



FCC RADIO TEST REPORT

FCC ID : PU5-TP00139AM
Equipment : Notebook Computer
Brand Name : Lenovo
Model Name : TP00139A
Applicant : Wistron Corporation
21F, No. 88, Sec. 1, Hsin Tai Wu Rd., Hsichih Dist,
New Taipei City 221, Taiwan
Manufacturer : Lenovo PC HK Limited.
23/F, Lincoln House, Taikoo Place, 979 King's Road,
Quarry Bay, Hong Kong, P.R. China
Standard : FCC 47 CFR Part 2, and 30

Equipment: Foxconn T99W175 tested inside of Lenovo Notebook Computer.

The product was received on Dec. 16, 2021 and testing was started from Jan. 15, 2022 and completed on Feb. 22, 2022. We, Sporton International Inc. Wensan Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures ANSI C63.26-2015 and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Wensan Laboratory, the test report shall not be reproduced except in full.

Approved by: Louis Wu

Sporton International Inc. Wensan Laboratory



Table of Contents

| | |
|---|-----------|
| History of this test report..... | 3 |
| Summary of Test Result..... | 4 |
| 1 General Description | 5 |
| 1.1 Feature of Equipment Under Test..... | 5 |
| 1.2 Product Specification of Equipment Under Test | 5 |
| 1.3 Modification of EUT | 6 |
| 1.4 Testing Location | 6 |
| 1.5 Applied Standards | 6 |
| 2 Test Configuration of Equipment Under Test | 7 |
| 2.1 Test Mode..... | 7 |
| 2.2 Connection Diagram of Test System | 8 |
| 2.3 Support Unit used in test configuration | 8 |
| 2.4 Measurement Results Explanation Example | 8 |
| 2.5 Far Field Condition for Frequency above 18GHz..... | 9 |
| 2.6 Frequency List of Low/Middle/High Channels..... | 9 |
| 3 Radiated Test Items | 10 |
| 3.1 Measuring Instruments..... | 10 |
| 3.2 Test Setup | 10 |
| 3.3 Test Result of Radiated Test..... | 13 |
| 3.4 EIRP Measurement | 14 |
| 3.5 Occupied Bandwidth | 15 |
| 3.6 Radiated Spurious Emission Measurement..... | 16 |
| 3.7 Frequency Stability Measurement..... | 17 |
| 4 List of Measuring Equipment..... | 18 |
| 5 Uncertainty of Evaluation..... | 20 |
| Appendix A. Test Results of EIRP and Radiated Test | |
| Appendix B. R&S Mixer and Horn Antenna Calibration Reports | |
| Appendix C. Setup Photo | |



History of this test report

| Report No. | Version | Description | Issued Date |
|------------|---------|--|---------------|
| FG1D1645K | 01 | Initial issue of report | Mar. 04, 2022 |
| FG1D1645K | 02 | 1. Remove Band NR band n258a and NR band n258b test result 2. Revise the support bandwidth in section 1.2 and 2.1 | Mar. 31, 2022 |
| FG1D1645K | 03 | 1. Add EUT antenna information in section 2.1 2. Add power plots for 100 MHz and 200 MHz bandwidths | Apr. 11, 2022 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |



Summary of Test Result

| Report Clause | Ref Std. Clause | Test Items | Limit | Result (PASS/FAIL) | Remark |
|---------------|--------------------|---|-------------------------|--------------------|--------|
| 3.4 | §2.1046 §30.202 | EIRP Measurement | +43dBm | Pass | - |
| 3.5 | §2.1049 | Occupied Bandwidth | Not Applicable | Reporting only | - |
| 3.6 | §2.1053 §30.203 | Radiated Spurious Emission | -5dBm/MHz -13dBm/MHz | Pass | - |
| 3.7 | §2.1055 | Frequency Stability for Temperature & Voltage | Within the band | Pass | - |

Declaration of Conformity:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results.
2. The measurement uncertainty please refer to this report "Uncertainty of Evaluation".

Comments and Explanations:

The product specifications of the EUT presented in the report are declared by manufacturer who shall take full responsibility for the authenticity.

Reviewed by: William Chen

Report Producer: Dara Chiu

1 General Description

1.1 Feature of Equipment Under Test

| Product Feature | |
|---------------------------------|--|
| Equipment | Notebook Computer |
| Brand Name | Lenovo |
| Model Name | TP00139A |
| FCC ID | PU5-TP00139AM |
| Sample 1 | EUT with AWAN Antenna |
| Sample 2 | EUT with LUXSHARE-ICT Antenna |
| EUT supports Radios application | WCDMA/HSPA/LTE/5G NR/GNSS WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80/VHT160 WLAN 11ax HE20/HE40/HE80/HE160 Bluetooth BR/EDR/LE |
| EUT Stage | Production Unit |

Remark:

1. The above EUT's information was declared by manufacturer.
2. Equipment: Foxconn T99W175 tested inside of Lenovo Notebook Computer.
3. All the tests were performed with Sample 1

1.2 Product Specification of Equipment Under Test

| Product Specification subjective to this standard | |
|---|--|
| Device Category in Part 30 | Transportable station |
| Tx Frequency | NR band n260: 37GHz ~ 40GHz NR band n261: 27.5GHz ~ 28.35GHz |
| Rx Frequency | NR band n260: 37GHz ~ 40GHz NR band n261: 27.5GHz ~ 28.35GHz |
| Support Bandwidth | NR band n260: 50 MHz, 100 MHz, and 200 MHz NR band n261: 50 MHz, 100 MHz, and 200 MHz |
| Maximum Number of contiguous CC | 2 |
| Maximum Aggregated Bandwidth | 200MHz |
| Maximum Output Power (EIRP) | NR band n260: Module 0: 26.87 dBm Module 1: 29.19 dBm Module 2: 27.25 dBm NR band n261: Module 0: 24.27 dBm Module 1: 29.38 dBm Module 2: 25.11 dBm |
| Type of Modulation | CP-OFDM: QPSK / 16QAM / 64QAM DFT-s-OFDM: Pi/2 BPSK / QPSK / 16QAM / 64QAM |

Remark: The above EUT's information is declared by manufacturer. Please refer to Comments and Explanations in report summary.



1.3 Modification of EUT

No modifications are made to the EUT during all test items.

1.4 Testing Location

| | | | | |
|------------------------------|--|-----------------|--------------------|-----------------|
| Test Site | Sporton International Inc. Wensan Laboratory | | | |
| Test Site Location | No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan | | | |
| Test Site Information | Site No. | Engineer | Temperature | Humidity |
| | 03CH18-HY | Steven Wu | 20.5~22.4°C | 51.3~53.2% |
| | 03CH19-HY | Yu Wang | 20.7~22.6°C | 51.5~53.4% |

Note 1: FCC Designation No.: TW3786

Note 2: The highest accredited frequency is 280GHz and the ISO 17025 accreditation letter can be found on TAF (Taiwan Accreditation Foundation) Website ([Website link](#)).

1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC 47 CFR Part 2, 30
- ♦ ANSI C63.26-2015
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01.
- ♦ FCC KDB 842590 D01 Upper Microwave Flexible Use Service v01r02

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. The TAF code is not including all the FCC KDB listed without accreditation.

2 Test Configuration of Equipment Under Test

EUT has total 3 millimeter wave antenna modules and up to dual-polarization beams operation for each module. Any antenna module cannot transmit simultaneously with the other antenna modules.

Preliminary EIRP test was performed for all beam configurations in the anechoic chamber at the manufacturer's facility so the EIRP worst case beam-pair were identified.

EIRP was investigated that the dual beam rated maximum EIRP is higher than single beam.

The NR radio operation is controlled via software tool QRCT FTM mode (Factory mode).

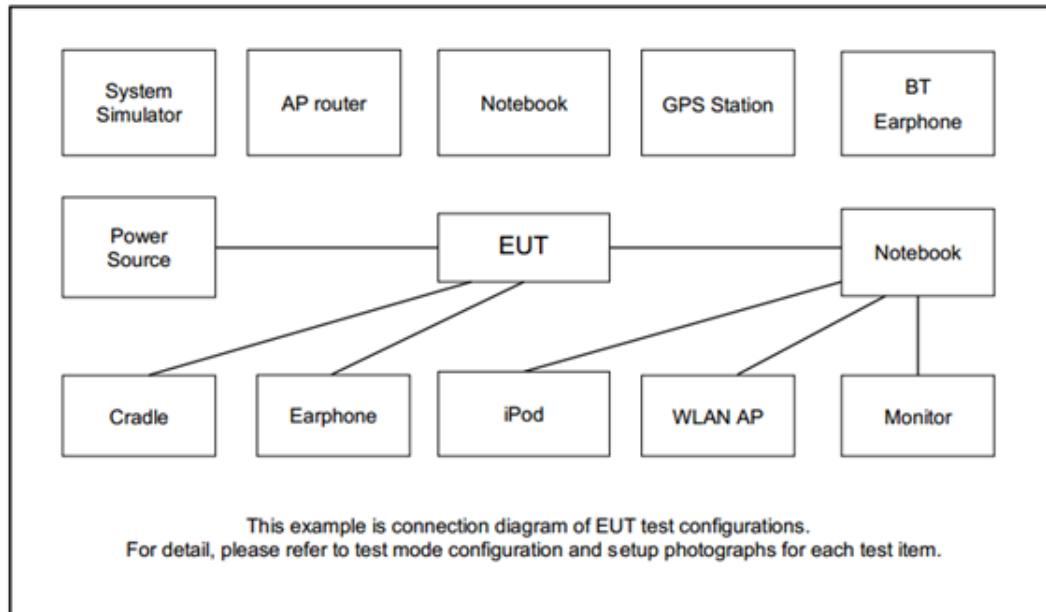
The EUT is forced to operate continuously (100% duty cycle) with maximum output power during the test.

2.1 Test Mode

For radiated measurement, the pre-scan is performed to find the worst cases EUT position.

| Test Items | Band | Bandwidth (MHz) | | | Modulation | | | RB # | | | Test Channel | | | |
|------------------------|---|-----------------|-----|-----|------------|-------|-------|------|------------|------------|--------------|---|---|---|
| | | 50 | 100 | 200 | QPSK | 16QAM | 64QAM | 1 | Inner Full | Outer Full | L | M | H | |
| EIRP | n260 n261 | v | v | v | v | v | v | v | v | v | v | v | v | v |
| 99% Occupied Bandwidth | n260 n261 | v | v | v | v | v | v | - | - | v | v | v | v | v |
| Out of Band Emission | n260 n261 | v | v | v | v | v | v | v | - | v | v | - | v | v |
| Spurious Emission | n260 n261 | v | v | v | v | - | - | v | - | - | v | v | v | v |
| Frequency Stability | n260 n261 | CW tone | | | | | | | | | - | v | - | |
| Remark | <ol style="list-style-type: none"> The mark "v " means that this configuration is chosen for testing. The device is investigated from 9kHz to 200GHz of fundamental signal for radiated spurious emission test under different RB size and modulations in exploratory test. Subsequently, only the worst case emissions are reported. Both modulation type DFT-s OFDM and CP-OFDM are evaluated and reported. The out of band emission were measured radiated EIRP. The TRP method is applied when EIRP exceeds limit. EUT antenna gain information is not listed because the test procedure defined in KDB 842590 D01 clause 4.4.2.5 EIRP to Conducted Power Conversion in Band Edge Using Antenna Gain is no used. | | | | | | | | | | | | | |

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration

| Item | Equipment | Brand Name | Model No. | FCC ID | Data Cable | Power Cord |
|------|-----------|------------|---------------|---------|------------|--|
| 1. | Notebook | ACER | A515-54G-51QB | FCC DoC | N/A | AC I/P : Unshielded, 1.2m DC O/P : Shielded, 1.8m |

2.4 Measurement Results Explanation Example

According to ANSI C63.26-2015 Section 5.2.7

$$EIRP \text{ (dBm)} = E \text{ (dBuV/m)} + 20 \log (D) - 104.8.$$

- where D is the measurement distance (in the far field region) in m.
- $E \text{ (dBuV/m)} = \text{Spectrum Reading Level (dBm)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107$

Hence, the spectrum analyzer *Offset* is derived including RF cable loss and antenna factor.

$$Offset = \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107 + 20 \log (D) - 104.8$$

The conversion loss of RF mixer is also included by the mixer table of spectrum analyzer when measurement frequency is above 40GHz.

Example :

$$\begin{aligned}
 Offset &= \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107 + 20 \log (D) - 104.8 \\
 &= 42.3 + 3.0 + 107 + 20 \log (1) - 104.8 \\
 &= 47.5 \text{ (dB)}
 \end{aligned}$$



2.5 Far Field Condition for Frequency above 18GHz

| Horn Antenna | Frequency (GHz) | Antenna Dimension A (mm) | Wavelength (λ) (m) | Far field R (m) $\geq 2A^2 / \lambda$ | Measurement Distance (D) (m) | Distance Factor $20\log(D)$ (dB) |
|--------------|-----------------|--------------------------|--------------------|---------------------------------------|------------------------------|----------------------------------|
| BBHA 9170 | 18 | 60 | 0.0167 | 0.43 | 1 | 0.00 |
| | 40 | 60 | 0.0075 | 0.96 | | |
| QWH-UPRR00 | 40 | 48 | 0.0075 | 0.61 | 1 | 0.00 |
| | 60 | 48 | 0.0050 | 0.92 | | |
| QWH-EPRR00 | 60 | 31 | 0.0050 | 0.38 | 1 | 0.00 |
| | 90 | 31 | 0.0033 | 0.58 | | |
| QWH-FPRR00 | 90 | 21 | 0.0033 | 0.26 | 1 | 0.00 |
| | 140 | 21 | 0.0021 | 0.41 | | |
| QWH-GPRR00 | 140 | 15 | 0.0021 | 0.21 | 0.5 | -6.02 |
| | 220 | 15 | 0.0014 | 0.33 | | |

2.6 Frequency List of Low/Middle/High Channels

| NR Band n260 Channel and Frequency List | | | | |
|---|------------------------|--------|--------|---------|
| BW [MHz] | Channel/Frequency(MHz) | Lowest | Middle | Highest |
| 50 | Frequency | 37025 | 38500 | 39975 |
| 100 | Frequency | 37050 | 38500 | 39950 |
| 200 | Frequency 1 | 37050 | 38350 | 39650 |
| | Frequency 2 | 37150 | 38450 | 39750 |

| NR Band n261 Channel and Frequency List | | | | |
|---|------------------------|--------|--------|---------|
| BW [MHz] | Channel/Frequency(MHz) | Lowest | Middle | Highest |
| 50 | Frequency | 27525 | 27925 | 28325 |
| 100 | Frequency | 27550 | 27925 | 28300 |
| 200 | Frequency 1 | 27550 | 27775 | 28000 |
| | Frequency 2 | 27650 | 27875 | 28100 |

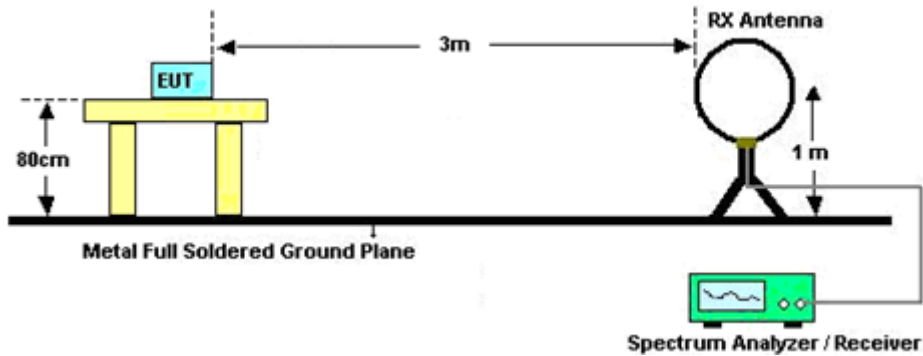
3 Radiated Test Items

3.1 Measuring Instruments

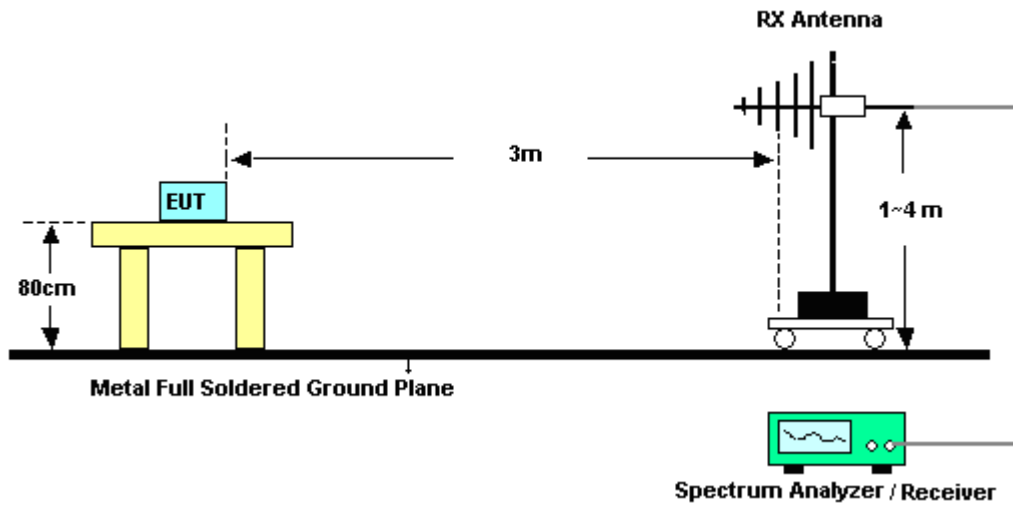
Please refer to the measuring equipment list in this test report.

3.2 Test Setup

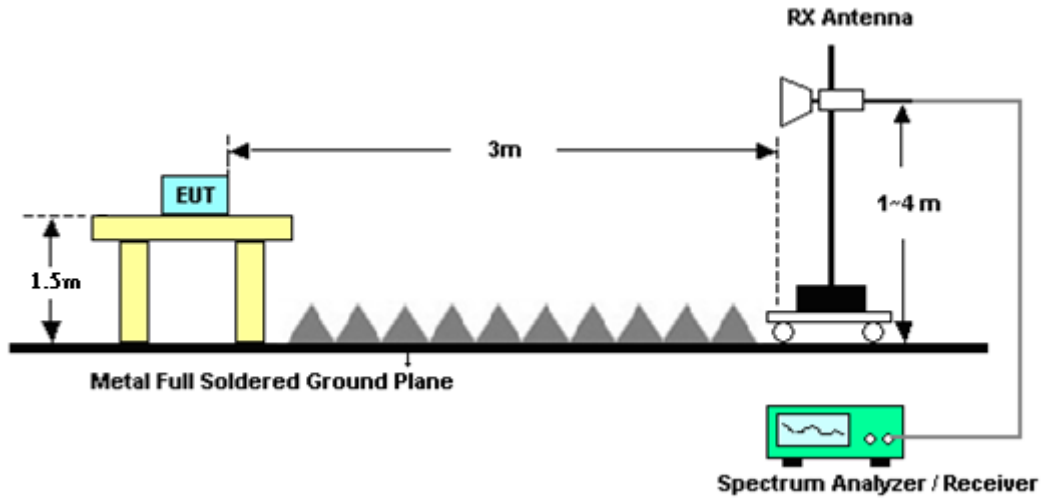
For radiated emissions from 9kHz to 30MHz



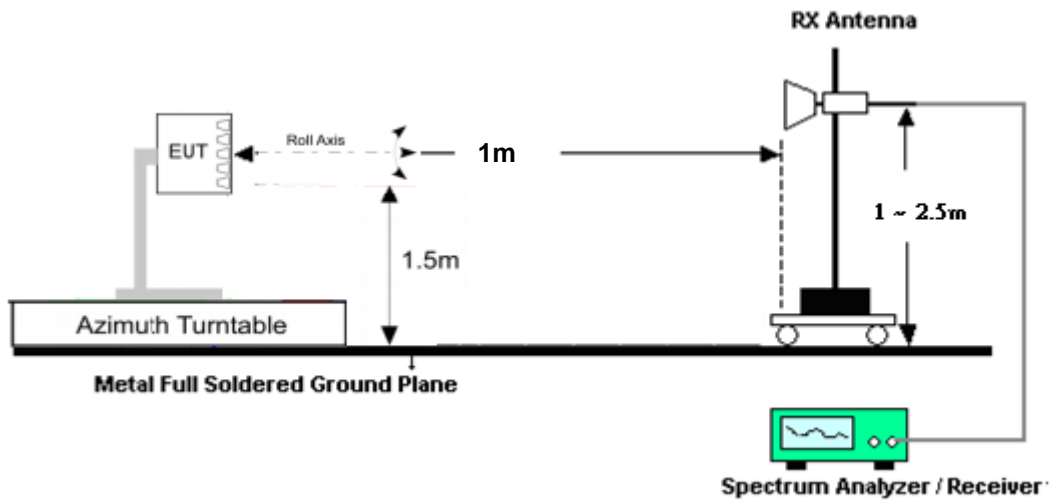
For radiated emissions from 30MHz to 1GHz



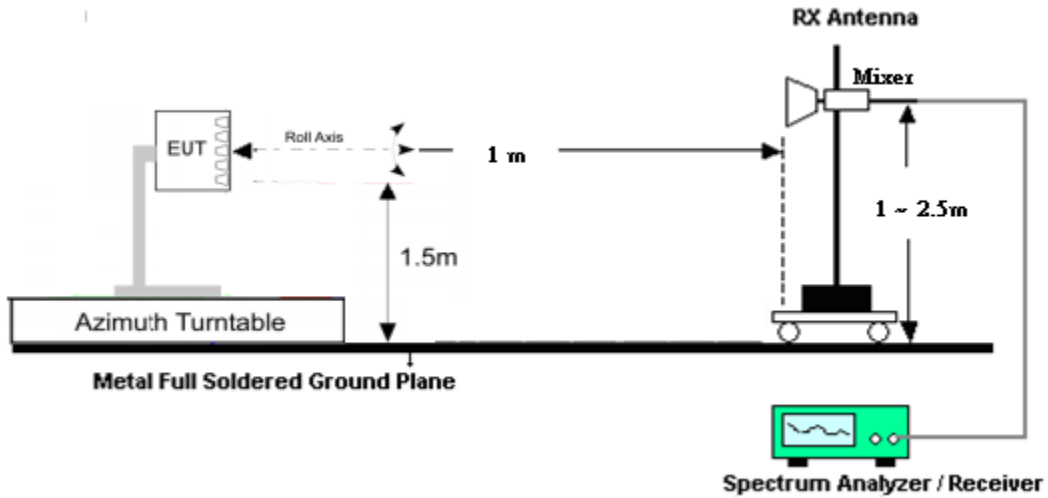
For radiated emissions 1GHz to 18GHz



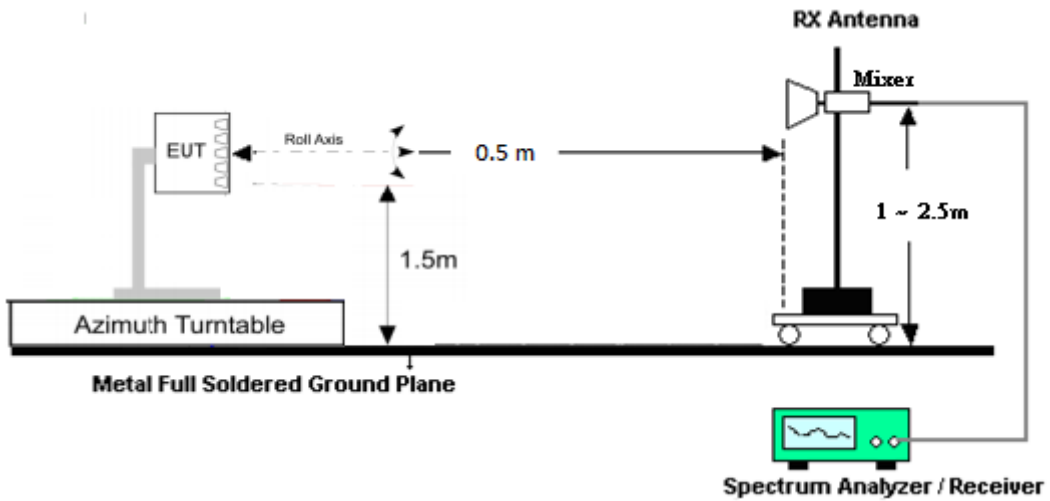
For radiated emissions above 18GHz up to 40GHz

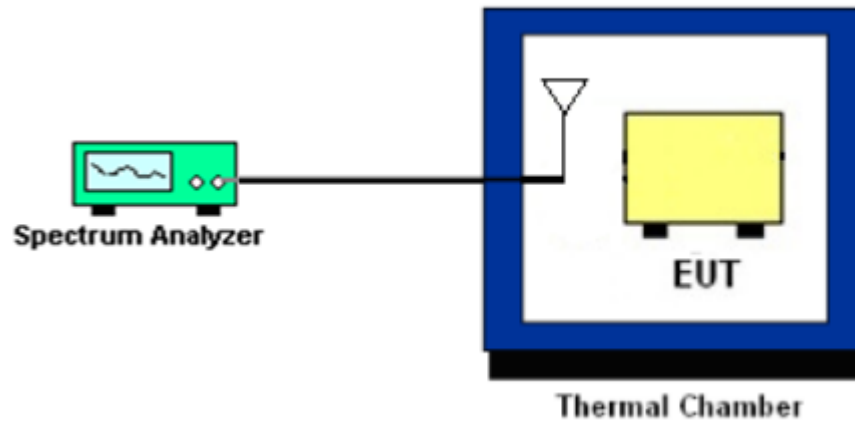


For radiated emissions above 40GHz up to 140GHz



For radiated emissions above 140GHz up to 200GHz



Frequency stability Setup**3.3 Test Result of Radiated Test**

Please refer to Appendix A.

Note:

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.



