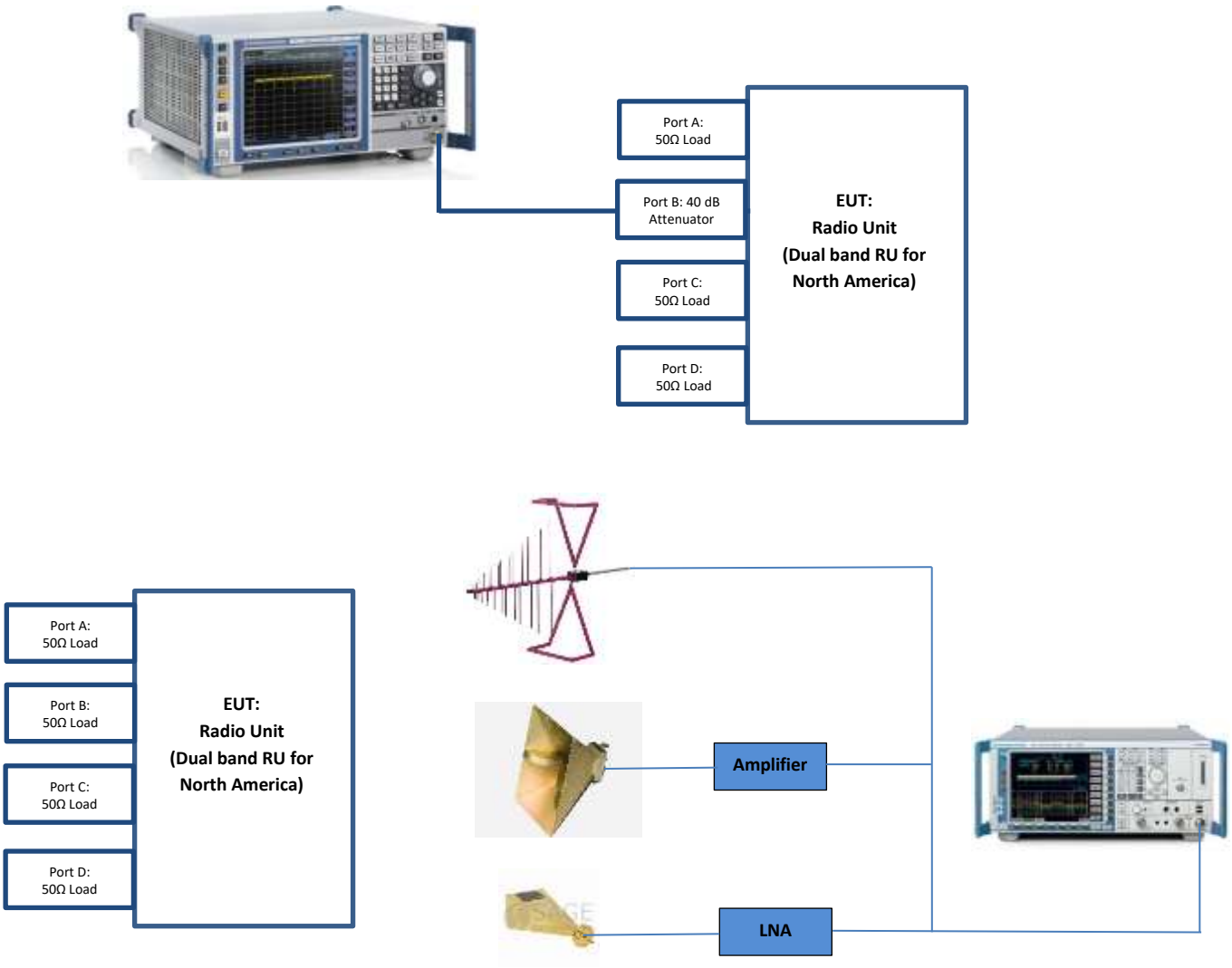



***Figure 3.6-1:*** *Setup diagram*

# **Section 4.** Engineering considerations

## 4.1 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

## 4.2 Technical judgment

None

## 4.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

# **Section 5.** Test conditions

## 5.1 Atmospheric conditions

| | |
|---|---|
| Temperature | 15–30 °C |
| Relative humidity | 20–75 % |
| Air pressure | 860–1060 mbar |

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

## 5.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.

# **Section 6.** Measurement uncertainty

## 6.1 Uncertainty of measurement

Measurement uncertainty budgets for the tests are detailed below. Measurement uncertainty calculations assume a coverage factor of K = 2 with 95% certainty.

***Table 6.1-1:*** *Measurement uncertainty.*

| Test name | Measurement uncertainty, dB |
|---|---|
| All antenna port measurements/ including OBW | 0.55 |
| Conducted spurious emissions | 1.13 |
| Radiated spurious emissions | 3.78 |
| AC power line conducted emissions | 1.38 |
| Supply Voltages | 0.05% |
| Time | 2.09% |

# **Section 7.** Test equipment

## 7.1 Test equipment list

***Table 7.1-1:*** *Equipment list*

| Equipment | Manufacturer | Model no. | Asset no. | Cal cycle | Next cal. |
|---|---|---|---|---|---|
| EMC Test Receiver | Rohde & Schwarz | ESU 40 | E1121 | 1 year | 05-19-2022 |
| Signal Analyzer | Rohde & Schwarz | FSV 40 | E1120 | 2 years | 11-19-2023 |
| Antenna, Bilog | Schaffner-Chase | CBL6111C | 1763 | 2 years | 02-18-2022 |
| Antenna, Horn | ETS | 3117-PA | E1139 | 2 years | 04-20-2022 |
| Antenna, Horn | Sage Millimeter | SAR-2309-42-S2 | E1143 | 2 years | 11-13-2022 |
| Low Noise Amplifier | Sage Millimeter | SBL-1834034030-KFKF-SI | E1228 | NCR | NCR |
| Power sensor | ETS-Lindgren | 7002-006 | E1062 | 1 year | 05-20-2022 |

Note: NCR - no calibration required

# Section 8. Testing data

## 8.1 FCC §2.1033(c)(4) Modulation type

### 8.1.1 Definitions and limits

(c) Applications for equipment other than that operating under parts 15, 11 and 18 of this chapter shall be accompanied by a technical report containing the following information:

(4) Type or types of emission

### 8.1.2 Test summary

| | | | |
|---|---|---|---|
| Test date | January 24, 2022 | Temperature | 22 °C |
| Test engineer | Martha Espinoza | Air pressure | 1003 mbar |
| Verdict | Pass | Relative humidity | 54 % |

### 8.1.3 Observations, settings and special notes

None

### 8.1.4 Test data

| Band | Channel (MHz) | Bandwidth (MHz) | Emission type |
|---|---|---|---|
| n66 | 2117.5 | 15 | QPSK; 16QAM; 64QAM; 256QAM |
| n66 | 2155 | 15 | QPSK; 16QAM; 64QAM; 256QAM |
| n66 | 2192.5 | 15 | QPSK; 16QAM; 64QAM; 256QAM |
| n70 | 2002.5 | 15 | QPSK; 16QAM; 64QAM; 256QAM |
| n70 | 2012.5 | 15 | QPSK; 16QAM; 64QAM; 256QAM |

***Table 8.1-1:*** *Types of emission*

## 8.2 FCC §2.1049(h) & 99% §27.5 (h)(j) Occupied Bandwidth and frequency ranges

### 8.2.1 Definitions and limits

§2.1049 (h) Transmitters employing digital modulation techniques—when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at the discretion of the use.
§27 (h)(j)(k)
(h) 1710-1755 MHz, 2110-2155 MHz, 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz bands.
(j) 2000-2020 MHz and 2180-2200 MHz bands.
(k) 1915-1920 MHz and 1995-2000 MHz bands.

### 8.2.2 Test summary

| | | | |
|---|---|---|---|
| Test date | January 24, 2022 | Temperature | 22 °C |
| Test engineer | Martha Espinoza | Air pressure | 1003 mbar |
| Verdict | Pass | Relative humidity | 54 % |

### 8.2.3 Observations, settings and special notes

Spectrum analyzer settings:

| | |
|---|---|
| Resolution bandwidth | 1% - 5% OBW |
| Video bandwidth | 3*RBW |
| Frequency span | 2*OBW |
| Detector mode | Peak |
| Trace mode | Max Hold |

### 8.2.4 Test data

| Band | OBW Declared | Port | Channel (MHz) | 99% OBW |
|---|---|---|---|---|
| n66 | 15 MHz | B | 2117.5 | 14.239 MHz |
| n66 | 15 MHz | B | 2155 | 14.242 MHz |
| n66 | 15 MHz | B | 2192.5 | 14.242 MHz |
| n70 | 15 MHz | B | 2002.5 | 14.239 MHz |
| n70 | 15 MHz | B | 2012.5 | 14.242 MHz |

***Table 8.2-1**: 99% Occupied bandwidth, QPSK Modulation.*

| Band | OBW Declared | Port | Channel (MHz) | 99% OBW |
|---|---|---|---|---|
| n66 | 15 MHz | B | 2117.5 | 14.304 MHz |
| n66 | 15 MHz | B | 2155 | 14.310 MHz |
| n66 | 15 MHz | B | 2192.5 | 14.309 MHz |
| n70 | 15 MHz | B | 2002.5 | 14.307 MHz |
| n70 | 15 MHz | B | 2012.5 | 14.314 MHz |

***Table 8.2-2**: 99% Occupied bandwidth, 16QAM Modulation.*

| Band | OBW Declared | Port | Channel (MHz) | 99% OBW |
|---|---|---|---|---|
| n66 | 15 MHz | B | 2117.5 | 14.235 MHz |
| n66 | 15 MHz | B | 2155 | 14.236 MHz |
| n66 | 15 MHz | B | 2192.5 | 14.234 MHz |
| n70 | 15 MHz | B | 2002.5 | 14.234 MHz |
| n70 | 15 MHz | B | 2012.5 | 14.237 MHz |

***Table 8.2-3**: 99% Occupied bandwidth, 64QAM Modulation.*

| Band | OBW Declared | Port | Channel (MHz) | 99% OBW |
|---|---|---|---|---|
| n66 | 15 MHz | B | 2117.5 | 14.224 MHz |
| n66 | 15 MHz | B | 2155 | 14.231 MHz |
| n66 | 15 MHz | B | 2192.5 | 14.221 MHz |
| n70 | 15 MHz | B | 2002.5 | 14.223 MHz |
| n70 | 15 MHz | B | 2012.5 | 14.227 MHz |

***Table 8.2-4**: 99% Occupied bandwidth, 256QAM Modulation.*

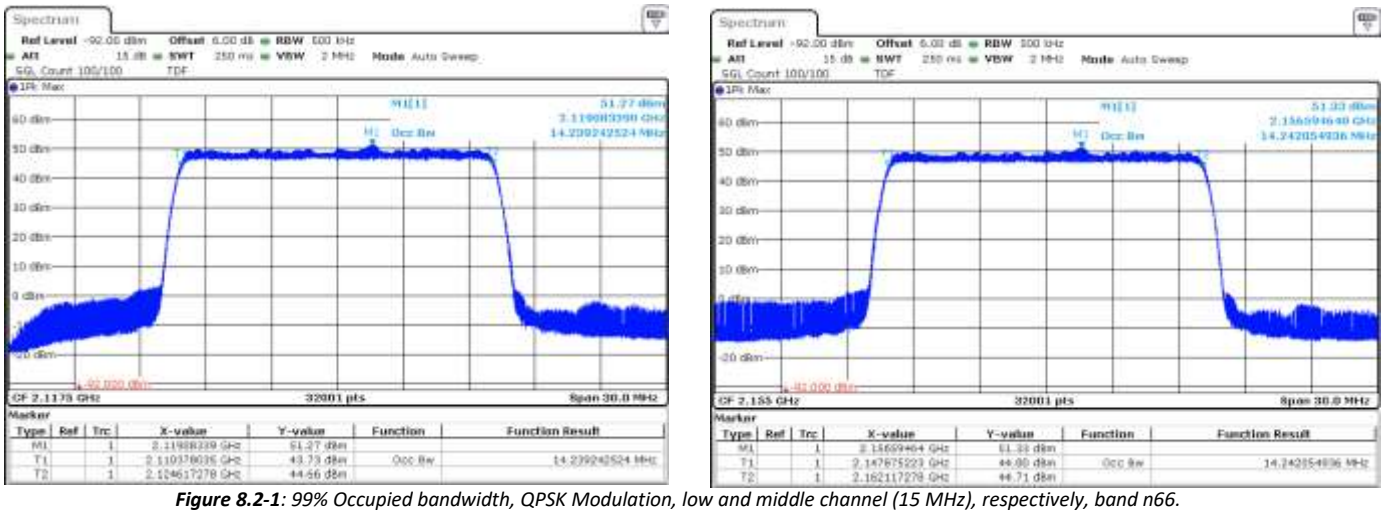



***Figure 8.2-1**: 99% Occupied bandwidth, QPSK Modulation, low and middle channel (15 MHz), respectively, band n66.*

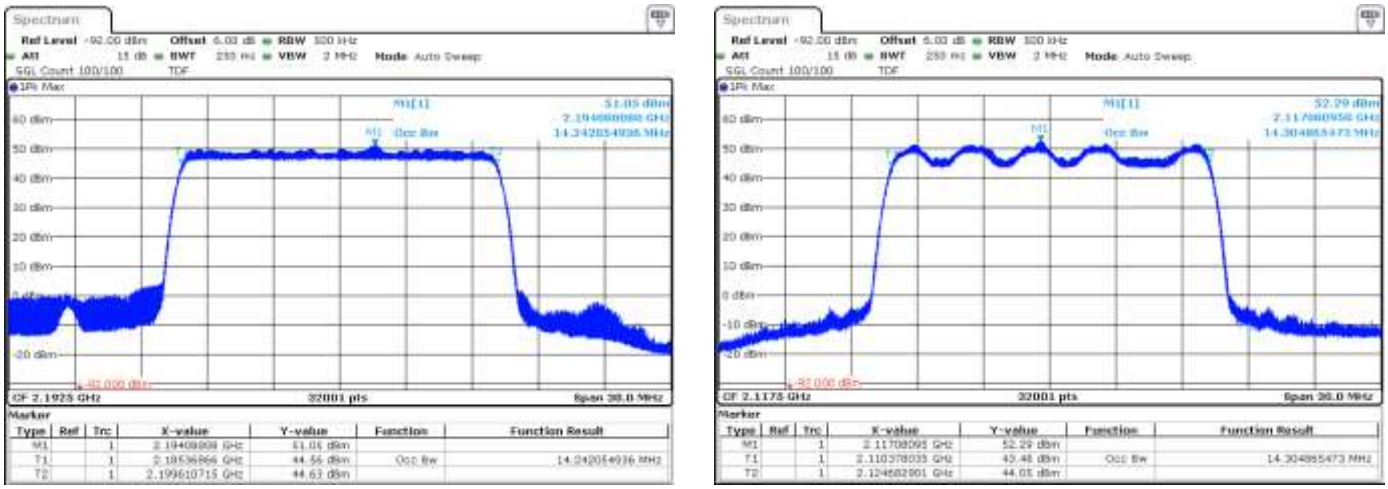



***Figure 8.2-2**: 99% Occupied bandwidth, QPSK Modulation, high channel (15 MHz) and 16QAM Modulation, low channel (15 MHz), respectively, band n66*

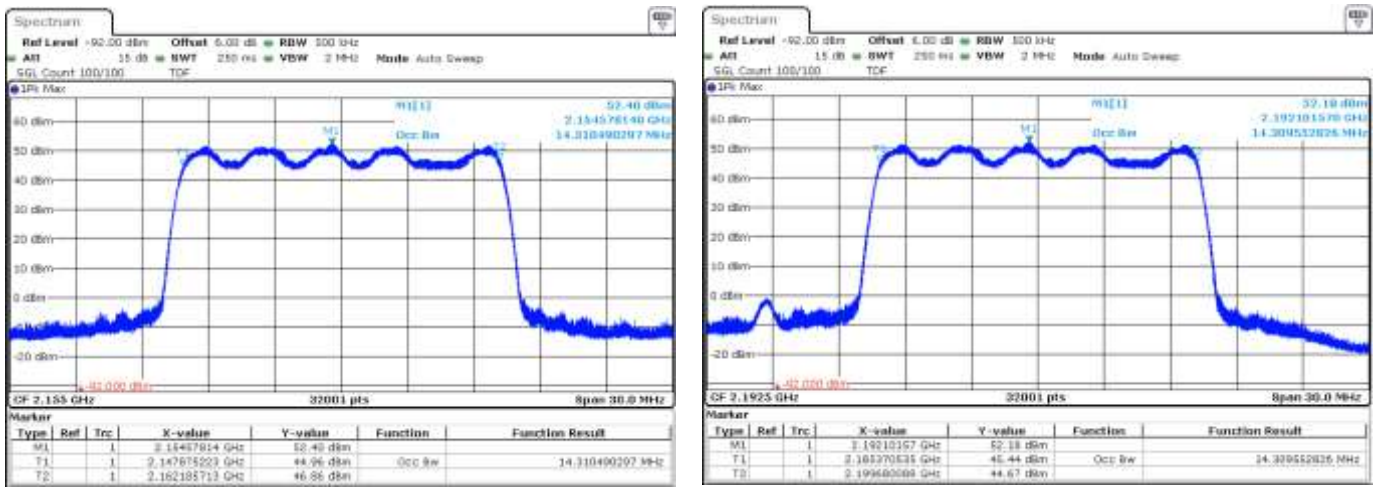


***Figure 8.2-3**: 99% Occupied bandwidth, 16QAM Modulation, middle and high channel (15 MHz), respectively, band n66.*

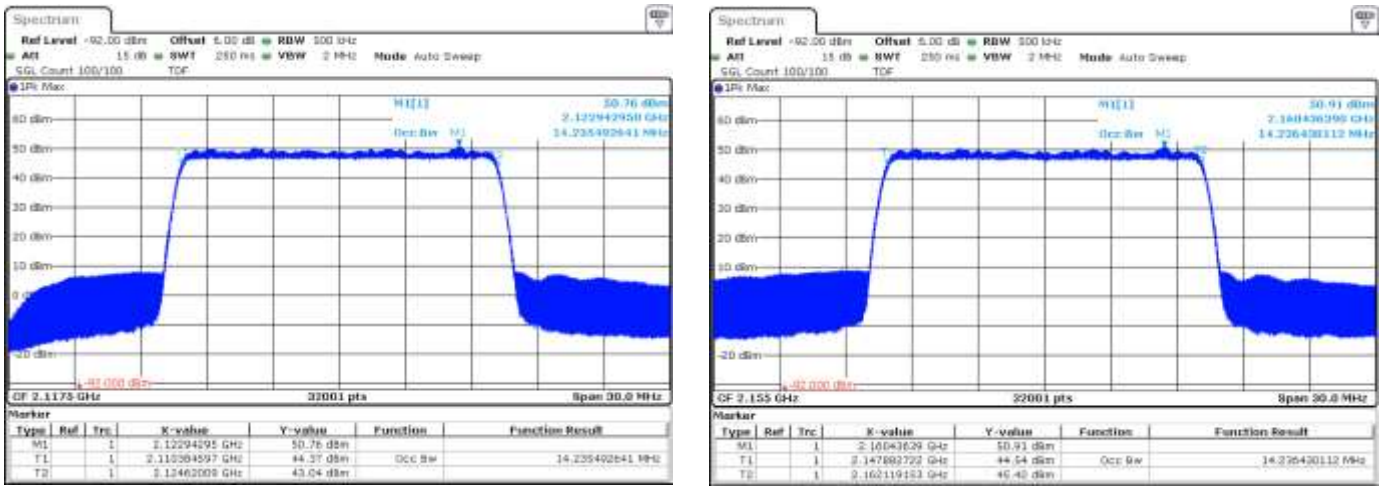


***Figure 8.2-4**: 99% Occupied bandwidth, 64QAM Modulation, low and middle channel (15 MHz), respectively, band n66.*

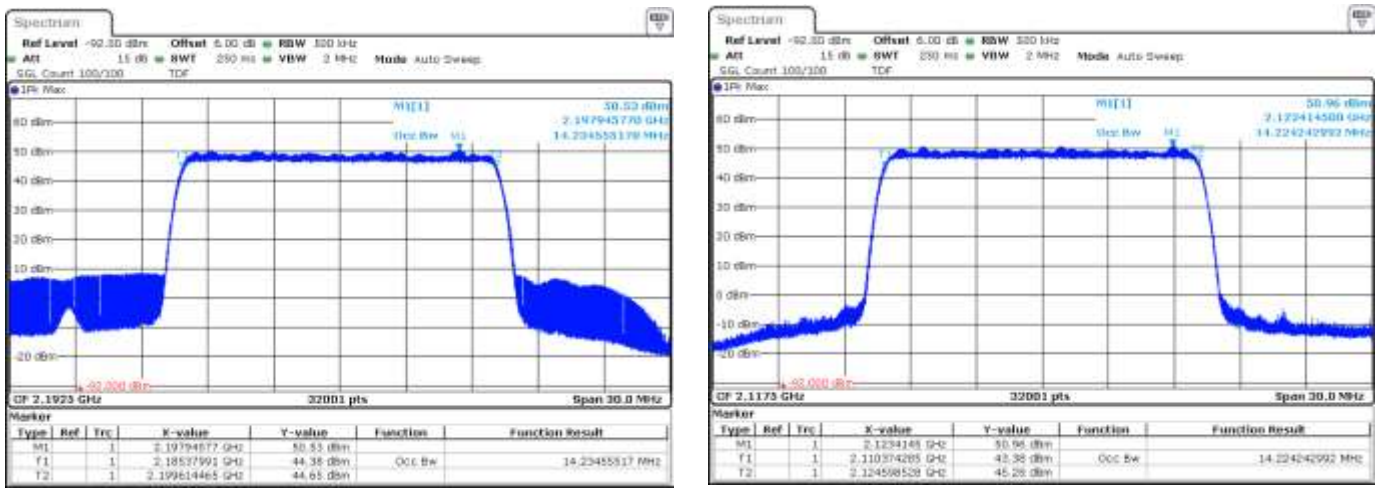
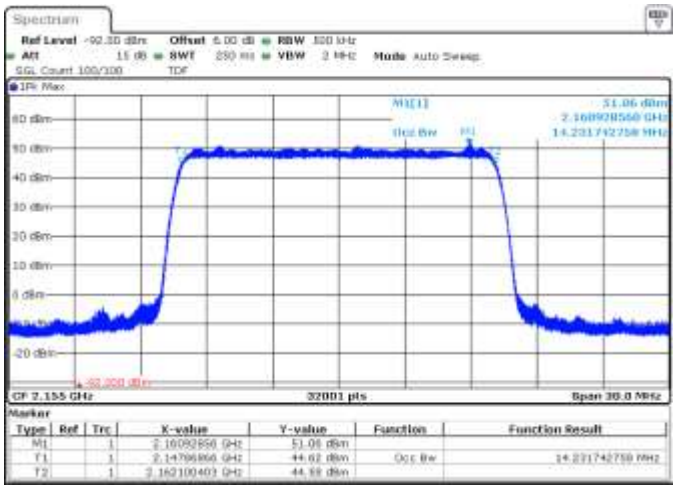


***Figure 8.2-5**: 99% Occupied bandwidth, 64QAM Modulation, high channel (15 MHz) and 256QAM Modulation, low channel (15 MHz), respectively, band n66*



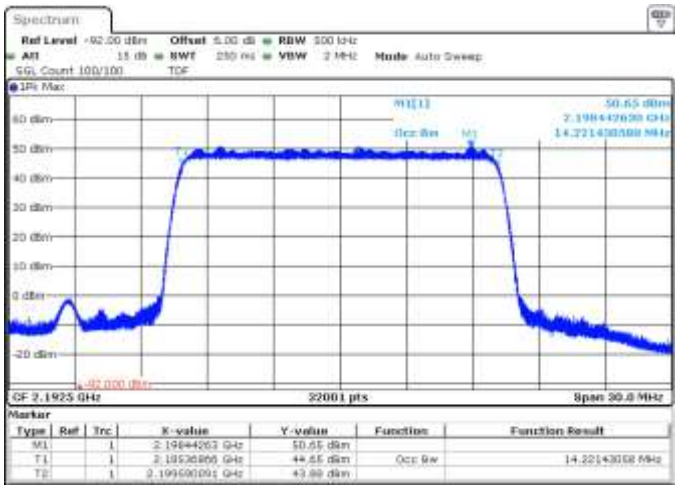
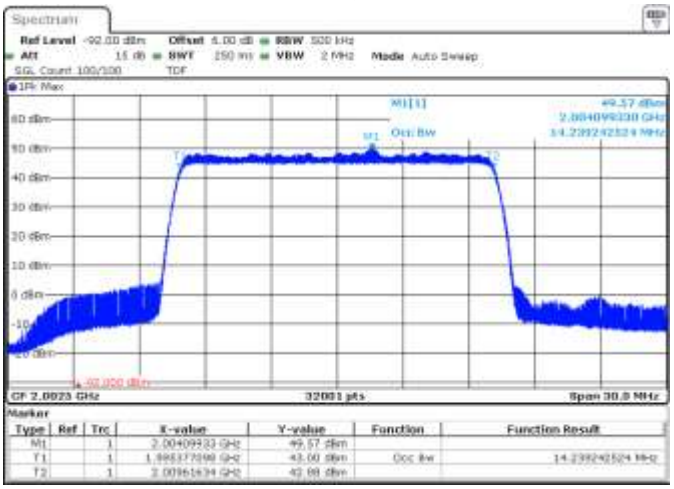




***Figure 8.2-6**: 99% Occupied bandwidth, 256QAM Modulation, middle and high channel (15 MHz), respectively, band n66.*



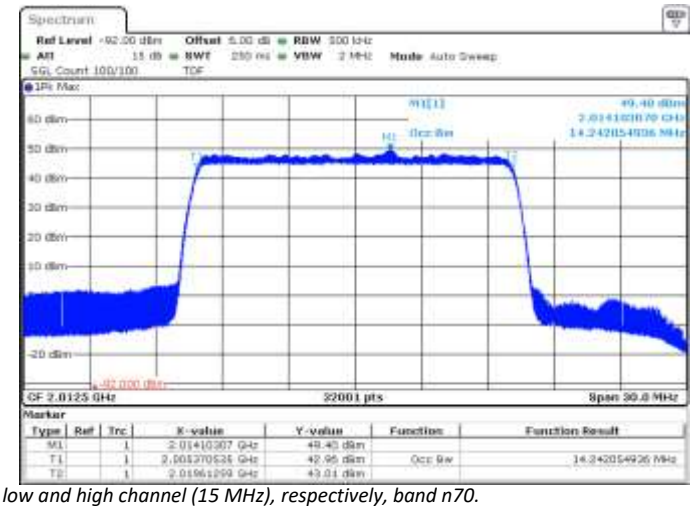
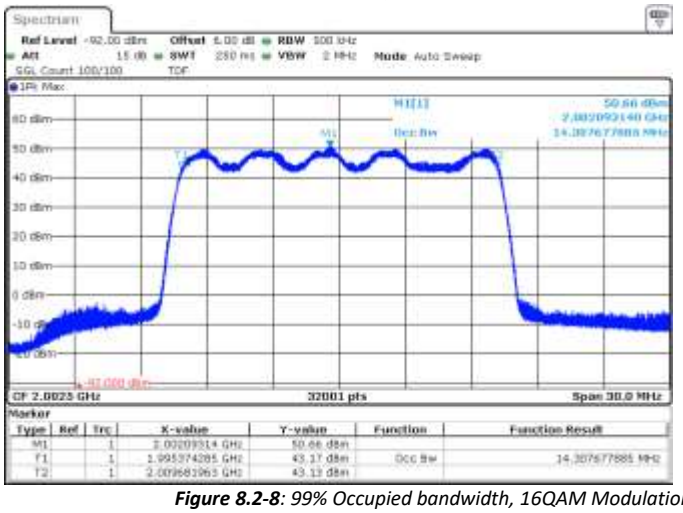




***Figure 8.2-7**: 99% Occupied bandwidth, QPSK Modulation, low and high channel (15 MHz), respectively, band n70.*



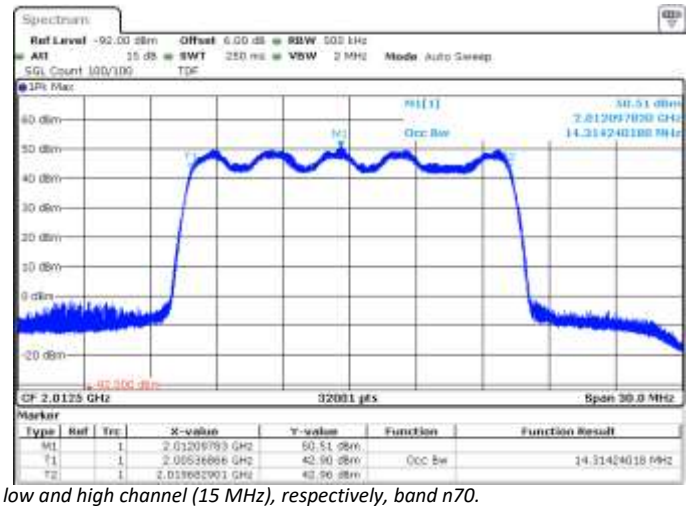




***Figure 8.2-8**: 99% Occupied bandwidth, 16QAM Modulation, low and high channel (15 MHz), respectively, band n70.*

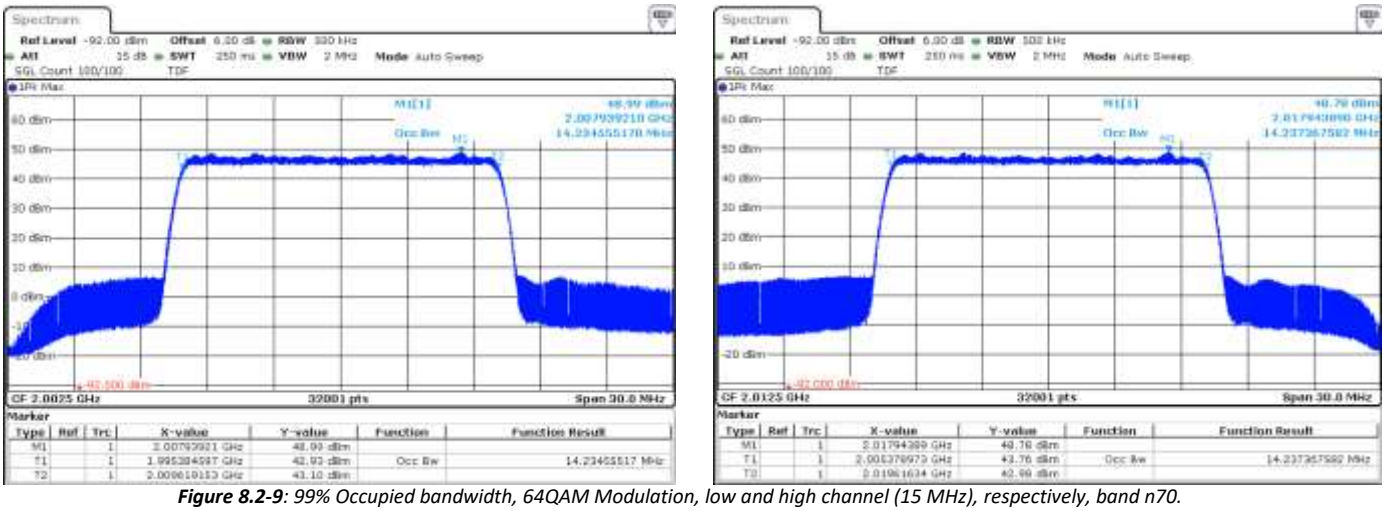



***Figure 8.2-9**: 99% Occupied bandwidth, 64QAM Modulation, low and high channel (15 MHz), respectively, band n70.*

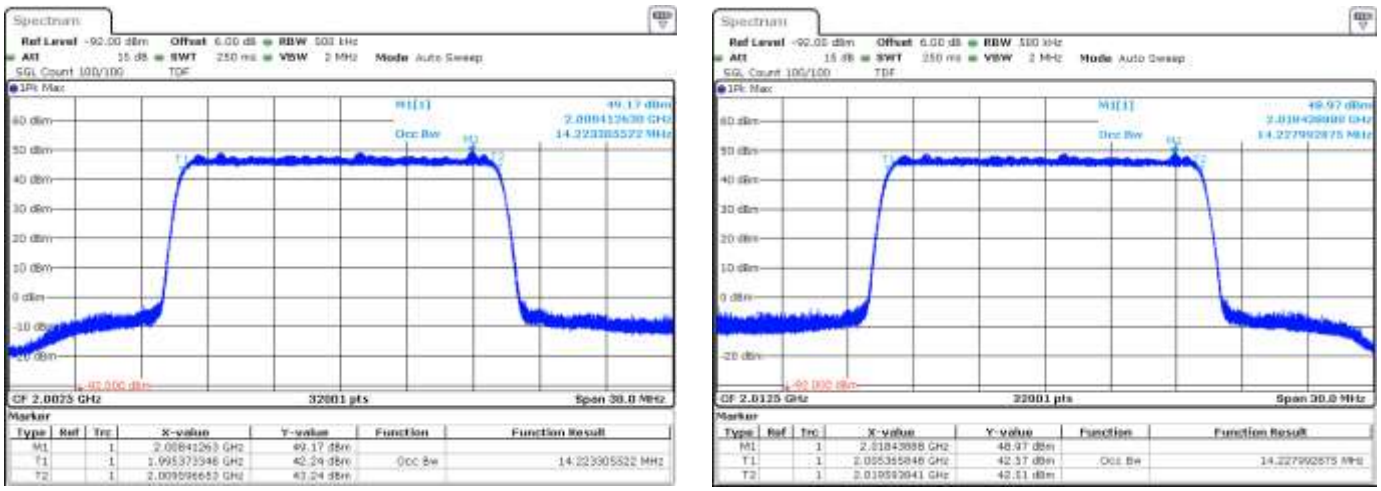



***Figure 8.2-10**: 99% Occupied bandwidth, 256QAM Modulation, low and high channel (15 MHz), respectively, band n70.*

## 8.3 FCC §27.53 (h)(3) 26 dB Occupied Bandwidth

### 8.3.1 Definitions and limits

(3) Measurement procedure. (i) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1-megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

