



# TEST REPORT: FCC RF Test Report AQQQA

FCC ID: VBNAQQQA-01

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Appendices: 3

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Equipment Under Test: Aircscale Base Transceiver Station Radio Unit 64T64R  
3.45G and 3.7G bands

Radio Access technology: NR (TDD)

Type: AQQQA

Manufacturer: Nokia Solutions and Networks Oy

Address: Kaapelitie 4, FI-90620, Oulu, Finland

Task: Conformance test according to the specifications  
mentioned below

Test Specification(s): FCC 47 CFR part 2  
FCC 47 CFR part 27

Result: The EUT complies with the requirements of the  
specification

The results relate only to the items tested as described in this test report.

**Approved by:**

**Date**

**Signature**

Jarkko Kenttälä  
Squad Group Lead, Type  
Approval  
Nokia Networks

30 Sep 2024



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# Contents

|         |                                                                                       |    |
|---------|---------------------------------------------------------------------------------------|----|
| 1       | Summary.....                                                                          | 4  |
| 1.1     | Time Schedule .....                                                                   | 5  |
| 1.2     | Participants .....                                                                    | 5  |
| 2       | Equipment Under Test .....                                                            | 6  |
| 2.1     | Configuration of EUT .....                                                            | 6  |
| 2.2     | Operating Conditions .....                                                            | 7  |
| 3       | Test Configuration .....                                                              | 9  |
| 3.1     | Calibration of the Test Equipment .....                                               | 9  |
| 4       | Test Results.....                                                                     | 10 |
| 4.1     | Test No. 1: RF Power Output (§ 2.1046, § 27.50).....                                  | 10 |
| 4.1.1   | Limits.....                                                                           | 10 |
| 4.1.2   | Test Procedure and Results.....                                                       | 10 |
| 4.2     | Test No. 2: Modulation Characteristics (§ 2.1047) .....                               | 16 |
| 4.3     | Test No. 3: Occupied Bandwidth (§ 2.1049, § 2.201, § 27.53).....                      | 17 |
| 4.3.1   | Limits.....                                                                           | 17 |
| 4.3.2   | Test Procedure and Results.....                                                       | 17 |
| 4.4     | Test No. 4 Spurious Emissions at Antenna Terminals (§ 2.1051, § 2.1057, § 27.53)..... | 19 |
| 4.4.1   | Limits.....                                                                           | 19 |
| 4.4.2   | Test Configurations .....                                                             | 19 |
| 4.4.3   | Test Procedure and Results.....                                                       | 21 |
| 5       | Test Data and Screenshots.....                                                        | 36 |
| 5.1     | Part List of the RF Measurement Test Equipment.....                                   | 36 |
| 5.2     | Spectral Plots.....                                                                   | 37 |
| 5.2.1   | Test No. 1: RF Output Power .....                                                     | 37 |
| 5.2.2   | Test No. 2: Modulation Characteristics.....                                           | 43 |
| 5.2.3   | Test No. 3: Occupied Bandwidth.....                                                   | 45 |
| 5.2.3.1 | Occupied Bandwidth 99% plots.....                                                     | 45 |
| 5.2.3.2 | Occupied Bandwidth -26dB plots.....                                                   | 47 |



|                                                                     |    |
|---------------------------------------------------------------------|----|
| 5.2.4 Test No. 4: Spurious Emissions at the Antenna Terminals ..... | 49 |
| Appendix A: AQQA Multicarrier Multiband configurations.....         | 75 |
| Appendix B: AQQA 3.45G EIRP calculations .....                      | 78 |
| Appendix C: AQQA 3.45G Emission Designators .....                   | 79 |

# 1 Summary

The following tests were performed according to the FCC rules in order to verify the compliance of the EUT with the FCC requirements.

The scope of testing in this effort is FCC radio certification of the AQQQA adds 5G NR 10 MHz TDD Single Carrier operations in the 3.45G and Multicarrier Multiband operations with 3.45G Band 2cc + 3.7G Band 1cc.

| Test No. | Measurement                             | FCC Rule                       | Page Number of this Report | Result    |
|----------|-----------------------------------------|--------------------------------|----------------------------|-----------|
| 1        | RF Power Output                         | § 2.1046,<br>§ 27.50,          | 10                         | compliant |
| 2        | Modulation Characteristics              | § 2.1047,                      | 16                         | compliant |
| 3        | Occupied Bandwidth                      | § 2.1049, § 2.201,<br>§ 27.53, | 17                         | compliant |
| 4        | Spurious Emissions at Antenna Terminals | § 2.1051, § 2.1057<br>§ 27.53  | 19                         | compliant |

Table 1 Results – Summary

In accordance with the FCC Rule §15.3 (z) the equipment was tested with the limits that are valid for an *unintentional radiator*.

Measurements guidance: FCC OET laboratory KDB: 662911 D01 Multiple Transmitter Output v02r01, 971168 D03 IM Emission Repeater Amp v01, 971168 D01 Power Meas License Digital Systems v03r01 and ANSI C63.26-2015.

Test Laboratory:

Nokia Solutions and Networks Oy

Kaapelitie 4,

FI-90620, Oulu, Finland

Jarkko Kenttälä

FCC Reg. No: 261413

Testing laboratory accreditation number: T297

## 1.1 Time Schedule

| Test No.       | 1, 2, 3, 4, |
|----------------|-------------|
| Start of Test: | 03 Sep 2024 |
| End of Test:   | 12 Sep 2024 |

## 1.2 Participants

| Name                   | Function           | Signature                                                                          |
|------------------------|--------------------|------------------------------------------------------------------------------------|
| RF Test person (Nokia) | Tests no: 1,2,3, 4 |  |
| Timo Lindvall          | Setup of EUT       |                                                                                    |

## 2 Equipment Under Test

The EUT is a AirScale Dual Band MAA (Massive Adaptive Antenna) 64T64R Radio Unit (RU) variant AQQQA.

The BTS performs the full RAN function of NR system (New Radio).

### 2.1 Configuration of EUT

The used different EUT configurations are shown by the following table.

| Module Type               | AirScale Dual Band MAA 64T64R Radio Unit, 3.45G and 3.7G bands, 480W (including both bands)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Radio Access Technology   | NR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Duplex mode               | Time Division Duplex (TDD)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Channel Bandwidth         | NR Single carrier 10MHz (3.45G band) ( <b>Config. A</b> ),<br>Multicarrier Multiband TC 1 ( <b>Config. B</b> ),<br>Multicarrier Multiband TC 2 ( <b>Config. C</b> ),<br>Multicarrier Multiband TC 3 ( <b>Config. D</b> ),<br>Multicarrier Multiband TC 4 ( <b>Config. E</b> ),<br>Multicarrier Multiband TC 5 ( <b>Config. F</b> ),<br>Multicarrier Multiband TC 6 ( <b>Config. G</b> ),<br>Multicarrier Multiband TC 7 ( <b>Config. H</b> )<br><br>Detailed description of Multicarrier Multiband configurations (Config B, C, D, E, F, G and H) in Appendix A.                                                                                                                                                                                                                    |
| Supply Voltage            | 48.0 V DC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Frequency Range           | 3.45G Band: 3450 – 3550 MHz<br>3.7G Band: 3700 – 3980 MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Rated Output Power (Prat) | <b>3.45G Band:</b> Maximum RF output power <b>200W</b> (3.125W/TRX x 64TRXs)<br><b>3.7G Band:</b> Maximum RF output power <b>320W</b> (5W/TRX x 64TRXs)<br><b>AQQQA</b> (including both bands): <b>Maximum RF output power 480W</b> (7.5W/TRX x 64TRXs)<br><br><b>The 3.45G Band</b> single carrier channel bandwidth maximum RF output power per TRX:<br><b>NR 10MHz:</b> 1.25W / 31.0dBm per TRX for single carrier only, (0.78W / 28.9dBm per carrier for multicarrier)<br><b>NR 20MHz:</b> 2.5W / 34.0dBm per TRX for single carrier only, (1.56W / 31.9dBm per carrier for multicarrier)<br><b>NR 30MHz:</b> 2.5W / 34.0dBm per TRX<br><b>NR 40MHz:</b> 3.125W / 35.0dBm per TRX<br><br><b>The 3.7G Band</b> single carrier channel bandwidth maximum RF output power per TRX: |

|                                |                                                                                                                                                                                                              |           |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|                                | <b>NR 20MHz:</b> 2.5W / 34.0dBm per TRX<br><b>NR 40MHz:</b> 5W / 37.0dBm per TRX<br><b>NR 60MHz:</b> 5W / 37.0dBm per TRX<br><b>NR 80MHz:</b> 5W / 37.0dBm per TRX<br><b>NR 100MHz:</b> 5W / 37.0dBm per TRX |           |
| <b>Downlink/Uplink ratio</b>   | 7:2                                                                                                                                                                                                          |           |
|                                | <b>RX</b>                                                                                                                                                                                                    | <b>TX</b> |
| <b>Number of Antenna Ports</b> | 64                                                                                                                                                                                                           | 64        |
| <b>MiMo</b>                    | Yes                                                                                                                                                                                                          | Yes       |

Table 2 Overview of EUT configuration

The tests were performed with one EUT at the TAB port 57.

The used different EUT configurations are shown by the following table.

| Module Name                     | Serial-No.  | Module Type | Test No. |
|---------------------------------|-------------|-------------|----------|
| AQQQA                           | BL2318G601N | 64T64R RU   | 1,2,3,4  |
| <b>BTS Software version</b>     |             |             |          |
| SBTS24R3_ENB_0000_000386_000000 |             |             |          |

Table 3 Configuration of EUT

For a functional description of the modules, please refer to the appropriate related parts and exhibit sections of this certification application.

## 2.2 Operating Conditions

The EUT supports QPSK, 16QAM, 64QAM and 256QAM modulation. If not stated otherwise, the following standard setup procedure for the EUT was used:

The transmitter was set up according to 3GPP TS 38.141-1 NR Test Models (TM) for all tests:

- TM 1.1: All QPSK modulation testing
- TM 3.2: All 16QAM modulation testing
- TM 3.1: All 64QAM modulation testing
- TM 3.1A All 256QAM modulation testing

NR Test Models TM1.1, TM3.2, TM3.1 and TM3.1A have Downlink/Uplink ratio 7:2.

During the measurements, one carrier channel was tested at a time. The carrier was set to the maximum power level to ensure the maximum emission amplitudes during all measurements.



During the tests, the AirScale BTS is transmitting a pseudo random bit pattern on the data channels. This ensures that the measurements of the emission characteristics of the transmitter are pursuant to § 2.1049.

## 3 Test Configuration

If not stated otherwise, the following measurement configuration was used to perform all measurements (see figure below).

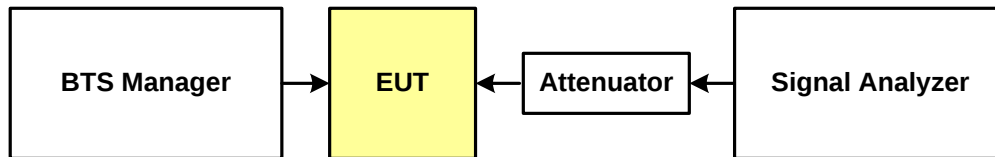


Figure 1 Test Configuration (single output)

The RF output of the transceiver (cell) under test is connected to a signal analyzer via a high-power attenuator to protect the input of the signal analyzer from high RF power levels. A description of the analyzer settings is given in each of the sections describing the measurements. The other transceivers are terminated.

A complete list of the measurement equipment is included on page 36 of this measurement report.

### 3.1 Calibration of the Test Equipment

All relevant test equipment has a valid calibration from an external calibration laboratory. Additionally, the signal analyzer has a built-in self-calibration procedure. This calibration procedure was activated prior to the measurements so that the analyzer is deemed accurate. High quality cables were used to connect the measurement equipment to the EUT. The actual loss of the attenuator and the cables was measured with a high precision network analyzer and taken into account for all measurements.

## 4 Test Results

### 4.1 Test No. 1: RF Power Output (§ 2.1046, § 27.50)

#### 4.1.1 Limits

EIRP limits are calculated and found in Appendix B.

3.45G Band EIRP limits: 3280W/MHz i.e. 65.16dBm/MHz or 1640W/MHz i.e. 62.15dBm/MHz. (§ 27.50(k)(1), (2))

Peak to average power (PAPR) limit is 13dBm (0.1% of time). (§ 27.50(k)(4), ANSI C63.26 5.2.3.4)

#### 4.1.2 Test Procedure and Results

Detachable Antenna: The maximum output power at the antenna terminals was measured using a signal analyzer.

The RF power was measured with a frequency sweep across the carrier. The carrier power was calculated from the signal analyzer by integration over the result. The base station maximum output power was measured with signal analyzer with offset adjust in testcase. (Offset is measured connection loss of the test set up.)

The tests were performed at the TAB port 57.

The testing was performed on the same version of hardware (AQQQA) as the original certification test. The AQQQA antenna ports are essentially electrically identical (the RF power output variation between TAB ports is small as shown in the original certification testing) and TAB port 57 was selected at random to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraph 5.7.2i.

Peak to average power (PAPR) was examined using CCDF method and 0.1% value recorded in dB to the tables below.

Average Power Spectral density was measured using FSW signal Analyzer.

The following tables shows the measured output powers at the antenna connector.

| Measured laboratory room temperature and humidity during the tests |                      |         |                   |          |
|--------------------------------------------------------------------|----------------------|---------|-------------------|----------|
| Date                                                               | Temperature Min-Max: |         | Humidity Min-Max: |          |
| 03.09.2024 – 10.09.2024                                            | 24.9 °C              | 27.0 °C | 32.4 RH%          | 53.0 RH% |

## Config A:

| Test Model 1.1<br>Modulation QPSK |       | Test Model 3.2<br>Modulation 16QAM |       | Test Model 3.1<br>Modulation 64QAM |       | Test Model 3.1a<br>Modulation 256QAM |       |
|-----------------------------------|-------|------------------------------------|-------|------------------------------------|-------|--------------------------------------|-------|
| Channel Frequency<br>3455.01MHz   |       | Channel Frequency<br>3455.01MHz    |       | Channel Frequency<br>3455.01MHz    |       | Channel Frequency<br>3455.01MHz      |       |
| Tx Port                           | (dBm) | Tx Port                            | (dBm) | Tx Port                            | (dBm) | Tx Port                              | (dBm) |
| 57                                | 30.55 | 57                                 | 30.50 | 57                                 | 30.51 | 57                                   | 30.52 |
| Channel Frequency<br>3500.01MHz   |       | Channel Frequency<br>3500.01MHz    |       | Channel Frequency<br>3500.01MHz    |       | Channel Frequency<br>3500.01MHz      |       |
| Tx Port                           | (dBm) | Tx Port                            | (dBm) | Tx Port                            | (dBm) | Tx Port                              | (dBm) |
| 57                                | 30.50 | 57                                 | 30.47 | 57                                 | 30.43 | 57                                   | 30.45 |
| Channel Frequency<br>3544.995MHz  |       | Channel Frequency<br>3544.995MHz   |       | Channel Frequency<br>3544.995MHz   |       | Channel Frequency<br>3544.995MHz     |       |
| Tx Port                           | (dBm) | Tx Port                            | (dBm) | Tx Port                            | (dBm) | Tx Port                              | (dBm) |
| 57                                | 30.53 | 57                                 | 30.50 | 57                                 | 30.45 | 57                                   | 30.48 |

Table 4 RF Power Output (3.45G Band NR 10 MHz Channel BW)

## Config B:

| Test Model 1.1<br>Modulation QPSK |       |             |            |
|-----------------------------------|-------|-------------|------------|
| Channel Frequency                 |       |             |            |
| 3455.01 MHz                       |       | 3465.00 MHz | 3960.00MHz |
| Tx Port                           | (dBm) | (dBm)       | (dBm)      |
| 57                                | 28.31 | 28.81       | 36.56      |

Table 5 RF Power Output (Multicarrier Multiband TC1: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config C:

| Test Model 1.1<br>Modulation QPSK |             |              |            |
|-----------------------------------|-------------|--------------|------------|
| Channel Frequency                 |             |              |            |
|                                   | 3534.99 MHz | 3544.995 MHz | 3720.00MHz |
| Tx Port                           | (dBm)       | (dBm)        | (dBm)      |
| 57                                | 28.59       | 28.28        | 36.39      |

Table 6 RF Power Output (Multicarrier Multiband TC2: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config D:

| Test Model 1.1<br>Modulation QPSK |             |              |            |
|-----------------------------------|-------------|--------------|------------|
| Channel Frequency                 |             |              |            |
|                                   | 3455.01 MHz | 3544.995 MHz | 3720.00MHz |
| Tx Port                           | (dBm)       | (dBm)        | (dBm)      |
| 57                                | 28.24       | 28.43        | 36.41      |

Table 7 RF Power Output (Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config E:

| Test Model 1.1<br>Modulation QPSK |             |             |            |
|-----------------------------------|-------------|-------------|------------|
| Channel Frequency                 |             |             |            |
|                                   | 3460.02 MHz | 3480.00 MHz | 3960.00MHz |
| Tx Port                           | (dBm)       | (dBm)       | (dBm)      |
| 57                                | 31.49       | 31.62       | 35.97      |

Table 8 RF Power Output (Multicarrier Multiband TC4: 3.45G Band 2xNR 20MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config F:

| Test Model 1.1<br>Modulation QPSK |             |             |            |
|-----------------------------------|-------------|-------------|------------|
| Channel Frequency                 |             |             |            |
|                                   | 3519.99 MHz | 3540.00 MHz | 3720.00MHz |
| Tx Port                           | (dBm)       | (dBm)       | (dBm)      |
| 57                                | 31.66       | 31.36       | 35.77      |

Table 9 RF Power Output (Multicarrier Multiband TC5: 3.45G Band 2xNR 20MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config G:

| Test Model 1.1<br>Modulation QPSK |             |             |            |
|-----------------------------------|-------------|-------------|------------|
| Channel Frequency                 |             |             |            |
|                                   | 3460.02 MHz | 3540.00 MHz | 3960.00MHz |
| Tx Port                           | (dBm)       | (dBm)       | (dBm)      |
| 57                                | 31.40       | 31.48       | 35.96      |

Table 10 RF Power Output (Multicarrier Multiband TC6: 3.45G Band 2xNR 20MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config H:

| Test Model 1.1<br>Modulation QPSK |             |             |            |
|-----------------------------------|-------------|-------------|------------|
| Channel Frequency                 |             |             |            |
|                                   | 3470.01 MHz | 3529.98 MHz | 3930.00MHz |
| Tx Port                           | (dBm)       | (dBm)       | (dBm)      |
| 57                                | 31.55       | 31.67       | 35.83      |

Table 11 RF Power Output (Multicarrier Multiband TC7: 3.45G Band 2xNR 40MHz + 3.7G Band 1xNR 100MHz Channel BW)

The base station maximum output power was found to be compliant with the manufacturer's specifications and with all requirements of the FCC rules.

### Config A:

| Test Model 1.1<br>Modulation QPSK |         | Test Model 3.2<br>Modulation 16QAM |         | Test Model 3.1<br>Modulation 64QAM |         | Test Model 3.1a<br>Modulation 256QAM |         |
|-----------------------------------|---------|------------------------------------|---------|------------------------------------|---------|--------------------------------------|---------|
| Channel Frequency<br>3455.01MHz   |         | Channel Frequency<br>3455.01MHz    |         | Channel Frequency<br>3455.01MHz    |         | Channel Frequency<br>3455.01MHz      |         |
| Tx Port                           | dBm/MHz | Tx Port                            | dBm/MHz | Tx Port                            | dBm/MHz | Tx Port                              | dBm/MHz |
| 57                                | 21.62   | 57                                 | 22.39   | 57                                 | 21.60   | 57                                   | 21.60   |
| Channel Frequency<br>3500.01MHz   |         | Channel Frequency<br>3500.01MHz    |         | Channel Frequency<br>3500.01MHz    |         | Channel Frequency<br>3500.01MHz      |         |
| Tx Port                           | dBm/MHz | Tx Port                            | dBm/MHz | Tx Port                            | dBm/MHz | Tx Port                              | dBm/MHz |
| 57                                | 21.57   | 57                                 | 22.23   | 57                                 | 21.42   | 57                                   | 21.42   |
| Channel Frequency<br>3544.995MHz  |         | Channel Frequency<br>3544.995MHz   |         | Channel Frequency<br>3544.995MHz   |         | Channel Frequency<br>3544.995MHz     |         |
| Tx Port                           | dBm/MHz | Tx Port                            | dBm/MHz | Tx Port                            | dBm/MHz | Tx Port                              | dBm/MHz |
| 57                                | 21.61   | 57                                 | 22.31   | 57                                 | 21.57   | 57                                   | 21.58   |

Table 12 Power Spectral Density (3.45G Band NR 10 MHz Channel BW)

The base station power spectral density was found to be compliant with the manufacturer's specifications and with the 3280 W/MHz (65.16 dBm/MHz) FCC regulatory limit.

The AQQQQA 5G NR 10MHz channel bandwidth carrier power level using sixty-four port MIMO operation need to be reduced to meet 1640 W/MHz (62.15 dBm/MHz) FCC regulatory limit. See details in Appendix B.

### Config A:

| Test Model 1.1<br>Modulation QPSK |           | Test Model 3.2<br>Modulation 16QAM |           | Test Model 3.1<br>Modulation 64QAM |           | Test Model 3.1a<br>Modulation 256QAM |           |
|-----------------------------------|-----------|------------------------------------|-----------|------------------------------------|-----------|--------------------------------------|-----------|
| Channel Frequency<br>3455.01MHz   |           | Channel Frequency<br>3455.01MHz    |           | Channel Frequency<br>3455.01MHz    |           | Channel Frequency<br>3455.01MHz      |           |
| Tx Port                           | CCDF 0.1% | Tx Port                            | CCDF 0.1% | Tx Port                            | CCDF 0.1% | Tx Port                              | CCDF 0.1% |
| 57                                | 8.64      | 57                                 | 8.34      | 57                                 | 8.50      | 57                                   | 8.60      |
| Channel Frequency<br>3500.01MHz   |           | Channel Frequency<br>3500.01MHz    |           | Channel Frequency<br>3500.01MHz    |           | Channel Frequency<br>3500.01MHz      |           |
| Tx Port                           | CCDF 0.1% | Tx Port                            | CCDF 0.1% | Tx Port                            | CCDF 0.1% | Tx Port                              | CCDF 0.1% |
| 57                                | 8.64      | 57                                 | 8.32      | 57                                 | 8.56      | 57                                   | 8.58      |
| Channel Frequency<br>3544.995MHz  |           | Channel Frequency<br>3544.995MHz   |           | Channel Frequency<br>3544.995MHz   |           | Channel Frequency<br>3544.995MHz     |           |
| Tx Port                           | CCDF 0.1% | Tx Port                            | CCDF 0.1% | Tx Port                            | CCDF 0.1% | Tx Port                              | CCDF 0.1% |
| 57                                | 8.58      | 57                                 | 8.36      | 57                                 | 8.52      | 57                                   | 8.70      |

Table 13 Peak to Average Power (3.45G Band NR 10 MHz Channel BW)

The base station peak to average power was found to be compliant with the manufacturer's specifications and with all requirements of the FCC rules.

## 4.2 Test No. 2: Modulation Characteristics (§ 2.1047)

The occupied bandwidth was measured to be compliant with the manufacturer's specifications and with all requirements of the FCC rules, which represents the 99% power bandwidth (see the following section and screenshots on page 45).

No further testing is required under this section of the FCC rules. No measurements other than the occupied bandwidth are required. Sample of modulation screenshots are on page 43, in I/Q constellation diagrams and tables, showing QPSK, 16QAM, 64QAM and 256QAM –modulation generation.

## 4.3 Test No. 3: Occupied Bandwidth (§ 2.1049, § 2.201, § 27.53)

### 4.3.1 Limits

FCC § 2.1049: The 99% occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to 0.5% of the emitted power.

FCC § 27.53(n)(1) for 3.45G Band: 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.

### 4.3.2 Test Procedure and Results

The 99% occupied bandwidth of the carrier emission is measured using a signal analyzer with Resolution Bandwidth set to 200kHz (1-5% of bandwidth; see screenshots on page 45 for details).

The Relative measurement procedure of OBW is measured as the width of the spectral envelope of the modulated signal, at an amplitude level reduced from a reference value by a specified ratio (or in decibels, a specified number of dB down from the reference value). The typical ratio for transmitters is -26 dB, corresponding to the 26 dB BW. The Relative measurement procedure emission is measured using a signal analyzer with Resolution Bandwidth set to 200kHz (1-5% of bandwidth; see screenshots on page 47 for details).

Emission designator summary table is found in Appendix C.

