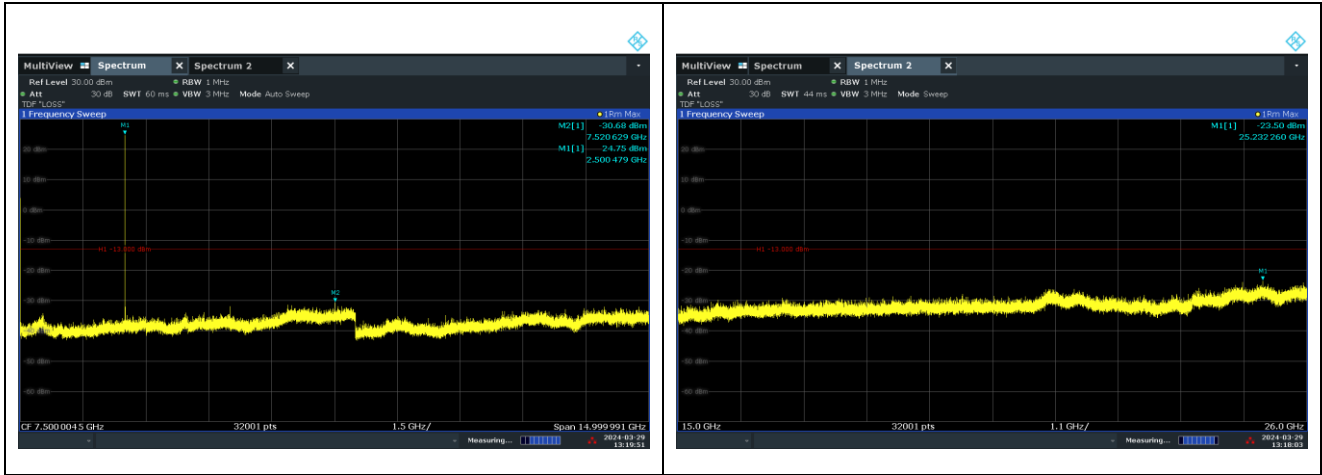
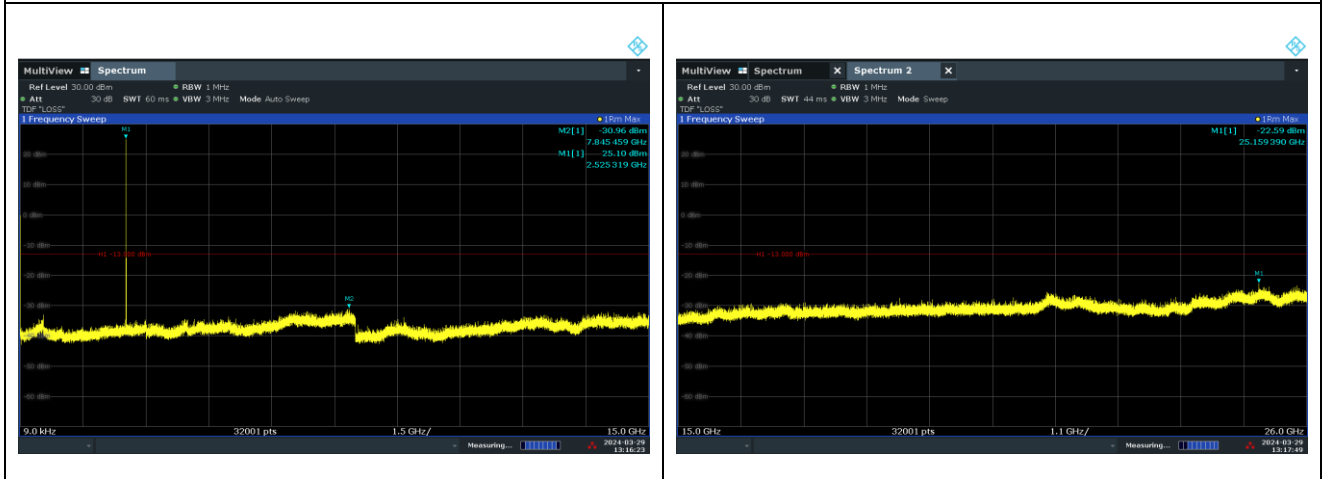


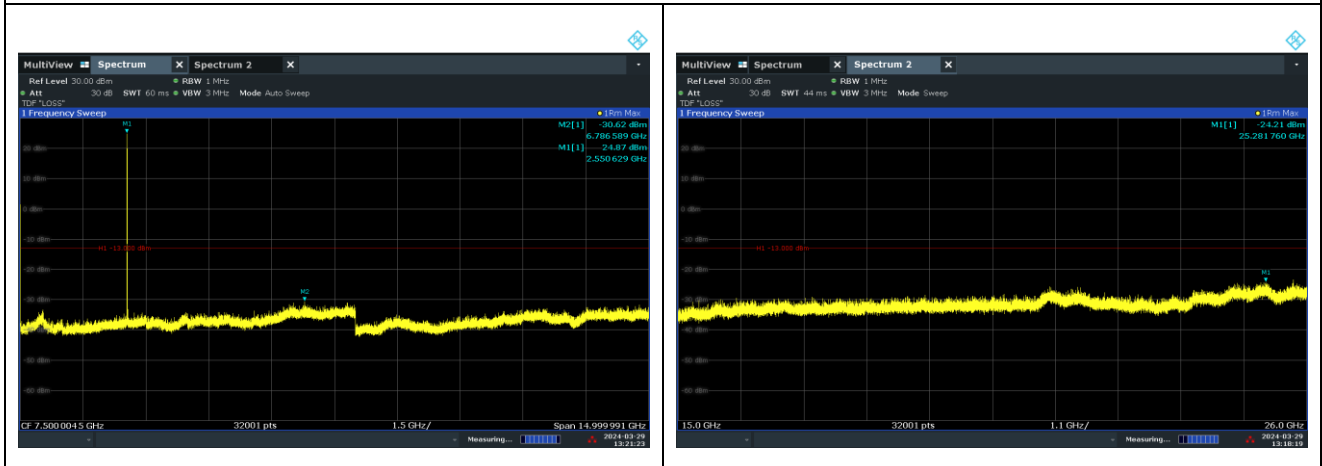
**NR band 7**



**DFT-S-OFDM BPSK - 20 MHz Low Channel - 1 RB**

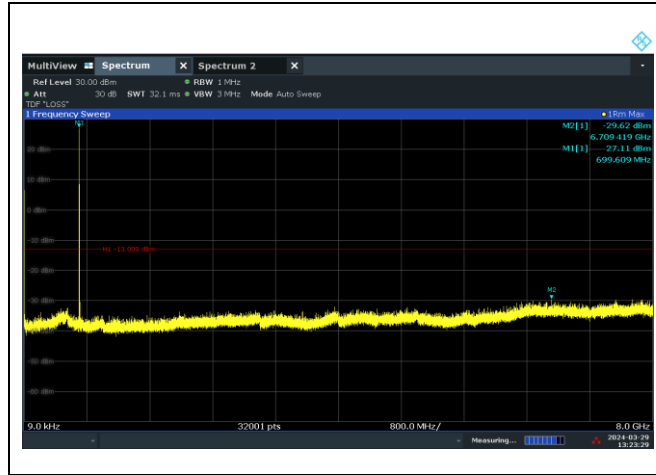


**DFT-S-OFDM BPSK - 20 MHz Middle Channel - 1 RB**



**DFT-S-OFDM BPSK - 20 MHz High Channel - 1 RB**

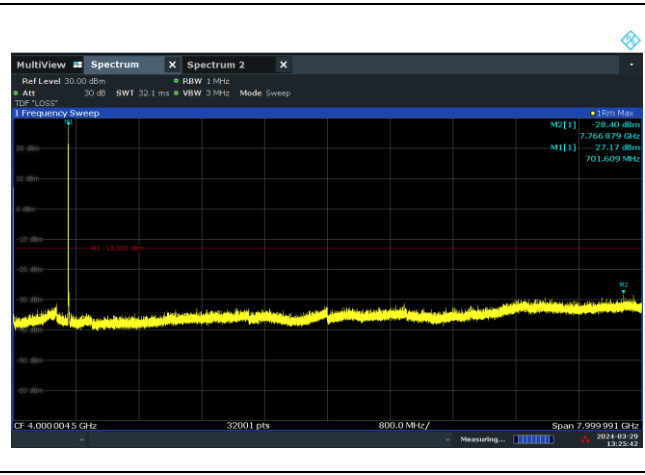
NR band 12



DFT-S-OFDM QPSK - 15 MHz Low Channel - 1 RB

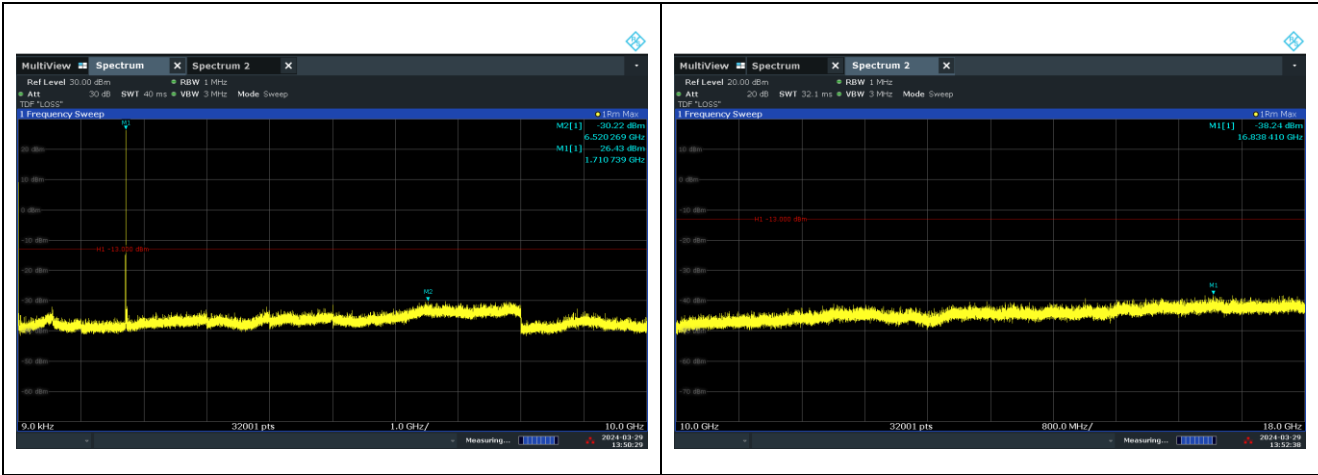


DFT-S-OFDM QPSK - 15 MHz Middle Channel - 1 RB

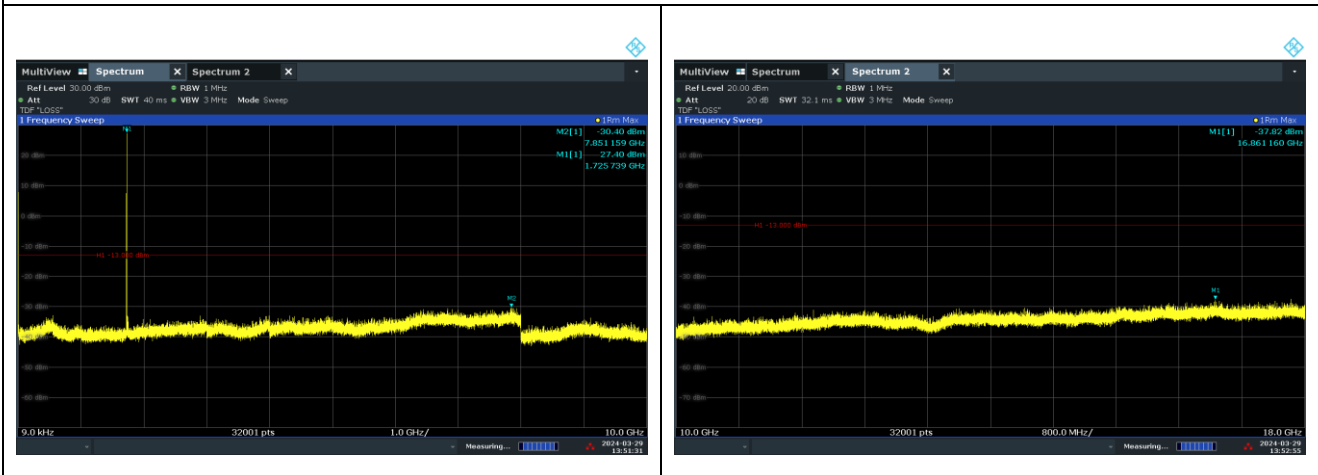


DFT-S-OFDM QPSK - 15 MHz High Channel - 1 RB

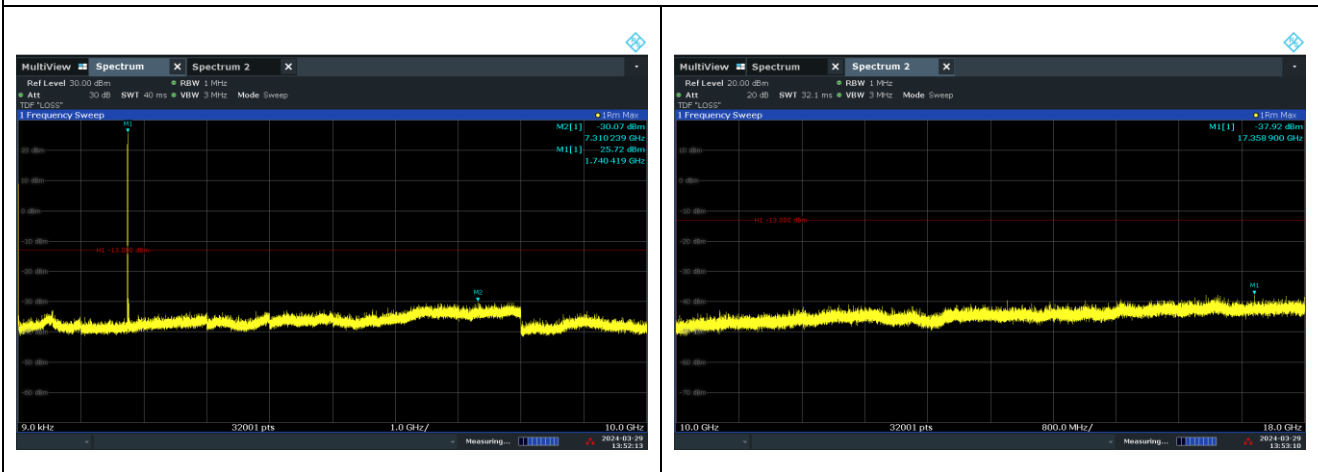
**NR band 66**



**DFT-S-OFDM BPSK - 20 MHz Low Channel - 1 RB**

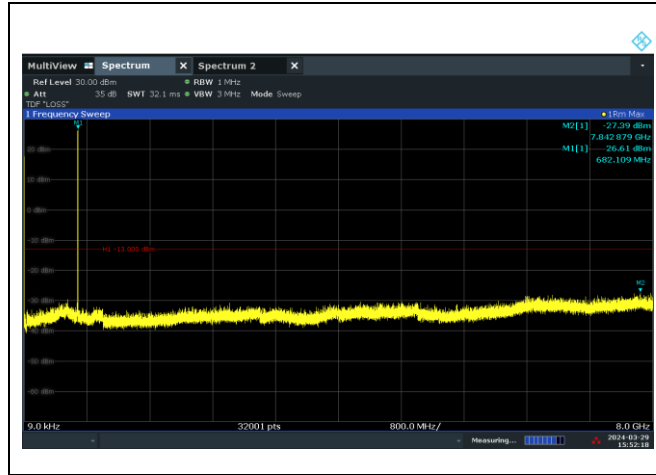


**DFT-S-OFDM BPSK - 20 MHz Middle Channel - 1 RB**

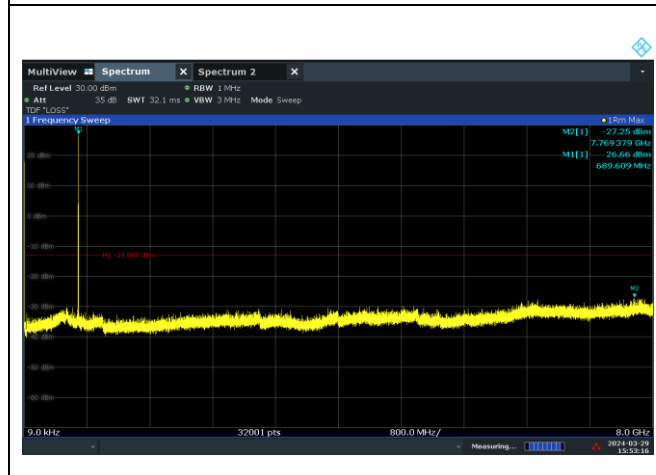


**DFT-S-OFDM BPSK - 20 MHz High Channel - 1 RB**

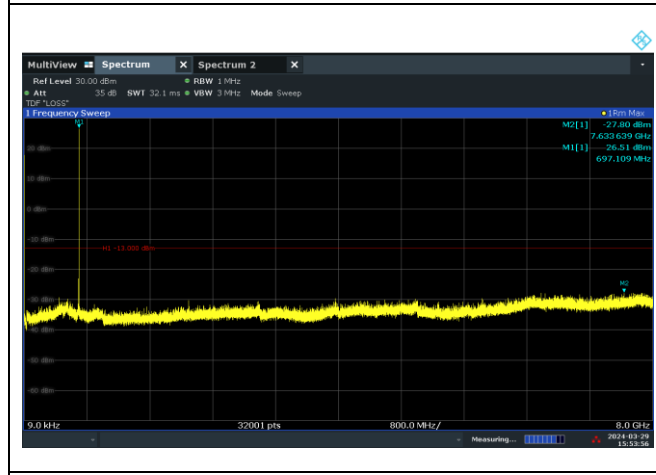
NR band 71



DFT-S-OFDM QPSK - 20 MHz Low Channel - 1 RB



DFT-S-OFDM QPSK - 20 MHz Middle Channel - 1 RB



DFT-S-OFDM QPSK - 20 MHz High Channel - 1 RB

## 7. Band Edge and Emission Mask

### 7.1. Limit

#### FCC

- §22.917(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10\log(P)$  dB.

- §24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

- §27.53(g), the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB.

- §27.53(h)(1), for operations in the 1 695-1 710 MHz, 1 710-1 755 MHz, 1 755-1 780 MHz, 1 915-1 920 MHz, 1 995-2 000 MHz, 2 000-2 020 MHz, 2 110-2 155 MHz, 2 155-2 180 MHz, and 2 180-2 200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10} (P)$  dB.

- §27.53(m)(4), for mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log_{10} (P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log_{10} (P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log_{10} (P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that  $43 + 10 \log_{10} (P)$  dB on all frequencies between 2 490.5 MHz and 2 496 MHz and  $55 + 10 \log_{10} (P)$  dB at or below 2 490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2 495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

**IC**

- RSS-130 Issue 2

4.7.1, the unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dB W), by at least  $43 + 10 \log_{10} p$  (watts), dB. However, in the 100 kHz band immediately outside the equipment's operating frequency block range, a resolution bandwidth of 30 kHz may be employed.

- RSS-132 Issue 4

5.5, Equipment shall meet the unwanted emission limits specified below.

(i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1 % of the occupied bandwidth shall be attenuated below the transmitter output power P (dB W) by at least  $43 + 10 \log(p)$  dB.