### 8.3.2 Test summary

| | | | |
|---|---|---|---|
| Test date | January 24, 2022 | Temperature | 22 °C |
| Test engineer | Martha Espinoza | Air pressure | 1003 mbar |
| Verdict | Pass | Relative humidity | 54 % |

### 8.3.3 Observations, settings and special notes

Spectrum analyzer settings:

| | |
|---|---|
| Resolution bandwidth | 1% - 5% OBW |
| Video bandwidth | 3*RBW |
| Frequency span | 2*OBW |
| Detector mode | Peak |
| Trace mode | Max Hold |

### 8.3.4 Test data

| Band | OBW Declared | Port | Channel (MHz) | 26 dB OBW |
|---|---|---|---|---|
| n66 | 15 MHz | B | 2117.5 | 15.263 MHz |
| n66 | 15 MHz | B | 2155 | 15.259 MHz |
| n66 | 15 MHz | B | 2192.5 | 15.242 MHz |
| n70 | 15 MHz | B | 2002.5 | 15.272 MHz |
| n70 | 15 MHz | B | 2012.5 | 15.263 MHz |

***Table 8.3-1**: 26 dB Occupied bandwidth, QPSK Modulation.*

| Band | OBW Declared | Port | Channel (MHz) | 26 dB OBW |
|---|---|---|---|---|
| n66 | 15 MHz | B | 2117.5 | 15.258 MHz |
| n66 | 15 MHz | B | 2155 | 15.258 MHz |
| n66 | 15 MHz | B | 2192.5 | 15.246 MHz |
| n70 | 15 MHz | B | 2002.5 | 15.266 MHz |
| n70 | 15 MHz | B | 2012.5 | 15.253 MHz |

***Table 8.3-2**: 26 dB Occupied bandwidth, 16QAM Modulation.*

| Band | OBW Declared | Port | Channel (MHz) | 26 dB OBW |
|---|---|---|---|---|
| n66 | 15 MHz | B | 2117.5 | 15.272 MHz |
| n66 | 15 MHz | B | 2155 | 15.289 MHz |
| n66 | 15 MHz | B | 2192.5 | 15.290 MHz |
| n70 | 15 MHz | B | 2002.5 | 15.283 MHz |
| n70 | 15 MHz | B | 2012.5 | 15.263 MHz |

***Table 8.3-3**: 26 dB Occupied bandwidth, 64QAM Modulation.*

| Band | OBW Declared | Port | Channel (MHz) | 26 dB OBW |
|---|---|---|---|---|
| n66 | 15 MHz | B | 2117.5 | 15.263 MHz |
| n66 | 15 MHz | B | 2155 | 15.279 MHz |
| n66 | 15 MHz | B | 2192.5 | 15.258 MHz |
| n70 | 15 MHz | B | 2002.5 | 15.272 MHz |
| n70 | 15 MHz | B | 2012.5 | 15.274 MHz |

***Table 8.3-4**: 26 dB Occupied bandwidth, 256QAM Modulation.*

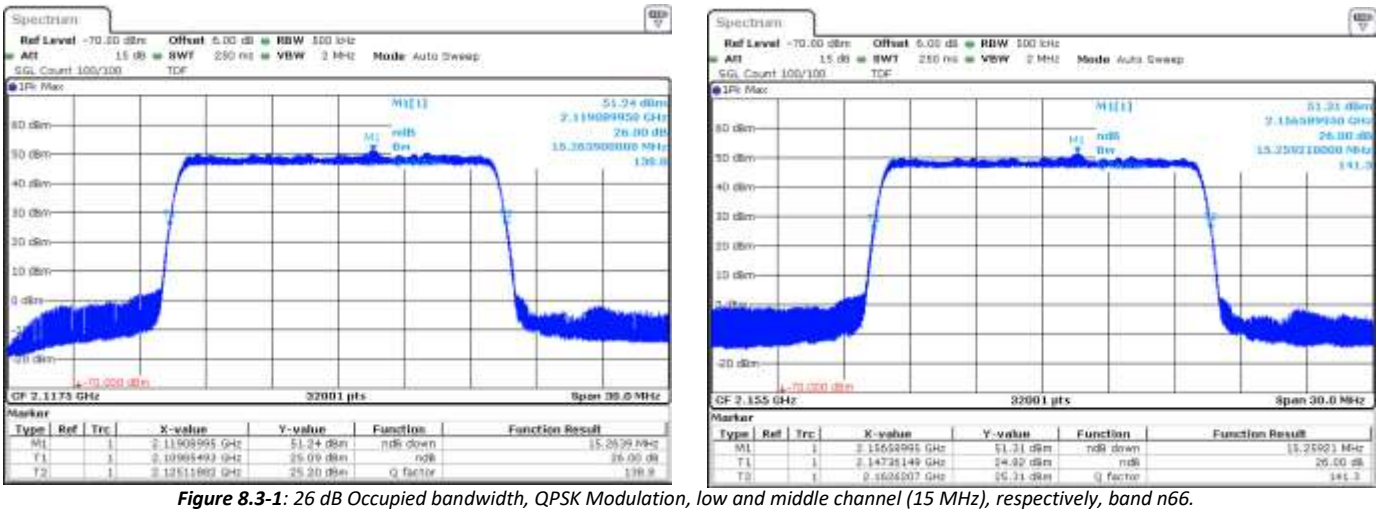


***Figure 8.3-1**: 26 dB Occupied bandwidth, QPSK Modulation, low and middle channel (15 MHz), respectively, band n66.*

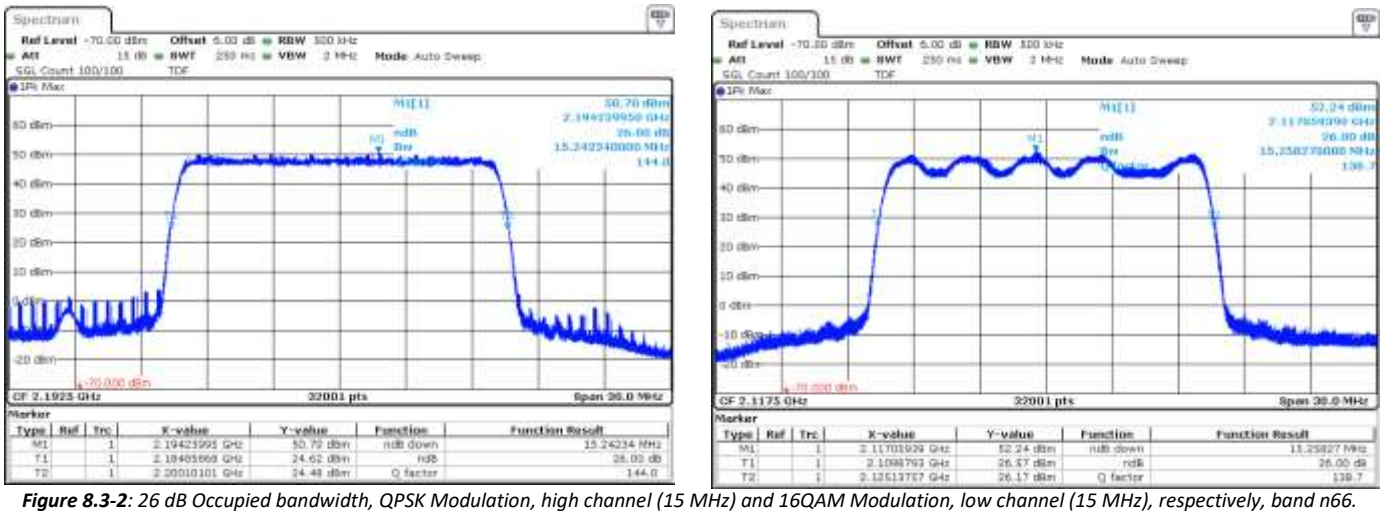


***Figure 8.3-2**: 26 dB Occupied bandwidth, QPSK Modulation, high channel (15 MHz) and 16QAM Modulation, low channel (15 MHz), respectively, band n66.*

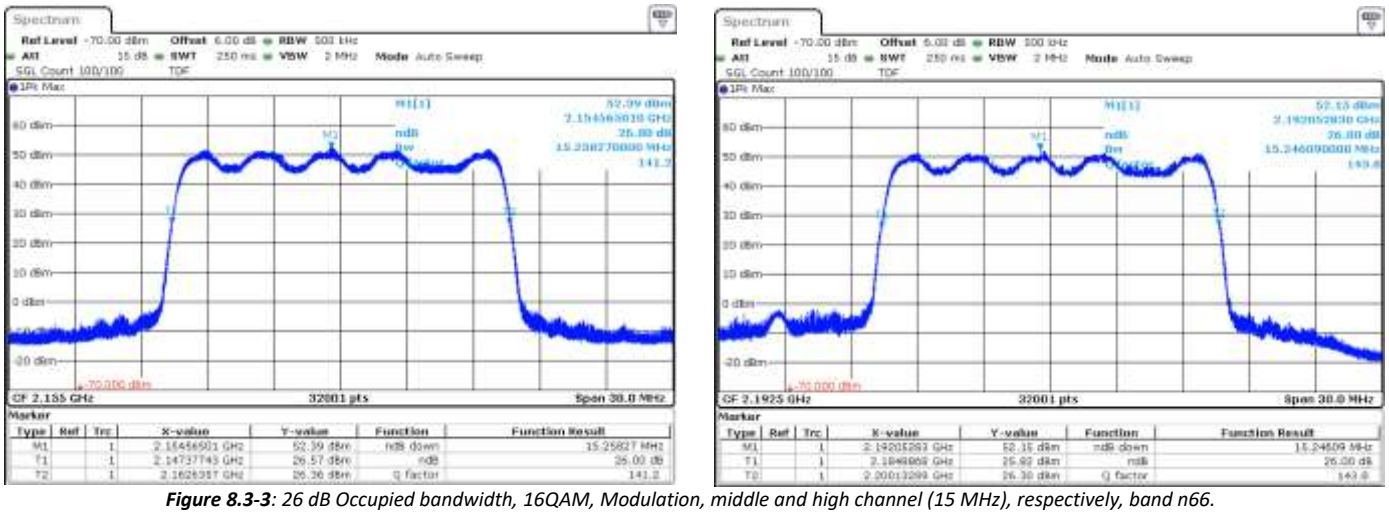



***Figure 8.3-3**: 26 dB Occupied bandwidth, 16QAM, Modulation, middle and high channel (15 MHz), respectively, band n66.*

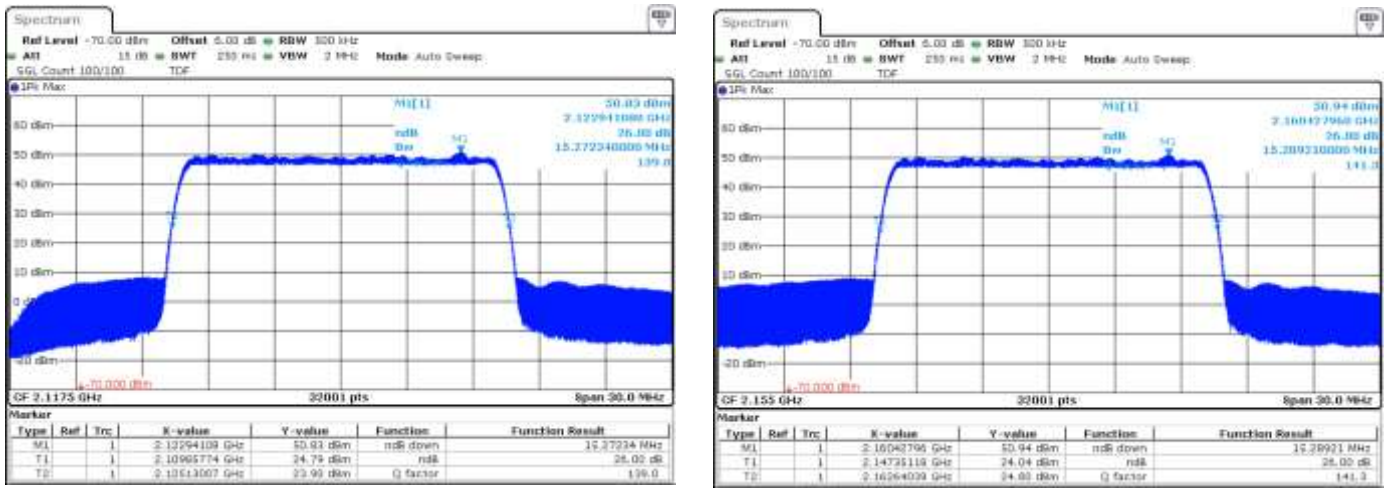



***Figure 8.3-4**: 26 dB Occupied bandwidth, 64QAM, Modulation, low and middle channel (15 MHz), respectively, band n66.*

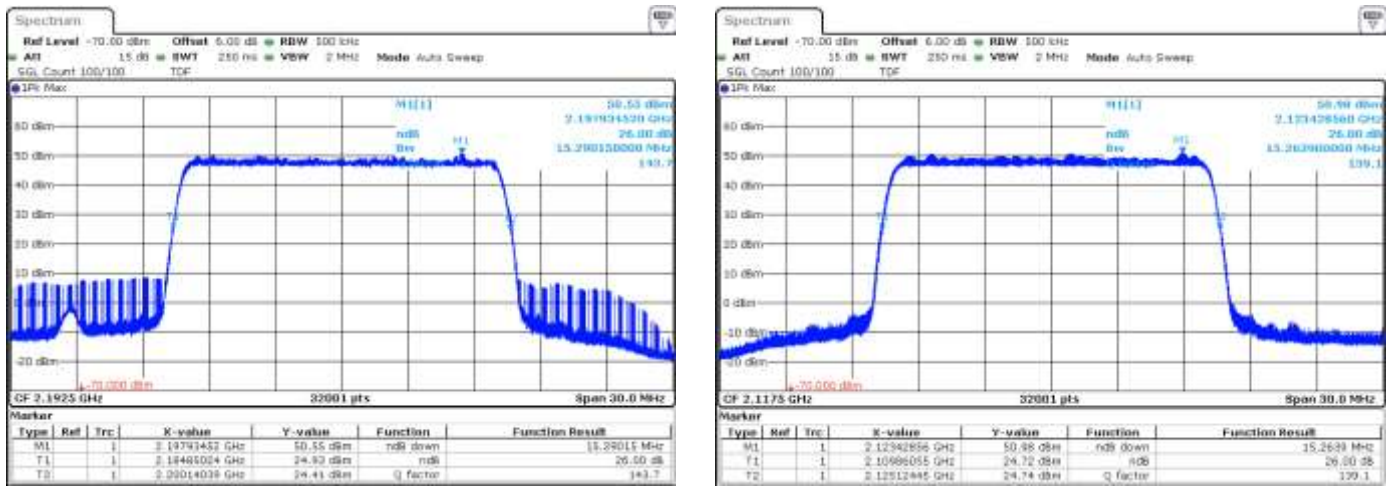
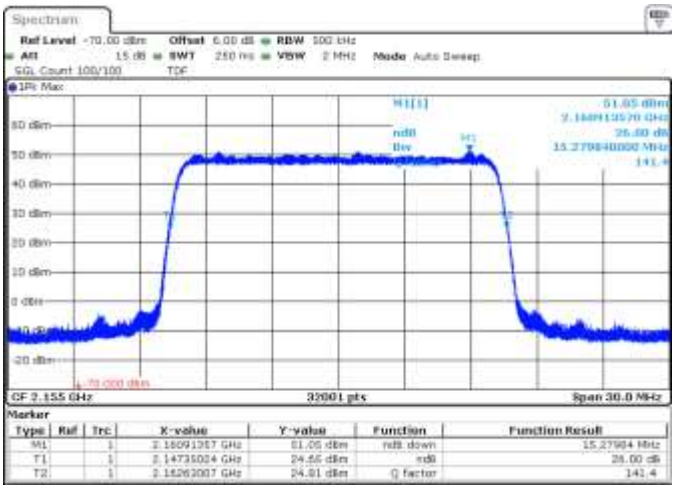



***Figure 8.3-5**: 26 dB Occupied bandwidth, 64QAM, Modulation, high channel (15 MHz) and 256QAM Modulation, low channel (15 MHz), respectively, band n66.*



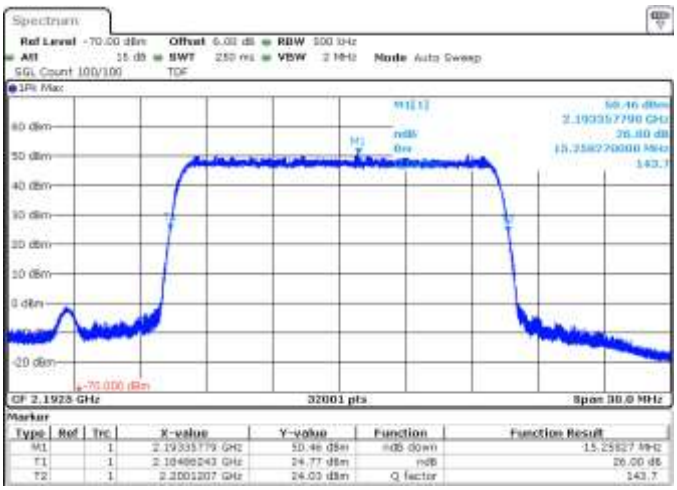
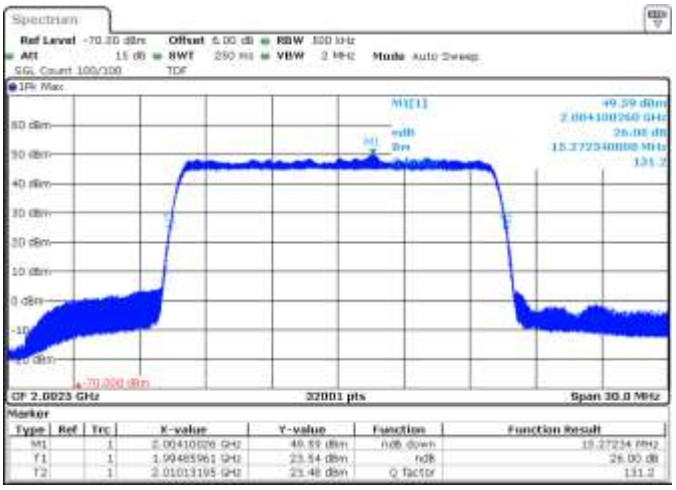




***Figure 8.3-6**: 26 dB Occupied bandwidth, 256QAM, Modulation, middle and high channel (15 MHz), respectively, band n66.*



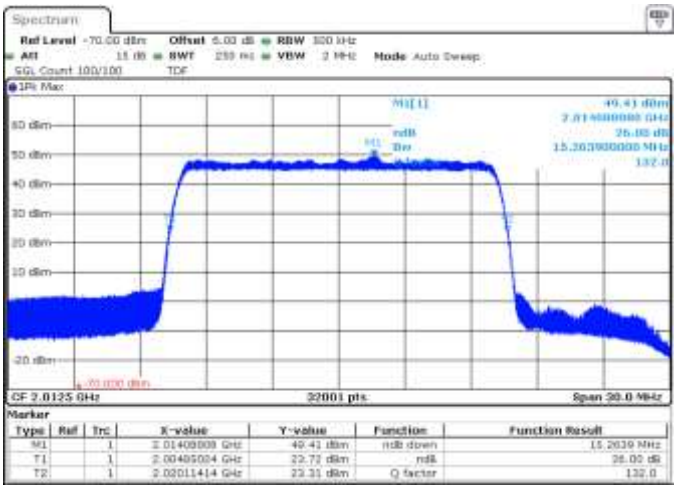
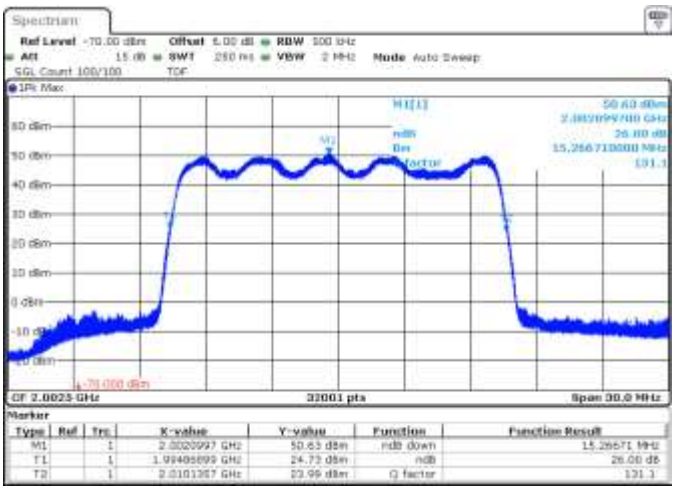




***Figure 8.3-7**: 26 dB Occupied bandwidth, QPSK, Modulation, low and high channel (15 MHz), respectively, band n70.*



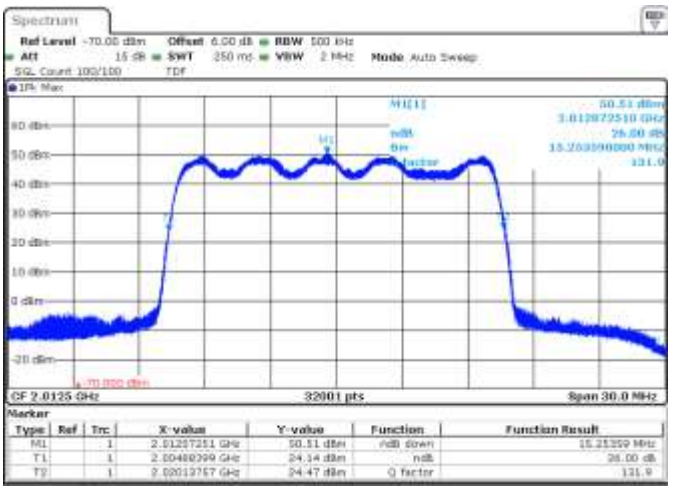




***Figure 8.3-8**: 26 dB Occupied bandwidth, 16QAM, Modulation, low and high channel (15 MHz), respectively, band n70.*

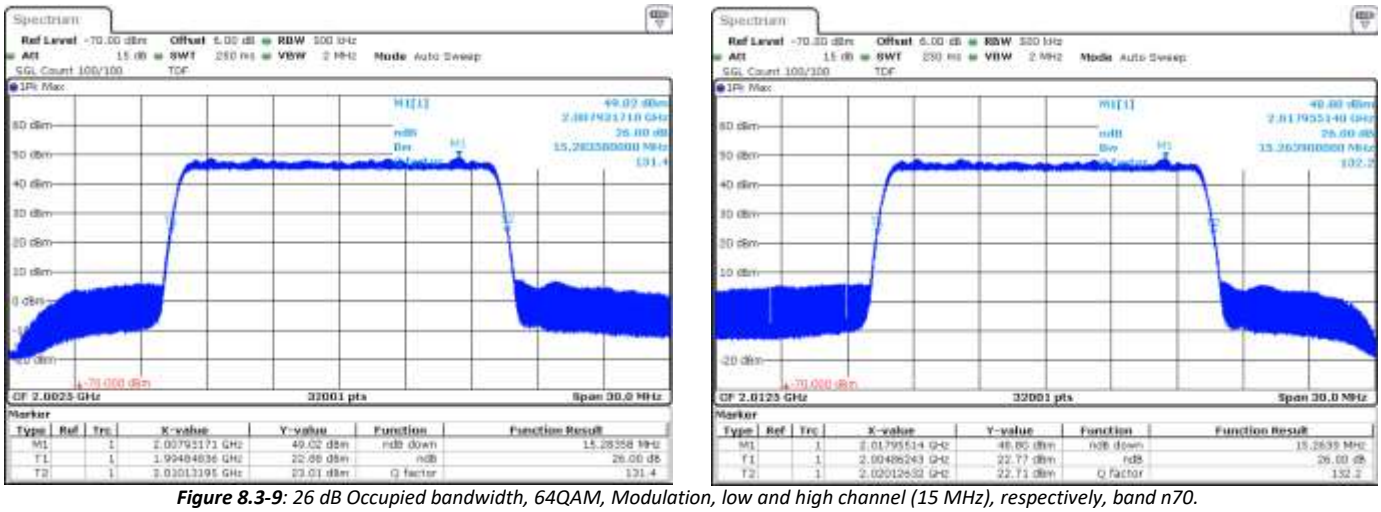



***Figure 8.3-9**: 26 dB Occupied bandwidth, 64QAM, Modulation, low and high channel (15 MHz), respectively, band n70.*

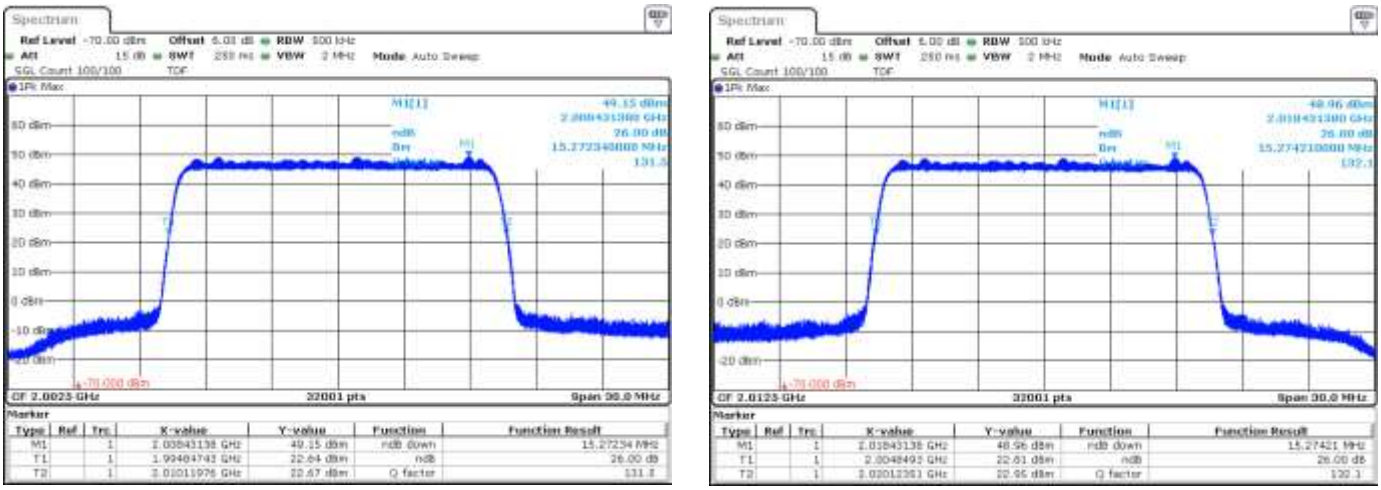



***Figure 8.3-10**: 26 dB Occupied bandwidth, 256QAM, Modulation, low and high channel (15 MHz), respectively, band n70.*

## 8.4 FCC 27.50(d)(2)(ii) Output power

### 8.4.1 Definitions and limits

(d) The following power and antenna height requirements apply to stations transmitting in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz and 2180-2200 MHz bands:

(2) The power of each fixed or base station transmitting in the 1995-2000 MHz, the 2110-2155 MHz 2155-2180 MHz band, or 2180-2200 MHz band and situated in any geographic location other than that described in paragraph (d)(1) of this section is limited to:

(i) An equivalent isotropically radiated power (EIRP) of 1640 watts when transmitting with an emission bandwidth of 1 MHz or less;

(ii) An EIRP of 1640 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz.

### 8.4.2 Test summary

| | | | |
|---|---|---|---|
| Test date | January 24, 2022 | Temperature | 22 °C |
| Test engineer | Martha Espinoza | Air pressure | 1003 mbar |
| Verdict | Pass | Relative humidity | 54 % |

### 8.4.3 Observations, settings and special notes

Power sensor settings were:

| | |
|---|---|
| Sample rate | 5MS/s |
| Gap time | 100 ms |
| Detector mode | RMS |
| Trigger level | -40 dBm |

This test was made across the conducted port and using a sensor power. An offset of 41.3 dB was added to the measurement to compensate the losses from the cable and attenuator (40 dB) used. The signal transmitted continuously and with a 100% of duty cycle.
EUT has four ports which can transmit at the same time in a correlated way. This correlation permit to make the measurement in one port getting as a result the total power from the four ports adding a factor calculated from the next equation:

$$Correlation\ factor = 10Log\ (N)$$

Where N is the number of ports. In this specific case, N = 4,

$$Correlation\ factor = 10Log\ (4)\ = 6.02\ dB$$

To select the measurement port, a quick power test was done. The four ports are similar, however, the port with maximum power was chosen to make all the remaining tests. This pre-test was applied to both bands (n66 and n70):

| Band | Modulation | OBW | Channel | Power Port A | Power Port B | Power Port C | Power Port D |
|---|---|---|---|---|---|---|---|
| n66 | 256QAM | 15 MHz | 2117.5 MHz | 47.98 dBm | **48.01 dBm** | 47.99 dBm | 47.98 dBm |
| n70 | 64QAM | 15 MHz | 2002.5 MHz | 46.3 dBm | **46.45 dBm** | 46.33 dBm | 46.40 dBm |

*Port B was selected for both bands, and it will be used to evaluate all the tests of this document.*

EUT can transmit dual band: band n66 and band n70. The scope of this document for band n66 consist in three channels, four modulations, one bandwidth. For band n70, only one channel, four modulations and one bandwidth are under test. Unit transmit the selected signal at full power: 60 Watts in band n66 and 40 Watts in band n70. The maximum power is only available in one band at the time due the maximum power supported by unit is 80 Watts.