3.4 EIRP Measurement

3.4.1 Description of EIRP Measurement

For mobile stations, the average power of the sum of all antenna elements is limited to a maximum EIRP of +43 dBm.

3.4.2 Test Procedures

1. Set EUT at maximum output power.
2. Select lowest, middle, and highest channels for each band and different modulation.
3. Enable channel power function of spectrum analyzer
4. Set frequency would like to be investigated.
5. Set Detector = RMS
6. Set Trace mode = trace average
7. Set Sweep time = auto couple
8. Set sweep points $\geq 2 \times \text{Span/RBW}$
9. Set sweep count 100 and wait until the trace to be stabilized
10. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
11. Measure and record the power level from the spectrum analyzer.
12. The test result is calculated according to

ANSI C63.26-2015 Section 5.2.7

$$\text{EIRP (dBm)} = \text{E(dBuV/m)} + 20\log(D) - 104.8.$$

where D is the measurement distance (in the far field region) in m.

$$\text{E (dBuV/m)} = \text{Spectrum Level (dBm)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107$$

That is, set the spectrum offset including sum of

$$\text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107 + 20\log(D) - 104.8$$



3.5 Occupied Bandwidth

3.5.1 Description of Occupied Bandwidth Measurement

This is for reporting only.

The 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 a specified percentage 0.5% of the total mean transmitted power.

3.5.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.4.4

1. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be at least 1.5 times the anticipated OBW.
2. The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
3. Set the detection mode to peak, and the trace mode to max hold.
4. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

3.6 Radiated Spurious Emission Measurement

3.6.1 Description of Radiated Spurious Emission Measurement

The spectrum is scanned from 30 MHz up to 200GHz.

The conductive power or the total radiated power of any emission outside a licensee's frequency block shall be -13 dBm/MHz or lower. However, in the bands immediately outside and adjacent to the licensee's frequency block, having a bandwidth equal to 10 percent of the channel bandwidth, the conductive power or the total radiated power of any emission shall be -5 dBm/MHz or lower.

3.6.2 Test Procedures

1. Set EUT at maximum output power..
2. Select lowest, middle, and highest channels for each band and different modulation.
3. Measure and record the power level from the spectrum analyzer.
4. Set frequency would like to be investigated.
5. Set Detector = RMS, Trace mode = trace average, sweep time = auto couple
6. Set sweep points $\geq 2 \times \text{Span}/\text{RBW}$, sweep count 100 and wait until the trace to be stabilized.
7. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
8. For measurement frequency from 30MHz to 18GHz,
An antenna was substituted in place of the EUT and was driven by a signal generator.
Tune the output power of signal generator to the same emission level with EUT maximum spurious emission. Take record of output power and repeat for another polarization.
9. For measurement frequency above 18GHz, the test result is calculated according to ANSI C63.26-2015 Section 5.2.7 and 5.7.3 and 5.7.4
$$\text{EIRP (dBm)} = \text{E(dBuV/m)} + 20\log(D) - 104.8.$$
where D is the measurement distance (in the far field region) in m.
$$\text{E (dBuV/m)} = \text{Spectrum Level (dBm)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107$$
That is, set the spectrum offset including sum of
$$\text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107 + 20\log(D) - 104.8$$
10. The conversion loss of RF mixer is also included in conversion loss table of the spectrum analyzer when measurement frequency is above 40GHz.
11. The TRP method refers to the clause 4.4.2.2 of FCC KDB 842590 D01 v01r02.
If EIRP measurement results exceed the emission limit, then TRP measurement will be used as an alternative method. Test results of TRP measurement are marked as "TRP Measurement".



3.7 Frequency Stability Measurement

3.7.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block.

3.7.2 Test Procedures for Temperature Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.

1. The EUT was set up in the thermal chamber.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.7.3 Test Procedures for Voltage Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.

1. The EUT was placed in a temperature chamber at 20° C.
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.



4 List of Measuring Equipment

| Instrument | Brand Name | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|-------------------------|--------------------|-----------------------------------|-------------------|----------------------------------|------------------|----------------------------------|-----------------|--------------------------|
| Preamplifier | COM-POWER | PAM-103 | 18020201 | 1MHz-1000MHz | Jan. 03, 2022 | Feb. 16, 2022 ~ Feb. 17, 2022 | Jan. 02, 2023 | Radiation (03CH19-HY) |
| Bilog Antenna | TESEQ | CBL 6111D & 00800N1D01N -06 | 55608 & 09 | 30MHz~1GHz | Oct. 17, 2021 | Feb. 16, 2022 ~ Feb. 17, 2022 | Oct. 16, 2022 | Radiation (03CH19-HY) |
| Horn Antenna | SCHWARZBE CK | BBHA 9120 D | 02360 | 1GHz~18GHz | Nov. 02, 2021 | Feb. 16, 2022 ~ Feb. 17, 2022 | Nov. 01, 2022 | Radiation (03CH19-HY) |
| Amplifier | EMCI | EMC118A45S E | 980792 | 1GHz-18GHz | Nov. 15, 2021 | Feb. 16, 2022 ~ Feb. 17, 2022 | Nov. 14, 2022 | Radiation (03CH19-HY) |
| Spectrum Analyzer | Keysight | N9010B | MY60241055 | 9kHz~30GHz | Jul. 12, 2021 | Feb. 16, 2022 ~ Feb. 17, 2022 | Jul. 11, 2022 | Radiation (03CH19-HY) |
| Controller | EMEC | EM 1000 | N/A | Control Turn table & Ant Mast | N/A | Feb. 16, 2022 ~ Feb. 17, 2022 | N/A | Radiation (03CH19-HY) |
| Antenna Mast | EMEC | AM-BS-4500-B | N/A | 1~4m | N/A | Feb. 16, 2022 ~ Feb. 17, 2022 | N/A | Radiation (03CH19-HY) |
| Turn Table | EMEC | TT 2200 | N/A | 0~360 Degree | N/A | Feb. 16, 2022 ~ Feb. 17, 2022 | N/A | Radiation (03CH19-HY) |
| Software | Audix | E3 6.2009-8-24 | RK-002155 | N/A | Jun .20, 2021 | Feb. 16, 2022 ~ Feb. 17, 2022 | N/A | Radiation (03CH19-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 102 | 505134/2 | 30MHz~40GHz | Feb. 22, 2021 | Feb. 16, 2022 ~ Feb. 17, 2022 | Feb. 21, 2022 | Radiation (03CH19-HY) |
| SHF-EHF Horn Antenna | SCHWARZBE CK | BBHA 9170 | 00991 | 18GHz~40GHz | May 12, 2021 | Jan. 15, 2022 ~ Feb. 21, 2022 | May 11, 2022 | Radiation (03CH18-HY) |
| Spectrum Analyzer | Rohde & Schwarz | FSV3044 | 101010 | 10Hz~44GHz | Nov. 24, 2021 | Jan. 15, 2022 ~ Feb. 21, 2022 | Nov. 23, 2022 | Radiation (03CH18-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 102 | 801589/2 | 9kHz~40GHz | Nov. 30, 2021 | Jan. 15, 2022 ~ Feb. 21, 2022 | Nov. 29, 2022 | Radiation (03CH18-HY) |
| Turn Table | EMEC | N/A | N/A | Phi/Theta 0~360 Degree | N/A | Jan. 15, 2022 ~ Feb. 21, 2022 | N/A | Radiation (03CH18-HY) |
| Controller | EMEC | EM 1000 | N/A | Control Turn table | N/A | Jan. 15, 2022 ~ Feb. 21, 2022 | N/A | Radiation (03CH18-HY) |
| Spectrum Analyzer | Rohde & Schwarz | FSV30 | 103738 | 9kHz to 30GHz | May 19, 2021 | Feb. 21, 2022 ~ Feb. 22, 2022 | May 18, 2022 | Radiation (03CH18-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 102 | 801607/2 | 9kHz~40GHz | Dec. 30, 2021 | Feb. 21, 2022 ~ Feb.22,2022 | Dec. 29, 2022 | Radiation (03CH18-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 102 | 801589/2 | 9kHz~40GHz | Nov. 30, 2021 | Feb. 21, 2022 ~ Feb. 22, 2022 | Nov. 29, 2022 | Radiation (03CH18-HY) |
| Harmonic Mixer | Rohde & Schwarz | RPG FS-Z60 | 100986 | 40GHz to 60GHz | Apr. 09, 2021 | Feb. 21, 2022 ~ Feb. 22, 2022 | Apr. 08, 2024 | Radiation (03CH18-HY) |
| Harmonic Mixer | Rohde & Schwarz | FS-Z90 | 101811 | 60GHz to 90GHz | Nov. 16 , 2021 | Feb. 21, 2022 ~ Feb. 22, 2022 | Nov. 15 , 2024 | Radiation (03CH18-HY) |
| Harmonic Mixer | Rohde & Schwarz | RPG FS-Z140 | 101128 | 90GHz to 140GHz | Oct. 26, 2020 | Feb. 21, 2022 ~ Feb. 22, 2022 | Oct. 25, 2023 | Radiation (03CH18-HY) |
| Harmonic Mixer | R&S | RPG FS-Z220 | 101008 | 140GHz to 220GHz | Apr. 04, 2019 | Feb. 21, 2022 ~ Feb. 22, 2022 | Apr. 03, 2022 | Radiation (03CH18-HY) |
| Antenna | Quinstar | QWH-UPRR00 | QWH-UPRR0 0-01 | 40-60 GHz | Jul. 06, 2021 | Feb. 21, 2022 ~ Feb. 22, 2022 | N/A (Note 3) | Radiation (03CH18-HY) |
| Antenna | Quinstar | QWH-EPRR00 | 1372000000 | 60-90 GHz | Jul. 06, 2021 | Feb. 21, 2022 ~ Feb. 22, 2022 | N/A (Note 3) | Radiation (03CH18-HY) |
| Antenna | Quinstar | QWH-FPRR00 | 1011500008 | 90-140 GHz | Jul. 06, 2021 | Feb. 21, 2022 ~ Feb. 22, 2022 | N/A (Note 3) | Radiation (03CH18-HY) |
| Antenna | Quinstar | QWH-GPRR00 | QWH-GPRR0 0-01 | 140-220 GHz | Jul. 06, 2021 | Feb. 21, 2022 ~ Feb. 22, 2022 | N/A (Note 3) | Radiation (03CH18-HY) |



| Instrument | Brand Name | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|------------|------------|-----------|------------|-----------------|------------------|----------------------------------|---------------|--------------------------|
| Hygrometer | TECPEL | DTM-303B | TP200722 | N/A | Mar. 09, 2021 | Feb. 21, 2022 ~ Feb. 22, 2022 | Mar. 08, 2022 | Radiation (03CH18-HY) |

Note 1: (*) Equipment manufacturer's Calibration Certificate.

Note 2: The Standard Gain Horn Antennas are calibrated by the ISO 17025 accredited test lab MWM Lab

(<http://en.mwmlab.com/about>), a sub unit of Belarussian State University of Informatics and Radio electronics which is accredited by the Belarusian State Centre for Accreditation (BSCA). BSCA is the National accreditation body of the Republic of Belarus and an associated member of the International Laboratory Accreditation Cooperation (ILAC).

Note 3: The standard gain horn's critical dimensions is verified on an annual basis within the equipment specification according to KDB 842590 D01 v01r02 clause 2)a)2)iii).



5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

| | |
|---|------|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 3.31 |
|---|------|

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

| | |
|---|------|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 3.62 |
|---|------|

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

| | |
|---|------|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 4.62 |
|---|------|

Uncertainty of Radiated Emission Measurement (40 GHz ~ 140 GHz)

| | |
|---|------|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 5.92 |
|---|------|

Uncertainty of Radiated Emission Measurement (140 GHz ~ 200 GHz)

| | |
|---|------|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 6.78 |
|---|------|



Appendix A. Test Results of EIRP and Radiated Test

EIRP Power (Average power)

NR Band n260 Module 0

| NR Band n260 Module 0 AG0+1 (Beam ID:30+158) | | | | | |
|---|----------|----------|------------|-----------|------------|
| Maximum Average EIRP [dBm] | | | | | |
| Lowest | BW [MHz] | Waveform | Modulation | Inner 1RB | Inner Full |
| | 50 | DFT-S | BPSK | 26.66 | 26.83 |
| | 50 | DFT-S | QPSK | 26.87 | 26.84 |
| | 50 | DFT-S | 16QAM | 24.55 | 24.61 |
| | 50 | DFT-S | 64QAM | 21.42 | 22.47 |
| | 50 | CP | QPSK | 21.76 | 20.98 |
| | 100 | DFT-S | BPSK | 25.45 | 25.77 |
| | 100 | DFT-S | QPSK | 25.62 | 26.03 |
| | 100 | DFT-S | 16QAM | 23.25 | 23.82 |
| | 100 | DFT-S | 64QAM | 20.34 | 21.38 |
| | 100 | CP | QPSK | 20.99 | 20.55 |
| | 200 | DFT-S | BPSK | 18.92 | 21.49 |
| | 200 | DFT-S | QPSK | 19.35 | 21.6 |
| | 200 | DFT-S | 16QAM | 19.33 | 20.89 |
| | 200 | DFT-S | 64QAM | 19.09 | 19.3 |
| 200 | CP | QPSK | 17.31 | 18.5 | |

Note : The 200MHz Bw is carrier aggregation by 2CC of 100MHz.



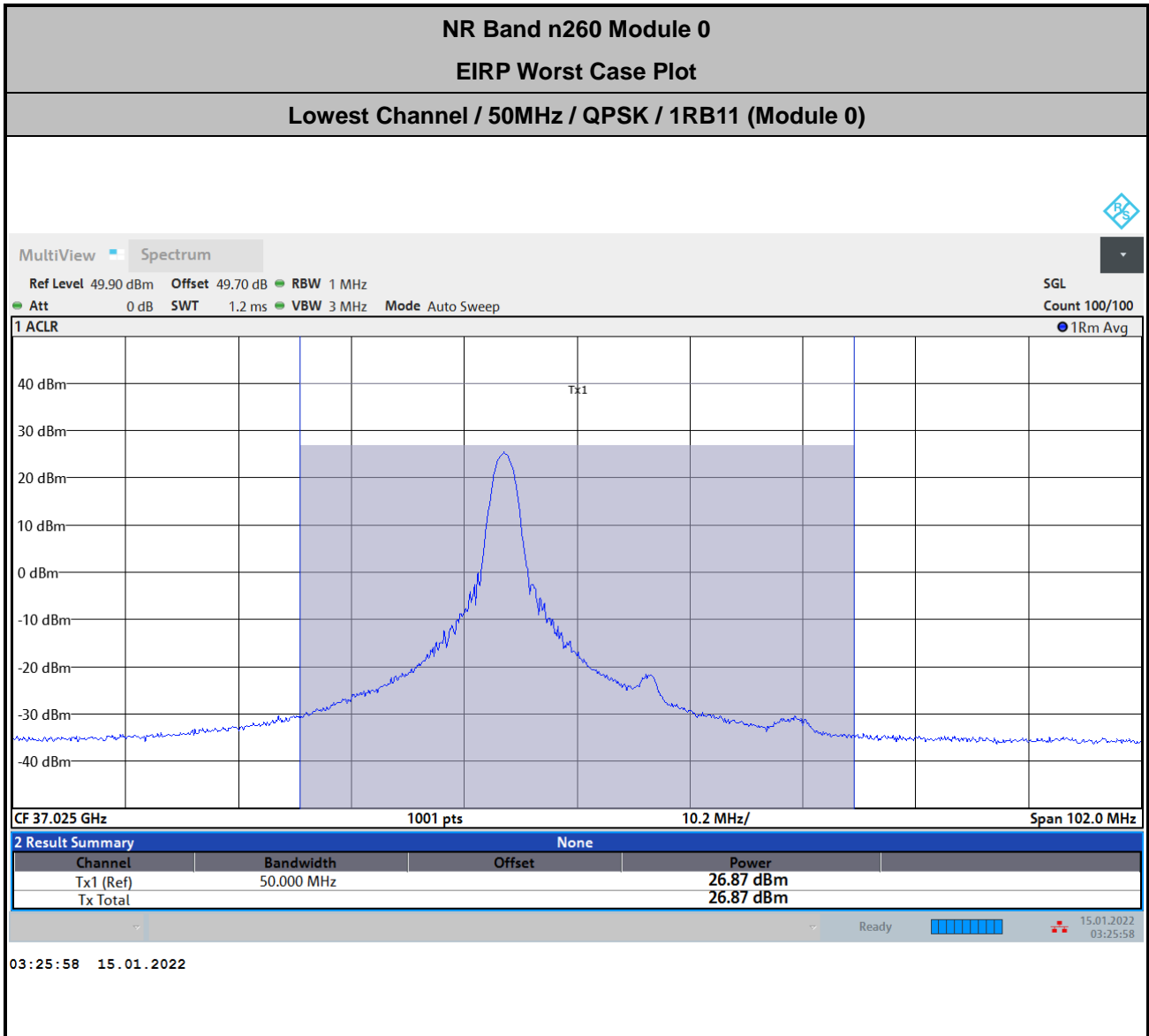
| NR Band n260 Module 0 AG0+1 (Beam ID:30+158) | | | | | |
|---|----------|----------|------------|-----------|------------|
| Maximum Average EIRP [dBm] | | | | | |
| Middle | BW [MHz] | Waveform | Modulation | Inner 1RB | Inner Full |
| | 50 | DFT-S | BPSK | 26.8 | 26.62 |
| | 50 | DFT-S | QPSK | 26.7 | 26.77 |
| | 50 | DFT-S | 16QAM | 24.7 | 24.63 |
| | 50 | DFT-S | 64QAM | 22.78 | 22.68 |
| | 50 | CP | QPSK | 21.29 | 21.27 |
| | 100 | DFT-S | BPSK | 25.51 | 25.26 |
| | 100 | DFT-S | QPSK | 25.45 | 25.02 |
| | 100 | DFT-S | 16QAM | 23.51 | 23.07 |
| | 100 | DFT-S | 64QAM | 21.38 | 21.21 |
| | 100 | CP | QPSK | 19.83 | 19.61 |
| | 200 | DFT-S | BPSK | 16.83 | 20.28 |
| | 200 | DFT-S | QPSK | 17.1 | 20.38 |
| | 200 | DFT-S | 16QAM | 16.61 | 19.63 |
| | 200 | DFT-S | 64QAM | 17 | 16.95 |
| 200 | CP | QPSK | 14.83 | 16.13 | |

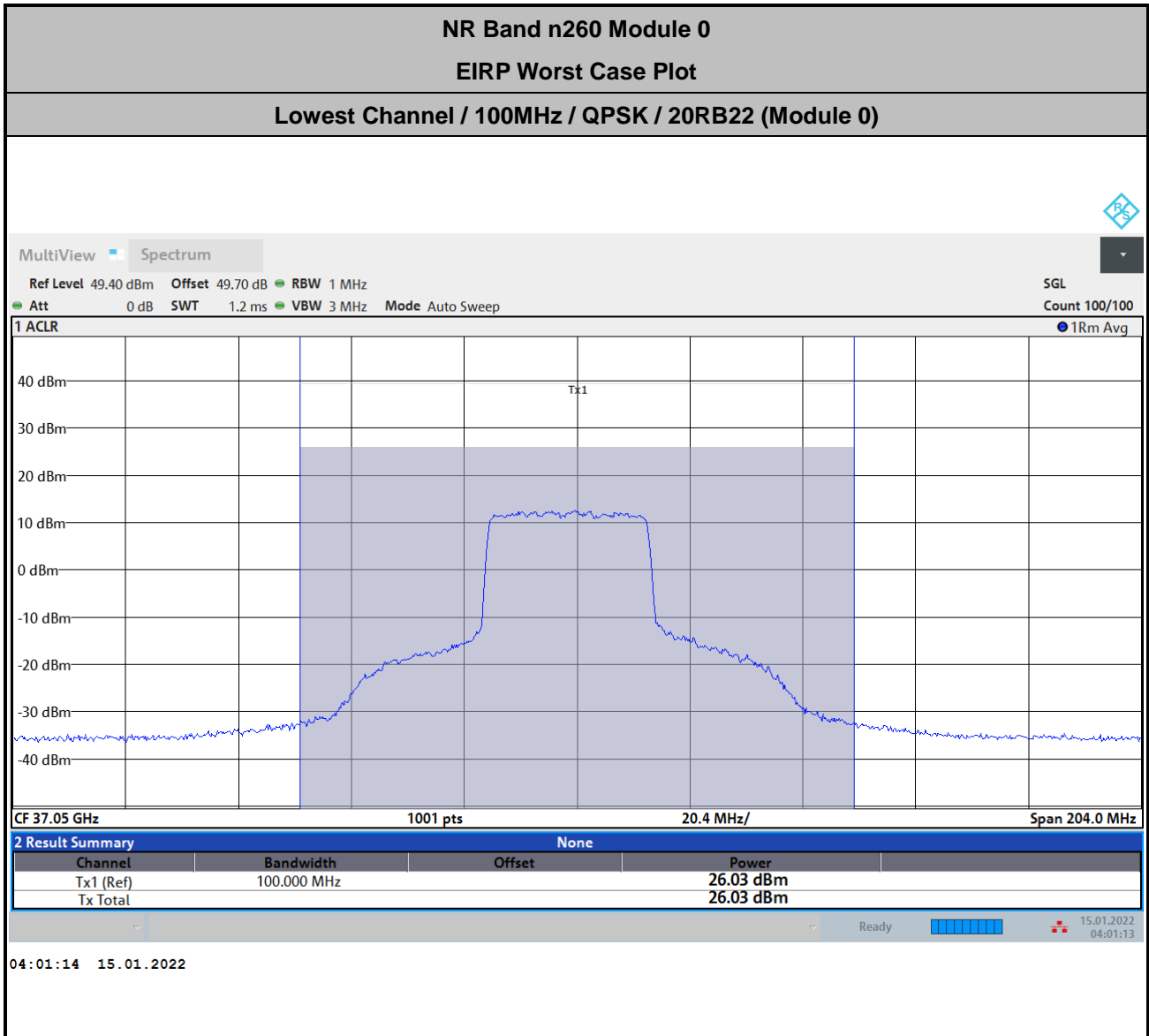
Note : The 200MHz Bw is carrier aggregation by 2CC of 100MHz.

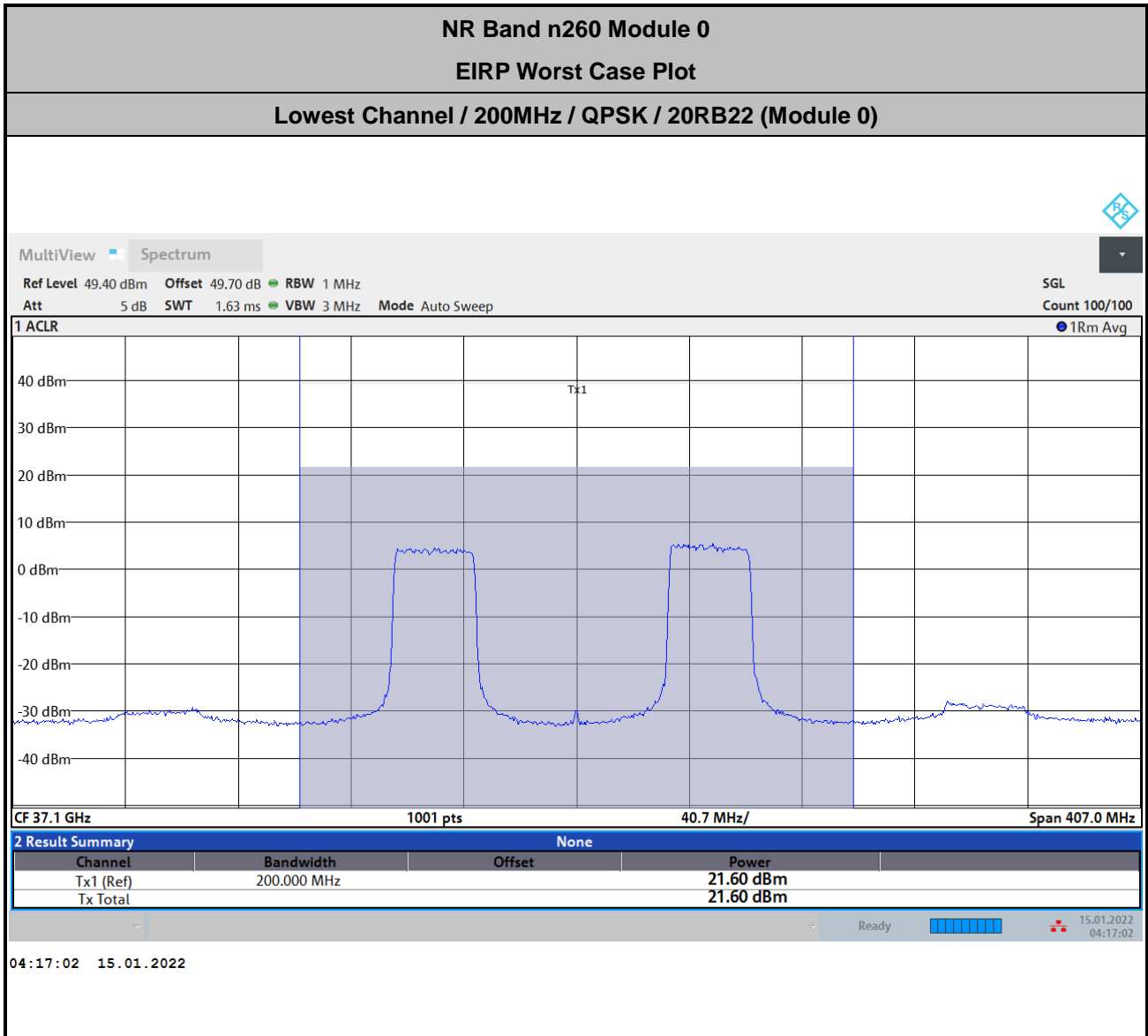


| NR Band n260 Module 0 AG0+1 (Beam ID:30+158) | | | | | |
|---|----------|----------|------------|-----------|------------|
| Maximum Average EIRP [dBm] | | | | | |
| Highest | BW [MHz] | Waveform | Modulation | Inner 1RB | Inner Full |
| | 50 | DFT-S | BPSK | 25.58 | 25.92 |
| | 50 | DFT-S | QPSK | 25.68 | 26.2 |
| | 50 | DFT-S | 16QAM | 23.39 | 23.87 |
| | 50 | DFT-S | 64QAM | 20.52 | 21.66 |
| | 50 | CP | QPSK | 20.48 | 19.53 |
| | 100 | DFT-S | BPSK | 25.33 | 25.63 |
| | 100 | DFT-S | QPSK | 25.5 | 25.74 |
| | 100 | DFT-S | 16QAM | 23.27 | 23.58 |
| | 100 | DFT-S | 64QAM | 20.24 | 21.33 |
| | 100 | CP | QPSK | 19.77 | 19.17 |
| | 200 | DFT-S | BPSK | 17.77 | 20.79 |
| | 200 | DFT-S | QPSK | 18.23 | 20.9 |
| | 200 | DFT-S | 16QAM | 18.16 | 20.22 |
| | 200 | DFT-S | 64QAM | 17.84 | 18.25 |
| 200 | CP | QPSK | 15.1 | 15.77 | |

Note : The 200MHz Bw is carrier aggregation by 2CC of 100MHz.







$$\text{Offset} = \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107 + 20\log(D) - 104.8$$

$$= 43.8 + 3.7 + 107 + 20\log(1) - 104.8 = 49.7 \text{ (dB)}$$



NR Band n260 Module 1

| NR Band n260 Module 1 AG0+1 (Beam ID:34+162) | | | | | |
|---|----------|----------|------------|-----------|------------|
| Maximum Average EIRP [dBm] | | | | | |
| Lowest | BW [MHz] | Waveform | Modulation | Inner 1RB | Inner Full |
| | 50 | DFT-S | BPSK | 26.87 | 27.16 |
| | 50 | DFT-S | QPSK | 26.83 | 27.19 |
| | 50 | DFT-S | 16QAM | 24.85 | 25.15 |
| | 50 | DFT-S | 64QAM | 22.55 | 22.92 |
| | 50 | CP | QPSK | 21.57 | 20.85 |
| | 100 | DFT-S | BPSK | 25.98 | 26.49 |
| | 100 | DFT-S | QPSK | 26.02 | 26.42 |
| | 100 | DFT-S | 16QAM | 24.19 | 24.36 |
| | 100 | DFT-S | 64QAM | 21.66 | 21.88 |
| | 100 | CP | QPSK | 21.1 | 20.41 |
| | 200 | DFT-S | BPSK | 20.08 | 22.32 |
| | 200 | DFT-S | QPSK | 19.7 | 22.27 |
| | 200 | DFT-S | 16QAM | 19.32 | 21.72 |
| | 200 | DFT-S | 64QAM | 20.72 | 19.96 |
| 200 | CP | QPSK | 17.2 | 18.7 | |

Note : The 200MHz Bw is carrier aggregation by 2CC of 100MHz.



