**LTE band (814MHz-824MHz),5MHz(-26dBc BW)**

| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 819 | 4.885 | 4.870 |

**LTE band 26 , 5MHz Bandwidth,QPSK (-26dBc BW)**
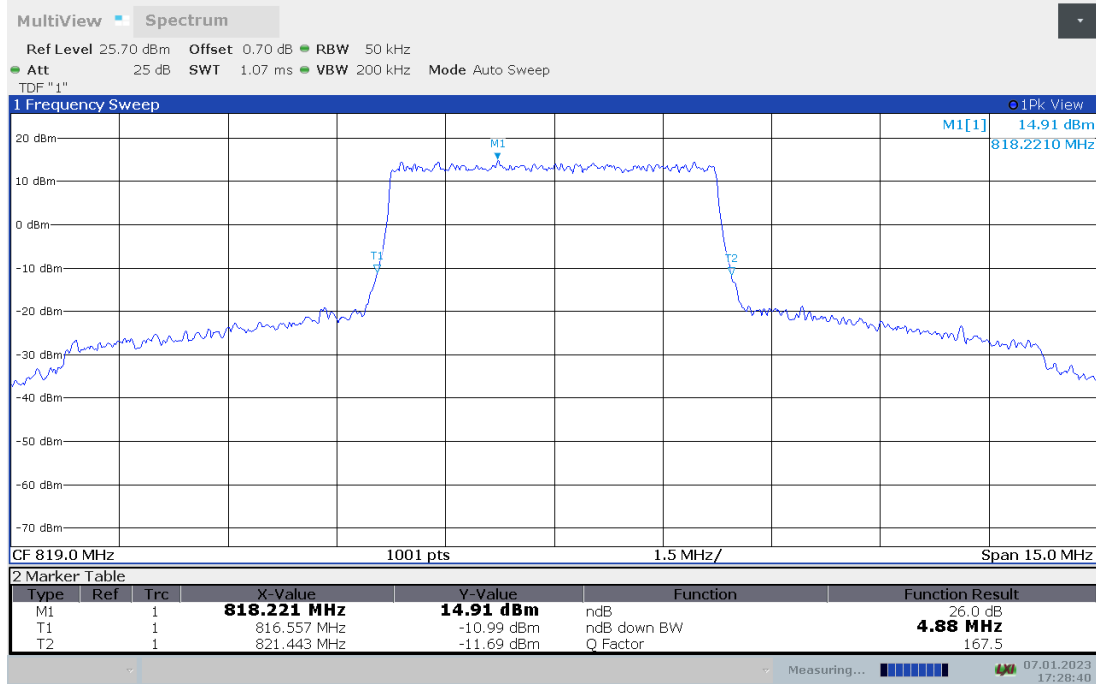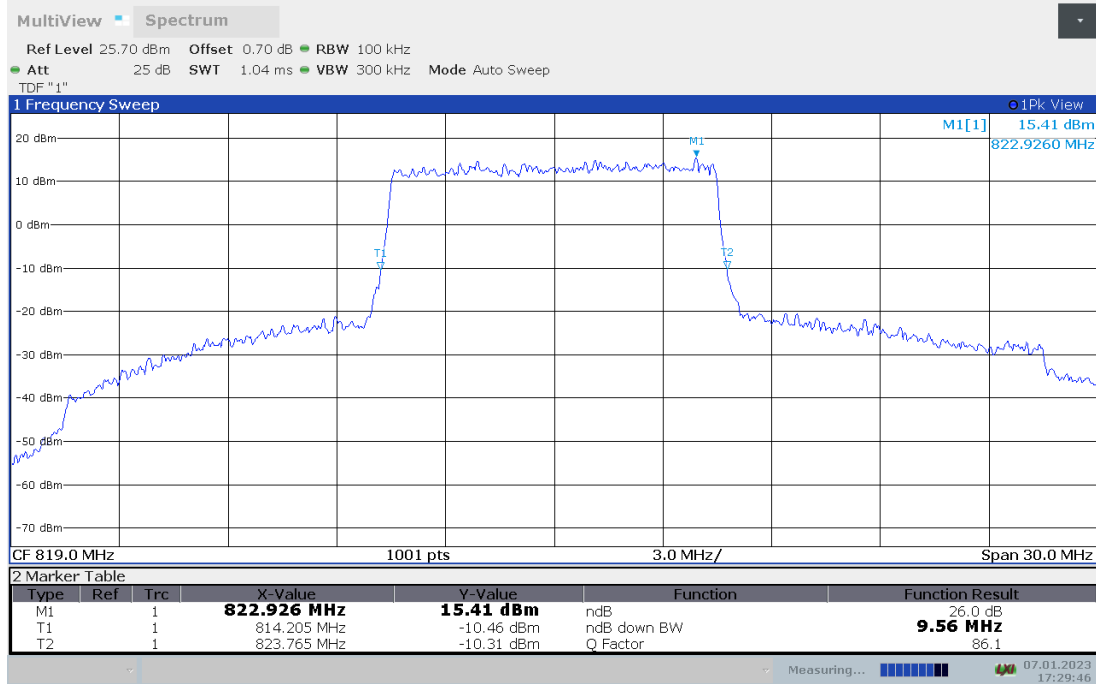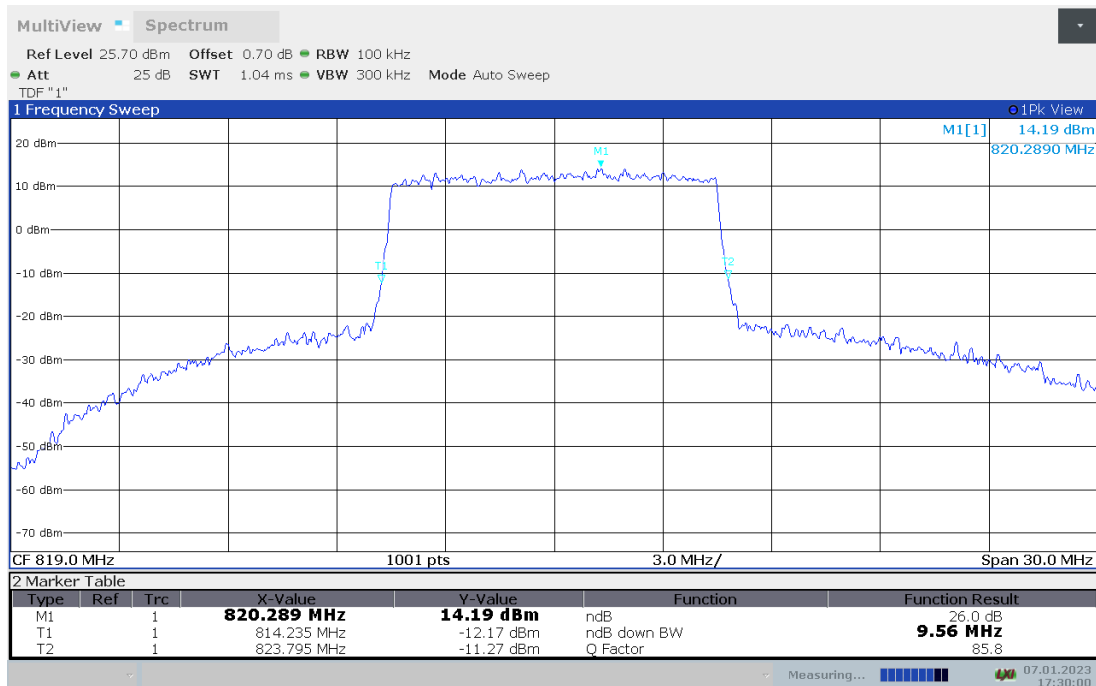


**LTE band 26 , 5MHz Bandwidth,16QAM (-26dBc BW)**
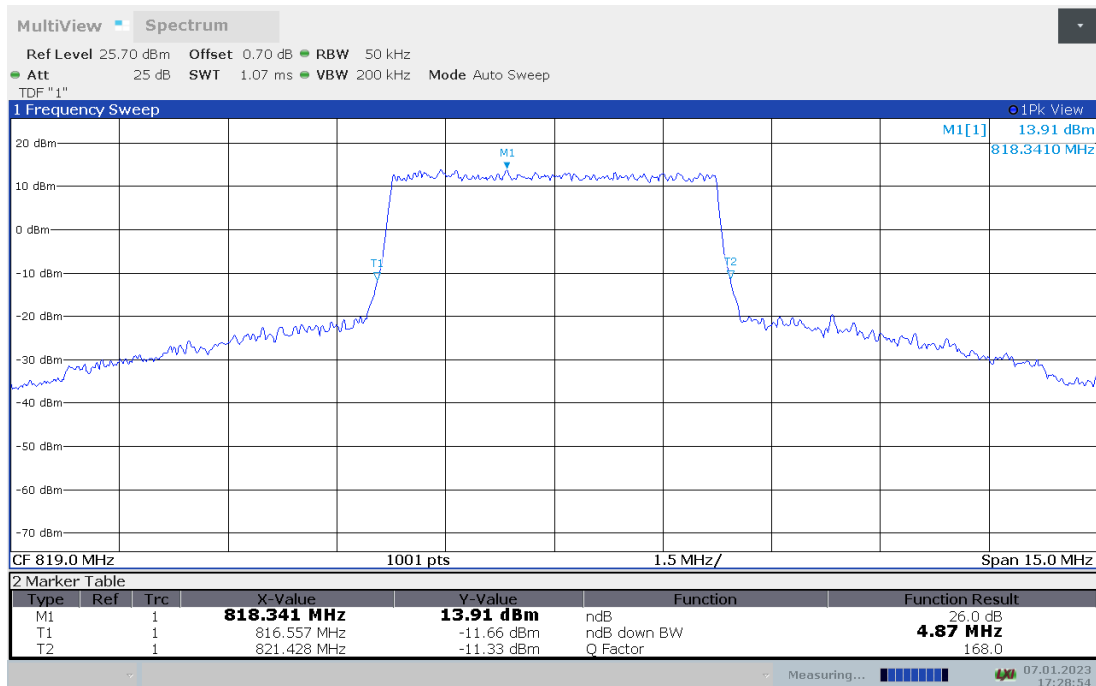
## LTE band (814MHz-824MHz),10MHz(-26dBc BW)

| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 819 | 9.560 | 9.560 |

## LTE band 26 , 10MHz Bandwidth,QPSK (-26dBc BW)



## LTE band 26 , 10MHz Bandwidth,16QAM (-26dBc BW)

### LTE band 38,5MHz(-26dBc BW)

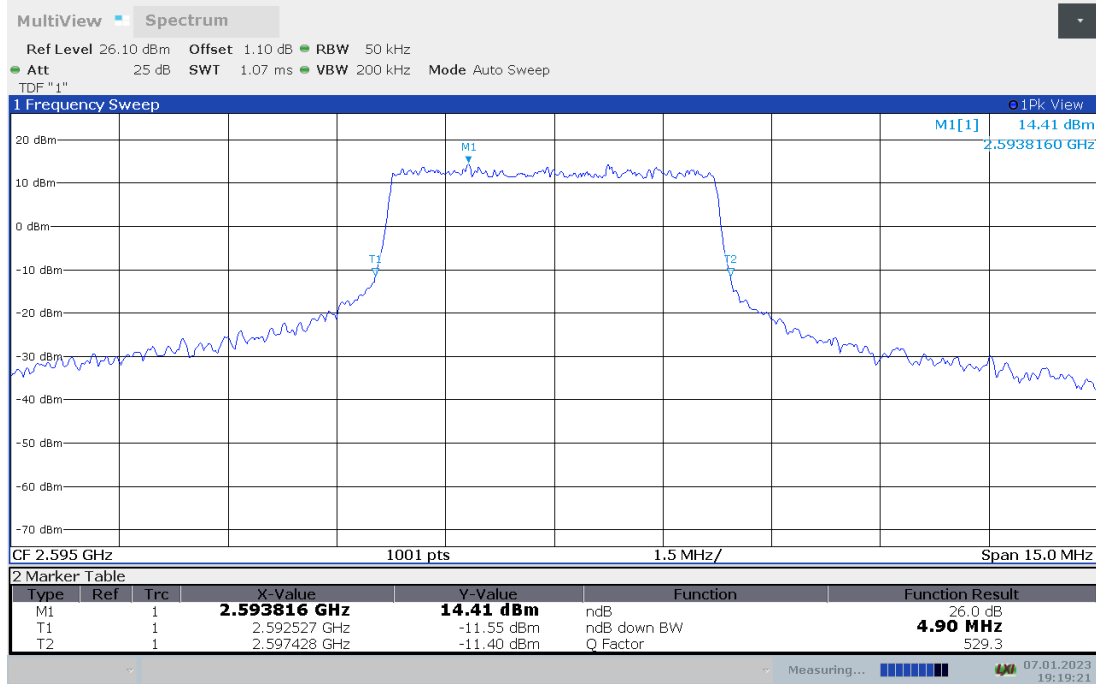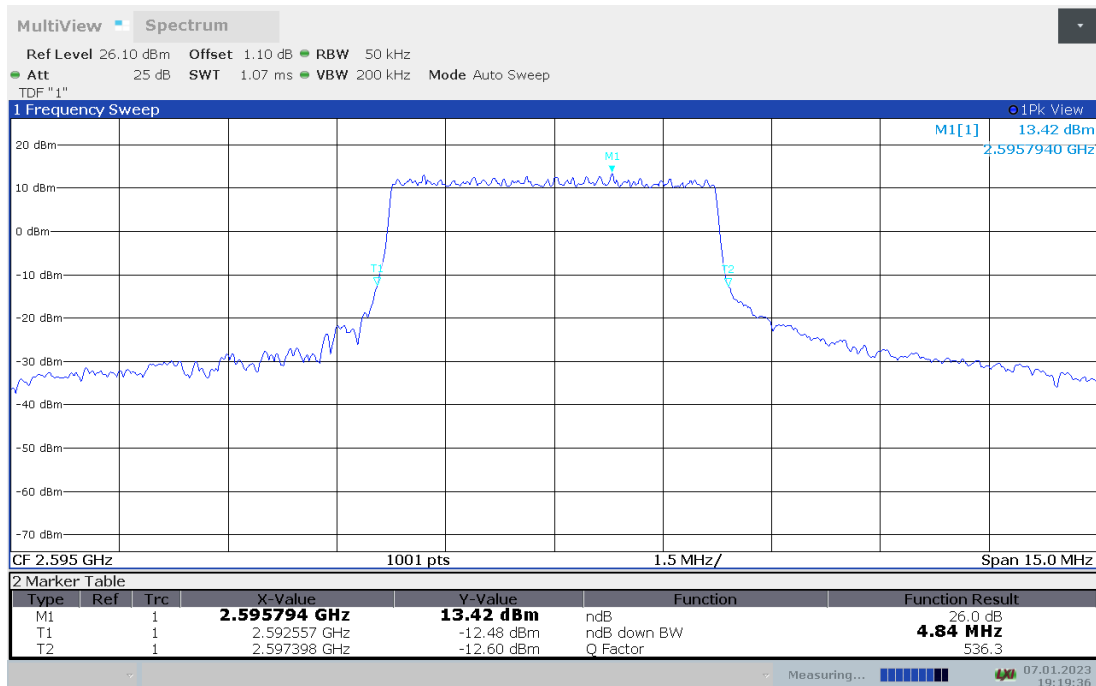| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 2595 | 4.900 | 4.840 |

### LTE band 38 , 5MHz Bandwidth,QPSK (-26dBc BW)



### LTE band 38 , 5MHz Bandwidth,16QAM (-26dBc BW)

## LTE band 38,10MHz(-26dBc BW)

| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 2595 | 9.560 | 9.530 |

## LTE band 38 , 10MHz Bandwidth,QPSK (-26dBc BW)



## LTE band 38 , 10MHz Bandwidth,16QAM (-26dBc BW)

**LTE band 38,15MHz(-26dBc BW)**

| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 2595 | 14.431 | 14.520 |

**LTE band 38 , 15MHz Bandwidth,QPSK (-26dBc BW)**



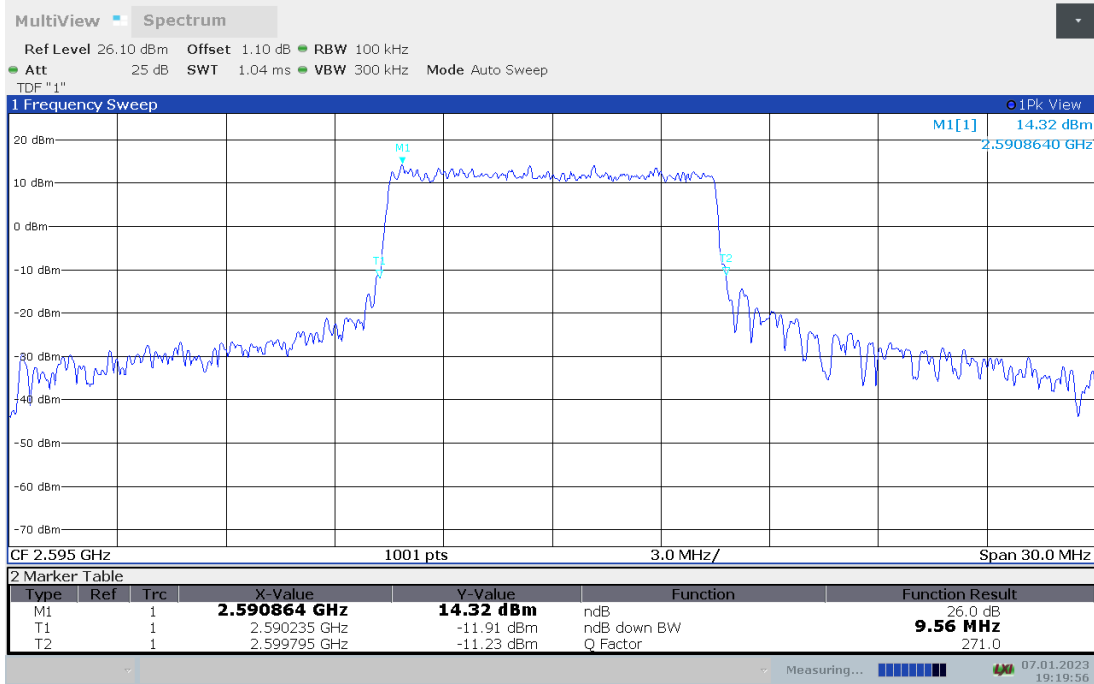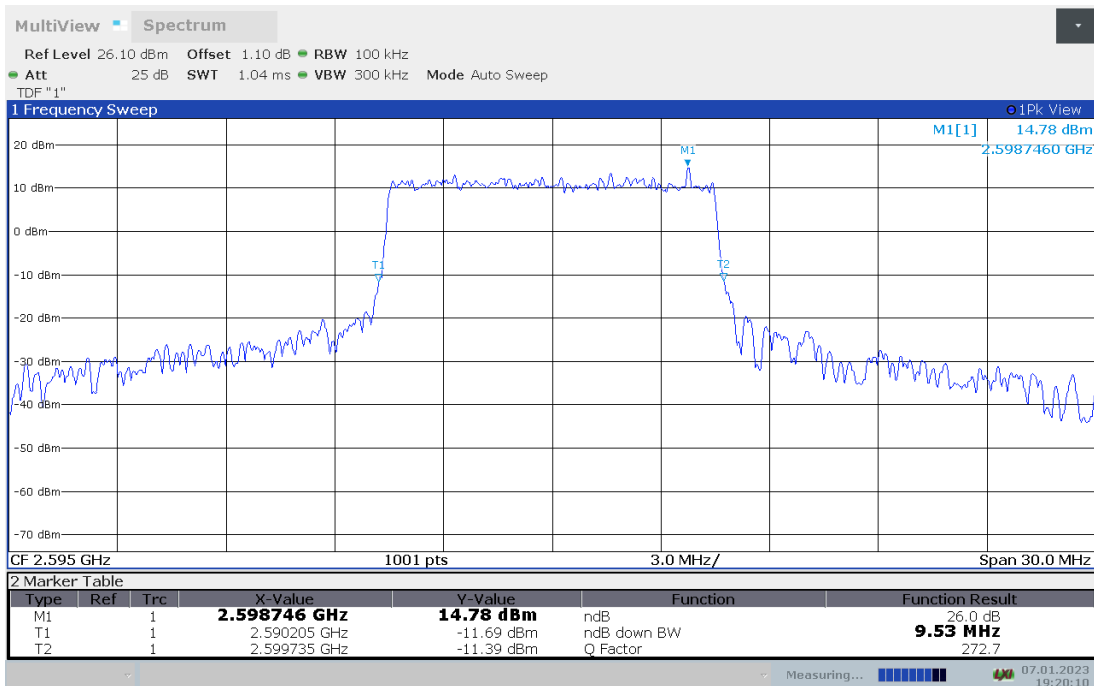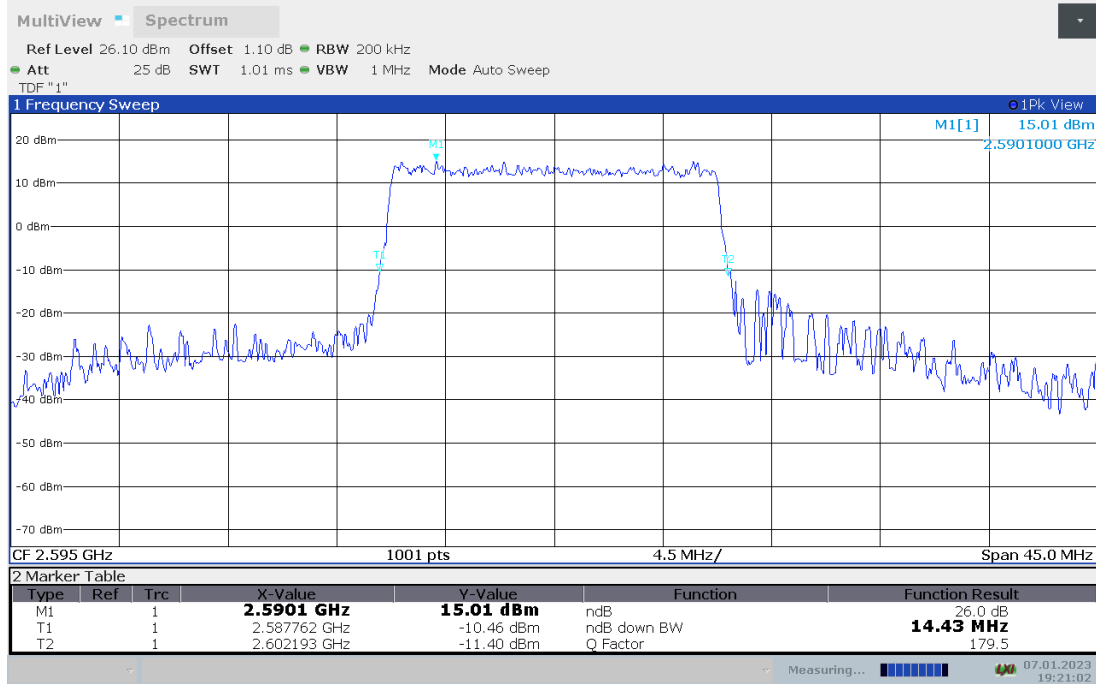**LTE band 38 , 15MHz Bandwidth,16QAM (-26dBc BW)**