### 8.4.4 Test data

| Band | Modulation | OBW (MHz) | Port | Channel (MHz) | Power (RMS) (dBm) | Correlation factor (dB) | Total power across all ports (dBm) |
|---|---|---|---|---|---|---|---|
| n66 | QPSK | 15 | B | 2117.5 | 47.97 | 6.02 | 53.99 |
| n66 | QPSK | 15 | B | 2155 | 48.07 | 6.02 | 54.09 |
| n66 | QPSK | 15 | B | 2192.5 | 47.91 | 6.02 | 53.93 |
| n66 | 16QAM | 15 | B | 2117.5 | 47.99 | 6.02 | 54.01 |
| n66 | 16QAM | 15 | B | 2155 | 48.09 | 6.02 | 54.11 |
| n66 | 16QAM | 15 | B | 2192.5 | 47.93 | 6.02 | 53.95 |
| n66 | 64QAM | 15 | B | 2117.5 | 48.02 | 6.02 | 54.04 |
| n66 | 64QAM | 15 | B | 2155 | 48.09 | 6.02 | 54.11 |
| n66 | 64QAM | 15 | B | 2192.5 | 47.98 | 6.02 | 54.00 |
| n66 | 256QAM | 15 | B | 2117.5 | 48.01 | 6.02 | 54.03 |
| n66 | 256QAM | 15 | B | 2155 | 48.11 | 6.02 | 54.13 |
| n66 | 256QAM | 15 | B | 2192.5 | 47.96 | 6.02 | 53.98 |

***Table 8.4-1:*** *Conducted output power, band n66, 15 MHz OBW*

| Band | Modulation | OBW (MHz) | Port | Channel (MHz) | Power (RMS) (dBm) | Correlation factor (dB) | Total power across all ports (dBm) |
|---|---|---|---|---|---|---|---|
| n70 | QPSK | 15 | B | 2002.5 | 46.42 | 6.02 | 52.44 |
| n70 | QPSK | 15 | B | 2012.5 | 46.26 | 6.02 | 52.28 |
| n70 | 16QAM | 15 | B | 2002.5 | 46.44 | 6.02 | 52.46 |
| n70 | 16QAM | 15 | B | 2012.5 | 46.32 | 6.02 | 52.34 |
| n70 | 64QAM | 15 | B | 2002.5 | 46.45 | 6.02 | 52.47 |
| n70 | 64QAM | 15 | B | 2012.5 | 46.31 | 6.02 | 52.33 |
| n70 | 256QAM | 15 | B | 2002.5 | 46.46 | 6.02 | 52.48 |
| n70 | 256QAM | 15 | B | 2012.5 | 46.32 | 6.02 | 52.34 |

***Table 8.4-2:*** *Conducted output power, band n70, 15 MHz OBW*

## 8.5 FCC 27.50(d)(5) Peak to Average Power Ratio

### 8.5.1 Definitions and limits

(d) The following power and antenna height requirements apply to stations transmitting in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 MHz bands:
(5) Equipment employed must be authorized in accordance with the provisions of §24.51. Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

### 8.5.2 Test summary

| | | | |
|---|---|---|---|
| Test date | January 24, 2022 | Temperature | 22 °C |
| Test engineer | Martha Espinoza | Air pressure | 1003 mbar |
| Verdict | Pass | Relative humidity | 54 % |

### 8.5.3 Observations, settings and special notes

Spectrum analyzer settings:

| | |
|---|---|
| Resolution bandwidth | ≥ OBW |
| Number of counts | The necessary number up to stabilizes the measured |
| Trace mode | Clear/Write |

### 8.5.4 Test data

| Band | OBW Declared | Port | Channel (MHz) | 0.1% | 0.1% Limit | Margin |
|---|---|---|---|---|---|---|
| n66 | 15 MHz | B | 2117.5 | 7.74 dB | 13 dB | 5.26 dB |
| n66 | 15 MHz | B | 2155 | 7.74 dB | 13 dB | 5.26 dB |
| n66 | 15 MHz | B | 2192.5 | 7.74 dB | 13 dB | 5.26 dB |
| n70 | 15 MHz | B | 2002.5 | 7.62 dB | 13 dB | 5.38 dB |
| n70 | 15 MHz | B | 2012.5 | 7.62 dB | 13 dB | 5.38 dB |

***Table 8.5-1**: Peak to average power ratio, QPSK Modulation.*

| Band | OBW Declared | Port | Channel (MHz) | 0.1% | 0.1% Limit | Margin |
|---|---|---|---|---|---|---|
| n66 | 15 MHz | B | 2117.5 | 7.77 dB | 13 dB | 5.23 dB |
| n66 | 15 MHz | B | 2155 | 7.77 dB | 13 dB | 5.23 dB |
| n66 | 15 MHz | B | 2192.5 | 7.77 dB | 13 dB | 5.23 dB |
| n70 | 15 MHz | B | 2002.5 | 7.65 dB | 13 dB | 5.35 dB |
| n70 | 15 MHz | B | 2012.5 | 7.65 dB | 13 dB | 5.35 dB |

***Table 8.5-2**: Peak to average power ratio, 16QAM Modulation.*

| Band | OBW Declared | Port | Channel (MHz) | 0.1% | 0.1% Limit | Margin |
|---|---|---|---|---|---|---|
| n66 | 15 MHz | B | 2117.5 | 7.74 dB | 13 dB | 5.26 dB |
| n66 | 15 MHz | B | 2155 | 7.74 dB | 13 dB | 5.26 dB |
| n66 | 15 MHz | B | 2192.5 | 7.74 dB | 13 dB | 5.26 dB |
| n70 | 15 MHz | B | 2002.5 | 7.62 dB | 13 dB | 5.38 dB |
| n70 | 15 MHz | B | 2012.5 | 7.62 dB | 13 dB | 5.38 dB |

***Table 8.5-3**: Peak to average power ratio, 64QAM Modulation.*

| Band | OBW Declared | Port | Channel (MHz) | 0.1% | 0.1% Limit | Margin |
|---|---|---|---|---|---|---|
| n66 | 15 MHz | B | 2117.5 | 7.74 dB | 13 dB | 5.26 dB |
| n66 | 15 MHz | B | 2155 | 7.74 dB | 13 dB | 5.26 dB |
| n66 | 15 MHz | B | 2192.5 | 7.74 dB | 13 dB | 5.26 dB |
| n70 | 15 MHz | B | 2002.5 | 7.62 dB | 13 dB | 5.38 dB |
| n70 | 15 MHz | B | 2012.5 | 7.62 dB | 13 dB | 5.38 dB |

***Table 8.5-4**: Peak to average power ratio, 256QAM Modulation.*

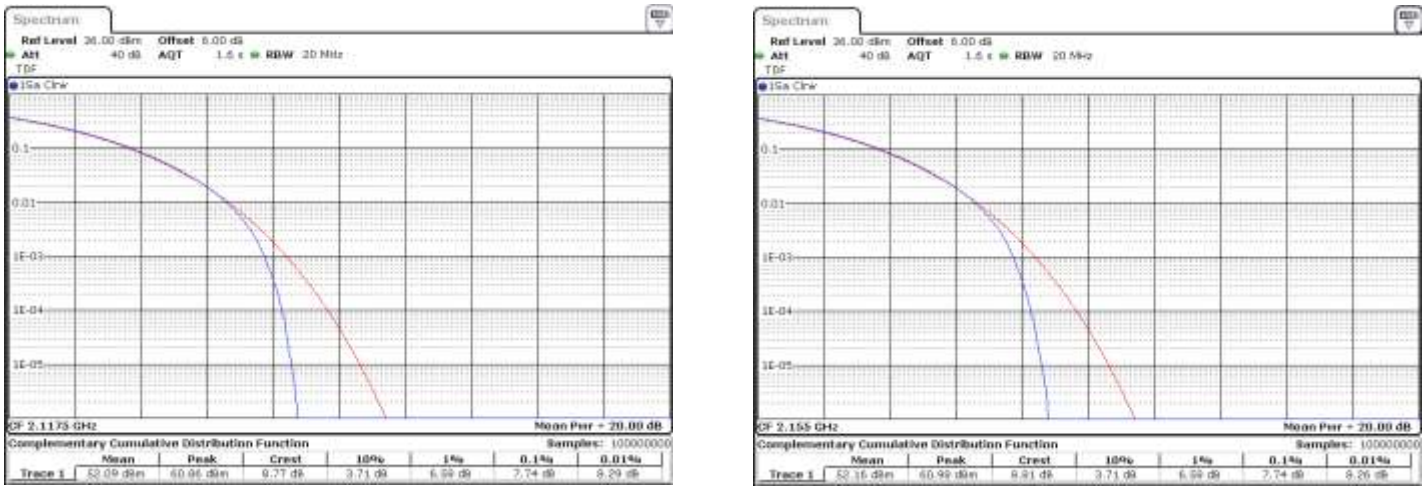



***Figure 8.5-1**: Peak to average power ratio, QPSK Modulation, low and middle channel (15 MHz), respectively, band n66.*

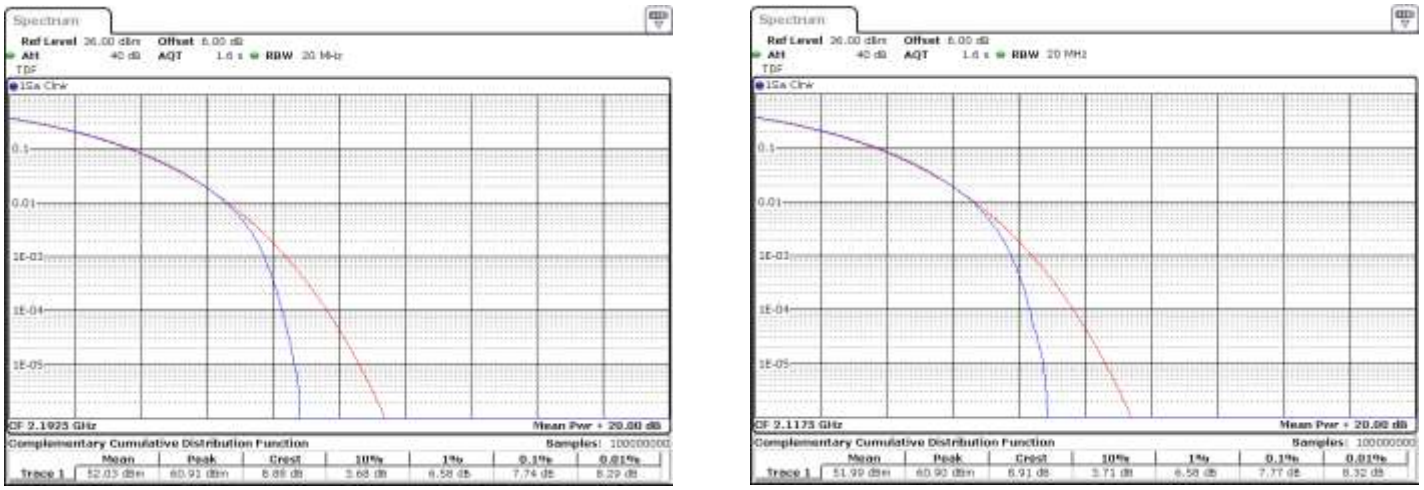
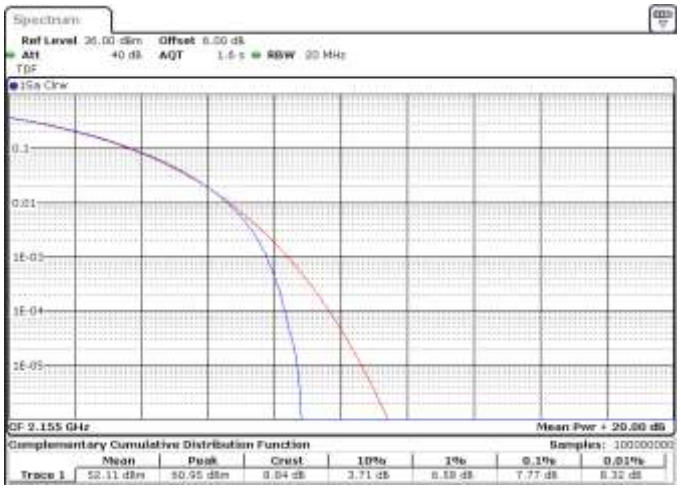



***Figure 8.5-2**: Peak to average power ratio, QPSK Modulation, high channel (15 MHz) and 16QAM Modulation, low channel (15 MHz), respectively, band n66.*



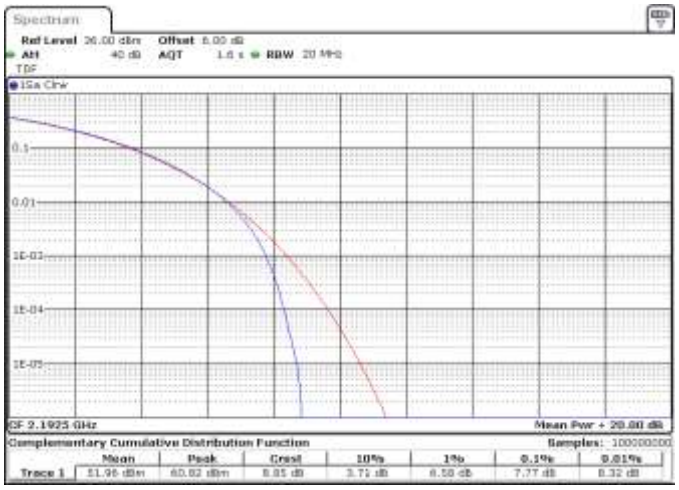




***Figure 8.5-3**: Peak to average power ratio, 16QAM Modulation, middle and high channel (15 MHz), respectively, band n66.*

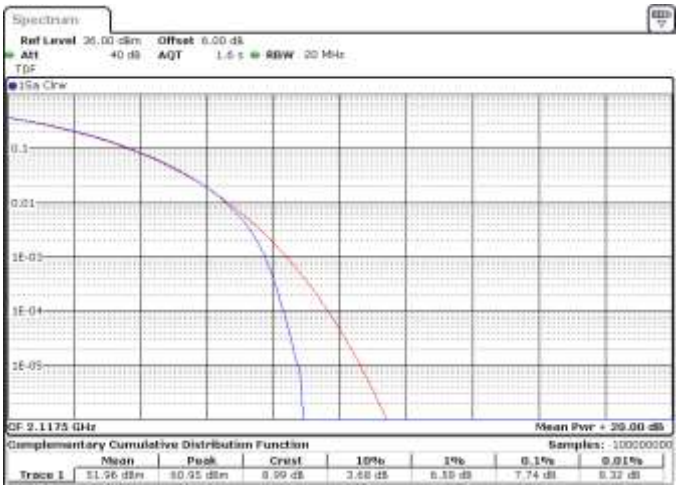
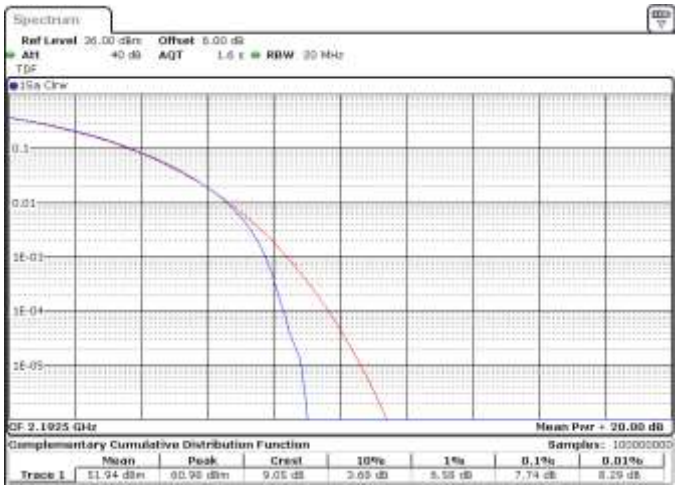




***Figure 8.5-4**: Peak to average power ratio, 64QAM Modulation, low and middle channel (15 MHz), respectively, band n66.*



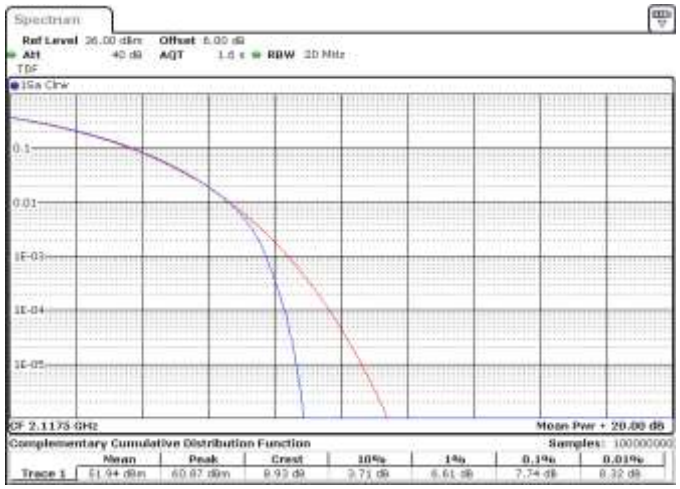
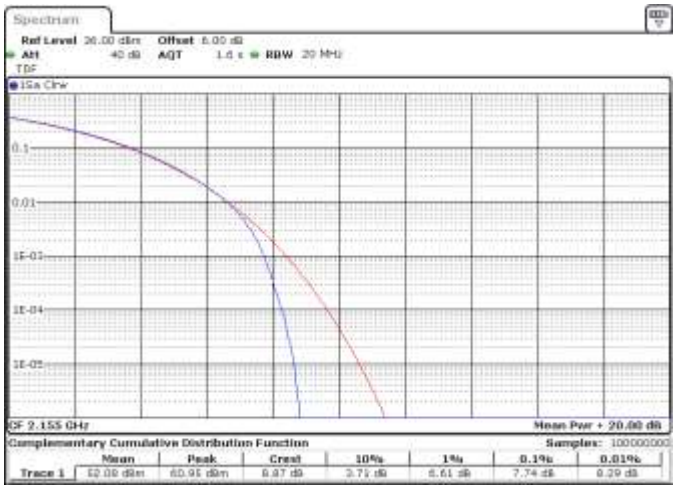




***Figure 8.5-5**: Peak to average power ratio, 64QAM Modulation, high channel (15 MHz) and 256QAM Modulation, low channel (15 MHz), respectively, band n66*



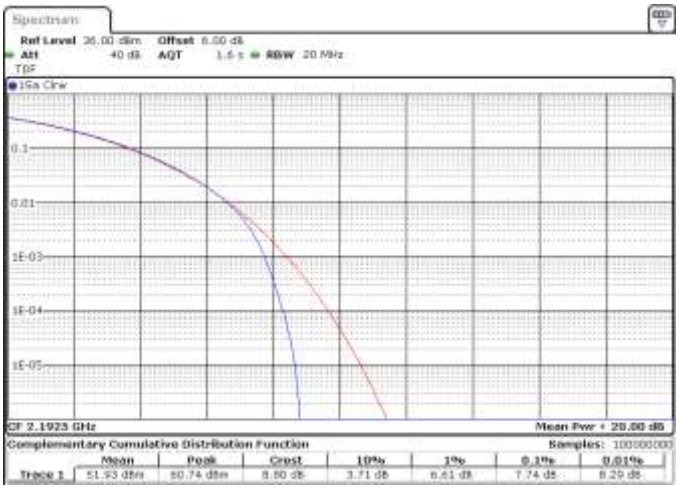
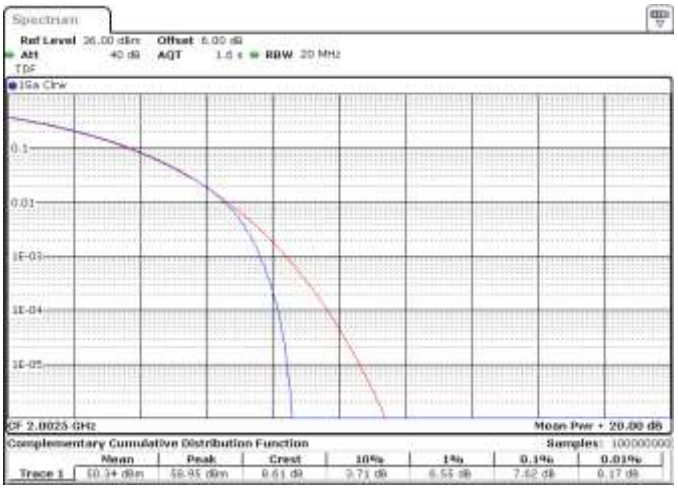




***Figure 8.5-6**: Peak to average power ratio, 256QAM Modulation, middle and high channel (15 MHz), respectively, band n66.*



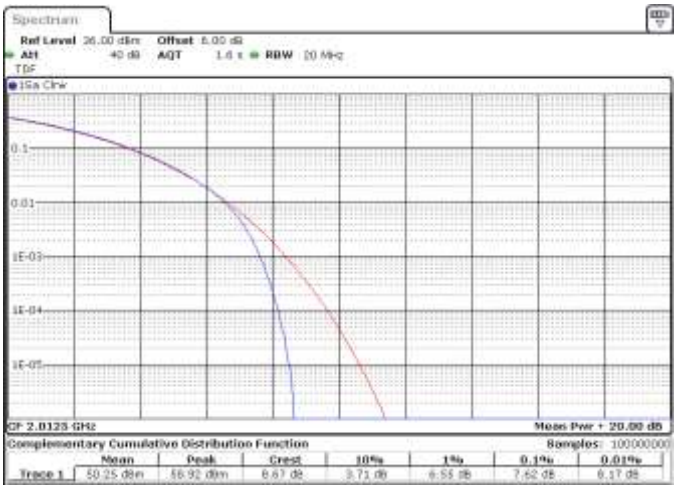
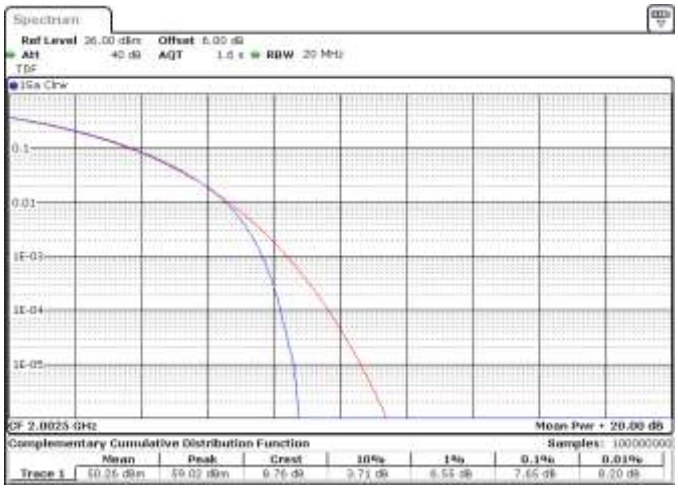




***Figure 8.5-7**: Peak to average power ratio, QPSK Modulation, low and high channel (15 MHz), respectively, band n70.*



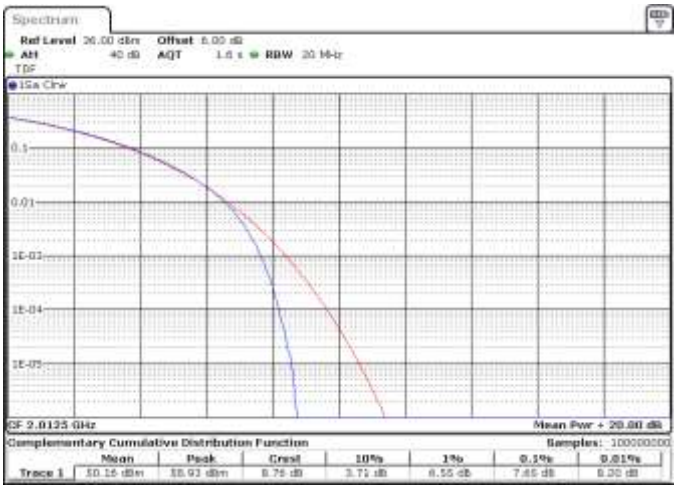
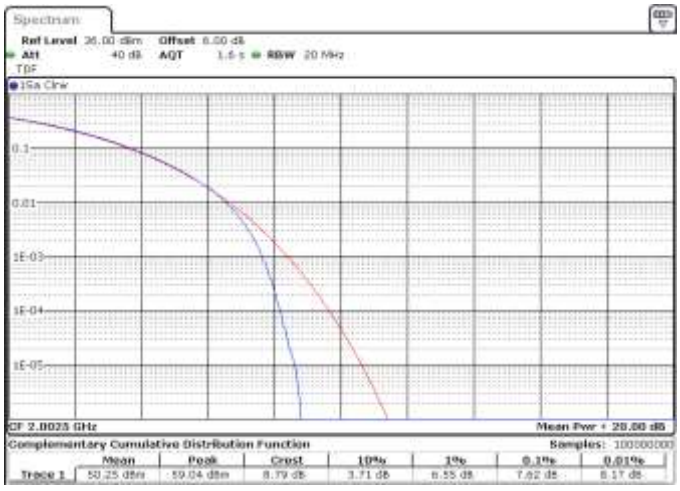




***Figure 8.5-8**: Peak to average power ratio, 16QAM Modulation, low and high channel (15 MHz), respectively, band n70.*



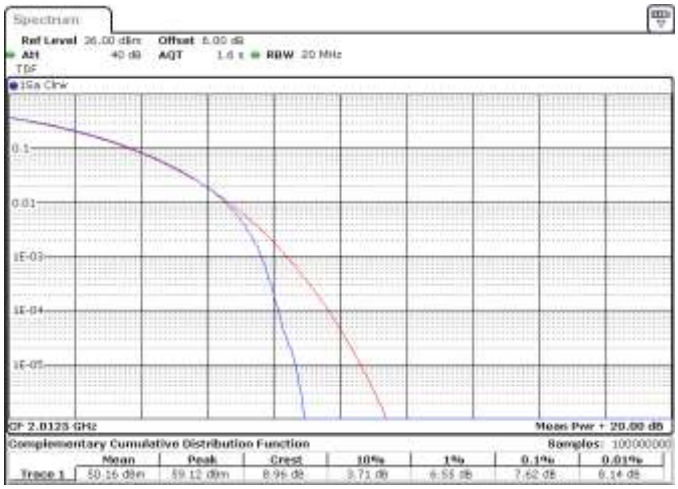
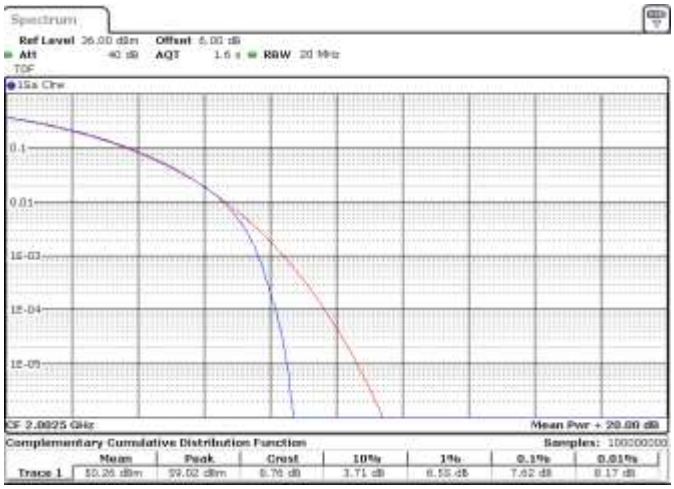




***Figure 8.5-9**: Peak to average power ratio, 64QAM Modulation, low and high channel (15 MHz), respectively, band n70.*



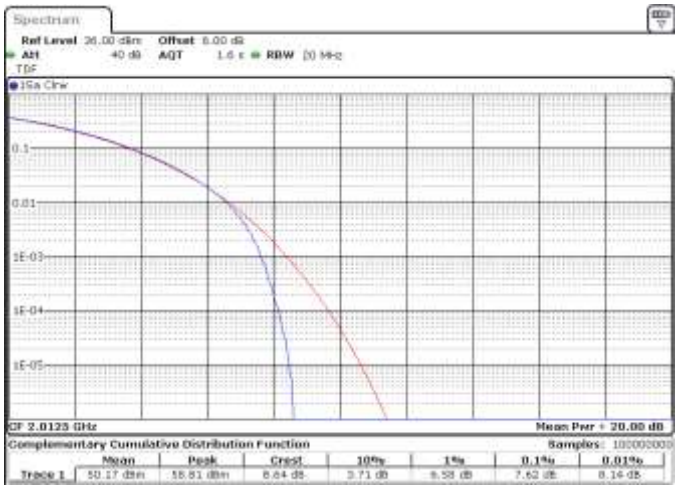




***Figure 8.5-10**: Peak to average power ratio, 256QAM Modulation, low and high channel (15 MHz), respectively, band n70.*

## 8.6 FCC 27.53(h) Emission Limits

### 8.6.1 Definitions and limits

(h) AWS emission limits— (1) General protection levels. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

### 8.6.2 Test summary

| | | | |
|---|---|---|---|
| Test date | January 25, 2022<br>January 26, 2022<br>January 27, 2022 | Temperature | 20 °C<br>19 °C<br>19 °C |
| Test engineer | Martha Espinoza | Air pressure | 1003; 1005;1002 mbar |
| Verdict | Pass | Relative humidity | 56%; 55%; 57% |

### 8.6.3 Observations, settings and special notes

| | |
|---|---|
| EUT setup configuration | Table top |
| Test facility | 3 m Semi anechoic chamber |
| Measuring distance | 3m |
| Antenna height variation | 1–4 m |
| Turn table position | 0–360° |
| Measurement details | A preview measurement was generated with receiver in continuous scan or sweep mode while the EUT was rotated and antenna adjusted to maximize radiated emission. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement. |

Receiver/spectrum analyzer settings for frequencies below 1 GHz:

| | |
|---|---|
| Resolution bandwidth | 120 kHz |
| Video bandwidth | 300 kHz |
| Detector mode | – Peak (Preview measurement)<br>– Quasi-peak (Final measurement) |
| Trace mode | Max Hold |
| Measurement time | – 100 ms (Peak preview measurement)<br>– 5000 ms (Quasi-peak final measurement) |

Receiver/spectrum analyzer settings for frequencies above 1 GHz:

| | |
|---|---|
| Resolution bandwidth | 1 MHz |
| Video bandwidth | 3 MHz |
| Detector mode | Peak (Preview measurement)<br>Peak and CAverage (Final measurement) |
| Trace mode | Max Hold |
| Measurement time | – 100 ms (Peak preview measurement)<br>– 5000 ms (Peak and CAverage final measurement) |

Spectrum analyzer settings (conducted test):

| | |
|---|---|
| Resolution bandwidth | 1 MHz |
| Video bandwidth | 3 MHz |
| Frequency span | The necessary to make an accuracy measurement |
| Detector mode | RMS |
| Trace mode | Average power |

### 8.6.3 Observations, settings and special notes, continued

This test was realized in two parts: one with a conducted setup and another one with a radiated setup.
The conducted test was made in the port B (this port was selected based on test showed on section 8.4), transmitting at max power and with the other three ports loaded with 50 Ω loads. For capturing the signal with the equipment, it was divided in three ranges, using a transducer factor to compensate the losses caused by a cable and attenuator used to protect the test equipment. Additional to this number, a 6 dB correlation factor was added to evaluate the complete power across the four ports, considering the ranges where harmonic can be observed. The first range was measured from 30 MHz to 3 GHz where the fundamental signal is visible. The second range was selected from 3 GHz to 15 GHz, where a highpass filter was used to avoid saturation in the port. Last range was measured from 15 GHz to 26.5 GHz, three ranges used the 6 dB offset and a transducer factor (include the cable losses and attenuator). The evaluation was made using three channels for band n66 and two channels for band n70 and all the modulations for both bands.