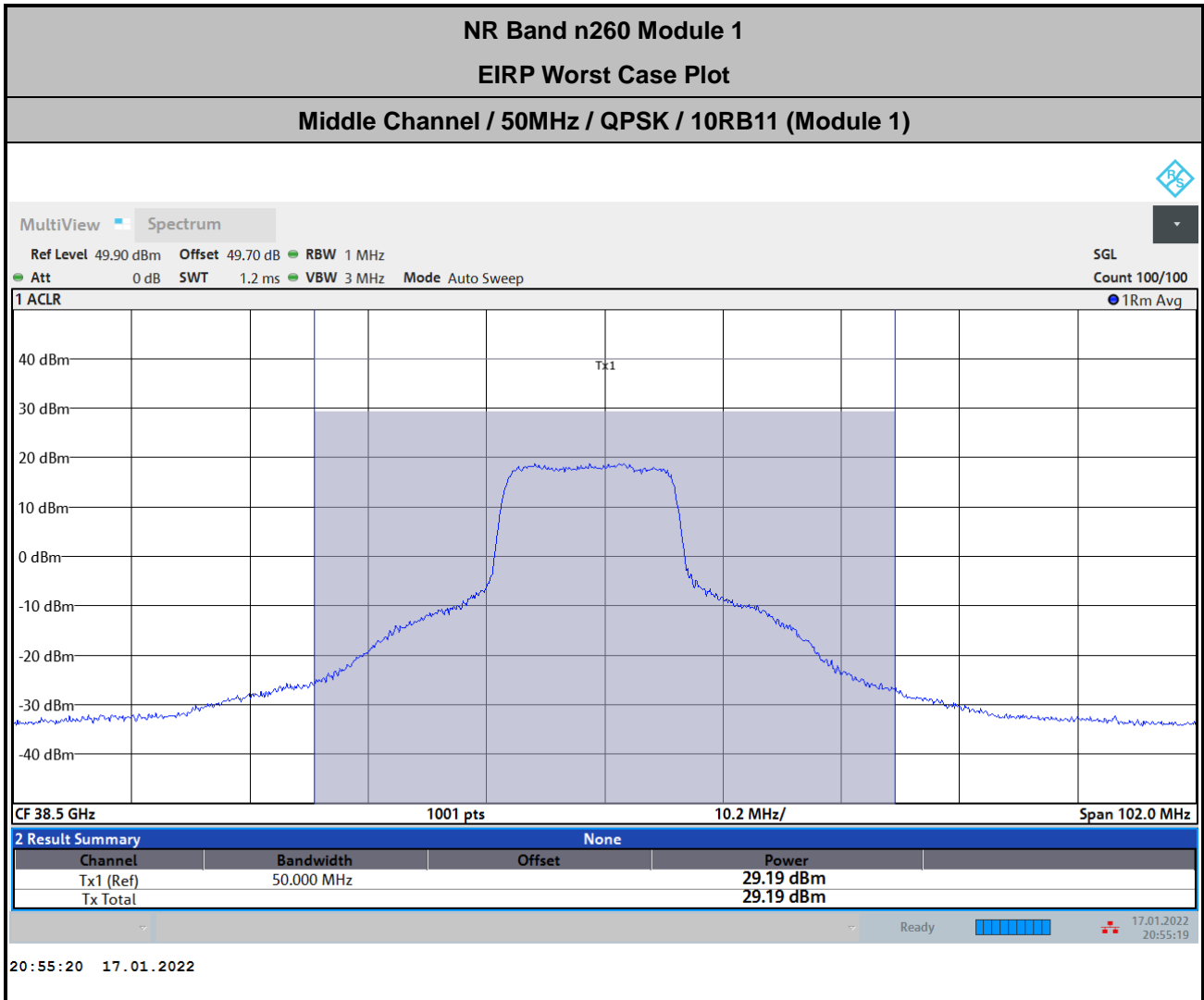
| NR Band n260 Module 1 AG0+1 (Beam ID:34+162) | | | | | |
|---|----------|----------|------------|-----------|------------|
| Maximum Average EIRP [dBm] | | | | | |
| | BW [MHz] | Waveform | Modulation | Inner 1RB | Inner Full |
| Middle | 50 | DFT-S | BPSK | 29.06 | 29.08 |
| | 50 | DFT-S | QPSK | 29.1 | 29.19 |
| | 50 | DFT-S | 16QAM | 26.21 | 27.08 |
| | 50 | DFT-S | 64QAM | 25.99 | 25.22 |
| | 50 | CP | QPSK | 23.69 | 23.04 |
| | 100 | DFT-S | BPSK | 28.39 | 27.89 |
| | 100 | DFT-S | QPSK | 27.82 | 28.01 |
| | 100 | DFT-S | 16QAM | 24.86 | 25.65 |
| | 100 | DFT-S | 64QAM | 24.63 | 23.74 |
| | 100 | CP | QPSK | 22.44 | 21.46 |
| | 200 | DFT-S | BPSK | 20.36 | 23.85 |
| | 200 | DFT-S | QPSK | 20.46 | 23.87 |
| | 200 | DFT-S | 16QAM | 19.69 | 22.99 |
| | 200 | DFT-S | 64QAM | 21.52 | 20.57 |
| 200 | CP | QPSK | 16.88 | 18.71 | |

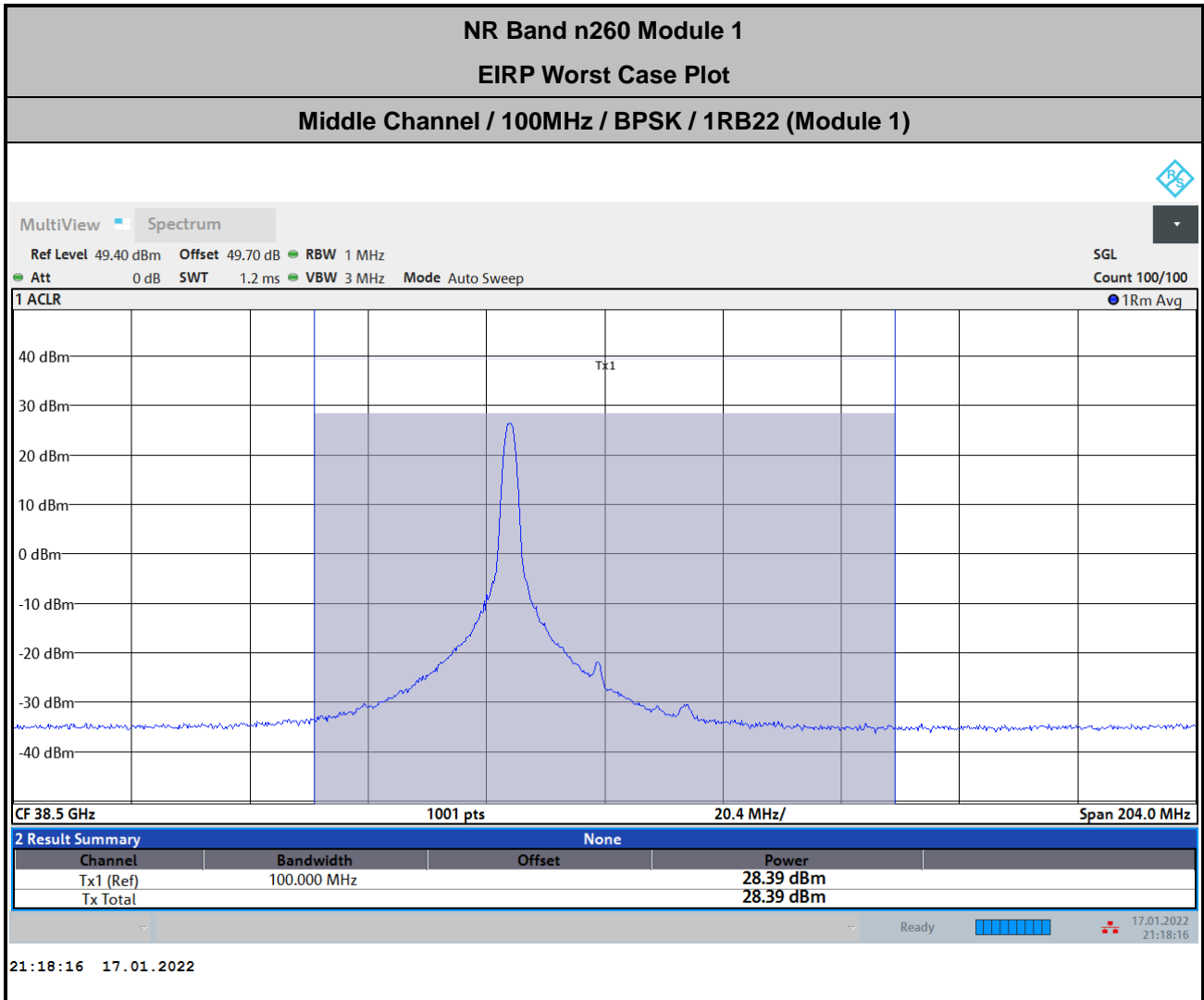
Note : The 200MHz Bw is carrier aggregation by 2CC of 100MHz.

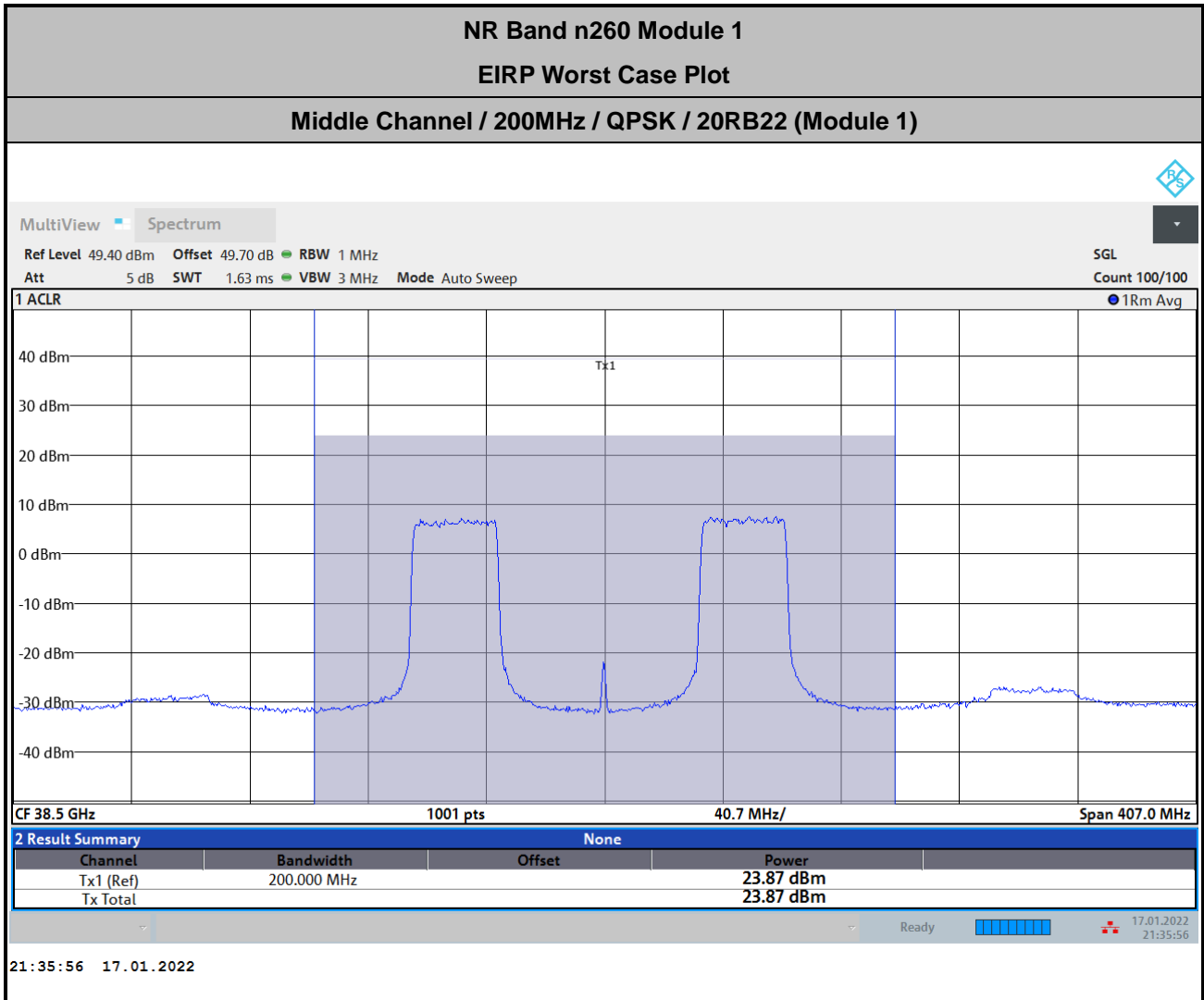


| NR Band n260 Module 1 AG0+1 (Beam ID:34+162) | | | | | |
|---|----------|----------|------------|-----------|------------|
| Maximum Average EIRP [dBm] | | | | | |
| Highest | BW [MHz] | Waveform | Modulation | Inner 1RB | Inner Full |
| | 50 | DFT-S | BPSK | 26.77 | 27.18 |
| | 50 | DFT-S | QPSK | 26.59 | 27.15 |
| | 50 | DFT-S | 16QAM | 24.81 | 25.26 |
| | 50 | DFT-S | 64QAM | 22.61 | 23.09 |
| | 50 | CP | QPSK | 21.16 | 20.73 |
| | 100 | DFT-S | BPSK | 26.37 | 26.64 |
| | 100 | DFT-S | QPSK | 26.05 | 26.52 |
| | 100 | DFT-S | 16QAM | 24.5 | 24.45 |
| | 100 | DFT-S | 64QAM | 22.24 | 22.15 |
| | 100 | CP | QPSK | 20.83 | 20.34 |
| | 200 | DFT-S | BPSK | 19.53 | 22.22 |
| | 200 | DFT-S | QPSK | 19.06 | 22.12 |
| | 200 | DFT-S | 16QAM | 18.64 | 21.47 |
| | 200 | DFT-S | 64QAM | 20.18 | 19.39 |
| 200 | CP | QPSK | 15.84 | 17.41 | |

Note : The 200MHz Bw is carrier aggregation by 2CC of 100MHz.







$$\text{Offset} = \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107 + 20\log(D) - 104.8$$

$$= 43.8 + 3.7 + 107 + 20\log(1) - 104.8 = 49.7 \text{ (dB)}$$



NR Band n260 Module 2

| NR Band n260 Module 2 AG0+1 (Beam ID:52+180) | | | | | |
|---|----------|----------|------------|-----------|------------|
| Maximum Average EIRP [dBm] | | | | | |
| Lowest | BW [MHz] | Waveform | Modulation | Inner 1RB | Inner Full |
| | 50 | DFT-S | BPSK | 26.71 | 26.76 |
| | 50 | DFT-S | QPSK | 26.78 | 26.80 |
| | 50 | DFT-S | 16QAM | 24.35 | 24.86 |
| | 50 | DFT-S | 64QAM | 21.97 | 22.51 |
| | 50 | CP | QPSK | 21.94 | 21.23 |
| | 100 | DFT-S | BPSK | 26.03 | 25.98 |
| | 100 | DFT-S | QPSK | 26.15 | 26.07 |
| | 100 | DFT-S | 16QAM | 23.5 | 23.89 |
| | 100 | DFT-S | 64QAM | 21.23 | 21.58 |
| | 100 | CP | QPSK | 20.87 | 20.46 |
| | 200 | DFT-S | BPSK | 19.11 | 21.48 |
| | 200 | DFT-S | QPSK | 18.96 | 21.46 |
| | 200 | DFT-S | 16QAM | 19.02 | 20.89 |
| | 200 | DFT-S | 64QAM | 20.13 | 19.17 |
| 200 | CP | QPSK | 18.11 | 18.73 | |

Note : The 200MHz Bw is carrier aggregation by 2CC of 100MHz.



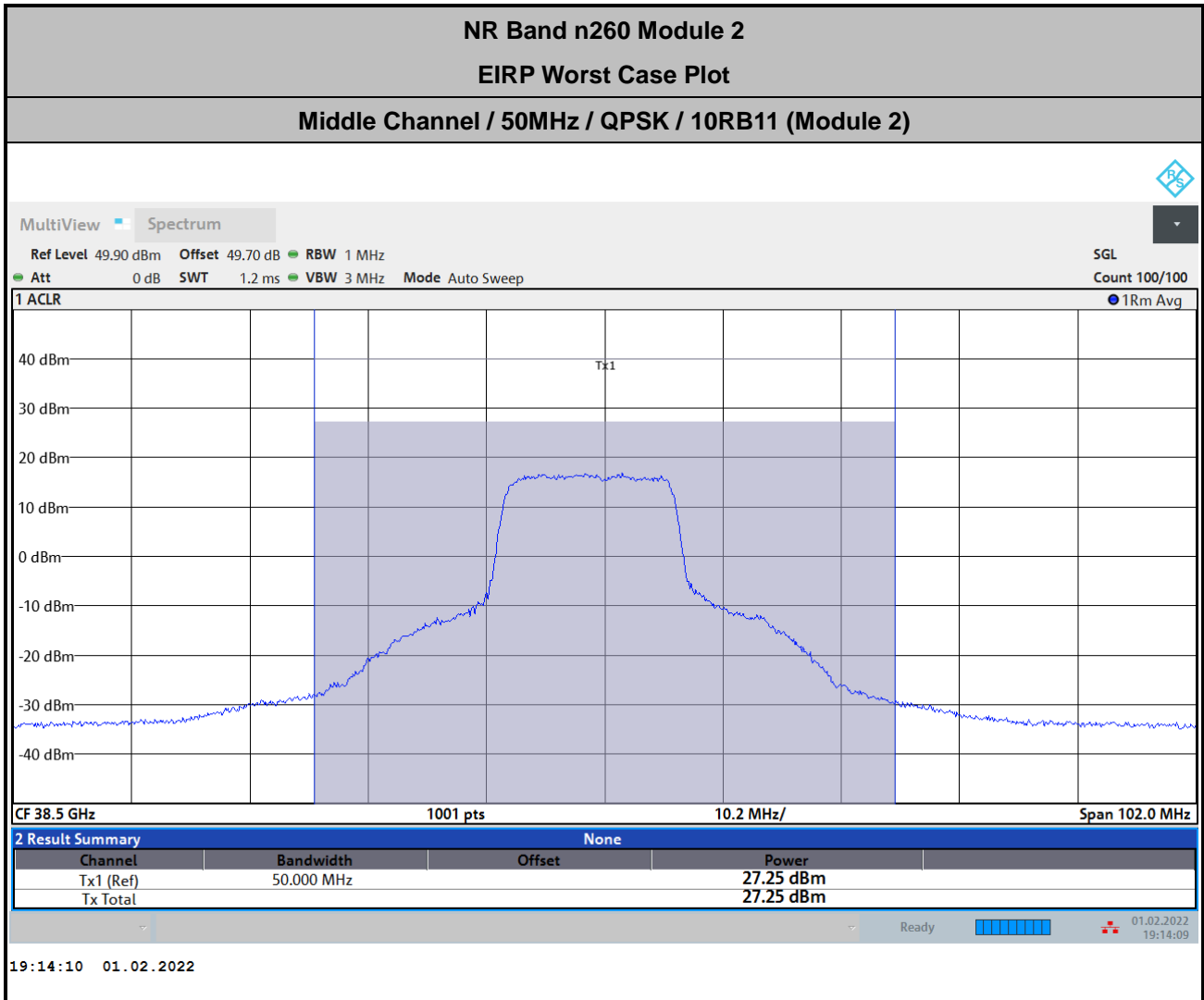
| NR Band n260 Module 2 AG0+1 (Beam ID:52+180) | | | | | |
|---|----------|----------|------------|-----------|------------|
| Maximum Average EIRP [dBm] | | | | | |
| Middle | BW [MHz] | Waveform | Modulation | Inner 1RB | Inner Full |
| | 50 | DFT-S | BPSK | 26.99 | 27.18 |
| | 50 | DFT-S | QPSK | 27.24 | 27.25 |
| | 50 | DFT-S | 16QAM | 25.24 | 25.20 |
| | 50 | DFT-S | 64QAM | 23.23 | 23.11 |
| | 50 | CP | QPSK | 21.46 | 21.38 |
| | 100 | DFT-S | BPSK | 26.25 | 26.23 |
| | 100 | DFT-S | QPSK | 26.59 | 26.27 |
| | 100 | DFT-S | 16QAM | 24.47 | 24.26 |
| | 100 | DFT-S | 64QAM | 22.45 | 22.24 |
| | 100 | CP | QPSK | 20.85 | 20.33 |
| | 200 | DFT-S | BPSK | 18.43 | 22.28 |
| | 200 | DFT-S | QPSK | 18.68 | 22.29 |
| | 200 | DFT-S | 16QAM | 19.1 | 21.55 |
| | 200 | DFT-S | 64QAM | 19.52 | 18.91 |
| 200 | CP | QPSK | 16.19 | 17.70 | |

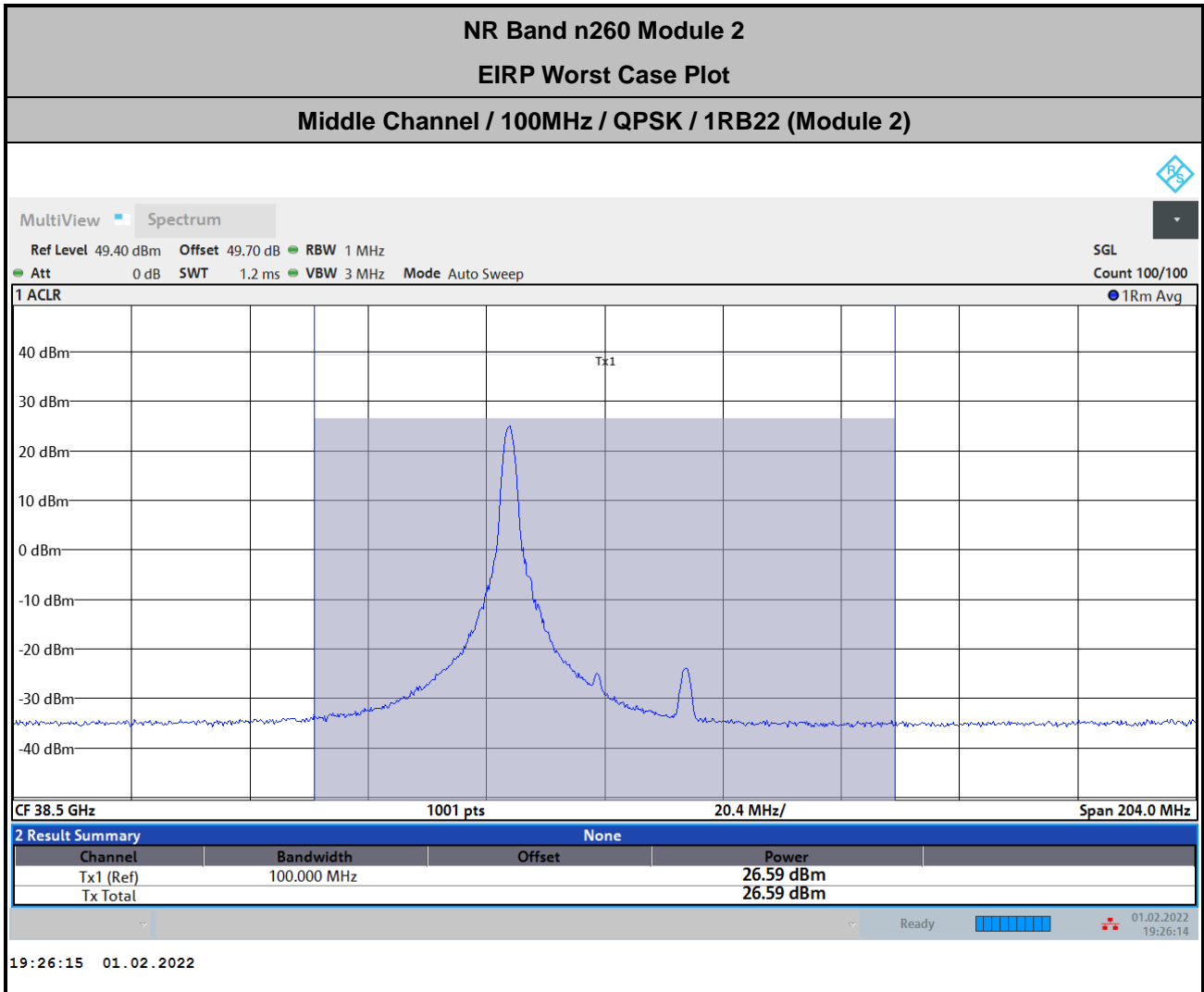
Note : The 200MHz Bw is carrier aggregation by 2CC of 100MHz.