## LTE band 38,20MHz(-26dBc BW)

| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 2595 | 19.061 | 19.001 |

### LTE band 38 , 20MHz Bandwidth,QPSK (-26dBc BW)



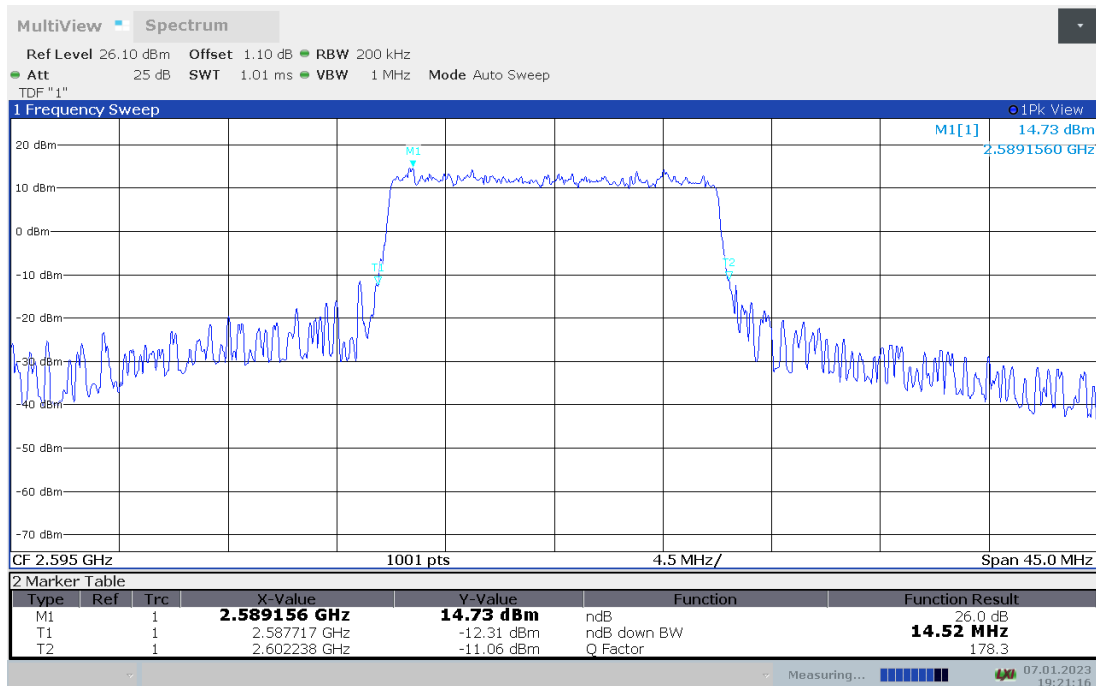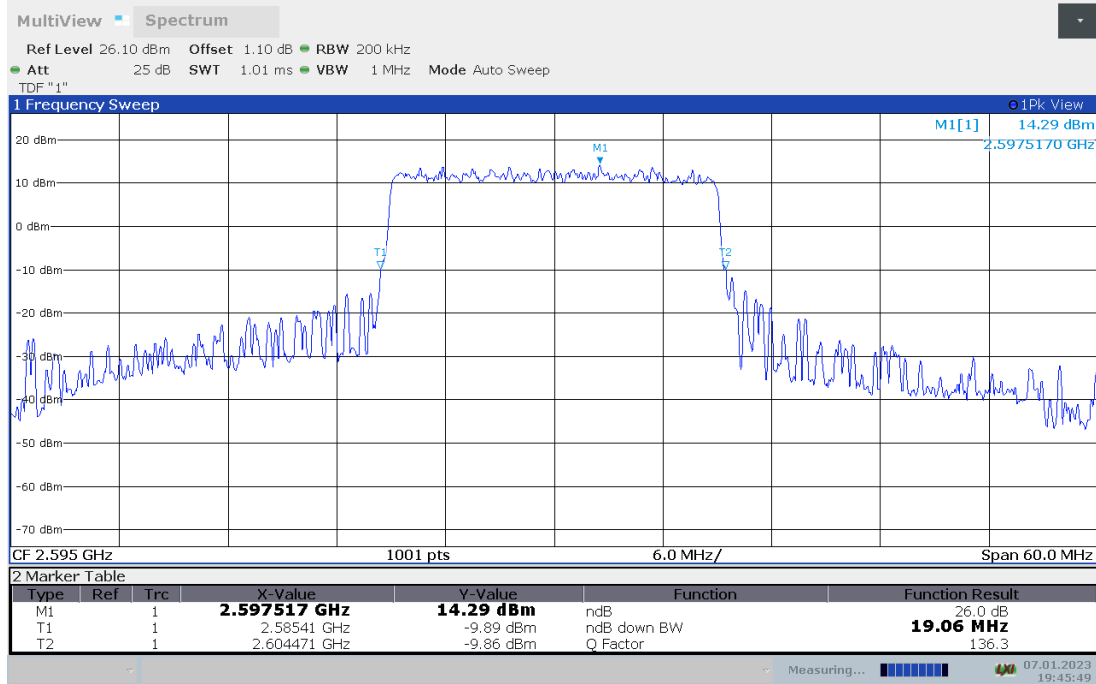### LTE band 38 , 20MHz Bandwidth,16QAM (-26dBc BW)

## LTE band 41,5MHz(-26dBc BW)

| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 2593 | 4.900 | 4.870 |

## LTE band 41 , 5MHz Bandwidth,QPSK (-26dBc BW)
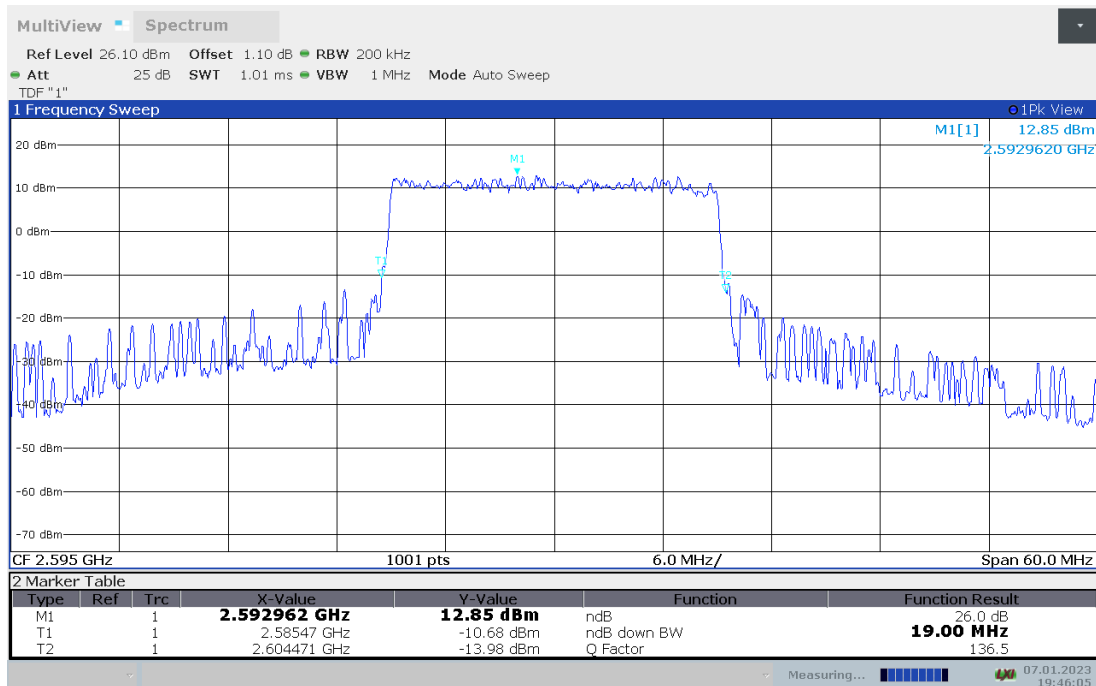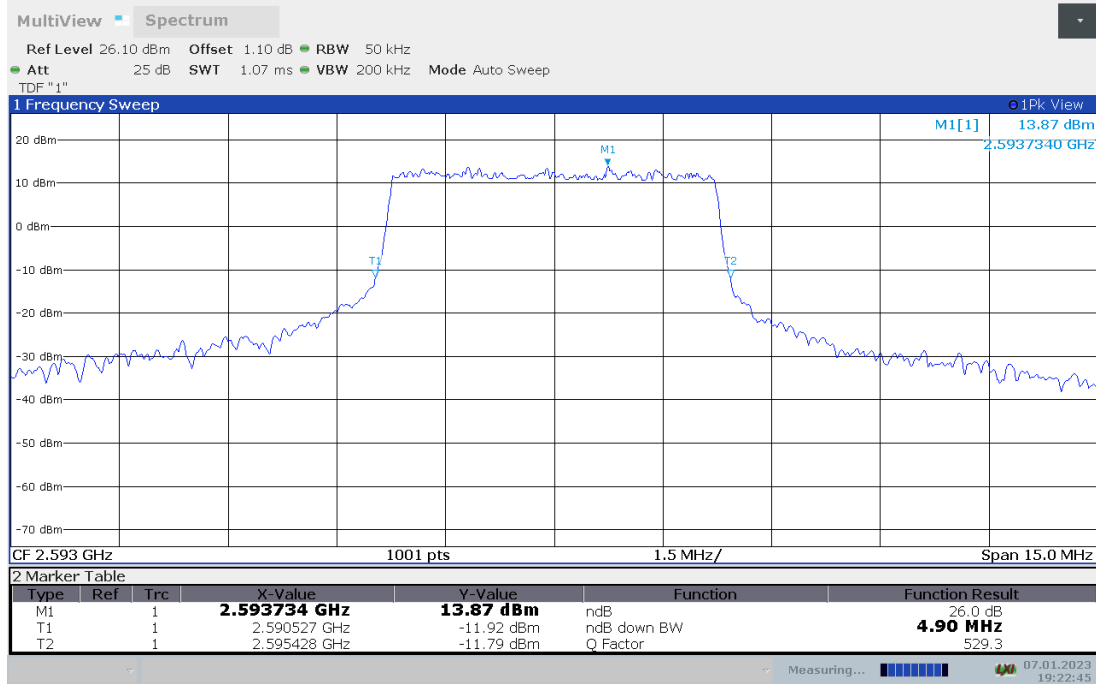


## LTE band 41 , 5MHz Bandwidth,16QAM (-26dBc BW)

### LTE band 41,10MHz(-26dBc BW)

| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 2593 | 9.590 | 9.560 |

### LTE band 41 , 10MHz Bandwidth,QPSK (-26dBc BW)
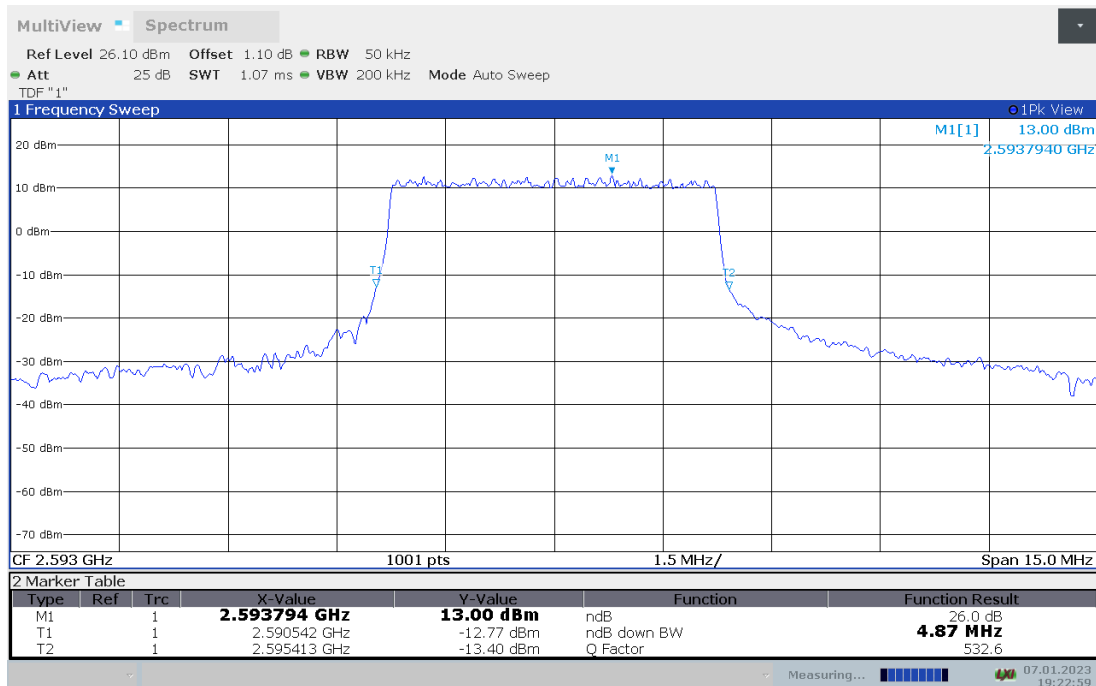


### LTE band 41 , 10MHz Bandwidth,16QAM (-26dBc BW)

### LTE band 41,15MHz(-26dBc BW)

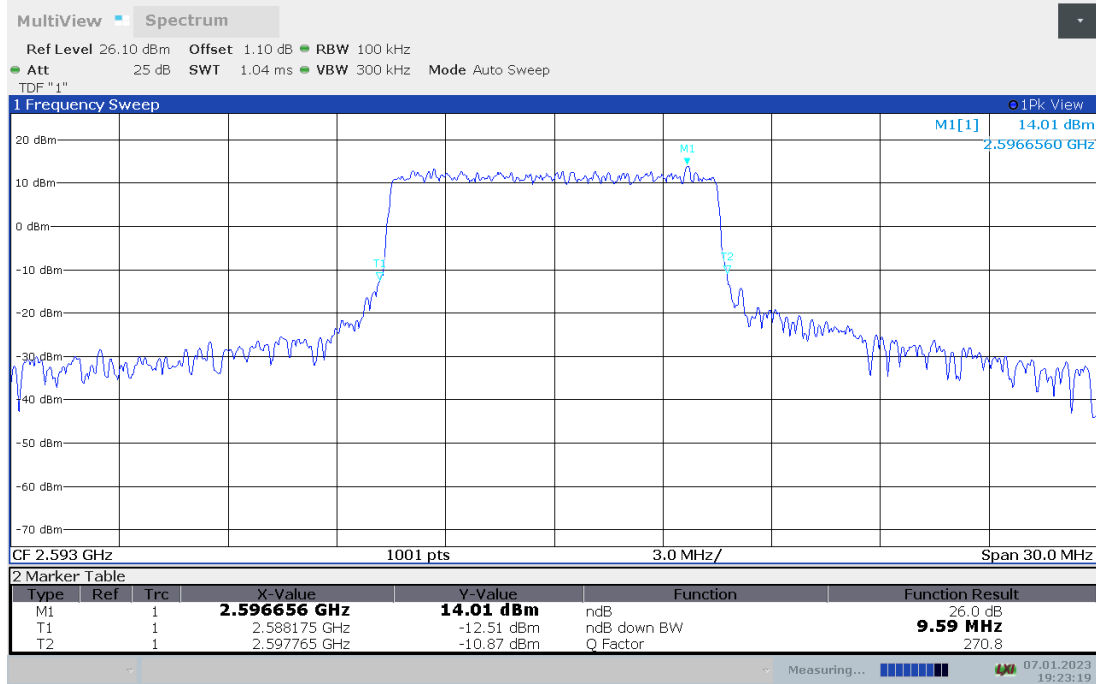| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 2593 | 14.341 | 14.431 |