(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated below the transmitter output power P (dB W) by at least  $43 + 10 \log(p)$  dB. If the measurement is performed using 1 % of the occupied bandwidth, power integration over 100 kHz is required.

- RSS-133 Issue 6

6.5, Equipment shall comply with the limits in (i) and (ii) below.

(i) In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1 % of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dB W) by at least  $43 + 10 \log_{10} p$ (watts).

(ii) After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dB W) by at least  $43 + 10 \log_{10} p$ (watts). If the measurement is performed using 1 % of the emission bandwidth, power integration over 1.0 MHz is required.

- RSS-139 Issue 4

5.6, Unwanted emissions shall be measured in terms of average values.

For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors) of the unwanted emissions outside the frequency block or frequency block group shall not exceed the limits shown in table 6.

**Table 6: Unwanted emission limits**

Offset from the edge of the frequency block or frequency block group	Unwanted emission limit
$\leq 1$ MHz	-13 dB m/(1% of OB)*
$> 1$ MHz	-13 dB m

\* OB is the occupied bandwidth

- RSS-199 Issue 4

5.6, unwanted emissions shall be measured in terms of average values when the transmitter is operating at the manufacturer's rated power and modulated as specified in RSS-Gen.

Equipment shall meet the unwanted emission limits, specified below, outside each frequency block group. For each channel bandwidth supported by the equipment under test, the unwanted emissions shall be measured and reported for two channel frequencies: one located as close as possible to the low end and one located as close as possible to the high end of the equipment's operating frequency range.

For the unwanted emission limits, in the 1 MHz band immediately outside and adjacent to the frequency block group, the power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth for fixed stations, base stations, and fixed subscriber equipment, and 2 % for subscriber equipment other than fixed subscriber equipment. Beyond this 1 MHz band, a resolution bandwidth of 1 MHz shall be used. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz, or 1 % or 2 % of the occupied bandwidth, as applicable.

For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors), where applicable, of the unwanted emissions outside the frequency block or frequency block group shall not exceed the limits shown in the tables below.

**Table 4: Unwanted emission limits for fixed station, base station and fixed subscriber equipment**

Offset from the edge of the frequency block or frequency block group (MHz)	Unwanted emission limit
≤1	-13 dB m/(1% of OB*)
>1	-13 dB m/MHz

\* OB is the occupied bandwidth

**Table 5: Unwanted emission limits for subscriber equipment other than fixed subscriber equipment**

Offset from the edge of the frequency block or frequency block group (MHz)	Unwanted emission limit
0-1	-10 dB m/(2% of OB*)
1-5	-10 dB m/MHz
5-X**	-13 dB m/MHz
≥X	-25 dB m/MHz

\* OB is the occupied bandwidth

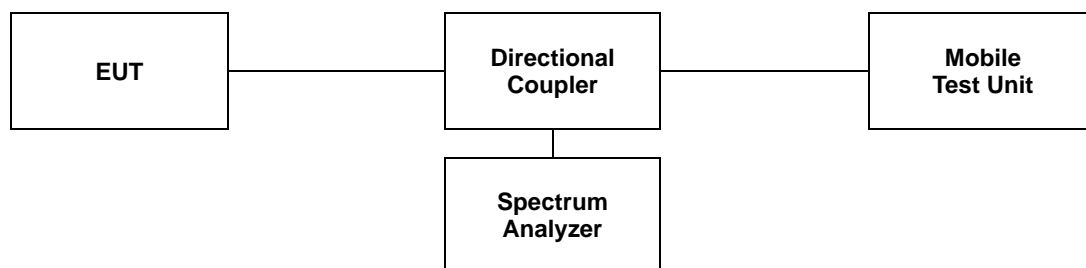
\*\* X is 6 MHz or the equipment occupied bandwidth, whichever is greater

In addition to complying with the limits in table 5, subscriber equipment other than fixed subscriber equipment shall not exceed -13 dB m/MHz on all frequencies between 2 490.5 MHz and 2 496 MHz, and -25 dB m/MHz at or below 2 490.5 MHz.

## 7.2. Test Procedure

The test follows section 5.7 of ANSI C63.26-2015.

- a. Span was set large enough so as to capture all out of band emissions near the band edge.
- b.  $RBW \geq 1\%$  of OBW
- c.  $VBW \geq 3 \times RBW$ .
- d. Detector = RMS.
- e. Trace mode = Average.
- f. Sweep time = Auto.
- g. The trace was allowed to stabilize.
- h. All path loss of frequency range was investigated and compensated to spectrum analyzer as TDF function.



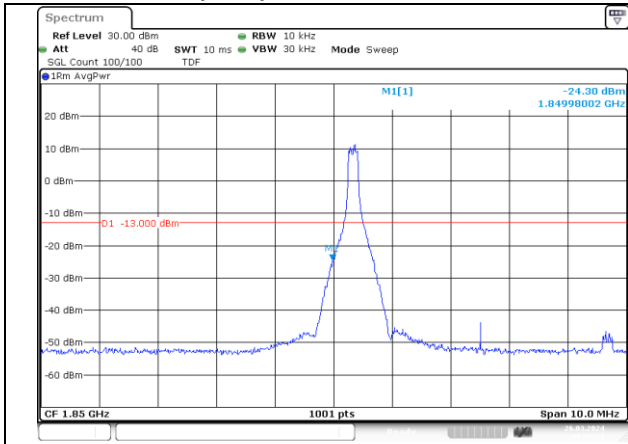


### 7.3. Test Results

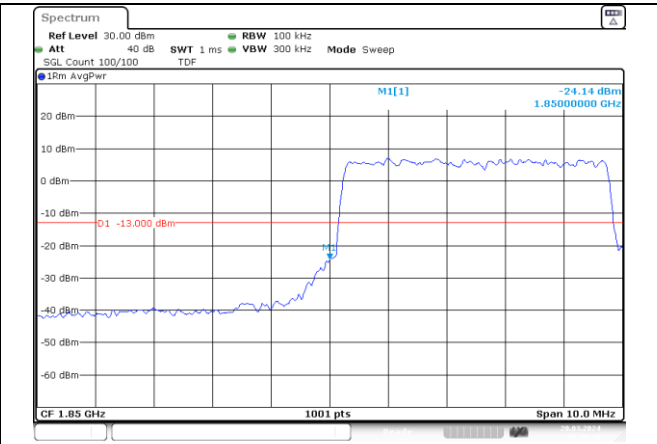
Ambient temperature : (23 ± 1) °C  
 Relative humidity : 47 % R.H.

#### - Test plots

##### NR band 25/2 (5 MHz)

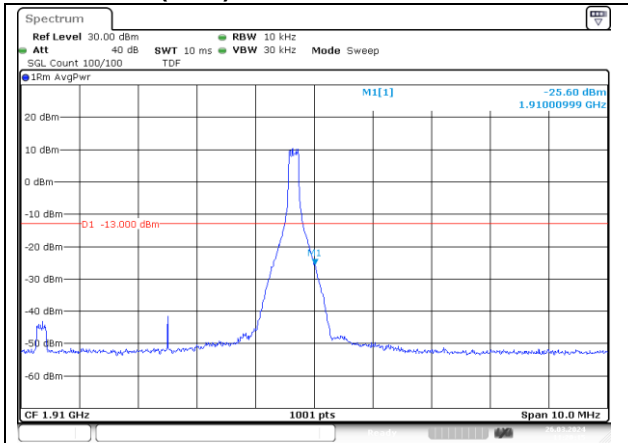


DFT-S-OFDM QPSK - Low Channel - 1 RB

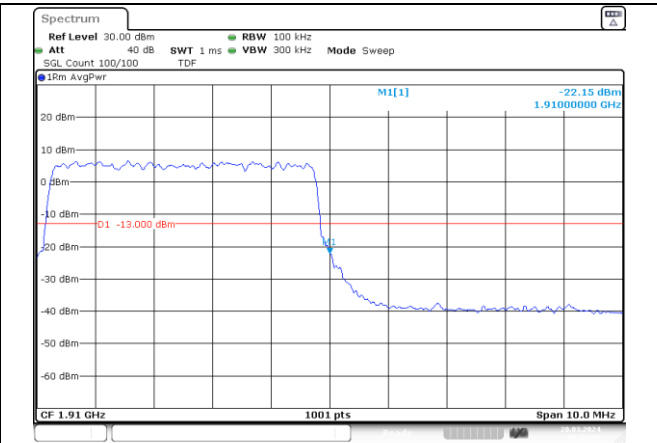


DFT-S-OFDM QPSK - Low Channel - Full RB

##### NR band 2 (5 MHz)

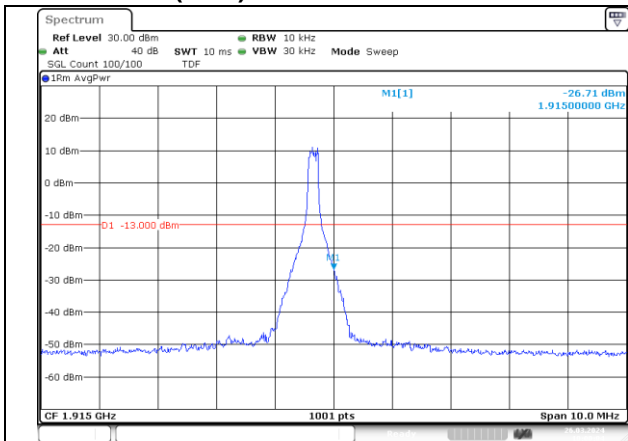


DFT-S-OFDM QPSK - High Channel - 1 RB

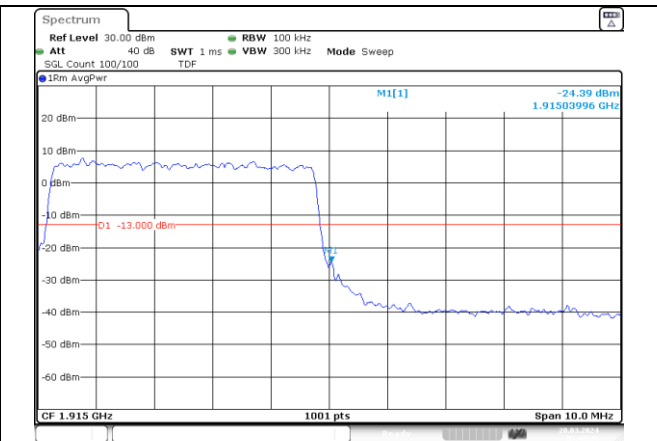


DFT-S-OFDM QPSK - High Channel - Full RB

##### NR band 25 (5 MHz)

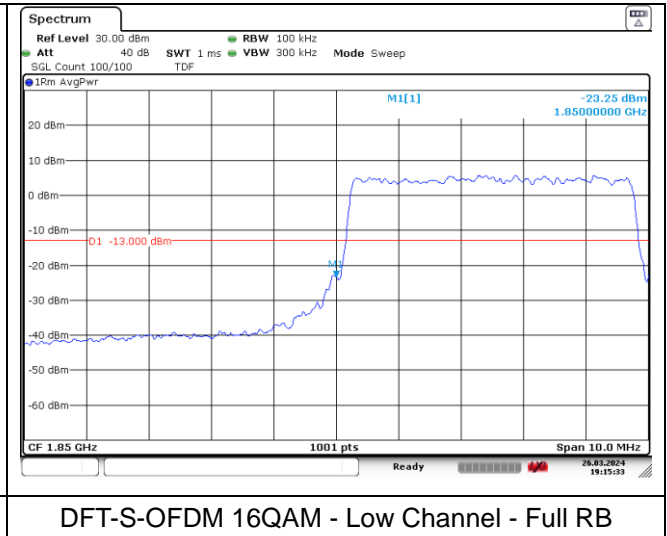
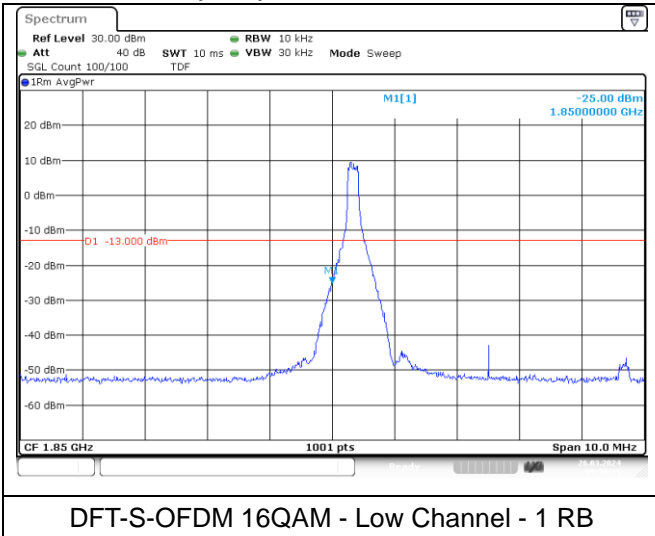


DFT-S-OFDM QPSK - High Channel - 1 RB

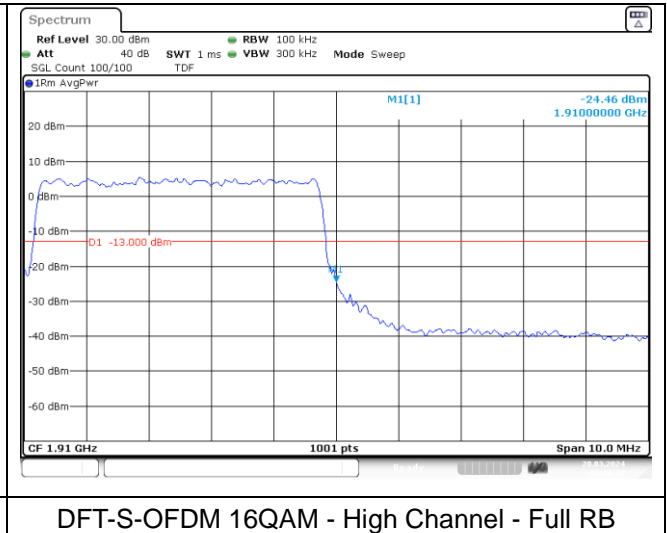
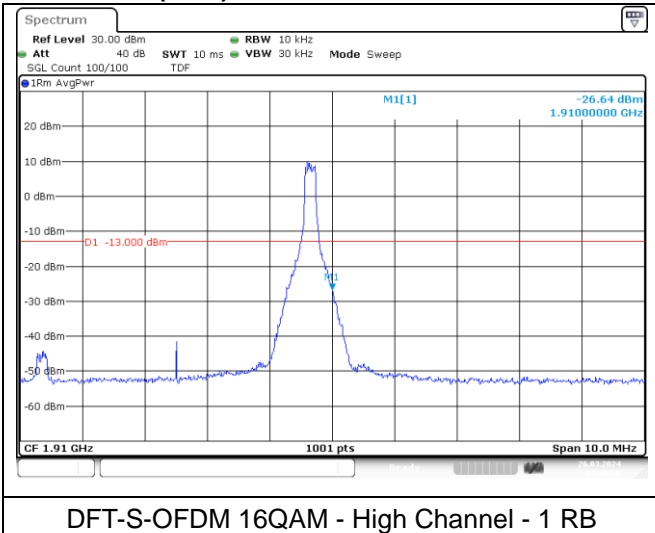


DFT-S-OFDM QPSK - High Channel - Full RB

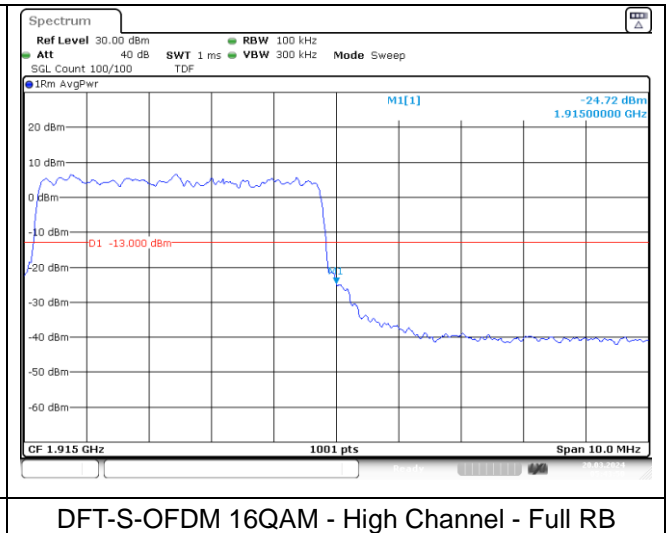
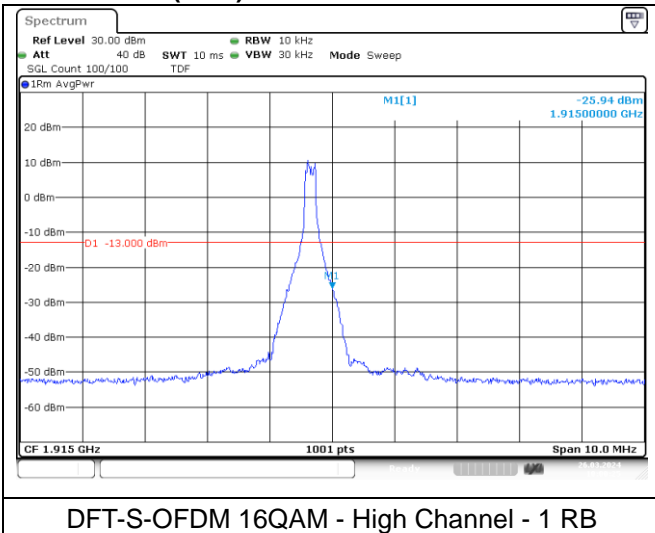
**NR band 25/2 (5 MHz)**



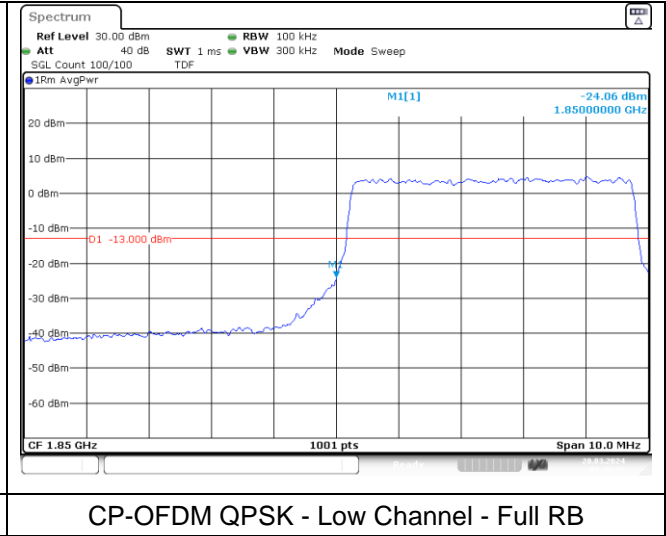
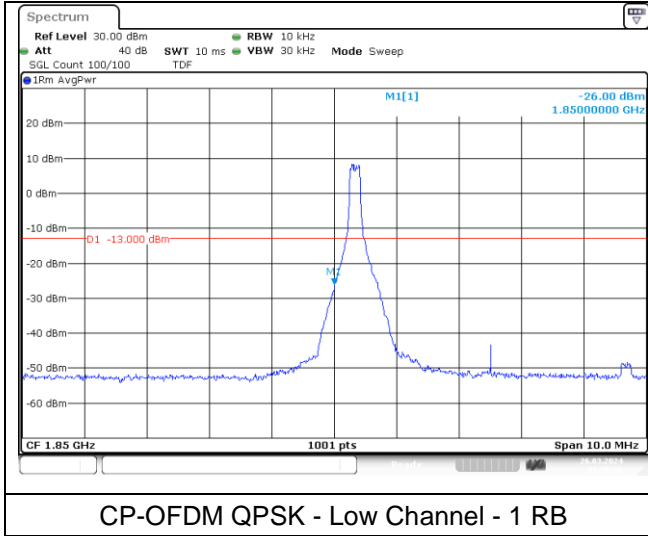
**NR band 2 (5 MHz)**