The radiated test was made transmitting at max power with the four ports terminated with 50 Ω loads. The scans were made from 30 MHz to 26 GHz with the modulation with the highest power as was shown at section 8.4. For band n66 and band n70, the modulation selected was 256QAM.

Based on equation 43 + 10 log10 (P) dB, the general emission limit is -13 dBm (conducted and radiated test) or the equivalent at 3m is 82.23 dBµV/m above 1 GHz and 84.38 dBµV/m below 1 GHz.

### 8.6.4 Test data

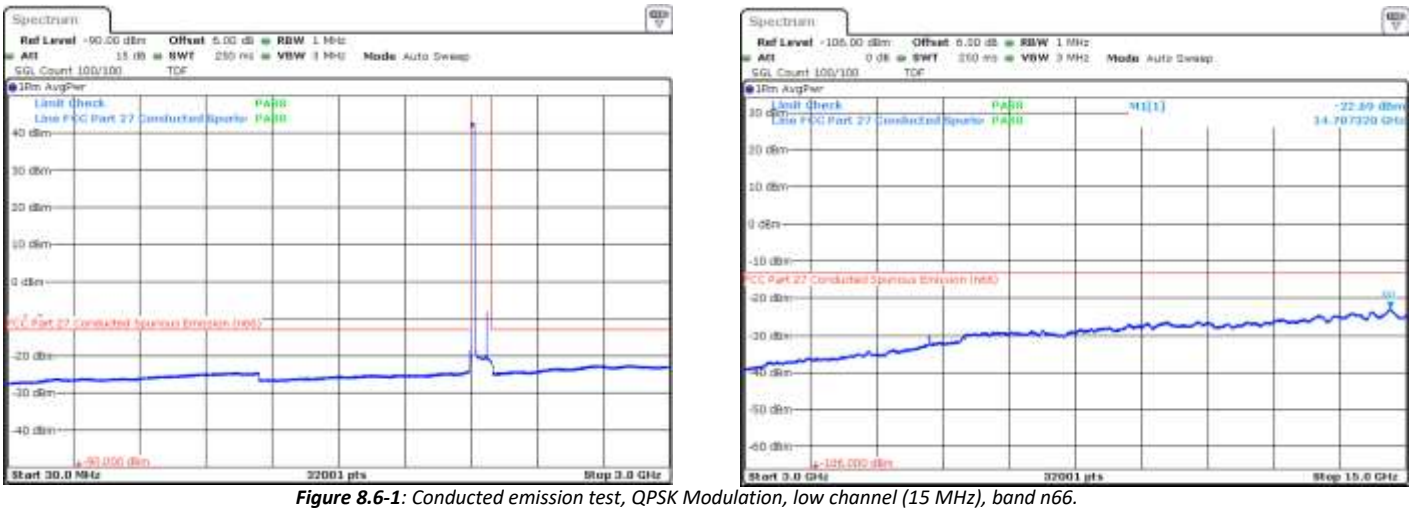



***Figure 8.6-1**: Conducted emission test, QPSK Modulation, low channel (15 MHz), band n66.*

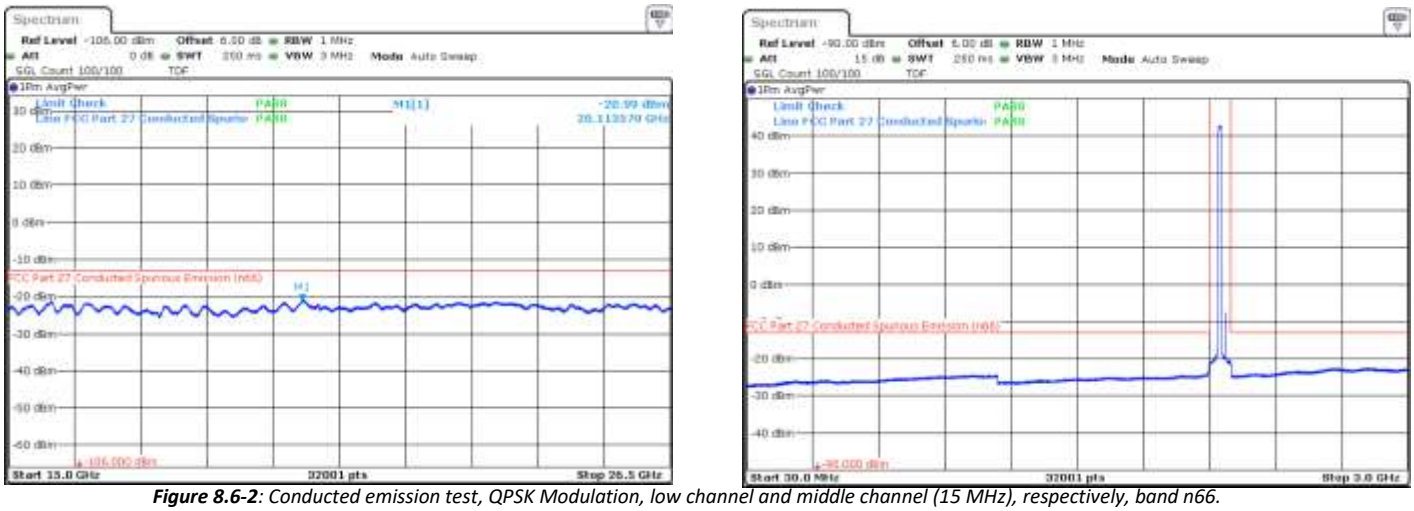



***Figure 8.6-2**: Conducted emission test, QPSK Modulation, low channel and middle channel (15 MHz), respectively, band n66.*

## 8.6.4 Test data, continued

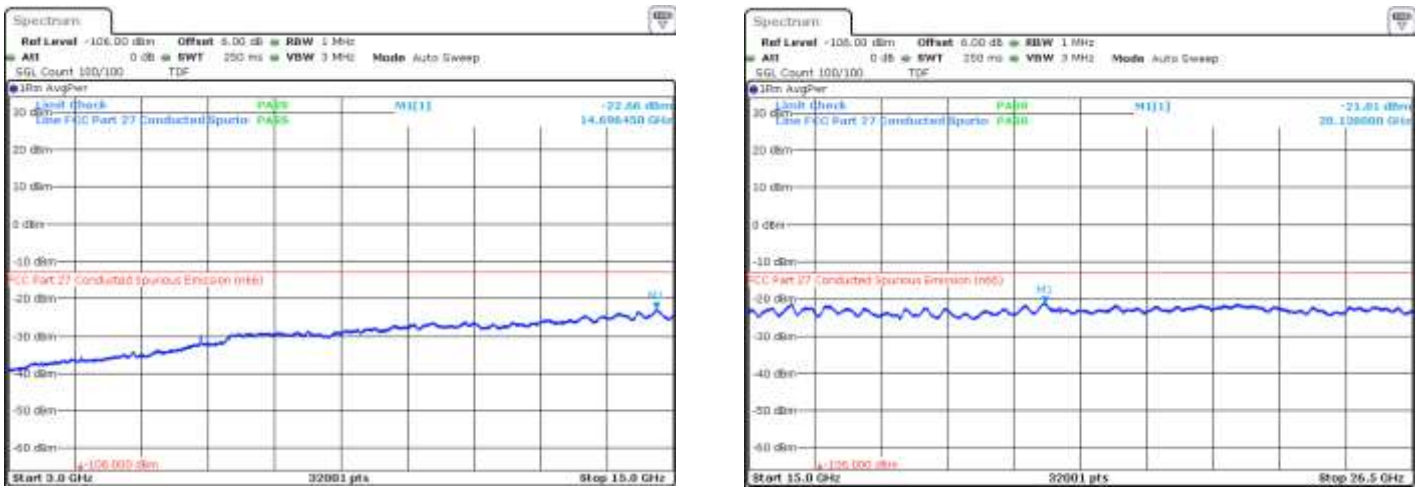



***Figure 8.6-3**: Conducted emission test, QPSK Modulation, middle channel (15 MHz), band n66.*

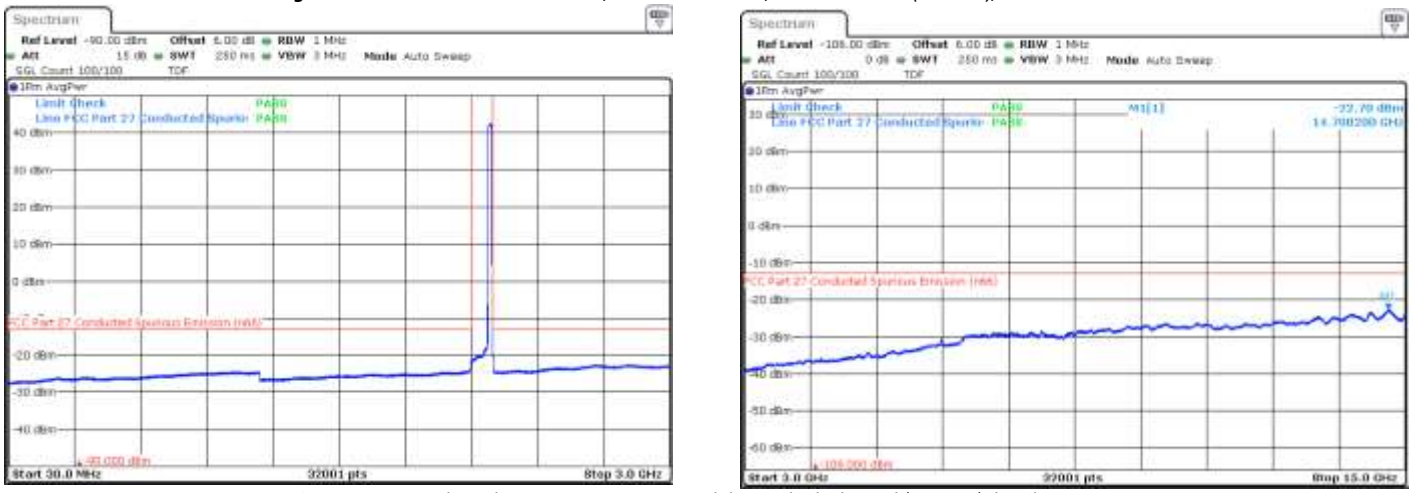



***Figure 8.6-4**: Conducted emission test, QPSK Modulation, high channel (15 MHz), band n66.*

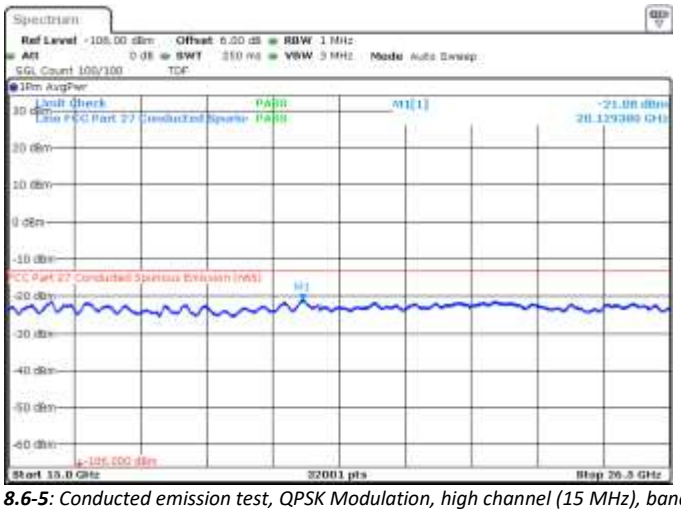



***Figure 8.6-5**: Conducted emission test, QPSK Modulation, high channel (15 MHz), band n66.*

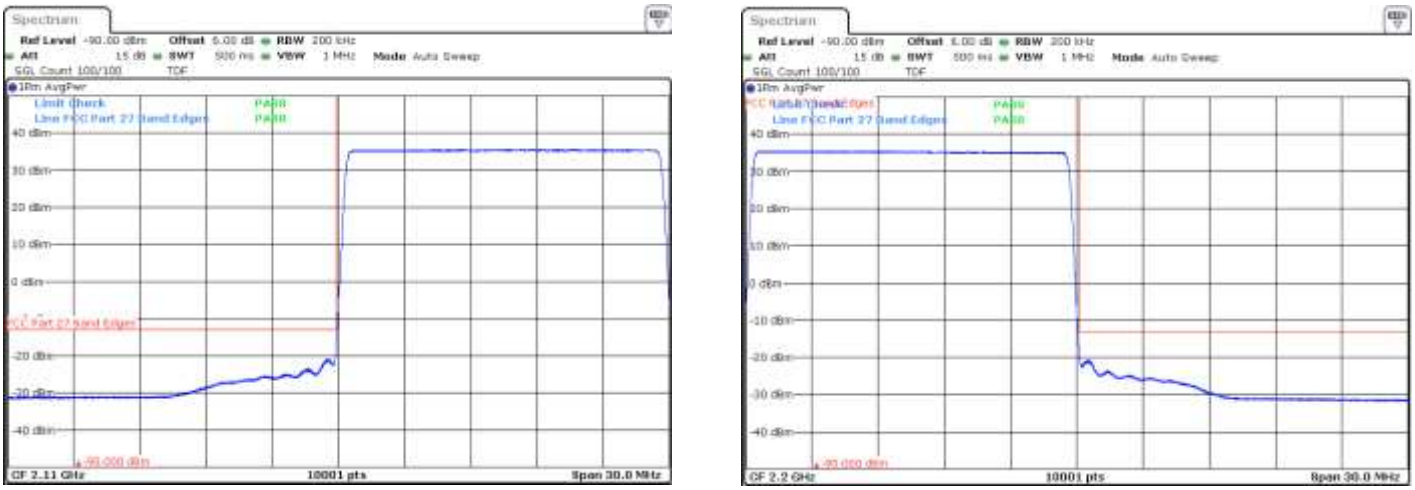



***Figure 8.6-6**: Conducted emission test, QPSK Modulation, band edge: low and high channels, respectively (15 MHz), band n66.*

***Note: For this specific test the frequency limit has a frequency offset equivalent at RBW/2 (±100 kHz from the low and high edge of the band), in order to demonstrate compliance. This offset was taken according to ANSI C63.26 Clause 5.7.2 (g) rules.***

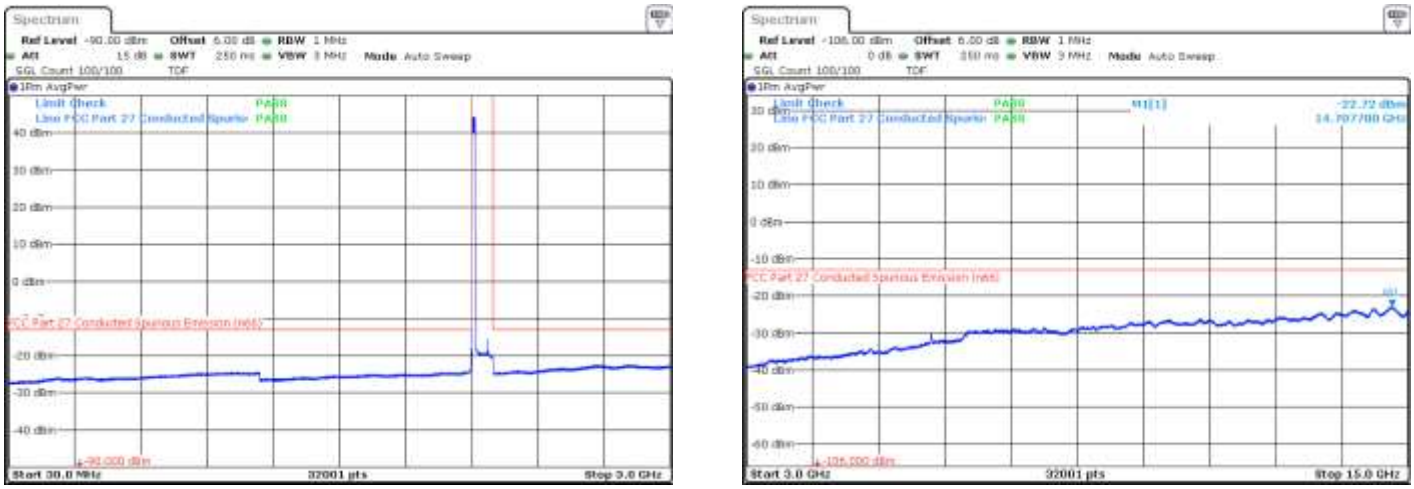



***Figure 8.6-7**: Conducted emission test, 16QAM Modulation, low channel (15 MHz), band n66.*

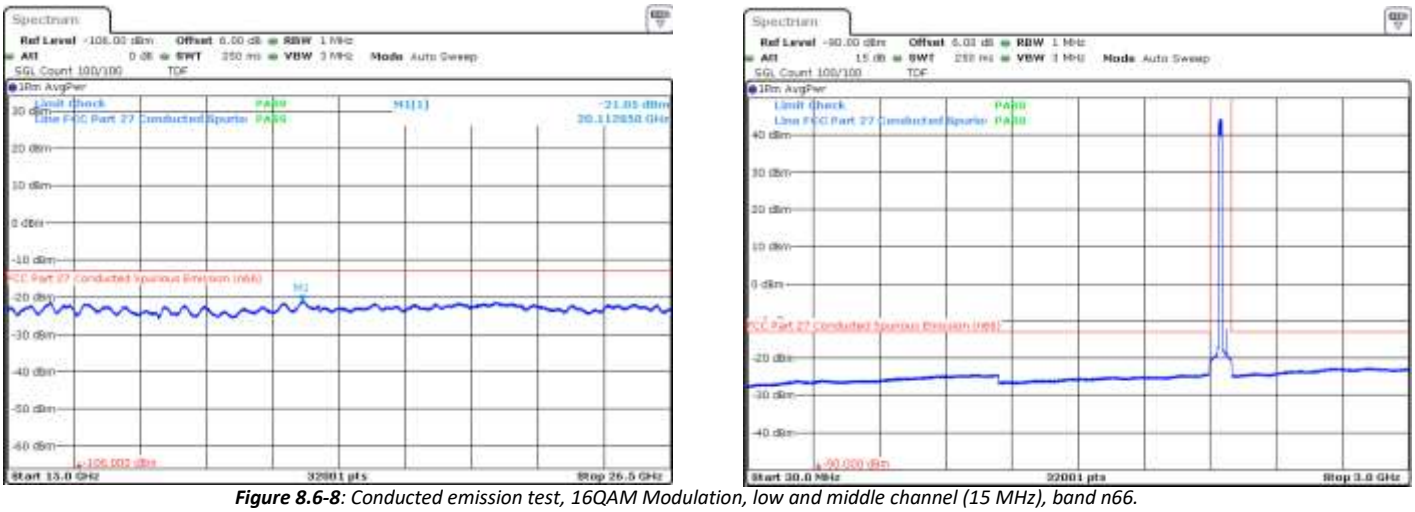



***Figure 8.6-8**: Conducted emission test, 16QAM Modulation, low and middle channel (15 MHz), band n66.*

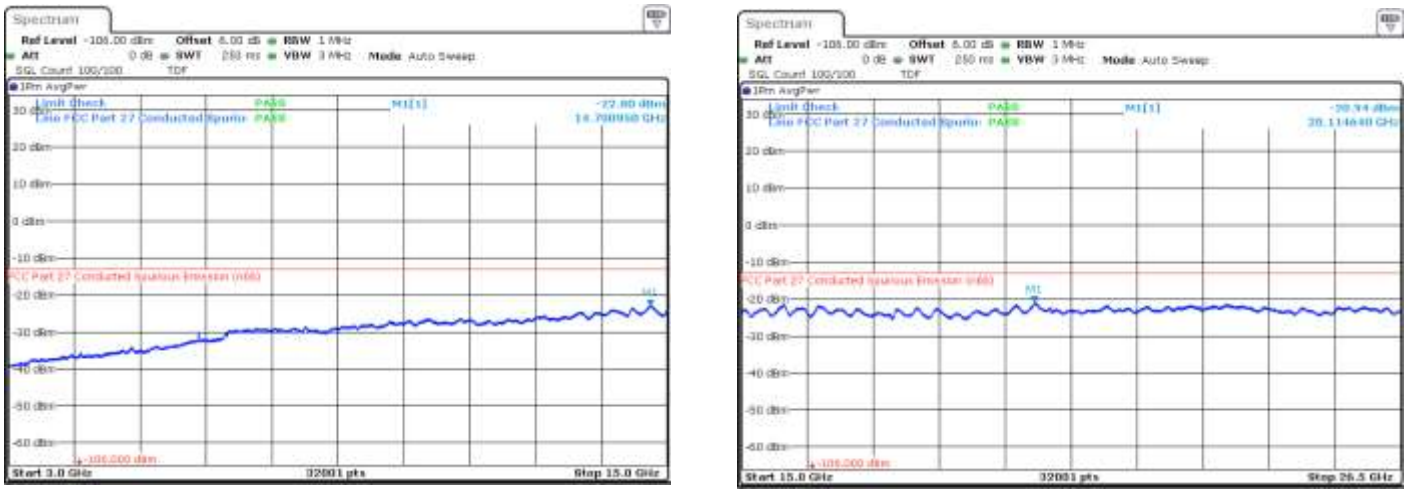


***Figure 8.6-9**: Conducted emission test, 16QAM Modulation, middle channel (15 MHz), respectively, band n66.*

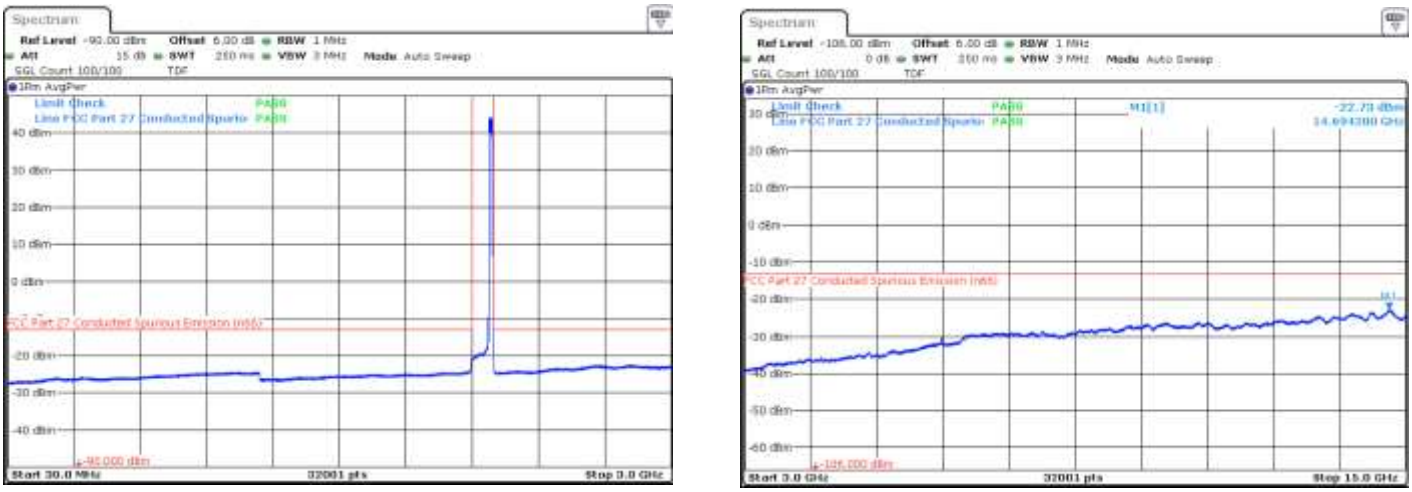


***Figure 8.6-10**: Conducted emission test, 16QAM Modulation, high channel (15 MHz), band n66.*

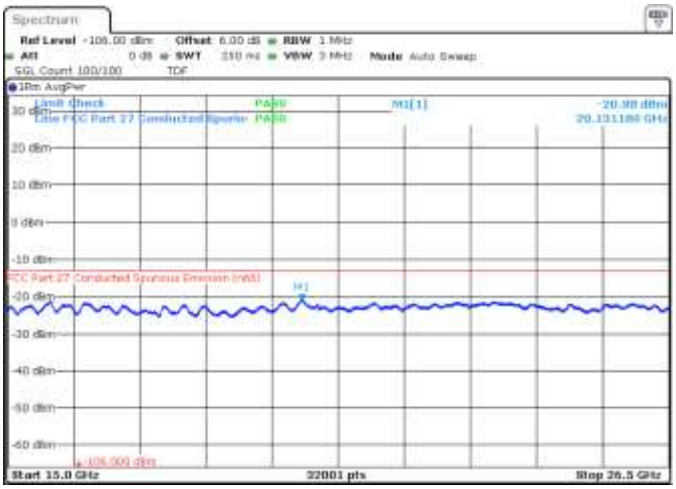


***Figure 8.6-11**: Conducted emission test, 16QAM Modulation, high channel (15 MHz), band n66.*

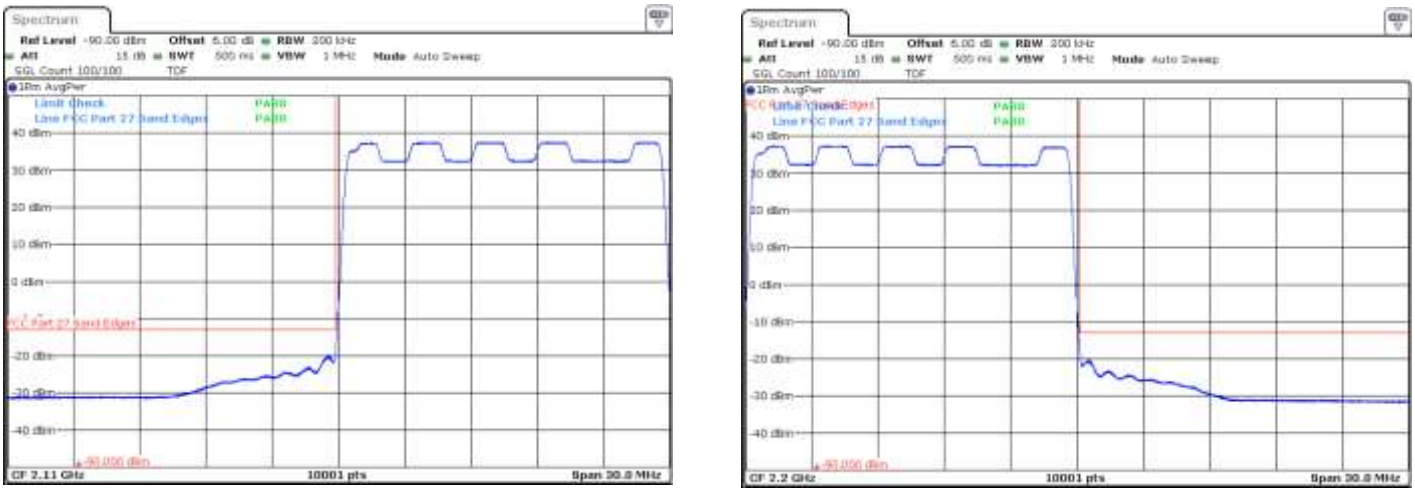


***Figure 8.6-12**: Conducted emission test, 16QAM Modulation, band edge: low and high channels, respectively (15 MHz), band n66.*

***Note: For this specific test the frequency limit has a frequency offset equivalent at RBW/2 (±100 kHz from the low and high edge of the band), in order to demonstrate compliance. This offset was taken according to ANSI C63.26 Clause 5.7.2 (g) rules.***