### LTE band 41 , 15MHz Bandwidth,QPSK (-26dBc BW)



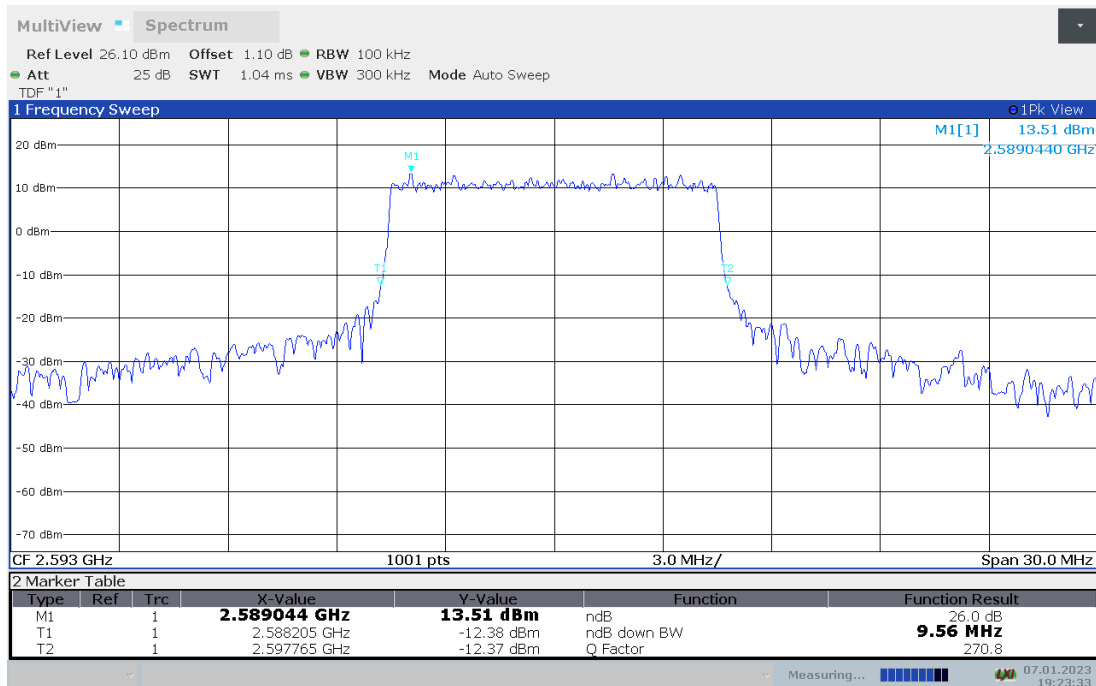### LTE band 41 , 15MHz Bandwidth,16QAM (-26dBc BW)

### LTE band 41,20MHz(-26dBc BW)

| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 2593 | 19.001 | 19.001 |

### LTE band 41 , 20MHz Bandwidth,QPSK (-26dBc BW)



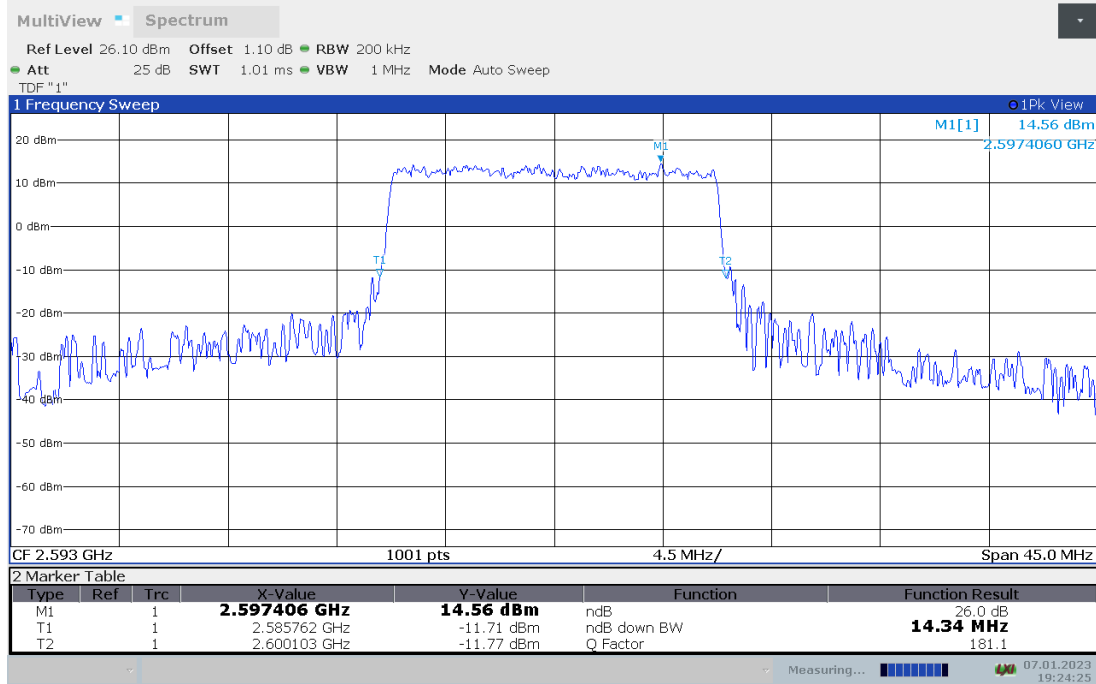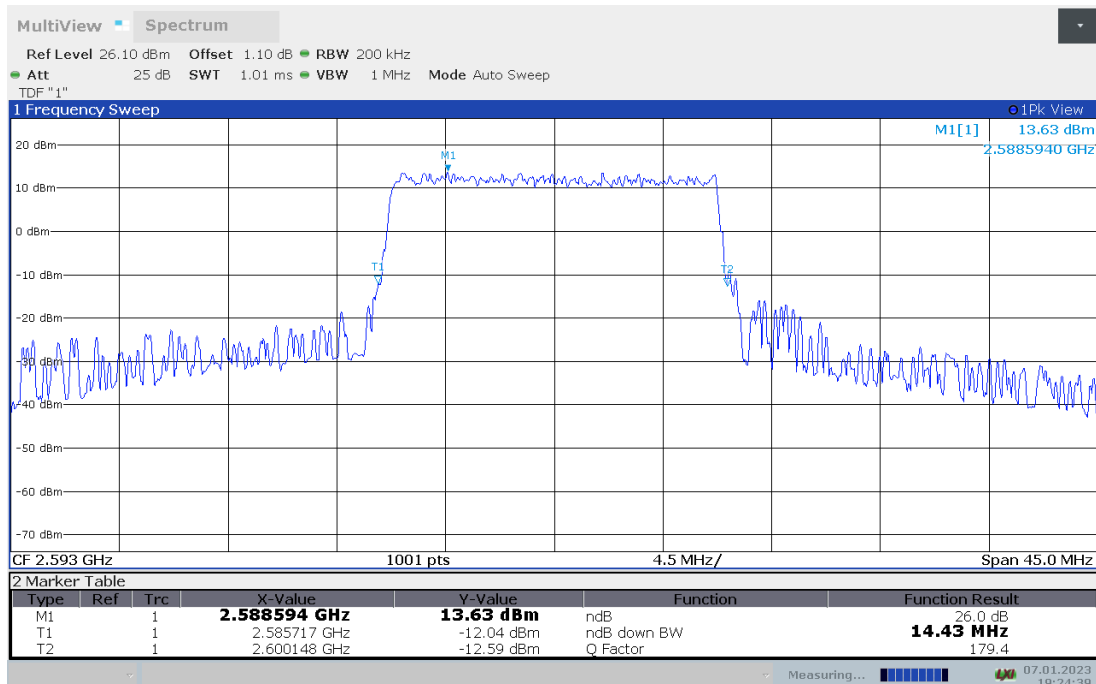### LTE band 41 , 20MHz Bandwidth,16QAM (-26dBc BW)
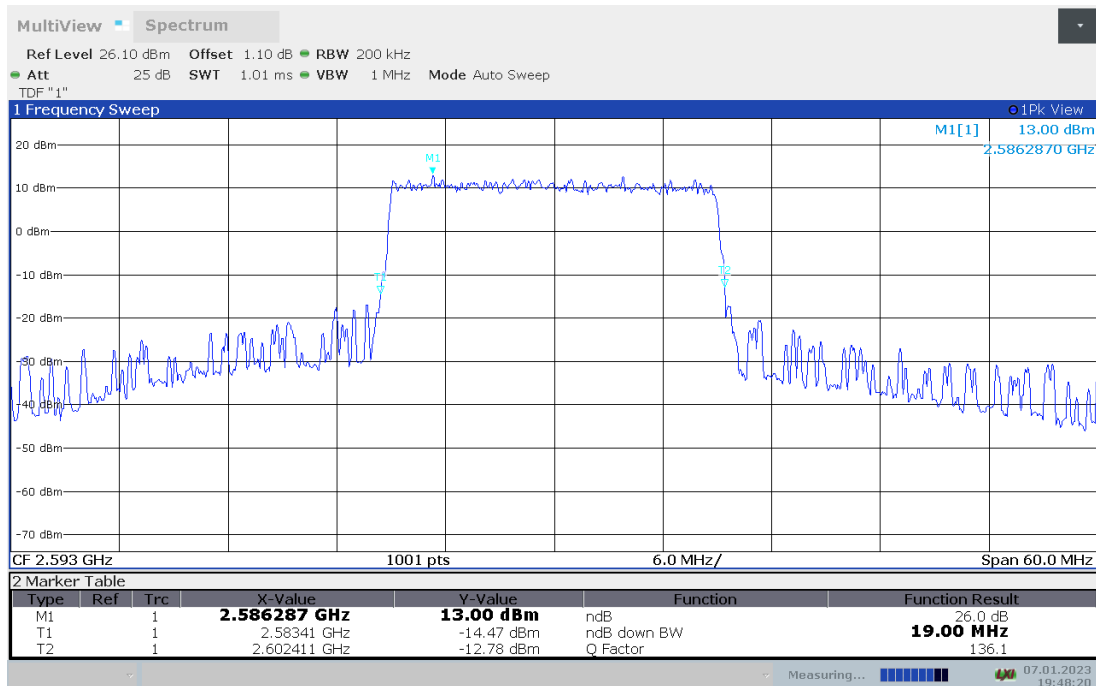
### LTE band 66,1.4MHz(-26dBc BW)

| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 1745 | 1.271 | 1.267 |

### LTE band 66 , 1.4MHz Bandwidth,QPSK (-26dBc BW)



### LTE band 66 , 1.4MHz Bandwidth,16QAM (-26dBc BW)
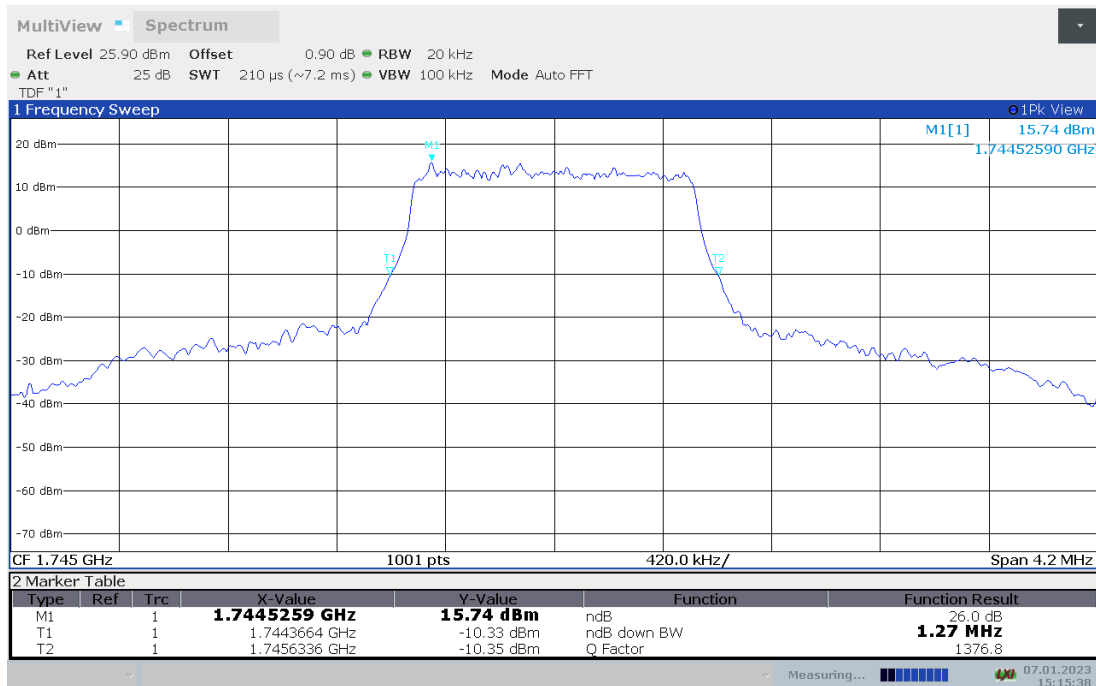
## LTE band 66,3MHz(-26dBc BW)

| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 1745 | 2.895 | 2.895 |

### LTE band 66 , 3MHz Bandwidth,QPSK (-26dBc BW)



### LTE band 66 , 3MHz Bandwidth,16QAM (-26dBc BW)

### LTE band 66,5MHz(-26dBc BW)

| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 1745 | 4.855 | 4.900 |

### LTE band 66 , 5MHz Bandwidth,QPSK (-26dBc BW)
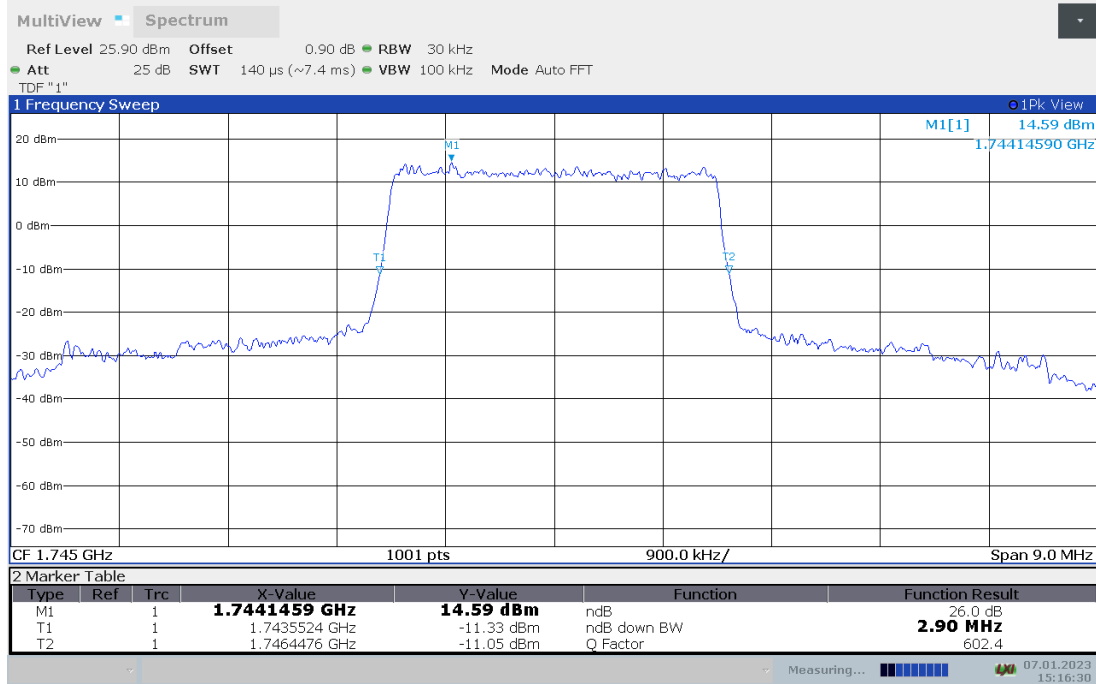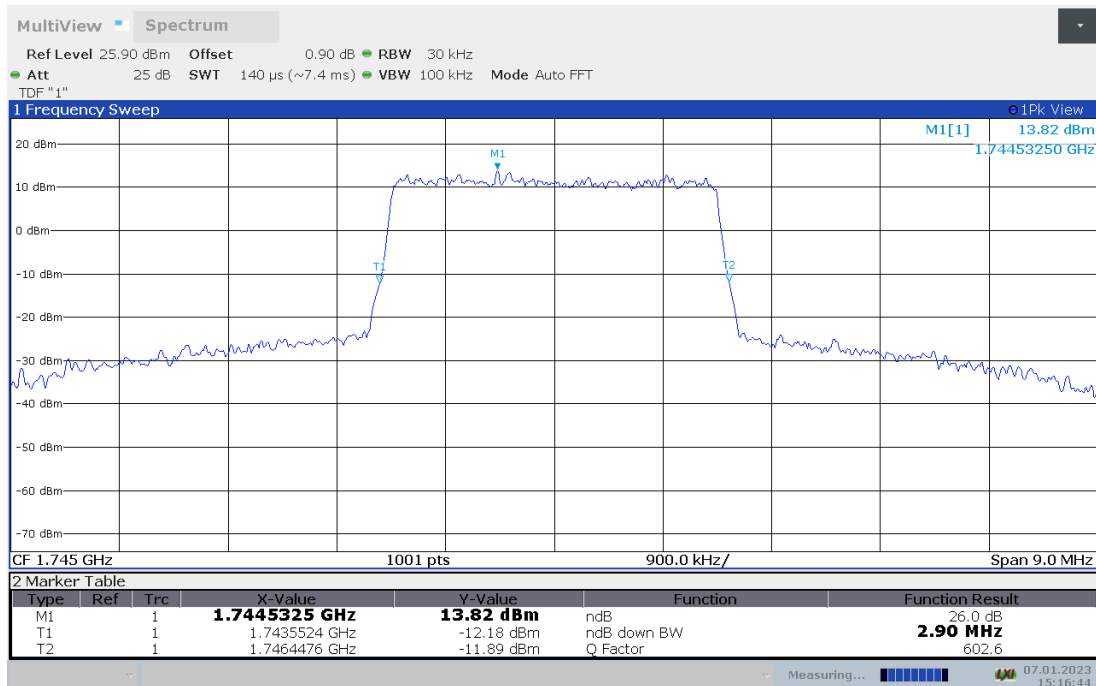