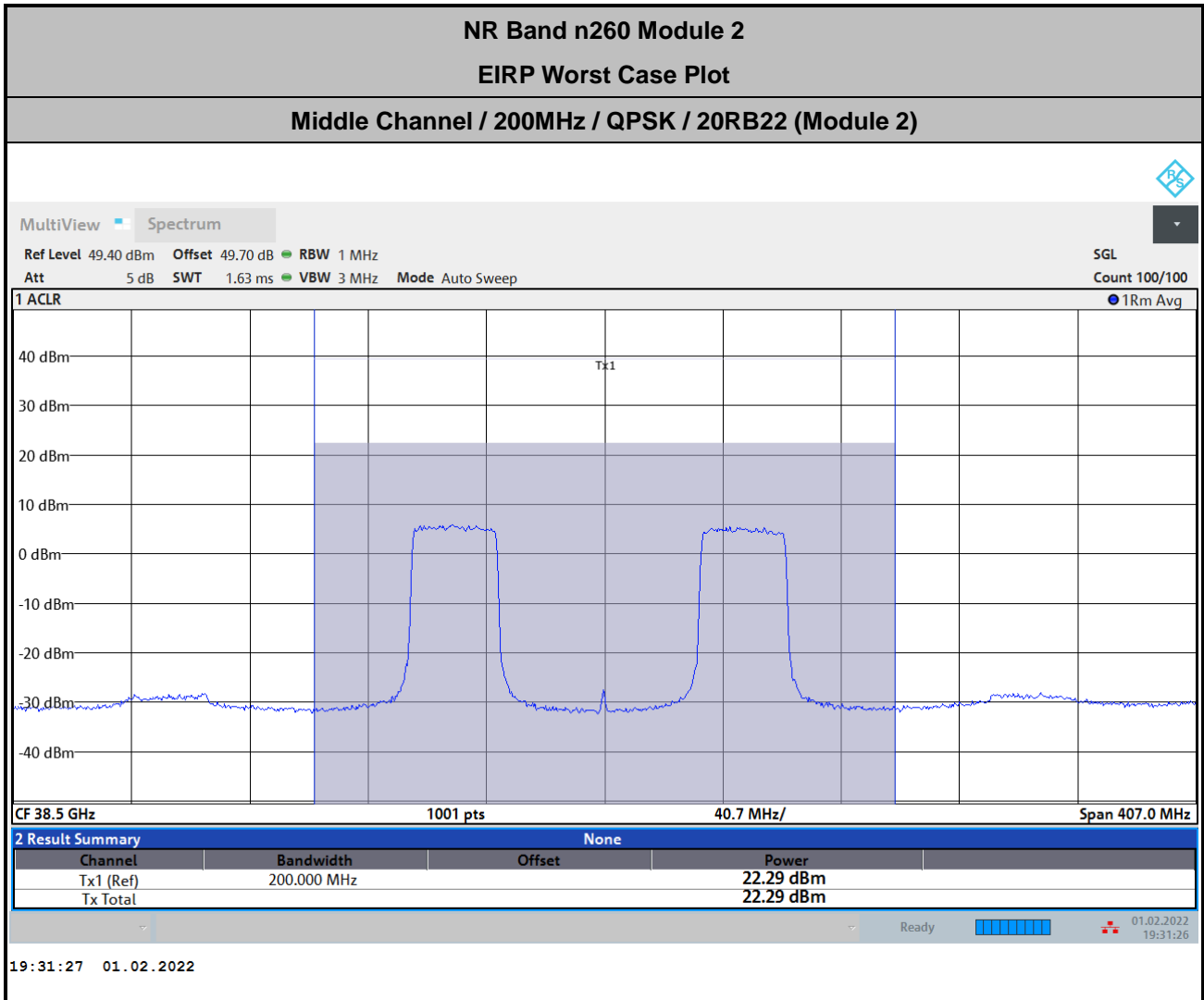


| NR Band n260 Module 2 AG0+1 (Beam ID:52+180) | | | | | |
|---|----------|----------|------------|-----------|------------|
| Maximum Average EIRP [dBm] | | | | | |
| Highest | BW [MHz] | Waveform | Modulation | Inner 1RB | Inner Full |
| | 50 | DFT-S | BPSK | 26.24 | 26.39 |
| | 50 | DFT-S | QPSK | 26.67 | 26.40 |
| | 50 | DFT-S | 16QAM | 24.22 | 24.44 |
| | 50 | DFT-S | 64QAM | 22.08 | 22.33 |
| | 50 | CP | QPSK | 21.14 | 20.53 |
| | 100 | DFT-S | BPSK | 26.37 | 26.24 |
| | 100 | DFT-S | QPSK | 26.44 | 26.18 |
| | 100 | DFT-S | 16QAM | 23.86 | 24.18 |
| | 100 | DFT-S | 64QAM | 21.7 | 22.05 |
| | 100 | CP | QPSK | 20.62 | 20.45 |
| | 200 | DFT-S | BPSK | 19.17 | 22.04 |
| | 200 | DFT-S | QPSK | 18.94 | 22.03 |
| | 200 | DFT-S | 16QAM | 19.26 | 21.35 |
| | 200 | DFT-S | 64QAM | 20.17 | 19.31 |
| 200 | CP | QPSK | 17.26 | 18.22 | |

Note : The 200MHz Bw is carrier aggregation by 2CC of 100MHz.







$$\text{Offset} = \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107 + 20\log(D) - 104.8$$

$$= 43.8 + 3.7 + 107 + 20\log(1) - 104.8 = 49.7 \text{ (dB)}$$



NR Band n261 Module 0

| NR Band n261 Module 0 AG0+1 (Beam ID:44+172) | | | | | |
|---|----------|----------|------------|-----------|------------|
| Maximum Average EIRP [dBm] | | | | | |
| Lowest | BW [MHz] | Waveform | Modulation | Inner 1RB | Inner Full |
| | 50 | DFT-S | BPSK | 23.23 | 23.6 |
| | 50 | DFT-S | QPSK | 23.75 | 23.65 |
| | 50 | DFT-S | 16QAM | 21.28 | 21.63 |
| | 50 | DFT-S | 64QAM | 18.74 | 19.32 |
| | 50 | CP | QPSK | 19.79 | 19.86 |
| | 100 | DFT-S | BPSK | 23.69 | 23.92 |
| | 100 | DFT-S | QPSK | 23.94 | 24.04 |
| | 100 | DFT-S | 16QAM | 21.65 | 21.98 |
| | 100 | DFT-S | 64QAM | 19.3 | 19.79 |
| | 100 | CP | QPSK | 19.75 | 19.58 |
| | 200 | DFT-S | BPSK | 17.41 | 19.83 |
| | 200 | DFT-S | QPSK | 17.43 | 20.01 |
| | 200 | DFT-S | 16QAM | 17.87 | 19.47 |
| | 200 | DFT-S | 64QAM | 17.59 | 17.8 |
| 200 | CP | QPSK | 17.7 | 17.39 | |

Note : The 200MHz Bw is carrier aggregation by 2CC of 100MHz.



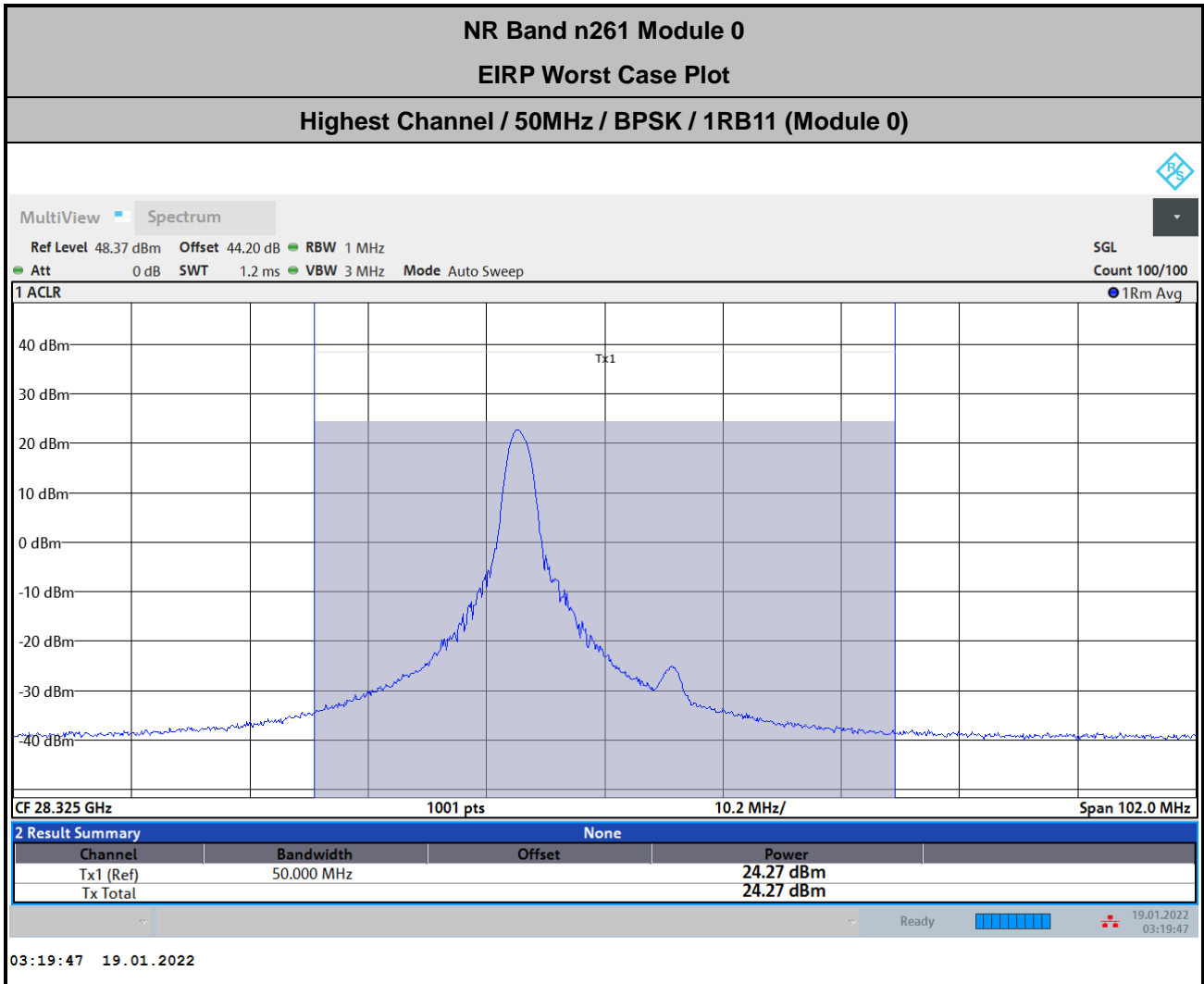
| NR Band n261 Module 0 AG0+1 (Beam ID:44+172) | | | | | |
|---|----------|----------|------------|-----------|------------|
| Maximum Average EIRP [dBm] | | | | | |
| | BW [MHz] | Waveform | Modulation | Inner 1RB | Inner Full |
| Middle | 50 | DFT-S | BPSK | 21.56 | 21.46 |
| | 50 | DFT-S | QPSK | 21.56 | 21.74 |
| | 50 | DFT-S | 16QAM | 19.59 | 19.34 |
| | 50 | DFT-S | 64QAM | 17.43 | 17.27 |
| | 50 | CP | QPSK | 17.27 | 17.6 |
| | 100 | DFT-S | BPSK | 22.23 | 22.16 |
| | 100 | DFT-S | QPSK | 22.21 | 22.26 |
| | 100 | DFT-S | 16QAM | 20.2 | 20.07 |
| | 100 | DFT-S | 64QAM | 18.13 | 18.06 |
| | 100 | CP | QPSK | 17.52 | 17.78 |
| | 200 | DFT-S | BPSK | 16.65 | 18.8 |
| | 200 | DFT-S | QPSK | 16.04 | 18.77 |
| | 200 | DFT-S | 16QAM | 17.2 | 18.31 |
| | 200 | DFT-S | 64QAM | 16.27 | 16.57 |
| 200 | CP | QPSK | 14.76 | 16.01 | |

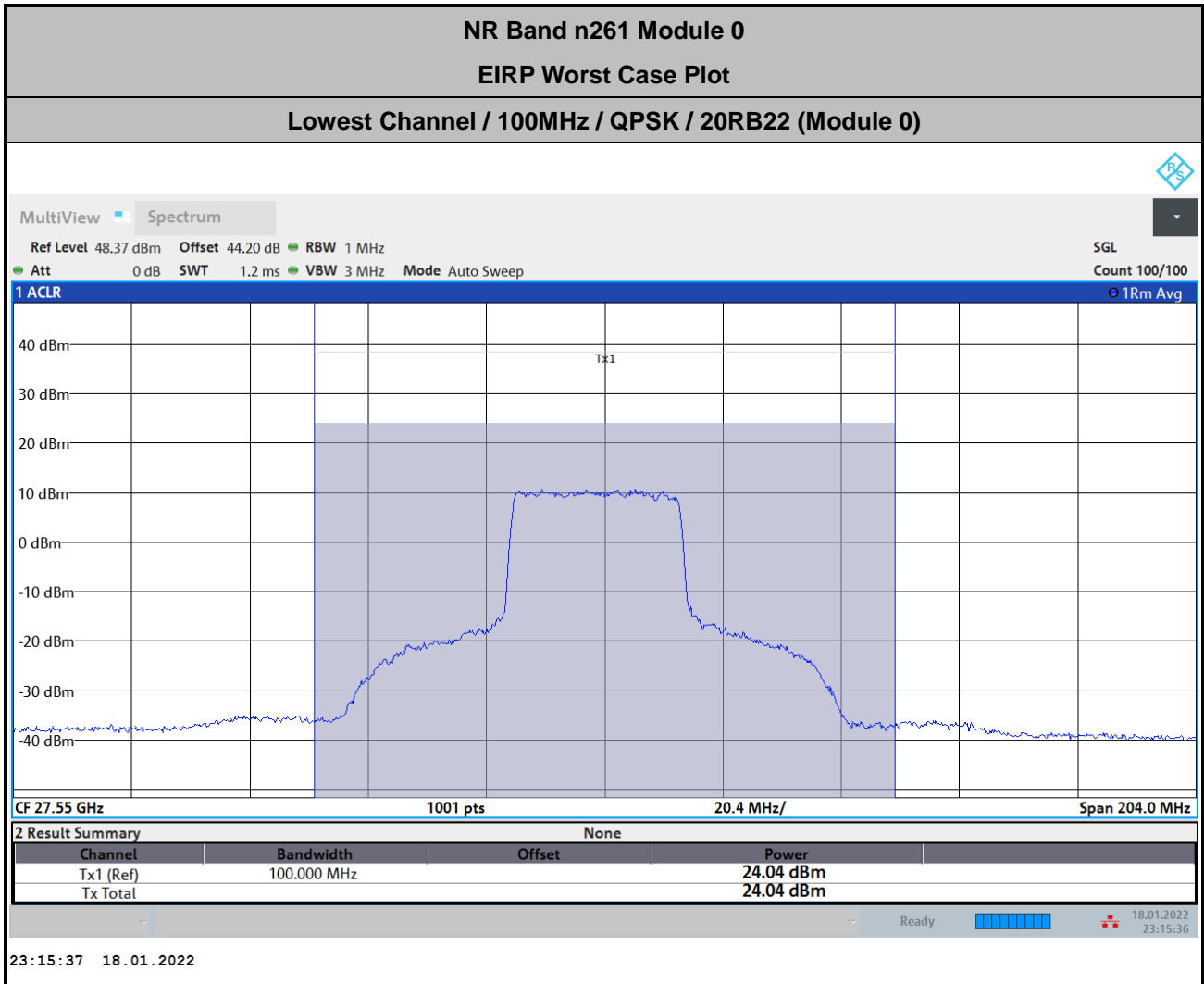
Note : The 200MHz Bw is carrier aggregation by 2CC of 100MHz.

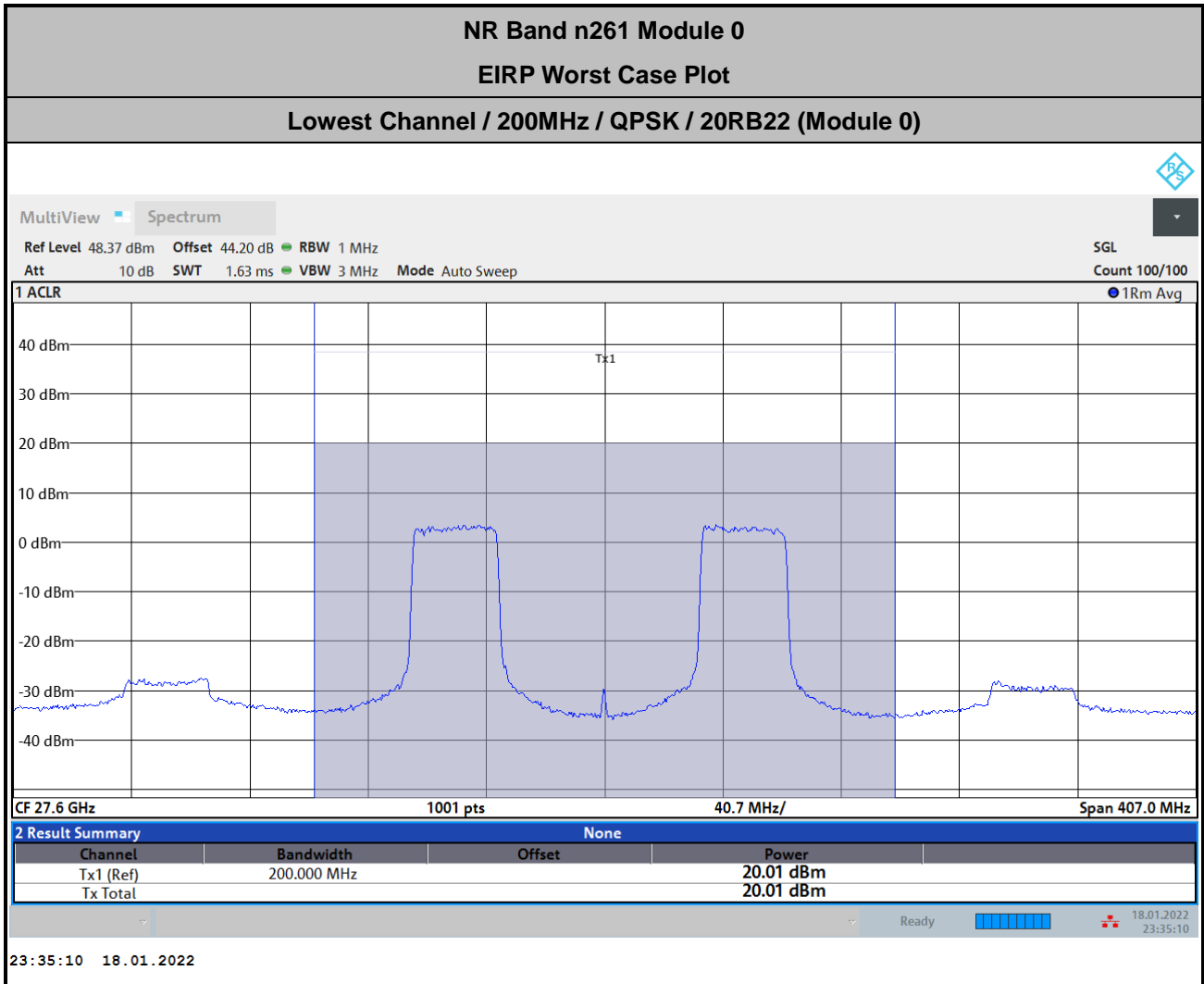


| NR Band n261 Module 0 AG0+1 (Beam ID:44+172) | | | | | |
|---|----------|----------|------------|-----------|------------|
| Maximum Average EIRP [dBm] | | | | | |
| Highest | BW [MHz] | Waveform | Modulation | Inner 1RB | Inner Full |
| | 50 | DFT-S | BPSK | 24.27 | 23.94 |
| | 50 | DFT-S | QPSK | 24.16 | 23.82 |
| | 50 | DFT-S | 16QAM | 21.89 | 21.78 |
| | 50 | DFT-S | 64QAM | 19.87 | 19.71 |
| | 50 | CP | QPSK | 18.25 | 18.82 |
| | 100 | DFT-S | BPSK | 23.83 | 23.68 |
| | 100 | DFT-S | QPSK | 23.85 | 23.67 |
| | 100 | DFT-S | 16QAM | 21.57 | 21.61 |
| | 100 | DFT-S | 64QAM | 19.6 | 19.54 |
| | 100 | CP | QPSK | 17.98 | 18.58 |
| | 200 | DFT-S | BPSK | 14.23 | 16.62 |
| | 200 | DFT-S | QPSK | 13.79 | 16.57 |
| | 200 | DFT-S | 16QAM | 15.27 | 16.12 |
| | 200 | DFT-S | 64QAM | 14.1 | 14.44 |
| 200 | CP | QPSK | 15.83 | 17.4 | |

Note : The 200MHz Bw is carrier aggregation by 2CC of 100MHz.







$$\text{Offset} = \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107 + 20\log(D) - 104.8$$

$$= 39.3 + 2.7 + 107 + 20\log(1) - 104.8 = 44.2 \text{ (dB)}$$



NR Band n261 Module 1

| NR Band n261 Module 1 AG0+1 (Beam ID:33+161) | | | | | |
|---|----------|----------|------------|-----------|------------|
| Maximum Average EIRP [dBm] | | | | | |
| Lowest | BW [MHz] | Waveform | Modulation | Inner 1RB | Inner Full |
| | 50 | DFT-S | BPSK | 28.82 | 29.29 |
| | 50 | DFT-S | QPSK | 29.29 | 29.38 |
| | 50 | DFT-S | 16QAM | 27.33 | 27.35 |
| | 50 | DFT-S | 64QAM | 24.33 | 24.95 |
| | 50 | CP | QPSK | 23.91 | 23.66 |
| | 100 | DFT-S | BPSK | 28.07 | 28.54 |
| | 100 | DFT-S | QPSK | 28.49 | 28.78 |
| | 100 | DFT-S | 16QAM | 26.77 | 26.42 |
| | 100 | DFT-S | 64QAM | 23.68 | 24.37 |
| | 100 | CP | QPSK | 23.48 | 22.96 |
| | 200 | DFT-S | BPSK | 21.34 | 24.42 |
| | 200 | DFT-S | QPSK | 21.84 | 24.52 |
| | 200 | DFT-S | 16QAM | 22.57 | 23.91 |
| | 200 | DFT-S | 64QAM | 21.89 | 22.48 |
| 200 | CP | QPSK | 19.69 | 20.79 | |

Note : The 200MHz Bw is carrier aggregation by 2CC of 100MHz.