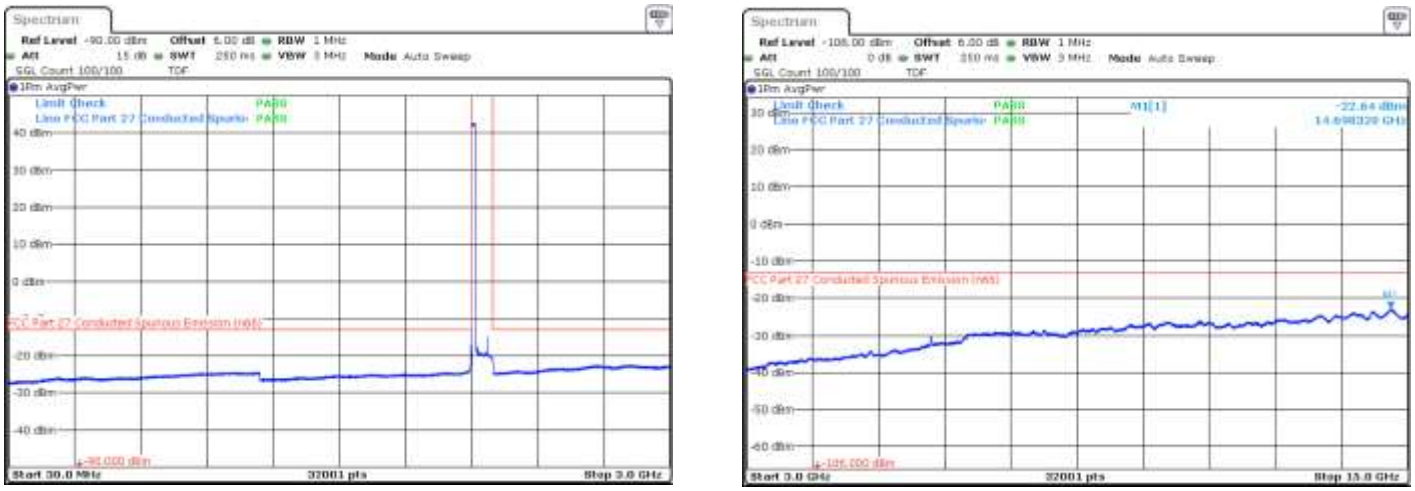


***Figure 8.6-13**: Conducted emission test, 64QAM Modulation, low channel (15 MHz), band n66.*

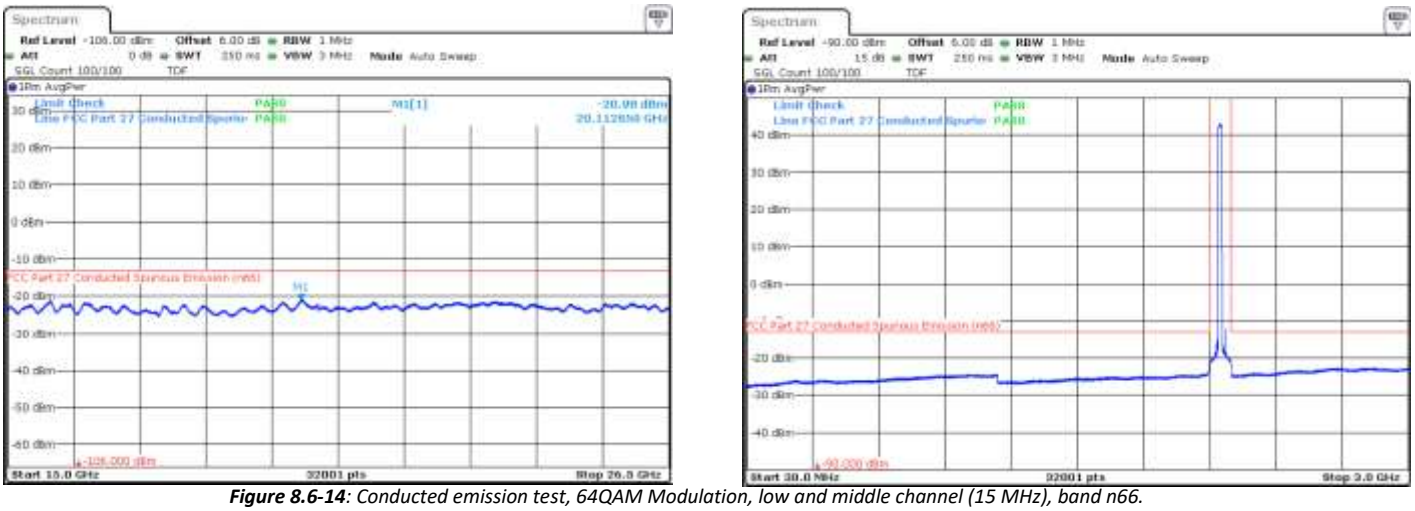


***Figure 8.6-14**: Conducted emission test, 64QAM Modulation, low and middle channel (15 MHz), band n66.*

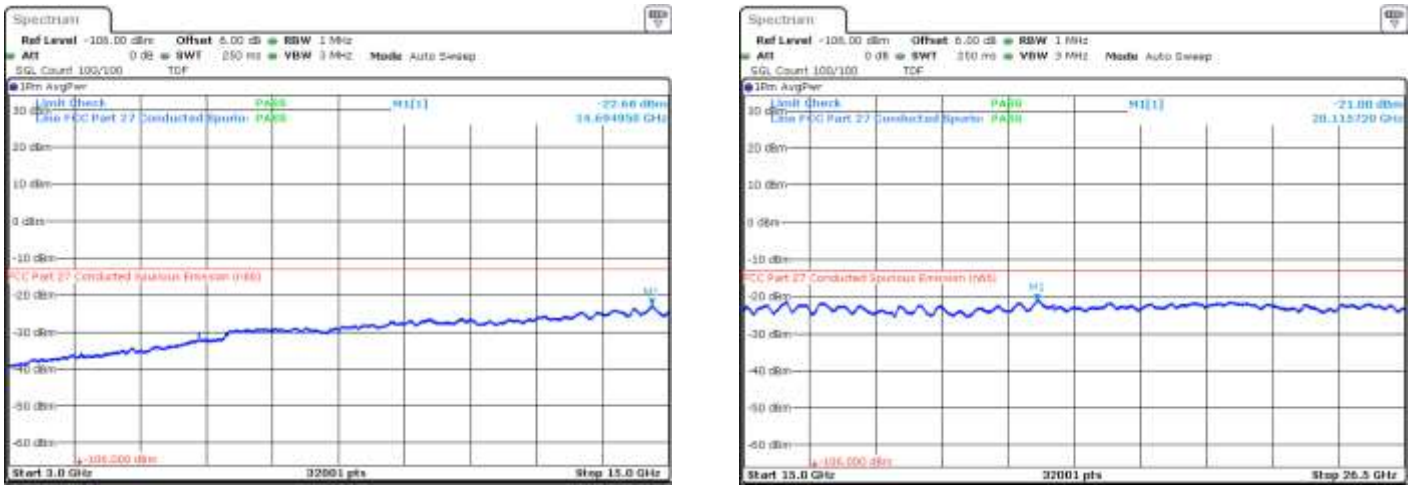



***Figure 8.6-15**: Conducted emission test, 64QAM Modulation, middle channel (15 MHz), respectively, band n66.*

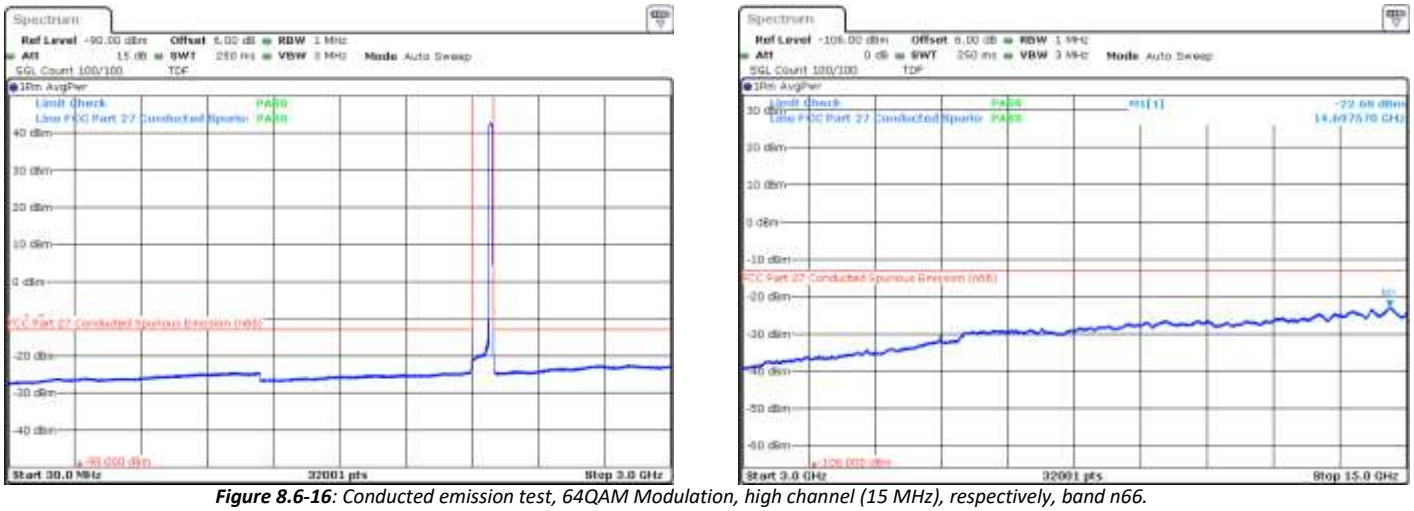



***Figure 8.6-16**: Conducted emission test, 64QAM Modulation, high channel (15 MHz), respectively, band n66.*

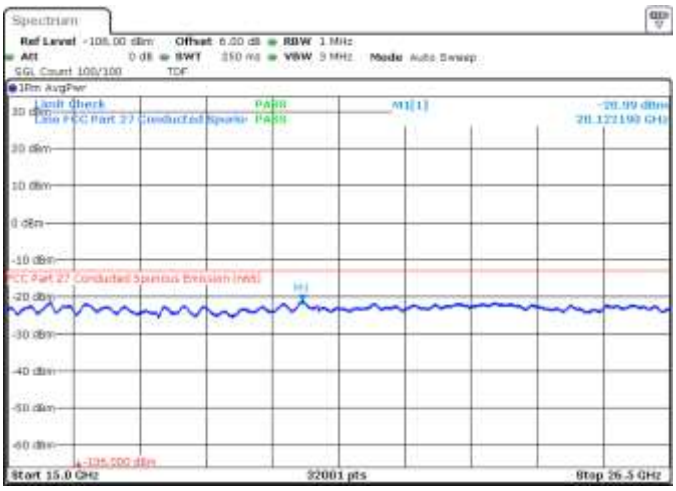



***Figure 8.6-17**: Conducted emission test, 64QAM Modulation, high channel (15 MHz), respectively, band n66.*

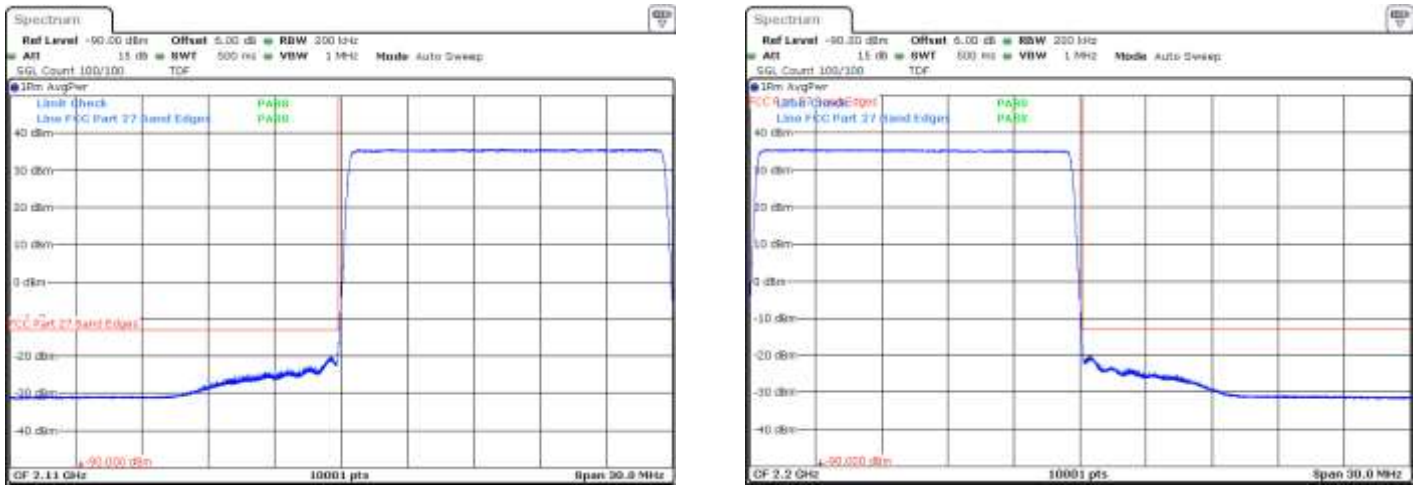



***Figure 8.6-18**: Conducted emission test, 64QAM Modulation, band edge: low and high channels, respectively (15 MHz), band n66.*

***Note: For this specific test the frequency limit has a frequency offset equivalent at RBW/2 (±100 kHz from the low and high edge of the band), in order to demonstrate compliance. This offset was taken according to ANSI C63.26 Clause 5.7.2 (g) rules.***

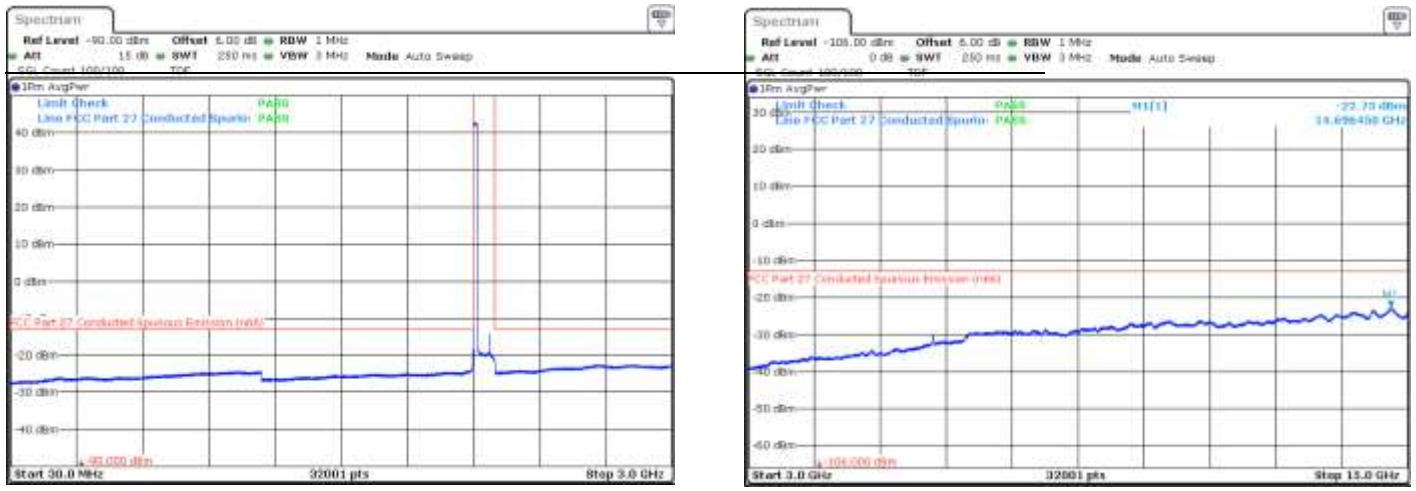



***Figure 8.6-19**: Conducted emission test, 256QAM Modulation, low channel (15 MHz), band n66.*

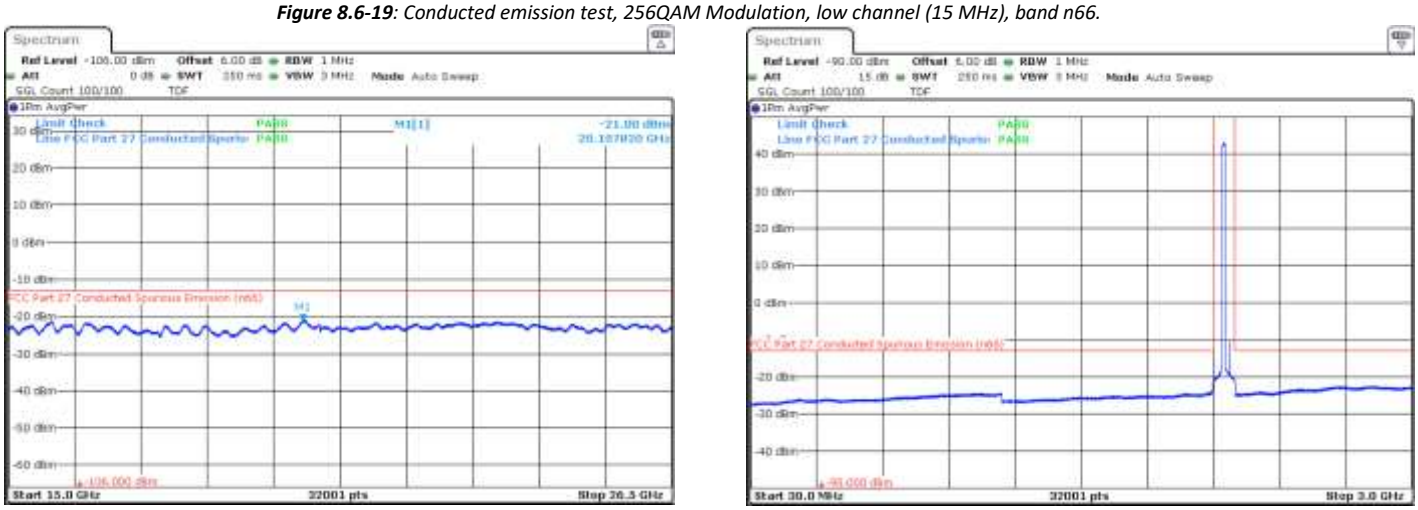
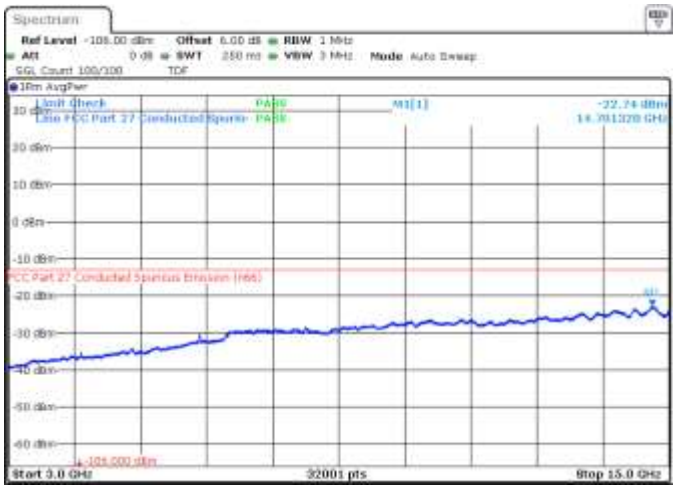



***Figure 8.6-20**: Conducted emission test, 256QAM Modulation, low and middle channel (15 MHz), band n66.*



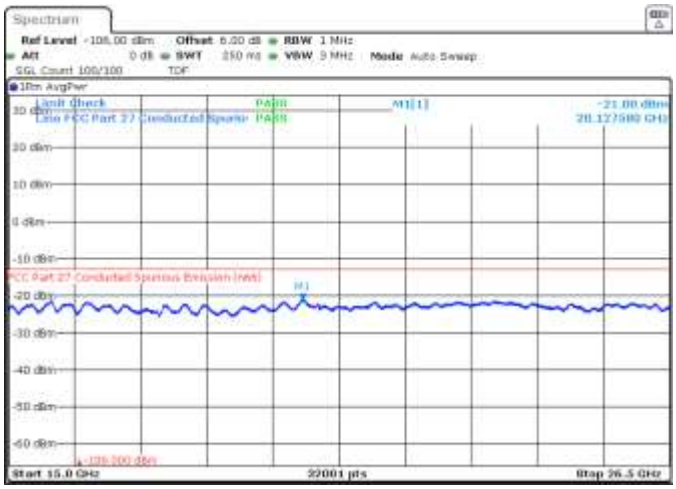
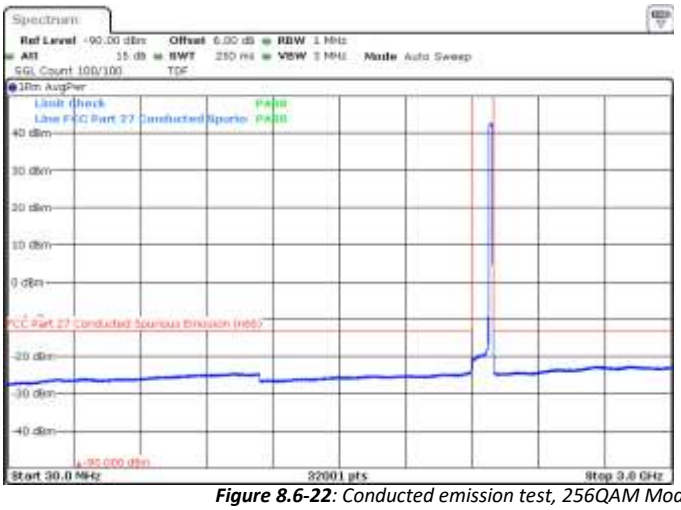




***Figure 8.6-21**: Conducted emission test, 256QAM Modulation, middle channel (15 MHz), respectively, band n66.*



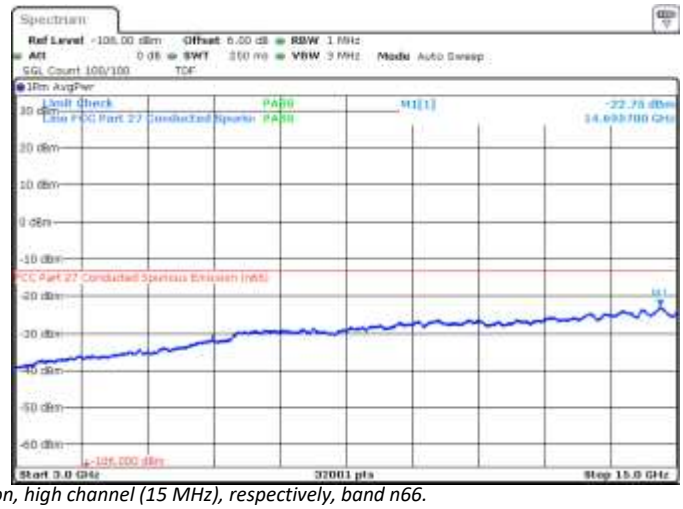




***Figure 8.6-22**: Conducted emission test, 256QAM Modulation, high channel (15 MHz), respectively, band n66.*

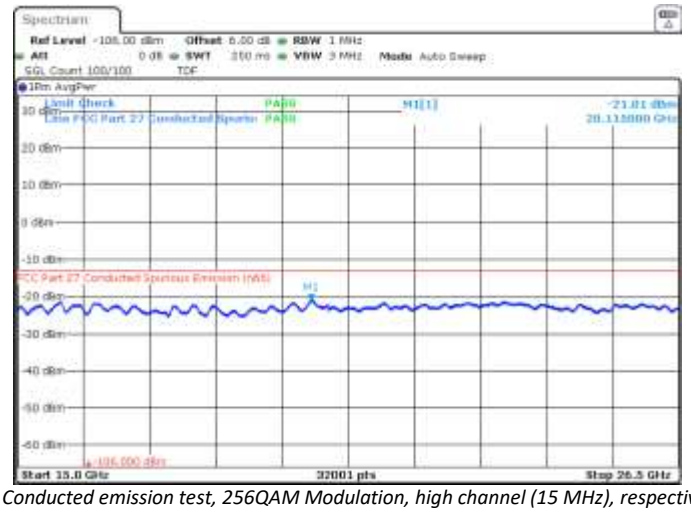



***Figure 8.6-23**: Conducted emission test, 256QAM Modulation, high channel (15 MHz), respectively, band n66.*

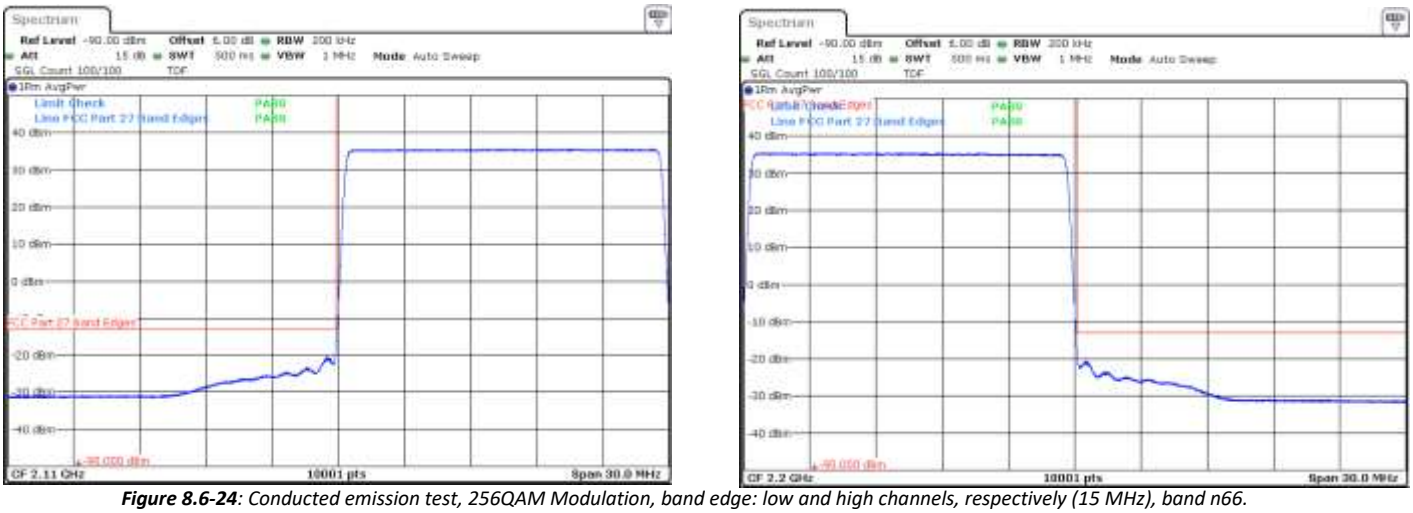



***Figure 8.6-24**: Conducted emission test, 256QAM Modulation, band edge: low and high channels, respectively (15 MHz), band n66.*

***Note: For this specific test the frequency limit has a frequency offset equivalent at RBW/2 (±100 kHz from the low and high edge of the band), in order to demonstrate compliance. This offset was taken according to ANSI C63.26 Clause 5.7.2 (g) rules.***

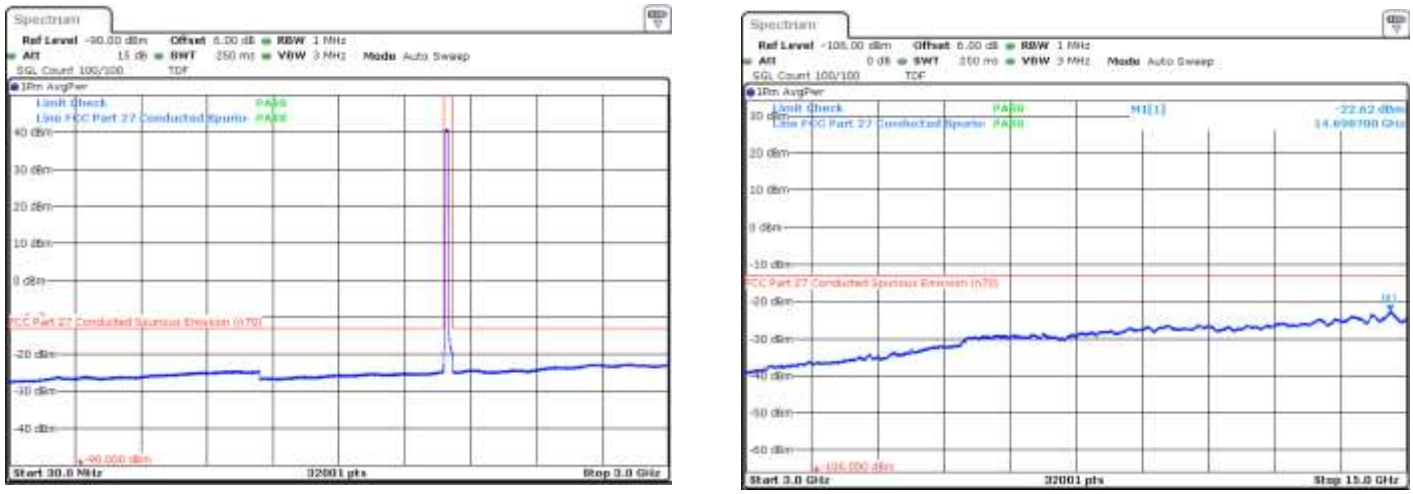



***Figure 8.6-25**: Conducted emission test, QPSK Modulation, low channel (15 MHz), band n70.*

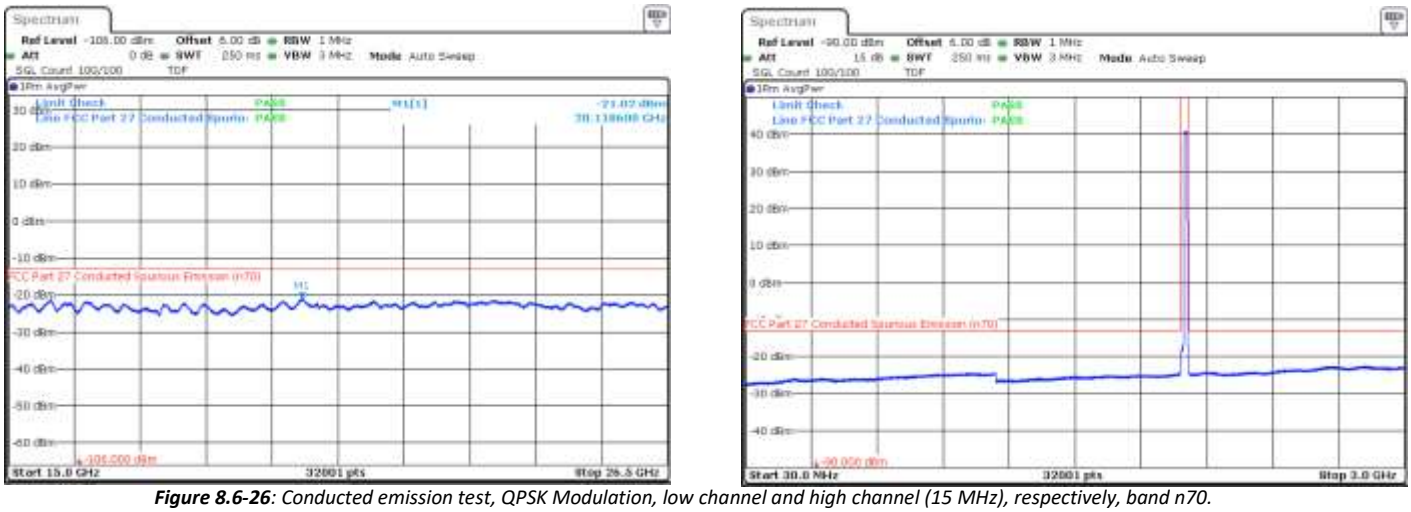



***Figure 8.6-26**: Conducted emission test, QPSK Modulation, low channel and high channel (15 MHz), respectively, band n70.*

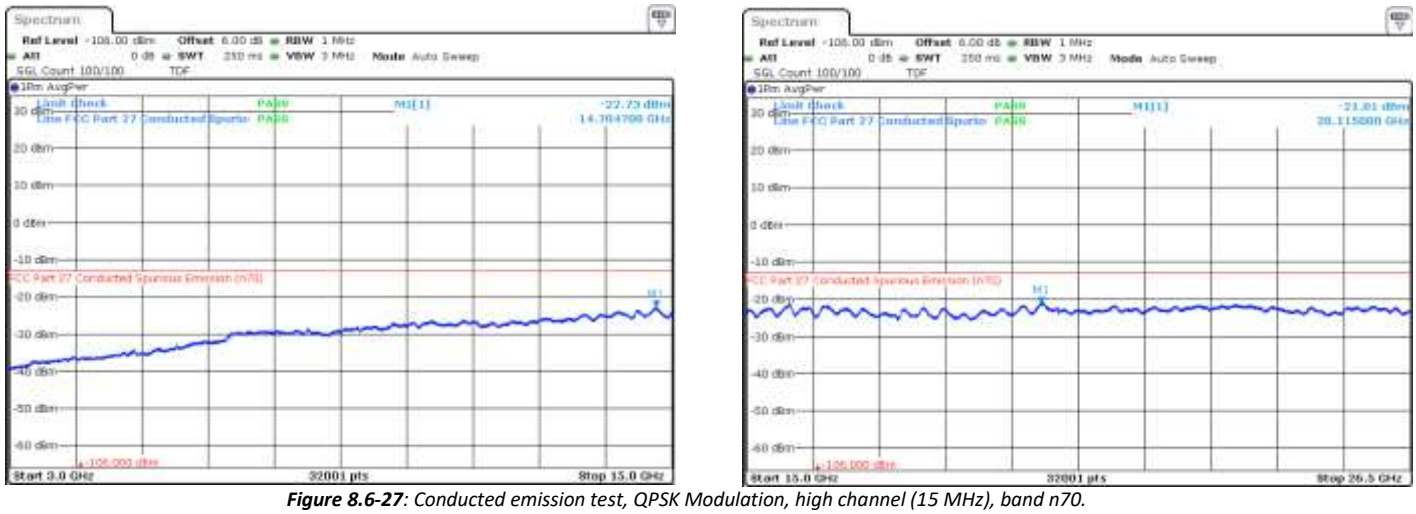


***Figure 8.6-27**: Conducted emission test, QPSK Modulation, high channel (15 MHz), band n70.*

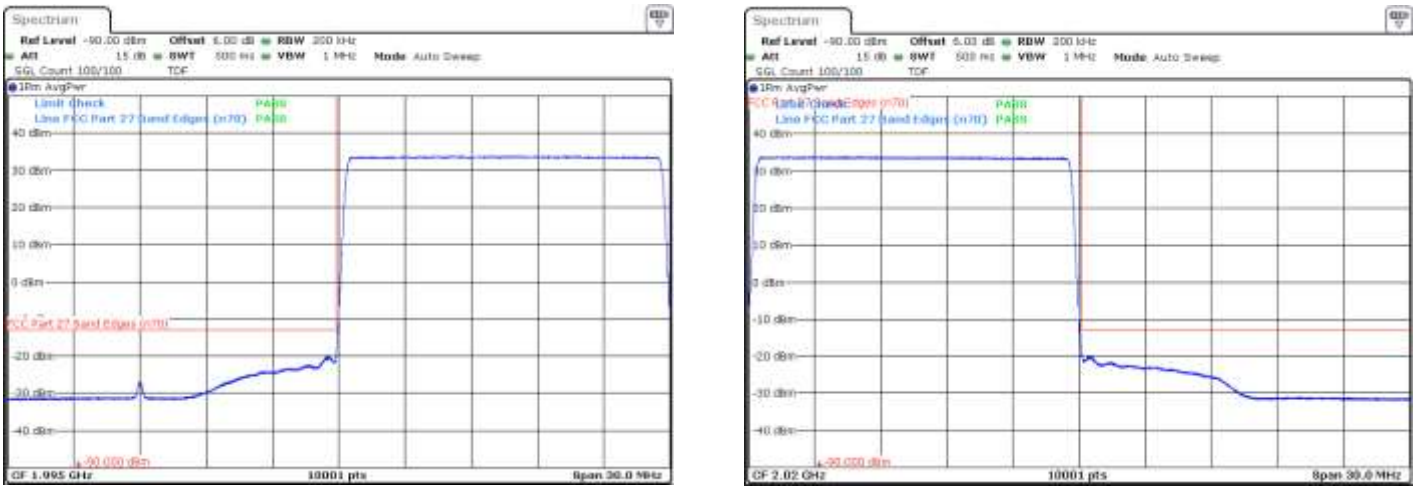


***Figure 8.6-28**: Conducted emission test, QPSK Modulation, band edge: low and high channels, respectively (15 MHz), band n70.*