### LTE band 66 , 5MHz Bandwidth,16QAM (-26dBc BW)

## LTE band 66,10MHz(-26dBc BW)

| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 1745 | 9.560 | 9.620 |

## LTE band 66 , 10MHz Bandwidth,QPSK (-26dBc BW)
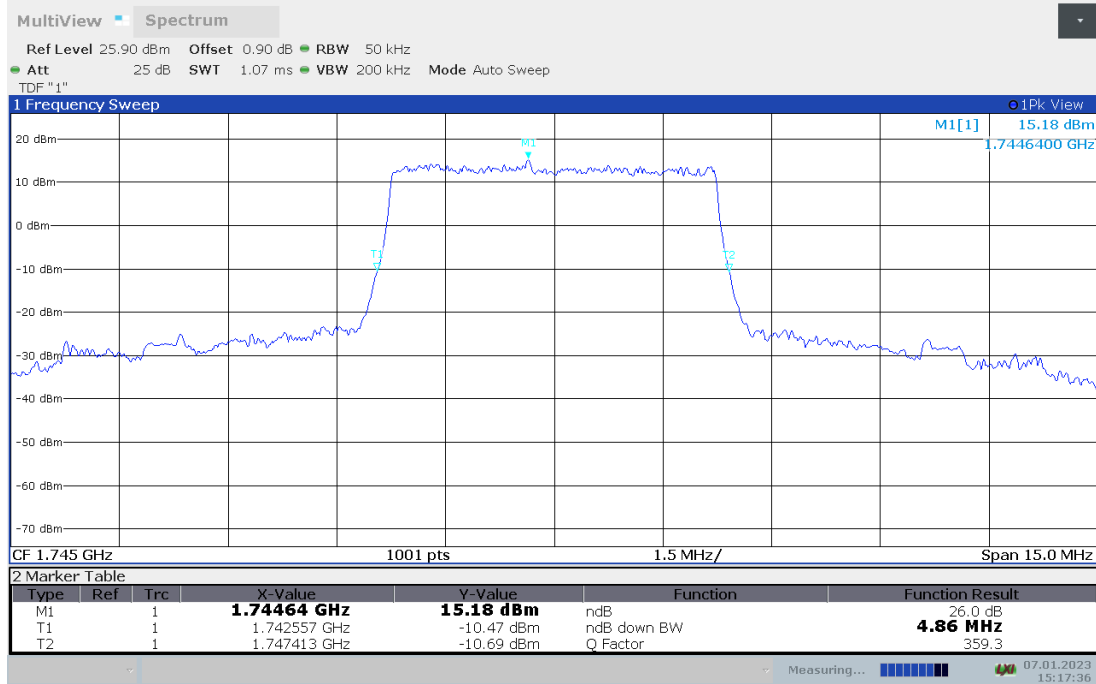


## LTE band 66 , 10MHz Bandwidth,16QAM (-26dBc BW)

## LTE band 66,15MHz(-26dBc BW)

| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 1745 | 14.431 | 14.476 |

## LTE band 66 , 15MHz Bandwidth,QPSK (-26dBc BW)
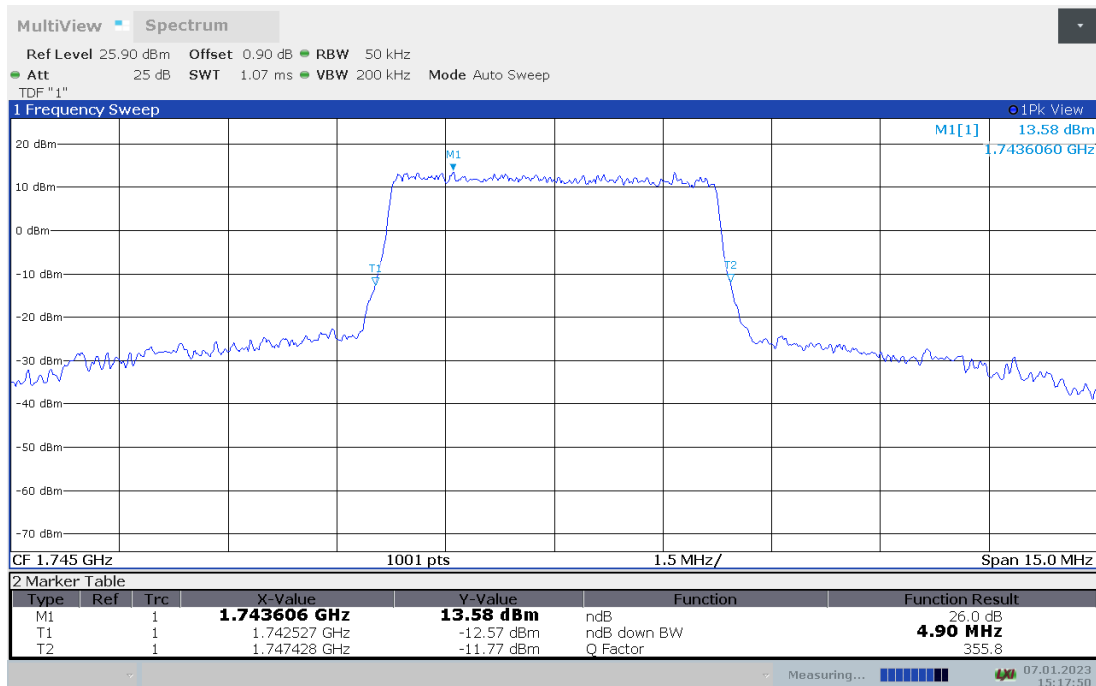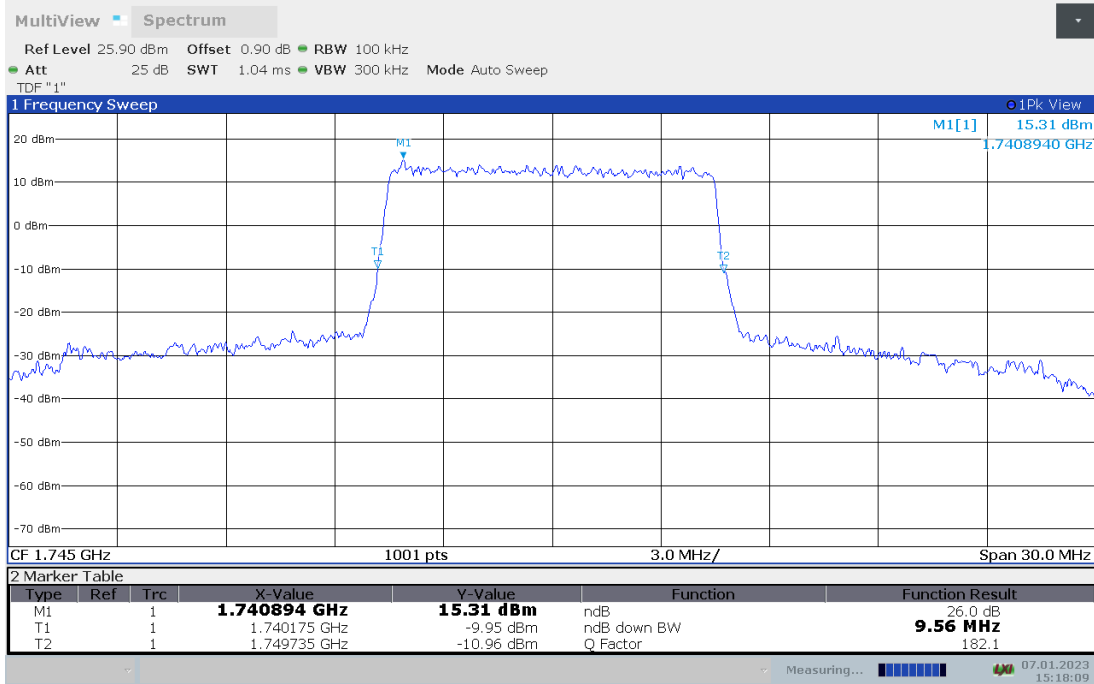


## LTE band 66 , 15MHz Bandwidth,16QAM (-26dBc BW)

### LTE band 66,20MHz(-26dBc BW)

| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
|---|---|---|
| | QPSK | 16QAM |
| 1745 | 19.061 | 19.121 |

### LTE band 66 , 20MHz Bandwidth,QPSK (-26dBc BW)
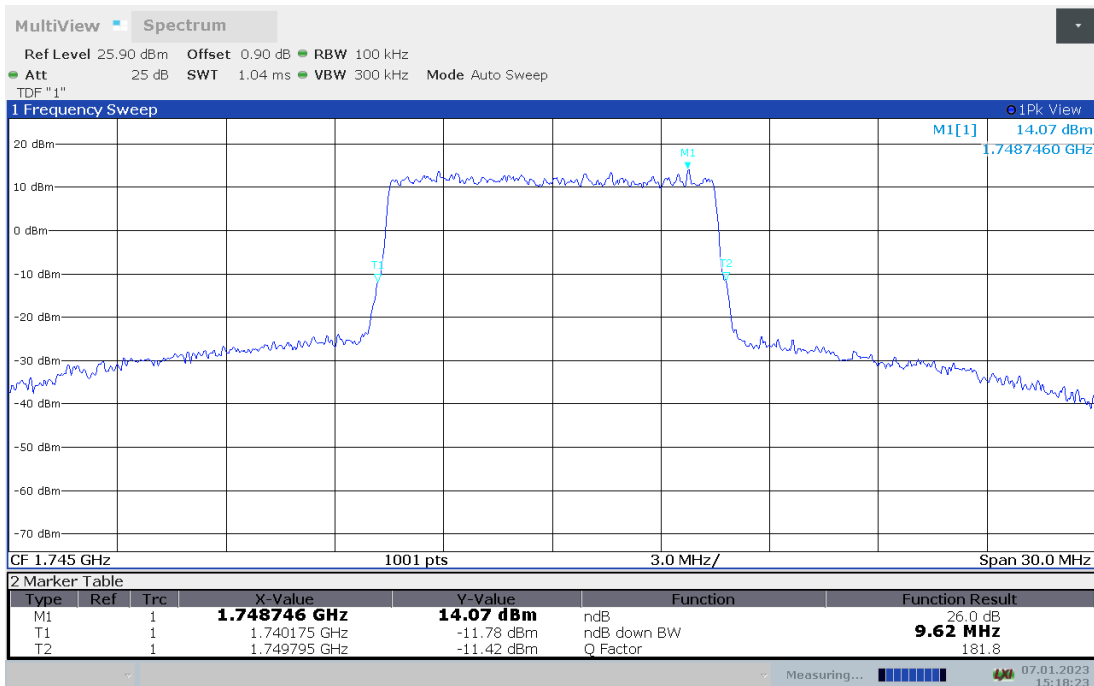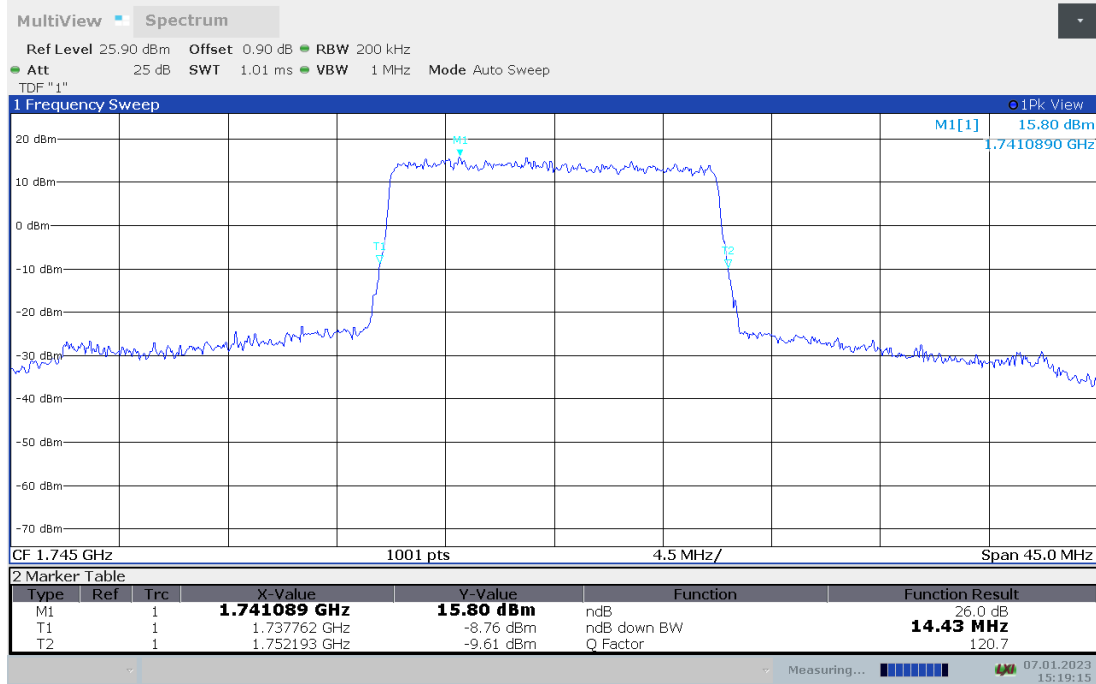


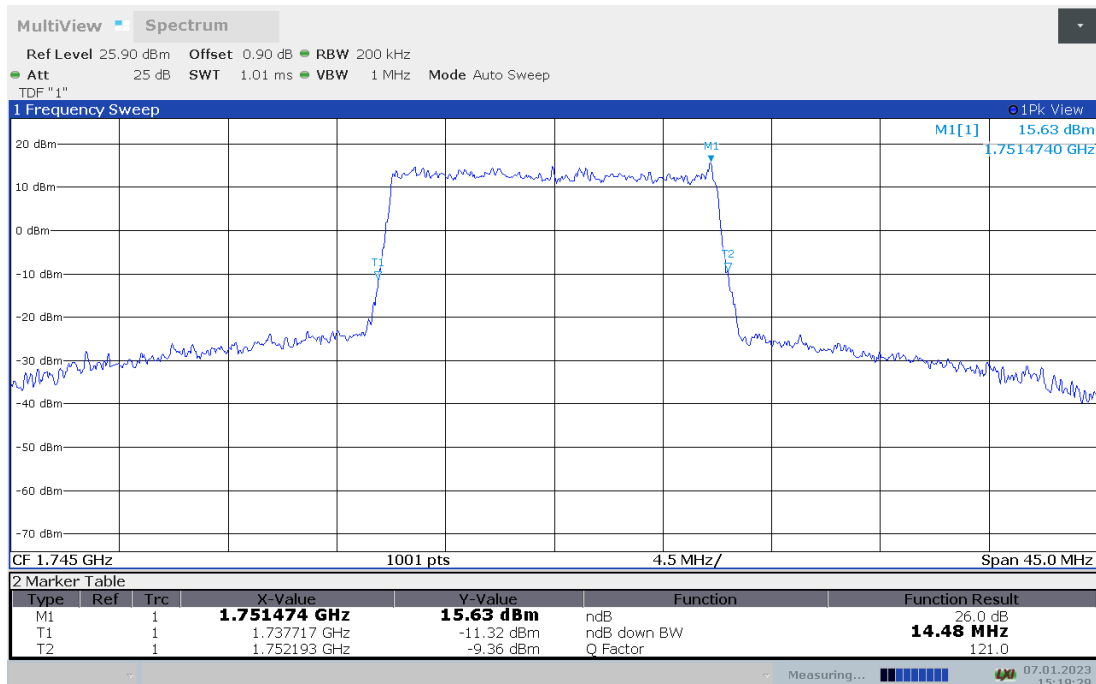### LTE band 66 , 20MHz Bandwidth,16QAM (-26dBc BW)