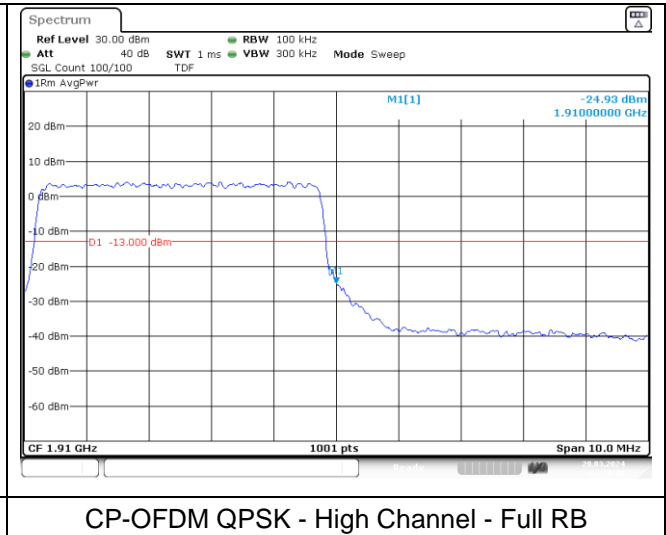
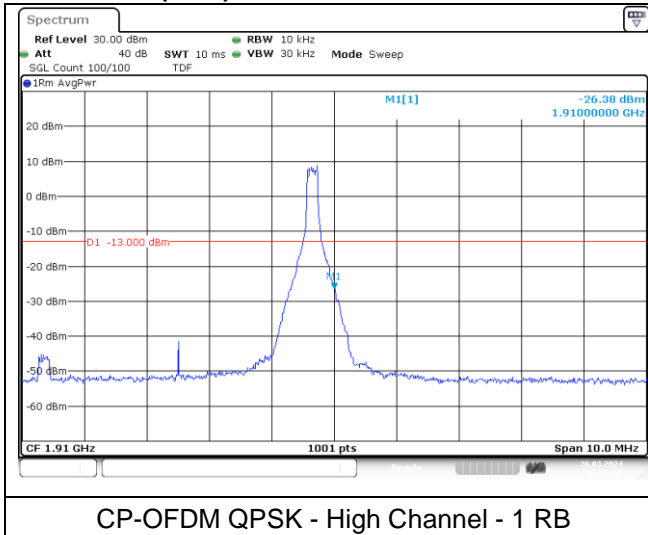
**NR band 25 (5 MHz)**



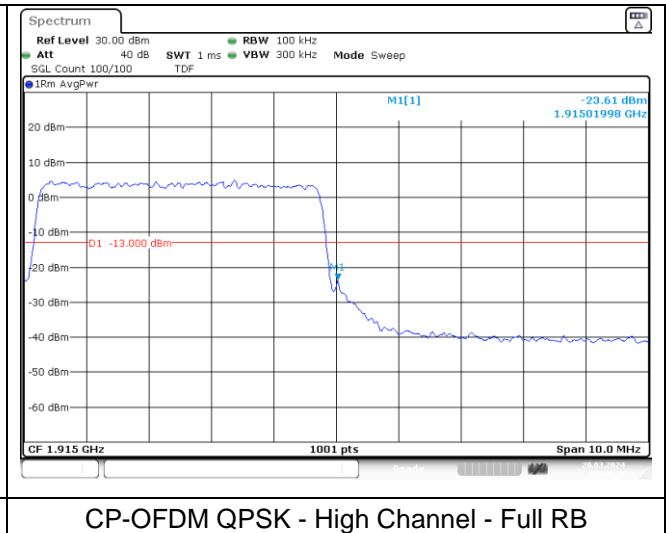
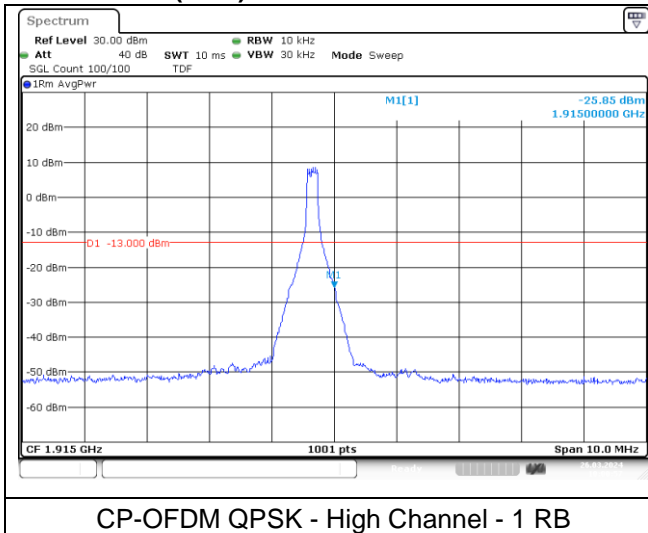
**NR band 25/2 (5 MHz)**



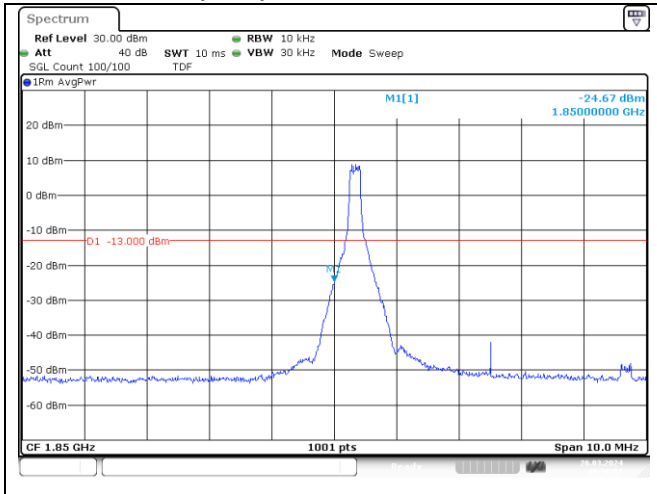
**NR band 2 (5 MHz)**



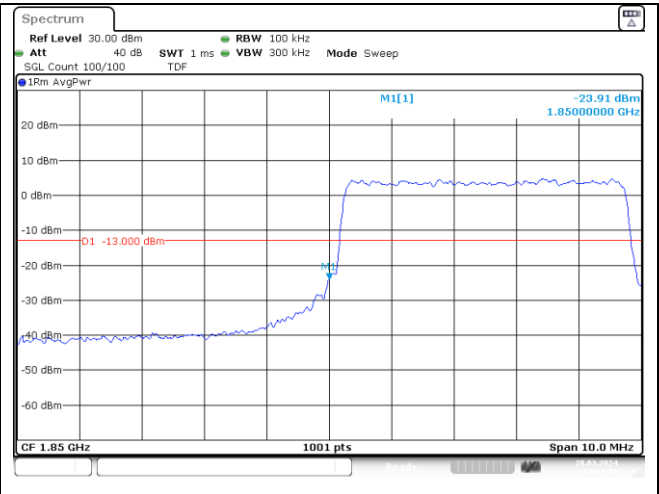
**NR band 25 (5 MHz)**



**NR band 25/2 (5 MHz)**

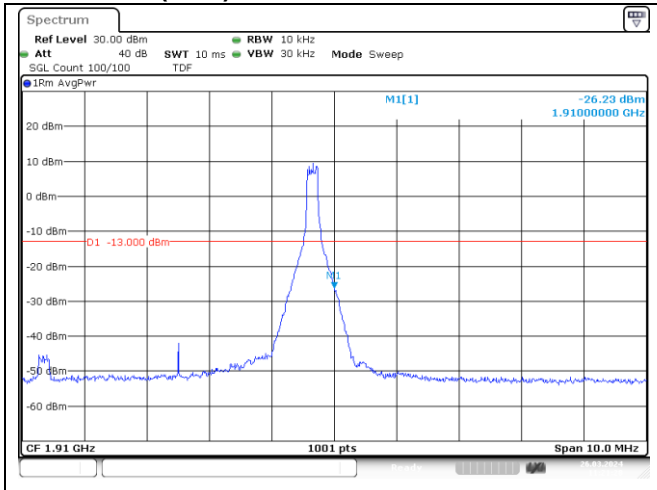


CP-OFDM 16QAM - Low Channel - 1 RB

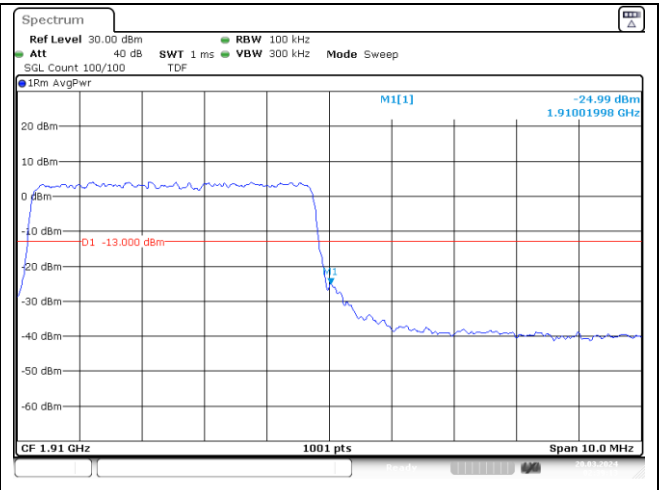


CP-OFDM 16QAM - Low Channel - Full RB

**NR band 2 (5 MHz)**

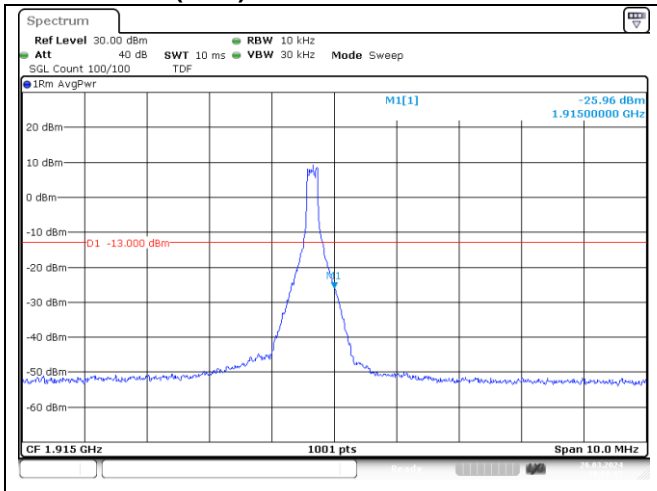


CP-OFDM 16QAM - High Channel - 1 RB

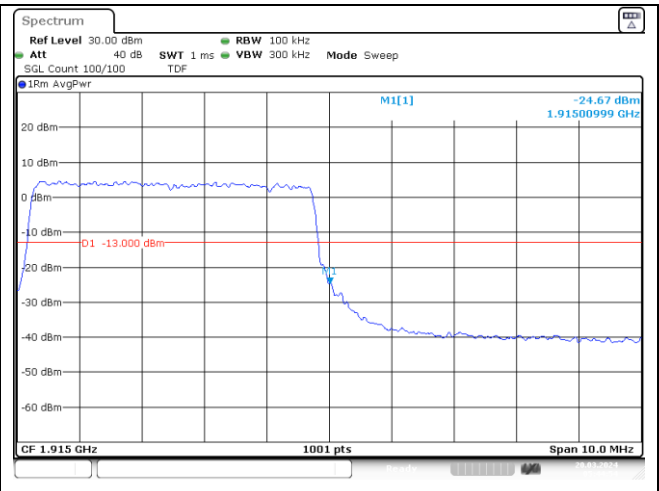


CP-OFDM 16QAM - High Channel - Full RB

**NR band 25 (5 MHz)**

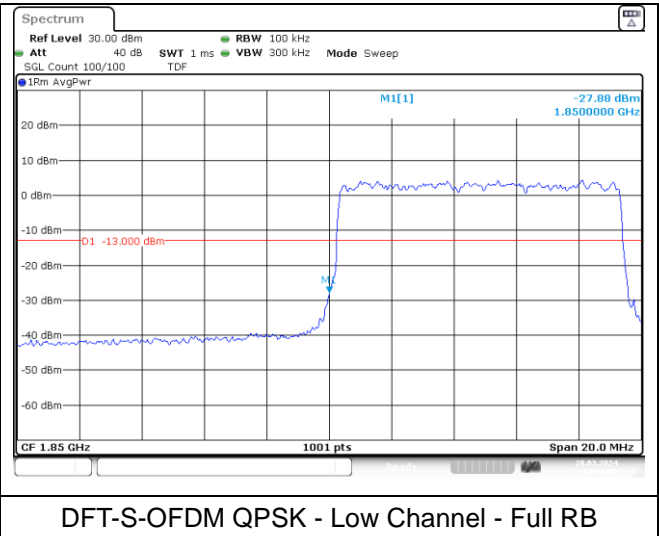
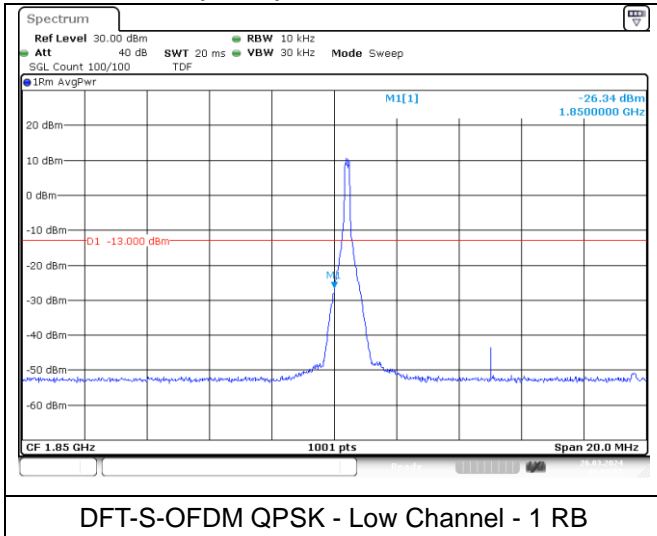


CP-OFDM 16QAM - High Channel - 1 RB

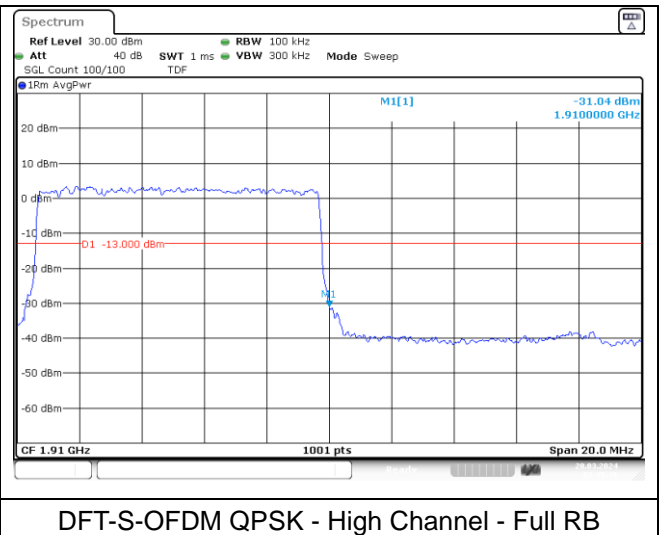
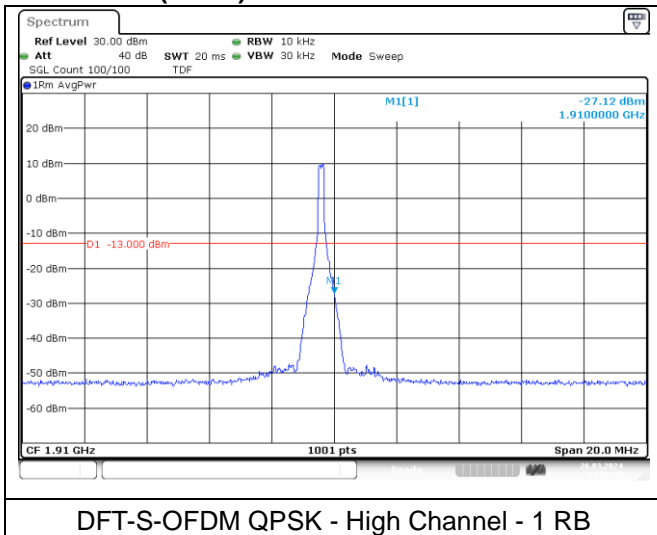


CP-OFDM 16QAM - High Channel - Full RB

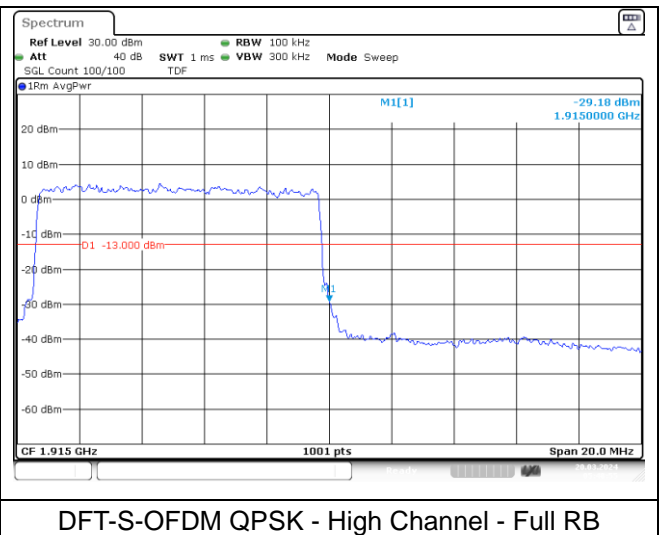
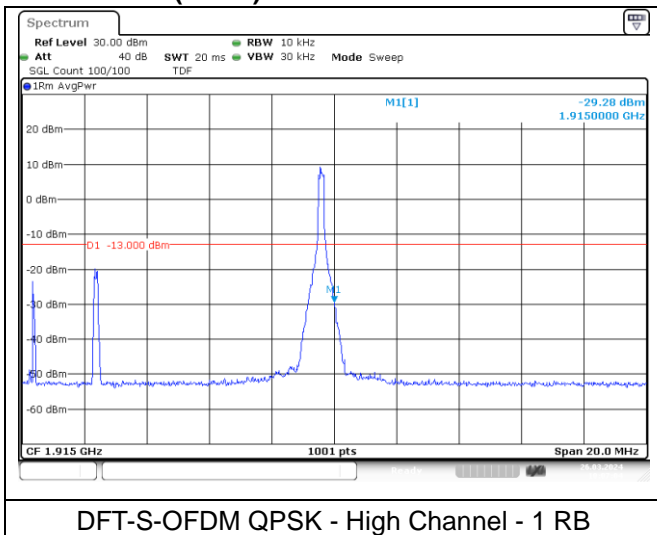
**NR band 25/2 (10 MHz)**