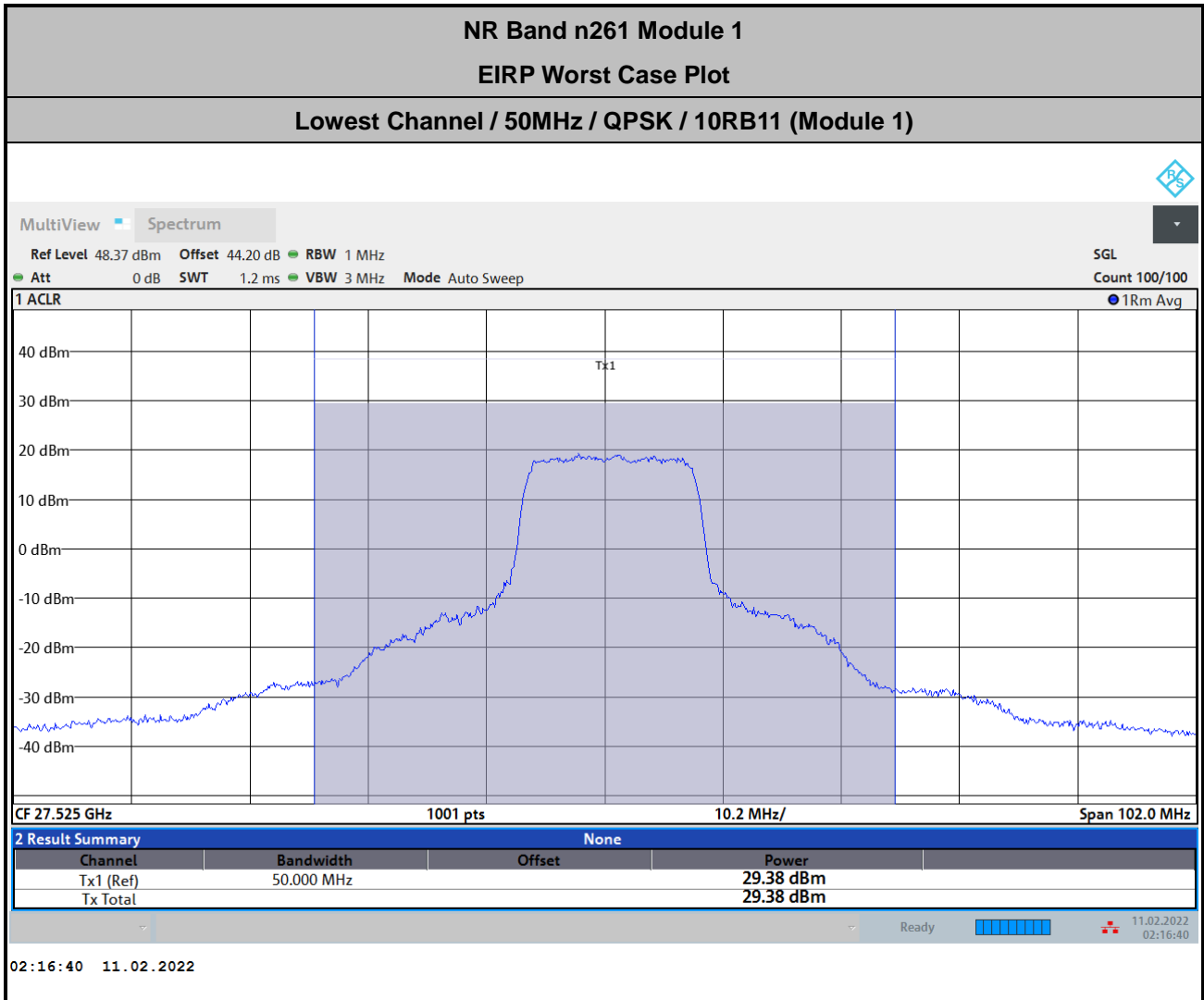
| NR Band n261 Module 1 AG0+1 (Beam ID:33+161) | | | | | |
|---|----------|----------|------------|-----------|------------|
| Maximum Average EIRP [dBm] | | | | | |
| Middle | BW [MHz] | Waveform | Modulation | Inner 1RB | Inner Full |
| | 50 | DFT-S | BPSK | 28.34 | 27.99 |
| | 50 | DFT-S | QPSK | 28.45 | 28.08 |
| | 50 | DFT-S | 16QAM | 26.34 | 15.86 |
| | 50 | DFT-S | 64QAM | 23.88 | 23.63 |
| | 50 | CP | QPSK | 22.62 | 23 |
| | 100 | DFT-S | BPSK | 28.88 | 28.97 |
| | 100 | DFT-S | QPSK | 28.97 | 28.86 |
| | 100 | DFT-S | 16QAM | 26.8 | 26.82 |
| | 100 | DFT-S | 64QAM | 24.54 | 24.79 |
| | 100 | CP | QPSK | 23.53 | 23.67 |
| | 200 | DFT-S | BPSK | 22.17 | 24.54 |
| | 200 | DFT-S | QPSK | 21.96 | 24.76 |
| | 200 | DFT-S | 16QAM | 23.02 | 24.18 |
| | 200 | DFT-S | 64QAM | 22.5 | 22.18 |
| 200 | CP | QPSK | 21.59 | 21.44 | |

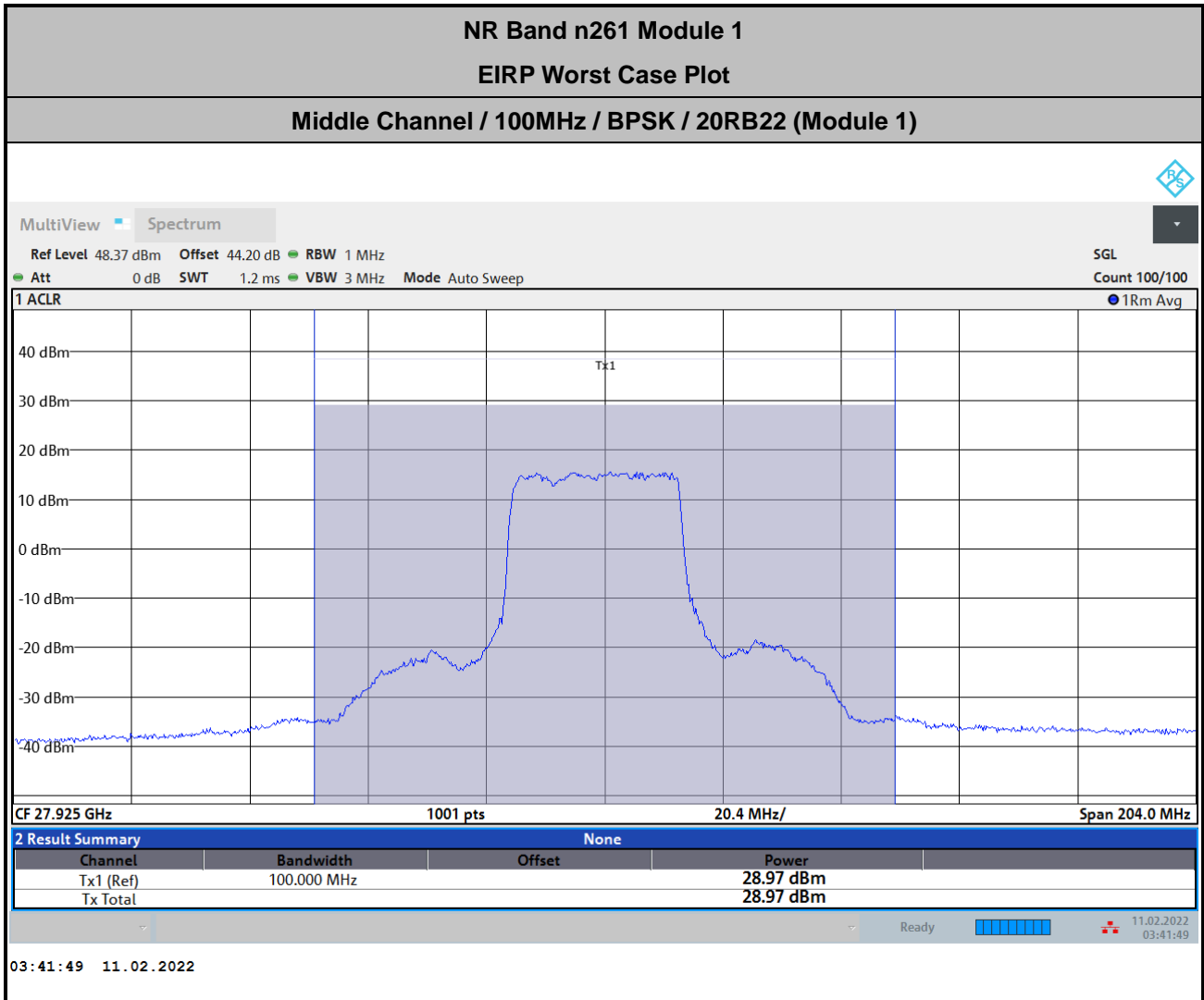
Note : The 200MHz Bw is carrier aggregation by 2CC of 100MHz.

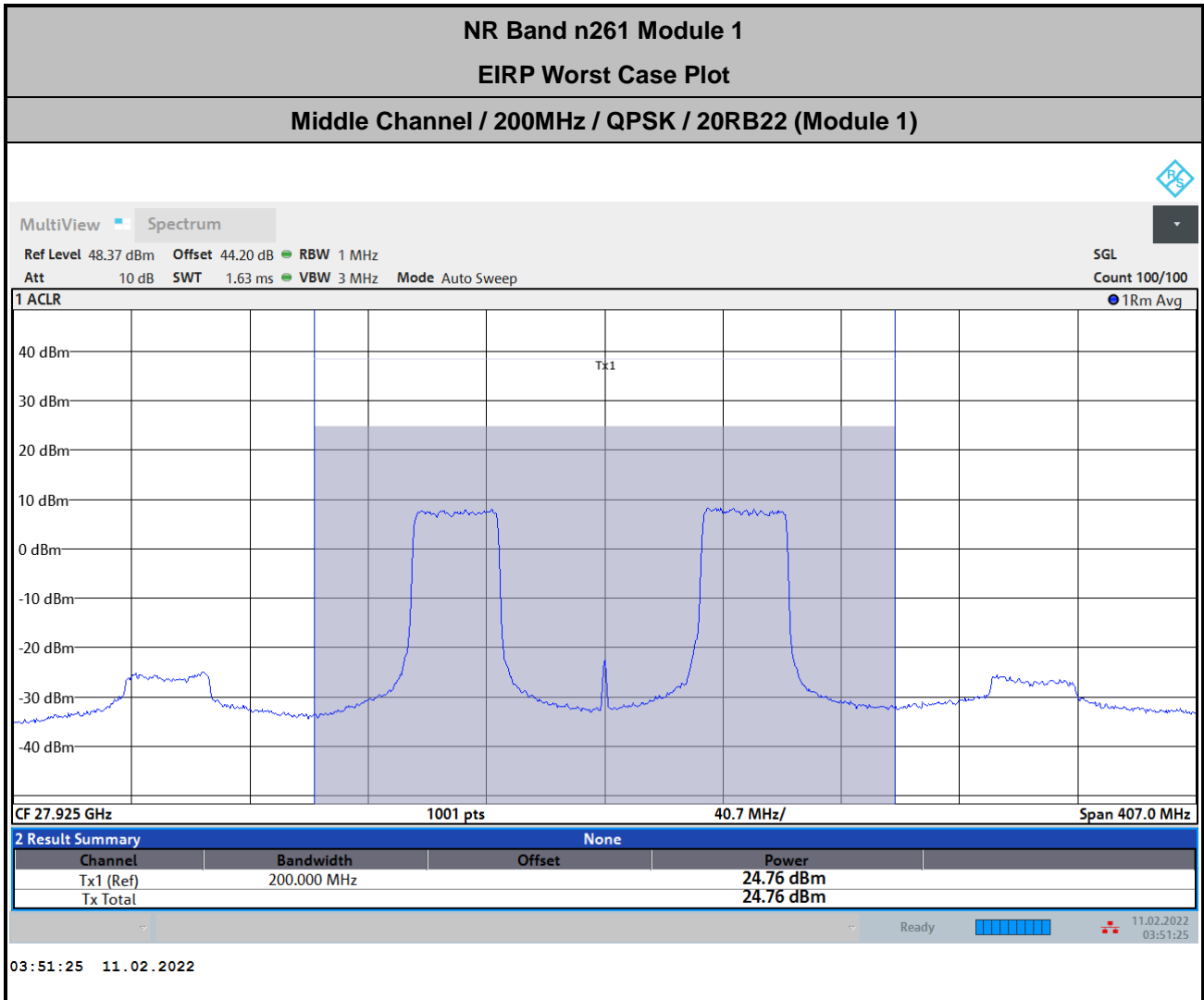


| NR Band n261 Module 1 AG0+1 (Beam ID:33+161) | | | | | |
|---|----------|----------|------------|-----------|------------|
| Maximum Average EIRP [dBm] | | | | | |
| Highest | BW [MHz] | Waveform | Modulation | Inner 1RB | Inner Full |
| | 50 | DFT-S | BPSK | 29.01 | 29.19 |
| | 50 | DFT-S | QPSK | 28.83 | 29.14 |
| | 50 | DFT-S | 16QAM | 27.03 | 27.26 |
| | 50 | DFT-S | 64QAM | 25.02 | 24.81 |
| | 50 | CP | QPSK | 23.22 | 23.04 |
| | 100 | DFT-S | BPSK | 28.72 | 28.87 |
| | 100 | DFT-S | QPSK | 28.74 | 28.86 |
| | 100 | DFT-S | 16QAM | 26.67 | 26.87 |
| | 100 | DFT-S | 64QAM | 24.75 | 24.55 |
| | 100 | CP | QPSK | 22.89 | 22.65 |
| | 200 | DFT-S | BPSK | 21.54 | 23.93 |
| | 200 | DFT-S | QPSK | 21.46 | 23.99 |
| | 200 | DFT-S | 16QAM | 22.18 | 23.55 |
| | 200 | DFT-S | 64QAM | 21.8 | 21.72 |
| 200 | CP | QPSK | 19.78 | 19.88 | |

Note : The 200MHz Bw is carrier aggregation by 2CC of 100MHz.







$$\text{Offset} = \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107 + 20\log(D) - 104.8$$

$$= 39.3 + 2.7 + 107 + 20\log(1) - 104.8 = 44.2 \text{ (dB)}$$



NR Band n261 Module 2

| NR Band n261 Module 2 AG0+1 (Beam ID:52+180) | | | | | |
|---|----------|----------|------------|-----------|------------|
| Maximum Average EIRP [dBm] | | | | | |
| Lowest | BW [MHz] | Waveform | Modulation | Inner 1RB | Inner Full |
| | 50 | DFT-S | BPSK | 25.11 | 24.97 |
| | 50 | DFT-S | QPSK | 25.09 | 24.93 |
| | 50 | DFT-S | 16QAM | 22.61 | 23 |
| | 50 | DFT-S | 64QAM | 20.39 | 20.84 |
| | 50 | CP | QPSK | 18.87 | 19.14 |
| | 100 | DFT-S | BPSK | 24.74 | 24.27 |
| | 100 | DFT-S | QPSK | 24.63 | 24.35 |
| | 100 | DFT-S | 16QAM | 22.22 | 22.34 |
| | 100 | DFT-S | 64QAM | 20 | 20.1 |
| | 100 | CP | QPSK | 18.77 | 18.85 |
| | 200 | DFT-S | BPSK | 17.87 | 20.02 |
| | 200 | DFT-S | QPSK | 17.45 | 20.04 |
| | 200 | DFT-S | 16QAM | 17.61 | 19.49 |
| | 200 | DFT-S | 64QAM | 18.81 | 17.88 |
| 200 | CP | QPSK | 15.45 | 16.64 | |

Note : The 200MHz Bw is carrier aggregation by 2CC of 100MHz.



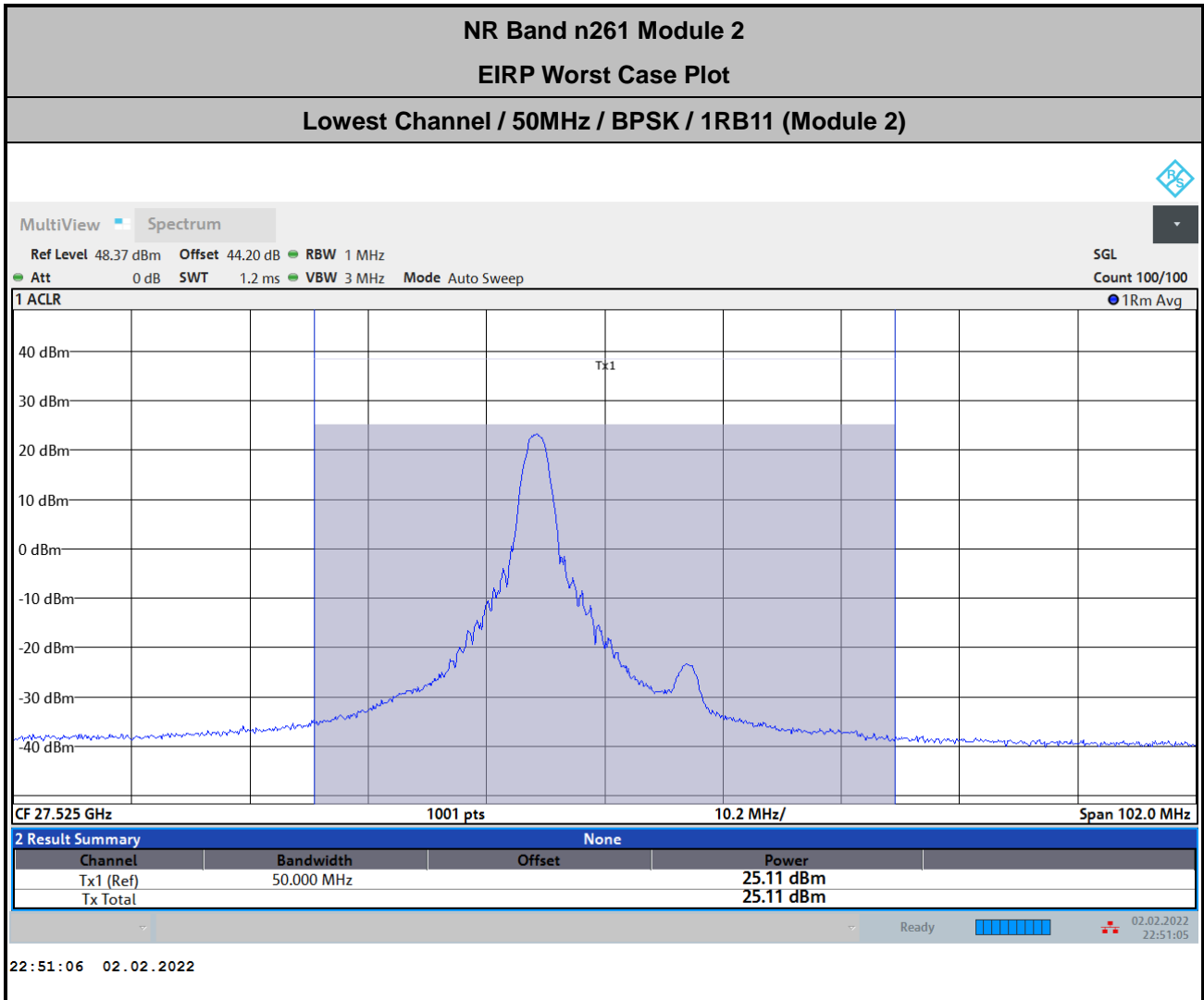
| NR Band n261 Module 2 AG0+1 (Beam ID:52+180) | | | | | |
|---|----------|----------|------------|-----------|------------|
| Maximum Average EIRP [dBm] | | | | | |
| Middle | BW [MHz] | Waveform | Modulation | Inner 1RB | Inner Full |
| | 50 | DFT-S | BPSK | 23.33 | 23.45 |
| | 50 | DFT-S | QPSK | 23.45 | 23.41 |
| | 50 | DFT-S | 16QAM | 22.11 | 21.42 |
| | 50 | DFT-S | 64QAM | 19.05 | 19.07 |
| | 50 | CP | QPSK | 18.23 | 17.93 |
| | 100 | DFT-S | BPSK | 24.13 | 24.25 |
| | 100 | DFT-S | QPSK | 24.35 | 24.07 |
| | 100 | DFT-S | 16QAM | 22.87 | 22.05 |
| | 100 | DFT-S | 64QAM | 19.84 | 19.96 |
| | 100 | CP | QPSK | 18.58 | 18.98 |
| | 200 | DFT-S | BPSK | 17.75 | 20.22 |
| | 200 | DFT-S | QPSK | 18.1 | 20.21 |
| | 200 | DFT-S | 16QAM | 18.39 | 19.77 |
| | 200 | DFT-S | 64QAM | 18.28 | 17.97 |
| 200 | CP | QPSK | 15.24 | 16.98 | |

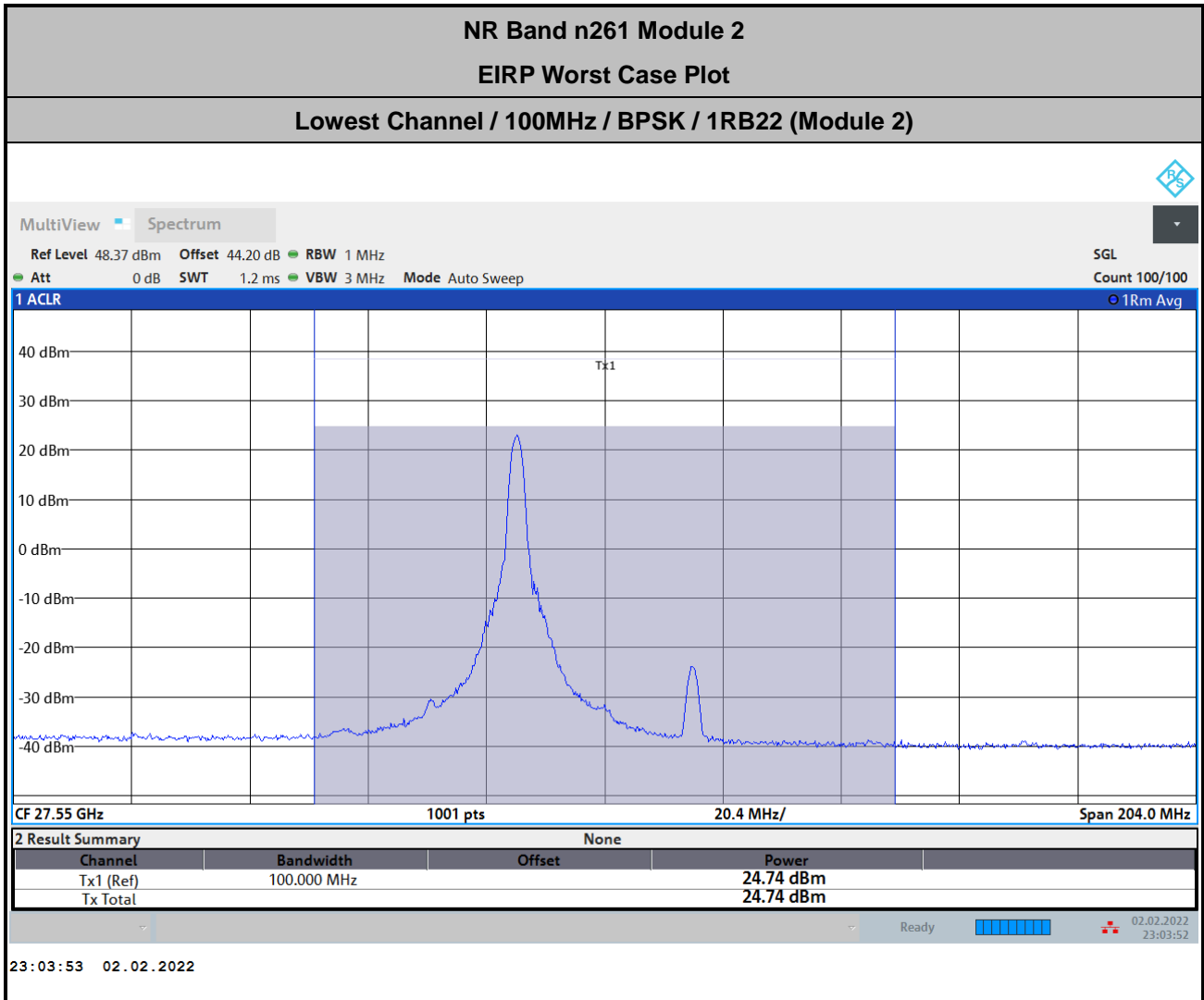
Note : The 200MHz Bw is carrier aggregation by 2CC of 100MHz.