The following tables summarize the results:

| Measured laboratory room temperature and humidity during the tests |                      |         |                   |          |
|--------------------------------------------------------------------|----------------------|---------|-------------------|----------|
| Date                                                               | Temperature Min-Max: |         | Humidity Min-Max: |          |
| 04.09.2024                                                         | 25.4 °C              | 26.8 °C | 41.7 RH%          | 53.0 RH% |

## Config A:

| Test Model 1.1<br>Modulation QPSK |              |               | Test Model 3.2<br>Modulation 16QAM |              |               | Test Model 3.1<br>Modulation 64QAM |              |               | Test Model 3.1a<br>Modulation 256QAM |              |               |
|-----------------------------------|--------------|---------------|------------------------------------|--------------|---------------|------------------------------------|--------------|---------------|--------------------------------------|--------------|---------------|
| Channel Frequency<br>3455.01MHz   |              |               | Channel Frequency<br>3455.01MHz    |              |               | Channel Frequency<br>3455.01MHz    |              |               | Channel Frequency<br>3455.01MHz      |              |               |
| Tx<br>Port                        | 99%<br>(MHz) | 26dB<br>(MHz) | Tx<br>Port                         | 99%<br>(MHz) | 26dB<br>(MHz) | Tx<br>Port                         | 99%<br>(MHz) | 26dB<br>(MHz) | Tx<br>Port                           | 99%<br>(MHz) | 26dB<br>(MHz) |
| 57                                | 8.68         | 9.74          | 57                                 | 8.63         | 9.60          | 57                                 | 8.66         | 9.67          | 57                                   | 8.65         | 9.68          |
| Channel Frequency<br>3500.01MHz   |              |               | Channel Frequency<br>3500.01MHz    |              |               | Channel Frequency<br>3500.01MHz    |              |               | Channel Frequency<br>3500.01MHz      |              |               |
| Tx<br>Port                        | 99%<br>(MHz) | 26dB<br>(MHz) | Tx<br>Port                         | 99%<br>(MHz) | 26dB<br>(MHz) | Tx<br>Port                         | 99%<br>(MHz) | 26dB<br>(MHz) | Tx<br>Port                           | 99%<br>(MHz) | 26dB<br>(MHz) |
| 57                                | 8.67         | 9.69          | 57                                 | 8.63         | 9.58          | 57                                 | 8.68         | 9.68          | 57                                   | 8.65         | 9.67          |
| Channel Frequency<br>3544.995MHz  |              |               | Channel Frequency<br>3544.995MHz   |              |               | Channel Frequency<br>3544.995MHz   |              |               | Channel Frequency<br>3544.995MHz     |              |               |
| Tx<br>Port                        | 99%<br>(MHz) | 26dB<br>(MHz) | Tx<br>Port                         | 99%<br>(MHz) | 26dB<br>(MHz) | Tx<br>Port                         | 99%<br>(MHz) | 26dB<br>(MHz) | Tx<br>Port                           | 99%<br>(MHz) | 26dB<br>(MHz) |
| 57                                | 8.67         | 9.68          | 57                                 | 8.62         | 9.56          | 57                                 | 8.68         | 9.71          | 57                                   | 8.65         | 9.67          |

Table 14 Occupied Bandwidth (3.45G Band NR 10 MHz Channel BW)

The occupied bandwidth was found to be compliant with the manufacturer's specifications and with all requirements of the FCC rules.

## 4.4 Test No. 4 Spurious Emissions at Antenna Terminals (§ 2.1051, § 2.1057, § 27.53)

### 4.4.1 Limits

Per section FCC §27.53(n)(1) for 3.45G Band, the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm/MHz. Additionally for base station operations in the 3450-3550 MHz band, the conducted power of any emission below 3440 MHz or above 3560 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3430 MHz or above 3570 MHz shall not exceed -40 dBm/MHz.

Per section FCC §27.53(l)(1) for 3.7G Band, the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm/MHz.

For MiMo output from 64 TX antenna connectors, one antenna connector was measured individually, and the individual limit line was reduced by  $10\log(64)$  according to FCC KDB 662911 D01 and ANSI C63.26-2015 guidance.

Limit line was calculated to show:

**-31.1 dBm** ( $-13 \text{ dBm} - 10\log(64)$ ) for the 3440-3450 MHz & 3550-3560 MHz ranges (and additionally for 3680-3700 MHz & 3980-4000 MHz with the Multicarrier Multiband Test Cases),

**-43.1 dBm** ( $-25 \text{ dBm} - 10\log(64)$ ) for the 3430-3440 MHz & 3560-3570 MHz ranges,

**-58.1 dBm** ( $-40 \text{ dBm} - 10\log(64)$ ) for the below 3430 MHz & above 3570 MHz ranges.

### 4.4.2 Test Configurations

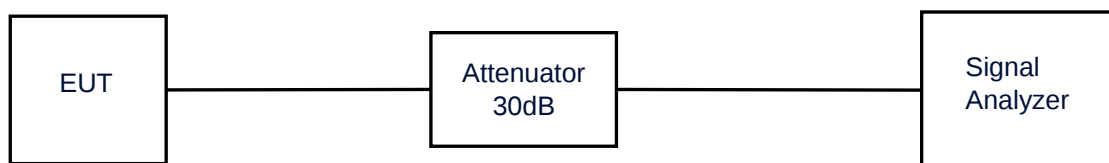


Figure 2 Band Edge Spurious Emission test configuration

The test configuration shown in Figure 2 was used for Band Edge measurements for 3430-3450MHz, 3550-3570MHz, 3680-3700MHz & 3980-4000MHz. Additionally, it was used for Spurious Emissions 3400-3600MHz (3.45G Single carrier operation) & 3400-4030MHz (Multicarrier Multiband operation) to show emissions and carriers in carrier bands.

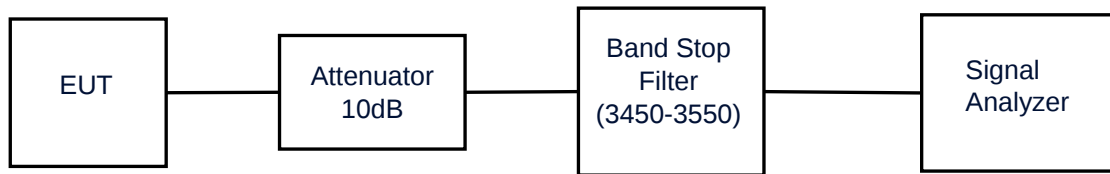


Figure 3 Spurious Emission 3.45G Single carrier operation test configuration

The test configuration shown in Figure 3 was used for Spurious emission measurements for 9kHz-3430MHz & 3570-6000MHz (3.45G Band Single carrier operation).

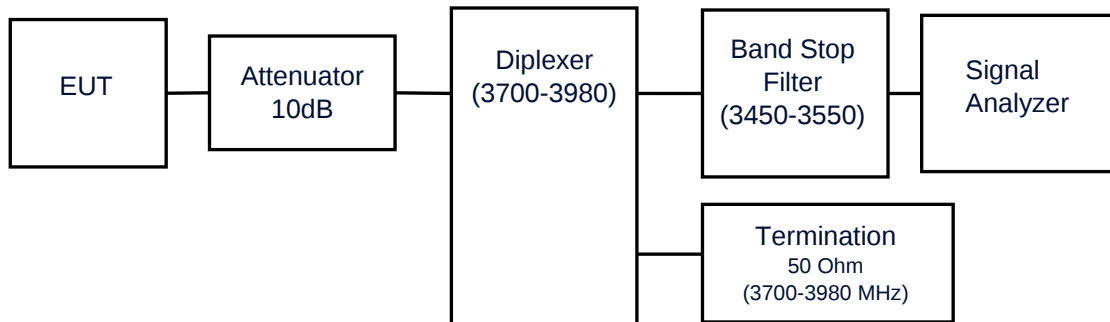


Figure 4 Spurious Emission Multicarrier Multiband operation test configuration

The test configuration shown in Figure 4 was used for Spurious emission measurements for 9kHz-3430MHz, 3570-3680MHz & 4000-6000MHz (Multicarrier Multiband operation).

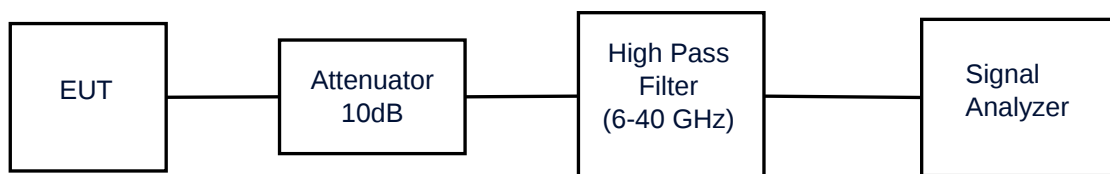


Figure 5 Spurious Emission 6-40GHz test configuration

The test configuration shown in Figure 5 was used for Spurious emission measurements for 6-40GHz.

A complete list of the measurement equipment is included on page 36 of this measurement report.

#### 4.4.3 Test Procedure and Results

The tests were performed at the TAB port 57.

The testing was performed on the same version of hardware (AQQQA) as the original certification test. The AQQQA antenna ports are essentially electrically identical (the RF power output variation between TAB ports is small as shown in the original certification testing) and TAB port 57 was selected at random to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraph 5.7.2i.

Only the QPSK modulation was required to be tested due to OBW variation is small between modulation types. (See ANSI C63.26. clause 5.7.2e)

The tests were carried out in accordance with § 27.53. For all frequency ranges except two (immediately below and above the carrier frequency block) a 1 MHz resolution bandwidth was used for the measurements.

FCC § 27.53(n)(1) for 3.45G Band: In the 1 MHz frequency bands immediately outside and adjacent to the carrier frequency block the resolution bandwidth is lowered to 1% of the 26 dB occupied bandwidth of the transmitted carrier but limited to a maximum of 200kHz.

FCC § 27.53(l)(1) for 3.7G Band: In the 1 MHz frequency bands immediately outside and adjacent to the carrier frequency block the resolution bandwidth is lowered to 1% of the 26 dB occupied bandwidth of the transmitted carrier.

According to § 2.1057, all emissions including the fundamental frequency from the lowest radio frequency generated in the equipment, without going below 9 kHz, up to the 10th harmonic were investigated.

The following tables summarize the worst case detected emission levels (see screenshots on page 49 for details). The external attenuation (cable loss of the set up) is already added in the results.

| Measured laboratory room temperature and humidity during the tests |                      |         |                   |          |
|--------------------------------------------------------------------|----------------------|---------|-------------------|----------|
| Date                                                               | Temperature Min-Max: |         | Humidity Min-Max: |          |
| 06.09.2024 – 12.09.2024                                            | 24.9 °C              | 27.1 °C | 32.4 RH%          | 51.7 RH% |

## Config A Lower band edge:

| Carrier Frequency: 3455.01 MHz |                          |                                                                                                                                                                                                              |             |           |
|--------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]          | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57     |                          |                                                                                                                                                                                                              |             |           |
| 3449 – 3450                    | 3450.0                   | -38.18                                                                                                                                                                                                       | -31.1       | compliant |
| 3448 – 3449                    | 3448.5                   | -37.10                                                                                                                                                                                                       | -31.1       | compliant |
| 3440 – 3448                    | 3447.9                   | -36.82                                                                                                                                                                                                       | -31.1       | compliant |
| 3430 - 3440                    | 3439.9                   | -47.30                                                                                                                                                                                                       | -43.1       | compliant |
| 3100 - 3430                    | 3421.6                   | -78.76                                                                                                                                                                                                       | -58.1       | compliant |
| Measurement Uncertainty:       |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 15 Spurious Emissions (Lower band edge) (3.45G Band NR 10 MHz Channel BW)

## Config A Upper band edge:

| Carrier Frequency: 3544.995 MHz |                          |                                                                                                                                                                                                              |             |           |
|---------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]           | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57      |                          |                                                                                                                                                                                                              |             |           |
| 3550 – 3551                     | 3550.0                   | -37.51                                                                                                                                                                                                       | -31.1       | compliant |
| 3551 – 3552                     | 3551.5                   | -35.26                                                                                                                                                                                                       | -31.1       | compliant |
| 3552 – 3560                     | 3552.0                   | -36.35                                                                                                                                                                                                       | -31.1       | compliant |
| 3560 - 3570                     | 3560.2                   | -47.85                                                                                                                                                                                                       | -43.1       | compliant |
| 3570 - 4030                     | 3573.9                   | -78.99                                                                                                                                                                                                       | -58.1       | compliant |
| Measurement Uncertainty:        |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 16 Spurious Emissions (Upper band edge) (3.45G Band NR 10 MHz Channel BW)

## Config A Spurious emissions:

| Carrier Frequency: 3500.01 MHz |                          |                                                                                                                                                                                                              |             |           |
|--------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]          | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57     |                          |                                                                                                                                                                                                              |             |           |
| 0.009 – 3430                   | 984.6                    | -75.67                                                                                                                                                                                                       | -58.1       | compliant |
| 3570 – 6000                    | 4829.3                   | -77.14                                                                                                                                                                                                       | -58.1       | compliant |
| 3400 – 3600                    | 3449.5                   | -40.72                                                                                                                                                                                                       | -31.1       | compliant |
| 6000 – 13000                   | 12512.7                  | -70.94                                                                                                                                                                                                       | -58.1       | compliant |
| 13000 - 40000                  | 39673.1                  | -71.18                                                                                                                                                                                                       | -58.1       | compliant |
| Measurement Uncertainty:       |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 17 Spurious Emissions (3.45G Band NR 10 MHz Channel BW)

### Config B Lower band edge (3.45G Band):

| Carrier Frequency: 3455.01/ 3465.00 / 3960.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|---------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                             | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                        |                          |                                                                                                                                                                                                              |             |           |
| 3449 – 3450                                       | 3450.0                   | -34.90                                                                                                                                                                                                       | -31.1       | compliant |
| 3448 – 3449                                       | 3448.5                   | -36.95                                                                                                                                                                                                       | -31.1       | compliant |
| 3440 – 3448                                       | 3447.6                   | -37.06                                                                                                                                                                                                       | -31.1       | compliant |
| 3430 – 3440                                       | 3439.9                   | -45.35                                                                                                                                                                                                       | -43.1       | compliant |
| Measurement Uncertainty:                          |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 18 Spurious Emissions (Lower band edge) (Multicarrier Multiband TC1: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config B Upper band edge (3.7G Band):

| Carrier Frequency: 3455.01/ 3465.00 / 3960.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|---------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                             | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                        |                          |                                                                                                                                                                                                              |             |           |
| 3980 – 3981                                       | 3980.5                   | -32.93                                                                                                                                                                                                       | -31.1       | compliant |
| 3981 – 3982                                       | 3981.5                   | -33.29                                                                                                                                                                                                       | -31.1       | compliant |
| 3982 – 4000                                       | 3982.1                   | -31.92                                                                                                                                                                                                       | -31.1       | compliant |
| Measurement Uncertainty:                          |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 19 Spurious Emissions (Upper band edge) (Multicarrier Multiband TC1: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config B Spurious emissions:

| Carrier Frequency: 3455.01/ 3465.00 / 3960.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|---------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                             | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                        |                          |                                                                                                                                                                                                              |             |           |
| 0.009 – 3400                                      | 996.8                    | -75.00                                                                                                                                                                                                       | -58.1       | compliant |
| 3100 – 3430                                       | 3426.2                   | -71.66                                                                                                                                                                                                       | -58.1       | compliant |
| 3400 – 4030                                       | 3859.5                   | -34.87                                                                                                                                                                                                       | -31.1       | compliant |
| 3570 – 3680                                       | 3674.5                   | -72.15                                                                                                                                                                                                       | -58.1       | compliant |
| 4000 – 4200                                       | 4005.3                   | -66.16                                                                                                                                                                                                       | -58.1       | compliant |
| 4030 – 6000                                       | 4454.9                   | -70.03                                                                                                                                                                                                       | -58.1       | compliant |
| 6000 – 13000                                      | 12468.9                  | -70.83                                                                                                                                                                                                       | -58.1       | compliant |
| 13000 - 40000                                     | 39667.2                  | -71.2                                                                                                                                                                                                        | -58.1       | compliant |
| Measurement Uncertainty:                          |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 20 Spurious Emissions (Multicarrier Multiband TC1: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config C Upper band edge (3.45G Band):

| Carrier Frequency: 3534.99/ 3544.995 / 3720.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|----------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                              | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                         |                          |                                                                                                                                                                                                              |             |           |
| 3550 – 3551                                        | 3550.0                   | -35.39                                                                                                                                                                                                       | -31.1       | compliant |
| 3551 – 3552                                        | 3551.5                   | -37.28                                                                                                                                                                                                       | -31.1       | compliant |
| 3552 – 3560                                        | 3552.0                   | -36.27                                                                                                                                                                                                       | -31.1       | compliant |
| 3560 - 3570                                        | 3560.2                   | -45.13                                                                                                                                                                                                       | -43.1       | compliant |
| Measurement Uncertainty:                           |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 21 Spurious Emissions (Upper band edge) (Multicarrier Multiband TC2: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config C Lower band edge (3.7G Band):

| Carrier Frequency: 3534.99/ 3544.995 / 3720.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|----------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                              | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                         |                          |                                                                                                                                                                                                              |             |           |
| 3699 – 3700                                        | 3699.5                   | -35.26                                                                                                                                                                                                       | -31.1       | compliant |
| 3698 – 3699                                        | 3698.5                   | -35.79                                                                                                                                                                                                       | -31.1       | compliant |
| 3680 - 3698                                        | 3697.9                   | -34.47                                                                                                                                                                                                       | -31.1       | compliant |
| Measurement Uncertainty:                           |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 22 Spurious Emissions (Lower band edge) (Multicarrier Multiband TC2: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config C Spurious emissions:

| Carrier Frequency: 3534.99/ 3544.995 / 3720.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|----------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                              | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                         |                          |                                                                                                                                                                                                              |             |           |
| 0.009 – 3400                                       | 995.5                    | -74.95                                                                                                                                                                                                       | -58.1       | compliant |
| 3100 – 3430                                        | 3423.9                   | -77.61                                                                                                                                                                                                       | -58.1       | compliant |
| 3400 – 4030                                        | 3860.1                   | -33.41                                                                                                                                                                                                       | -31.1       | compliant |
| 3570 – 3680                                        | 3674.8                   | -69.22                                                                                                                                                                                                       | -58.1       | compliant |
| 4000 – 4200                                        | 4006.9                   | -69.64                                                                                                                                                                                                       | -58.1       | compliant |
| 4030 – 6000                                        | 4864.1                   | -75.96                                                                                                                                                                                                       | -58.1       | compliant |
| 6000 – 13000                                       | 12473.1                  | -70.87                                                                                                                                                                                                       | -58.1       | compliant |
| 13000 - 40000                                      | 39667.1                  | -71.34                                                                                                                                                                                                       | -58.1       | compliant |
| Measurement Uncertainty:                           |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 23 Spurious Emissions (Multicarrier Multiband TC2: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config D Lower band edge (3.45G Band):

| Carrier Frequency: 3455.01/ 3544.995 / 3720.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|----------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                              | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                         |                          |                                                                                                                                                                                                              |             |           |
| 3449 – 3450                                        | 3450.0                   | -40.22                                                                                                                                                                                                       | -31.1       | compliant |
| 3448 – 3449                                        | 3448.5                   | -37.59                                                                                                                                                                                                       | -31.1       | compliant |
| 3440 – 3448                                        | 3447.9                   | -37.61                                                                                                                                                                                                       | -31.1       | compliant |
| 3430 – 3440                                        | 3440.0                   | -45.52                                                                                                                                                                                                       | -43.1       | compliant |
| Measurement Uncertainty:                           |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 24 Spurious Emissions (Lower band edge) (Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config D Upper band edge (3.45G Band):

| Carrier Frequency: 3455.01/ 3544.995 / 3720.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|----------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                              | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                         |                          |                                                                                                                                                                                                              |             |           |
| 3550 – 3551                                        | 3550.0                   | -39.49                                                                                                                                                                                                       | -31.1       | compliant |
| 3551 – 3552                                        | 3551.5                   | -36.92                                                                                                                                                                                                       | -31.1       | compliant |
| 3552 – 3560                                        | 3552.0                   | -36.62                                                                                                                                                                                                       | -31.1       | compliant |
| 3560 - 3570                                        | 3560.0                   | -45.70                                                                                                                                                                                                       | -43.1       | compliant |
| Measurement Uncertainty:                           |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 25 Spurious Emissions (Upper band edge) (Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config D Lower band edge (3.7G Band):

| Carrier Frequency: 3455.01/ 3544.995 / 3720.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|----------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                              | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                         |                          |                                                                                                                                                                                                              |             |           |
| 3699 – 3700                                        | 3699.5                   | -35.24                                                                                                                                                                                                       | -31.1       | compliant |
| 3698 – 3699                                        | 3698.5                   | -35.59                                                                                                                                                                                                       | -31.1       | compliant |
| 3680 - 3698                                        | 3697.9                   | -34.77                                                                                                                                                                                                       | -31.1       | compliant |
| Measurement Uncertainty:                           |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 26 Spurious Emissions (Lower band edge) (Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config D Spurious emissions:

| Carrier Frequency: 3455.01/ 3544.995 / 3720.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|----------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                              | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                         |                          |                                                                                                                                                                                                              |             |           |
| 0.009 – 3400                                       | 1000.2                   | -74.79                                                                                                                                                                                                       | -58.1       | compliant |
| 3100 – 3430                                        | 3425.9                   | -76.28                                                                                                                                                                                                       | -58.1       | compliant |
| 3400 – 4030                                        | 3859.8                   | -33.5                                                                                                                                                                                                        | -31.1       | compliant |
| 3570 – 3680                                        | 3675.2                   | -68.99                                                                                                                                                                                                       | -58.1       | compliant |
| 4000 – 4200                                        | 4006.9                   | -69.67                                                                                                                                                                                                       | -58.1       | compliant |
| 4030 – 6000                                        | 4978.1                   | -76.11                                                                                                                                                                                                       | -58.1       | compliant |
| 6000 – 13000                                       | 12472.8                  | -70.96                                                                                                                                                                                                       | -58.1       | compliant |
| 13000 - 40000                                      | 39671.7                  | -71.27                                                                                                                                                                                                       | -58.1       | compliant |
| Measurement Uncertainty:                           |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 27 Spurious Emissions (Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config E Lower band edge (3.45G Band):

| Carrier Frequency: 3460.02/ 3480.00 / 3960.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|---------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                             | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                        |                          |                                                                                                                                                                                                              |             |           |
| 3449 – 3450                                       | 3449.4                   | -36.24                                                                                                                                                                                                       | -31.1       | compliant |
| 3448 – 3449                                       | 3448.5                   | -34.92                                                                                                                                                                                                       | -31.1       | compliant |
| 3440 – 3448                                       | 3447.9                   | -33.53                                                                                                                                                                                                       | -31.1       | compliant |
| 3430 – 3440                                       | 3440.0                   | -43.99                                                                                                                                                                                                       | -43.1       | compliant |
| Measurement Uncertainty:                          |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 28 Spurious Emissions (Lower band edge) (Multicarrier Multiband TC4: 3.45G Band 2xNR 20MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config E Upper band edge (3.7G Band):

| Carrier Frequency: 3460.02/ 3480.00 / 3960.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|---------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                             | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                        |                          |                                                                                                                                                                                                              |             |           |
| 3980 – 3981                                       | 3980.5                   | -33.49                                                                                                                                                                                                       | -31.1       | compliant |
| 3981 – 3982                                       | 3981.5                   | -33.96                                                                                                                                                                                                       | -31.1       | compliant |
| 3982 – 4000                                       | 3982.1                   | -33.00                                                                                                                                                                                                       | -31.1       | compliant |
| Measurement Uncertainty:                          |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 29 Spurious Emissions (Upper band edge) (Multicarrier Multiband TC4: 3.45G Band 2xNR 20MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config E Spurious emissions:

| Carrier Frequency: 3460.02/ 3480.00 / 3960.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|---------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                             | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                        |                          |                                                                                                                                                                                                              |             |           |
| 0.009 – 3400                                      | 1000.2                   | -75.02                                                                                                                                                                                                       | -58.1       | compliant |
| 3100 – 3430                                       | 3425.9                   | -73.35                                                                                                                                                                                                       | -58.1       | compliant |
| 3400 – 4030                                       | 3860.4                   | -34.47                                                                                                                                                                                                       | -31.1       | compliant |
| 3570 – 3680                                       | 3675.2                   | -72.11                                                                                                                                                                                                       | -58.1       | compliant |
| 4000 – 4200                                       | 4003.0                   | -65.08                                                                                                                                                                                                       | -58.1       | compliant |
| 4030 – 6000                                       | 4439.8                   | -66.32                                                                                                                                                                                                       | -58.1       | compliant |
| 6000 – 13000                                      | 12468.6                  | -70.84                                                                                                                                                                                                       | -58.1       | compliant |
| 13000 - 40000                                     | 39670.4                  | -71.32                                                                                                                                                                                                       | -58.1       | compliant |
| Measurement Uncertainty:                          |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 30 Spurious Emissions (Multicarrier Multiband TC4: 3.45G Band 2xNR 20MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config F Upper band edge (3.45G Band):

| Carrier Frequency: 3519.99/ 3540.00 / 3720.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|---------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                             | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                        |                          |                                                                                                                                                                                                              |             |           |
| 3550 – 3551                                       | 3550.3                   | -36.17                                                                                                                                                                                                       | -31.1       | compliant |
| 3551 – 3552                                       | 3551.5                   | -35.07                                                                                                                                                                                                       | -31.1       | compliant |
| 3552 – 3560                                       | 3552.0                   | -34.61                                                                                                                                                                                                       | -31.1       | compliant |
| 3560 - 3570                                       | 3560.1                   | -44.59                                                                                                                                                                                                       | -43.1       | compliant |
| Measurement Uncertainty:                          |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 31 Spurious Emissions (Upper band edge) (Multicarrier Multiband TC5: 3.45G Band 2xNR 20MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config F Lower band edge (3.7G Band):

| Carrier Frequency: 3519.99/ 3540.00 / 3720.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|---------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                             | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                        |                          |                                                                                                                                                                                                              |             |           |
| 3699 – 3700                                       | 3699.5                   | -35.78                                                                                                                                                                                                       | -31.1       | compliant |
| 3698 – 3699                                       | 3698.5                   | -36.29                                                                                                                                                                                                       | -31.1       | compliant |
| 3680 - 3698                                       | 3697.9                   | -35.51                                                                                                                                                                                                       | -31.1       | compliant |
| Measurement Uncertainty:                          |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 32 Spurious Emissions (Lower band edge) (Multicarrier Multiband TC5: 3.45G Band 2xNR 20MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config F Spurious emissions:

| Carrier Frequency: 3519.99/ 3540.00 / 3720.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|---------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                             | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                        |                          |                                                                                                                                                                                                              |             |           |
| 0.009 – 3400                                      | 1000.5                   | -74.74                                                                                                                                                                                                       | -58.1       | compliant |
| 3100 – 3430                                       | 3425.0                   | -76.92                                                                                                                                                                                                       | -58.1       | compliant |
| 3400 – 4030                                       | 3860.4                   | -34.55                                                                                                                                                                                                       | -31.1       | compliant |
| 3570 – 3680                                       | 3675.5                   | -69.54                                                                                                                                                                                                       | -58.1       | compliant |
| 4000 – 4200                                       | 4006.9                   | -69.60                                                                                                                                                                                                       | -58.1       | compliant |
| 4030 – 6000                                       | 4983.0                   | -76.05                                                                                                                                                                                                       | -58.1       | compliant |
| 6000 – 13000                                      | 12324.4                  | -70.98                                                                                                                                                                                                       | -58.1       | compliant |
| 13000 - 40000                                     | 39673.5                  | -71.14                                                                                                                                                                                                       | -58.1       | compliant |
| Measurement Uncertainty:                          |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 33 Spurious Emissions (Multicarrier Multiband TC5: 3.45G Band 2xNR 20MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config G Lower band edge (3.45G Band):

| Carrier Frequency: 3460.02/ 3540.00 / 3960.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|---------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                             | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                        |                          |                                                                                                                                                                                                              |             |           |
| 3449 – 3450                                       | 3450.0                   | -35.52                                                                                                                                                                                                       | -31.1       | compliant |
| 3448 – 3449                                       | 3448.5                   | -35.59                                                                                                                                                                                                       | -31.1       | compliant |
| 3440 – 3448                                       | 3447.9                   | -35.15                                                                                                                                                                                                       | -31.1       | compliant |
| 3430 – 3440                                       | 3439.8                   | -44.94                                                                                                                                                                                                       | -43.1       | compliant |
| Measurement Uncertainty:                          |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 34 Spurious Emissions (Lower band edge) (Multicarrier Multiband TC6: 3.45G Band 2xNR 20MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config G Upper band edge (3.45G Band):

| Carrier Frequency: 3460.02/ 3540.00 / 3960.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|---------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                             | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                        |                          |                                                                                                                                                                                                              |             |           |
| 3550 – 3551                                       | 3550.0                   | -32.96                                                                                                                                                                                                       | -31.1       | compliant |
| 3551 – 3552                                       | 3551.5                   | -35.55                                                                                                                                                                                                       | -31.1       | compliant |
| 3552 – 3560                                       | 3552.0                   | -34.75                                                                                                                                                                                                       | -31.1       | compliant |
| 3560 - 3570                                       | 3560.2                   | -45.61                                                                                                                                                                                                       | -43.1       | compliant |
| Measurement Uncertainty:                          |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 35 Spurious Emissions (Upper band edge) (Multicarrier Multiband TC6: 3.45G Band 2xNR 20MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config G Upper band edge (3.7G Band):

| Carrier Frequency: 3460.02/ 3540.00 / 3960.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|---------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                             | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                        |                          |                                                                                                                                                                                                              |             |           |
| 3980 – 3981                                       | 3980.5                   | -33.53                                                                                                                                                                                                       | -31.1       | compliant |
| 3981 – 3982                                       | 3981.5                   | -34.02                                                                                                                                                                                                       | -31.1       | compliant |
| 3982 – 4000                                       | 3982.0                   | -32.39                                                                                                                                                                                                       | -31.1       | compliant |
| Measurement Uncertainty:                          |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 36 Spurious Emissions (Upper band edge) (Multicarrier Multiband TC6: 3.45G Band 2xNR 20MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config G Spurious emissions:

| Carrier Frequency: 3460.02/ 3540.00 / 3960.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|---------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                             | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                        |                          |                                                                                                                                                                                                              |             |           |
| 0.009 – 3400                                      | 1000.2                   | -75.01                                                                                                                                                                                                       | -58.1       | compliant |
| 3100 – 3430                                       | 3427.9                   | -74.70                                                                                                                                                                                                       | -58.1       | compliant |
| 3400 – 4030                                       | 3860.4                   | -34.47                                                                                                                                                                                                       | -31.1       | compliant |
| 3570 – 3680                                       | 3675.3                   | -71.99                                                                                                                                                                                                       | -58.1       | compliant |
| 4000 – 4200                                       | 4003.0                   | -65.64                                                                                                                                                                                                       | -58.1       | compliant |
| 4030 – 6000                                       | 4463.5                   | -69.23                                                                                                                                                                                                       | -58.1       | compliant |
| 6000 – 13000                                      | 12476.3                  | -70.98                                                                                                                                                                                                       | -58.1       | compliant |
| 13000 - 40000                                     | 39656.9                  | -71.22                                                                                                                                                                                                       | -58.1       | compliant |
| Measurement Uncertainty:                          |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 37 Spurious Emissions (Multicarrier Multiband TC6: 3.45G Band 2xNR 20MHz + 3.7G Band 1xNR 40MHz Channel BW)

### Config H Lower band edge (3.45G Band):

| Carrier Frequency: 3470.01/ 3529.98 / 3930.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|---------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                             | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                        |                          |                                                                                                                                                                                                              |             |           |
| 3449 – 3450                                       | 3450.0                   | -37.09                                                                                                                                                                                                       | -31.1       | compliant |
| 3448 – 3449                                       | 3448.5                   | -35.79                                                                                                                                                                                                       | -31.1       | compliant |
| 3440 – 3448                                       | 3447.9                   | -36.00                                                                                                                                                                                                       | -31.1       | compliant |
| 3430 – 3440                                       | 3439.9                   | -44.70                                                                                                                                                                                                       | -43.1       | compliant |
| Measurement Uncertainty:                          |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 38 Spurious Emissions (Lower band edge) (Multicarrier Multiband TC7: 3.45G Band 2xNR 40MHz + 3.7G Band 1xNR 100MHz Channel BW)

### Config H Upper band edge (3.45G Band):

| Carrier Frequency: 3470.01/ 3529.98 / 3930.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|---------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                             | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                        |                          |                                                                                                                                                                                                              |             |           |
| 3550 – 3551                                       | 3550.0                   | -38.24                                                                                                                                                                                                       | -31.1       | compliant |
| 3551 – 3552                                       | 3551.5                   | -36.29                                                                                                                                                                                                       | -31.1       | compliant |
| 3552 – 3560                                       | 3552.0                   | -35.74                                                                                                                                                                                                       | -31.1       | compliant |
| 3560 - 3570                                       | 3560.0                   | -45.50                                                                                                                                                                                                       | -43.1       | compliant |
| Measurement Uncertainty:                          |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 39 Spurious Emissions (Upper band edge) (Multicarrier Multiband TC7: 3.45G Band 2xNR 40MHz + 3.7G Band 1xNR 100MHz Channel BW)

### Config H Upper band edge (3.7G Band):

| Carrier Frequency: 3470.01/ 3529.98 / 3930.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|---------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                             | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                        |                          |                                                                                                                                                                                                              |             |           |
| 3980 – 3981                                       | 3980.5                   | -35.48                                                                                                                                                                                                       | -31.1       | compliant |
| 3981 – 3982                                       | 3981.5                   | -35.98                                                                                                                                                                                                       | -31.1       | compliant |
| 3982 – 4000                                       | 3983.1                   | -35.40                                                                                                                                                                                                       | -31.1       | compliant |
| Measurement Uncertainty:                          |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 40 Spurious Emissions (Upper band edge) (Multicarrier Multiband TC7: 3.45G Band 2xNR 40MHz + 3.7G Band 1xNR 100MHz Channel BW)

### Config H Spurious emissions:

| Carrier Frequency: 3470.01/ 3529.98 / 3930.00 MHz |                          |                                                                                                                                                                                                              |             |           |
|---------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|
| Frequency Range [MHz]                             | Emission Frequency [MHz] | Maximum Emission Level [dBm]                                                                                                                                                                                 | Limit [dBm] | Result    |
| QPSK-Modulation TX port 57                        |                          |                                                                                                                                                                                                              |             |           |
| 0.009 – 3400                                      | 1000.2                   | -74.93                                                                                                                                                                                                       | -58.1       | compliant |
| 3100 – 3430                                       | 3425.2                   | -72.16                                                                                                                                                                                                       | -58.1       | compliant |
| 3400 – 4030                                       | 3860.4                   | -35.20                                                                                                                                                                                                       | -31.1       | compliant |
| 3570 – 3680                                       | 3674.8                   | -71.62                                                                                                                                                                                                       | -58.1       | compliant |
| 4000 – 4200                                       | 4004.6                   | -65.60                                                                                                                                                                                                       | -58.1       | compliant |
| 4030 – 6000                                       | 4415.7                   | -71.77                                                                                                                                                                                                       | -58.1       | compliant |
| 6000 – 13000                                      | 12424.5                  | -70.95                                                                                                                                                                                                       | -58.1       | compliant |
| 13000 - 40000                                     | 39670.4                  | -71.13                                                                                                                                                                                                       | -58.1       | compliant |
| Measurement Uncertainty:                          |                          | $f < 1.0\text{GHz}: \pm 1.1\text{dB},$<br>$1.0\text{GHz} \leq f < 3.6\text{GHz}: \pm 1.2\text{dB},$<br>$3.6\text{GHz} \leq f < 8.0\text{GHz}: \pm 1.6\text{dB},$<br>$8.0\text{GHz} \leq f: \pm 1.9\text{dB}$ |             |           |

Table 41 Spurious Emissions (Multicarrier Multiband TC7: 3.45G Band 2xNR 40MHz + 3.7G Band 1xNR 100MHz Channel BW)

The measured conducted emission levels were found to be compliant with the manufacturer's specifications and with all requirements of the FCC rules.

## 5 Test Data and Screenshots

### 5.1 Part List of the RF Measurement Test Equipment

| No. | Test Equipment               | Manufacturer & Type                  | Serial Number | Calibration date | Calibration due | Test No.   |
|-----|------------------------------|--------------------------------------|---------------|------------------|-----------------|------------|
| 1   | Signal & Spectrum Analyser   | Rohde & Schwarz, FSW-43              | 104001        | 08.08.2024       | 07.08.2025      | 1, 2, 3, 4 |
| 2   | Vector Network Analyzer      | Rohde&Schwarz, ZVL-13                | 101177        | 11.12.2023       | 10.12.2024      | 4          |
| 3   | Vector Network Analyzer      | Rohde&Schwarz, ZVA-40                | 100146        | 29.12.2023       | 28.12.2024      | 1, 2, 3, 4 |
| 4   | Calibration Unit             | Rohde&Schwarz, ZV-Z54                | 100125        | 03.07.2024       | 02.07.2025      | 1, 2, 3, 4 |
| 5   | Rubidium Frequency Standard  | Symmetricom, 8040C                   | 161730115011  | 02.08.2024       | 01.08.2025      | 1, 2, 3, 4 |
| 6   | DC-power supply              | Elektro-Automatik, PSI 8080-510      | 1331460001    | cnn              | -               | 1, 2, 3, 4 |
| 7   | Attenuator                   | API Weinschel, 254-30-33             | UH352         | cnn              | -               | 1, 2, 3, 4 |
| 8   | Attenuator                   | Weinschel, 66-10-33                  | CE6853        | cnn              | -               | 4          |
| 9   | Band Stop Filter             | Creowave, CW-BSF-3450-3550-E5-M2     | 2370001       | cnn              | -               | 4          |
| 10  | Diplexer                     | Creowave, CW-DPF-3700-3980-E2-M2     | 1959001       | cnn              | -               | 4          |
| 11  | Termination                  | RD Microwaves, TA-A75NM-B            | 2230          | cnn              | -               | 4          |
| 12  | Attenuator                   | Signal Solutions, SSN-FA20K-40MF-10A | 1             | cnn              | -               | 4          |
| 13  | High Pass Filter             | RF-Lambda, RHPF23G06G40              | 21052000014   | cnn              | -               | 4          |
| 14  | Multimeter                   | Fluke, 83                            | 65870302      | 13.12.2023       | 12.12.2024      | 1, 2, 3, 4 |
| 15  | Humidity & Temperature Probe | Vaisala, HMP110                      | S0840831      | 24.12.2023       | 24.12.2024      | 1, 2, 3, 4 |

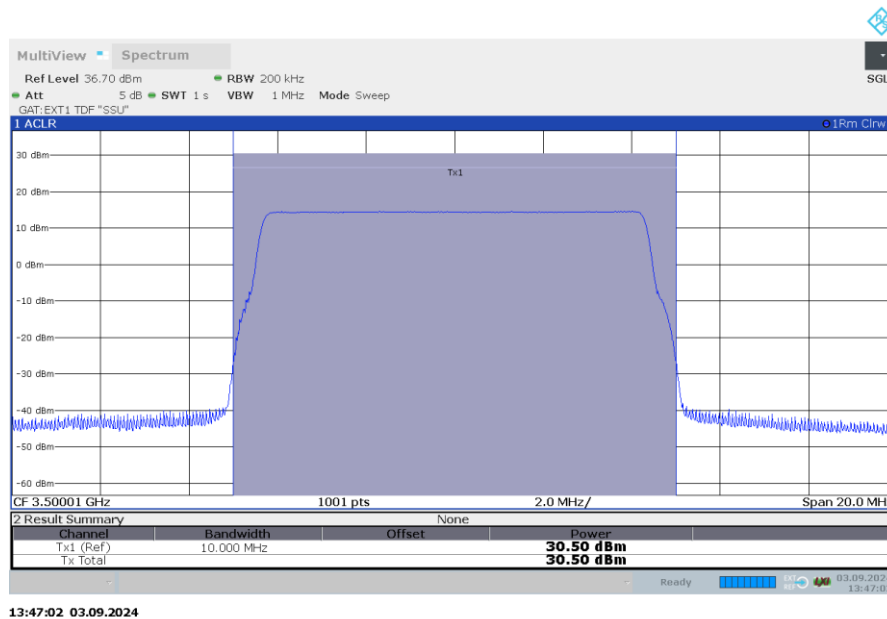
Table 424 Part List of the RF Measurement Test Equipment

## 5.2 Spectral Plots

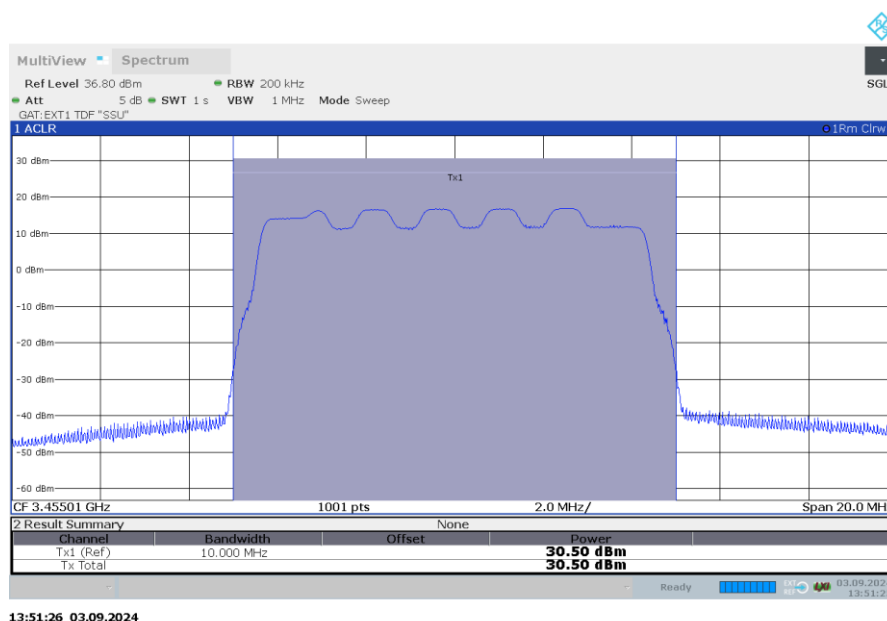
NOTE: Only a sample of the spectral plots are used and visible in this report. All measured test results and data are saved in Oulu located server.

### 5.2.1 Test No. 1: RF Output Power

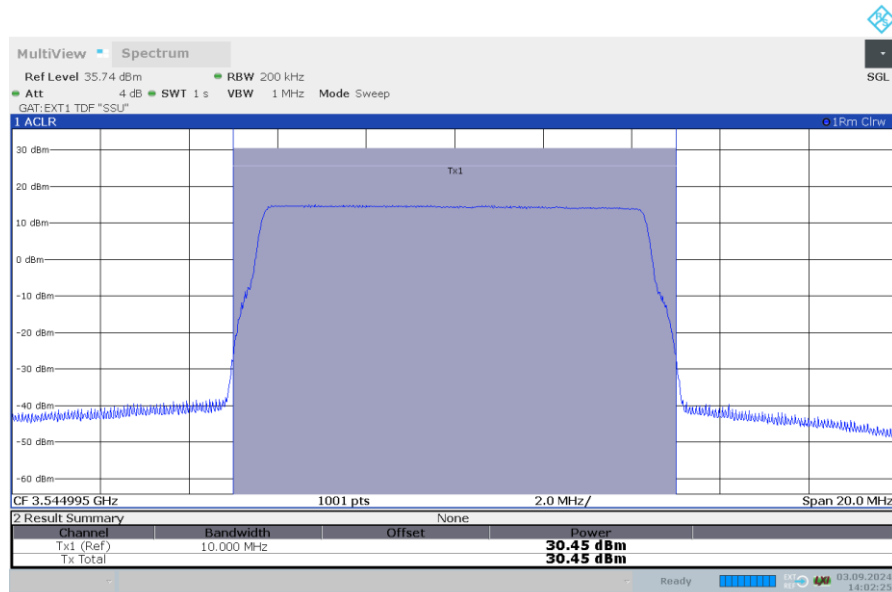
#### RF Power Output NR 10MHz BW (3.45G Band)



Test Model 1.1, Modulation QPSK, Channel Frequency 3500.01MHz, TX port 57

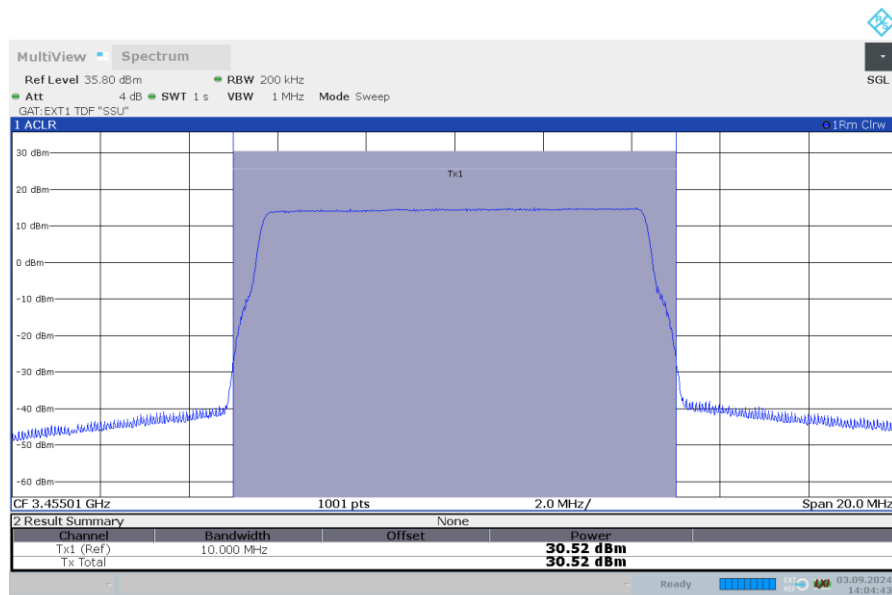


Test Model 3.2, Modulation 16QAM, Channel Frequency 3455.01MHz, TX port 57



14:02:26 03.09.2024

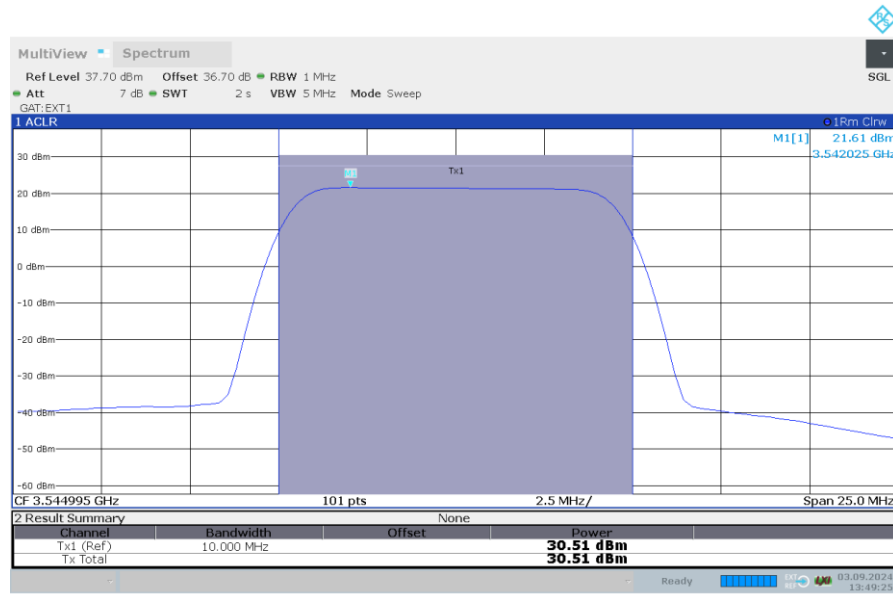
Test Model 3.1, Modulation 64QAM, Channel Frequency 3544.995MHz, TX port 57



14:04:44 03.09.2024

Test Model 3.1a, Modulation 256QAM, Channel Frequency 3455.01MHz, TX port 57

## Power spectral density NR 10MHz BW (3.45G Band)



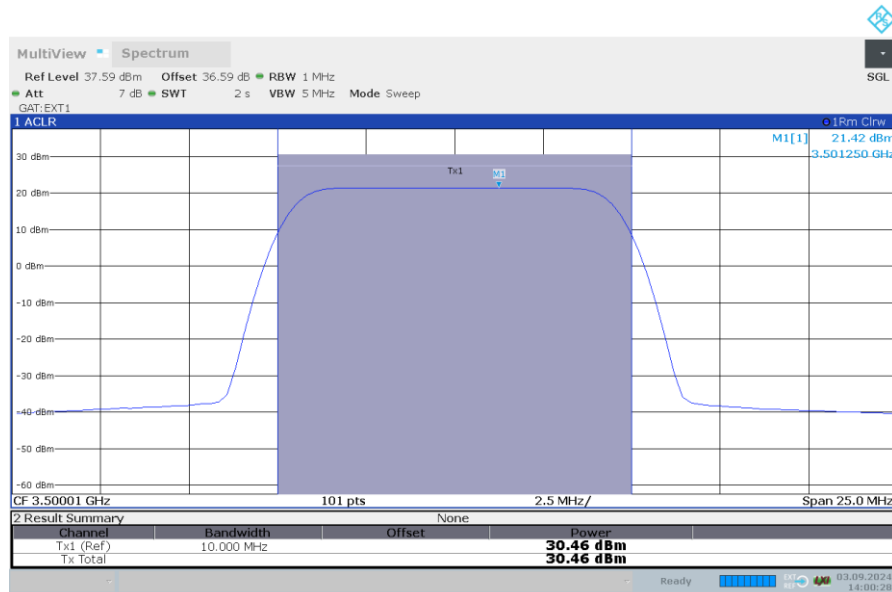
13:49:25 03.09.2024

Test Model 1.1, Modulation QPSK, Channel Frequency 3544.995MHz, TX port 57



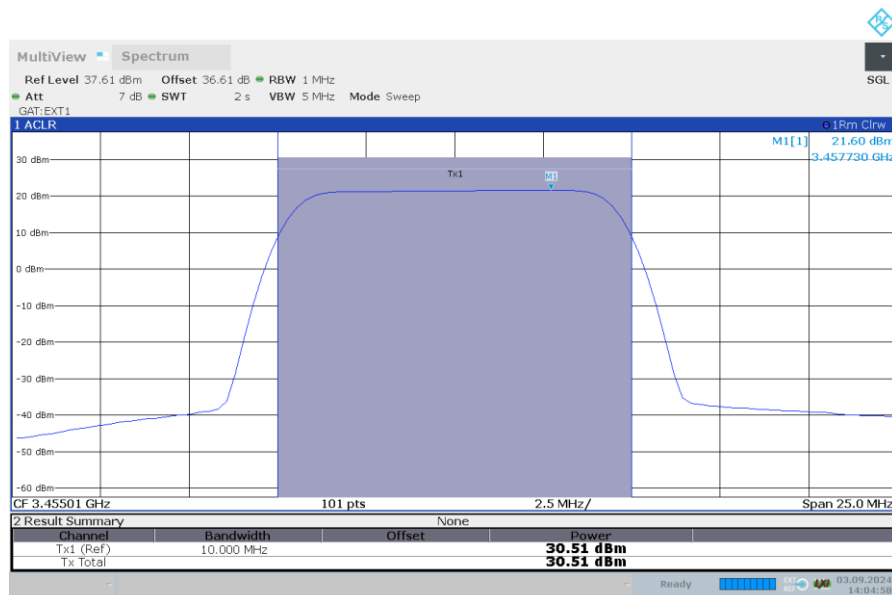
13:51:36 03.09.2024

Test Model 3.2, Modulation 16QAM, Channel Frequency 3455.01MHz, TX port 57



14:00:29 03.09.2024

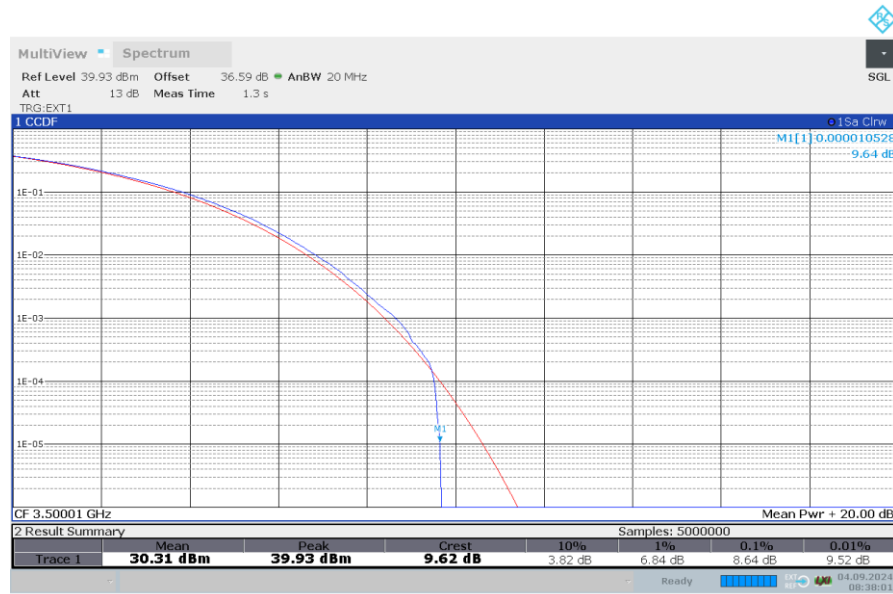
Test Model 3.1, Modulation 64QAM, Channel Frequency 3500.01MHz, TX port 57