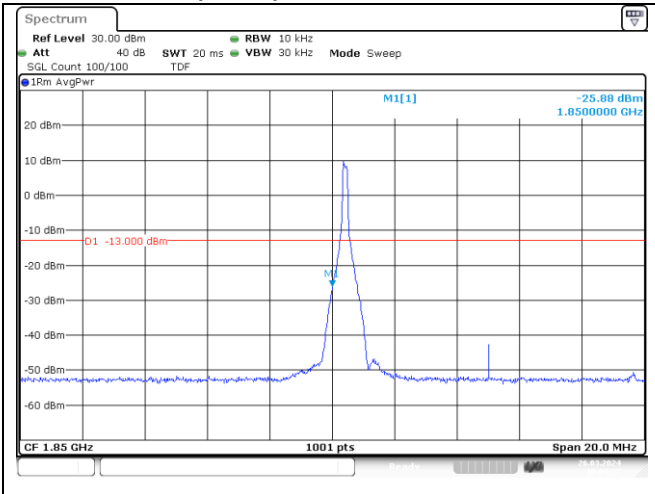
**NR band 2 (10 MHz)**



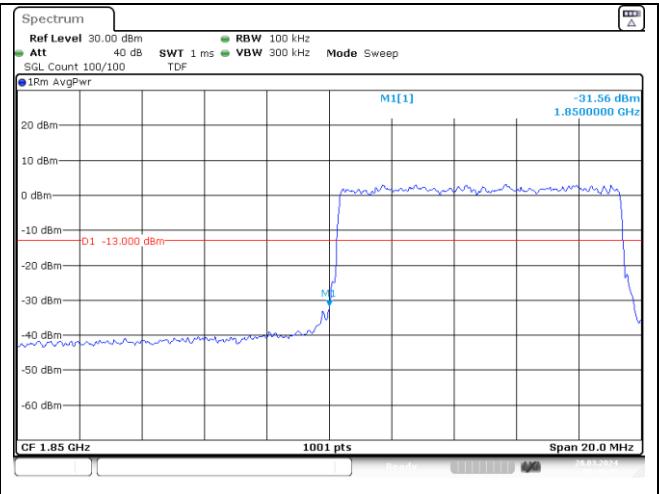
**NR band 25 (10 MHz)**



**NR band 25/2 (10 MHz)**

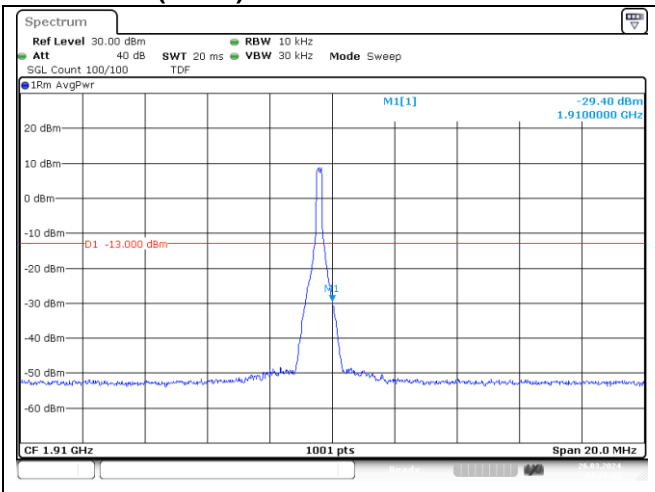


DFT-S-OFDM 16QAM - Low Channel - 1 RB

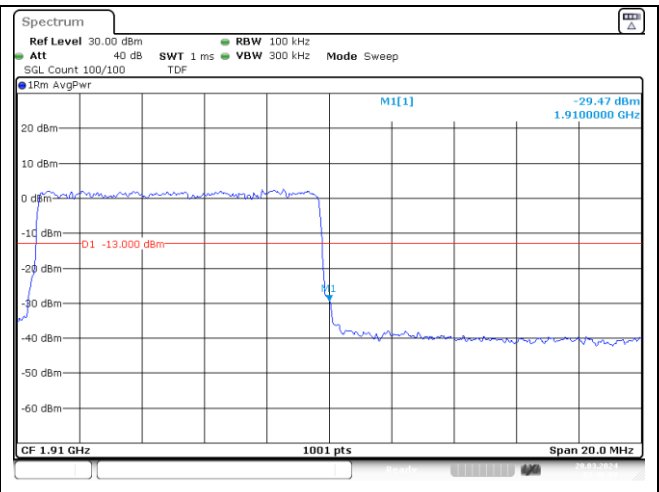


DFT-S-OFDM 16QAM - Low Channel - Full RB

**NR band 2 (10 MHz)**

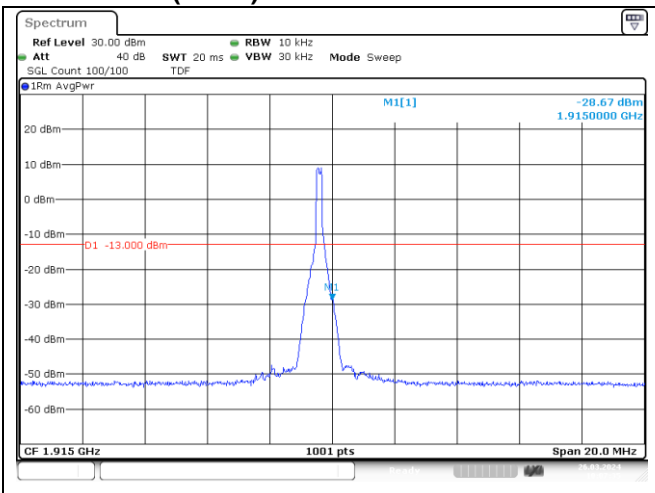


DFT-S-OFDM 16QAM - High Channel - 1 RB

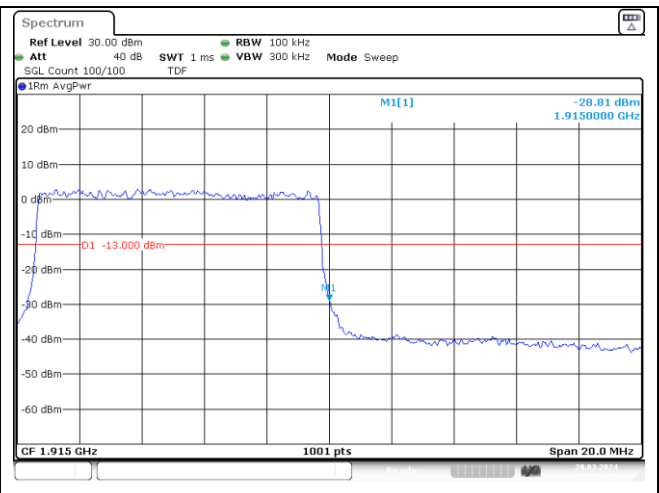


DFT-S-OFDM 16QAM - High Channel - Full RB

**NR band 25 (10 MHz)**

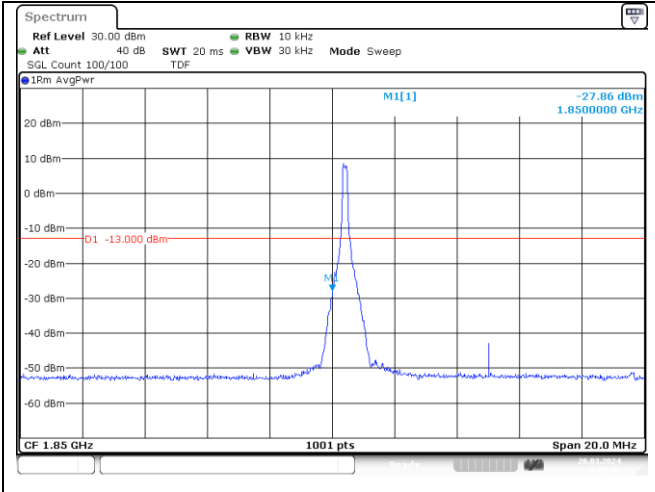


DFT-S-OFDM 16QAM - High Channel - 1 RB

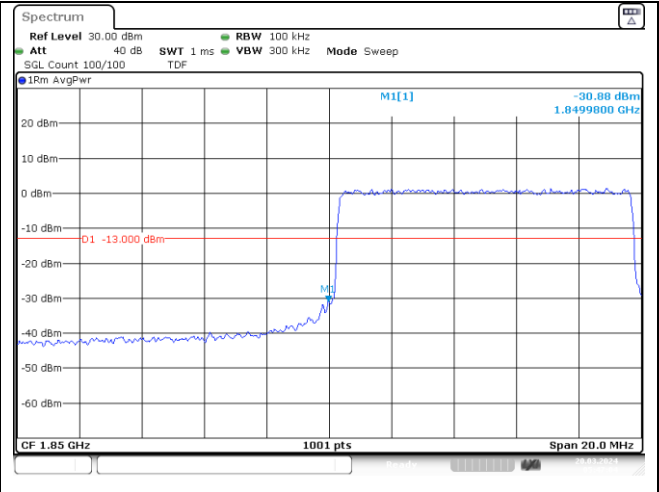


DFT-S-OFDM 16QAM - High Channel - Full RB

**NR band 25/2 (10 MHz)**

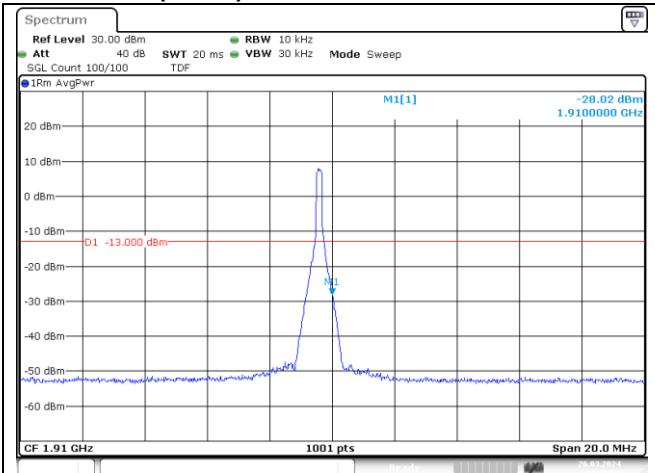


CP-OFDM QPSK - Low Channel - 1 RB

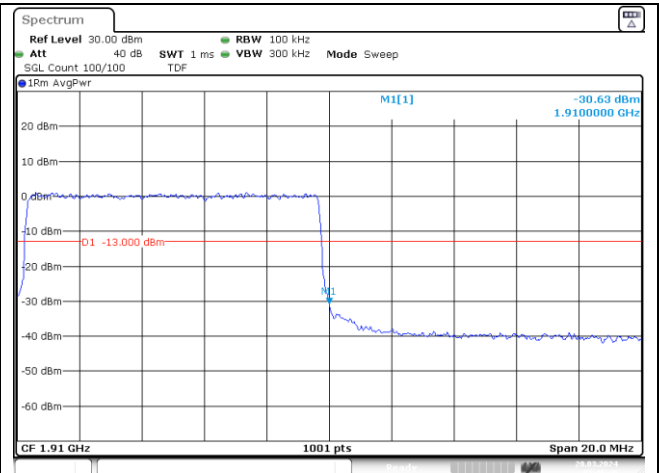


CP-OFDM QPSK - Low Channel - Full RB

**NR band 2 (10 MHz)**

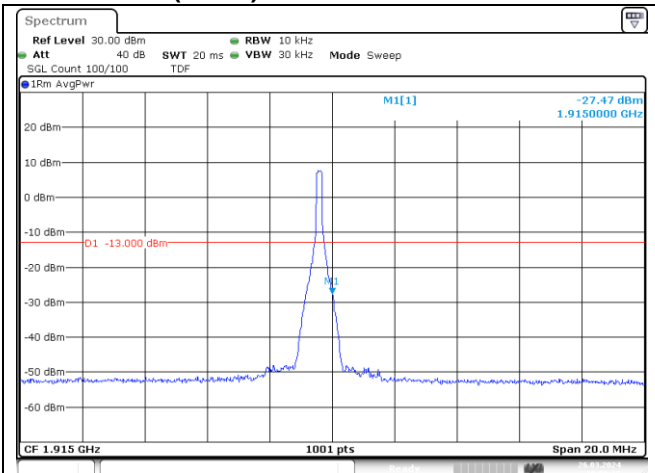


CP-OFDM QPSK - High Channel - 1 RB

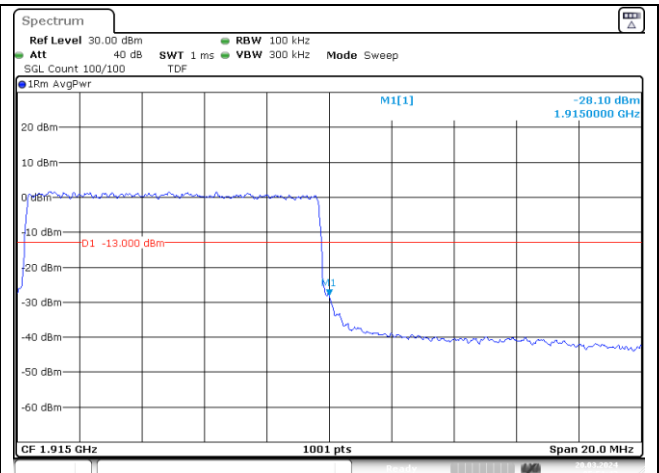


CP-OFDM QPSK - High Channel - Full RB

**NR band 25 (10 MHz)**

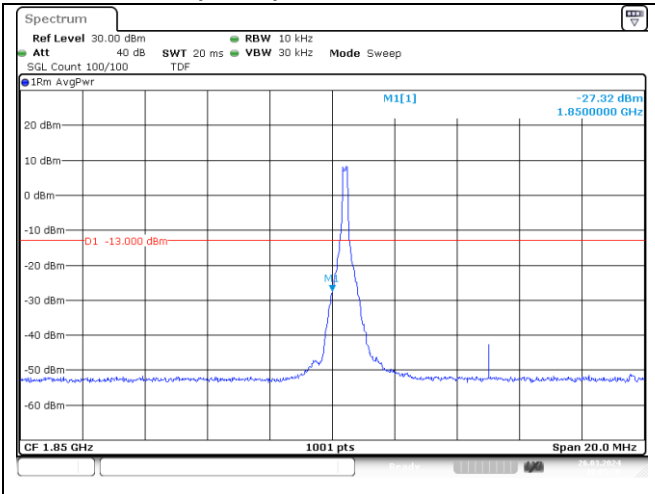


CP-OFDM QPSK - High Channel - 1 RB

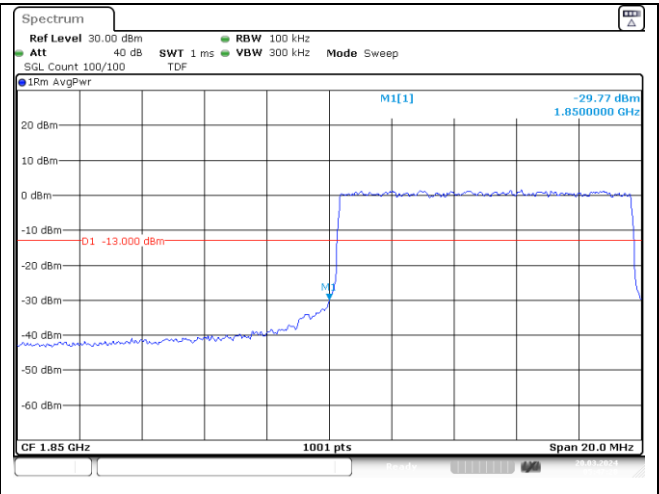


CP-OFDM QPSK - High Channel - Full RB