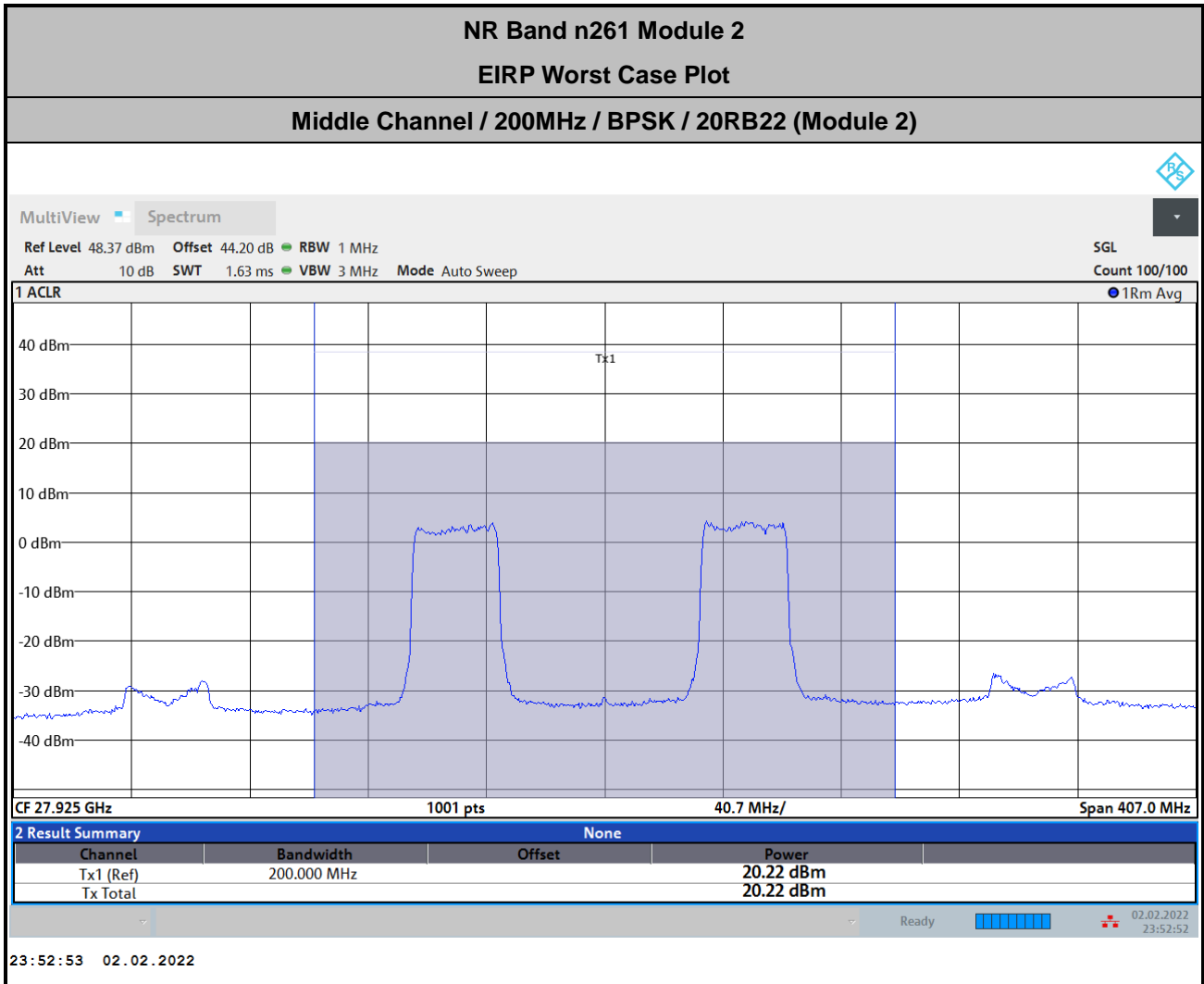


| NR Band n261 Module 2 AG0+1 (Beam ID:52+180) | | | | | |
|---|----------|----------|------------|-----------|------------|
| Maximum Average EIRP [dBm] | | | | | |
| Highest | BW [MHz] | Waveform | Modulation | Inner 1RB | Inner Full |
| | 50 | DFT-S | BPSK | 24.52 | 24.38 |
| | 50 | DFT-S | QPSK | 24.65 | 24.3 |
| | 50 | DFT-S | 16QAM | 23.01 | 22.33 |
| | 50 | DFT-S | 64QAM | 20.1 | 20.05 |
| | 50 | CP | QPSK | 19.66 | 19.22 |
| | 100 | DFT-S | BPSK | 24.34 | 24.18 |
| | 100 | DFT-S | QPSK | 24.62 | 24.06 |
| | 100 | DFT-S | 16QAM | 23.02 | 22.24 |
| | 100 | DFT-S | 64QAM | 19.91 | 20.02 |
| | 100 | CP | QPSK | 19.77 | 19.47 |
| | 200 | DFT-S | BPSK | 17.24 | 19.56 |
| | 200 | DFT-S | QPSK | 17.41 | 19.6 |
| | 200 | DFT-S | 16QAM | 17.93 | 19.1 |
| | 200 | DFT-S | 64QAM | 17.55 | 17.35 |
| 200 | CP | QPSK | 15.07 | 16.74 | |

Note : The 200MHz Bw is carrier aggregation by 2CC of 100MHz.







$$\text{Offset} = \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107 + 20\log(D) - 104.8$$

$$= 39.3 + 2.7 + 107 + 20\log(1) - 104.8 = 44.2 \text{ (dB)}$$



NR Band n260 Module 0

Occupied Bandwidth

| Mode | DFT-s-OFDM Module 0 NR Band n260 : 99%OBW(MHz) | | | | | | | | | | | |
|------------|--|-------|-------|-------|--------|-------|-------|-------|--------|--------|--------|--------|
| BW | 50MHz | | | | 100MHz | | | | 200MHz | | | |
| Mod. | BPSK | QPSK | 16QAM | 64QAM | BPSK | QPSK | 16QAM | 64QAM | BPSK | QPSK | 16QAM | 64QAM |
| Lowest CH | 45.78 | 46.13 | 45.88 | 46.03 | 91.52 | 91.28 | 91.38 | 91.43 | 190.01 | 189.53 | 189.76 | 189.91 |
| Middle CH | 45.85 | 46.14 | 45.89 | 46.07 | 91.47 | 91.24 | 91.35 | 91.43 | 189.91 | 189.97 | 190.28 | 190.27 |
| Highest CH | 45.81 | 46.02 | 46.27 | 46.00 | 91.40 | 91.21 | 91.39 | 91.43 | 190.08 | 189.68 | 190.02 | 190.09 |

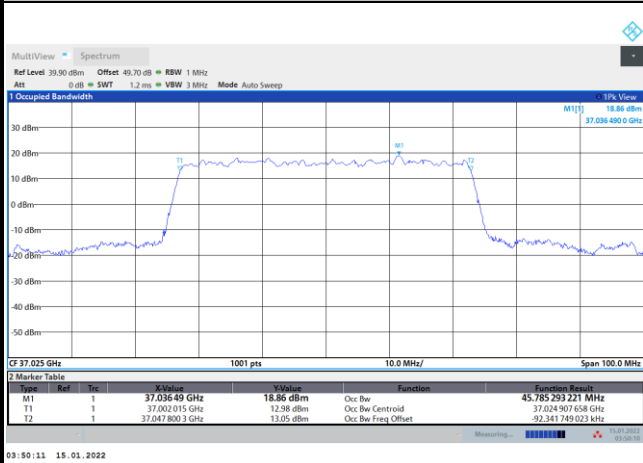
| Mode | CP-OFDM Module 0 NR Band n260 : 99%OBW(MHz) | | |
|------------|---|--------|--------|
| BW | 50MHz | 100MHz | 200MHz |
| Mod. | QPSK | QPSK | QPSK |
| Lowest CH | 46.15 | 94.44 | 192.83 |
| Middle CH | 46.31 | 94.45 | 192.81 |
| Highest CH | 46.28 | 94.45 | 193.18 |