14:04:59 03.09.2024

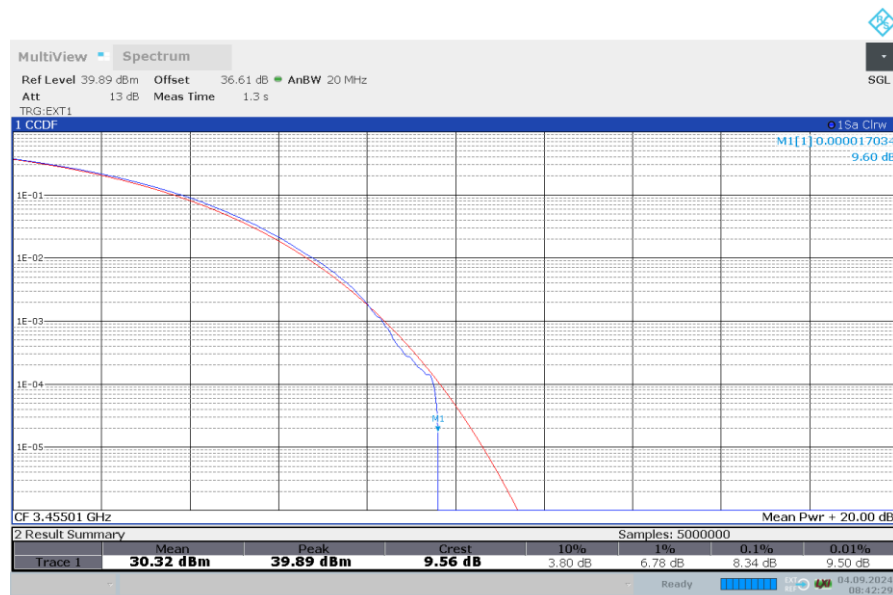
Test Model 3.1a, Modulation 256QAM, Channel Frequency 3455.01MHz, TX port 57

## Peak-to-Average Power Ratio (PAPR) NR 10MHz BW (3.45G Band)



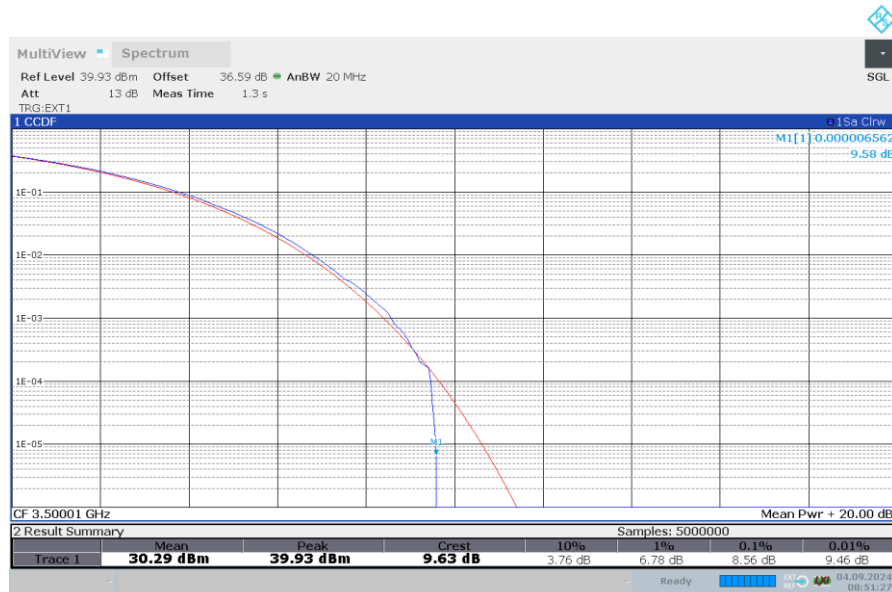
08:38:02 04.09.2024

Test Model 1.1, Modulation QPSK, Channel Frequency 3500.01MHz, TX port 57



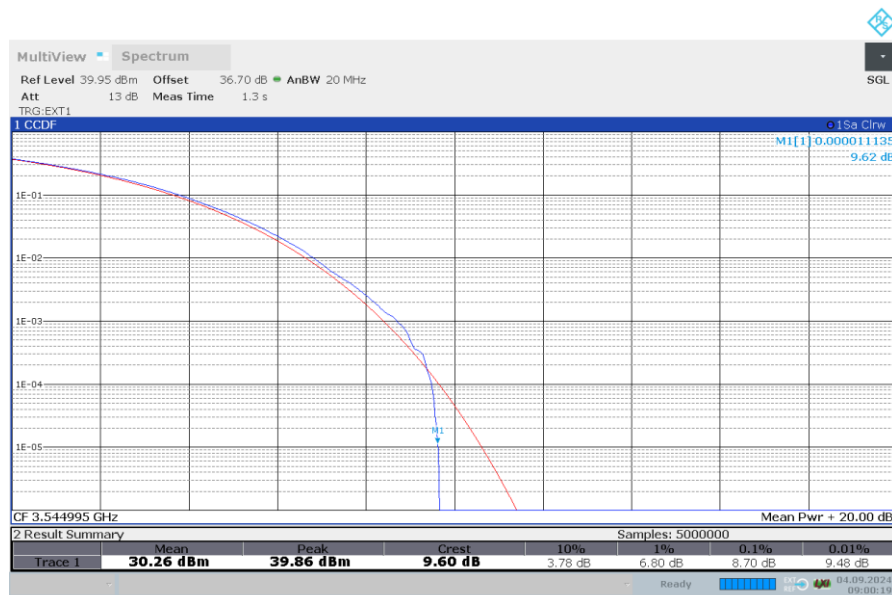
08:42:29 04.09.2024

Test Model 3.2, Modulation 16QAM, Channel Frequency 3455.01MHz, TX port 57



08:51:27 04.09.2024

Test Model 3.1, Modulation 64QAM, Channel Frequency 3500.01MHz, TX port 57



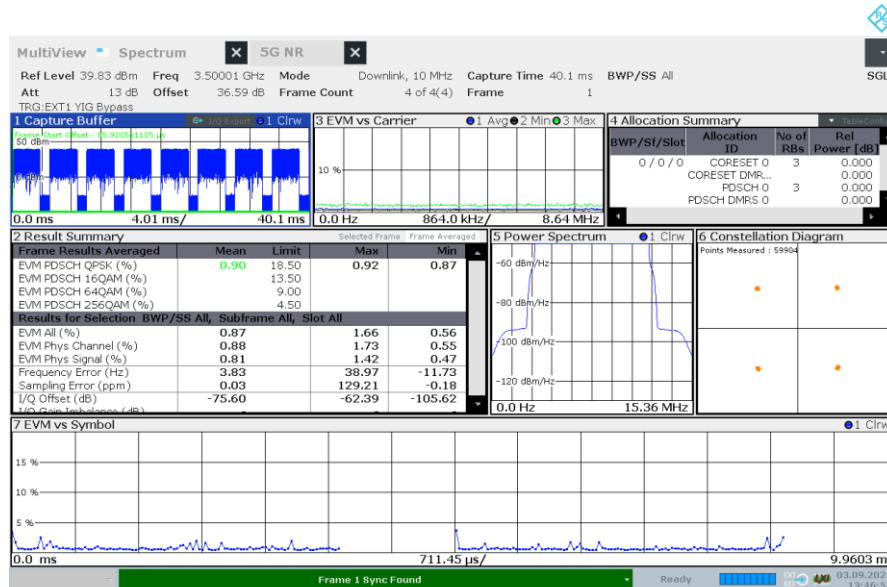
09:00:20 04.09.2024

Test Model 3.1a, Modulation 256QAM, Channel Frequency 3544.995MHz, TX port 57

## 5.2.2 Test No. 2: Modulation Characteristics

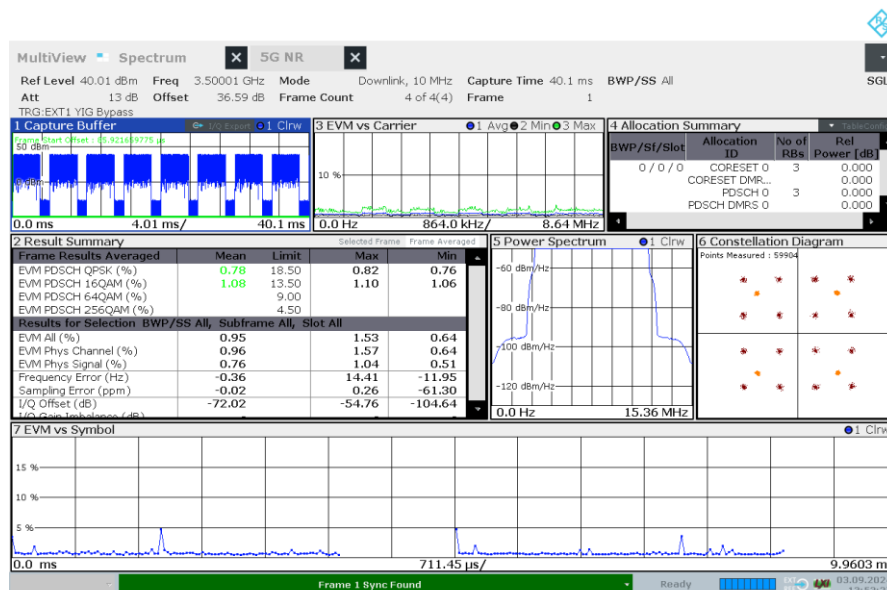
No additional measurements are required for the modulation characteristics. Please refer to test no. 3, occupied bandwidth on page 17.

Screenshots below show information about the modulations I/Q constellation form and modulation information table, displaying error to ideal modulation symbols.



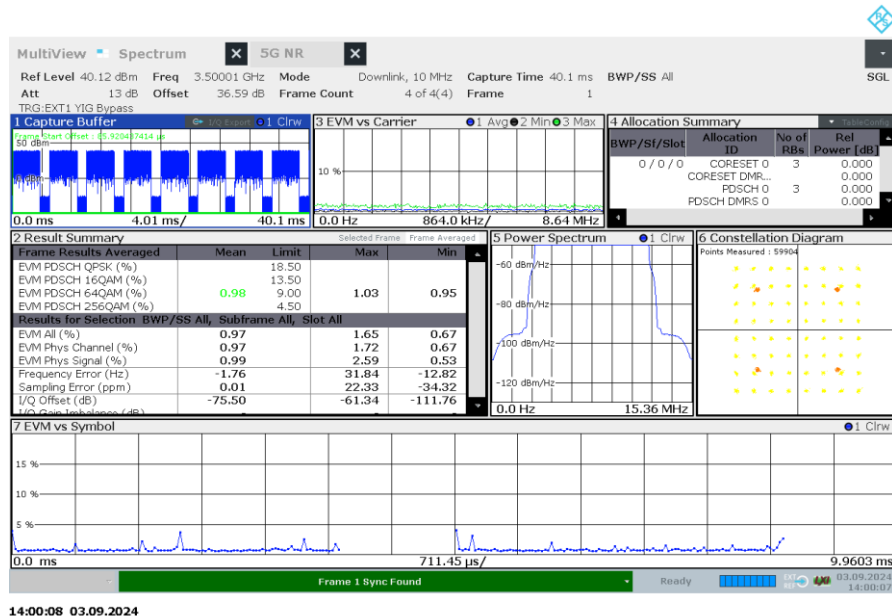
13:46:56 03.09.2024

I/Q constellation diagram with capture buffer – QPSK (3500.01MHz) (NR 10MHz Channel BW)

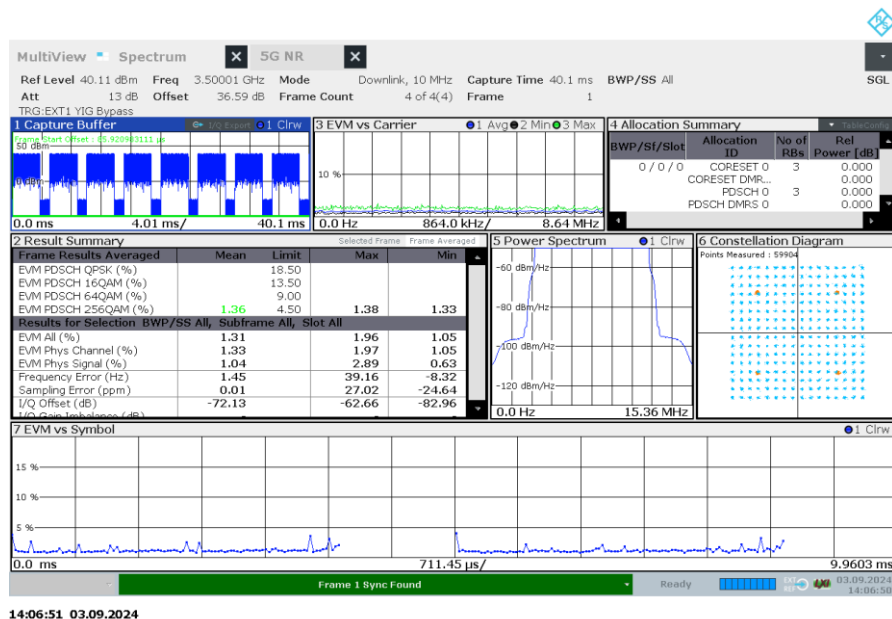


13:53:27 03.09.2024

I/Q constellation diagram with capture buffer – 16QAM (3500.01MHz) (NR 10MHz Channel BW)



I/Q constellation diagram with capture buffer – 64QAM (3500.01MHz) (NR 10MHz Channel BW)

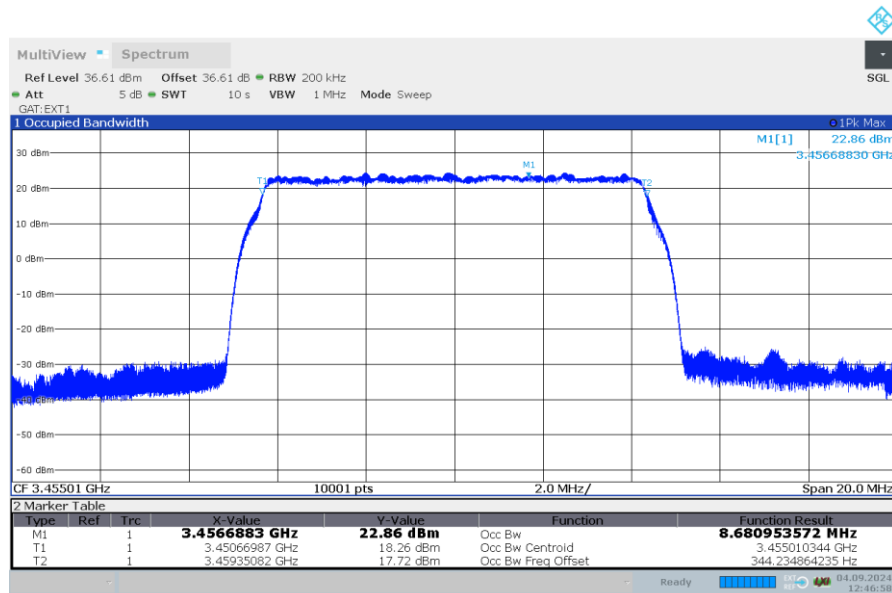


I/Q constellation table with I/Q error –256QAM (3500.01MHz) (NR 10MHz Channel BW)

## 5.2.3 Test No. 3: Occupied Bandwidth

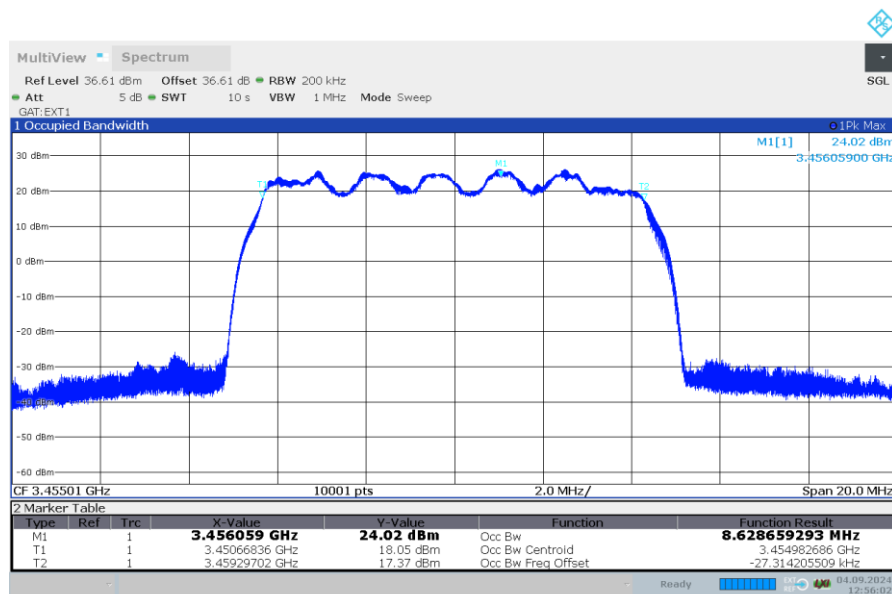
### 5.2.3.1 Occupied Bandwidth 99% plots

#### Occupied Bandwidth NR 10MHz BW (3.45G Band)



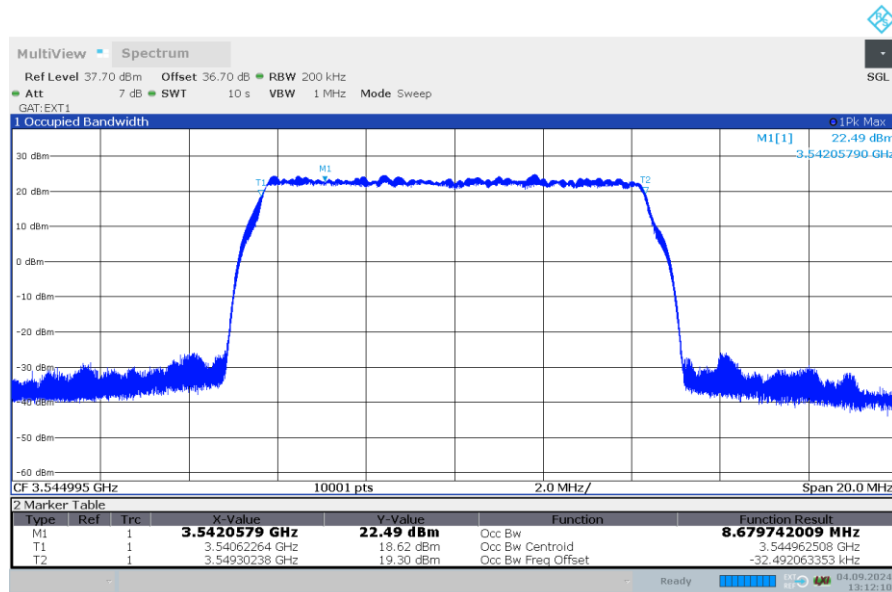
12:46:59 04.09.2024

Test Model 1.1, Modulation QPSK, Channel Frequency 3455.01MHz, TX port 57



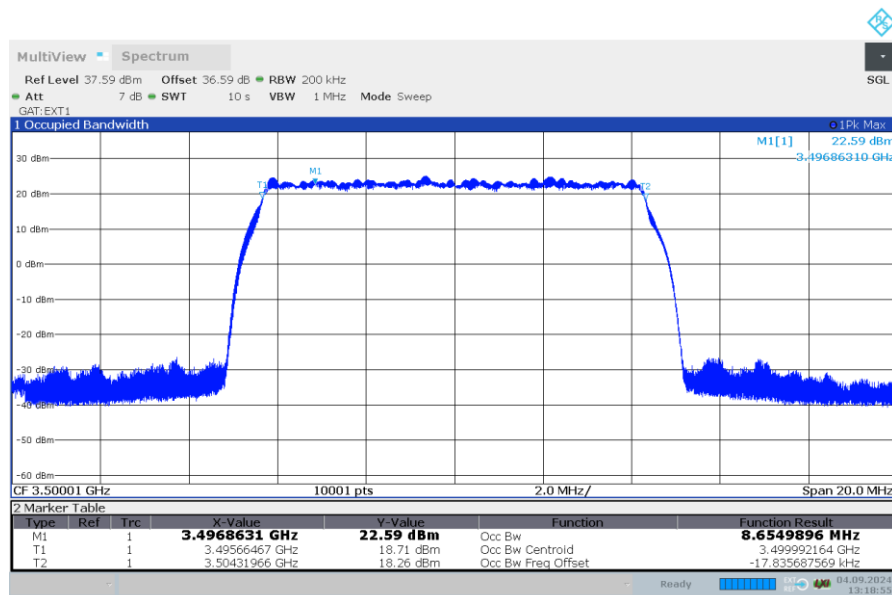
12:56:02 04.09.2024

Test Model 3.2, Modulation 16QAM, Channel Frequency 3455.01MHz, TX port 57



13:12:10 04.09.2024

Test Model 3.1, Modulation 64QAM, Channel Frequency 3544.995MHz, TX port 57

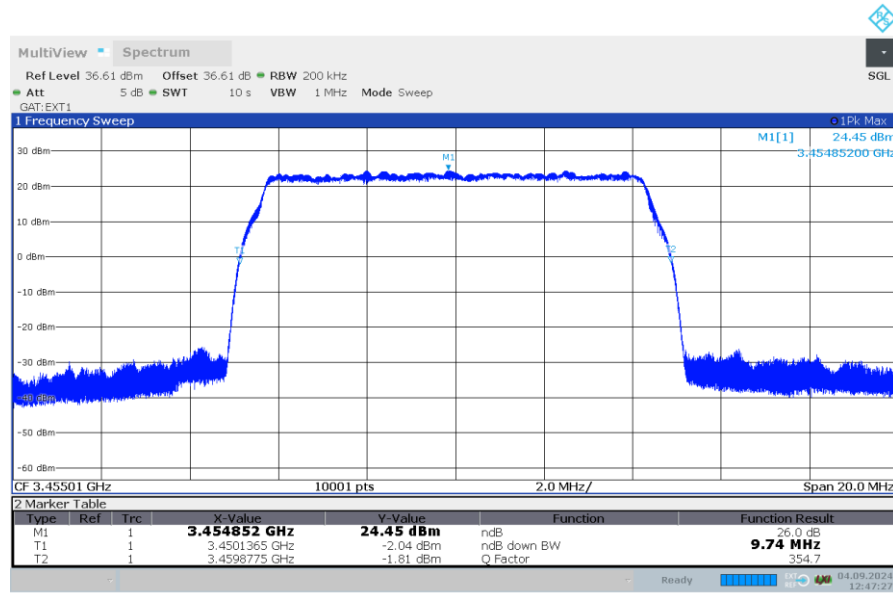


13:18:55 04.09.2024

Test Model 3.1a, Modulation 256QAM, Channel Frequency 3500.01MHz, TX port 57

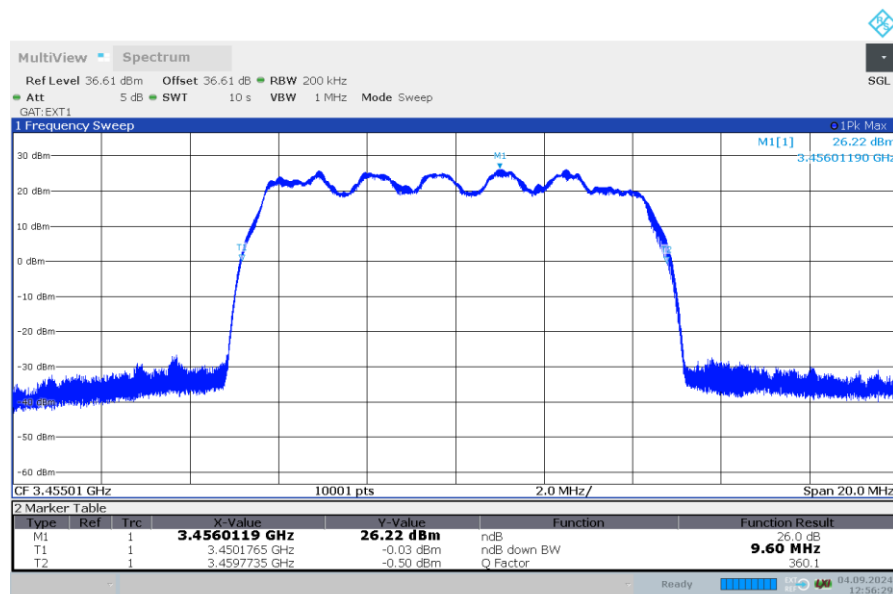
## 5.2.3.2 Occupied Bandwidth -26dB plots