**NR band 25/2 (10 MHz)**

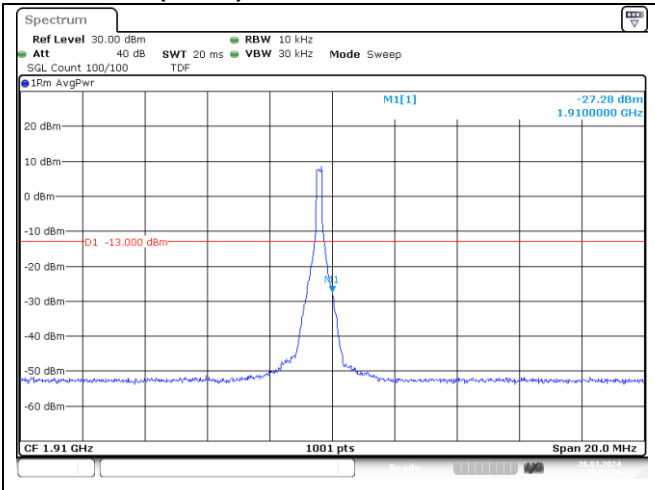


CP-OFDM 16QAM - Low Channel - 1 RB

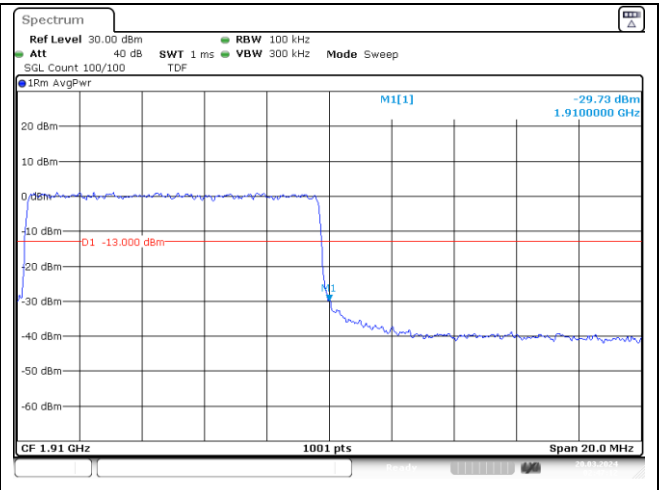


CP-OFDM 16QAM - Low Channel - Full RB

**NR band 2 (10 MHz)**

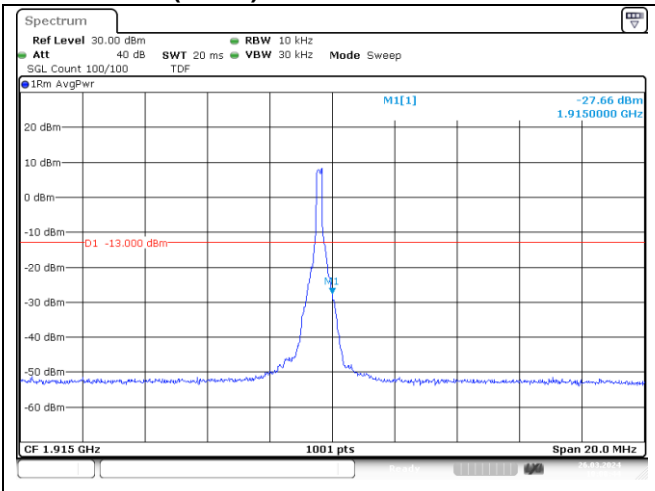


CP-OFDM 16QAM - High Channel - 1 RB

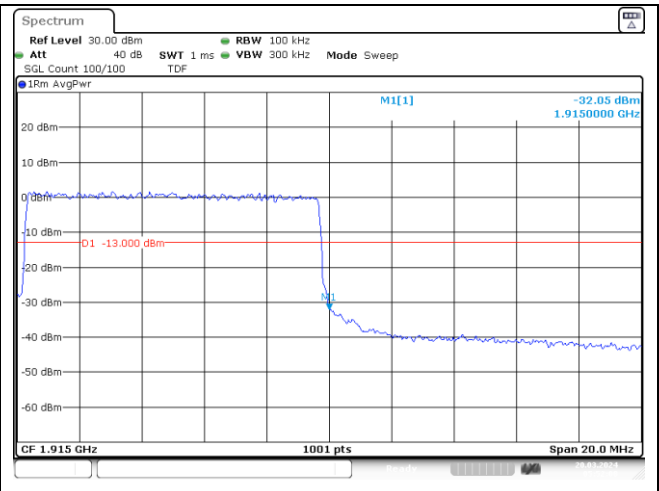


CP-OFDM 16QAM - High Channel - Full RB

**NR band 25 (10 MHz)**



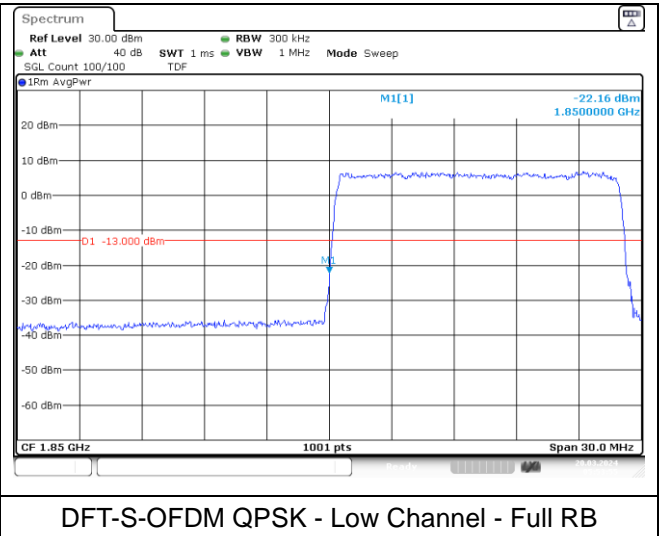
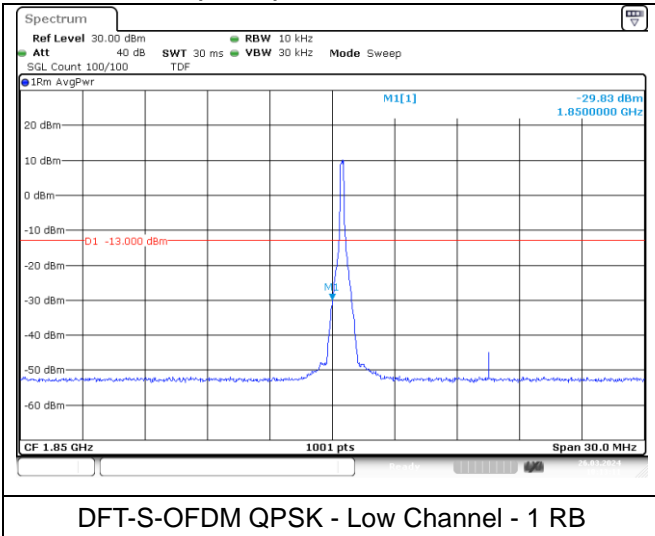
CP-OFDM 16QAM - High Channel - 1 RB



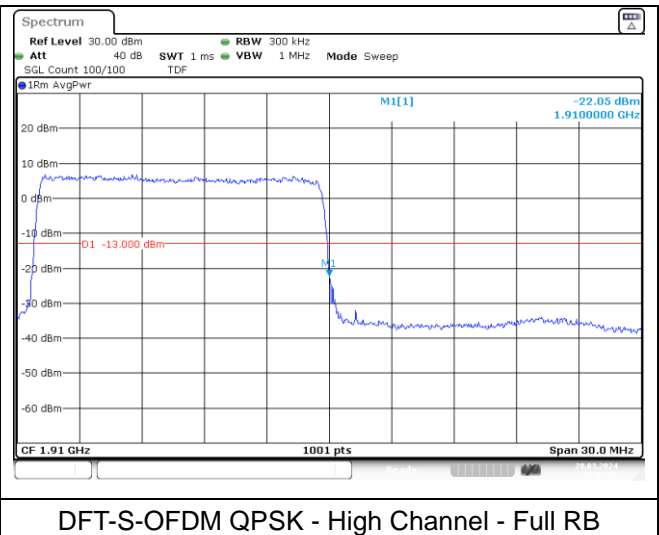
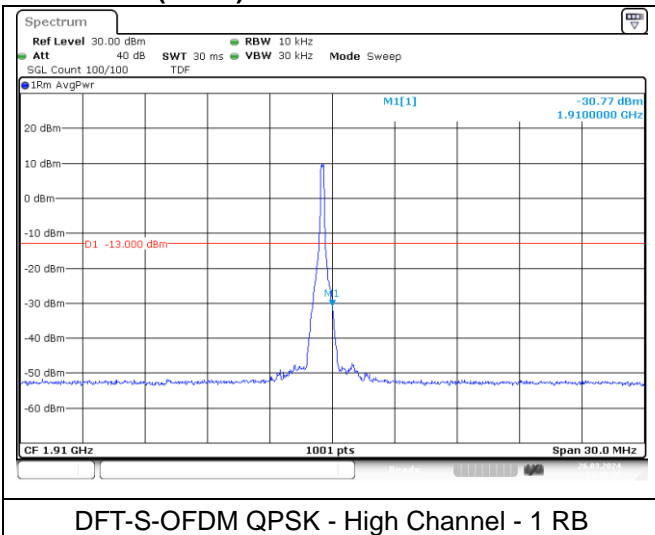
CP-OFDM 16QAM - High Channel - Full RB



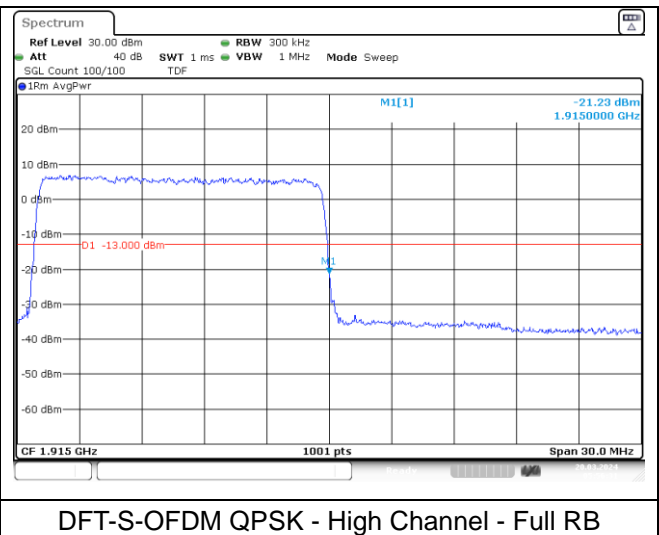
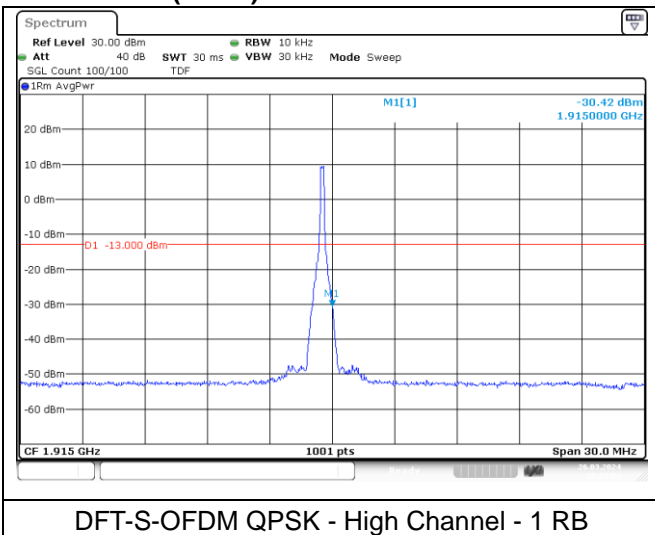
**NR band 25/2 (15 MHz)**



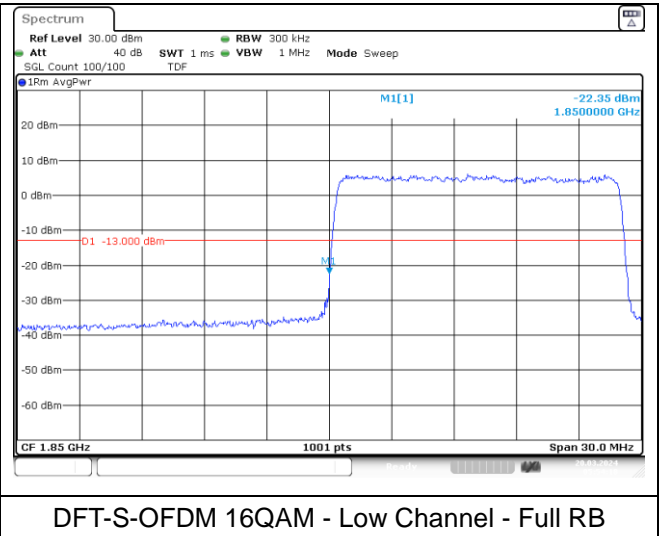
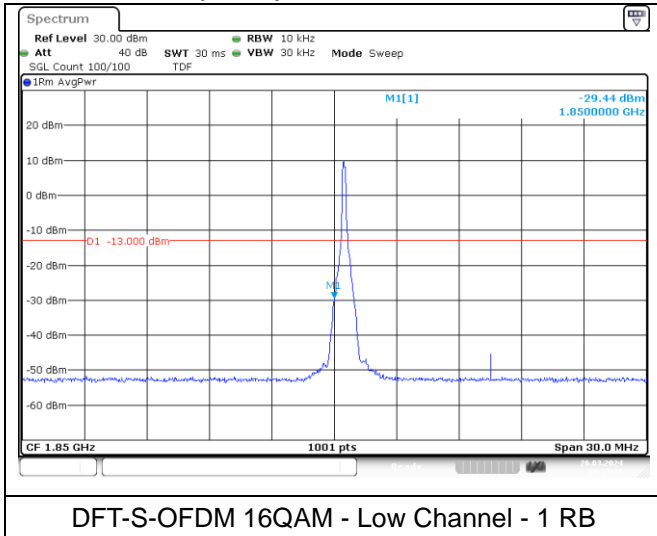
**NR band 2 (15 MHz)**



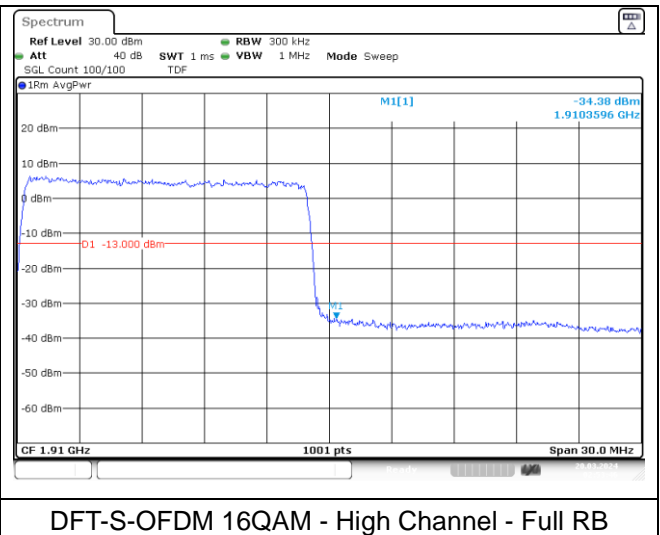
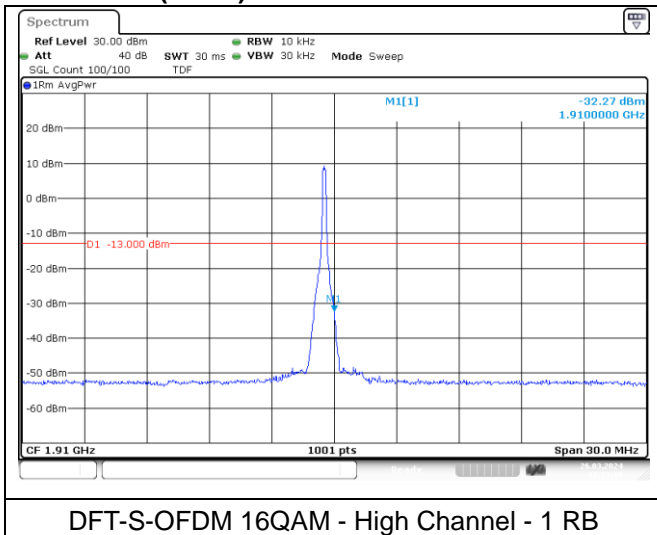
**NR band 25 (15 MHz)**



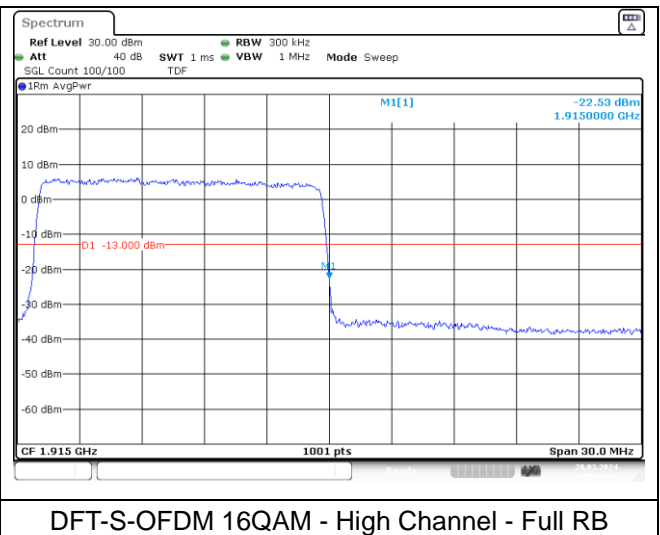
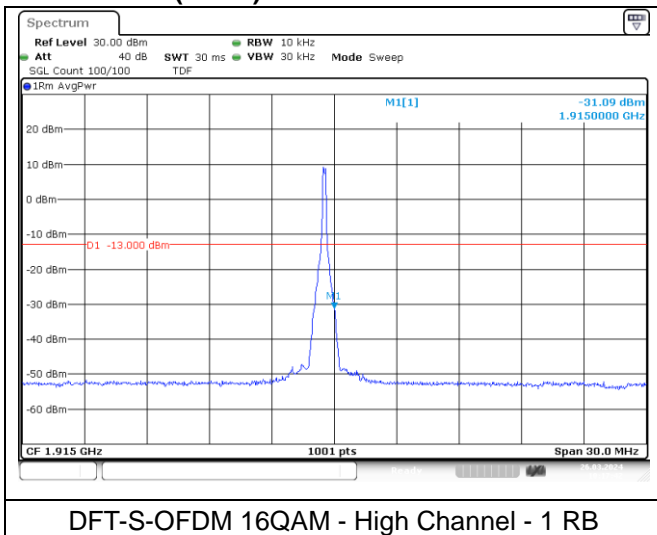
**NR band 25/2 (15 MHz)**



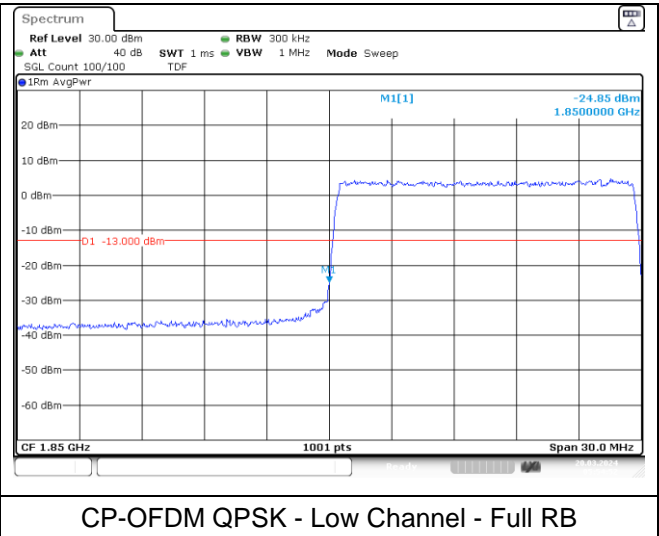
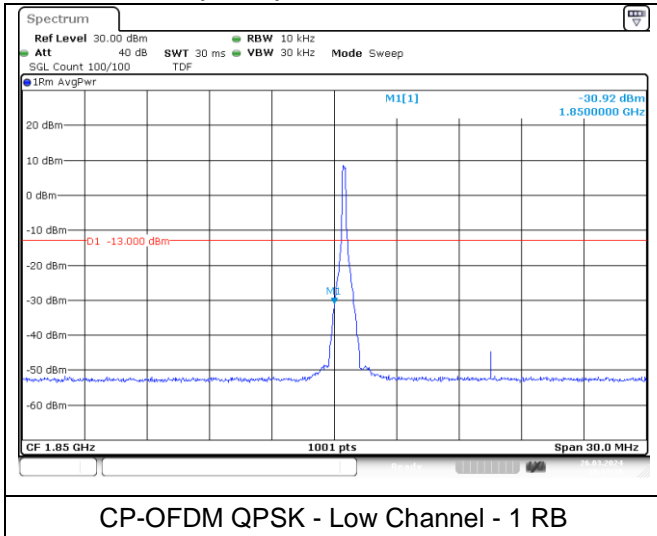
**NR band 2 (15 MHz)**



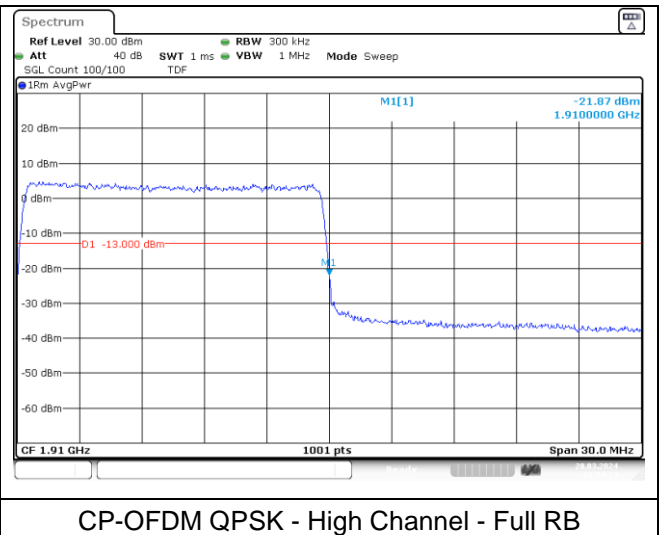
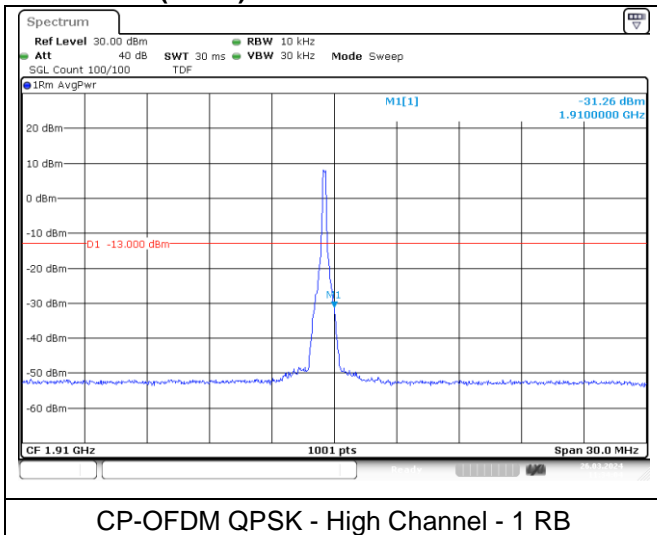
**NR band 25 (15 MHz)**