***Note: For this specific test the frequency limit has a frequency offset equivalent at RBW/2 (±100 kHz from the low and high edge of the band), in order to demonstrate compliance. This offset was taken according to ANSI C63.26 Clause 5.7.2 (g) rules.***

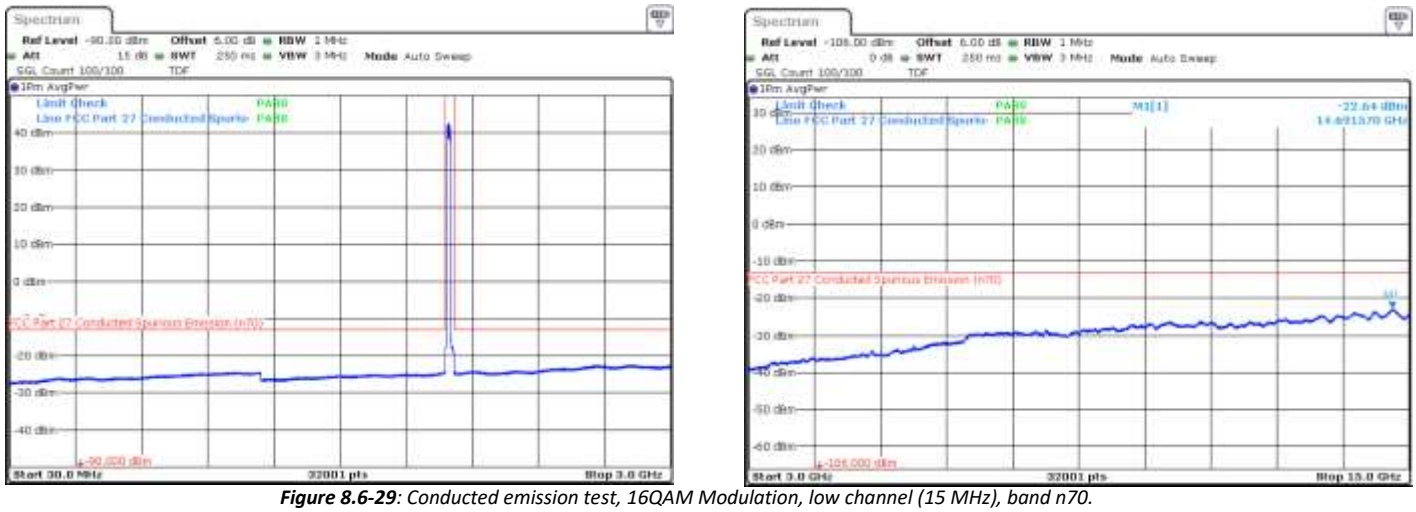
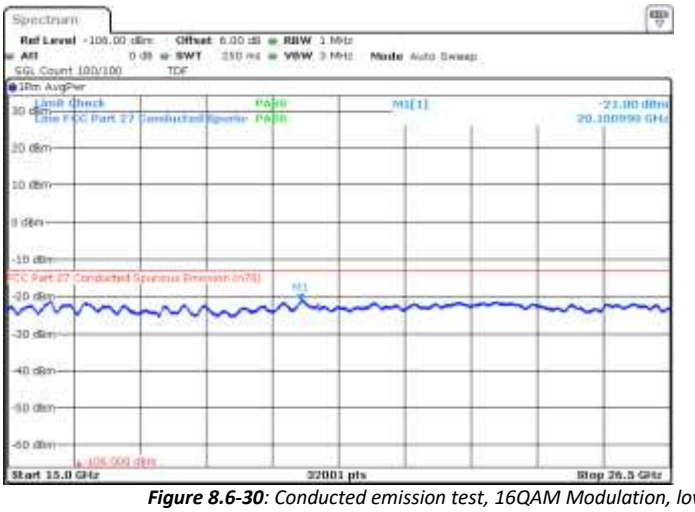


***Figure 8.6-29**: Conducted emission test, 16QAM Modulation, low channel (15 MHz), band n70.*



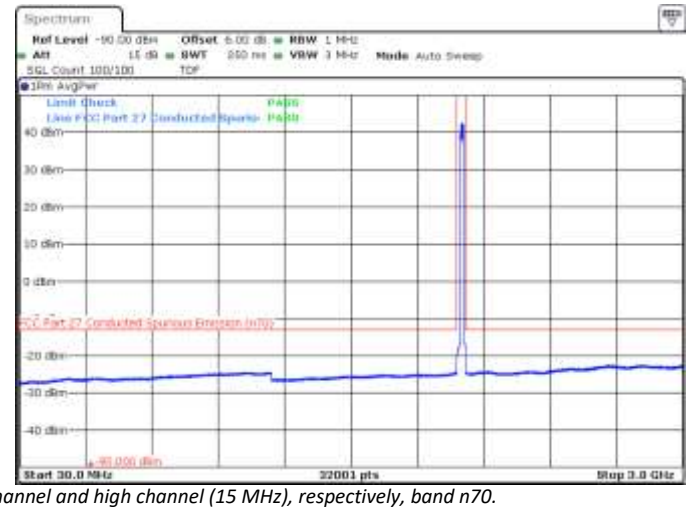
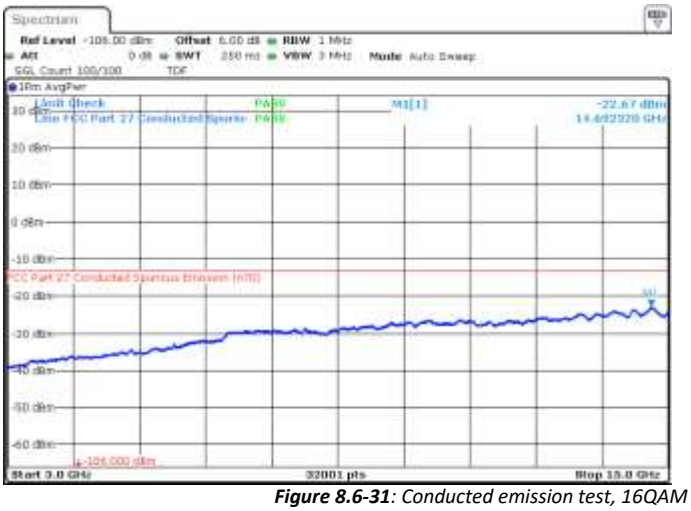




***Figure 8.6-30**: Conducted emission test, 16QAM Modulation, low channel and high channel (15 MHz), respectively, band n70.*



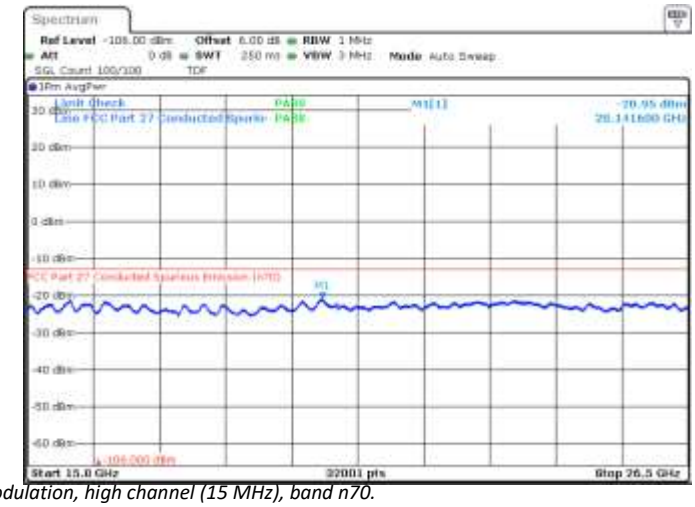




***Figure 8.6-31**: Conducted emission test, 16QAM Modulation, high channel (15 MHz), band n70.*

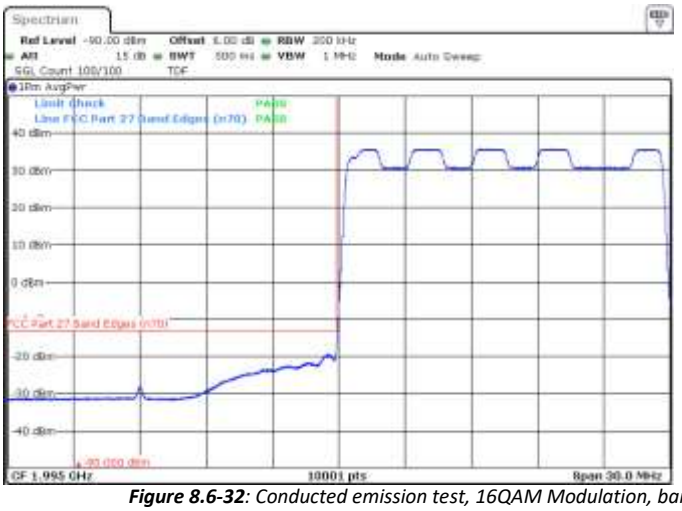
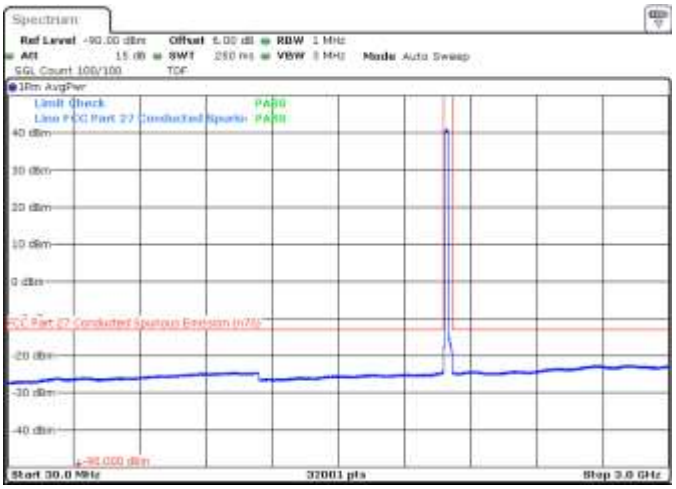




***Figure 8.6-32**: Conducted emission test, 16QAM Modulation, band edge: low and high channels, respectively (15 MHz), band n70.*

***Note: For this specific test the frequency limit has a frequency offset equivalent at RBW/2 (±100 kHz from the low and high edge of the band), in order to demonstrate compliance. This offset was taken according to ANSI C63.26 Clause 5.7.2 (g) rules.***



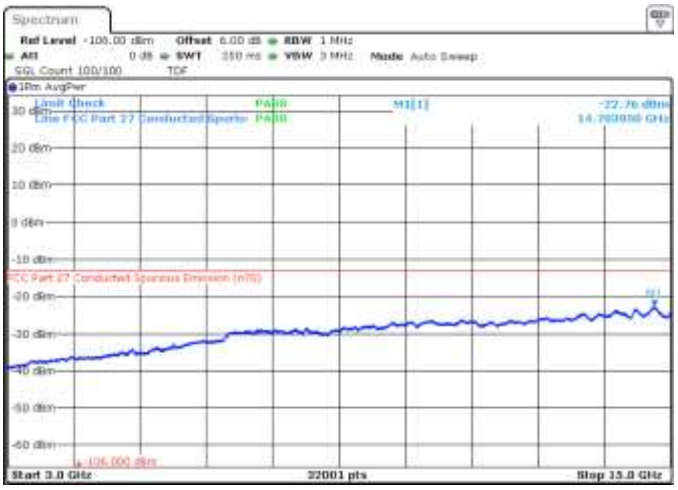
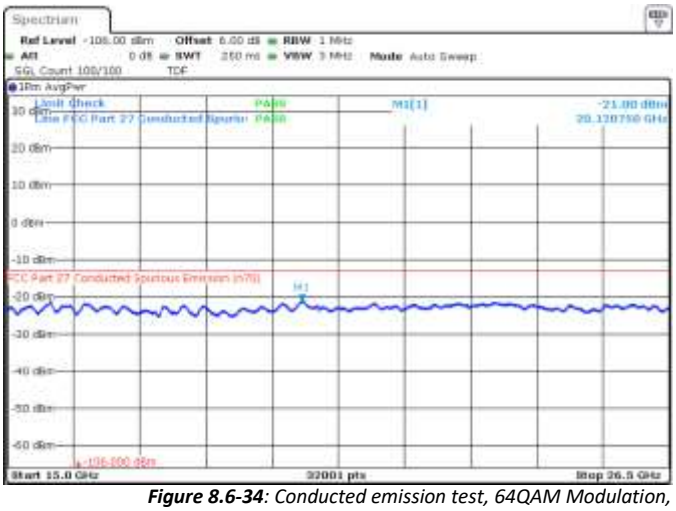




***Figure 8.6-33**: Conducted emission test, 64QAM Modulation, low channel (15 MHz), band n70.*



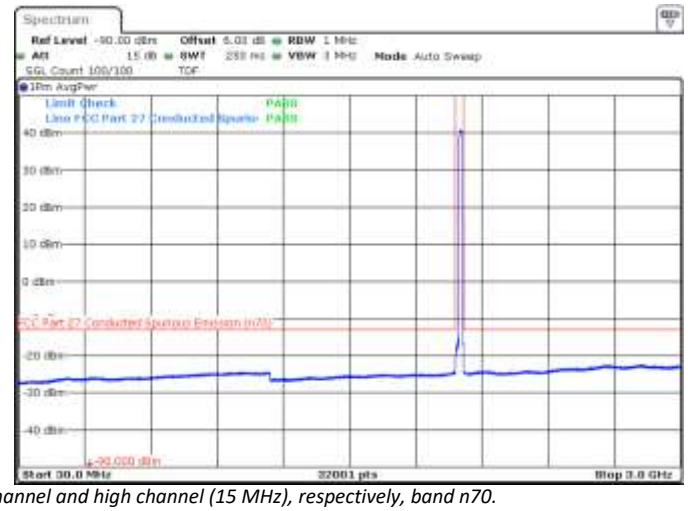
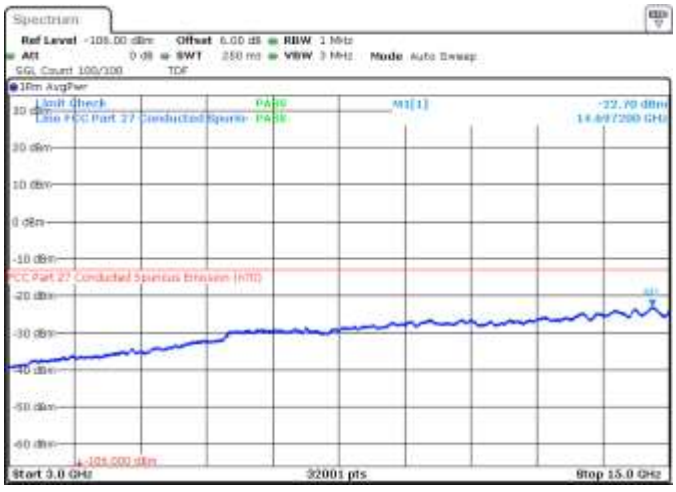




***Figure 8.6-34**: Conducted emission test, 64QAM Modulation, low channel and high channel (15 MHz), respectively, band n70.*



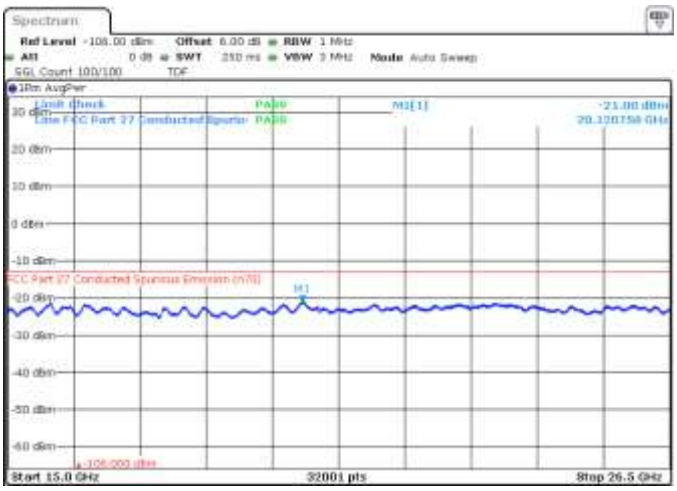




***Figure 8.6-35**: Conducted emission test, 64QAM Modulation, high channel (15 MHz), band n70.*

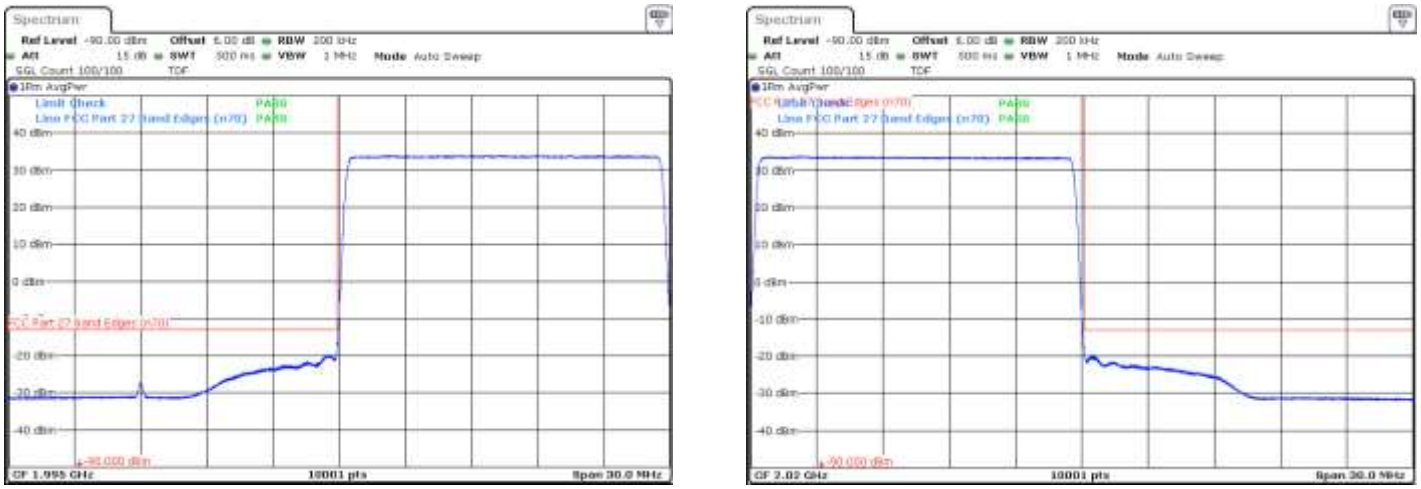


***Figure 8.6-36**: Conducted emission test, 64QAM Modulation, band edge: low and high channels, respectively (15 MHz), band n70.*

***Note: For this specific test the frequency limit has a frequency offset equivalent at RBW/2 (±100 kHz from the low and high edge of the band), in order to demonstrate compliance. This offset was taken according to ANSI C63.26 Clause 5.7.2 (g) rules.***

***Figure 8.6-37**: Conducted emission test, 256QAM Modulation, low channel (15 MHz), band n70.*

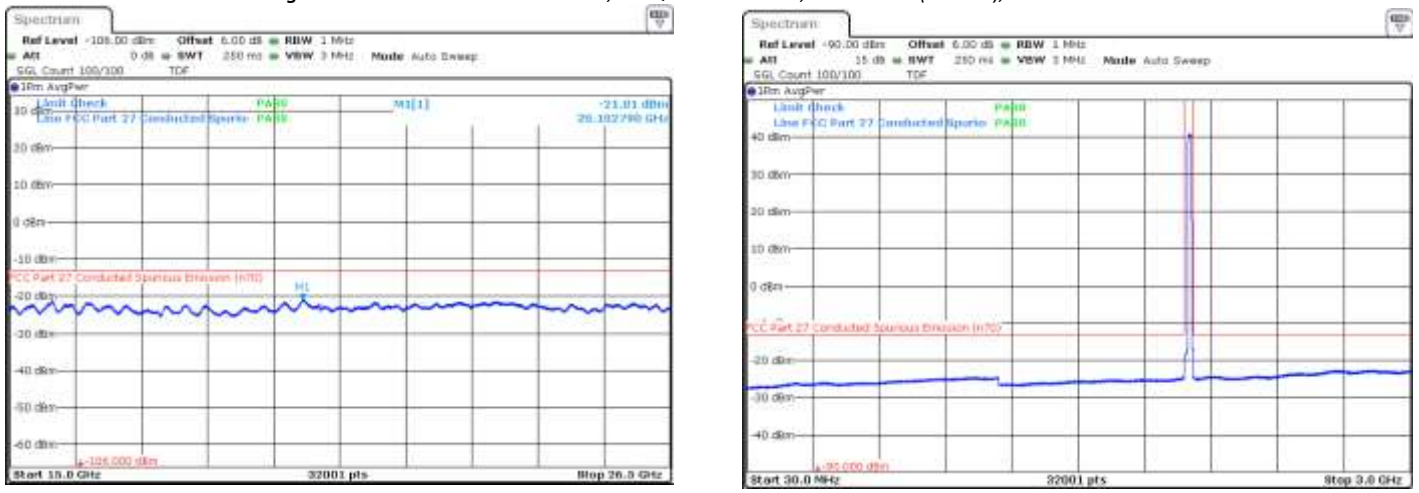
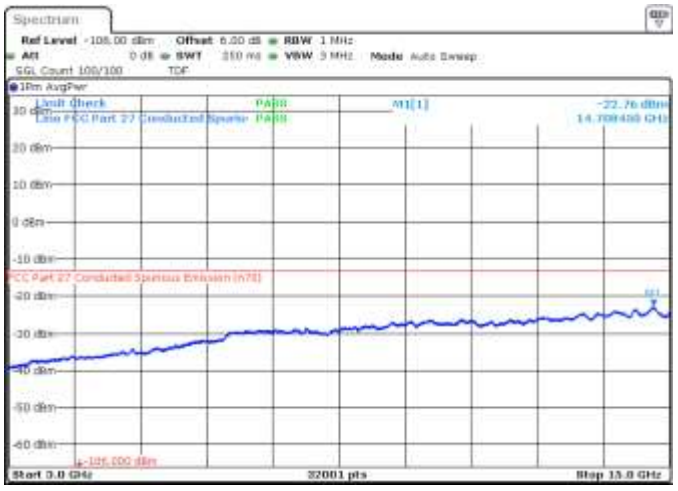


***Figure 8.6-38**: Conducted emission test, 256QAM Modulation, low channel and high channel (15 MHz), respectively, band n70.*



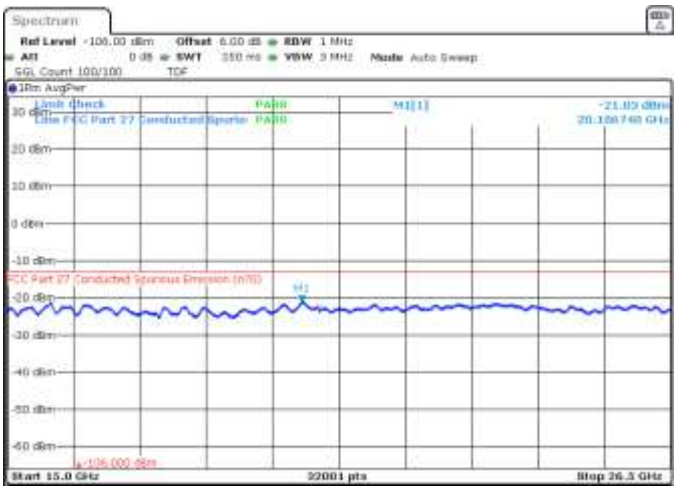
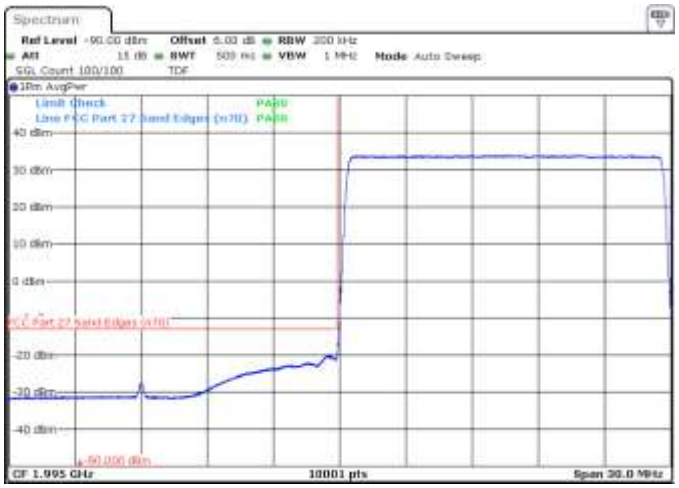




***Figure 8.6-39**: Conducted emission test, 256QAM Modulation, high channel (15 MHz), band n70.*



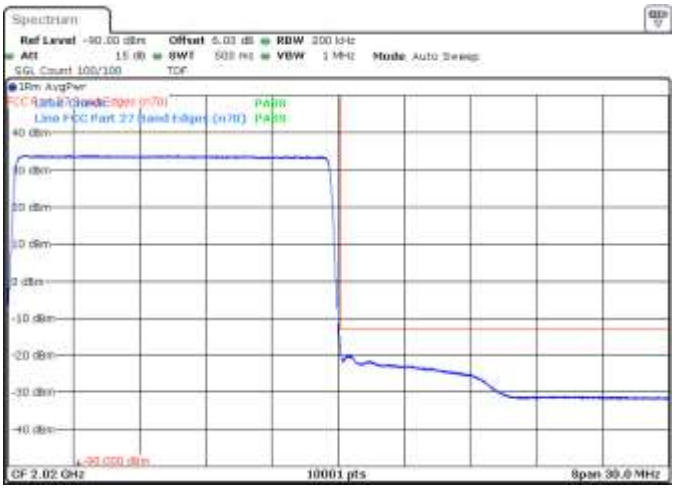
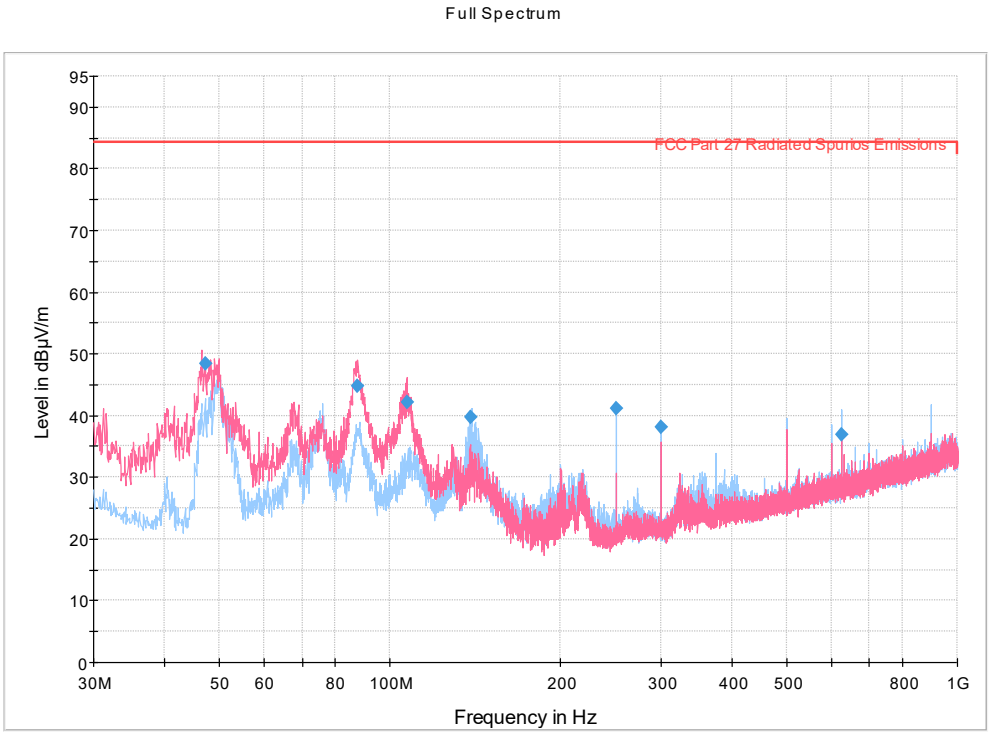




***Figure 8.6-40**: Conducted emission test, 256QAM Modulation, band edge: low and high channels, respectively (15 MHz), band n70.*

***Note: For this specific test the frequency limit has a frequency offset equivalent at RBW/2 (±100 kHz from the low and high edge of the band), in order to demonstrate compliance. This offset was taken according to ANSI C63.26 Clause 5.7.2 (g) rules.***




The spectral plot shows the vertical (red plot) and horizontal (blue plot) scans. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

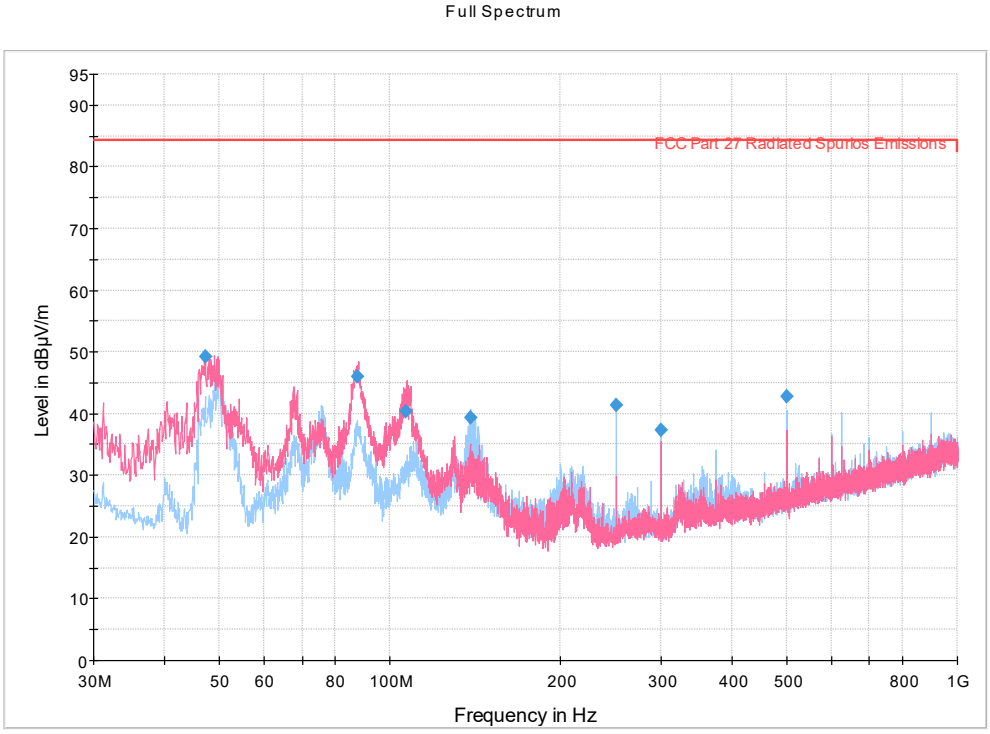
***Figure 8.6-41:*** *Emissions limit plot – Field strength measured from 0.030 to 1 GHz, 256QAM Modulation, 15 MHz OBW, Low channel, band n66.*