## LTE band 71,5MHz(-26dBc BW)

| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 680.5 | 4.870 | 4.870 |

## LTE band 71 , 5MHz Bandwidth,QPSK (-26dBc BW)
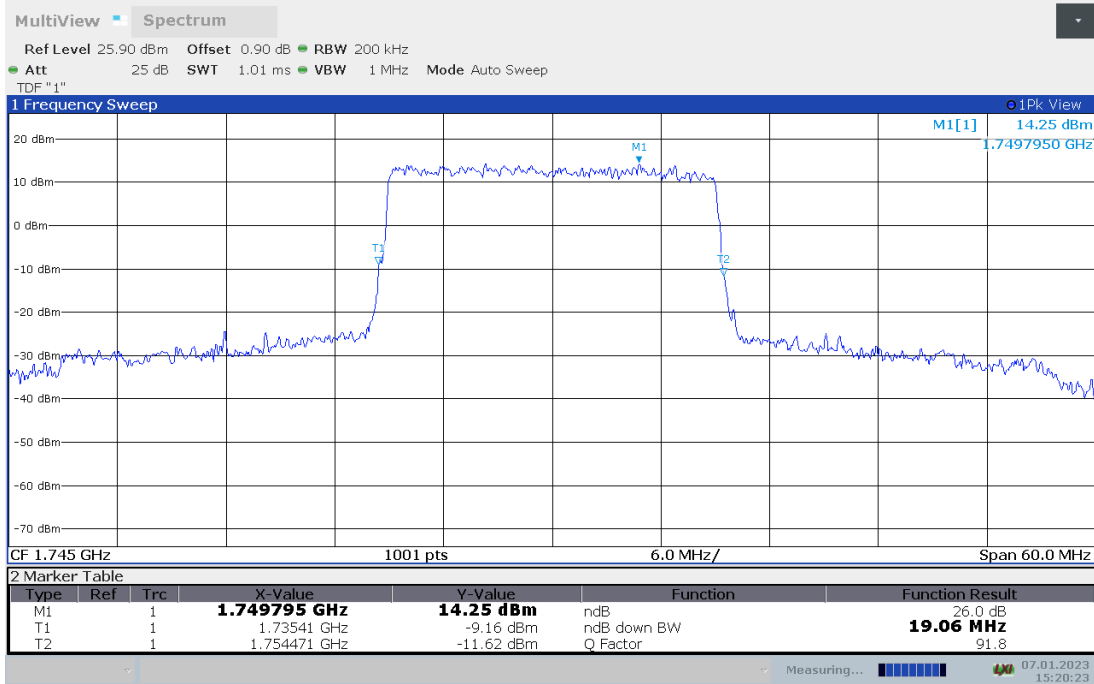


## LTE band 71 , 5MHz Bandwidth,16QAM (-26dBc BW)

## LTE band 71,10MHz(-26dBc BW)

| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 680.5 | 9.530 | 9.560 |

### LTE band 71 , 10MHz Bandwidth,QPSK (-26dBc BW)



### LTE band 71 , 10MHz Bandwidth,16QAM (-26dBc BW)

## LTE band 71,15MHz(-26dBc BW)

| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 680.5 | 14.431 | 14.520 |

## LTE band 71 , 15MHz Bandwidth,QPSK (-26dBc BW)
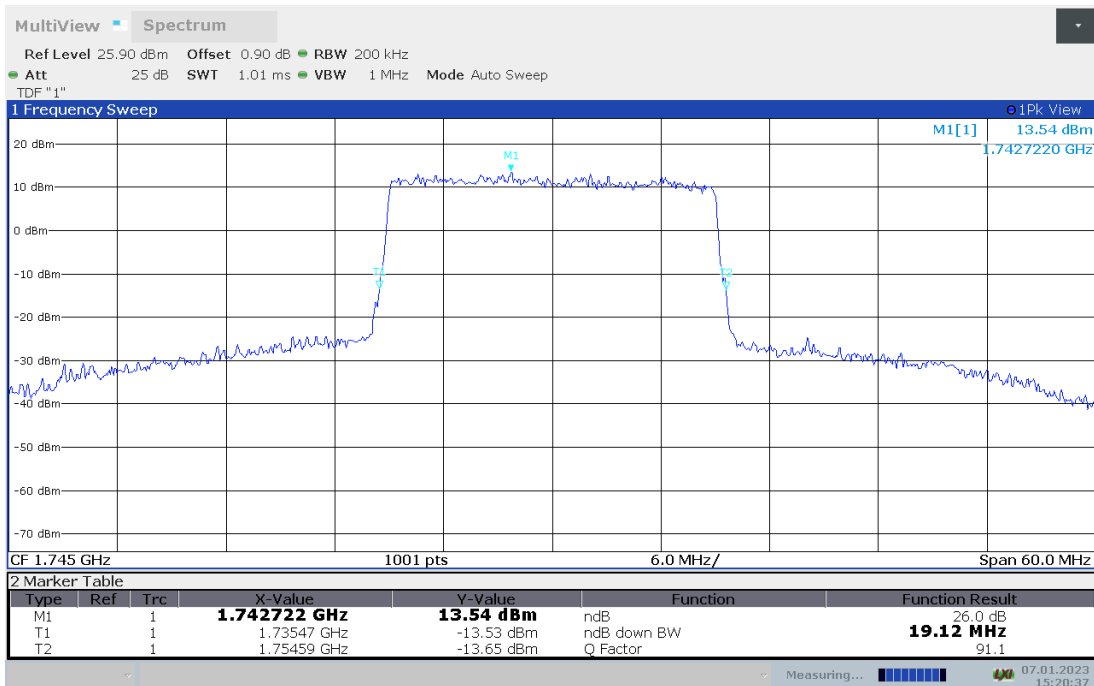


## LTE band 71 , 15MHz Bandwidth,16QAM (-26dBc BW)

### LTE band 71,20MHz(-26dBc BW)

| Frequency(MHz) | Emission Bandwidth (-26dBc BW)(MHz) | |
| --- | --- | --- |
| | QPSK | 16QAM |
| 683 | 19.001 | 19.121 |