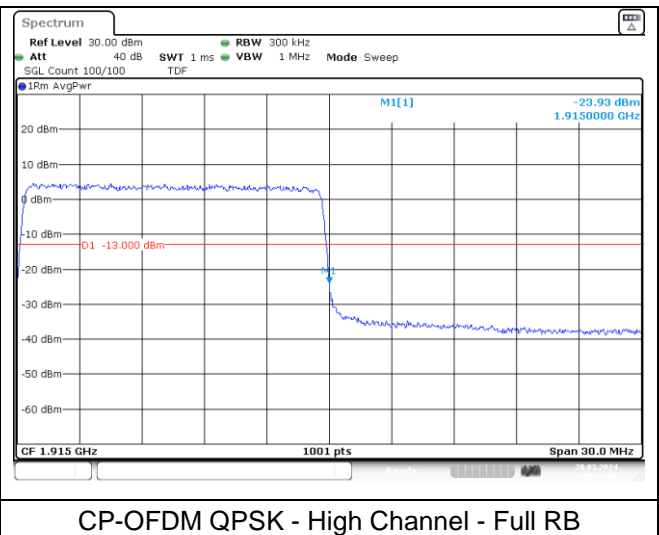
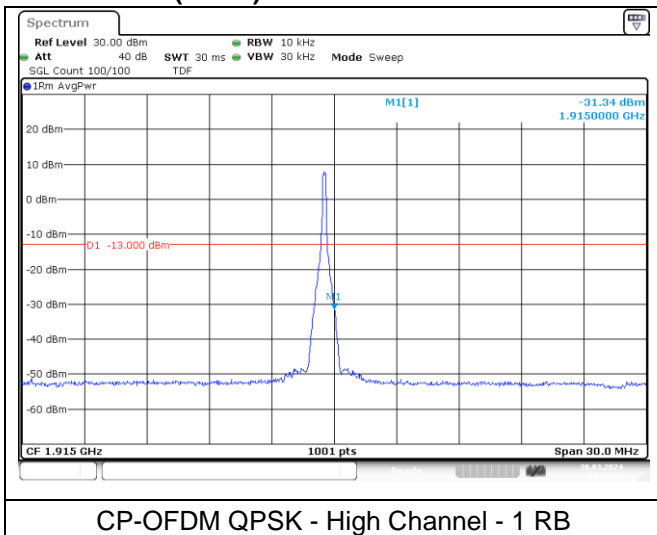
**NR band 25/2 (15 MHz)**



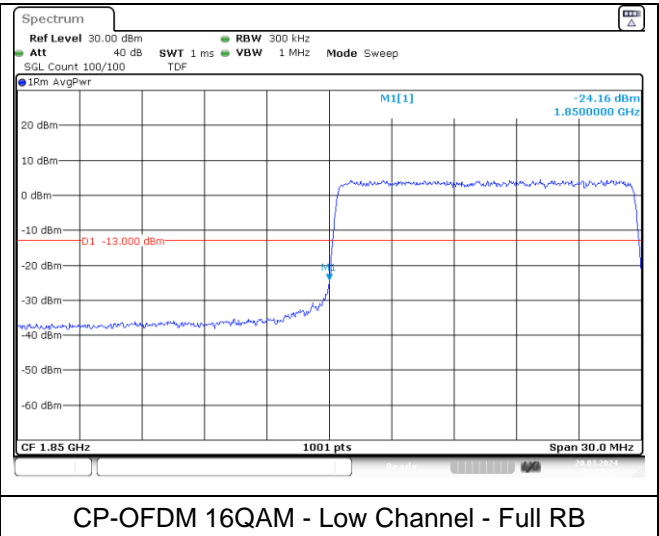
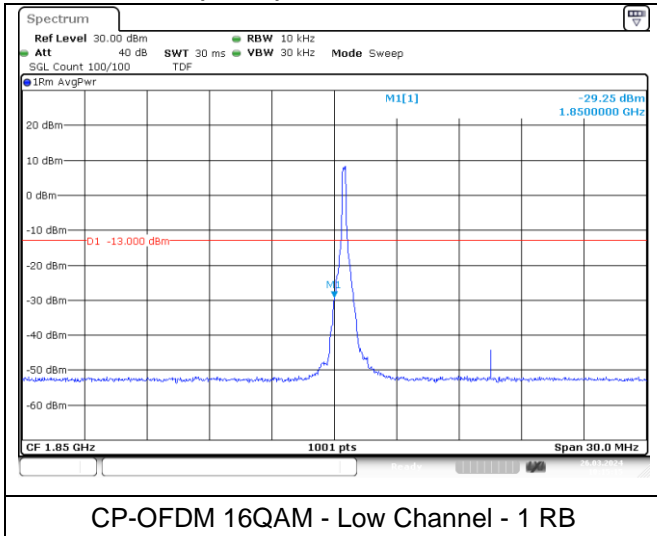
**NR band 2 (15 MHz)**



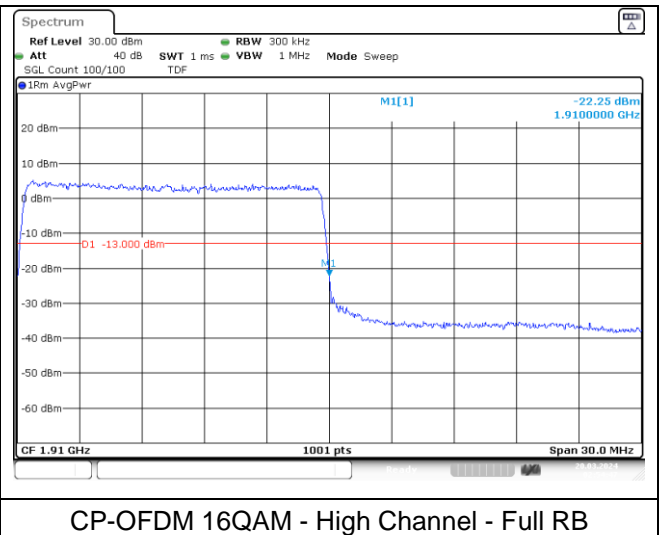
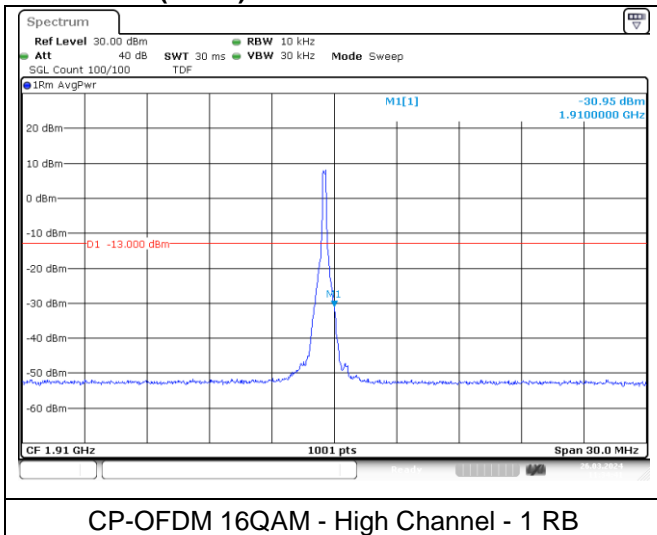
**NR band 25 (15 MHz)**



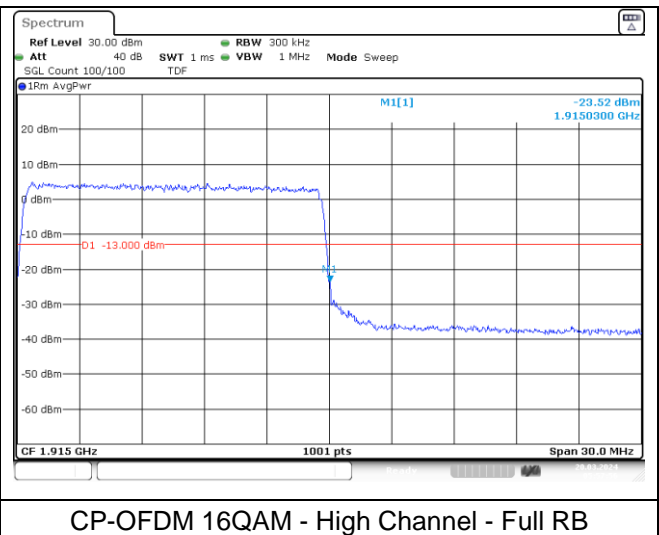
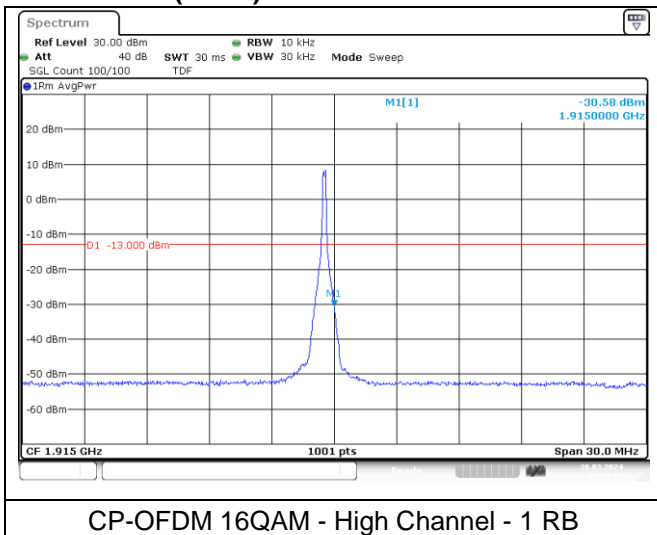
**NR band 25/2 (15 MHz)**