### Occupied Bandwidth NR 10MHz BW (3.45G Band)



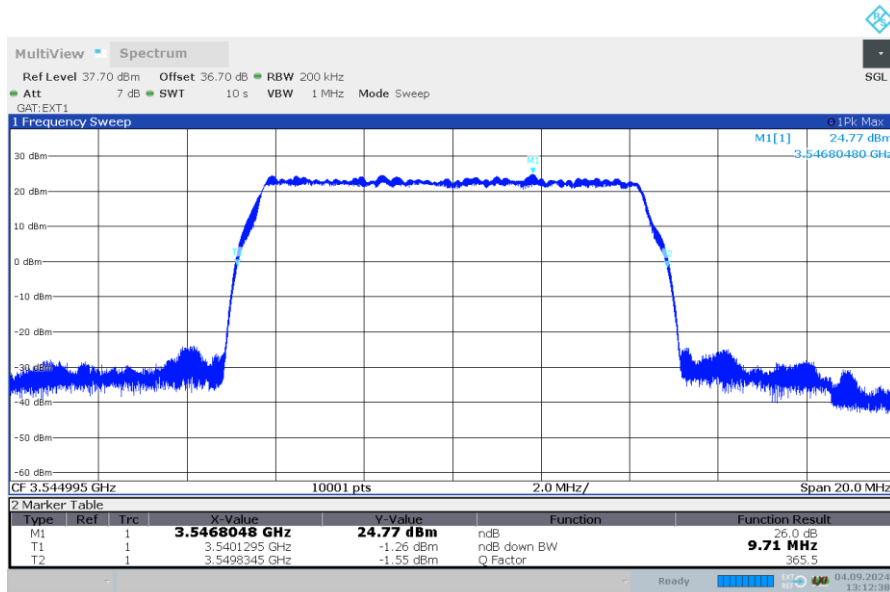
12:47:27 04.09.2024

Test Model 1.1, Modulation QPSK, Channel Frequency 3455.01MHz, TX port 57



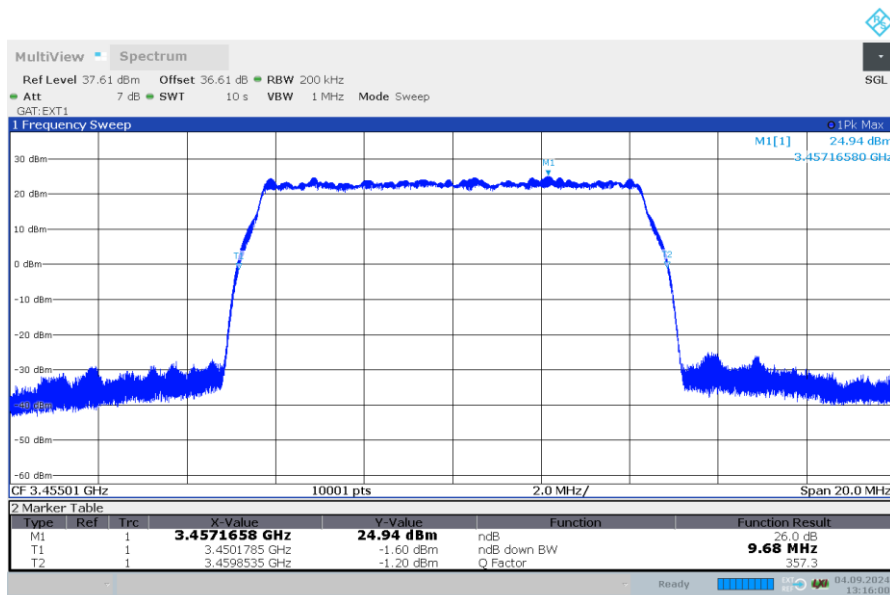
12:56:30 04.09.2024

Test Model 3.2, Modulation 16QAM, Channel Frequency 3455.01MHz, TX port 57



13:12:38 04.09.2024

Test Model 3.1, Modulation 64QAM, Channel Frequency 3544.995MHz, TX port 57

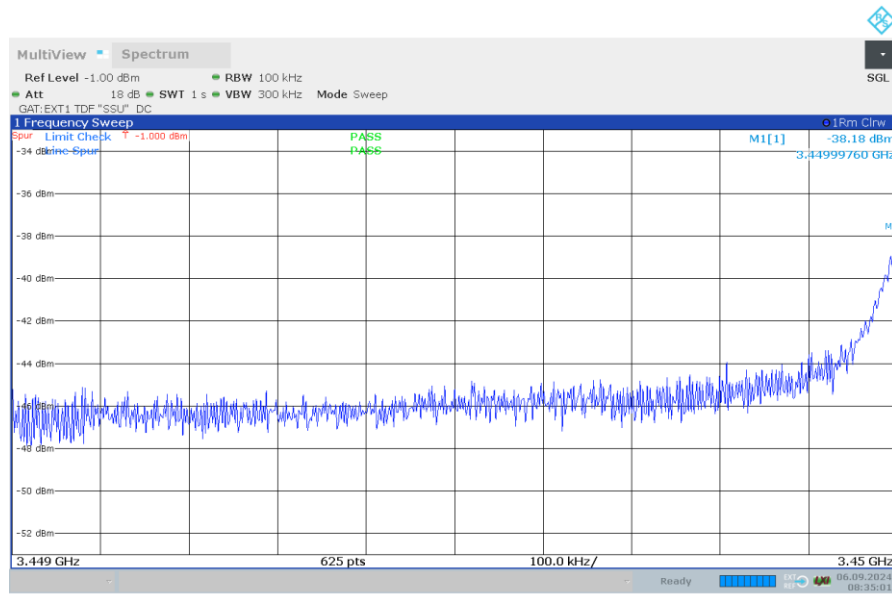


13:16:01 04.09.2024

Test Model 3.1a, Modulation 256QAM, Channel Frequency 3455.01MHz, TX port 57

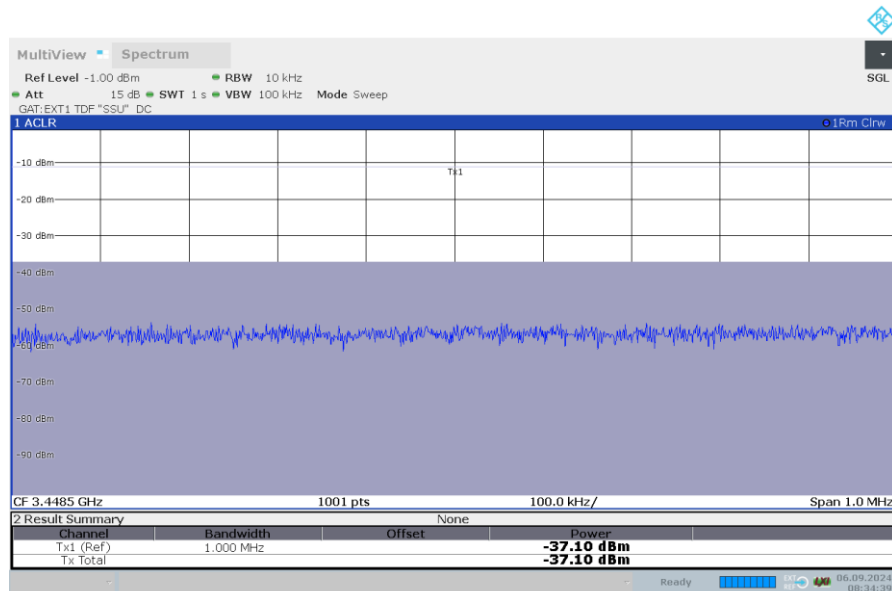
## 5.2.4 Test No. 4: Spurious Emissions at the Antenna Terminals

### Config A TX port 57:



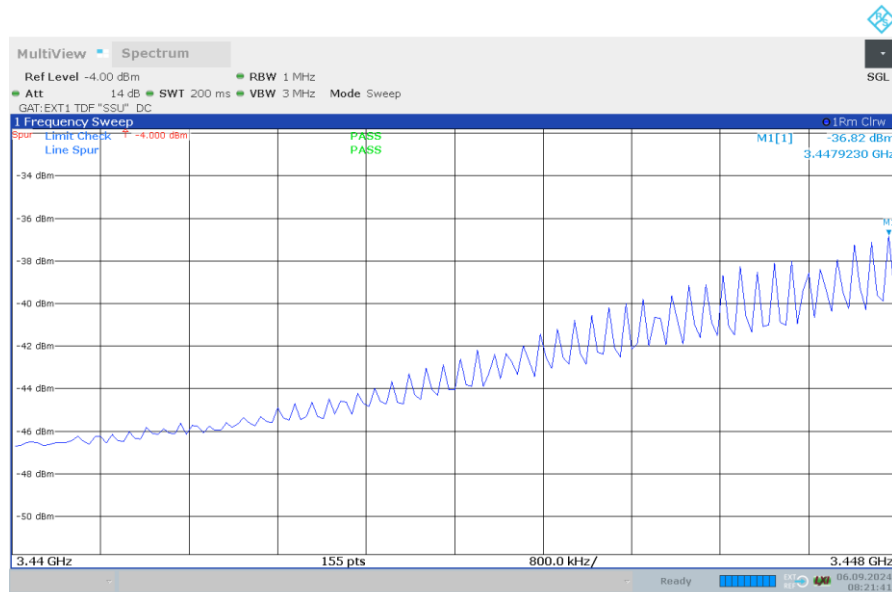
08:35:02 06.09.2024

Spurious Emissions (Lower Band Edge 3449-3450MHz) – QPSK (3455.01MHz) (10MHz Channel BW)



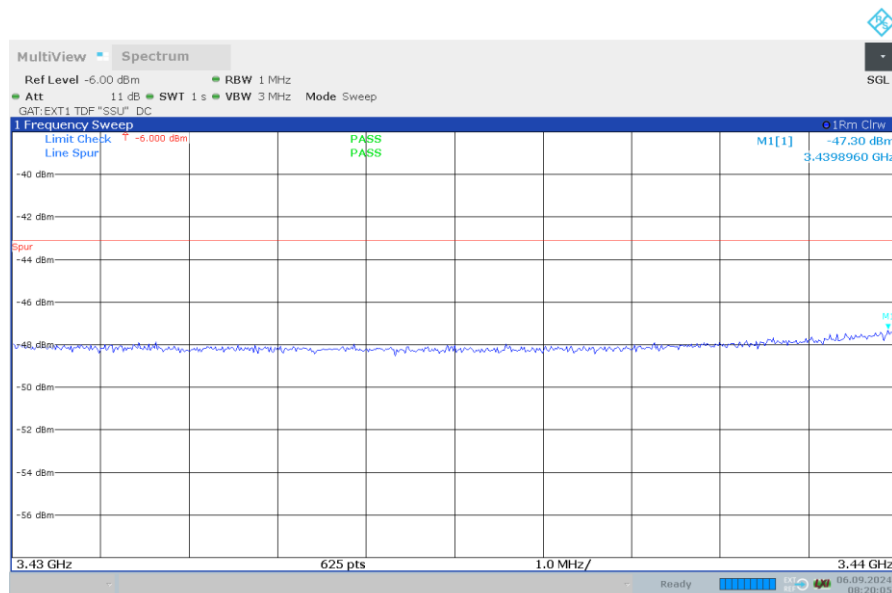
08:34:40 06.09.2024

Spurious Emissions (Lower Band Edge 3448-3449MHz) – QPSK (3455.01MHz) (10MHz Channel BW)



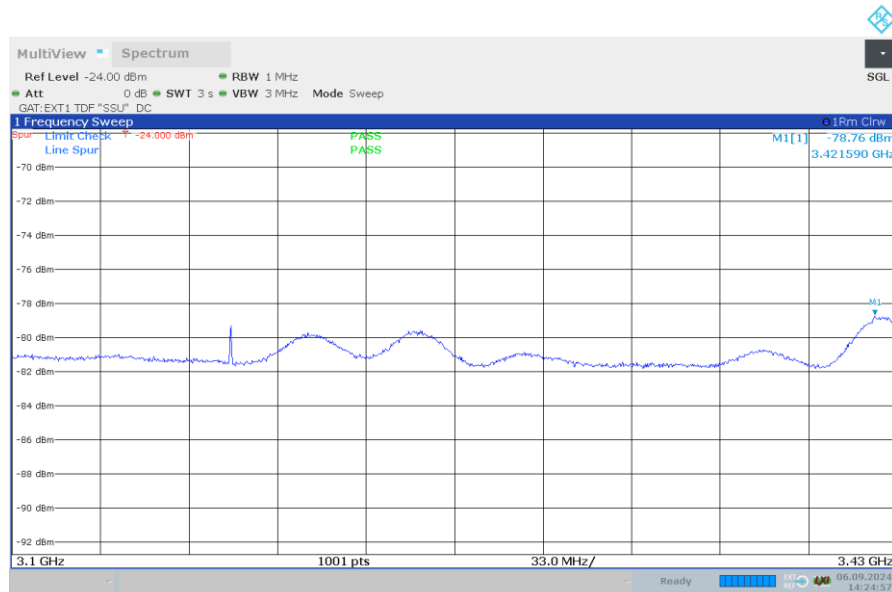
08:21:42 06.09.2024

Spurious Emissions (Lower Band Edge 3440-3448MHz) – QPSK (3455.01MHz) (10MHz Channel BW)



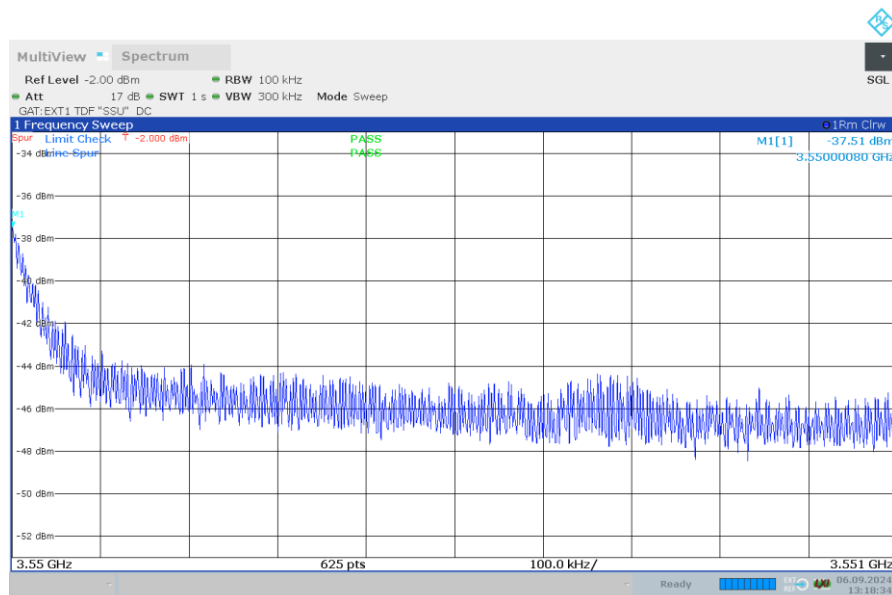
08:20:05 06.09.2024

Spurious Emissions (Lower Band Edge 3430-3440MHz) – QPSK (3455.01MHz) (10MHz Channel BW)



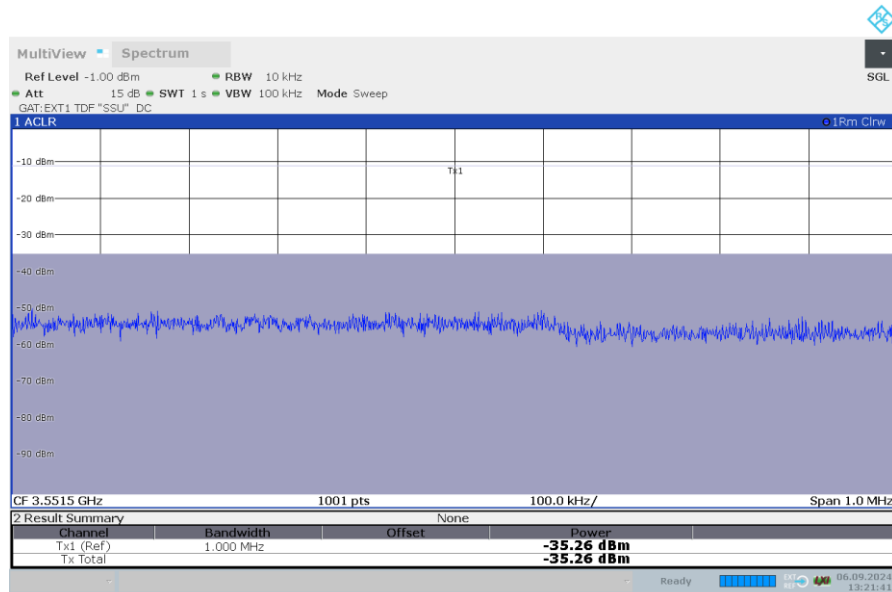
14:24:58 06.09.2024

Spurious Emissions (Lower Band Edge 3100-3430MHz) – QPSK (3455.01MHz) (10MHz Channel BW)



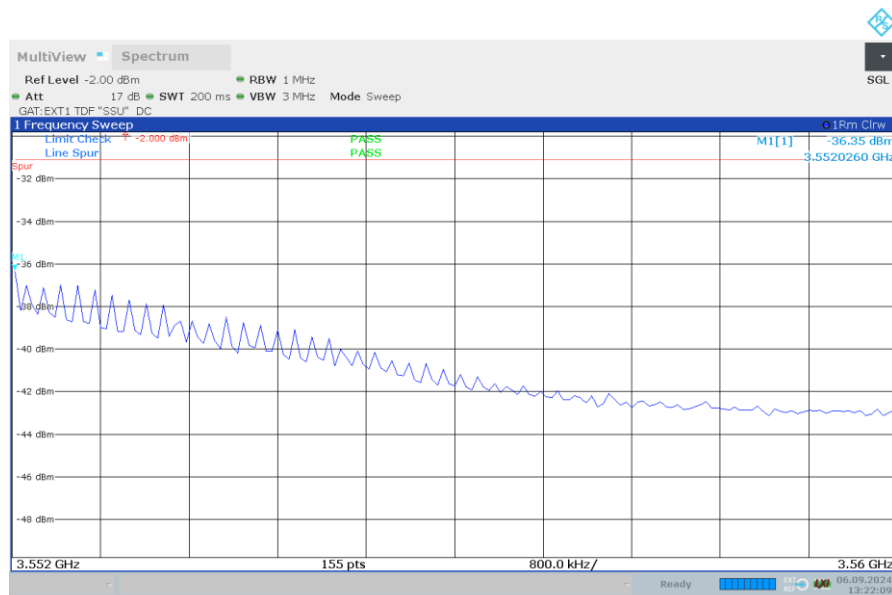
13:18:35 06.09.2024

Spurious Emissions (Upper Band Edge 3550-3551MHz) – QPSK (3544.995MHz) (10MHz Channel BW)



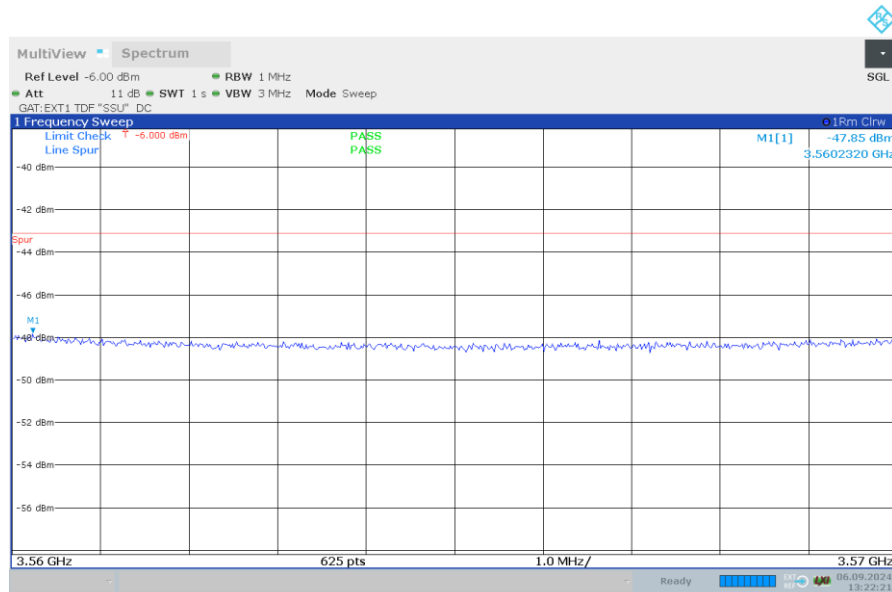
13:21:41 06.09.2024

Spurious Emissions (Upper Band Edge 3551-3552MHz) – QPSK (3544.995MHz) (10MHz Channel BW)



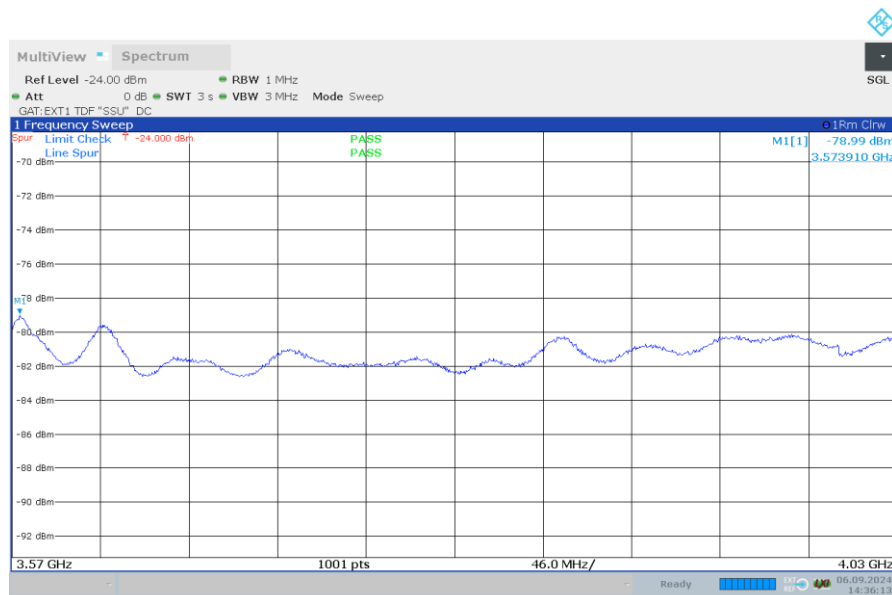
13:22:09 06.09.2024

Spurious Emissions (Upper Band Edge 3552-3560MHz) – QPSK (3544.995MHz) (10MHz Channel BW)



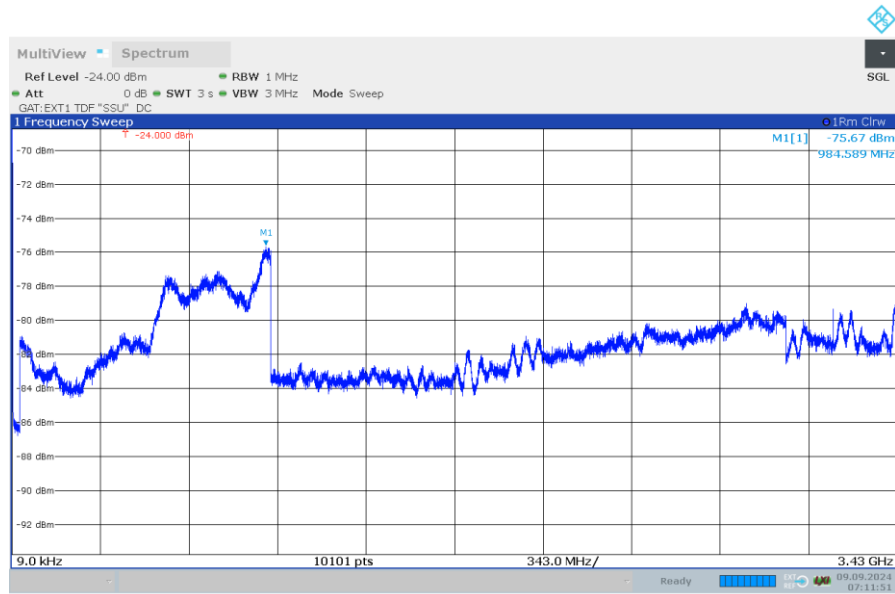
13:22:22 06.09.2024

Spurious Emissions (Upper Band Edge 3560-3570MHz) – QPSK (3544.995MHz) (10MHz Channel BW)