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|
| 47.290000 | 48.50 | 84.38 | 35.88 | 5000.0 | 120.000 | 100.0 | V | 32.0 | 17.2 |
| 87.555000 | 44.72 | 84.38 | 39.66 | 5000.0 | 120.000 | 100.0 | V | 348.0 | 15.8 |
| 107.153333 | 42.08 | 84.38 | 42.30 | 5000.0 | 120.000 | 110.0 | V | 322.0 | 18.5 |
| 138.405833 | 39.79 | 84.38 | 44.59 | 5000.0 | 120.000 | 174.0 | H | 86.0 | 19.7 |
| 250.028333 | 41.23 | 84.38 | 43.15 | 5000.0 | 120.000 | 100.0 | H | 121.0 | 20.9 |
| 300.023333 | 38.19 | 84.38 | 46.19 | 5000.0 | 120.000 | 225.0 | H | 112.0 | 22.0 |
| 624.974167 | 36.91 | 84.38 | 47.47 | 5000.0 | 120.000 | 200.0 | H | 156.0 | 29.4 |

***Table 8.6-1:*** *Emissions limit results – Field strength measured from 0.030 to 1 GHz, 256QAM Modulation, 15 MHz OBW, Low channel, band n66.*

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] The spectral plot shows the vertical and horizontal scan separately.
[5] This measurement was done at 3m

## 8.6.4 Test data, continued



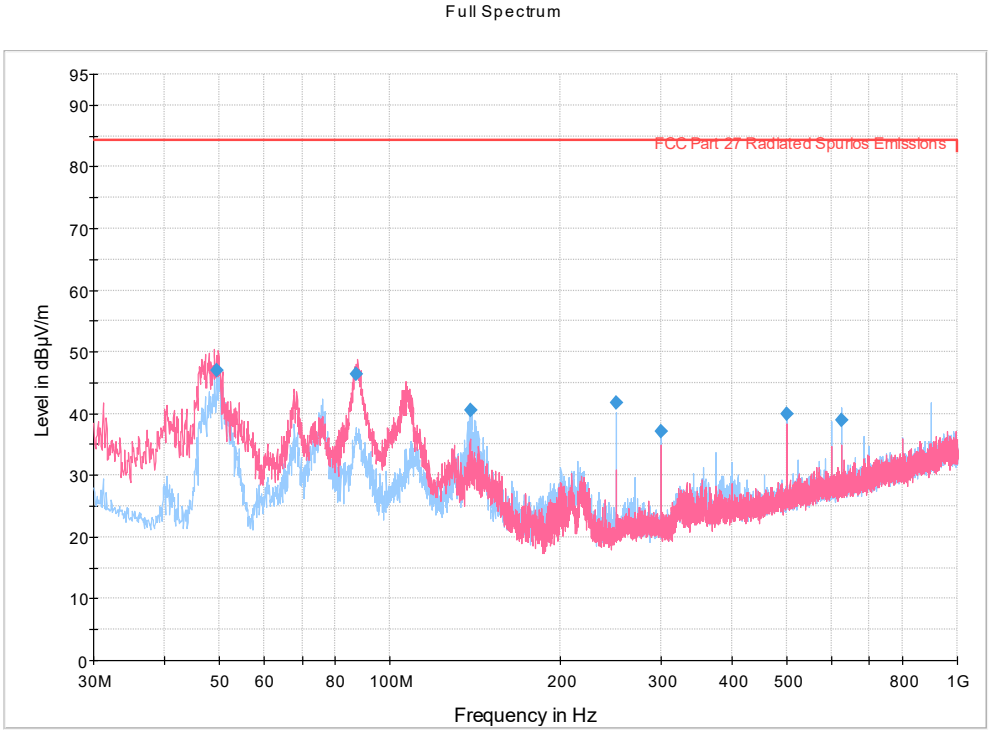

The spectral plot shows the vertical (red plot) and horizontal (blue plot) scans separately. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

***Figure 8.6-42:*** *Emissions limit plot – Field strength measured from 0.030 to 1 GHz, 256QAM Modulation, 15 MHz OBW, Middle channel, band n66*

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|
| 47.265000 | 49.15 | 84.38 | 35.23 | 5000.0 | 120.000 | 100.0 | V | 32.0 | 17.2 |
| 87.596667 | 45.98 | 84.38 | 38.40 | 5000.0 | 120.000 | 109.0 | V | 316.0 | 15.8 |
| 106.473333 | 40.29 | 84.38 | 44.09 | 5000.0 | 120.000 | 128.0 | V | 323.0 | 18.4 |
| 138.397500 | 39.43 | 84.38 | 44.95 | 5000.0 | 120.000 | 154.0 | H | 54.0 | 19.7 |
| 250.028333 | 41.26 | 84.38 | 43.12 | 5000.0 | 120.000 | 100.0 | H | 122.0 | 20.9 |
| 300.024167 | 37.25 | 84.38 | 47.13 | 5000.0 | 120.000 | 110.0 | H | 317.0 | 22.0 |
| 500.045833 | 42.80 | 84.38 | 41.58 | 5000.0 | 120.000 | 128.0 | H | 134.0 | 27.1 |

***Table 8.6-2:*** *Emissions limit results – Field strength measured from 0.030 to 1 GHz, 256QAM Modulation, 15 MHz OBW, Middle channel, band n66.*

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] The spectral plot shows the vertical and horizontal scan separately.
[5] This measurement was done at 3m



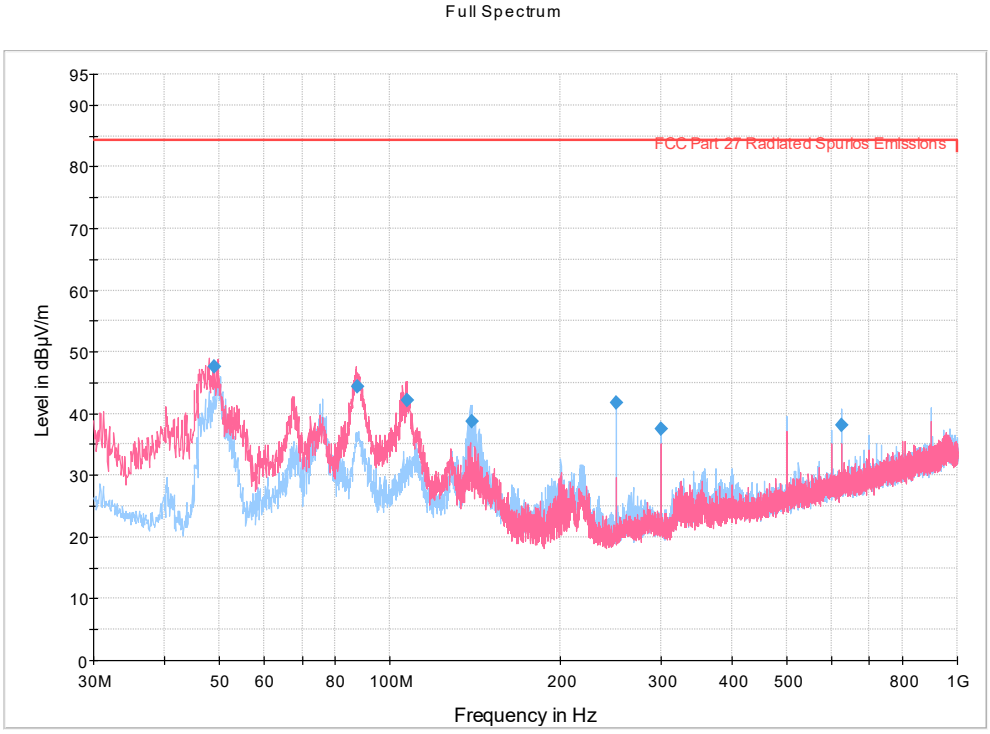

The spectral plot shows the vertical (red plot) and horizontal (blue plot) scans separately. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

***Figure 8.6-43:*** *Emissions limit plot – Fie Field strength measured from 0.030 to 1 GHz, 256QAM Modulation, 15 MHz OBW, High channel, band n66*

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|
| 49.515833 | 46.90 | 84.38 | 37.48 | 5000.0 | 120.000 | 100.0 | V | 20.0 | 16.1 |
| 87.195000 | 46.37 | 84.38 | 38.01 | 5000.0 | 120.000 | 100.0 | V | 330.0 | 15.7 |
| 138.396667 | 40.59 | 84.38 | 43.79 | 5000.0 | 120.000 | 211.0 | H | 64.0 | 19.7 |
| 250.028333 | 41.67 | 84.38 | 42.71 | 5000.0 | 120.000 | 100.0 | H | 126.0 | 20.9 |
| 300.024167 | 37.19 | 84.38 | 47.19 | 5000.0 | 120.000 | 100.0 | H | 290.0 | 22.0 |
| 500.046667 | 40.02 | 84.38 | 44.36 | 5000.0 | 120.000 | 193.0 | H | 0.0 | 27.1 |
| 625.014167 | 38.86 | 84.38 | 45.52 | 5000.0 | 120.000 | 202.0 | H | 76.0 | 29.4 |

***Table 8.6-3:*** *Emissions limit results – Field strength measured from 0.030 to 1 GHz, 256QAM Modulation, 15 MHz OBW, High channel, band n66*

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] The spectral plot shows the vertical and horizontal scan separately.
[5] This measurement was done at 3m



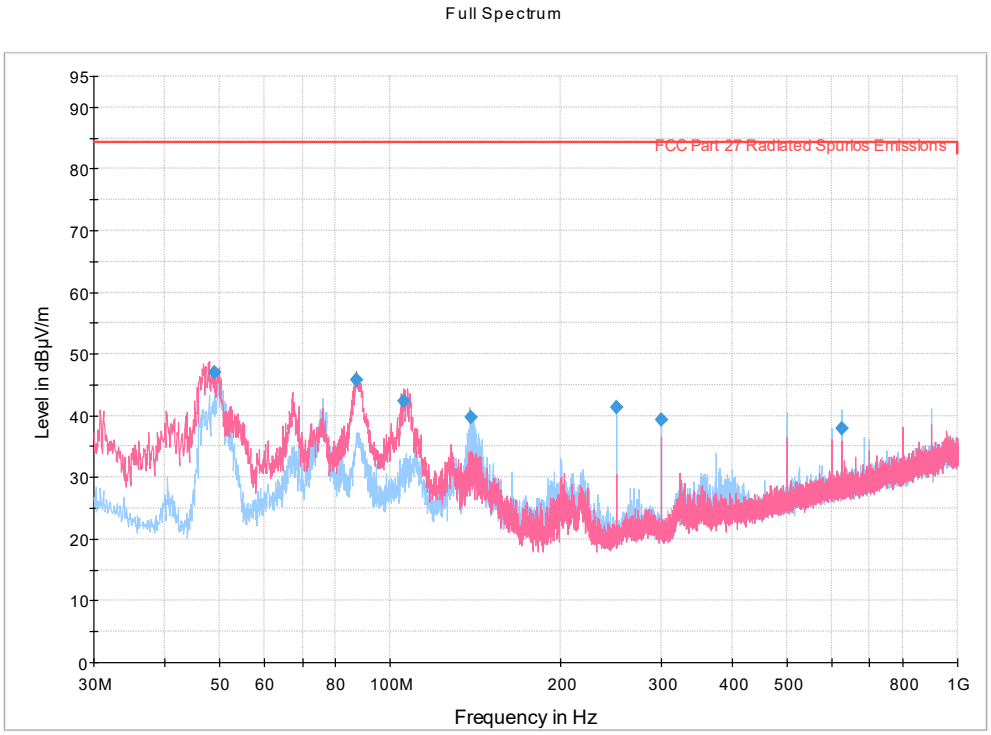

The spectral plot shows the vertical (red plot) and horizontal (blue plot) scans separately. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

***Figure 8.6-44:*** *Emissions limit plot – Field strength measured from 0.030 to 1 GHz, 256QAM Modulation, 15 MHz OBW, Low channel, band n70.*

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|
| 49.043333 | 47.68 | 84.38 | 36.70 | 5000.0 | 120.000 | 100.0 | V | 55.0 | 16.4 |
| 87.749167 | 44.45 | 84.38 | 39.93 | 5000.0 | 120.000 | 146.0 | V | 293.0 | 15.8 |
| 107.187500 | 42.21 | 84.38 | 42.17 | 5000.0 | 120.000 | 110.0 | V | 336.0 | 18.5 |
| 139.245833 | 38.69 | 84.38 | 45.69 | 5000.0 | 120.000 | 175.0 | H | 66.0 | 19.6 |
| 250.028333 | 41.81 | 84.38 | 42.57 | 5000.0 | 120.000 | 100.0 | H | 126.0 | 20.9 |
| 300.024167 | 37.50 | 84.38 | 46.88 | 5000.0 | 120.000 | 100.0 | H | 304.0 | 22.0 |
| 624.974167 | 38.15 | 84.38 | 46.23 | 5000.0 | 120.000 | 212.0 | H | 131.0 | 29.4 |

***Table 8.6-4:*** *Emissions limit results – Field strength measured from 0.030 to 1 GHz, 256QAM Modulation, 15 MHz OBW, Low channel, band n70.*

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] The spectral plot shows the vertical and horizontal scan separately.
[5] This measurement was done at 3m



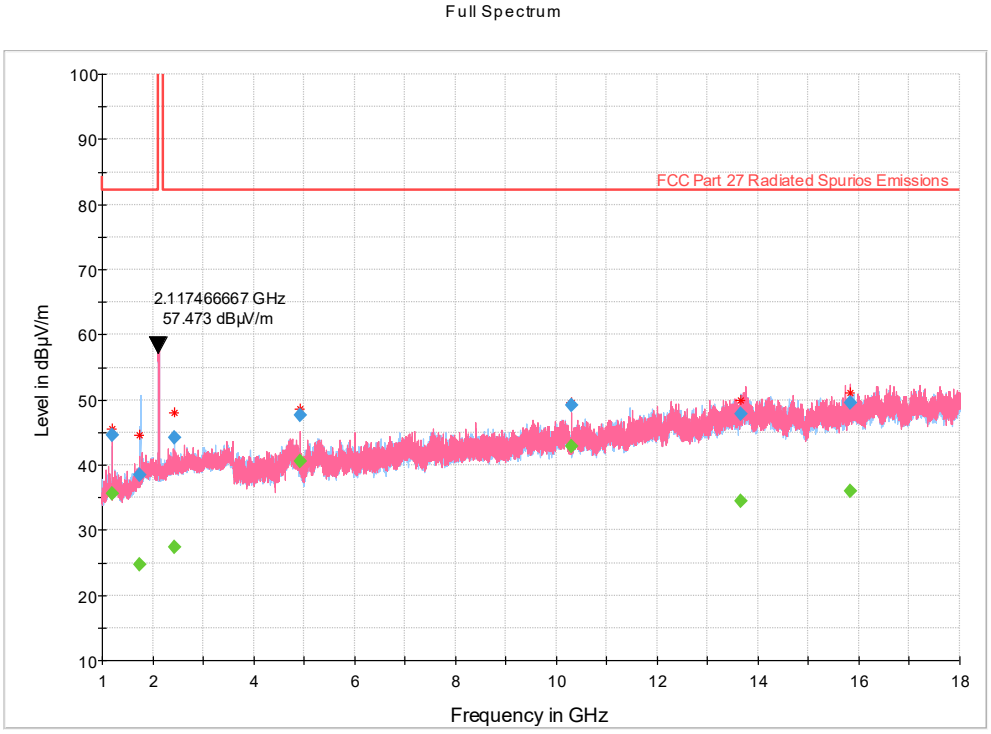

The spectral plot shows the vertical (red plot) and horizontal (blue plot) scans separately. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

***Figure 8.6-45:*** *Emissions limit plot – Field strength measured from 0.030 to 1 GHz, 256QAM Modulation, 15 MHz OBW, High channel, band n70.*

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|
| 49.065000 | 46.91 | 84.38 | 37.47 | 5000.0 | 120.000 | 100.0 | V | 20.0 | 16.4 |
| 87.027500 | 45.71 | 84.38 | 38.67 | 5000.0 | 120.000 | 110.0 | V | 319.0 | 15.7 |
| 105.376667 | 42.30 | 84.38 | 42.08 | 5000.0 | 120.000 | 118.0 | V | 342.0 | 18.3 |
| 138.396667 | 39.64 | 84.38 | 44.74 | 5000.0 | 120.000 | 193.0 | H | 66.0 | 19.7 |
| 250.028333 | 41.26 | 84.38 | 43.12 | 5000.0 | 120.000 | 100.0 | H | 121.0 | 20.9 |
| 300.023333 | 39.40 | 84.38 | 44.98 | 5000.0 | 120.000 | 212.0 | H | 109.0 | 22.0 |
| 625.014167 | 37.99 | 84.38 | 46.39 | 5000.0 | 120.000 | 203.0 | H | 64.0 | 29.4 |

***Table 8.6-5:*** *Emissions limit results – Field strength measured from 0.030 to 1 GHz, 256QAM Modulation, 15 MHz OBW, High channel, band n70.*

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] The spectral plot shows the vertical and horizontal scan separately.
[5] This measurement was done at 3m



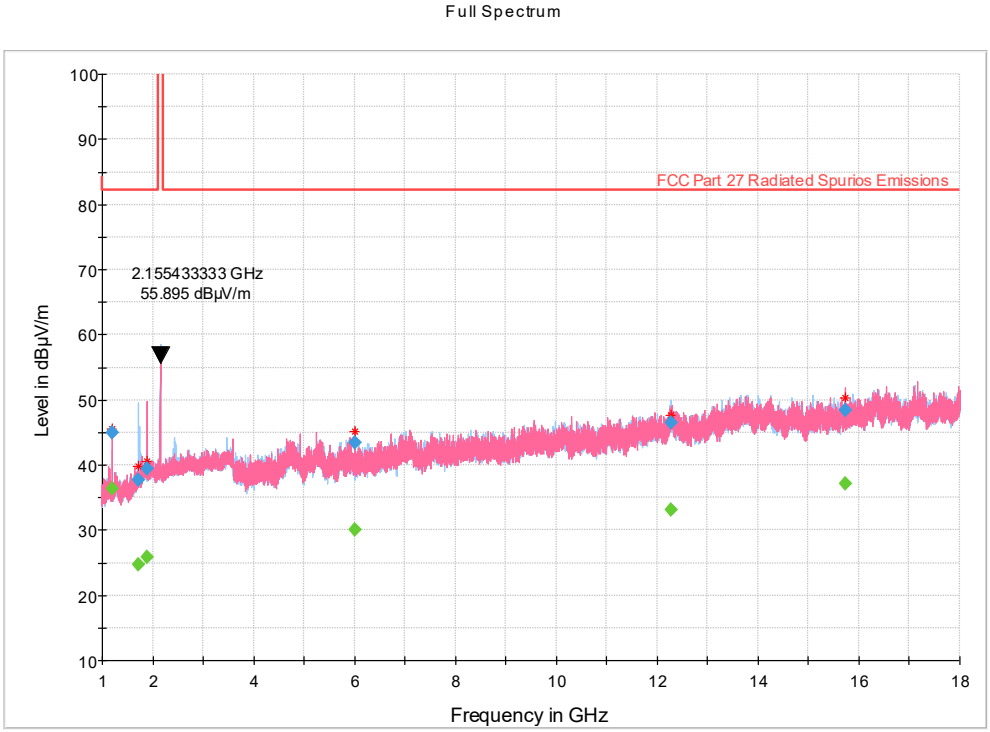

The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

***Figure 8.6-46:*** *Emissions limit plot – Field strength measured from 1 to 18 GHz, 256QAM Modulation, 15 MHz OBW, Low channel, band n66.*

| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1200.033333 | 44.60 | --- | 82.23 | 37.63 | 5000.0 | 1000.000 | 164.0 | V | 79.0 | -13.2 |
| 1200.033333 | --- | 35.54 | 82.23 | 46.69 | 5000.0 | 1000.000 | 164.0 | V | 79.0 | -13.2 |
| 1751.666667 | 38.38 | --- | 82.23 | 43.85 | 5000.0 | 1000.000 | 131.0 | H | 316.0 | -11.4 |
| 1751.666667 | --- | 24.77 | 82.23 | 57.46 | 5000.0 | 1000.000 | 131.0 | H | 316.0 | -11.4 |
| 2433.333333 | 44.22 | --- | 82.23 | 38.01 | 5000.0 | 1000.000 | 316.0 | H | 31.0 | -8.8 |
| 2433.333333 | --- | 27.30 | 82.23 | 54.93 | 5000.0 | 1000.000 | 316.0 | H | 31.0 | -8.8 |
| 4915.266667 | --- | 40.58 | 82.23 | 41.65 | 5000.0 | 1000.000 | 114.0 | V | 20.0 | -1.0 |
| 4915.266667 | 47.65 | --- | 82.23 | 34.58 | 5000.0 | 1000.000 | 114.0 | V | 20.0 | -1.0 |
| 10312.600000 | 49.21 | --- | 82.23 | 33.02 | 5000.0 | 1000.000 | 100.0 | V | 294.0 | 5.0 |
| 10312.600000 | --- | 42.86 | 82.23 | 39.37 | 5000.0 | 1000.000 | 100.0 | V | 294.0 | 5.0 |
| 13664.033333 | --- | 34.41 | 82.23 | 47.82 | 5000.0 | 1000.000 | 133.0 | H | 20.0 | 12.4 |
| 13664.033333 | 47.75 | --- | 82.23 | 34.48 | 5000.0 | 1000.000 | 133.0 | H | 20.0 | 12.4 |
| 15829.333333 | --- | 35.95 | 82.23 | 46.28 | 5000.0 | 1000.000 | 174.0 | V | 266.0 | 13.2 |
| 15829.333333 | 49.47 | --- | 82.23 | 32.76 | 5000.0 | 1000.000 | 174.0 | V | 266.0 | 13.2 |

***Table 8.6-6:*** *Emissions limit results – Field strength measured from 1 to 18 GHz, 256QAM Modulation, 15 MHz OBW, Low channel, band n66.*

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)+20 dB attenuator to protect the test equipment
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] The spectral plot is a summation of a vertical and horizontal scan.
[5] This measurement was done at 3m



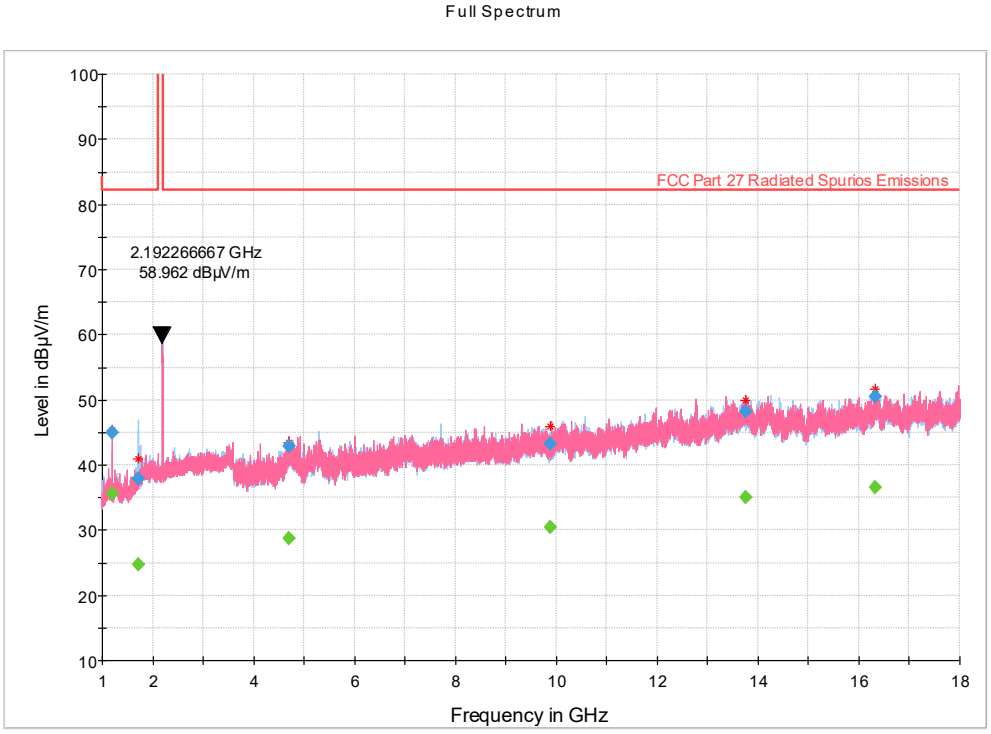

The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

***Figure 8.6-47:*** *Emissions limit plot – Field strength measured from 1 to 18 GHz, 256QAM Modulation, 15 MHz OBW, Middle channel, band n66.*

| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1200.433333 | --- | 36.36 | 82.23 | 45.87 | 5000.0 | 1000.000 | 167.0 | V | 76.0 | -13.2 |
| 1200.433333 | 45.00 | --- | 82.23 | 37.23 | 5000.0 | 1000.000 | 167.0 | V | 76.0 | -13.2 |
| 1710.933333 | --- | 24.68 | 82.23 | 57.55 | 5000.0 | 1000.000 | 121.0 | H | 234.0 | -11.8 |
| 1710.933333 | 37.69 | --- | 82.23 | 44.54 | 5000.0 | 1000.000 | 121.0 | H | 234.0 | -11.8 |
| 1886.066667 | --- | 25.76 | 82.23 | 56.47 | 5000.0 | 1000.000 | 339.0 | V | 222.0 | -10.1 |
| 1886.066667 | 39.40 | --- | 82.23 | 42.83 | 5000.0 | 1000.000 | 339.0 | V | 222.0 | -10.1 |
| 5999.266667 | 43.42 | --- | 82.23 | 38.81 | 5000.0 | 1000.000 | 147.0 | V | 20.0 | 0.4 |
| 5999.266667 | --- | 29.98 | 82.23 | 52.25 | 5000.0 | 1000.000 | 147.0 | V | 20.0 | 0.4 |
| 12271.400000 | --- | 33.05 | 82.23 | 49.18 | 5000.0 | 1000.000 | 361.0 | H | 126.0 | 8.2 |
| 12271.400000 | 46.52 | --- | 82.23 | 35.71 | 5000.0 | 1000.000 | 361.0 | H | 126.0 | 8.2 |
| 15731.066667 | 48.38 | --- | 82.23 | 33.85 | 5000.0 | 1000.000 | 117.0 | V | 66.0 | 12.9 |
| 15731.066667 | --- | 37.10 | 82.23 | 45.13 | 5000.0 | 1000.000 | 117.0 | V | 66.0 | 12.9 |

***Table 8.6-7:*** *Emissions limit results – Field strength measured from 1 to 18 GHz, 256QAM Modulation, 15 MHz OBW, Middle channel, band n66.*

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)+20 dB attenuator to protect the test equipment
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] The spectral plot is a summation of a vertical and horizontal scan.
[5] This measurement was done at 3m



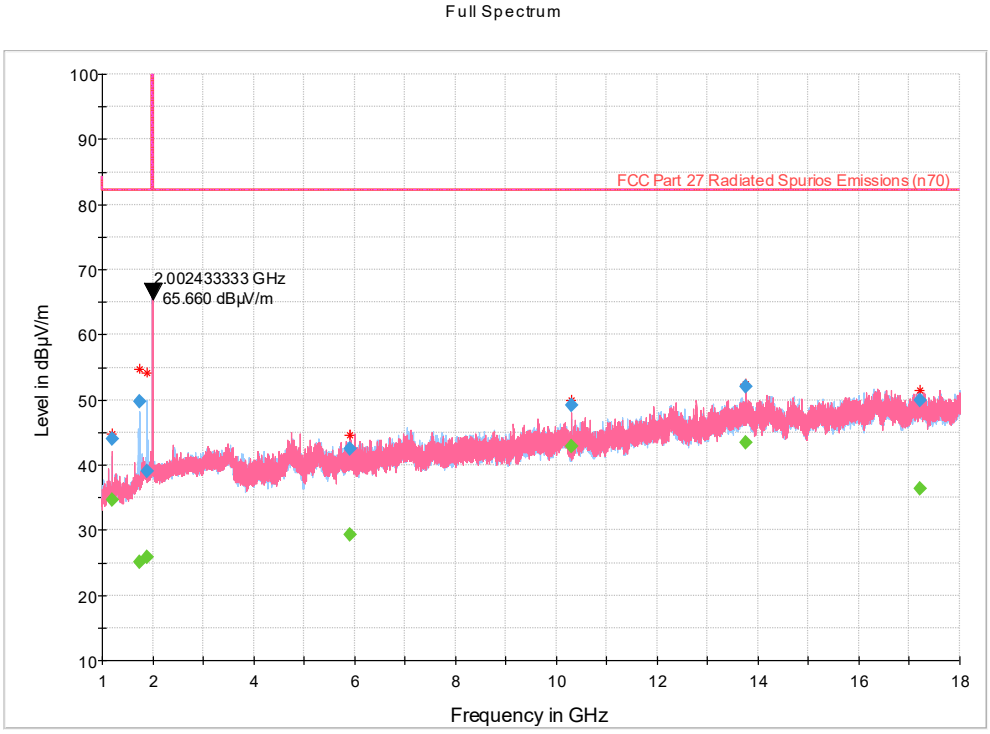

The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

***Figure 8.6-48:*** *Emissions limit plot – Field strength measured from 1 to 18 GHz, 256QAM Modulation, 15 MHz OBW, High channel, band n66.*

| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1200.033333 | --- | 35.61 | 82.23 | 46.62 | 5000.0 | 1000.000 | 164.0 | V | 77.0 | -13.2 |
| 1200.033333 | 45.03 | --- | 82.23 | 37.20 | 5000.0 | 1000.000 | 164.0 | V | 77.0 | -13.2 |
| 1714.366667 | 37.99 | --- | 82.23 | 44.24 | 5000.0 | 1000.000 | 275.0 | H | 304.0 | -11.8 |
| 1714.366667 | --- | 24.63 | 82.23 | 57.60 | 5000.0 | 1000.000 | 275.0 | H | 304.0 | -11.8 |
| 4710.466667 | 42.84 | --- | 82.23 | 39.39 | 5000.0 | 1000.000 | 249.0 | V | 222.0 | -0.6 |
| 4710.466667 | --- | 28.76 | 82.23 | 53.47 | 5000.0 | 1000.000 | 249.0 | V | 222.0 | -0.6 |
| 9888.333333 | 43.34 | --- | 82.23 | 38.89 | 5000.0 | 1000.000 | 383.0 | V | 0.0 | 4.8 |
| 9888.333333 | --- | 30.46 | 82.23 | 51.77 | 5000.0 | 1000.000 | 383.0 | V | 0.0 | 4.8 |
| 13760.100000 | --- | 35.01 | 82.23 | 47.22 | 5000.0 | 1000.000 | 243.0 | H | 354.0 | 12.9 |
| 13760.100000 | 48.22 | --- | 82.23 | 34.01 | 5000.0 | 1000.000 | 243.0 | H | 354.0 | 12.9 |
| 16328.266667 | 50.43 | --- | 82.23 | 31.80 | 5000.0 | 1000.000 | 188.0 | H | 300.0 | 14.9 |
| 16328.266667 | --- | 36.60 | 82.23 | 45.63 | 5000.0 | 1000.000 | 188.0 | H | 300.0 | 14.9 |

***Table 8.6-8:*** *Emissions limit results – Field strength measured from 1 to 18 GHz, 256QAM Modulation, 15 MHz OBW, High channel, band n66.*

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)+20 dB attenuator to protect the test equipment
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] The spectral plot is a summation of a vertical and horizontal scan.
[5] This measurement was done at 3m