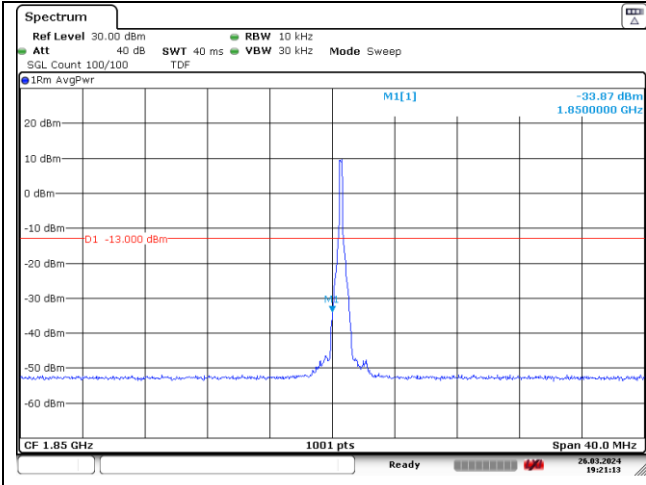
**NR band 2 (15 MHz)**



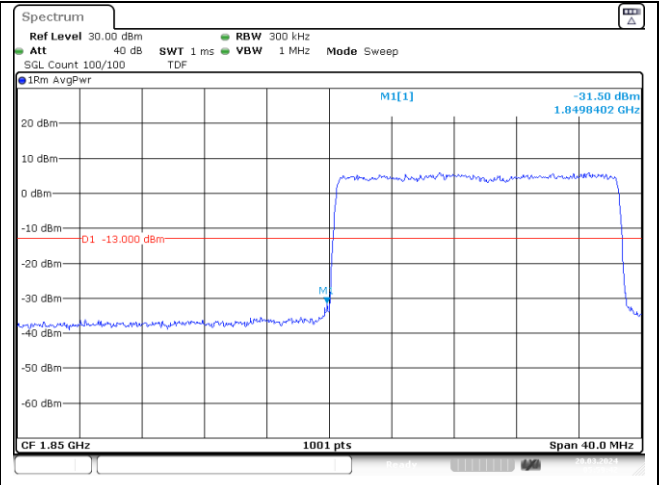
**NR band 25 (15 MHz)**



**NR band 25/2 (20 MHz)**

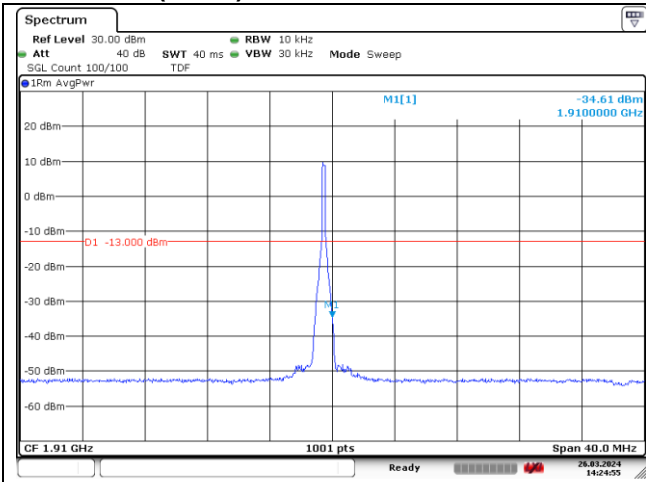


DFT-S-OFDM QPSK - Low Channel - 1 RB

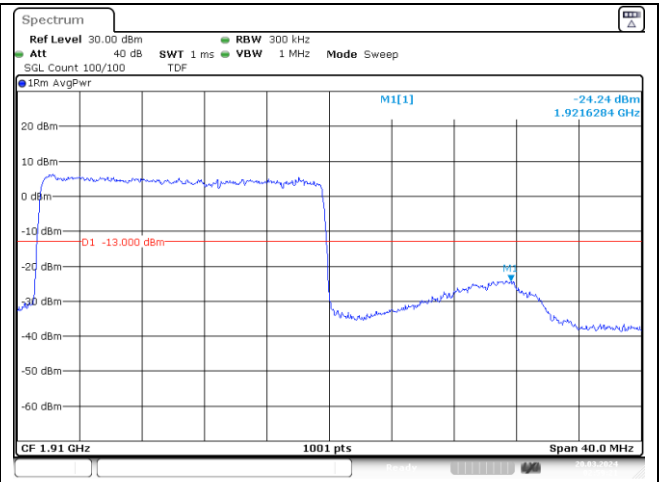


DFT-S-OFDM QPSK - Low Channel - Full RB

**NR band 2 (20 MHz)**

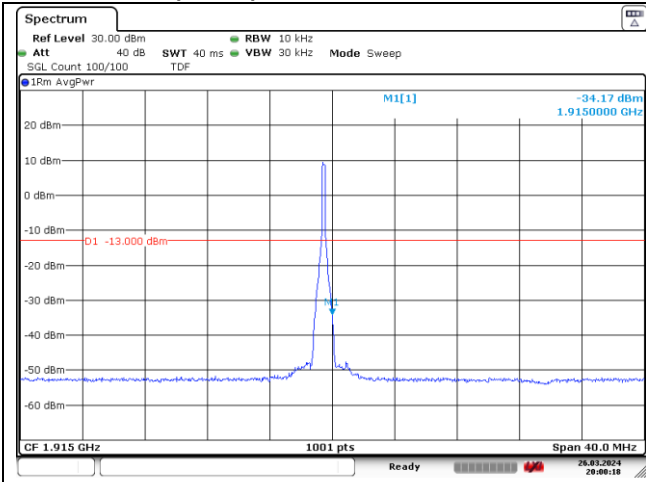


DFT-S-OFDM QPSK - High Channel - 1 RB

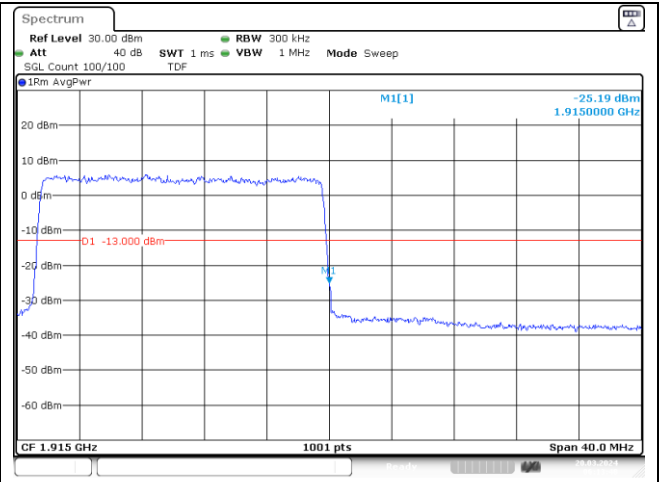


DFT-S-OFDM QPSK - High Channel - Full RB

**NR band 25 (20 MHz)**

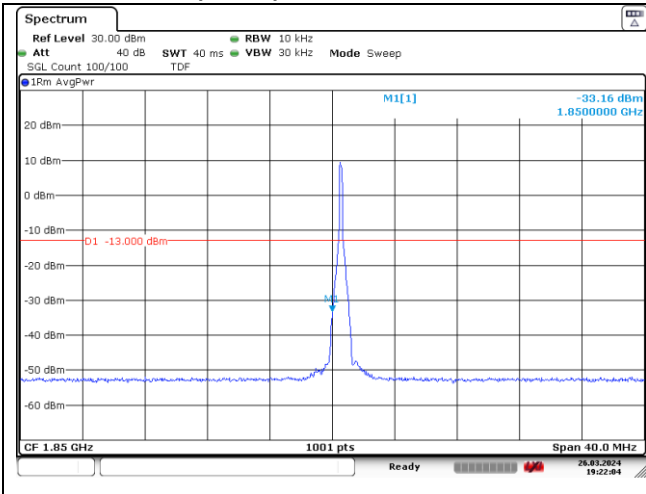


DFT-S-OFDM QPSK - High Channel - 1 RB

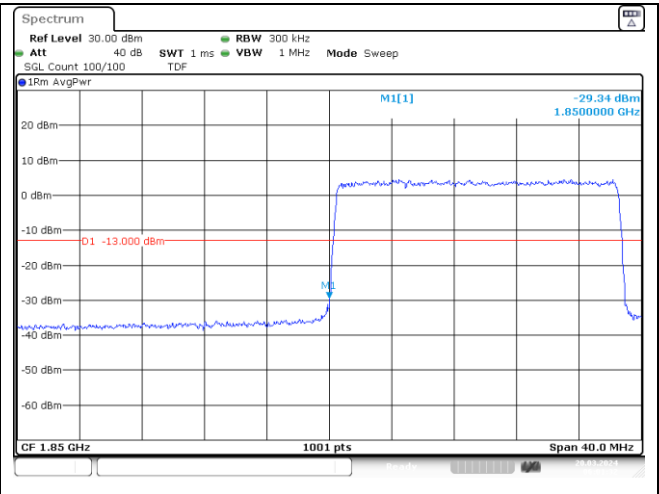


DFT-S-OFDM QPSK - High Channel - Full RB

**NR band 25/2 (20 MHz)**

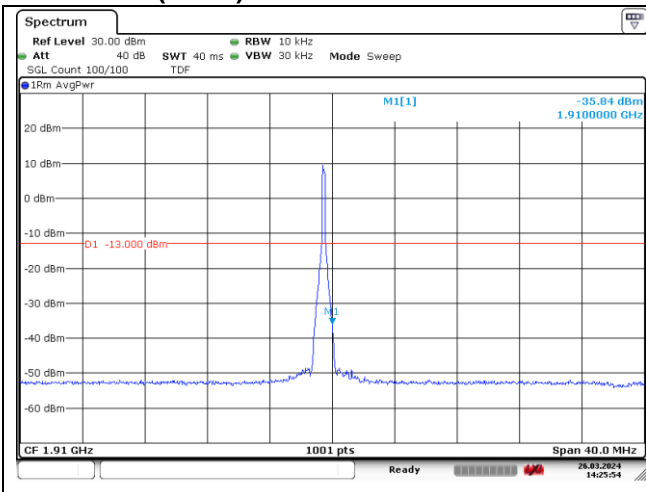


DFT-S-OFDM 16QAM - Low Channel - 1 RB

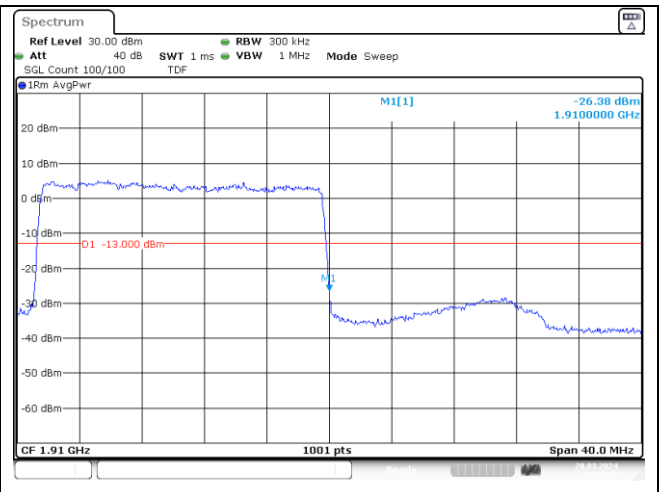


DFT-S-OFDM 16QAM - Low Channel - Full RB

**NR band 2 (20 MHz)**

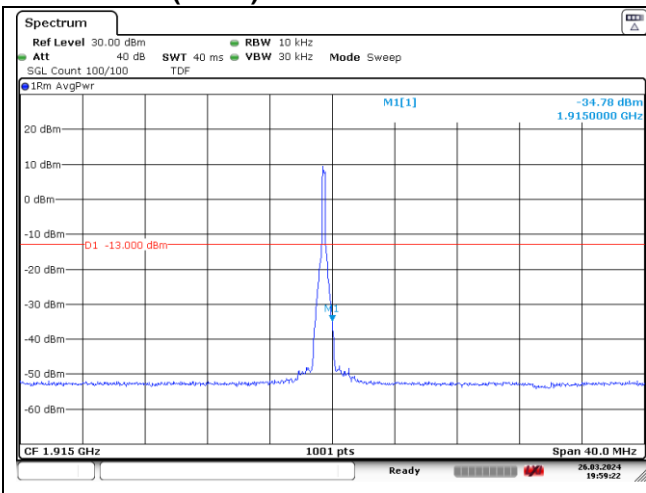


DFT-S-OFDM 16QAM - High Channel - 1 RB

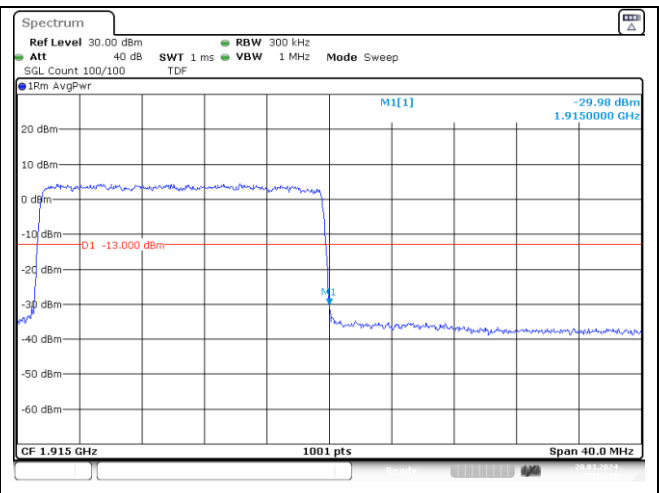


DFT-S-OFDM 16QAM - High Channel - Full RB

**NR band 25 (20 MHz)**

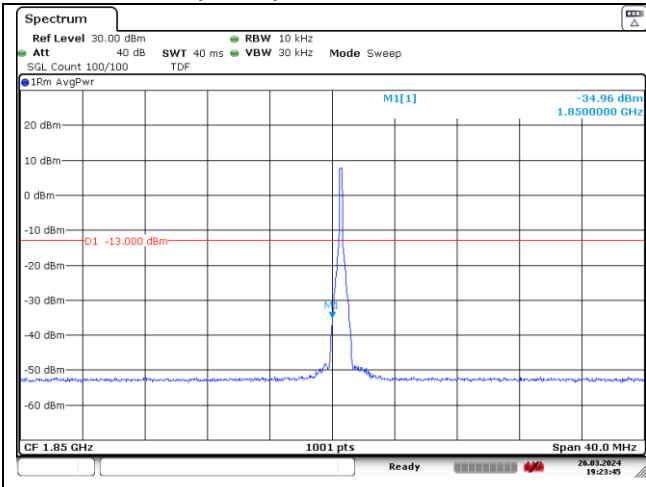


DFT-S-OFDM 16QAM - High Channel - 1 RB

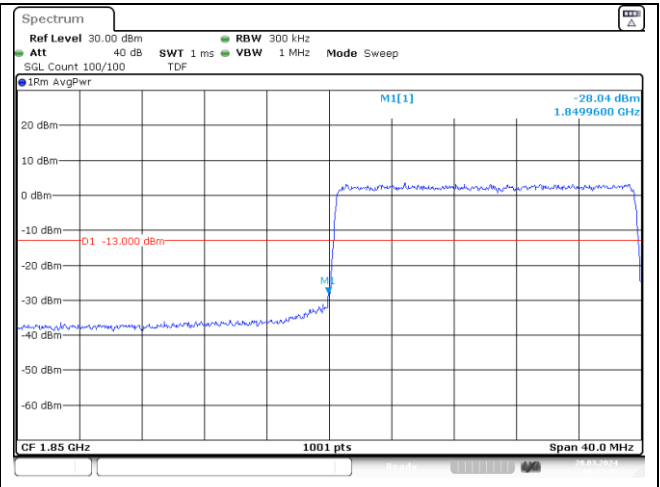


DFT-S-OFDM 16QAM - High Channel - Full RB

**NR band 25/2 (20 MHz)**

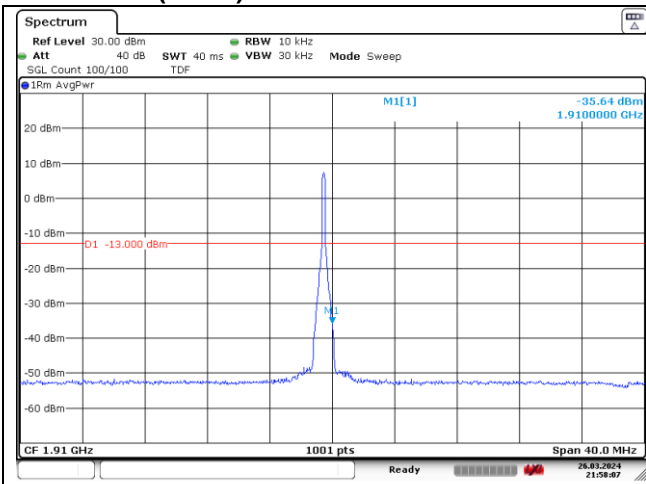


CP-OFDM QPSK - Low Channel - 1 RB

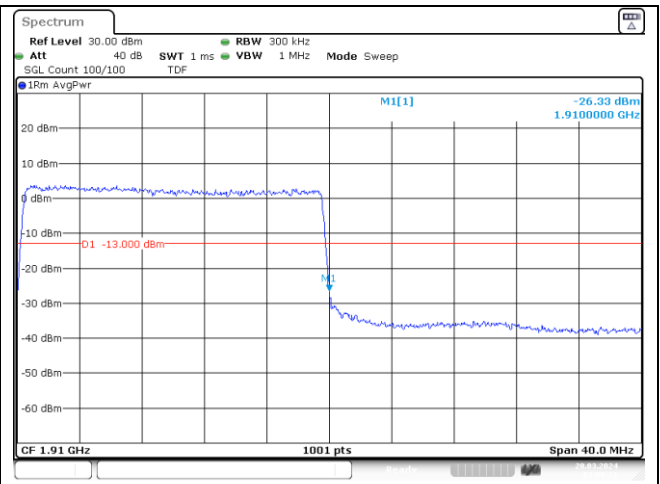


CP-OFDM QPSK - Low Channel - Full RB

**NR band 2 (20 MHz)**

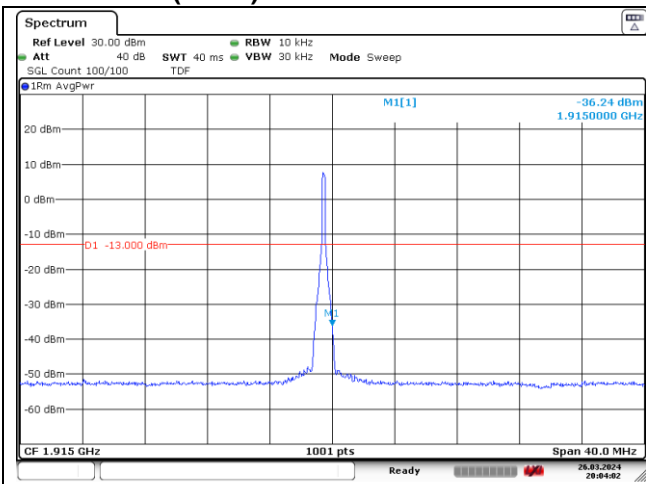


CP-OFDM QPSK - High Channel - 1 RB

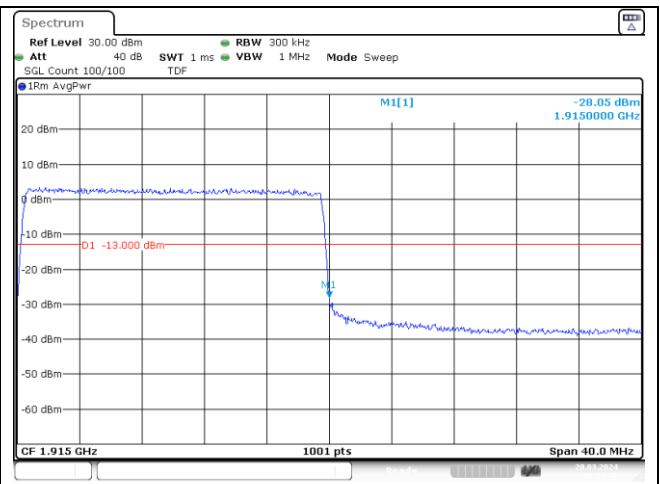


CP-OFDM QPSK - High Channel - Full RB

**NR band 25 (20 MHz)**

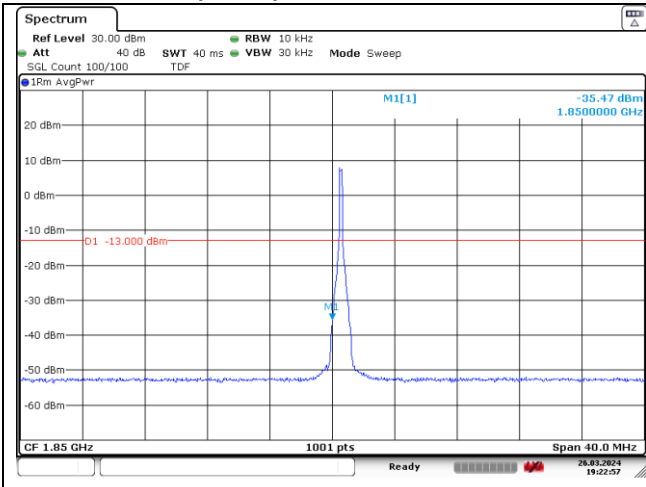


CP-OFDM QPSK - High Channel - 1 RB

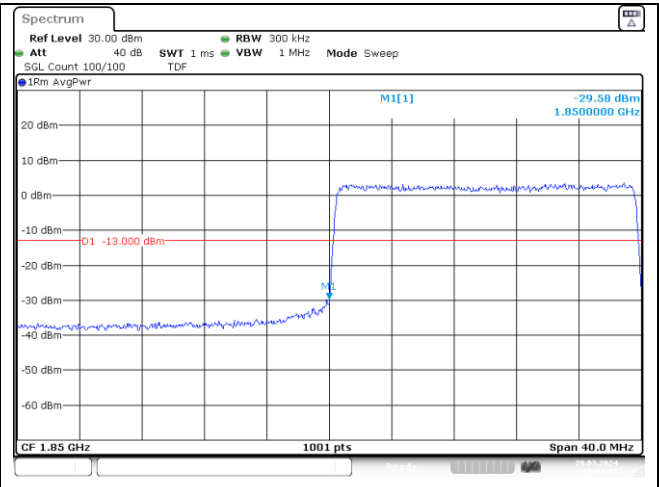


CP-OFDM QPSK - High Channel - Full RB

**NR band 25/2 (20 MHz)**

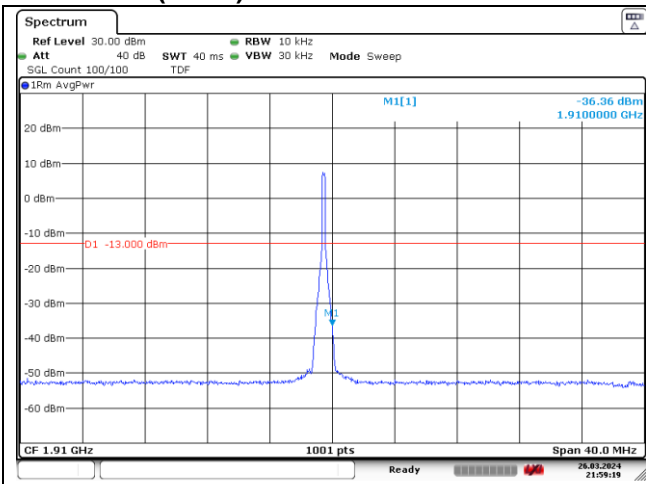


CP-OFDM 16QAM - Low Channel - 1 RB

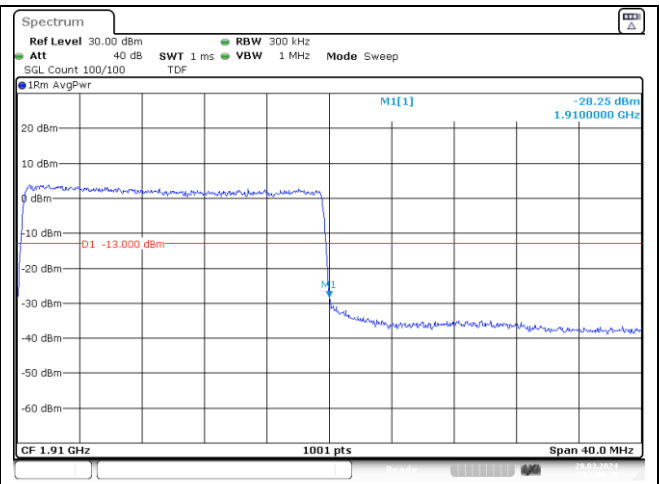


CP-OFDM 16QAM - Low Channel - Full RB