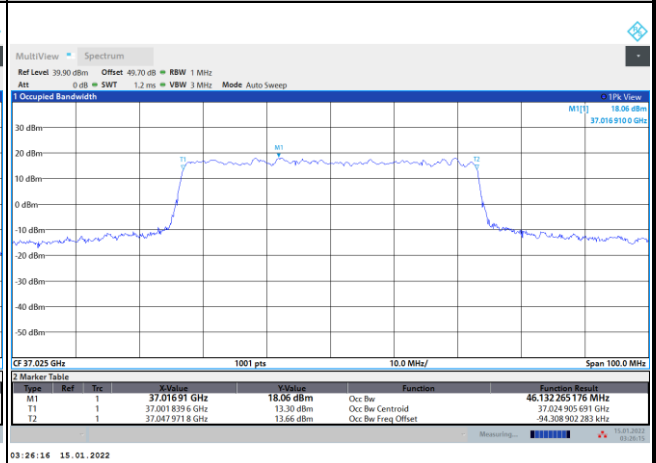
DFT-s-OFDM Module 0

NR Band n260

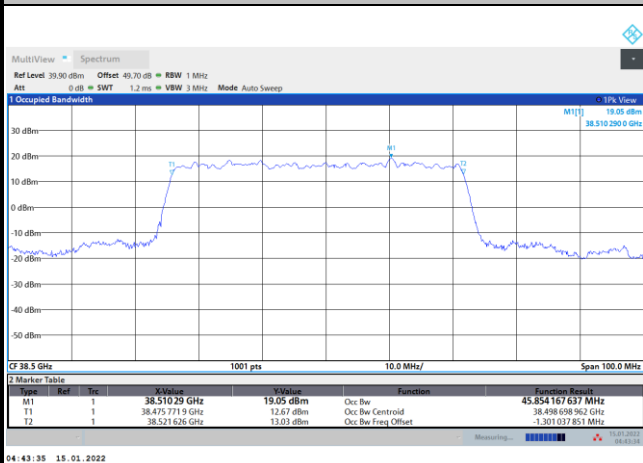
Lowest Channel / 50MHz / BPSK



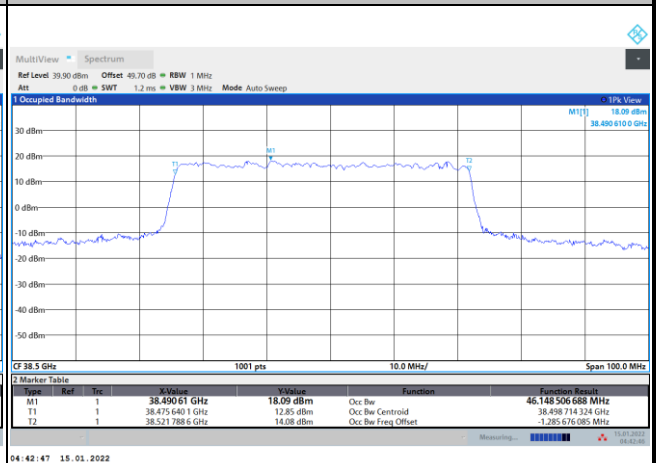
Lowest Channel / 50MHz / QPSK



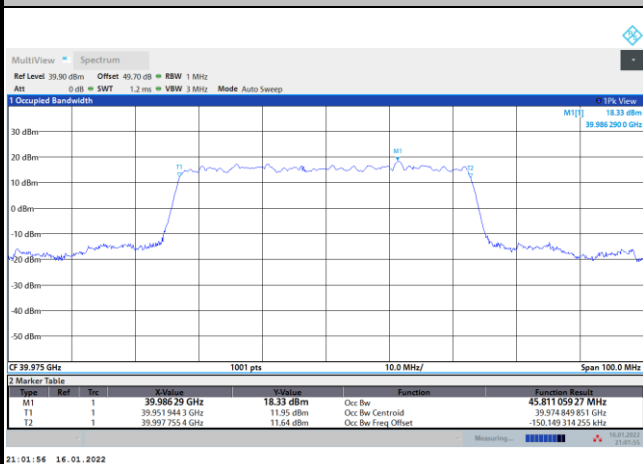
Middle Channel / 50MHz / BPSK



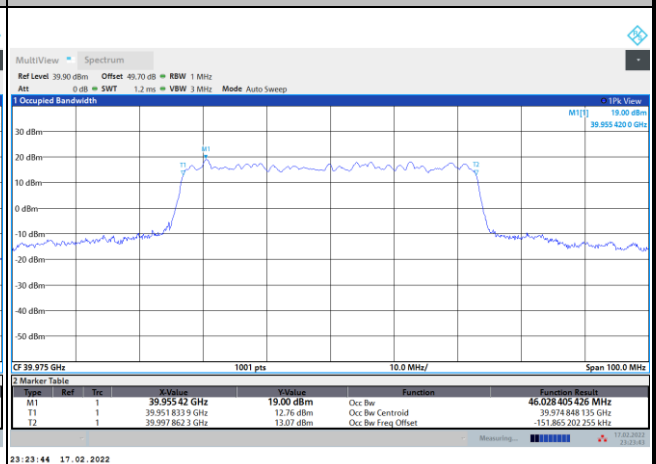
Middle Channel / 50MHz / QPSK



Highest Channel / 50MHz / BPSK



Highest Channel / 50MHz / QPSK

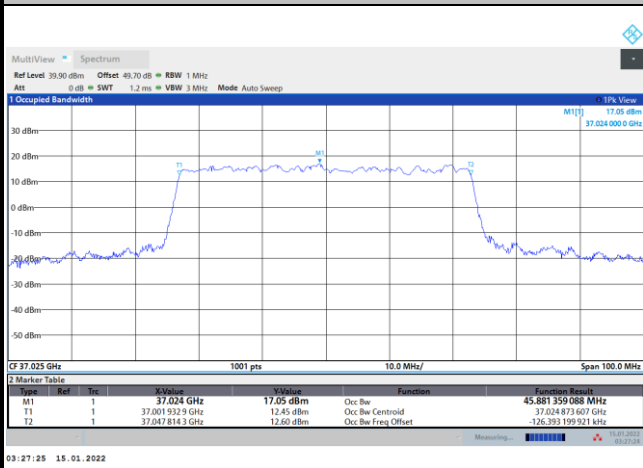




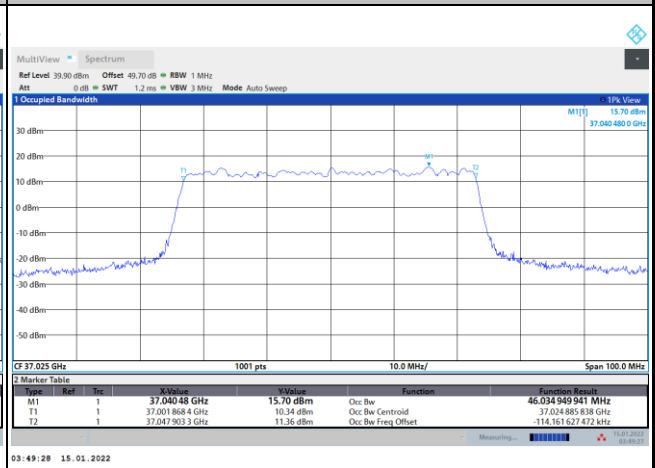
DFT-s-OFDM Module 0

NR Band n260

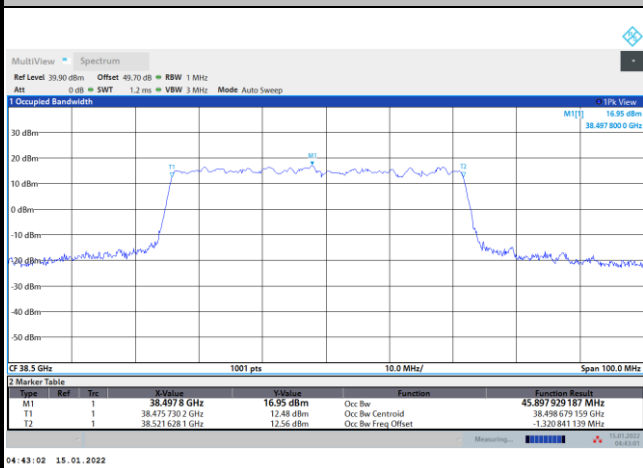
Lowest Channel / 50MHz / 16QAM



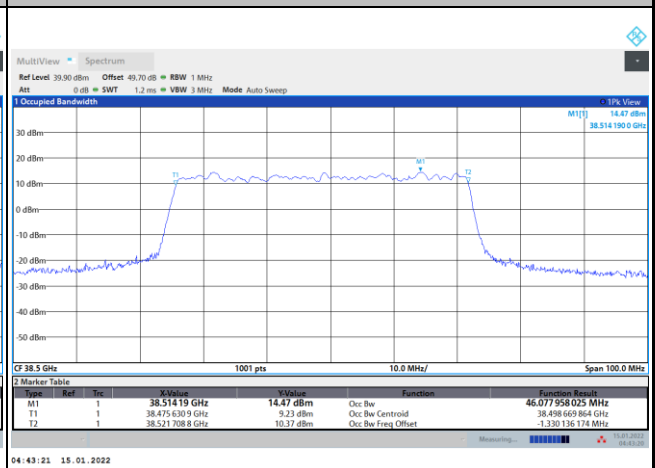
Lowest Channel / 50MHz / 64QAM



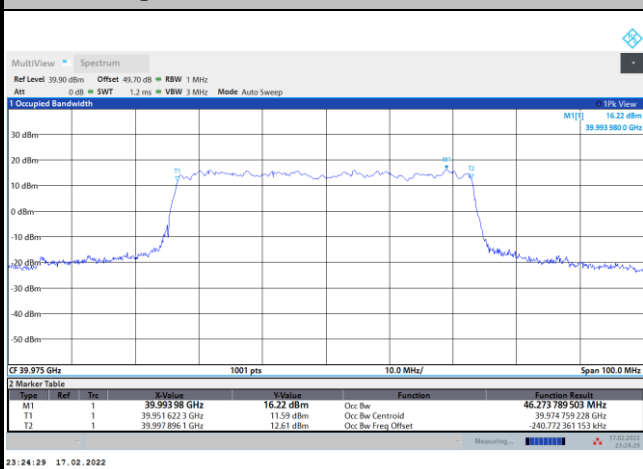
Middle Channel / 50MHz / 16QAM



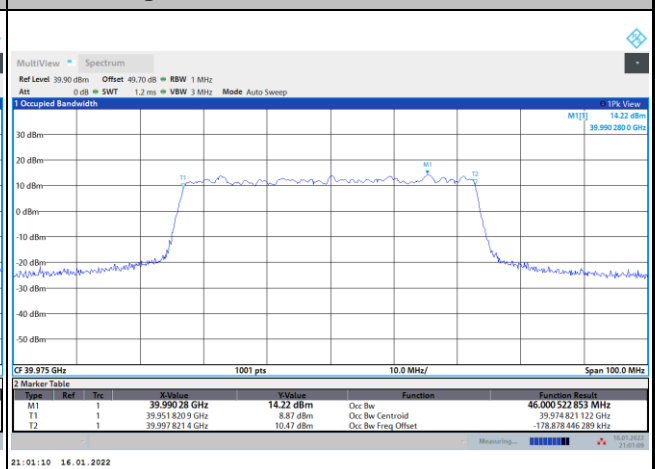
Middle Channel / 50MHz / 64QAM



Highest Channel / 50MHz / 16QAM



Highest Channel / 50MHz / 64QAM

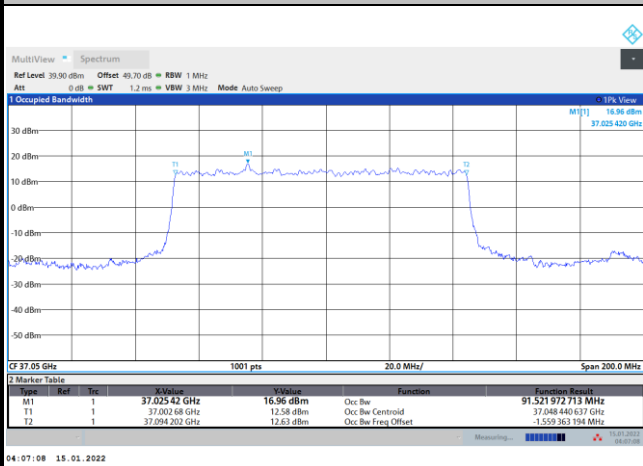




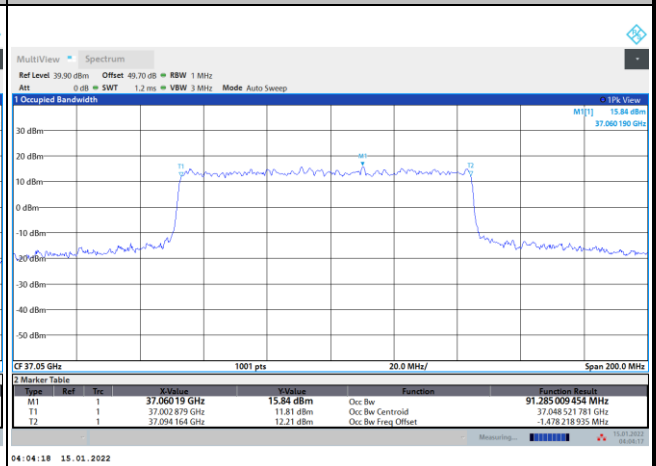
DFT-s-OFDM Module 0

NR Band n260

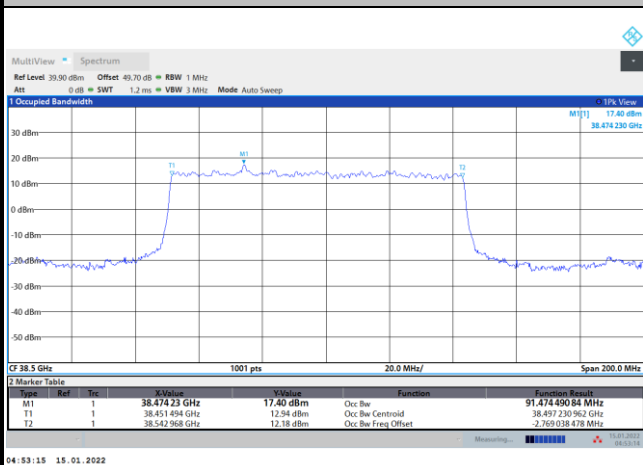
Lowest Channel / 100MHz / BPSK



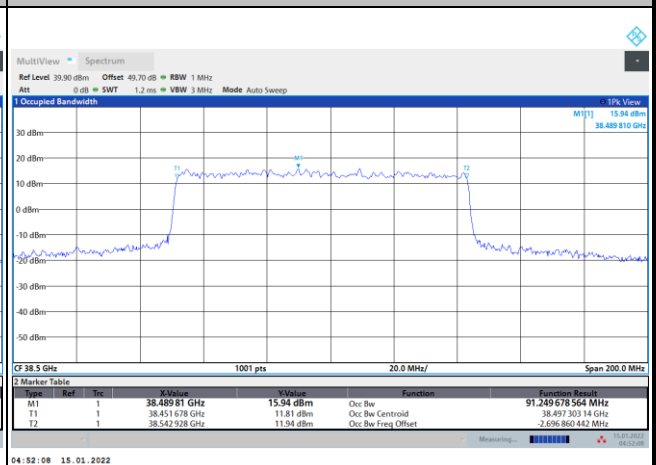
Lowest Channel / 100MHz / QPSK



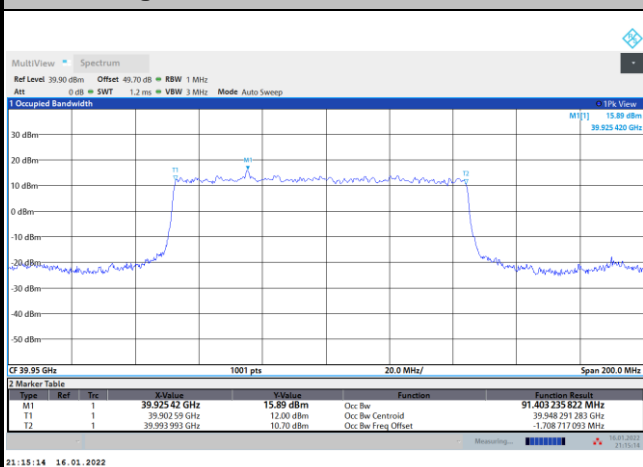
Middle Channel / 100MHz / BPSK



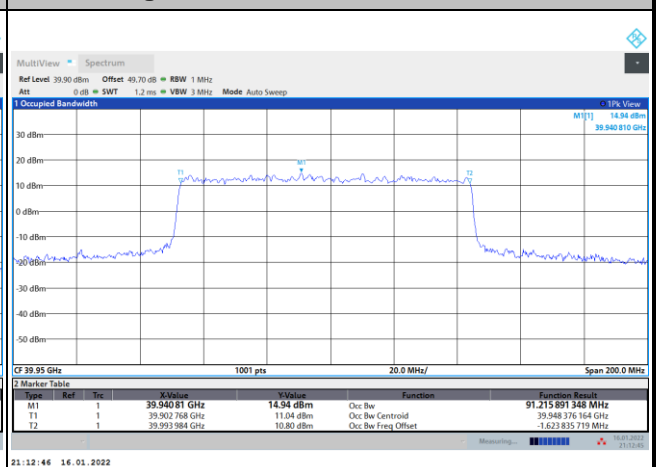
Middle Channel / 100MHz / QPSK



Highest Channel / 100MHz / BPSK



Highest Channel / 100MHz / QPSK

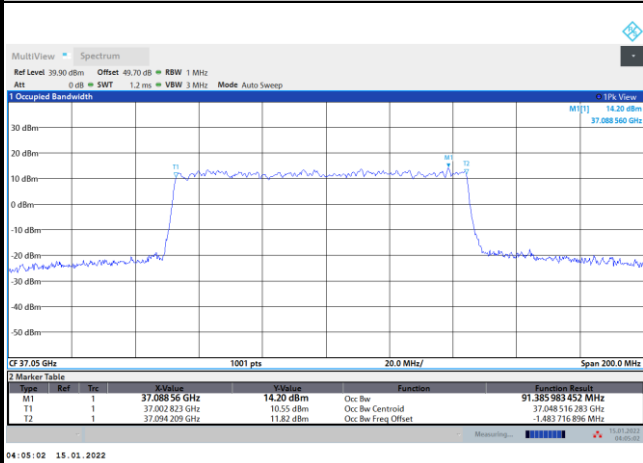




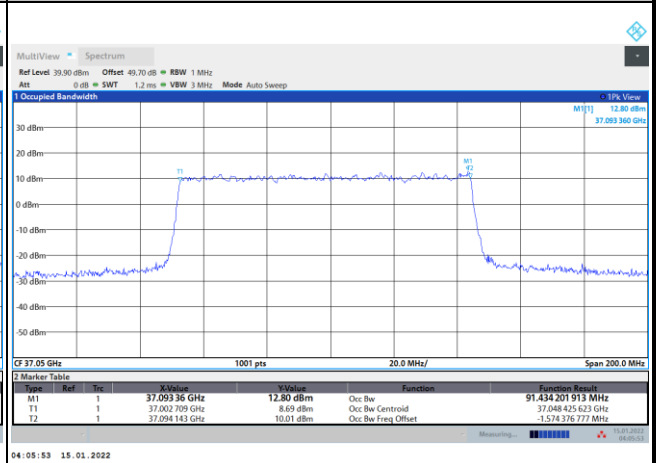
DFT-s-OFDM Module 0

NR Band n260

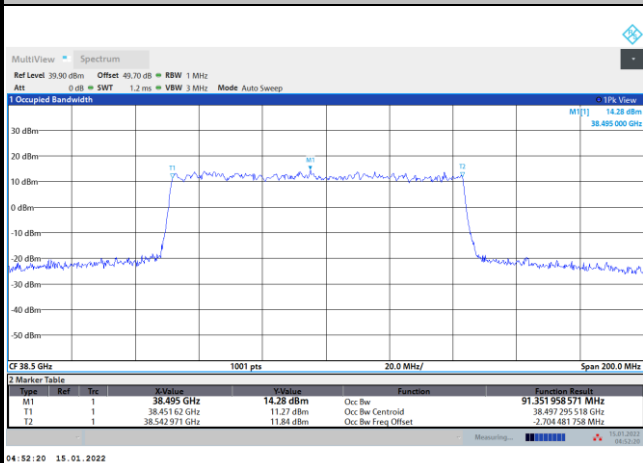
Lowest Channel / 100MHz / 16QAM



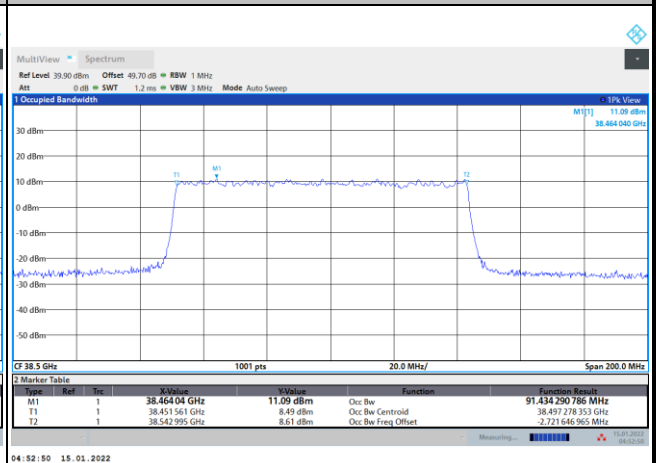
Lowest Channel / 100MHz / 64QAM



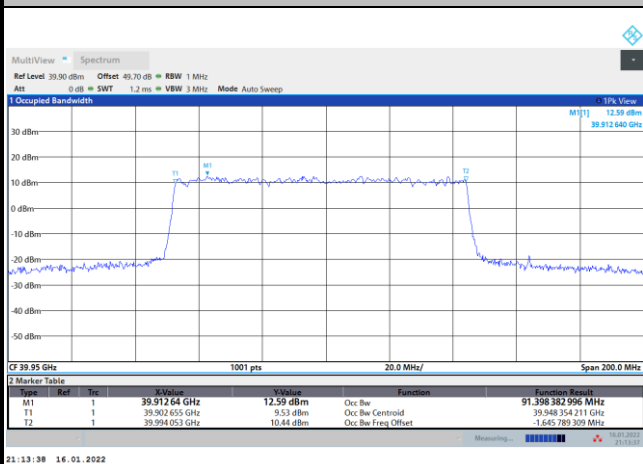
Middle Channel / 100MHz / 16QAM



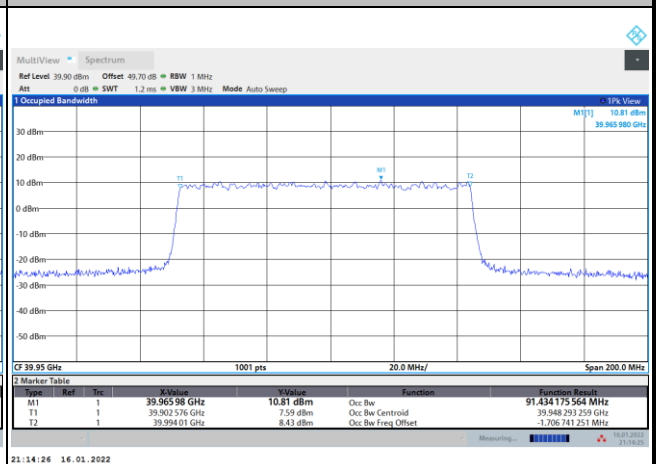
Middle Channel / 100MHz / 64QAM



Highest Channel / 100MHz / 16QAM



Highest Channel / 100MHz / 64QAM

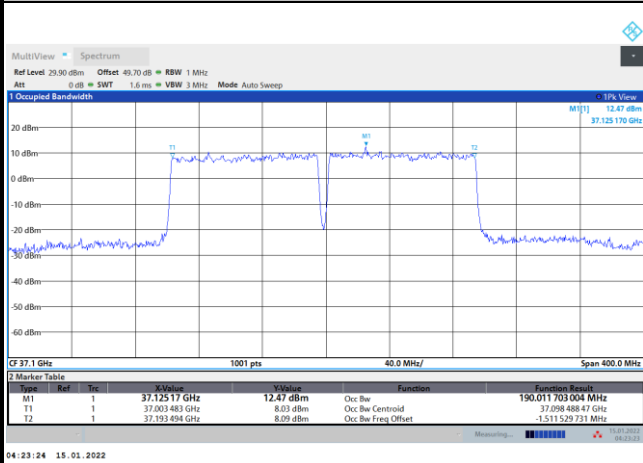




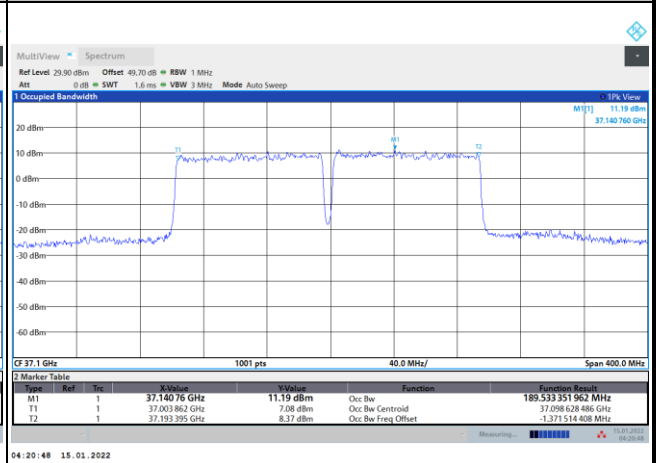
DFT-s-OFDM Module 0

NR Band n260

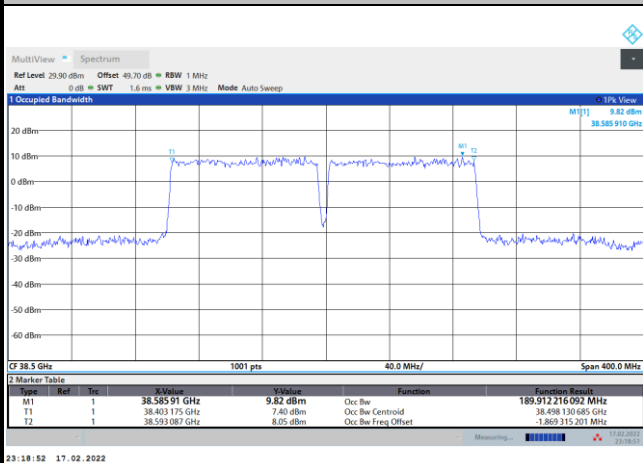
Lowest Channel / 200MHz / BPSK



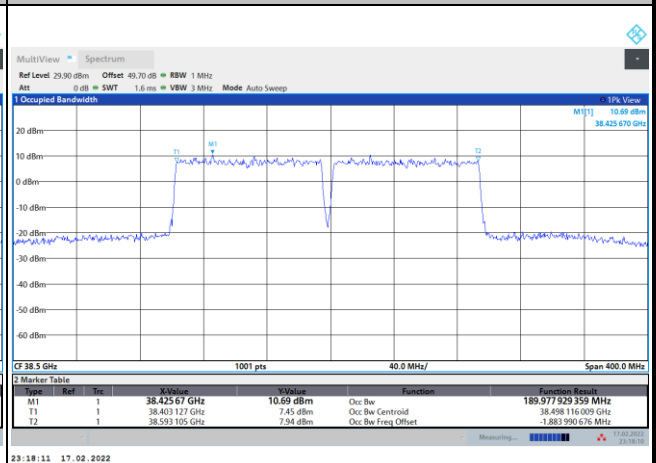
Lowest Channel / 200MHz / QPSK



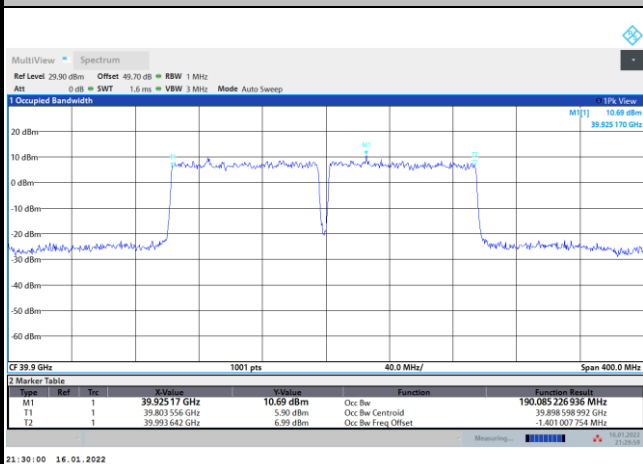
Middle Channel / 200MHz / BPSK



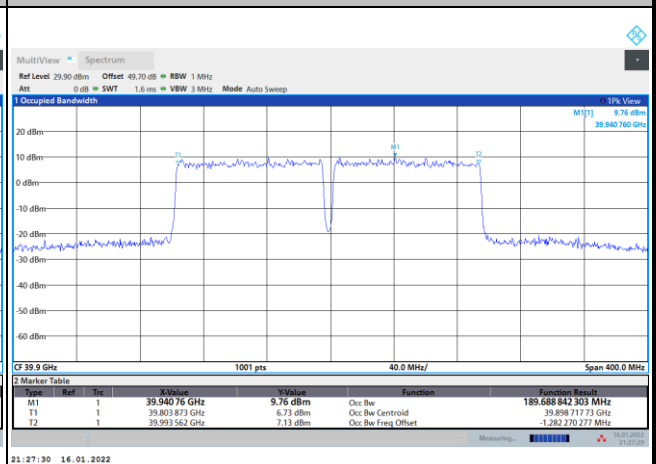
Middle Channel / 200MHz / QPSK



Highest Channel / 200MHz / BPSK



Highest Channel / 200MHz / QPSK

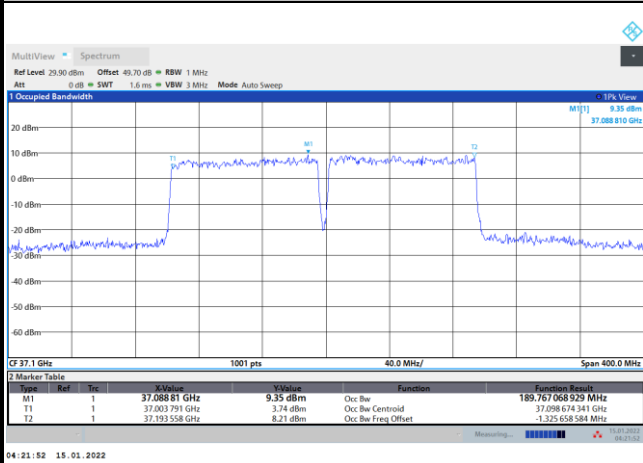




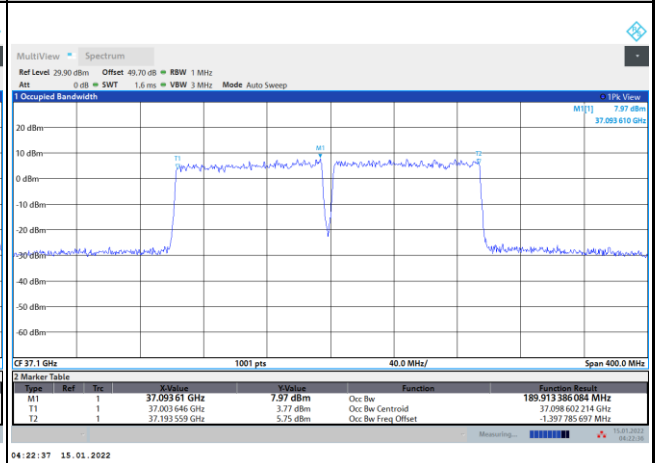
DFT-s-OFDM Module 0

NR Band n260

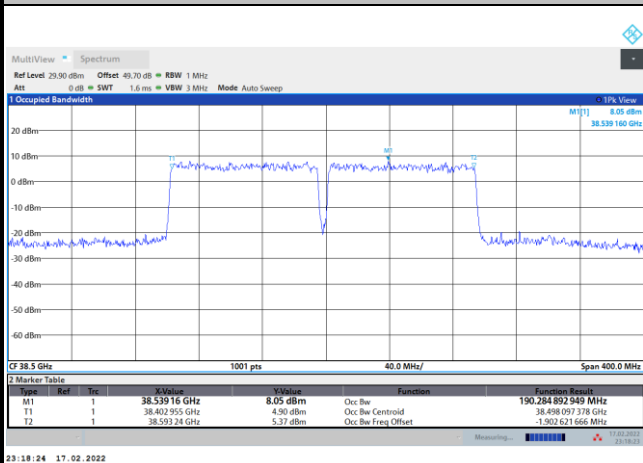
Lowest Channel / 200MHz / 16QAM



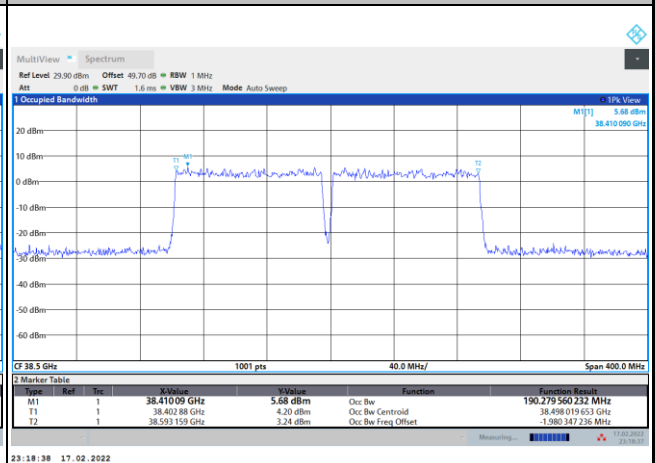
Lowest Channel / 200MHz / 64QAM



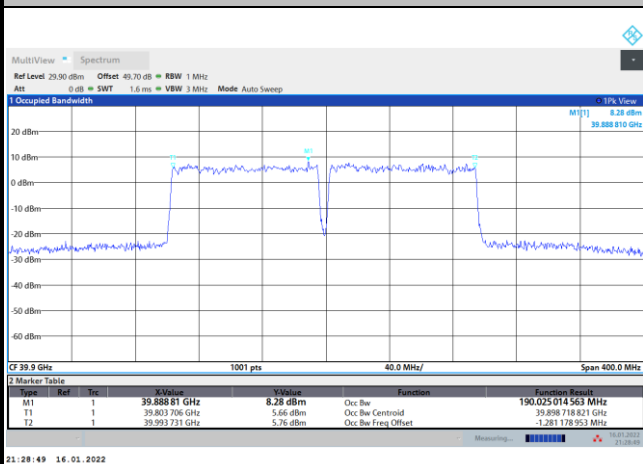
Middle Channel / 200MHz / 16QAM



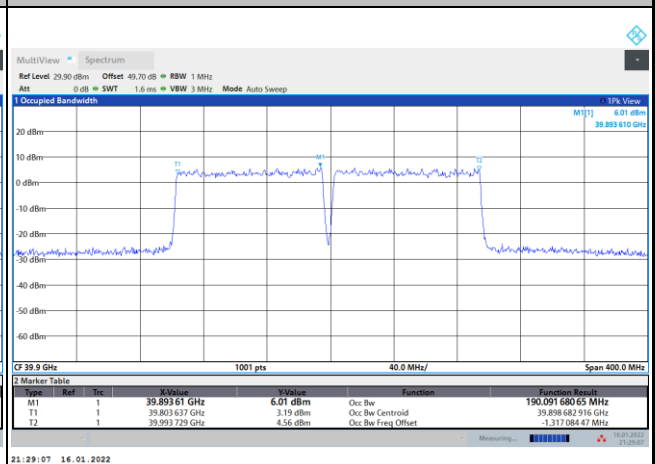
Middle Channel / 200MHz / 64QAM



Highest Channel / 200MHz / 16QAM



Highest Channel / 200MHz / 64QAM

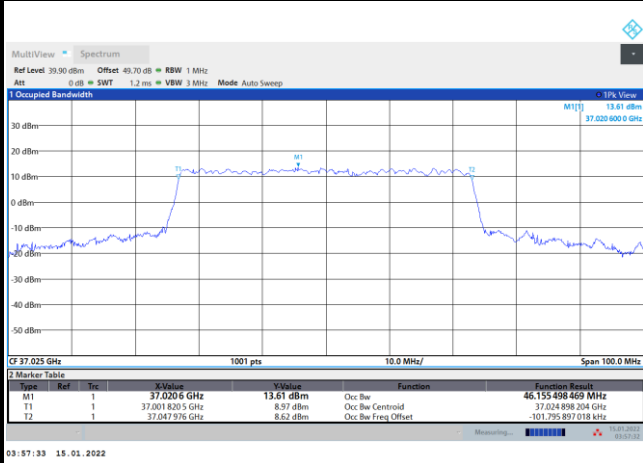




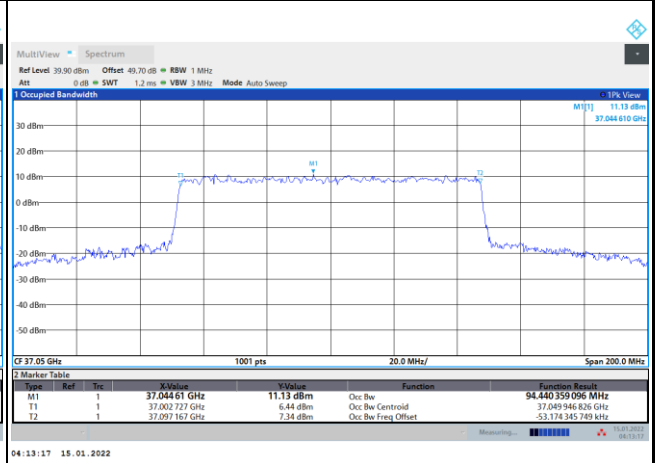
CP-OFDM Module 0

NR Band n260

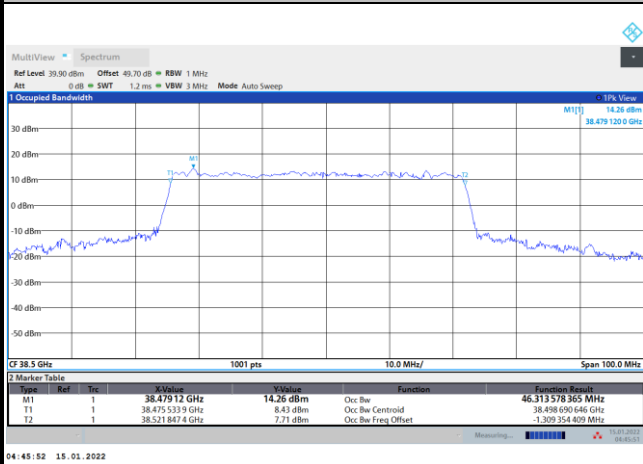
Lowest Channel / 50MHz / QPSK



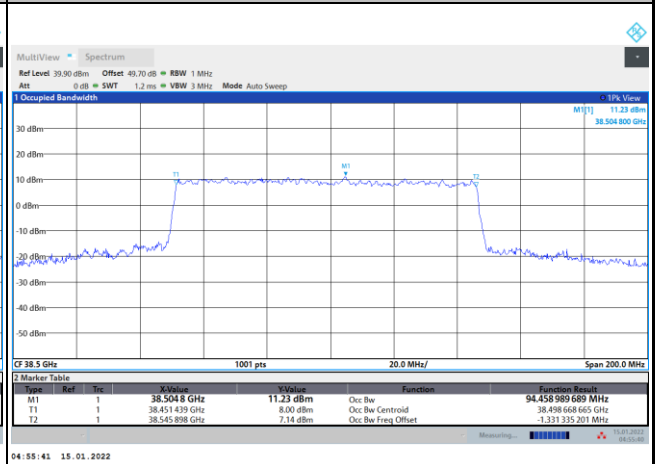
Lowest Channel / 100MHz / QPSK



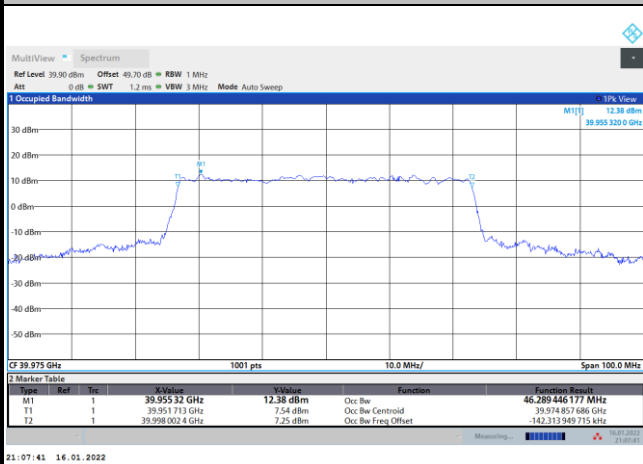
Middle Channel / 50MHz / QPSK



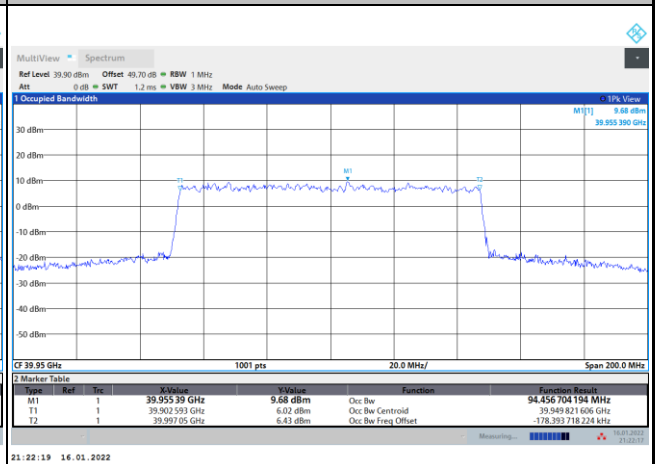
Middle Channel / 100MHz / QPSK



Highest Channel / 50MHz / QPSK



Highest Channel / 100MHz / QPSK

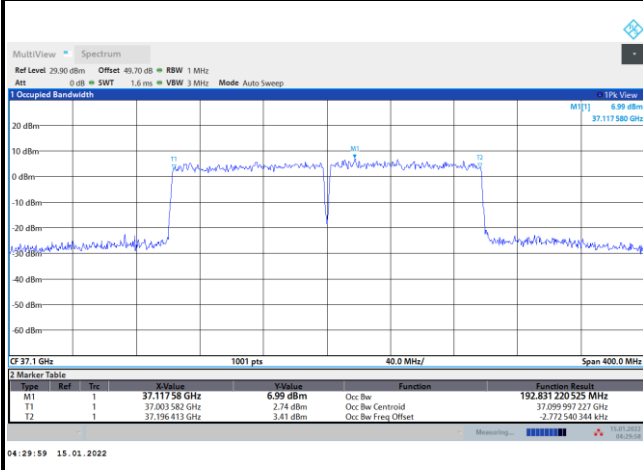




CP-OFDM Module 0

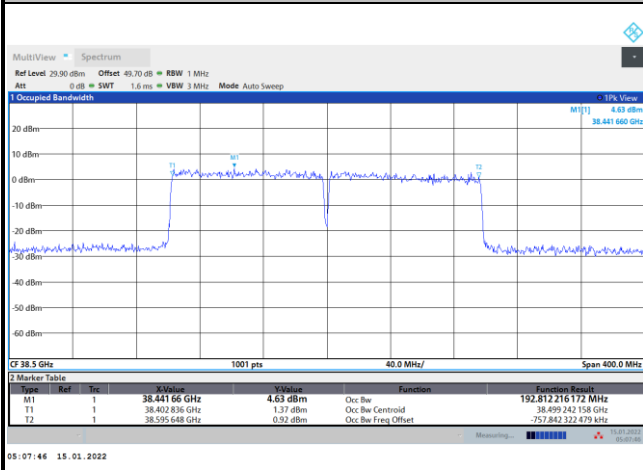
NR Band n260

Lowest Channel / 200MHz / QPSK



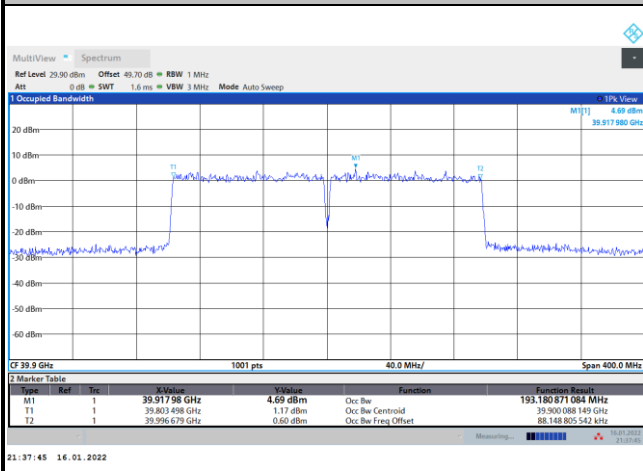
intentionally blank

Middle Channel / 200MHz / QPSK



intentionally blank

Highest Channel / 200MHz / QPSK



intentionally blank



Radiated Out of Band Emissions

| Mode | | | DFT-s-OFDM Module 0 NR Band n260 : BE (dBm) 1 RB | | | | | | | | | | | |
|-------------|---------|------|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| BW | | | 50MHz | | | | 100MHz | | | | 200MHz | | | |
| Limit (dBm) | | | BPSK | QPSK | 16QAM | 64QAM | BPSK | QPSK | 16QAM | 64QAM | BPSK | QPSK | 16QAM | 64QAM |
| Low CH | 0~10%OB | ≤-5 | -8.18 | -7.95 | -9.28 | -11.92 | -9.88 | -9.13 | -11.44 | -12.60 | -19.52 | -18.52 | -17.83 | -18.06 |
| | >10%OB | ≤-13 | -23.35 | -23.93 | -25.27 | -25.75 | -29.20 | -28.60 | -30.04 | -31.42 | -24.56 | -21.01 | -22.40 | -19.05 |
| High CH | 0~10%OB | ≤-5 | -10.67 | -10.42 | -12.98 | -14.33 | -11.72 | 12.73 | -13.78 | -15.67 | -21.22 | -20.58 | -20.14 | -20.16 |
| | >10%OB | ≤-13 | -23.37 | -22.00 | -23.34 | -25.36 | -27.70 | -27.74 | -29.20 | -30.56 | -26.01 | -23.00 | -22.58 | -22.27 |
| Result | | | Compliance | | | | | | | | | | | |

| Mode | | | CP-OFDM Module 0 NR Band n260 : BE (dBm) 1 RB | | | | | | | | | | | |
|-------------|---------|------|---|--|--|--|--------|--|--|--|---------|--|--|--|
| BW | | | 50MHz | | | | 100MHz | | | | 200MHz | | | |
| Limit (dBm) | | | QPSK | | | | QPSK | | | | QPSK | | | |
| Low CH | 0~10%OB | ≤-5 | -14.08 | | | | -13.67 | | | | -19.16 | | | |
| | >10%OB | ≤-13 | -27.07 | | | | -31.70 | | | | -16.85 | | | |
| High CH | 0~10%OB | ≤-5 | -15.51 | | | | -15.81 | | | | -21.86 | | | |
| | >10%OB | ≤-13 | -26.42 | | | | -30.61 | | | | -20.85- | | | |
| Result | | | Compliance | | | | | | | | | | | |

| Mode | | | DFT-s-OFDM Module 0 NR Band n260 : BE (dBm) Full RB | | | | | | | | | | | |
|-------------|---------|------|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| BW | | | 50MHz | | | | 100MHz | | | | 200MHz | | | |
| Limit (dBm) | | | BPSK | QPSK | 16QAM | 64QAM | BPSK | QPSK | 16QAM | 64QAM | BPSK | QPSK | 16QAM | 64QAM |
| Low CH | 0~10%OB | ≤-5 | -20.54 | -18.36 | -22.23 | -24.15 | -23.88 | -22.29 | -26.17 | -27.71 | -29.07 | -28.90 | -30.30 | -32.27 |
| | >10%OB | ≤-13 | -25.69 | -21.64 | -27.78 | -32.03 | -29.27 | -25.08 | -30.86 | -33.61 | -32.58 | -31.58 | -33.04 | -36.24 |
| High CH | 0~10%OB | ≤-5 | -20.24 | -18.13 | -22.84 | -25.73 | -25.83 | -23.25 | -27.86 | -30.65 | -29.55 | -29.47 | -31.08 | -33.55 |
| | >10%OB | ≤-13 | -26.06 | -20.54 | -27.18 | -30.80 | -28.90 | -24.80 | -29.76 | -32.39 | -31.61 | -30.38 | -32.24 | -34.48 |
| Result | | | Compliance | | | | | | | | | | | |

| Mode | | | CP-OFDM Module 0 NR Band n260 : BE (dBm) Full RB | | | | | | | | | | | |
|-------------|---------|------|--|--|--|--|--------|--|--|--|--------|--|--|--|
| BW | | | 50MHz | | | | 100MHz | | | | 200MHz | | | |
| Limit (dBm) | | | QPSK | | | | QPSK | | | | QPSK | | | |
| Low CH | 0~10%OB | ≤-5 | -22.62 | | | | -26.62 | | | | -31.90 | | | |
| | >10%OB | ≤-13 | -25.66 | | | | -28.86 | | | | -34.27 | | | |
| High CH | 0~10%OB | ≤-5 | -23.04 | | | | -26.72 | | | | -31.76 | | | |
| | >10%OB | ≤-13 | -26.13 | | | | -28.72 | | | | -33.38 | | | |
| Result | | | Compliance | | | | | | | | | | | |