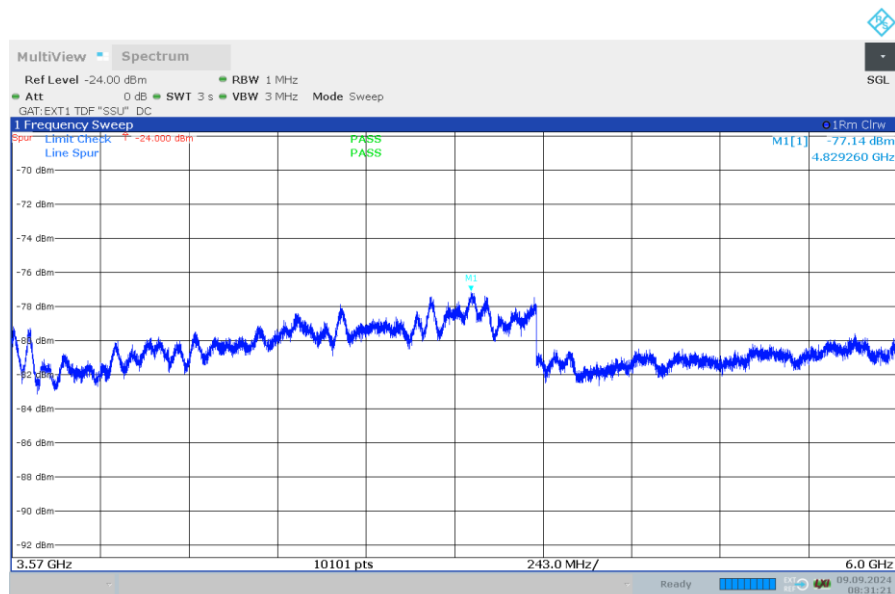
14:36:13 06.09.2024

Spurious Emissions (Upper Band Edge 3570-4030MHz) – QPSK (3544.995MHz) (10MHz Channel BW)



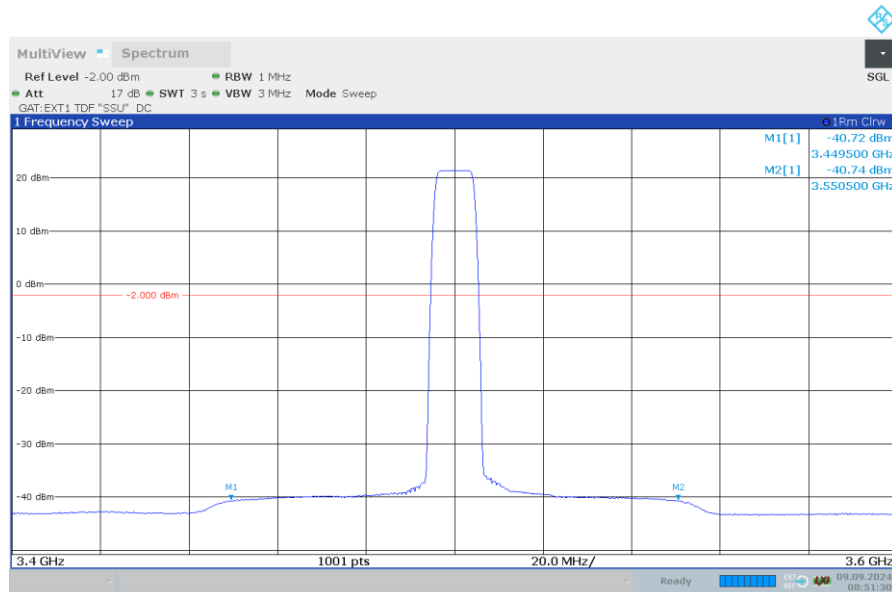
07:11:52 09.09.2024

Spurious Emissions (9kHz – 3430MHz) - QPSK (3500.01MHz) (10MHz Channel BW)



08:31:21 09.09.2024

Spurious Emissions (3570MHz – 6000MHz) - QPSK (3500.01MHz) (10MHz Channel BW)



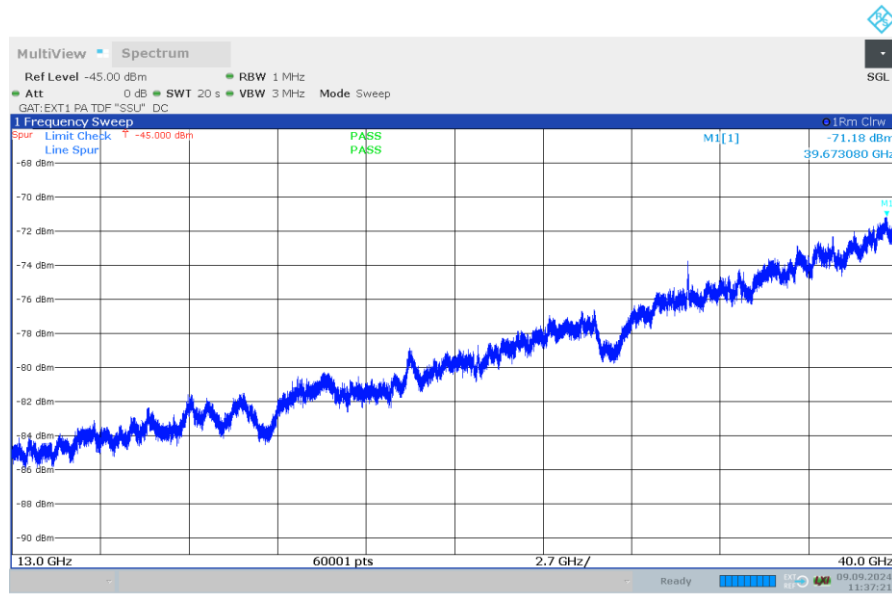
08:51:31 09.09.2024

Spurious Emissions (3400MHz – 3600MHz) - QPSK (3500.01MHz) (10MHz Channel BW)



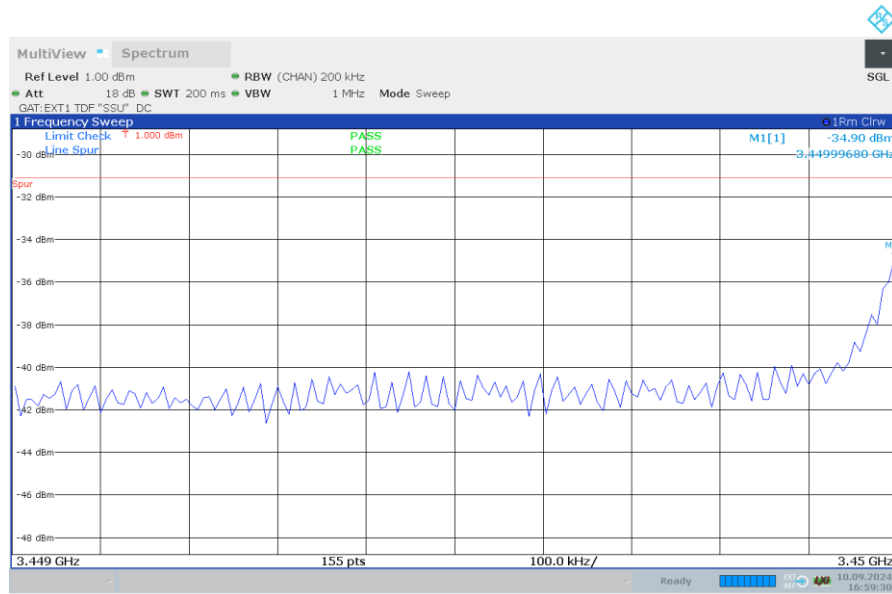
11:34:51 09.09.2024

Spurious Emissions (6GHz – 13GHz) - QPSK (3500.01MHz) (10MHz Channel BW)



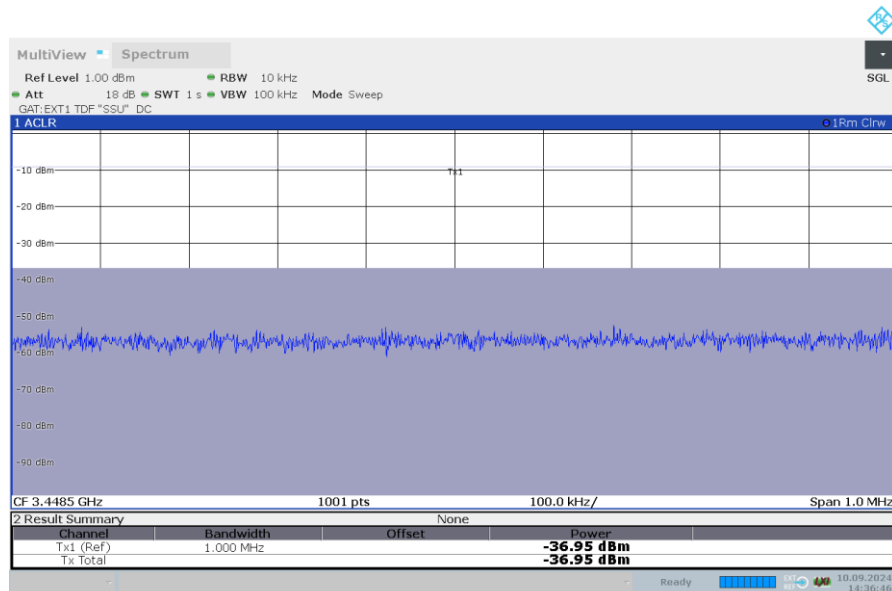
Spurious Emissions (13GHz – 40GHz) - QPSK (3500.01MHz) (10MHz Channel BW)

## Config B TX port 57:



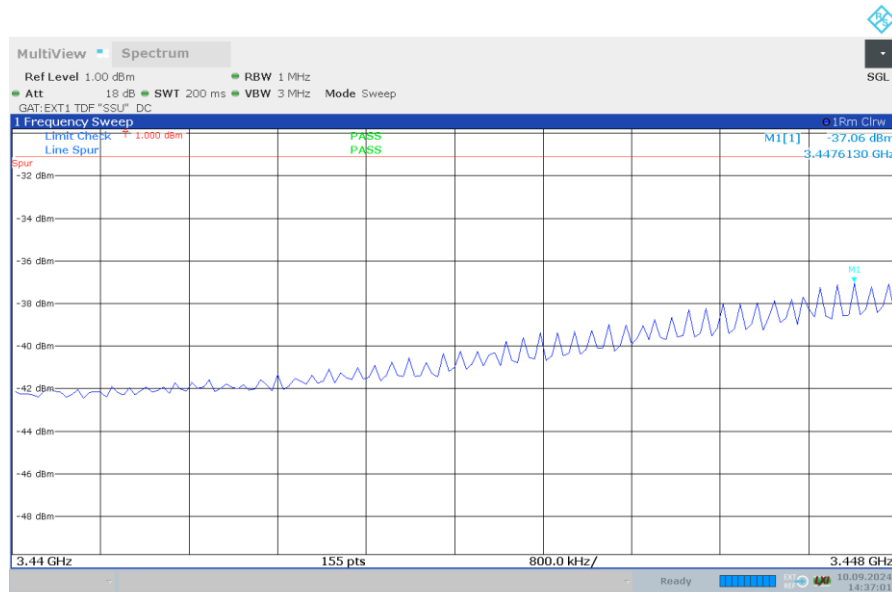
16:59:31 10.09.2024

Spurious Emissions (Lower Band Edge 3449-3450MHz) – QPSK (3455.01 / 3465.00 / 3960.00 MHz) (Multicarrier Multiband TC1: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



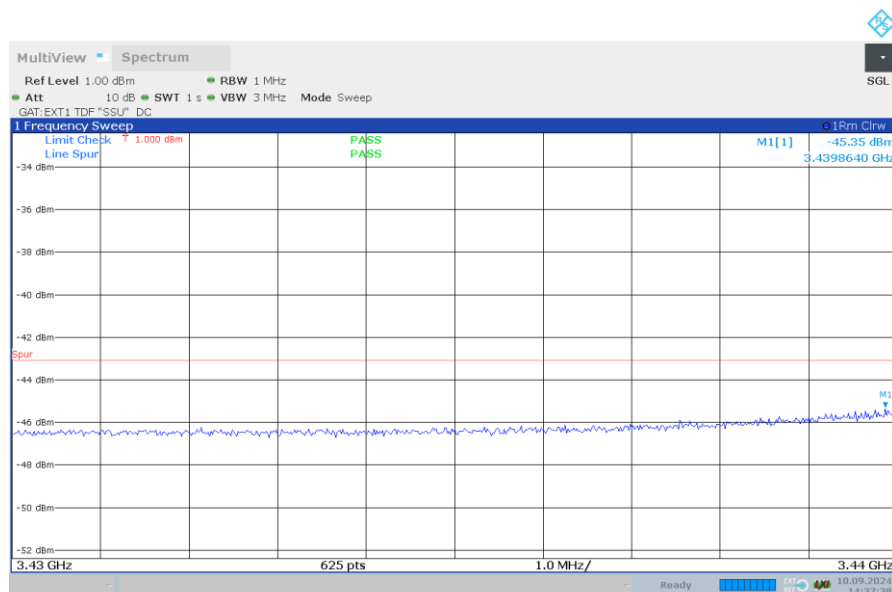
14:36:47 10.09.2024

Spurious Emissions (Lower Band Edge 3448-3449MHz) – QPSK (3455.01 / 3465.00 / 3960.00 MHz) (Multicarrier Multiband TC1: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



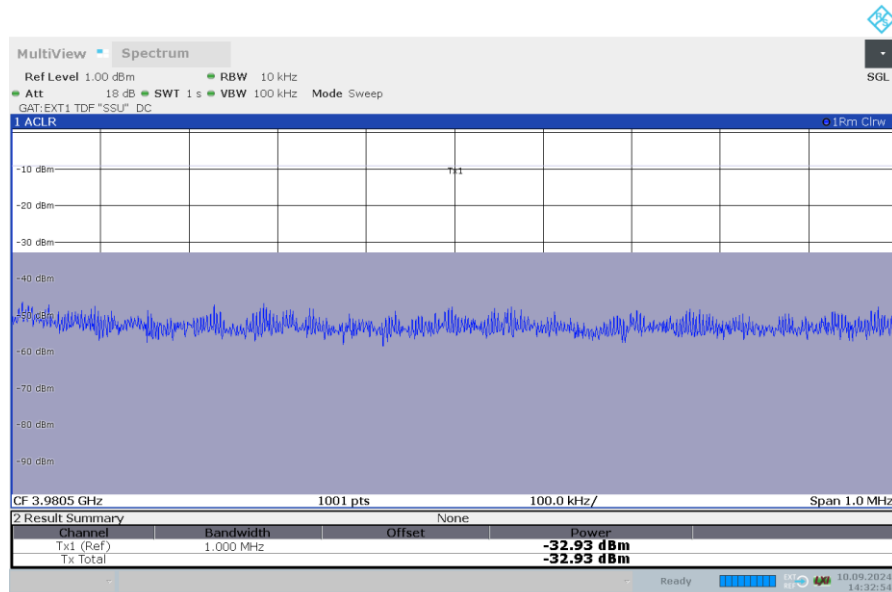
14:37:02 10.09.2024

Spurious Emissions (Lower Band Edge 3440-3448MHz) – QPSK (3455.01 / 3465.00 / 3960.00 MHz) (Multicarrier Multiband TC1: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



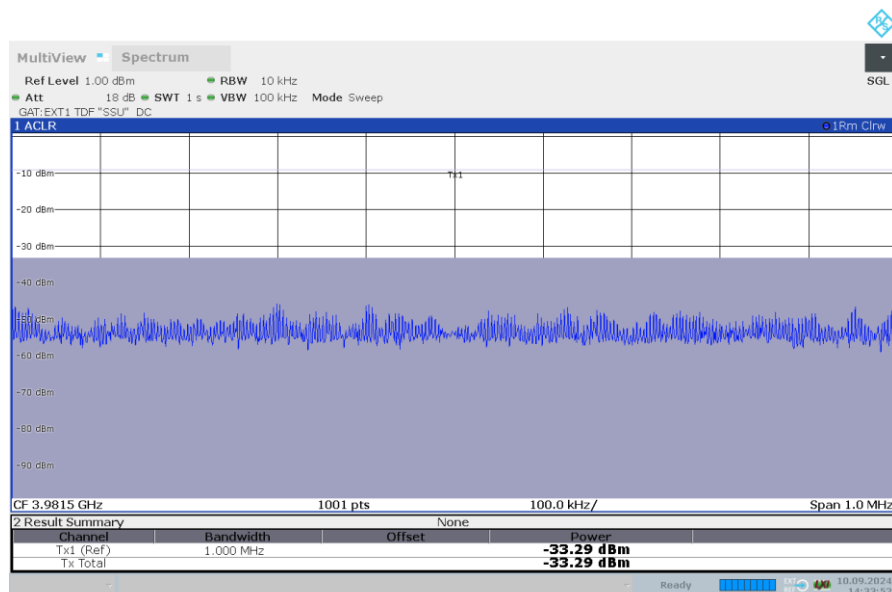
14:37:38 10.09.2024

Spurious Emissions (Lower Band Edge 3430-3440MHz) – QPSK (3455.01 / 3465.00 / 3960.00 MHz) (Multicarrier Multiband TC1: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



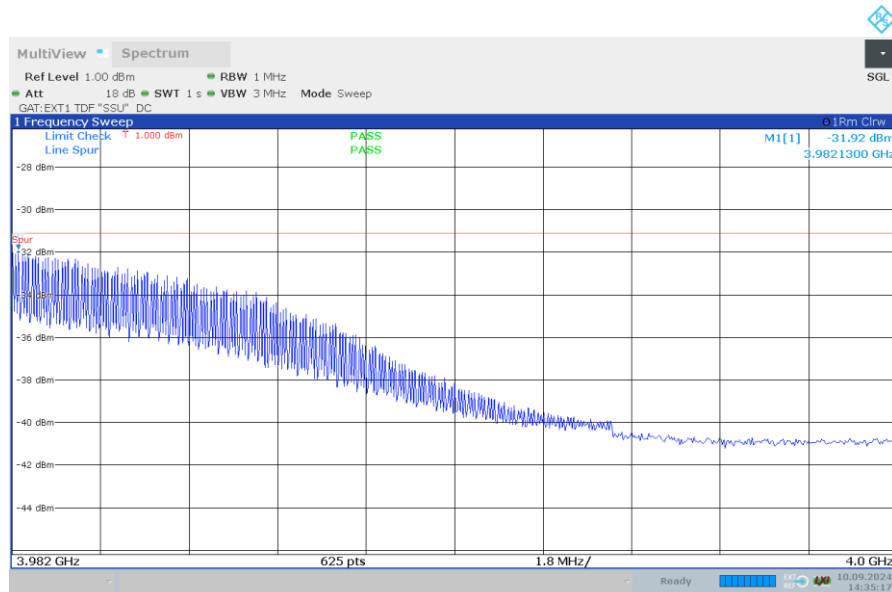
14:32:55 10.09.2024

Spurious Emissions (Upper Band Edge 3980-3981MHz) – QPSK (3455.01 / 3465.00 / 3960.00 MHz) (Multicarrier Multiband TC1: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



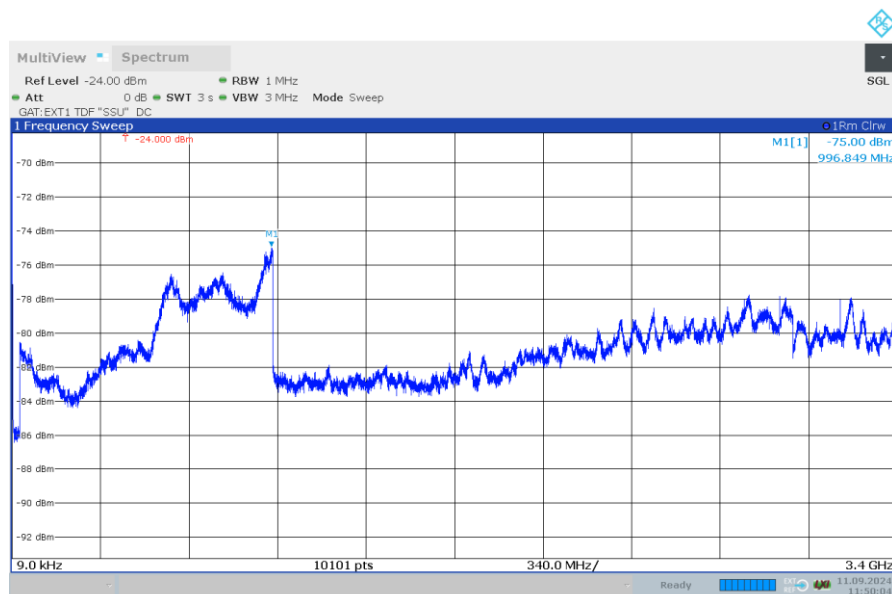
14:33:52 10.09.2024

Spurious Emissions (Upper Band Edge 3981-3982MHz) – QPSK (3455.01 / 3465.00 / 3960.00 MHz) (Multicarrier Multiband TC1: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



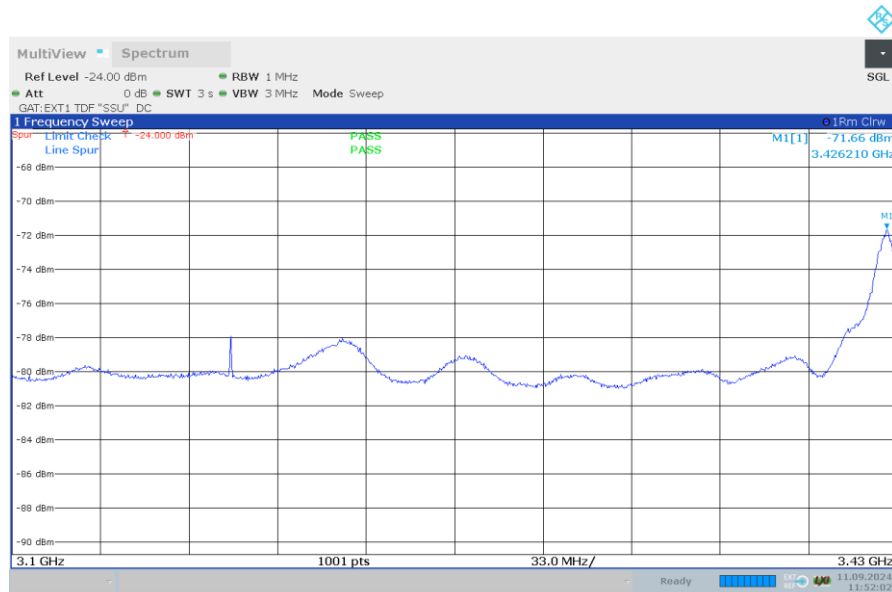
14:35:17 10.09.2024

Spurious Emissions (Upper Band Edge 3982-4000MHz) – QPSK (3455.01 / 3465.00 / 3960.00 MHz) (Multicarrier Multiband TC1: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)

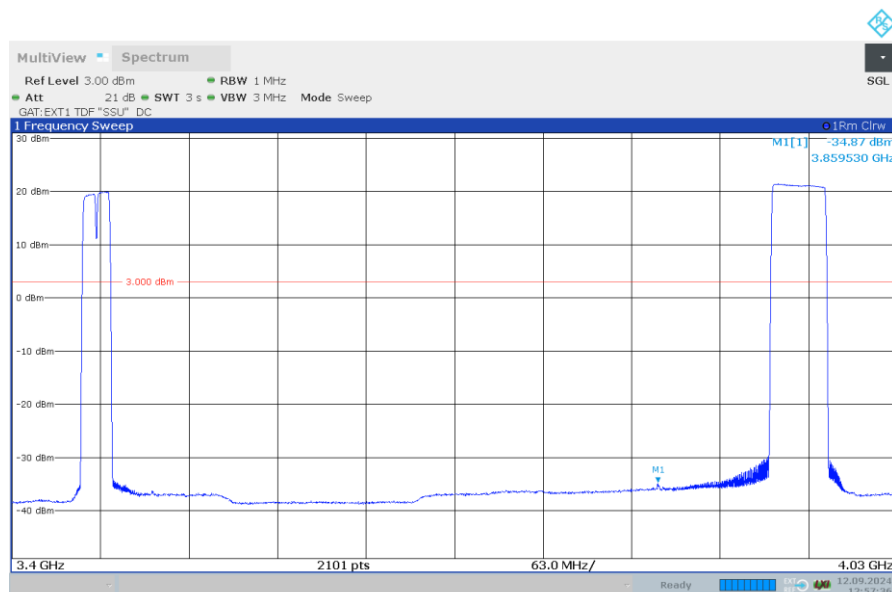


11:50:05 11.09.2024

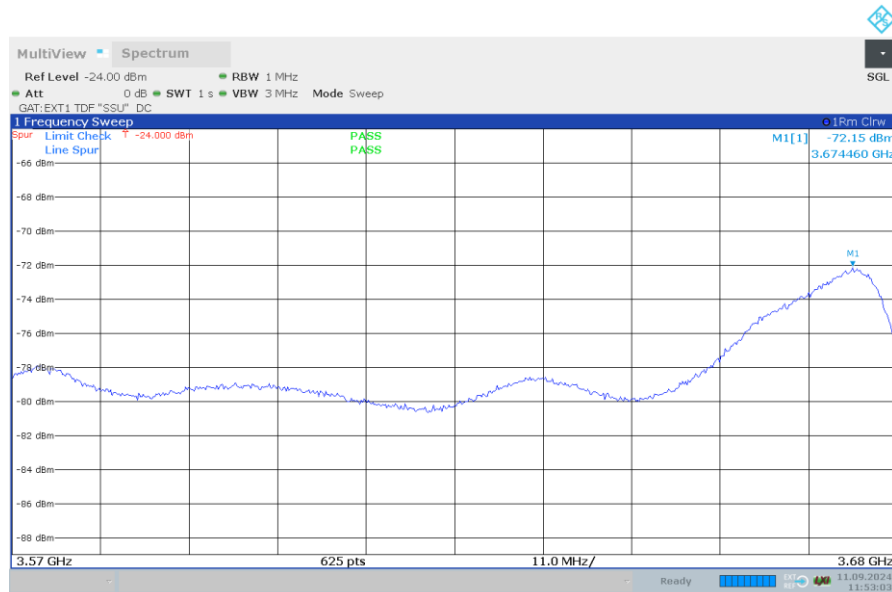
Spurious Emissions (9kHz – 3400MHz) - QPSK (3455.01 / 3465.00 / 3960.00 MHz) (Multicarrier Multiband TC1: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