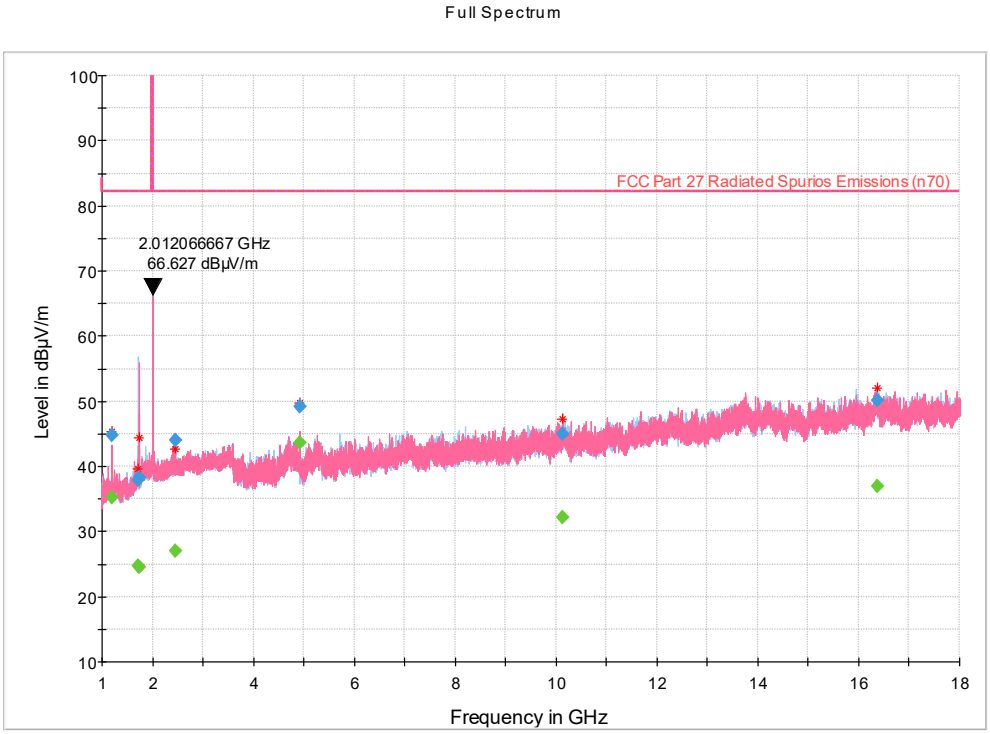

The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

***Figure 8.6-49:*** *Emissions limit plot – Field strength measured from 1 to 18 GHz, 256QAM Modulation, 15 MHz OBW, Low channel, band n70.*

| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1200.033333 | 44.03 | --- | 82.23 | 38.20 | 5000.0 | 1000.000 | 213.0 | V | 54.0 | -13.2 |
| 1200.033333 | --- | 34.71 | 82.23 | 47.52 | 5000.0 | 1000.000 | 213.0 | V | 54.0 | -13.2 |
| 1740.566667 | --- | 25.19 | 82.23 | 57.04 | 5000.0 | 1000.000 | 187.0 | H | 294.0 | -11.5 |
| 1740.566667 | 49.75 | --- | 82.23 | 32.48 | 5000.0 | 1000.000 | 187.0 | H | 294.0 | -11.5 |
| 1883.366667 | --- | 25.80 | 82.23 | 56.43 | 5000.0 | 1000.000 | 127.0 | H | 66.0 | -10.1 |
| 1883.366667 | 39.10 | --- | 82.23 | 43.13 | 5000.0 | 1000.000 | 127.0 | H | 66.0 | -10.1 |
| 5898.833333 | 42.43 | --- | 82.23 | 39.80 | 5000.0 | 1000.000 | 380.0 | V | 145.0 | 0.3 |
| 5898.833333 | --- | 29.27 | 82.23 | 52.96 | 5000.0 | 1000.000 | 380.0 | V | 145.0 | 0.3 |
| 10312.600000 | --- | 42.80 | 82.23 | 39.43 | 5000.0 | 1000.000 | 114.0 | V | 256.0 | 5.0 |
| 10312.600000 | 49.13 | --- | 82.23 | 33.10 | 5000.0 | 1000.000 | 114.0 | V | 256.0 | 5.0 |
| 13760.733333 | 52.09 | --- | 82.23 | 30.14 | 5000.0 | 1000.000 | 137.0 | V | 20.0 | 13.0 |
| 13760.733333 | --- | 43.36 | 82.23 | 38.87 | 5000.0 | 1000.000 | 137.0 | V | 20.0 | 13.0 |
| 17200.200000 | 49.87 | --- | 82.23 | 32.36 | 5000.0 | 1000.000 | 271.0 | H | 116.0 | 16.6 |
| 17200.200000 | --- | 36.38 | 82.23 | 45.85 | 5000.0 | 1000.000 | 271.0 | H | 116.0 | 16.6 |

***Table 8.6-9:*** *Emissions limit results – Field strength measured from 1 to 18 GHz, 256QAM Modulation, 15 MHz OBW, Low channel, band n70.*

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)+20 dB attenuator to protect the test equipment
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] The spectral plot is a summation of a vertical and horizontal scan.
[5] This measurement was done at 3m



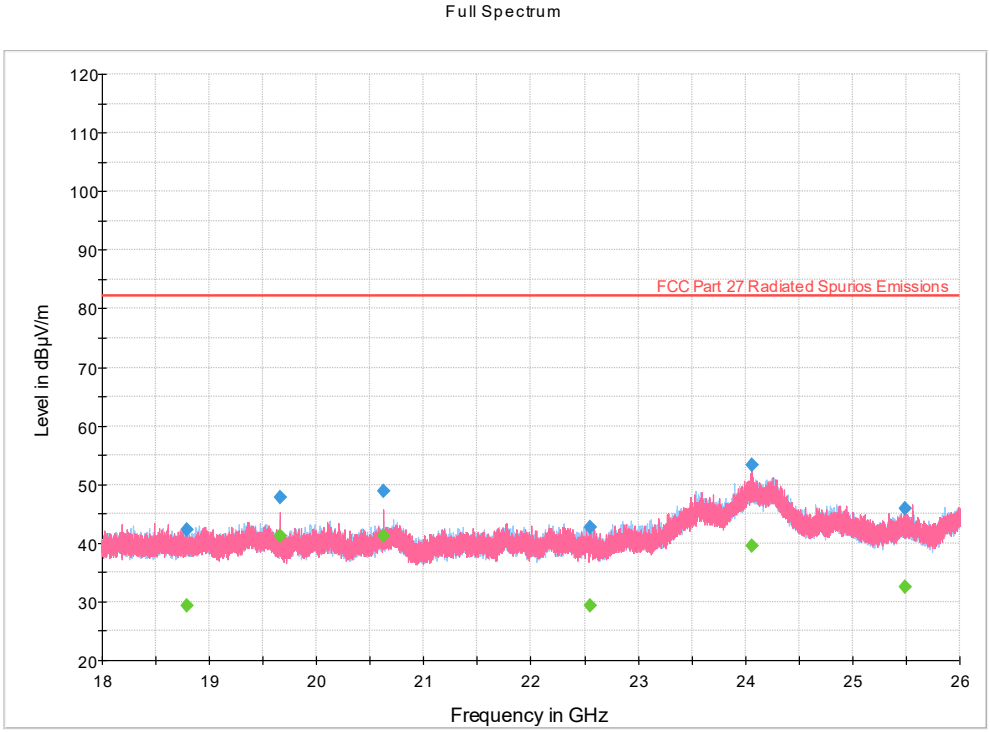

The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

***Figure 8.6-50:*** *Emissions limit plot – Field strength measured from 1 to 18 GHz, 256QAM Modulation, 15 MHz OBW, High channel, band n70.*

| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1200.033333 | 44.74 | --- | 82.23 | 37.49 | 5000.0 | 1000.000 | 161.0 | V | 76.0 | -13.2 |
| 1200.033333 | --- | 35.15 | 82.23 | 47.08 | 5000.0 | 1000.000 | 161.0 | V | 76.0 | -13.2 |
| 1727.200000 | 37.97 | --- | 82.23 | 44.26 | 5000.0 | 1000.000 | 292.0 | H | 356.0 | -11.7 |
| 1727.200000 | --- | 24.68 | 82.23 | 57.55 | 5000.0 | 1000.000 | 292.0 | H | 356.0 | -11.7 |
| 1743.766667 | 38.29 | --- | 82.23 | 43.94 | 5000.0 | 1000.000 | 207.0 | V | 0.0 | -11.5 |
| 1743.766667 | --- | 24.60 | 82.23 | 57.63 | 5000.0 | 1000.000 | 207.0 | V | 0.0 | -11.5 |
| 2462.433333 | 43.94 | --- | 82.23 | 38.29 | 5000.0 | 1000.000 | 110.0 | H | 354.0 | -8.7 |
| 2462.433333 | --- | 27.02 | 82.23 | 55.21 | 5000.0 | 1000.000 | 110.0 | H | 354.0 | -8.7 |
| 4915.100000 | 49.16 | --- | 82.23 | 33.07 | 5000.0 | 1000.000 | 110.0 | V | 20.0 | -1.0 |
| 4915.100000 | --- | 43.71 | 82.23 | 38.52 | 5000.0 | 1000.000 | 110.0 | V | 20.0 | -1.0 |
| 10116.866667 | --- | 32.21 | 82.23 | 50.02 | 5000.0 | 1000.000 | 207.0 | V | 222.0 | 5.4 |
| 10116.866667 | 45.02 | --- | 82.23 | 37.21 | 5000.0 | 1000.000 | 207.0 | V | 222.0 | 5.4 |
| 16362.833333 | 50.17 | --- | 82.23 | 32.06 | 5000.0 | 1000.000 | 318.0 | H | 80.0 | 14.7 |
| 16362.833333 | --- | 37.01 | 82.23 | 45.22 | 5000.0 | 1000.000 | 318.0 | H | 80.0 | 14.7 |

***Table 8.6-10:*** *Emissions limit results – Field strength measured from 1 to 18 GHz, 256QAM Modulation, 15 MHz OBW, High channel, band n70.*

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)+20 dB attenuator to protect the test equipment
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] The spectral plot is a summation of a vertical and horizontal scan.
[5] This measurement was done at 3m



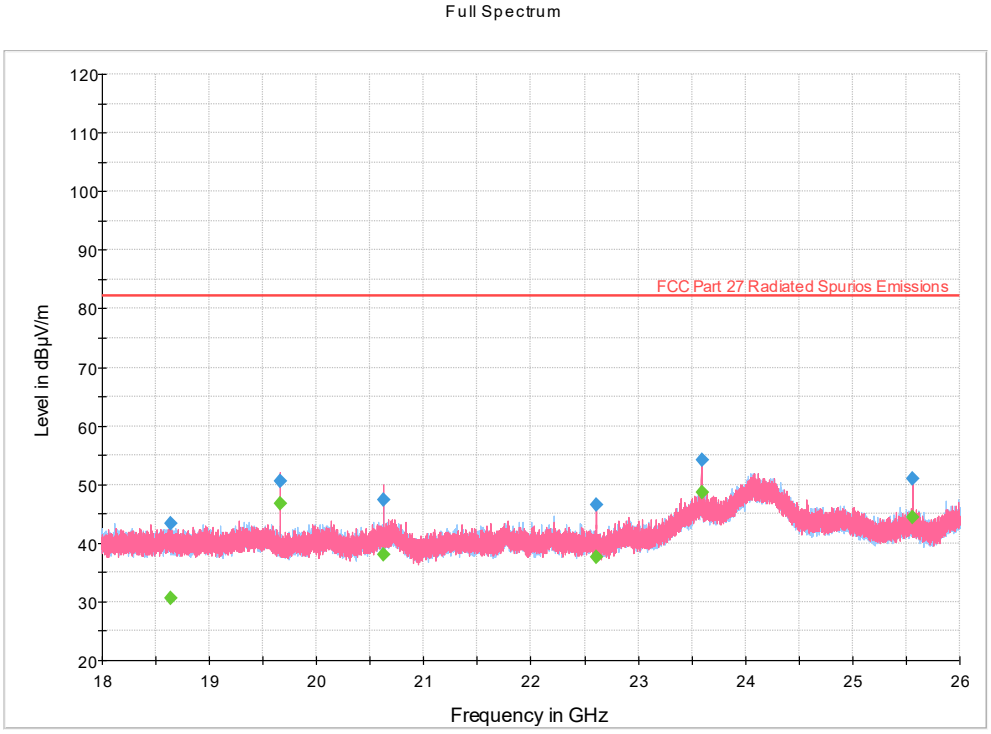

The spectral plot shows the vertical (red plot) and horizontal (blue plot) scans separately. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

***Figure 8.6-51:*** *Emissions limit plot – Field strength measured from 18 to 26 GHz, 256QAM Modulation, 15 MHz OBW, Low channel, band n66.*

| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 18785.800000 | 42.26 | --- | 82.23 | 39.97 | 5000.0 | 1000.000 | 167.0 | H | 142.0 | 17.6 |
| 18785.800000 | --- | 29.37 | 82.23 | 52.86 | 5000.0 | 1000.000 | 167.0 | H | 142.0 | 17.6 |
| 19660.600000 | 47.71 | --- | 82.23 | 34.52 | 5000.0 | 1000.000 | 110.0 | V | 96.0 | 18.0 |
| 19660.600000 | --- | 41.18 | 82.23 | 41.05 | 5000.0 | 1000.000 | 110.0 | V | 96.0 | 18.0 |
| 20624.866667 | --- | 41.30 | 82.23 | 40.93 | 5000.0 | 1000.000 | 119.0 | V | 130.0 | 19.5 |
| 20624.866667 | 48.85 | --- | 82.23 | 33.38 | 5000.0 | 1000.000 | 119.0 | V | 130.0 | 19.5 |
| 22549.666667 | --- | 29.43 | 82.23 | 52.80 | 5000.0 | 1000.000 | 350.0 | H | 68.0 | 19.6 |
| 22549.666667 | 42.62 | --- | 82.23 | 39.61 | 5000.0 | 1000.000 | 350.0 | H | 68.0 | 19.6 |
| 24056.066667 | --- | 39.45 | 82.23 | 42.78 | 5000.0 | 1000.000 | 272.0 | V | 239.0 | 29.7 |
| 24056.066667 | 53.32 | --- | 82.23 | 28.91 | 5000.0 | 1000.000 | 272.0 | V | 239.0 | 29.7 |
| 25483.533333 | --- | 32.59 | 82.23 | 49.64 | 5000.0 | 1000.000 | 150.0 | H | 182.0 | 24.1 |
| 25483.533333 | 45.97 | --- | 82.23 | 36.26 | 5000.0 | 1000.000 | 150.0 | H | 182.0 | 24.1 |

***Table 8.6-11:*** *Emissions limit results – Field strength measured from 18 to 26 GHz, 256QAM Modulation, 15 MHz OBW, Low channel, band n66.*

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] The spectral plot shows the vertical and horizontal scan separately.
[5] This measurement was done at 3m



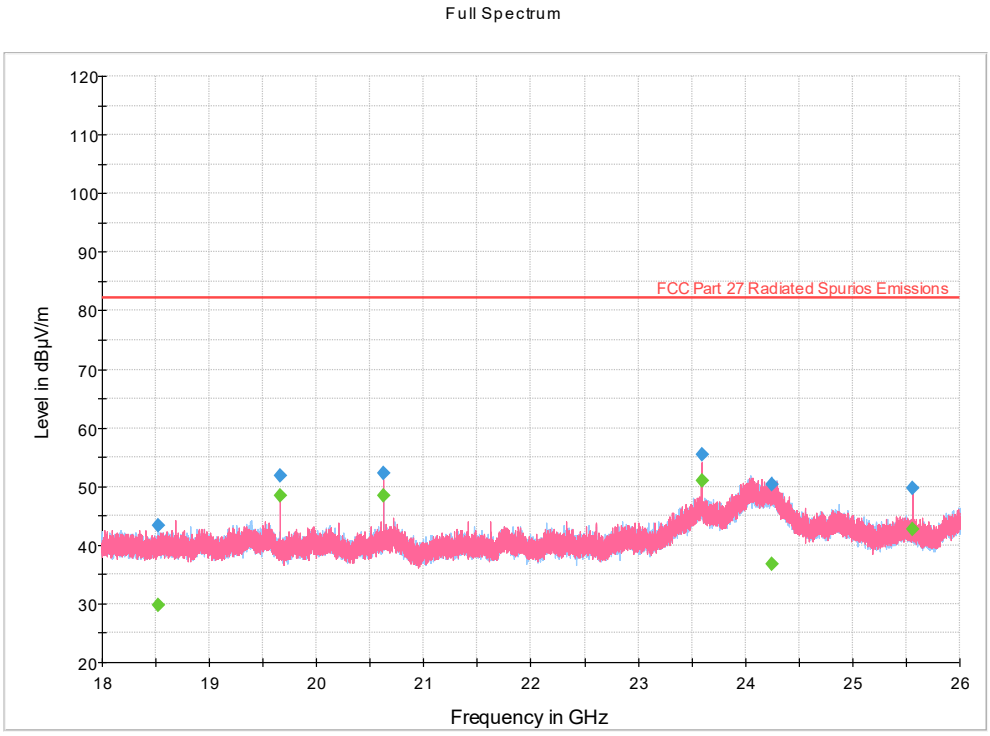

The spectral plot shows the vertical (red plot) and horizontal (blue plot) scans separately. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

***Figure 8.6-52:*** *Emissions limit plot – Field strength measured from 18 to 26 GHz, 256QAM Modulation, 15 MHz OBW, Middle channel, band n66.*

| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 18639.133333 | --- | 30.56 | 82.23 | 51.67 | 5000.0 | 1000.000 | 332.0 | H | 302.0 | 17.9 |
| 18639.133333 | 43.35 | --- | 82.23 | 38.88 | 5000.0 | 1000.000 | 332.0 | H | 302.0 | 17.9 |
| 19661.000000 | --- | 46.69 | 82.23 | 35.54 | 5000.0 | 1000.000 | 100.0 | V | 85.0 | 18.0 |
| 19661.000000 | 50.59 | --- | 82.23 | 31.64 | 5000.0 | 1000.000 | 100.0 | V | 85.0 | 18.0 |
| 20625.000000 | 47.45 | --- | 82.23 | 34.78 | 5000.0 | 1000.000 | 118.0 | V | 246.0 | 19.5 |
| 20625.000000 | --- | 37.99 | 82.23 | 44.24 | 5000.0 | 1000.000 | 118.0 | V | 246.0 | 19.5 |
| 22609.933333 | 46.57 | --- | 82.23 | 35.66 | 5000.0 | 1000.000 | 203.0 | V | 290.0 | 19.9 |
| 22609.933333 | --- | 37.57 | 82.23 | 44.66 | 5000.0 | 1000.000 | 203.0 | V | 290.0 | 19.9 |
| 23594.733333 | 54.24 | --- | 82.23 | 27.99 | 5000.0 | 1000.000 | 100.0 | V | 225.0 | 25.9 |
| 23594.733333 | --- | 48.69 | 82.23 | 33.54 | 5000.0 | 1000.000 | 100.0 | V | 225.0 | 25.9 |
| 25557.133333 | 50.96 | --- | 82.23 | 31.27 | 5000.0 | 1000.000 | 100.0 | V | 70.0 | 24.3 |
| 25557.133333 | --- | 44.52 | 82.23 | 37.71 | 5000.0 | 1000.000 | 100.0 | V | 70.0 | 24.3 |

***Table 8.6-12:*** *Emissions limit results – Field strength measured from 18 to 26 GHz, 256QAM Modulation, 15 MHz OBW, Middle channel, band n66.*

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] The spectral plot shows the vertical and horizontal scan separately.
[5] This measurement was done at 3m



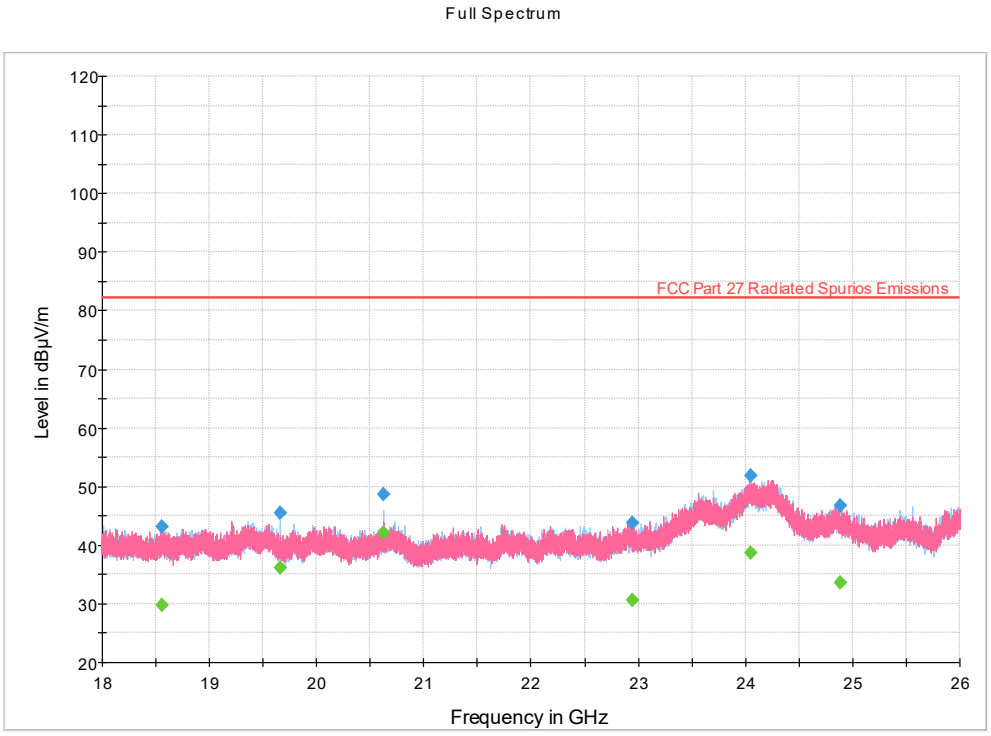

The spectral plot shows the vertical (red plot) and horizontal (blue plot) scans separately. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

***Figure 8.6-53:*** *Emissions limit plot – Field strength measured from 18 to 26 GHz, 256QAM Modulation, 15 MHz OBW, High channel, band n66.*

| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 18522.200000 | 43.41 | --- | 82.23 | 38.82 | 5000.0 | 1000.000 | 410.0 | H | 162.0 | 17.8 |
| 18522.200000 | --- | 29.70 | 82.23 | 52.53 | 5000.0 | 1000.000 | 410.0 | H | 162.0 | 17.8 |
| 19660.733333 | --- | 48.49 | 82.23 | 33.74 | 5000.0 | 1000.000 | 100.0 | V | 87.0 | 18.0 |
| 19660.733333 | 51.87 | --- | 82.23 | 30.36 | 5000.0 | 1000.000 | 100.0 | V | 87.0 | 18.0 |
| 20624.866667 | 52.18 | --- | 82.23 | 30.05 | 5000.0 | 1000.000 | 100.0 | V | 131.0 | 19.5 |
| 20624.866667 | --- | 48.49 | 82.23 | 33.74 | 5000.0 | 1000.000 | 100.0 | V | 131.0 | 19.5 |
| 23591.133333 | --- | 50.99 | 82.23 | 31.24 | 5000.0 | 1000.000 | 118.0 | V | 230.0 | 25.9 |
| 23591.133333 | 55.37 | --- | 82.23 | 26.86 | 5000.0 | 1000.000 | 118.0 | V | 230.0 | 25.9 |
| 24251.800000 | 50.26 | --- | 82.23 | 31.97 | 5000.0 | 1000.000 | 302.0 | H | 100.0 | 29.0 |
| 24251.800000 | --- | 36.87 | 82.23 | 45.36 | 5000.0 | 1000.000 | 302.0 | H | 100.0 | 29.0 |
| 25557.266667 | 49.81 | --- | 82.23 | 32.42 | 5000.0 | 1000.000 | 100.0 | V | 132.0 | 24.3 |
| 25557.266667 | --- | 42.79 | 82.23 | 39.44 | 5000.0 | 1000.000 | 100.0 | V | 132.0 | 24.3 |

***Table 8.6-13:*** *Emissions limit results – Field strength measured from 18 to 26 GHz, 256QAM Modulation, 15 MHz OBW, High channel, band n66.*

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] The spectral plot shows the vertical and horizontal scan separately.
[5] This measurement was done at 3m




The spectral plot shows the vertical (red plot) and horizontal (blue plot) scans separately. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

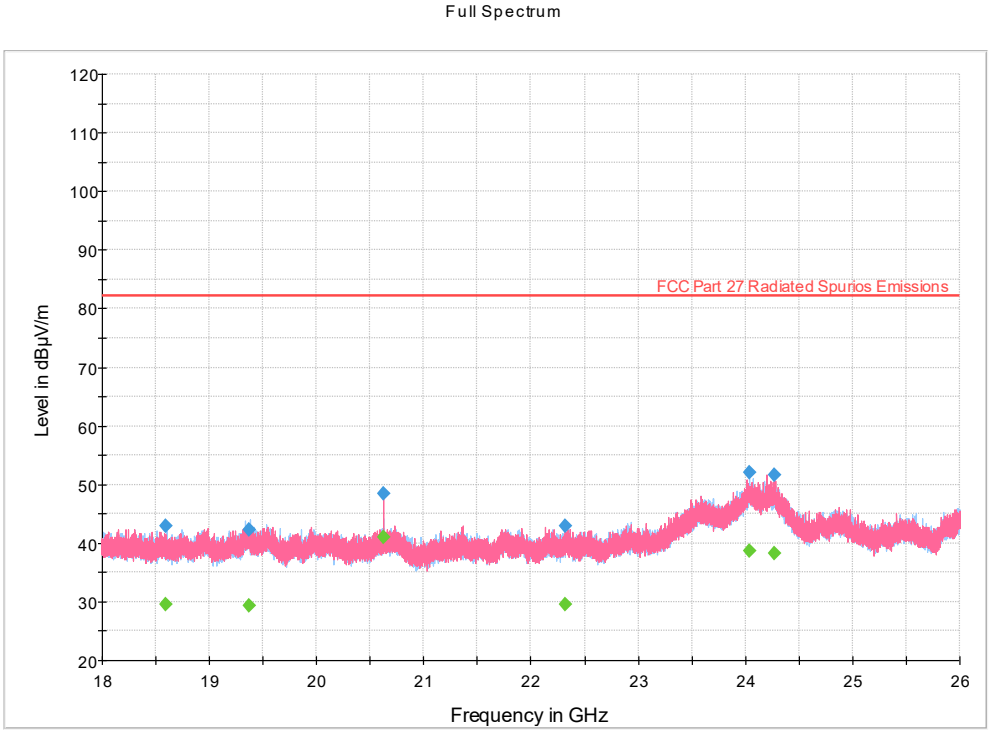
***Figure 8.6-54:*** *Emissions limit plot – Field strength measured from 18 to 26 GHz, 256QAM Modulation, 15 MHz OBW, Low channel, band n70.*

| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 18561.533333 | 43.25 | --- | 82.23 | 38.98 | 5000.0 | 1000.000 | 402.0 | V | 195.0 | 18.0 |
| 18561.533333 | --- | 29.73 | 82.23 | 52.50 | 5000.0 | 1000.000 | 402.0 | V | 195.0 | 18.0 |
| 19661.000000 | 45.58 | --- | 82.23 | 36.65 | 5000.0 | 1000.000 | 117.0 | H | 198.0 | 18.0 |
| 19661.000000 | --- | 36.11 | 82.23 | 46.12 | 5000.0 | 1000.000 | 117.0 | H | 198.0 | 18.0 |
| 20624.866667 | 48.59 | --- | 82.23 | 33.64 | 5000.0 | 1000.000 | 100.0 | H | 146.0 | 19.5 |
| 20624.866667 | --- | 42.17 | 82.23 | 40.06 | 5000.0 | 1000.000 | 100.0 | H | 146.0 | 19.5 |
| 22941.533333 | 43.71 | --- | 82.23 | 38.52 | 5000.0 | 1000.000 | 98.0 | V | 333.0 | 21.1 |
| 22941.533333 | --- | 30.52 | 82.23 | 51.71 | 5000.0 | 1000.000 | 98.0 | V | 333.0 | 21.1 |
| 24054.200000 | 51.75 | --- | 82.23 | 30.48 | 5000.0 | 1000.000 | 166.0 | H | 162.0 | 29.7 |
| 24054.200000 | --- | 38.65 | 82.23 | 43.58 | 5000.0 | 1000.000 | 166.0 | H | 162.0 | 29.7 |
| 24890.600000 | 46.70 | --- | 82.23 | 35.53 | 5000.0 | 1000.000 | 208.0 | V | 194.0 | 24.7 |
| 24890.600000 | --- | 33.55 | 82.23 | 48.68 | 5000.0 | 1000.000 | 208.0 | V | 194.0 | 24.7 |

***Table 8.6-14:*** *Emissions limit results – Field strength measured from 18 to 26 GHz, 256QAM Modulation, 15 MHz OBW, Low channel, band n70.*

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] The spectral plot shows the vertical and horizontal scan separately.
[5] This measurement was done at 3m

## 8.6.4 Test data, continued




The spectral plot shows the vertical (red plot) and horizontal (blue plot) scans separately. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

***Figure 8.6-55:*** *Emissions limit plot – Field strength measured from 18 to 26 GHz, 256QAM Modulation, 15 MHz OBW, High channel, band n70.*

| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 18597.933333 | 42.94 | --- | 82.23 | 39.29 | 5000.0 | 1000.000 | 166.0 | H | 239.0 | 17.9 |
| 18597.933333 | --- | 29.59 | 82.23 | 52.64 | 5000.0 | 1000.000 | 166.0 | H | 239.0 | 17.9 |
| 19373.933333 | --- | 29.32 | 82.23 | 52.91 | 5000.0 | 1000.000 | 382.0 | H | 255.0 | 18.4 |
| 19373.933333 | 42.33 | --- | 82.23 | 39.90 | 5000.0 | 1000.000 | 382.0 | H | 255.0 | 18.4 |
| 20624.866667 | 48.46 | --- | 82.23 | 33.77 | 5000.0 | 1000.000 | 110.0 | V | 130.0 | 19.5 |
| 20624.866667 | --- | 40.94 | 82.23 | 41.29 | 5000.0 | 1000.000 | 110.0 | V | 130.0 | 19.5 |
| 22314.200000 | 43.01 | --- | 82.23 | 39.22 | 5000.0 | 1000.000 | 146.0 | V | 0.0 | 19.5 |
| 22314.200000 | --- | 29.65 | 82.23 | 52.58 | 5000.0 | 1000.000 | 146.0 | V | 0.0 | 19.5 |
| 24033.800000 | --- | 38.67 | 82.23 | 43.56 | 5000.0 | 1000.000 | 369.0 | H | 68.0 | 29.7 |
| 24033.800000 | 51.96 | --- | 82.23 | 30.27 | 5000.0 | 1000.000 | 369.0 | H | 68.0 | 29.7 |
| 24264.866667 | 51.72 | --- | 82.23 | 30.51 | 5000.0 | 1000.000 | 147.0 | V | 221.0 | 28.9 |
| 24264.866667 | --- | 38.24 | 82.23 | 43.99 | 5000.0 | 1000.000 | 147.0 | V | 221.0 | 28.9 |

***Table 8.6-15:*** *Emissions limit results – Field strength measured from 18 to 26 GHz, 256QAM Modulation, 15 MHz OBW, High channel, band n70.*

Notes:
[1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)
[3] The maximum measured value observed over a period of 5 seconds was recorded.
[4] The spectral plot shows the vertical and horizontal scan separately.
[5] This measurement was done at 3m

# **Section 9.** Block diagrams of test setups

## 9.1 Radiated emissions set-up