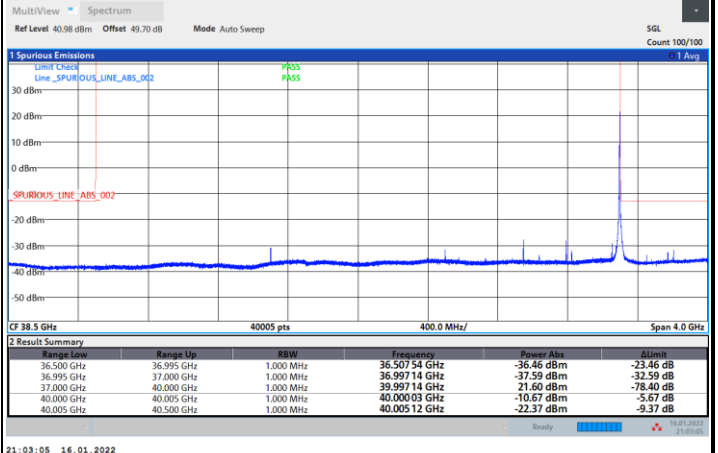
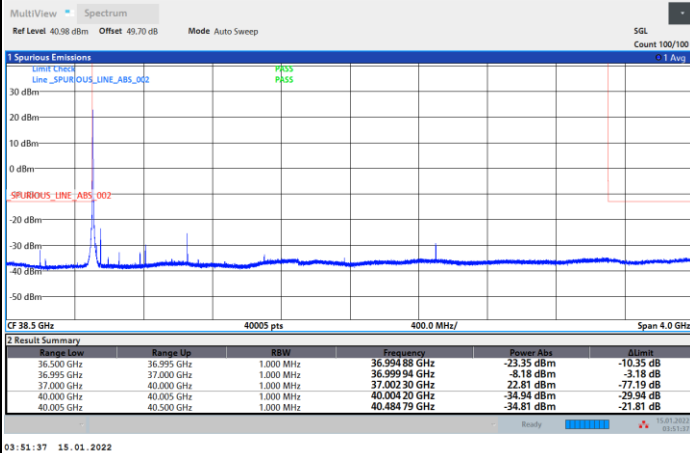


DFT-s-OFDM Module 0

NR Band n260 / 50MHz / BPSK

Lowest Band Edge / 1 RB

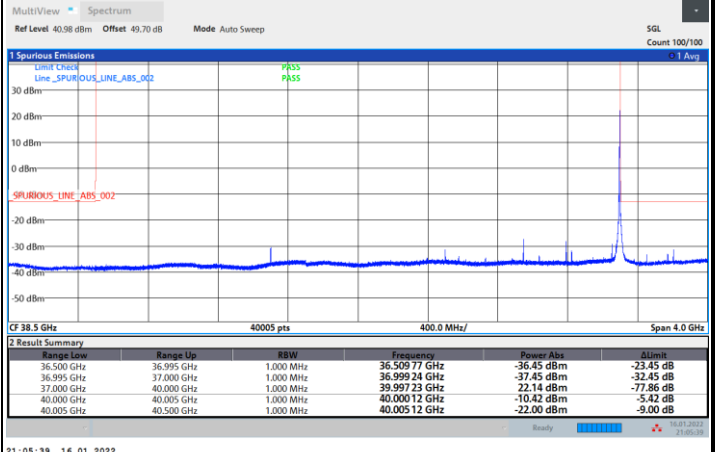
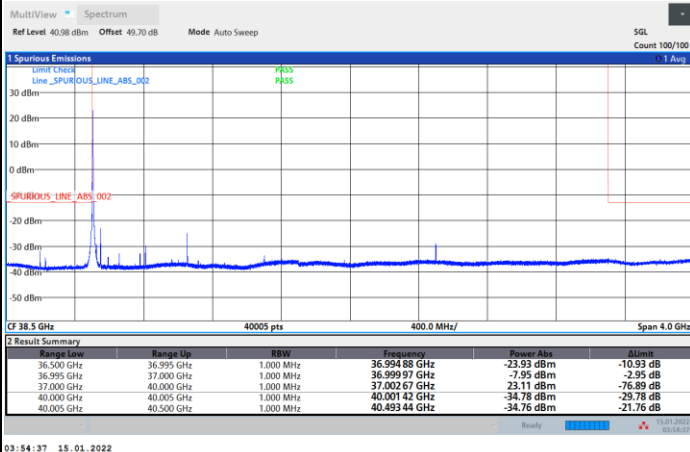
Highest Band Edge / 1 RB



NR Band n260 / 50MHz / QPSK

Lowest Band Edge / 1 RB

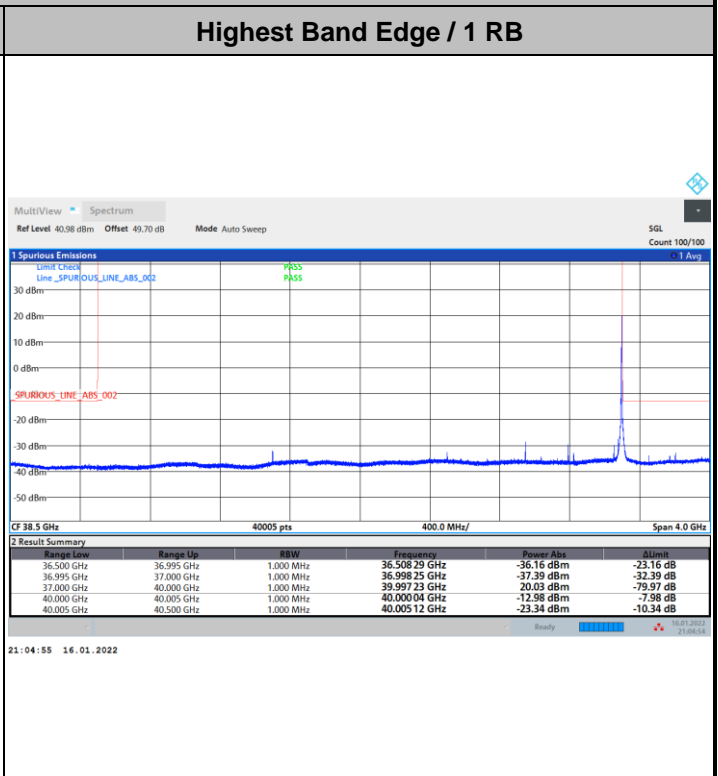
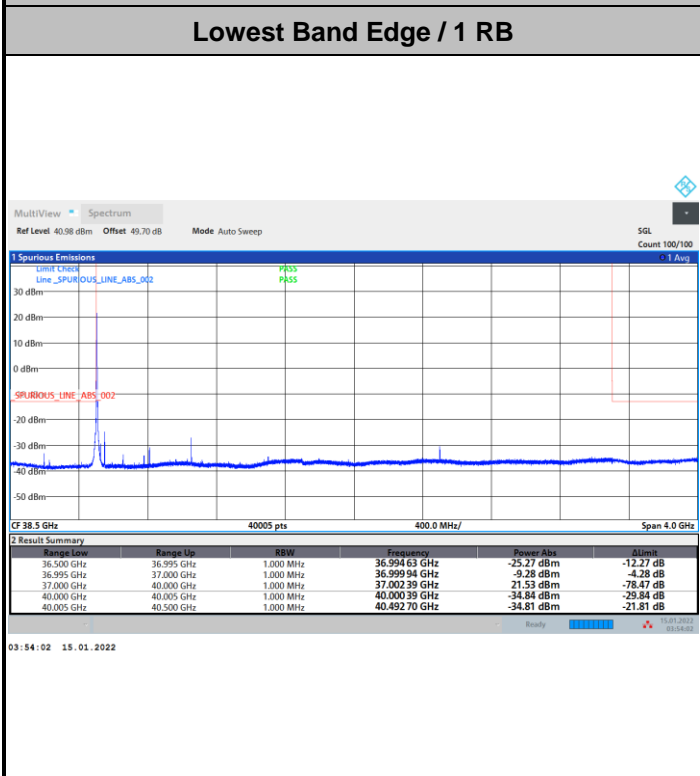
Highest Band Edge / 1 RB



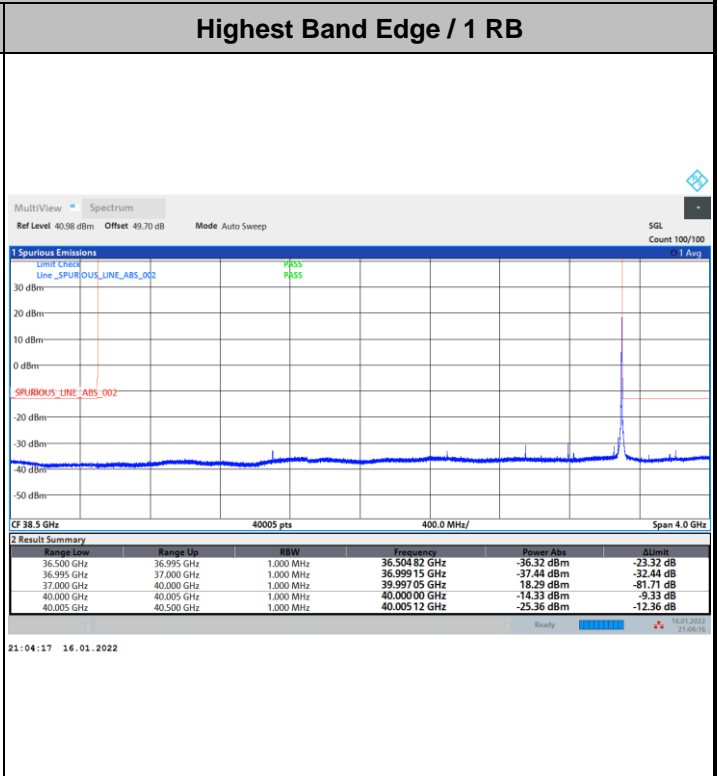
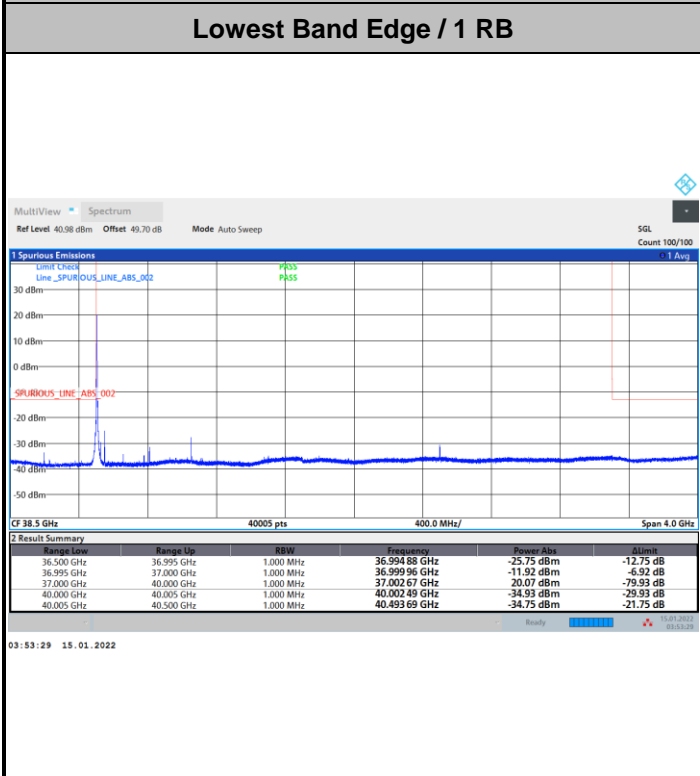


DFT-s-OFDM Module 0

NR Band n260 / 50MHz / 16QAM



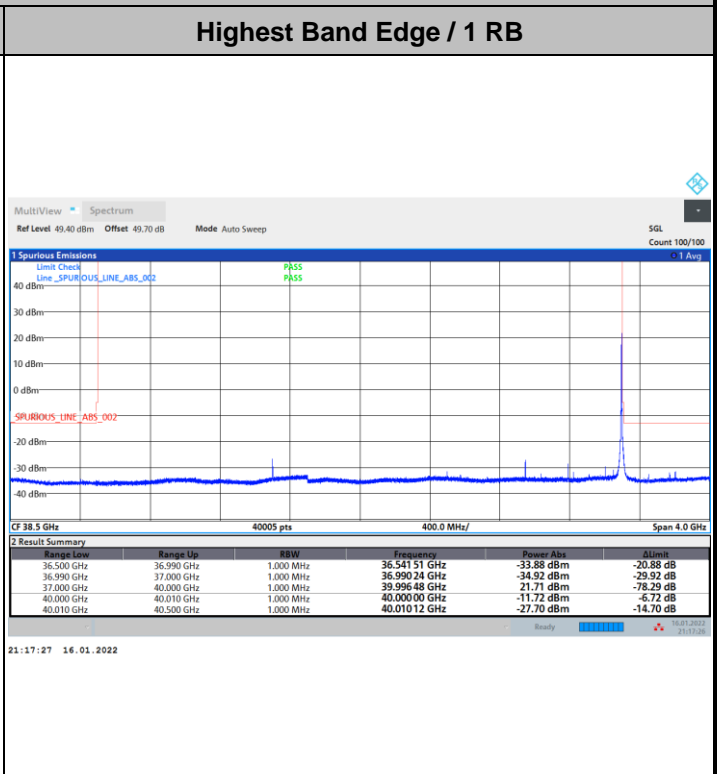
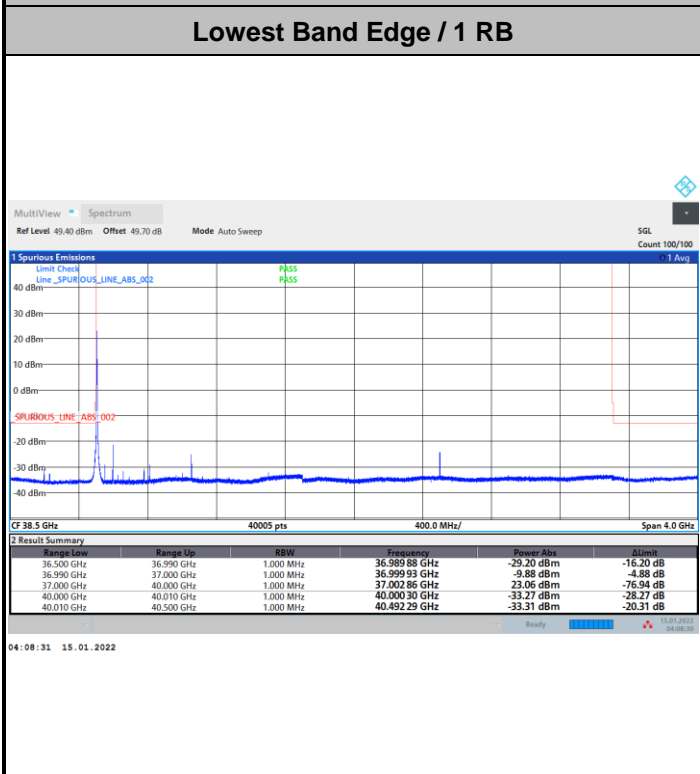
NR Band n260 / 50MHz / 64QAM



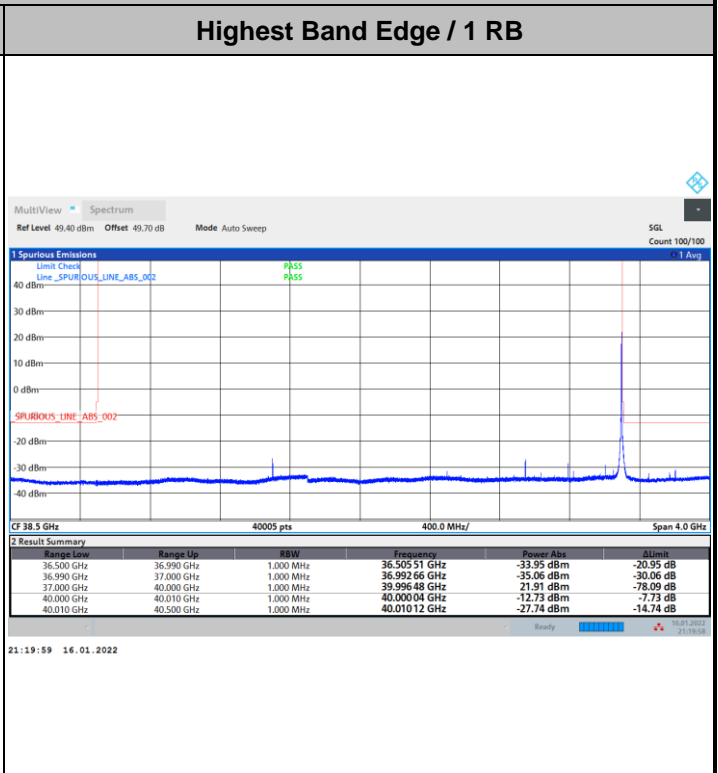
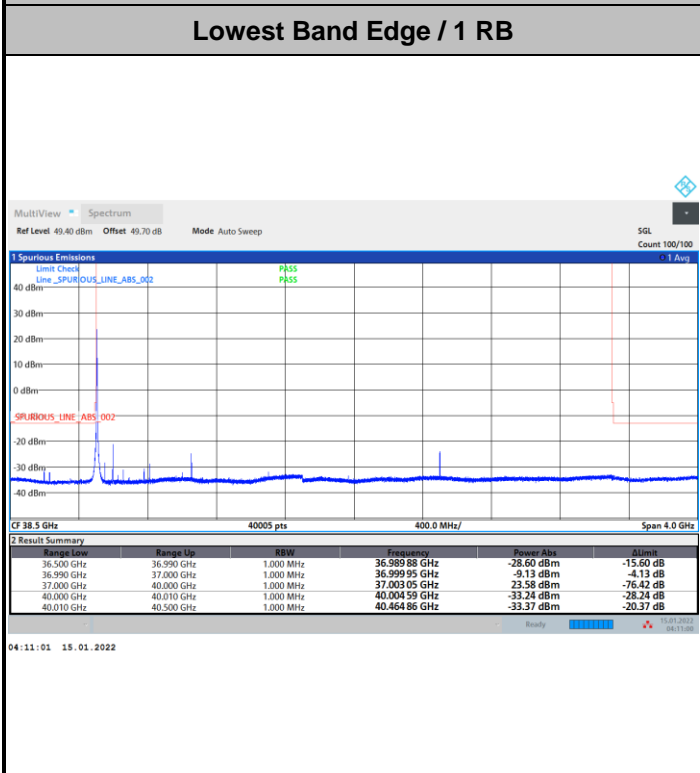


DFT-s-OFDM Module 0

NR Band n260 / 100MHz / BPSK



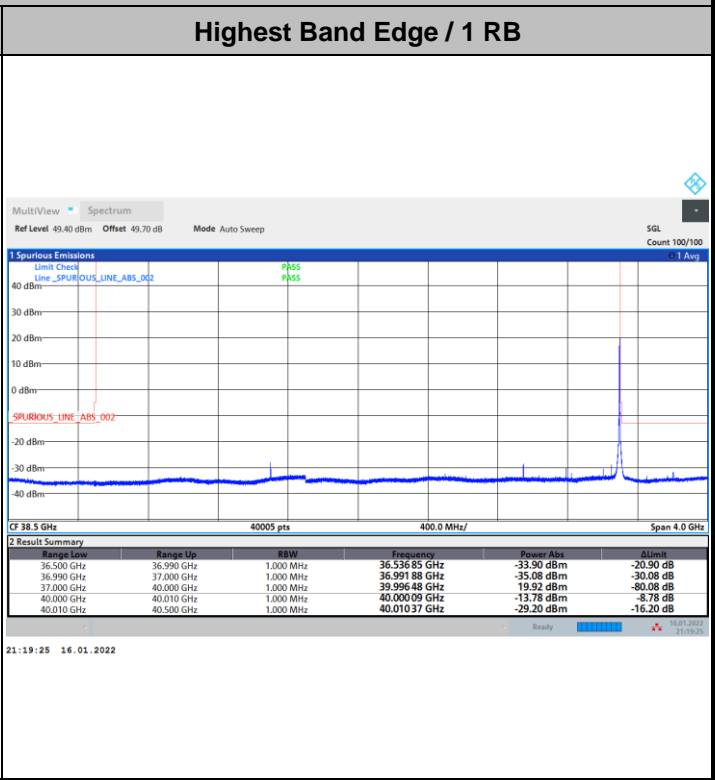
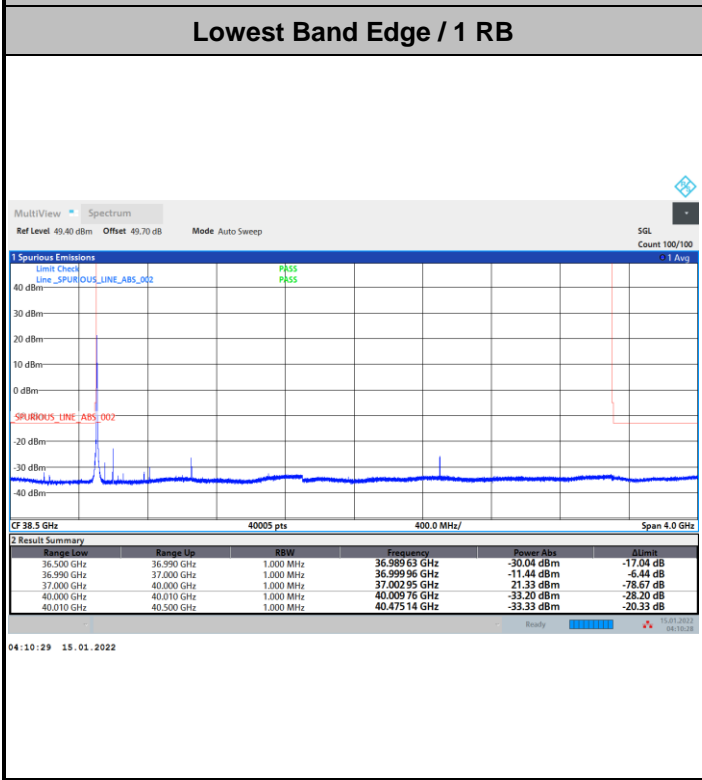
NR Band n260 / 100MHz / QPSK





DFT-s-OFDM Module 0

NR Band n260 / 100MHz / 16QAM



NR Band n260 / 100MHz / 64QAM