Spurious Emissions (3100MHz – 3430MHz) - QPSK (3455.01 / 3465.00 / 3960.00 MHz)  
(Multicarrier Multiband TC1: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)

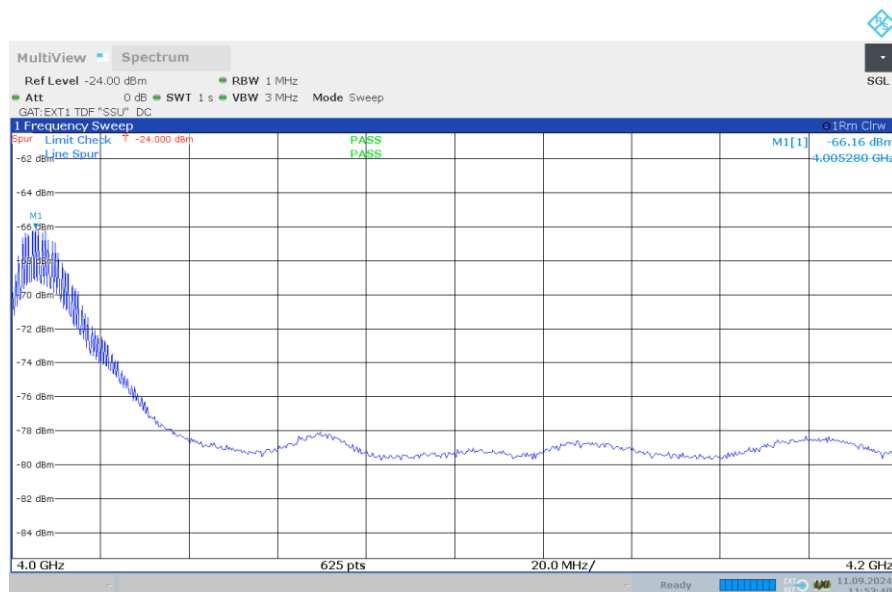


Spurious Emissions (3400MHz – 4030MHz) - QPSK (3455.01 / 3465.00 / 3960.00 MHz)  
(Multicarrier Multiband TC1: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



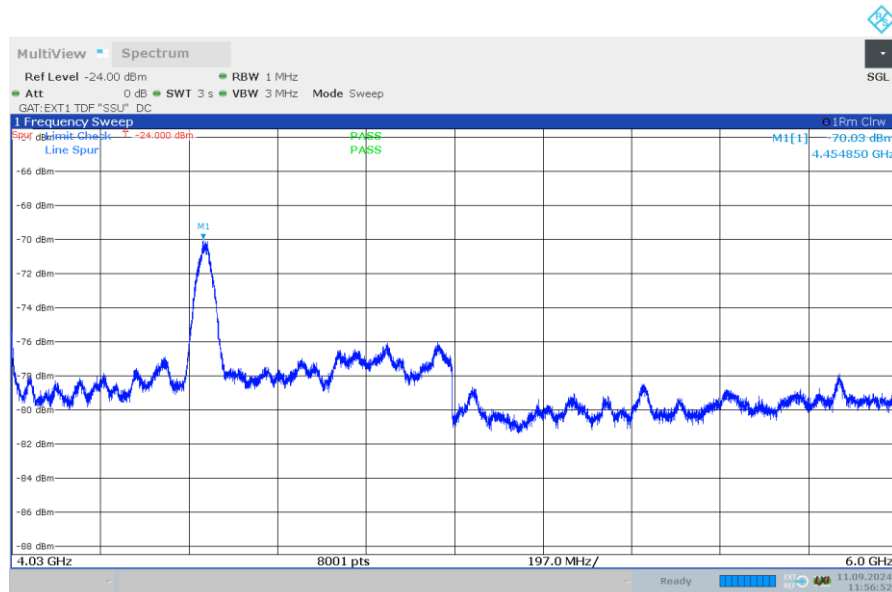
11:53:03 11.09.2024

Spurious Emissions (3570MHz – 3680MHz) - QPSK (3455.01 / 3465.00 / 3960.00 MHz)  
(Multicarrier Multiband TC1: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



11:53:40 11.09.2024

Spurious Emissions (4000MHz – 4200MHz) - QPSK (3455.01 / 3465.00 / 3960.00 MHz)  
(Multicarrier Multiband TC1: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



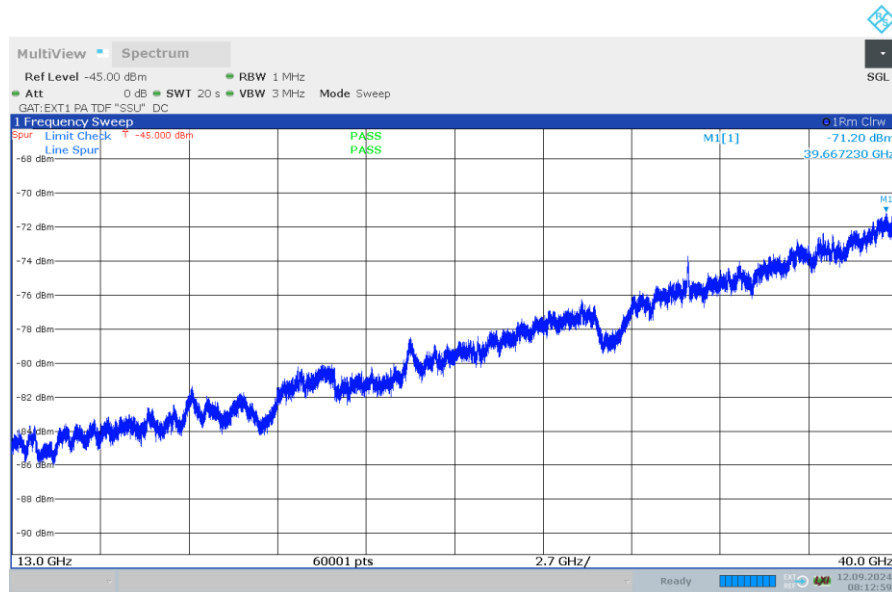
11:56:53 11.09.2024

Spurious Emissions (4030MHz – 6000MHz) - QPSK (3455.01 / 3465.00 / 3960.00 MHz)  
(Multicarrier Multiband TC1: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



08:11:06 12.09.2024

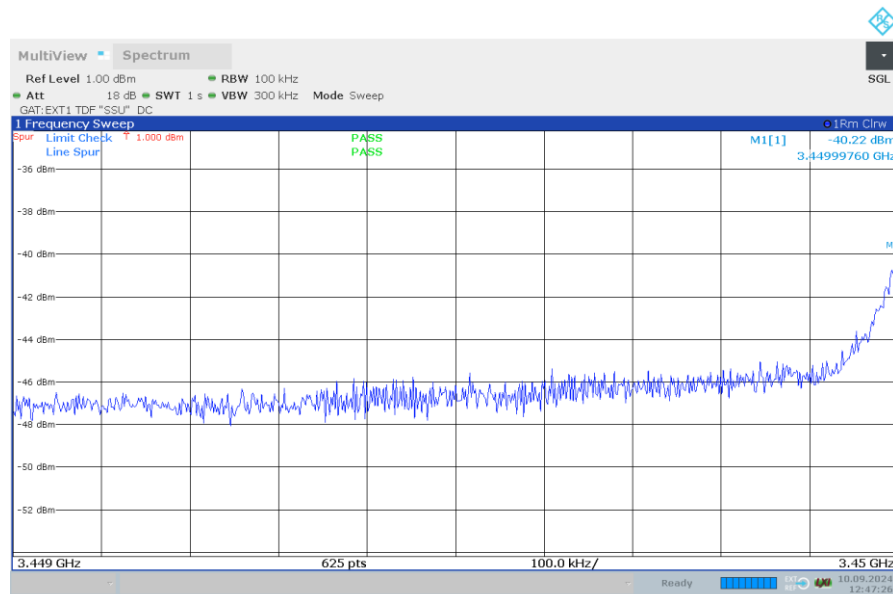
Spurious Emissions (6GHz – 13GHz) - QPSK (3455.01 / 3465.00 / 3960.00 MHz)  
(Multicarrier Multiband TC1: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



08:12:59 12.09.2024

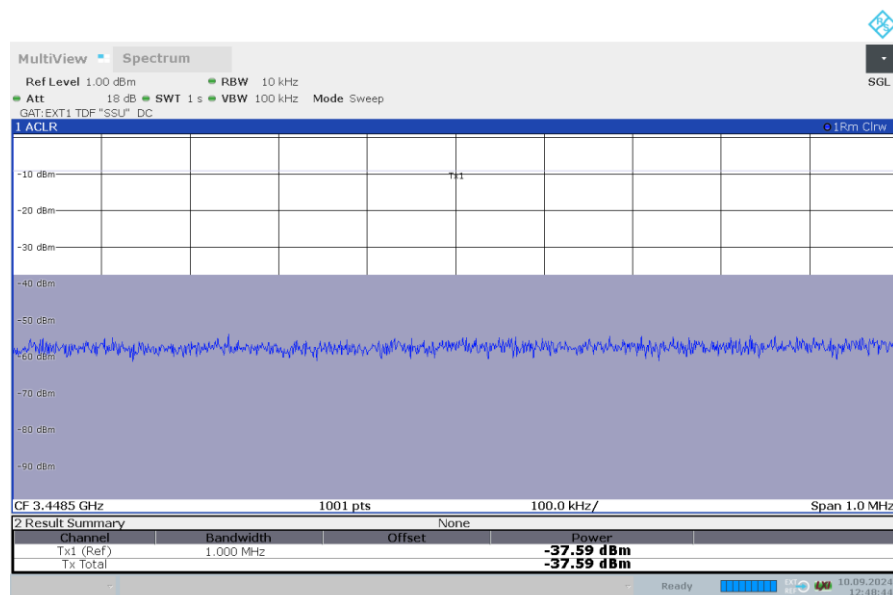
Spurious Emissions (13GHz – 40GHz) - QPSK (3455.01 / 3465.00 / 3960.00 MHz)  
 (Multicarrier Multiband TC1: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)

## Config D TX port 57:



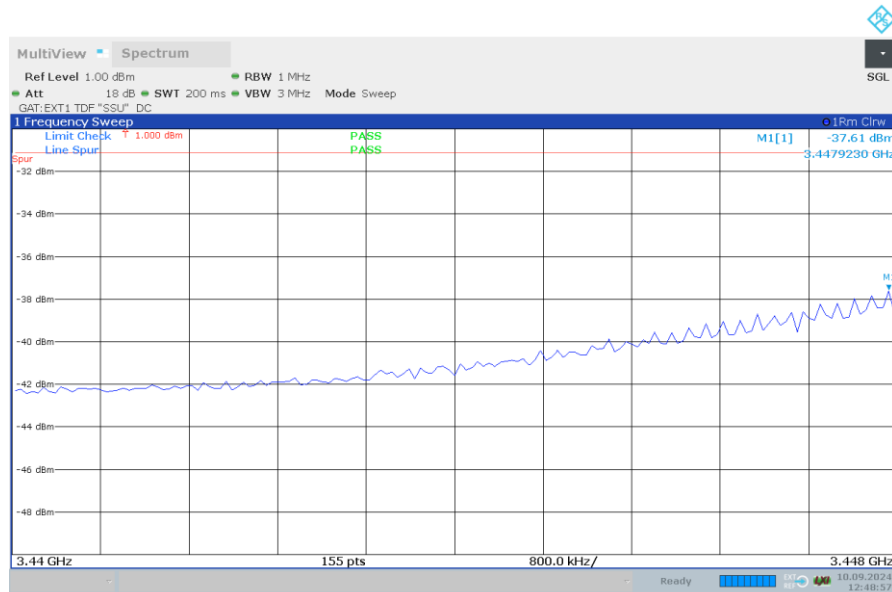
12:47:27 10.09.2024

Spurious Emissions (Lower Band Edge 3449-3450MHz) – QPSK (3455.01 / 3544.995 / 3720.00 MHz) (Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



12:48:45 10.09.2024

Spurious Emissions (Lower Band Edge 3448-3449MHz) – QPSK (3455.01 / 3544.995 / 3720.00 MHz) (Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



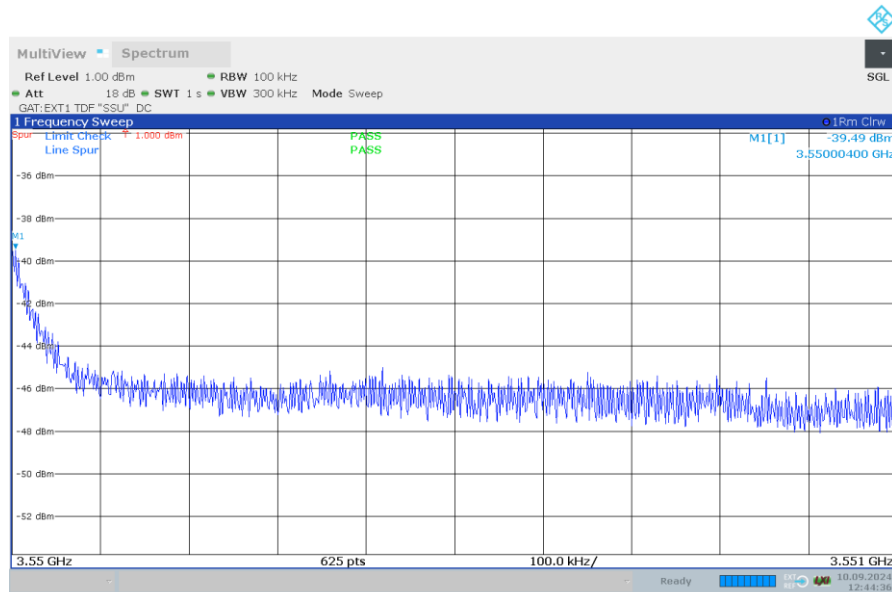
12:48:57 10.09.2024

Spurious Emissions (Lower Band Edge 3440-3448MHz) – QPSK (3455.01 / 3544.995 / 3720.00 MHz) (Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



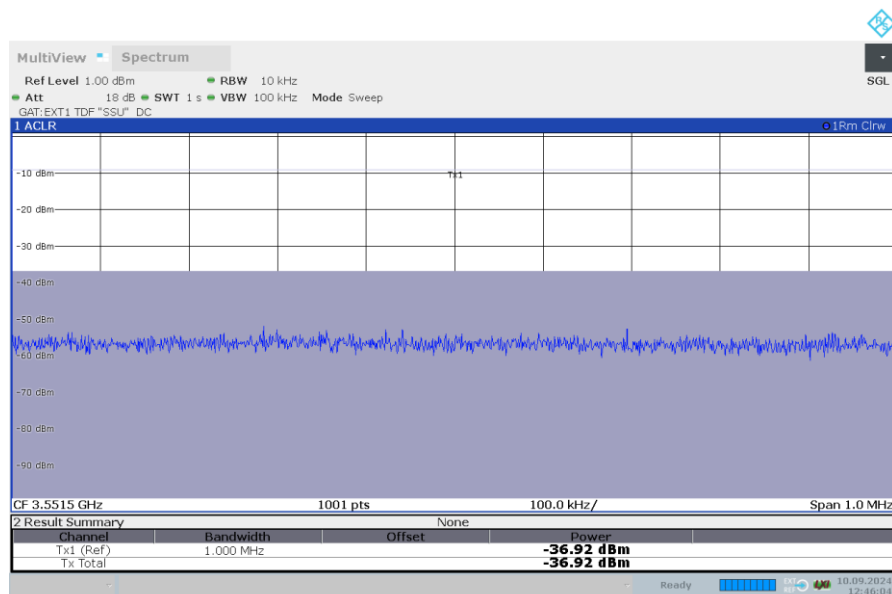
12:49:42 10.09.2024

Spurious Emissions (Lower Band Edge 3430-3440MHz) – QPSK (3455.01 / 3544.995 / 3720.00 MHz) (Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



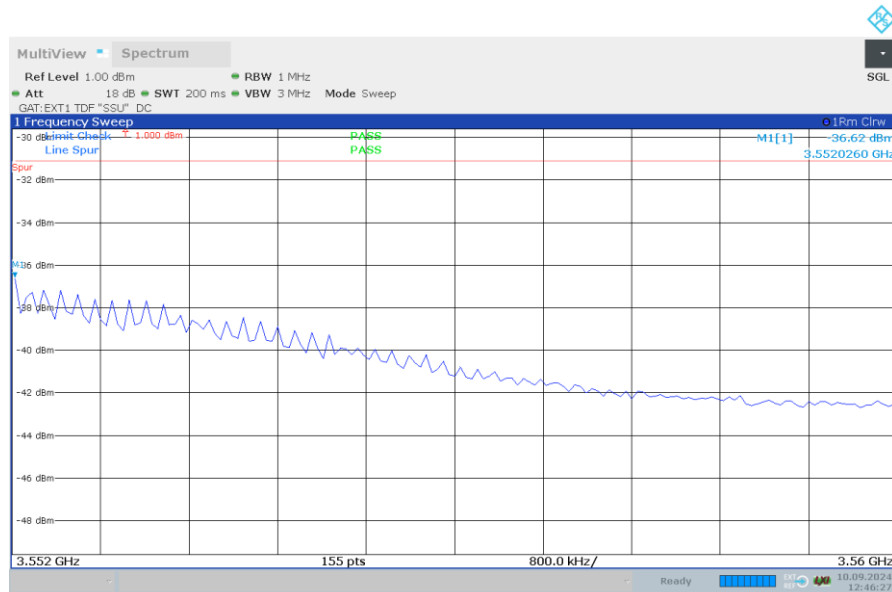
12:44:36 10.09.2024

Spurious Emissions (Upper Band Edge 3550-3551MHz) – QPSK (3455.01 / 3544.995 / 3720.00 MHz) (Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



12:46:05 10.09.2024

Spurious Emissions (Upper Band Edge 3551-3552MHz) – QPSK (3455.01 / 3544.995 / 3720.00 MHz) (Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



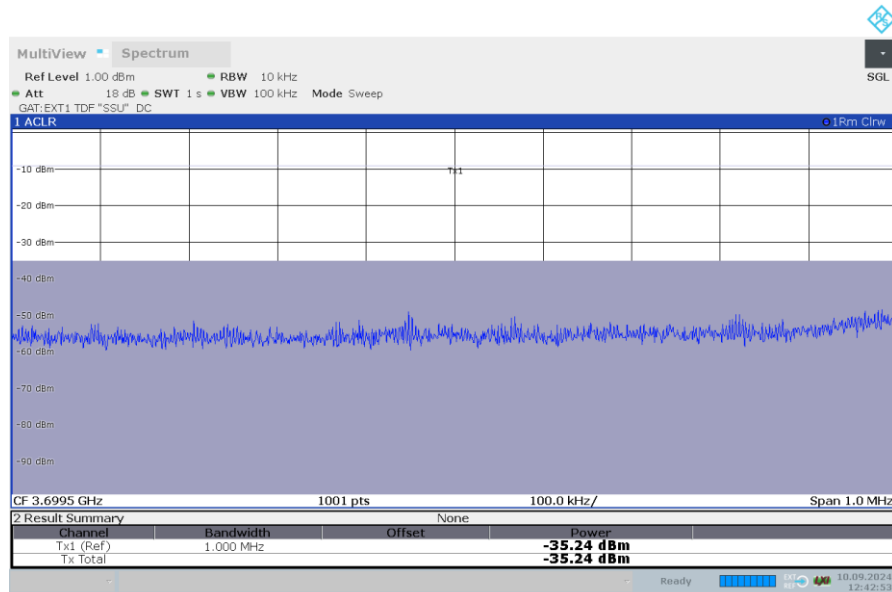
12:46:27 10.09.2024

Spurious Emissions (Upper Band Edge 3552-3560MHz) – QPSK (3455.01 / 3544.995 / 3720.00 MHz) (Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



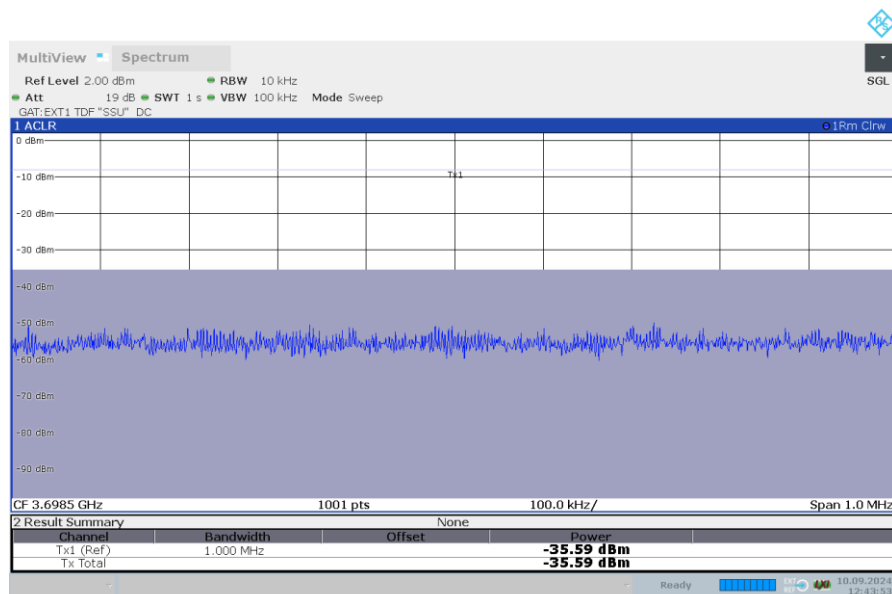
12:47:10 10.09.2024

Spurious Emissions (Upper Band Edge 3560-3570MHz) – QPSK (3455.01 / 3544.995 / 3720.00 MHz) (Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



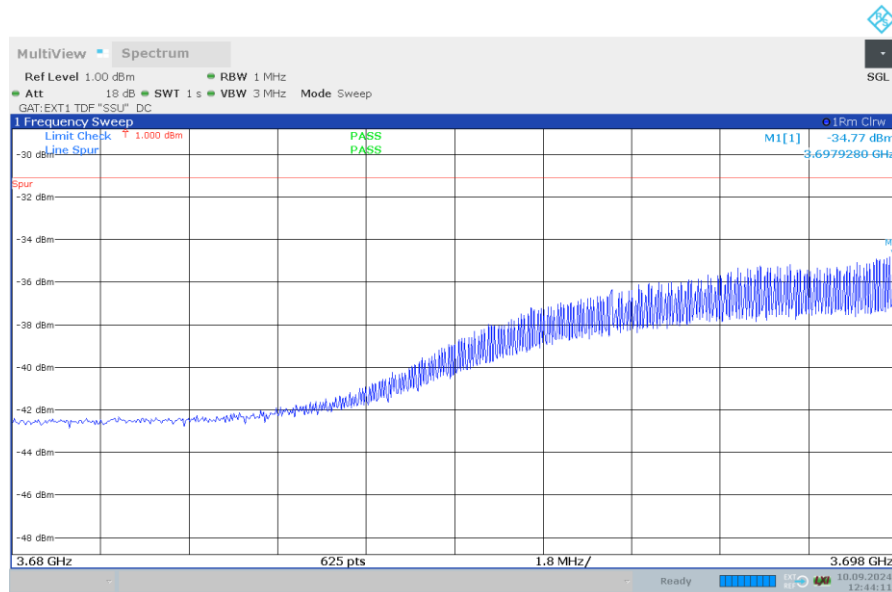
12:42:53 10.09.2024

Spurious Emissions (Lower Band Edge 3699-3700MHz) – QPSK (3455.01 / 3544.995 / 3720.00 MHz) (Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



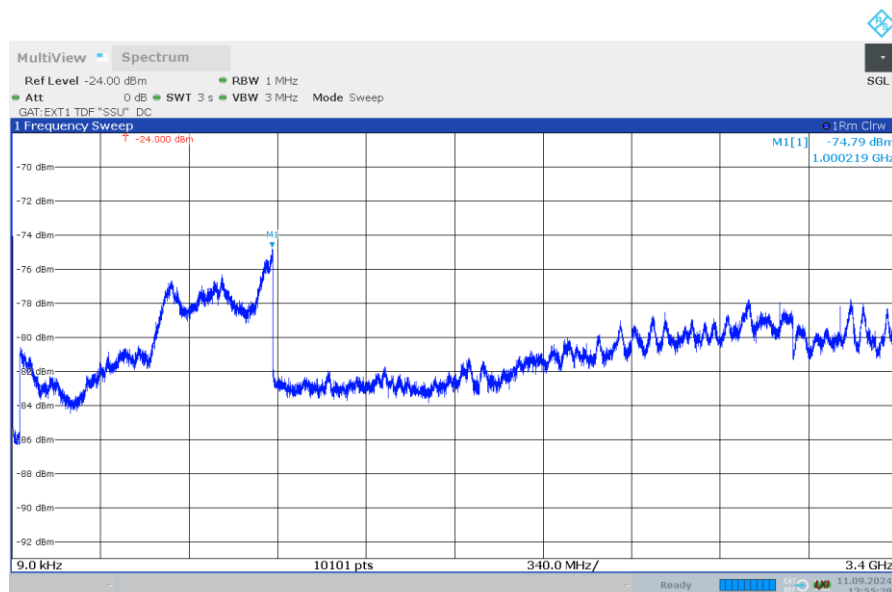
12:43:54 10.09.2024

Spurious Emissions (Lower Band Edge 3698-3699MHz) – QPSK (3455.01 / 3544.995 / 3720.00 MHz) (Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