**NR band 2 (20 MHz)**

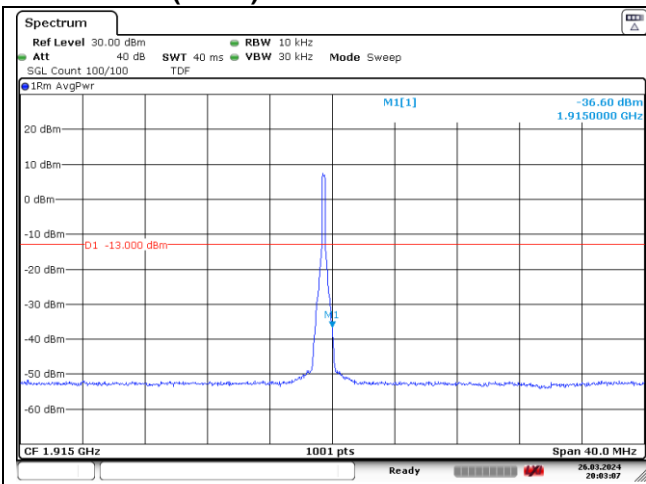


CP-OFDM 16QAM - High Channel - 1 RB

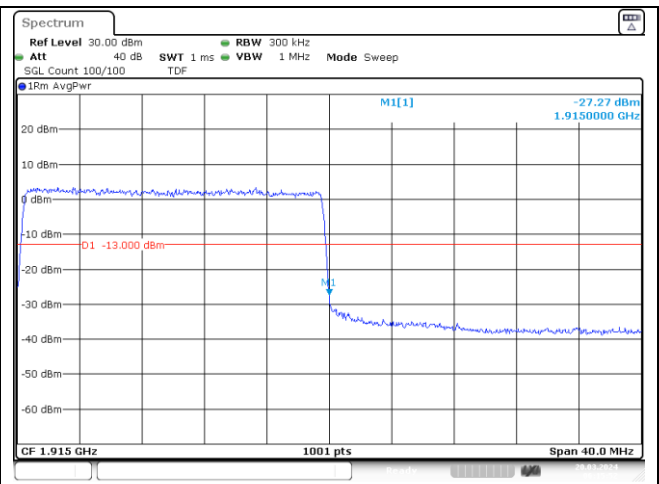


CP-OFDM 16QAM - High Channel - Full RB

**NR band 25 (20 MHz)**



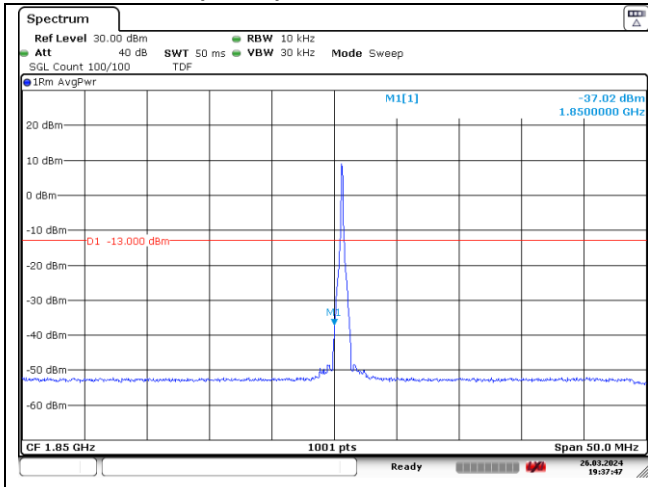
CP-OFDM 16QAM - High Channel - 1 RB



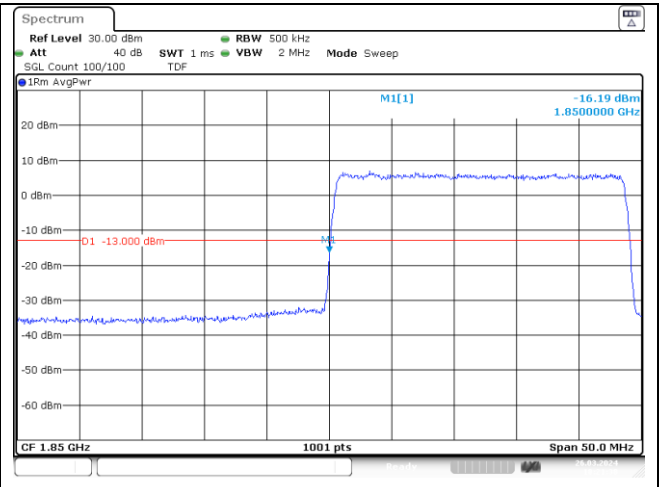
CP-OFDM 16QAM - High Channel - Full RB



**NR band 25/2 (25 MHz)**

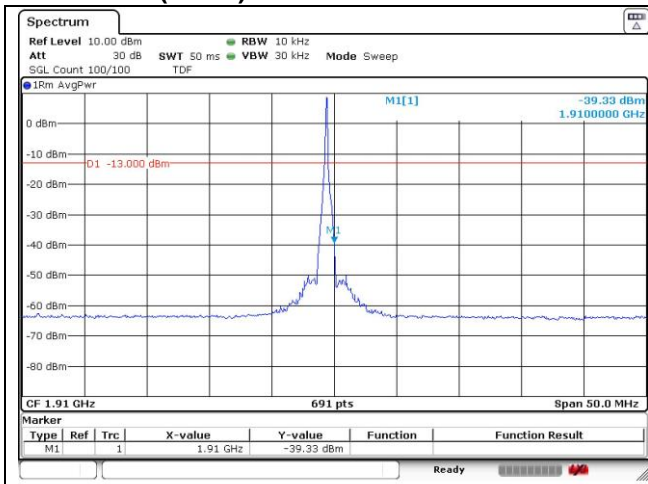


DFT-S-OFDM QPSK - Low Channel - 1 RB

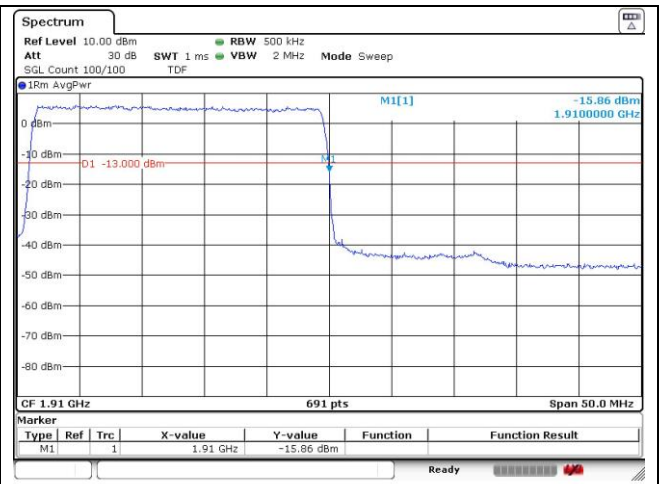


DFT-S-OFDM QPSK - Low Channel - Full RB

**NR band 2 (25 MHz)**

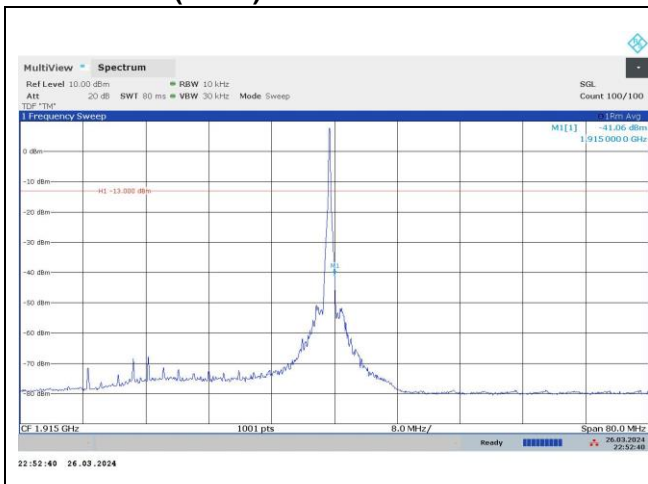


DFT-S-OFDM QPSK - High Channel - 1 RB

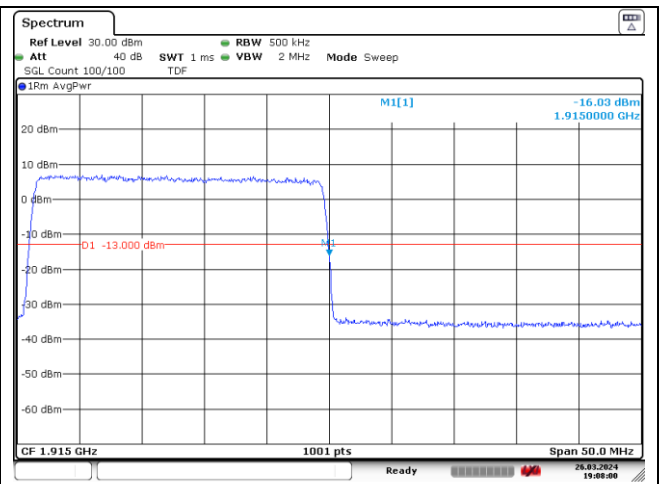


DFT-S-OFDM QPSK - High Channel - Full RB

**NR band 25 (25 MHz)**

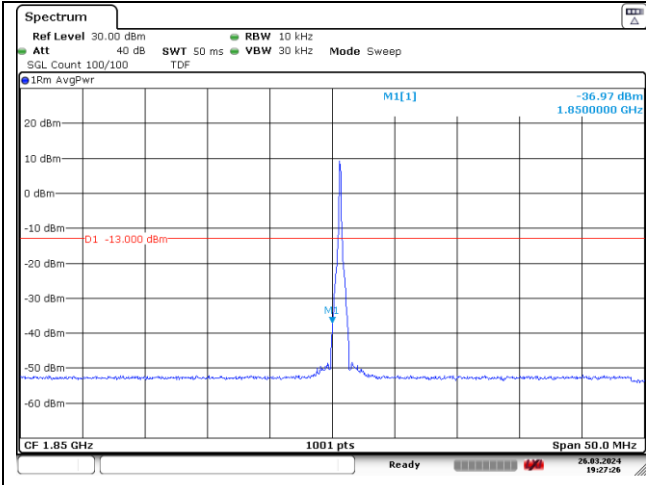


DFT-S-OFDM QPSK - High Channel - 1 RB

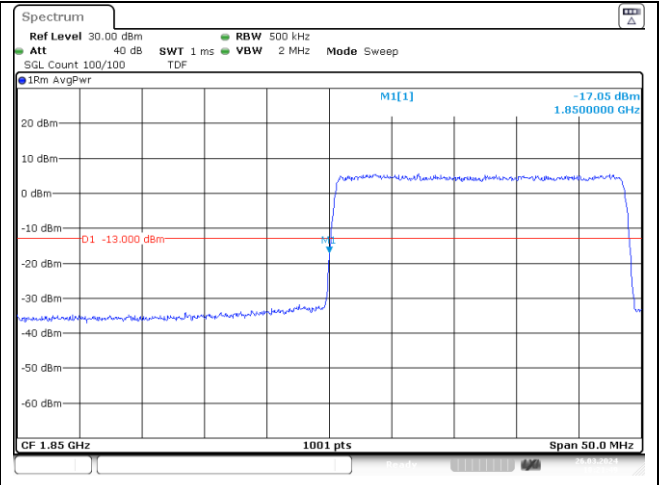


DFT-S-OFDM QPSK - High Channel - Full RB

**NR band 25/2 (25 MHz)**

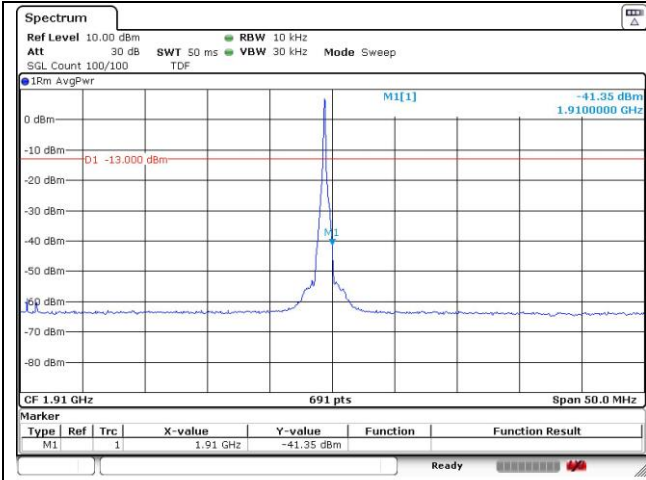


DFT-S-OFDM 16QAM - Low Channel - 1 RB

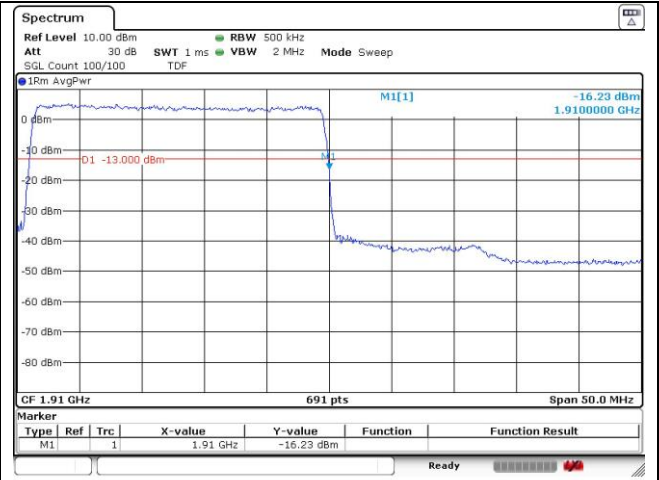


DFT-S-OFDM 16QAM - Low Channel - Full RB

**NR band 2 (25 MHz)**

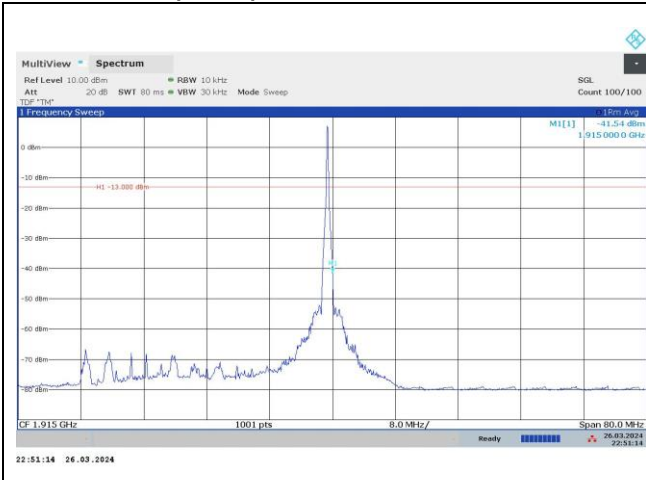


DFT-S-OFDM 16QAM - High Channel - 1 RB

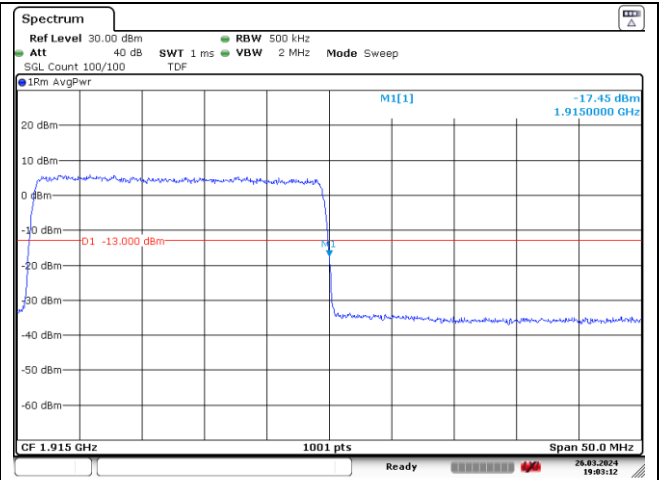


DFT-S-OFDM 16QAM - High Channel - Full RB

**NR band 25 (25 MHz)**

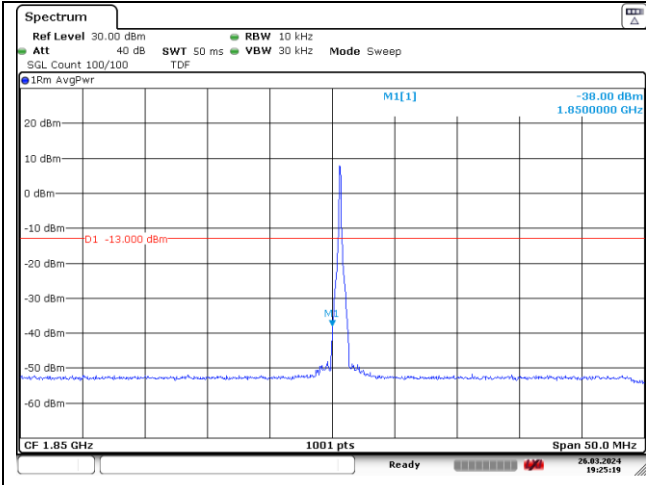


DFT-S-OFDM 16QAM - High Channel - 1 RB

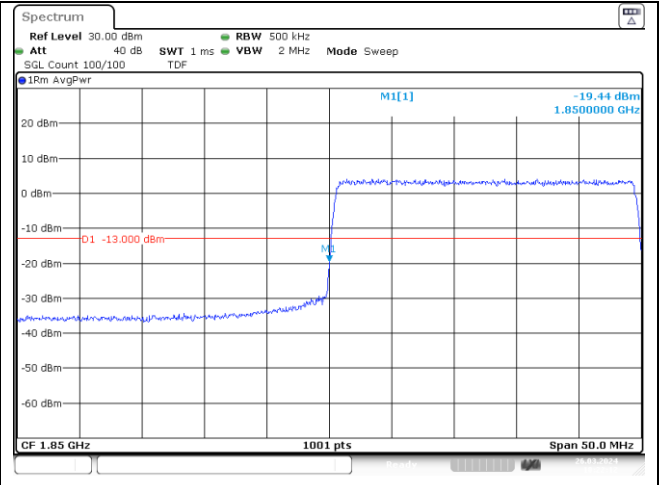


DFT-S-OFDM 16QAM - High Channel - Full RB

**NR band 25/2 (25 MHz)**

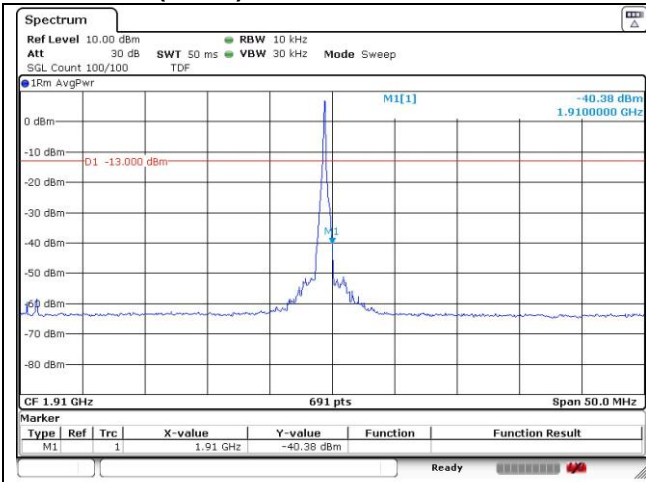


CP-OFDM QPSK - Low Channel - 1 RB

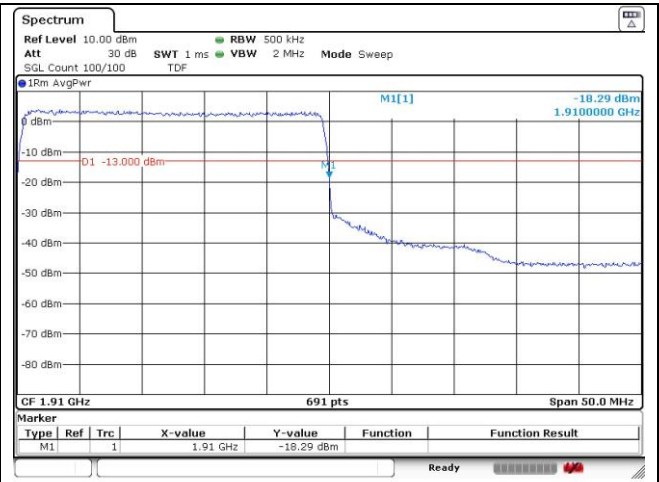


CP-OFDM QPSK - Low Channel - Full RB

**NR band 2 (25 MHz)**

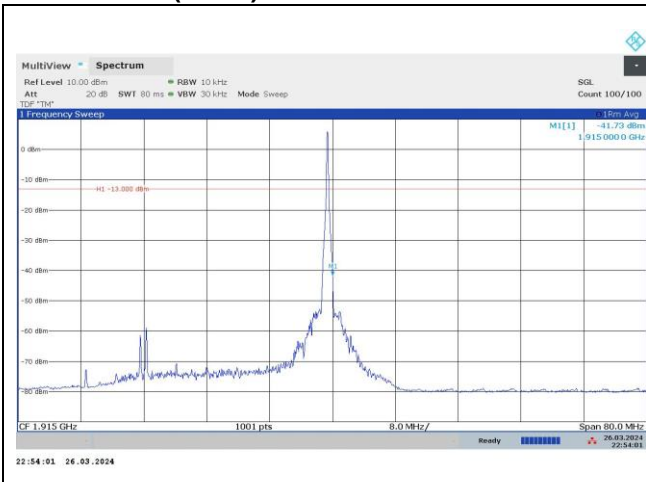


CP-OFDM QPSK - High Channel - 1 RB

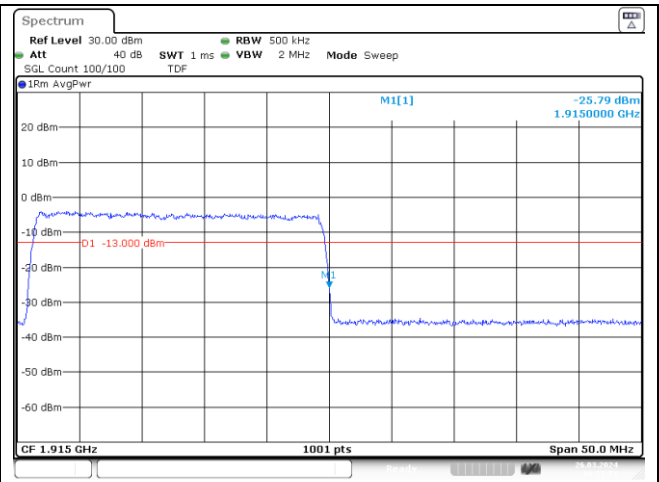


CP-OFDM QPSK - High Channel - Full RB

**NR band 25 (25 MHz)**



CP-OFDM QPSK - High Channel - 1 RB



CP-OFDM QPSK - High Channel - Full RB