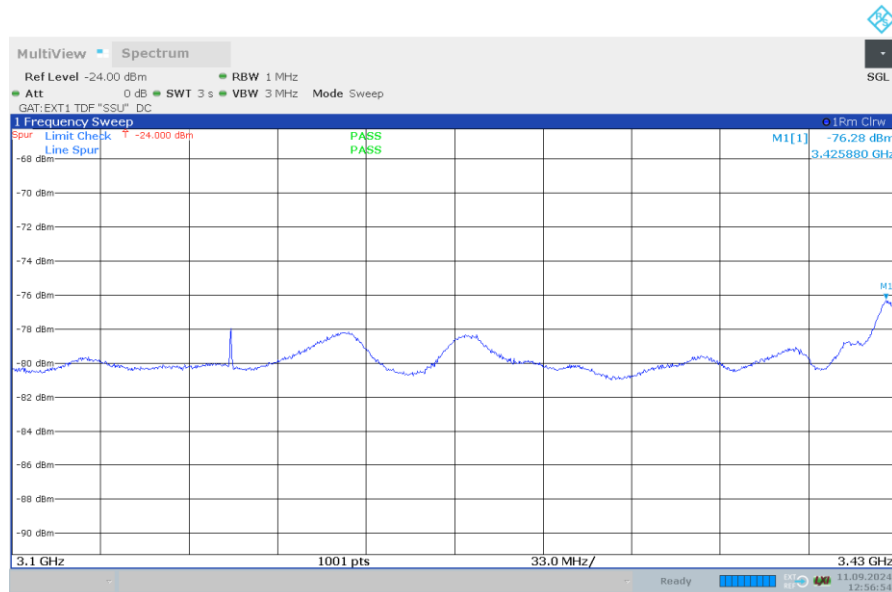
12:44:11 10.09.2024

Spurious Emissions (Lower Band Edge 3680-3698MHz) – QPSK (3455.01 / 3544.995 / 3720.00 MHz) (Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



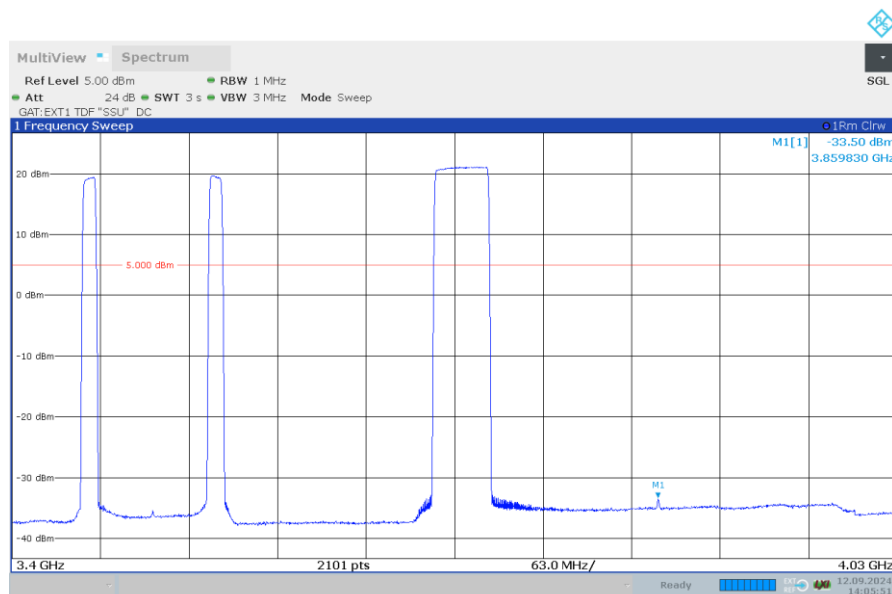
12:55:30 11.09.2024

Spurious Emissions (9kHz – 3400MHz) - QPSK (3455.01 / 3544.995 / 3720.00 MHz) (Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



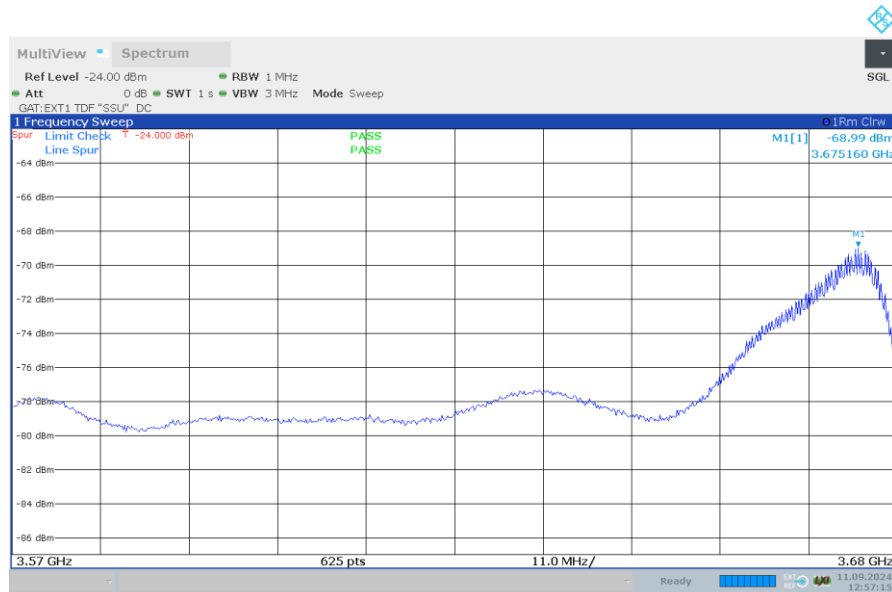
12:56:54 11.09.2024

Spurious Emissions (3100MHz – 3430MHz) - QPSK (3455.01 / 3544.995 / 3720.00 MHz)  
(Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



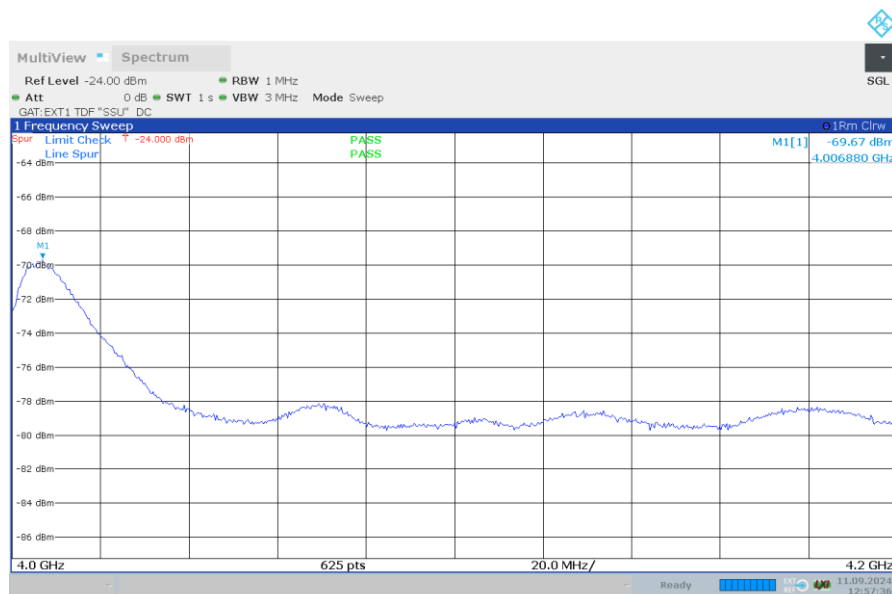
14:05:52 12.09.2024

Spurious Emissions (3400MHz – 4030MHz) - QPSK (3455.01 / 3544.995 / 3720.00 MHz)  
(Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



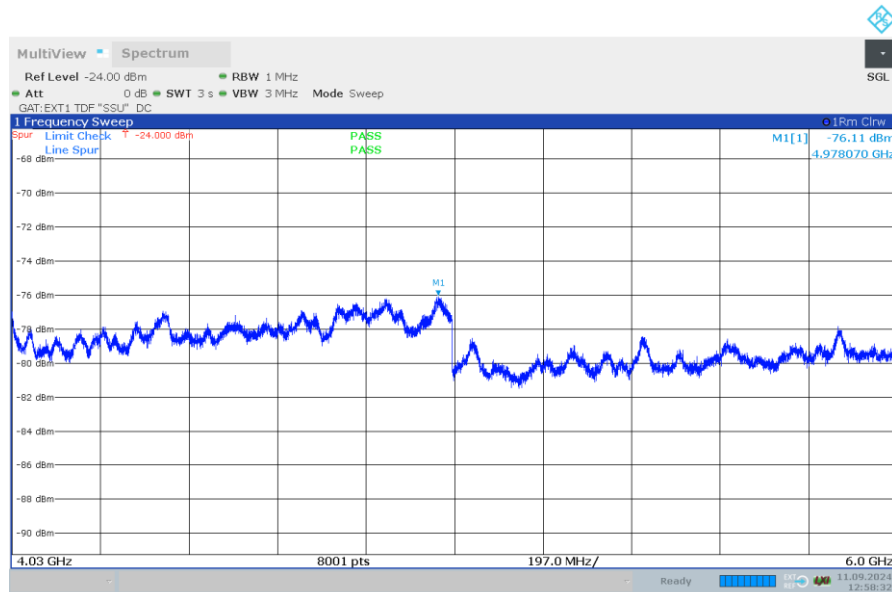
12:57:16 11.09.2024

Spurious Emissions (3570MHz – 3680MHz) - QPSK (3455.01 / 3544.995 / 3720.00 MHz)  
(Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



12:57:37 11.09.2024

Spurious Emissions (4000MHz – 4200MHz) - QPSK (3455.01 / 3544.995 / 3720.00 MHz)  
(Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



12:58:33 11.09.2024

Spurious Emissions (4030MHz – 6000MHz) - QPSK (3455.01 / 3544.995 / 3720.00 MHz)  
(Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



07:33:23 12.09.2024

Spurious Emissions (6GHz – 13GHz) - QPSK (3455.01 / 3544.995 / 3720.00 MHz)  
(Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)



07:35:25 12.09.2024

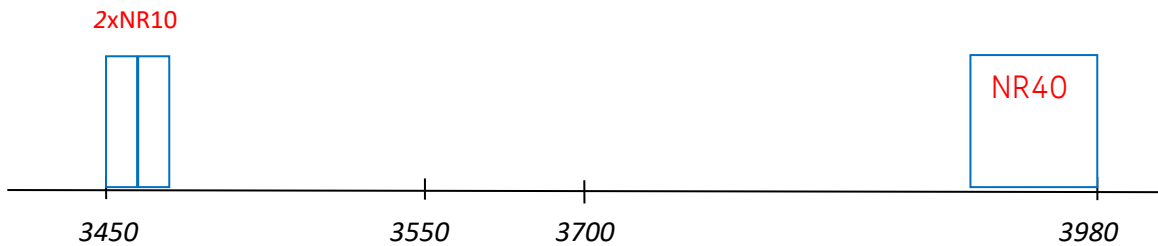
Spurious Emissions (13GHz – 40GHz) - QPSK (3455.01 / 3544.995 / 3720.00 MHz)  
(Multicarrier Multiband TC3: 3.45G Band 2xNR 10MHz + 3.7G Band 1xNR 40MHz Channel BW)

## Appendix A: AQQQA Multicarrier Multiband configurations

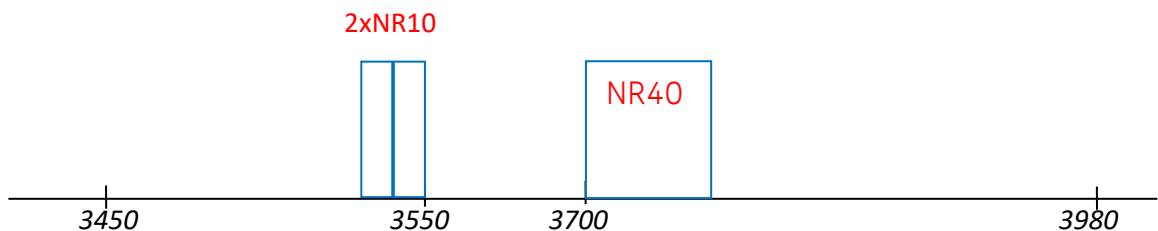
The TRX output power is enabled at maximum available carrier power for all multicarrier on 3.45G Band testing. The QPSK modulation type is used for all carriers.

Multicarrier multiband operations test cases have been developed as shown below (3.45G Band 2cc + 3.7G Band 1cc, any channel bandwidth combination):

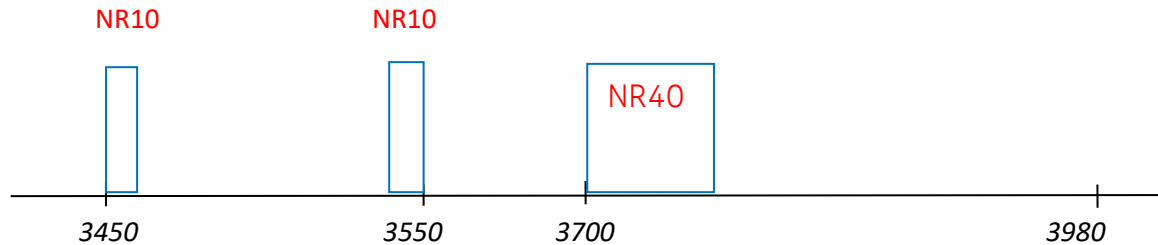
**Multicarrier Multiband Test Case 1 (Config B):** In 3.45G Band - Two contiguous NR10 carriers with minimum spacing between carrier frequencies at the lower band edge (3455.01 & 3465.00MHz). In 3.7G Band - One NR40 carrier at maximum carrier power (and Band power) at the upper band edge (3960.00MHz). The smallest channel bandwidth in 3.45G band is selected to maximize carrier power spectral density. The carriers are operated at maximum power (0.78W/NR10 carrier) and (5W/NR40 carrier) with a radio power of 420 watts.



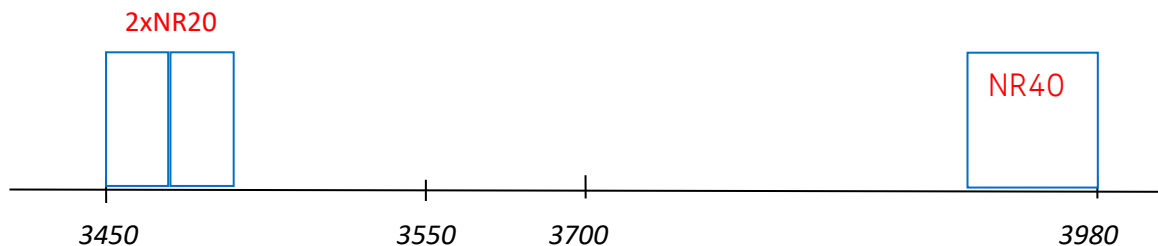
**Multicarrier Multiband Test Case 2 (Config C):** In 3.45G Band - Two contiguous NR10 carriers with minimum spacing between carrier frequencies at the upper band edge (3544.995 & 3534.99MHz). In 3.7G Band - One NR40 carrier at maximum carrier power (and Band power) at the lower band edge (3720.00MHz). The smallest channel bandwidth in 3.45G band is selected to maximize carrier power spectral density. The carriers are operated at maximum power (0.78W/NR10 carrier) and (5W/NR40 carrier) with a radio power of 420 watts.



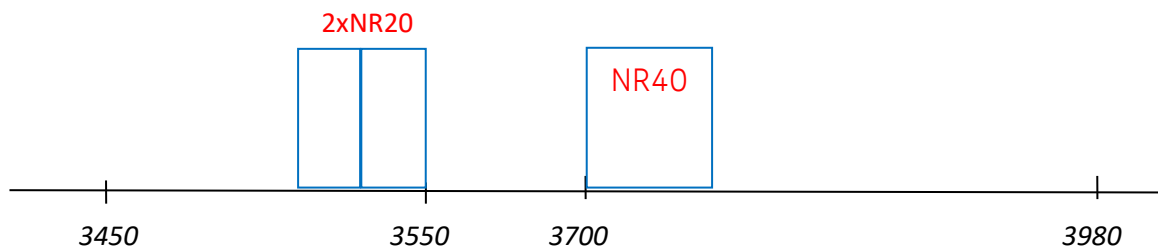
**Multicarrier Multiband Test Case 3 (Config D):** In 3.45G Band - Two non-contiguous NR10 carriers with maximum spacing between carrier frequencies at the lower/upper band edge (3455.01 & 3544.995MHz). In 3.7G Band - One NR40 carrier at maximum carrier power (and Band power) at the lower band edge (3720.00MHz). The smallest channel bandwidth in 3.45G band is selected to maximize carrier power spectral density. The carriers are operated at maximum power (0.78W/NR10 carrier) and (5W/NR40 carrier) with a radio power of 420 watts.



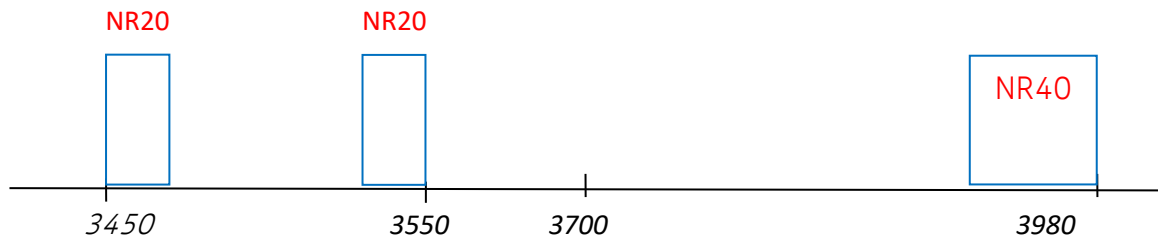
**Multicarrier Multiband Test Case 4 (Config E):** In 3.45G Band - Two contiguous NR20 carriers with minimum spacing between carrier frequencies at the lower band edge (3460.02 & 3480.00MHz). In 3.7G Band - One NR40 carrier at the upper band edge (3960.00MHz). The 20MHz channel bandwidth in 3.45G Band is selected to maximize port and band power. The carriers are operated at maximum power (1.56W/NR20 carrier) and (4.375W/NR40 carrier) with a maximum radio power of 480 watts.



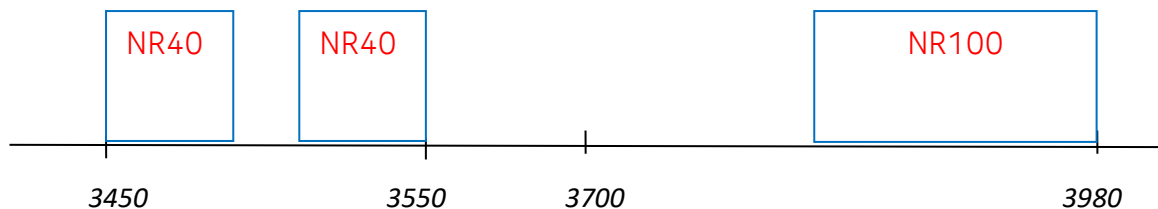
**Multicarrier Multiband Test Case 5 (Config F):** In 3.45G Band - Two contiguous NR20 carriers with minimum spacing between carrier frequencies at the upper band edge (3540.00 & 3519.99MHz). In 3.7G Band - One NR40 carrier at the lower band edge (3720.00MHz). The 20MHz channel bandwidth in 3.45G Band is selected to maximize port and band power. The carriers are operated at maximum power (1.56W/NR20 carrier) and (4.375W/NR40 carrier) with a maximum radio power of 480 watts.



**Multicarrier Multiband Test Case 6 (Config G):** In 3.45G Band - Two non-contiguous NR20 carriers with maximum spacing between carrier frequencies at the lower/upper band edge (3460.02 & 3540.00MHz). In 3.7G Band - One NR40 carrier at the upper band edge (3960.00MHz). The 20MHz channel bandwidth in 3.45G Band is selected to maximize port and band power. The carriers are operated at maximum power (1.56W/NR20 carrier) and (4.375W/NR40 carrier) with a maximum radio power of 480 watts.



**Multicarrier Multiband Test Case 7 (Config H):** In 3.45G Band - Two non-contiguous NR40 carriers with maximum spacing between carrier frequencies at the lower/upper band edge (3470.01 & 3529.98MHz). In 3.7G Band - One NR100 carrier at the upper band edge (3930.00MHz). The 40MHz channel bandwidth in 3.45G Band and 100MHz channel bandwidth in 3.7G Band are selected to maximize OBW, iBW, port and band power. The carriers are operated at maximum power (1.56W/NR40 carrier) and (4.375W/NR100 carrier) with a maximum radio power of 480 watts.



# Appendix B: AQQQA 3.45G EIRP calculations

## 5G NR EIRP Calculations for Sixty-Four Port MIMO Operations

EIRP calculations are needed at each transmitter location to optimize base station operational performance while meeting regulatory requirements. Each cell site installation needs to consider the power measurements in the radio certification report as well as site specific regulatory requirements (such as antenna height, population density, etc.), site installation parameters (line loss between antenna and radio, antenna parameters, etc.) and base station operational parameters (MIMO operational setup, carrier power level, channel bandwidth, modulation type, etc.) to optimize performance. Transmitter output power may be reduced (from maximum) by base station setup parameters.

The AQQQA antenna assembly has an array of 4 rows and 8 columns of ( $\pm 45^\circ$ ) cross-polarized (orthogonal) radiators. This antenna assembly has a maximum beamforming gain of 25.5 dBi. The sixty-four AQQQA transmitter outputs are connected to the antenna array (thirty-two are connected to  $+45^\circ$  radiators/antennas and thirty-two are connected to  $-45^\circ$  radiators/antennas).

Equivalent Isotropically Radiated Power (EIRP) is calculated (as specified in ANSI C63.26-2015 section 6.4 for a correlated output signals) from the results of power measurements (highest measured PSD for each channel bandwidth type). The maximum antenna assembly beamforming gain was used for this calculation. Calculations of worst-case EIRP for sixty-four port MIMO are as follows:

| Parameter                                                   | NR<br>10 MHz<br>Ch BW |
|-------------------------------------------------------------|-----------------------|
| Worst Case PSD/Antenna Port                                 | 22.4 dBm/MHz          |
| Cable Loss                                                  | 0 dB                  |
| Number of Ant Ports per Polarization                        | 32                    |
| Total PSD per Polarization<br>$10\log 32 = + 15.1\text{dB}$ | 37.5 dBm/MHz          |
| Maximum Antenna Beamforming Gain per Polarization           | 25.5 dBi              |
| EIRP per Polarization                                       | 63.0 dBm/MHz          |
| Number of Polarizations                                     | 2                     |
| EIRP Total =<br>$+45^\circ$ and $-45^\circ$<br>(See Note 1) | 63.0 dBm/MHz          |
| Passing FCC EIRP Limit                                      | 65.16 dBm/MHz         |

Note 1: The EIRP per antenna polarization is required to be below the regulatory limit as described in ANSI C63.26-2015 section 6.4.6.3 b)2) and KDB 662911 D02v01 page 3 example (2) since the two transmitter outputs to each antenna are 90 degree-phase shifted relative to each other (cross-polarized radiators).

## EIRP Calculation Summary for the 3.45G band

(1) The worst case AQQQA sixty-four port MIMO EIRP levels for 5G NR channel bandwidth 10MHz are less than the 3280W/MHz (65.16 dBm/MHz) FCC regulatory limit.

(2) The worst case AQQQA sixty-four port MIMO EIRP levels for 5G NR channel bandwidth 10MHz exceed the 1640W/MHz (62.15 dBm/MHz) FCC regulatory limit by 0.85 dB (63.0 dBm/MHz – 62.15 dBm/MHz). The AQQQA 5G NR 10MHz channel bandwidth carrier power level using sixty-four port MIMO operation need to be reduced to meet 1640 W/MHz (62.15 dBm/MHz) FCC regulatory limit.

# Appendix C: AQQQA 3.45G Emission Designators

| FCC 5G Emission Designators for 3.45G Band (3450MHz to 3550MHz)      |               |             |              |              |               |
|----------------------------------------------------------------------|---------------|-------------|--------------|--------------|---------------|
| Ch BW                                                                | Radio Channel | 5G-NR: QPSK | 5G-NR: 16QAM | 5G-NR: 64QAM | 5G-NR: 256QAM |
| 10MHz                                                                | Low           | 9M74G7W     | 9M60G7W      | 9M67G7W      | 9M68G7W       |
|                                                                      | Mid           | 9M69G7W     | 9M58G7W      | 9M68G7W      | 9M67G7W       |
|                                                                      | High          | 9M68G7W     | 9M56G7W      | 9M71G7W      | 9M67G7W       |
| Note: FCC emission designators are based on 26dB emission bandwidth. |               |             |              |              |               |