### LTE band 71 , 20MHz Bandwidth,QPSK (-26dBc BW)
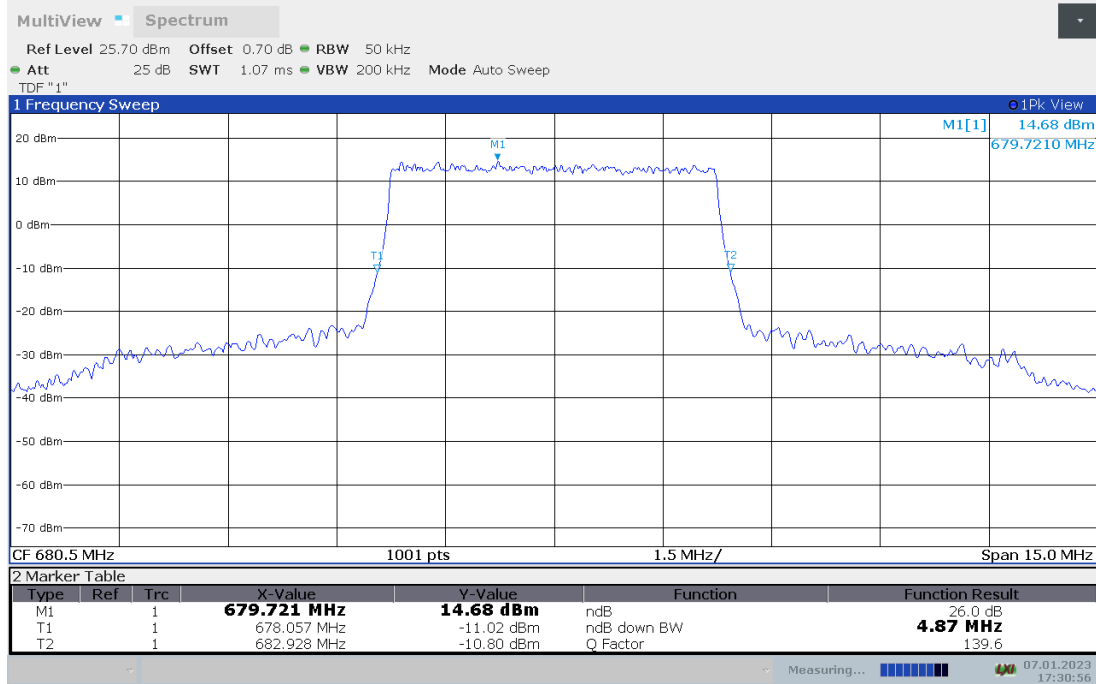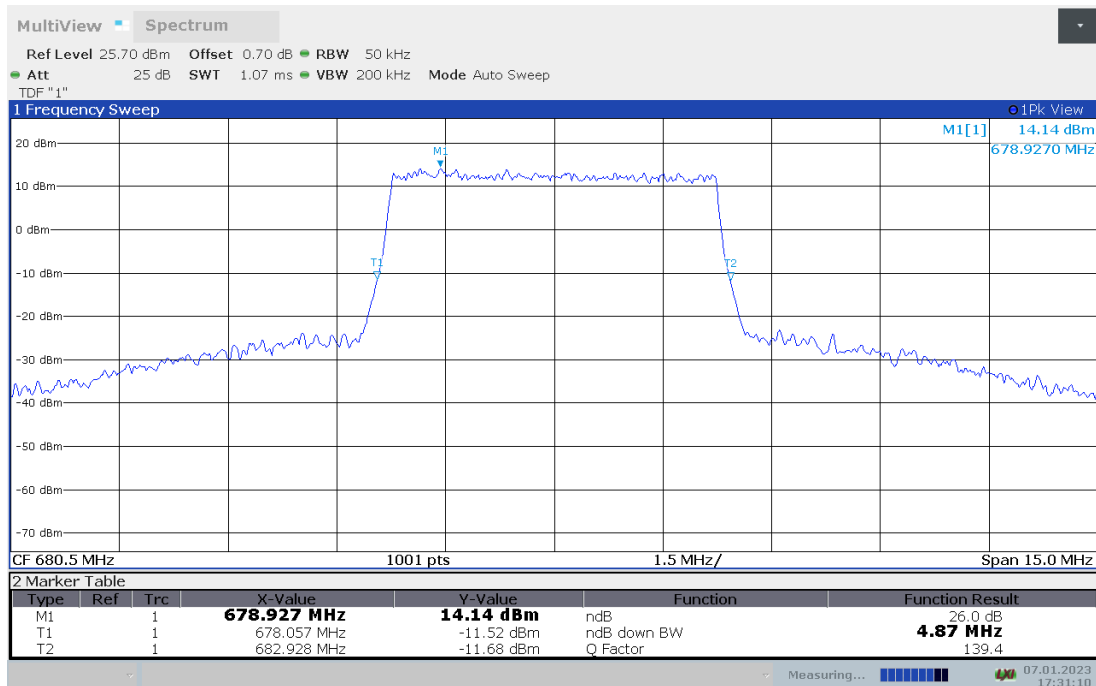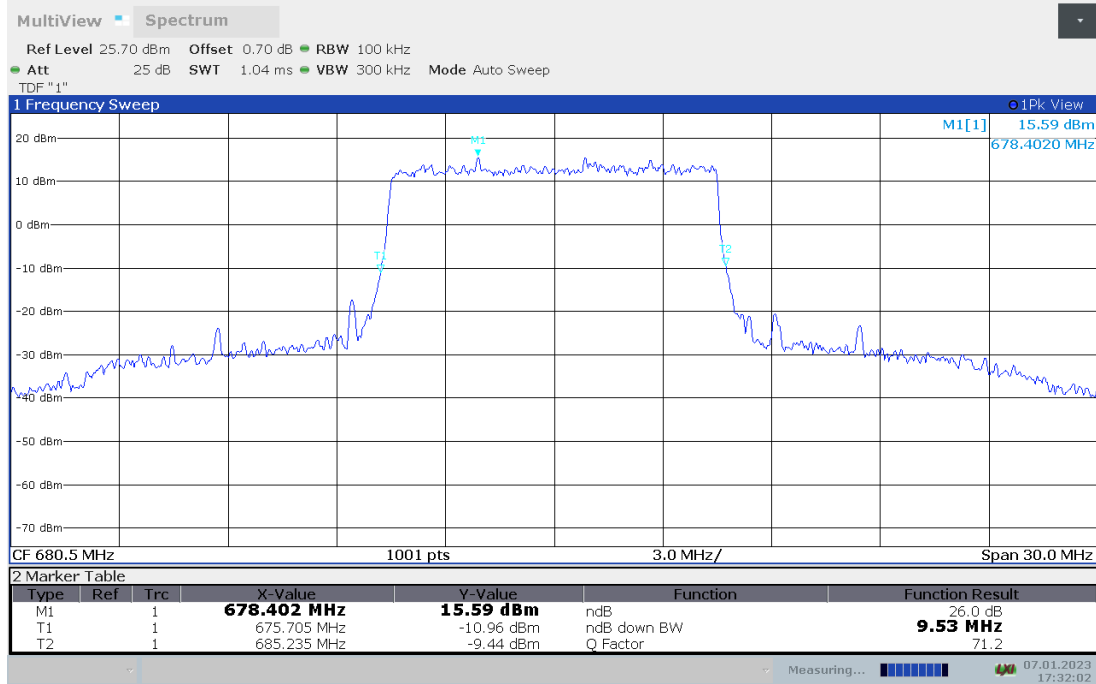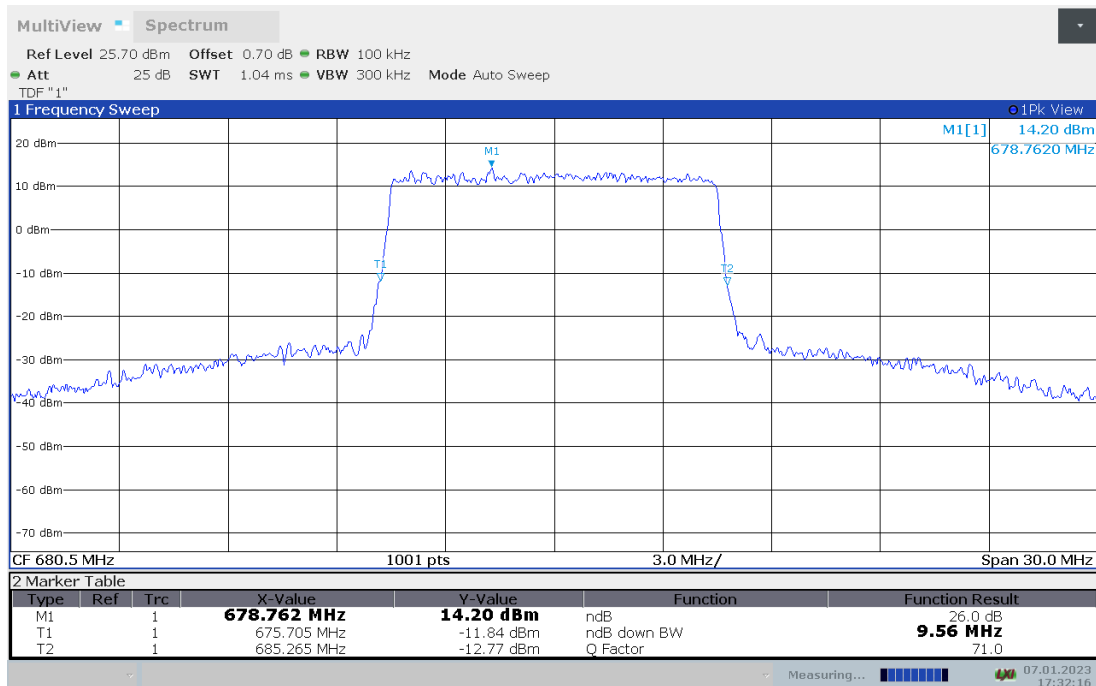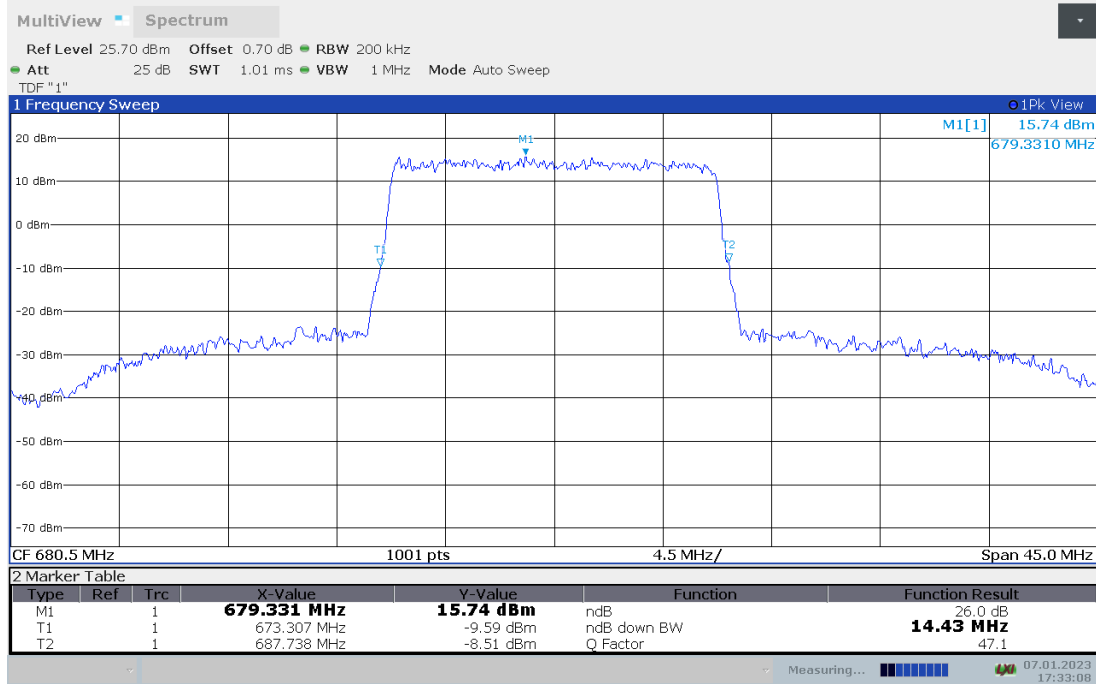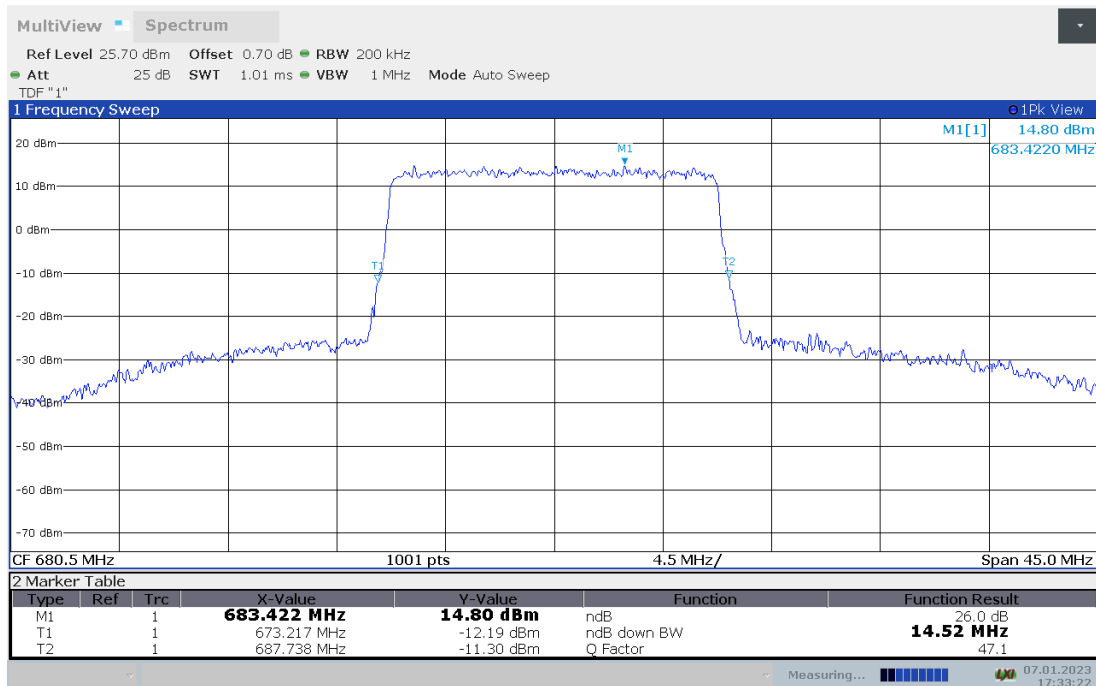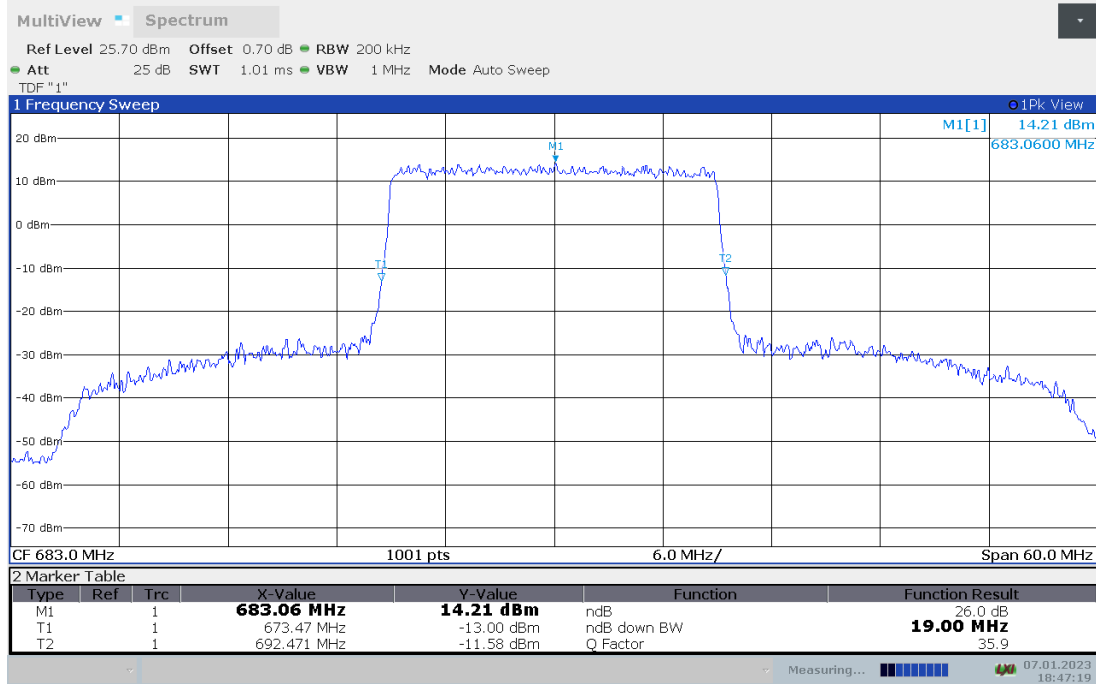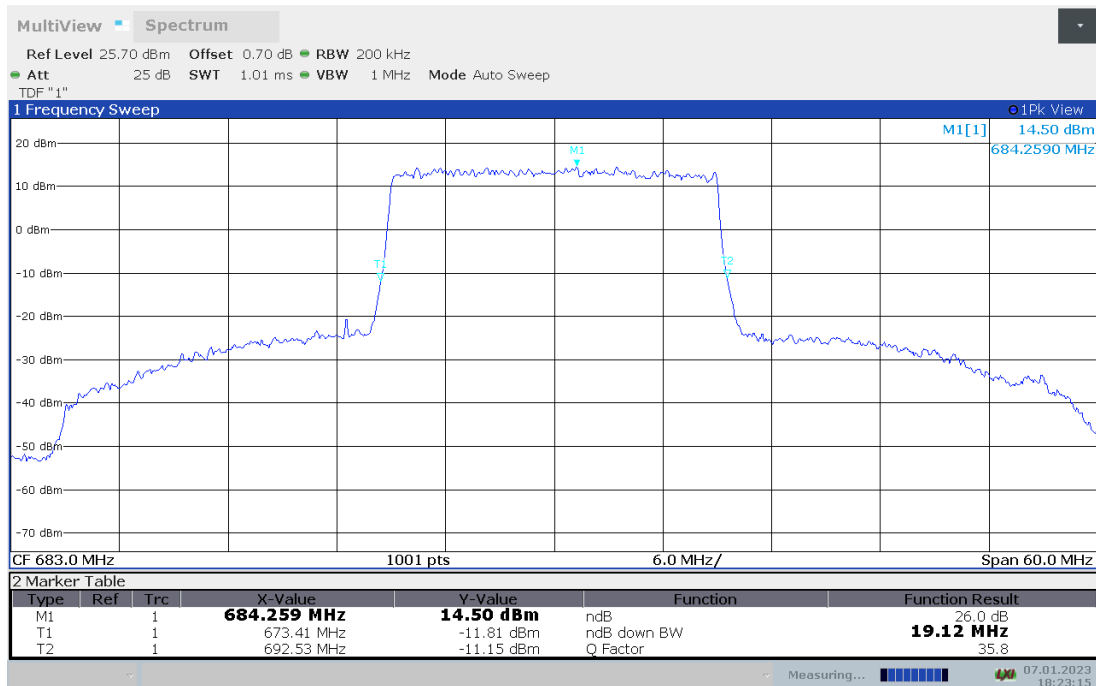


### LTE band 71 , 20MHz Bandwidth,16QAM (-26dBc BW)



Note: Expanded measurement uncertainty is $U$ = 3428 Hz, $k$ = 2

## A.5 BAND EDGE COMPLIANCE

### A.5.1 Measurement limit

Part 22.917,Part 24.238 and Part 27.53(h) specify that 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.

Part 27.53(m) specifies for mobile digital stations, the attenuation factor shall be not less than 40+ 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43+10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55+10 log (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+10log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55+10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 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.

Part 27.53(g) states for operations in the 600 MHz band and the 698–746 MHz band, 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. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

Part 27.53(c) states for operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the 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, in accordance with the following:(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 +10 log (P) dB;(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43+10 log (P) dB;(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65+10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

Part 27.53(g) states for operations in the 600 MHz band and the 698–746 MHz band, 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. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

Part 90.691 states that out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows: For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50+10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed

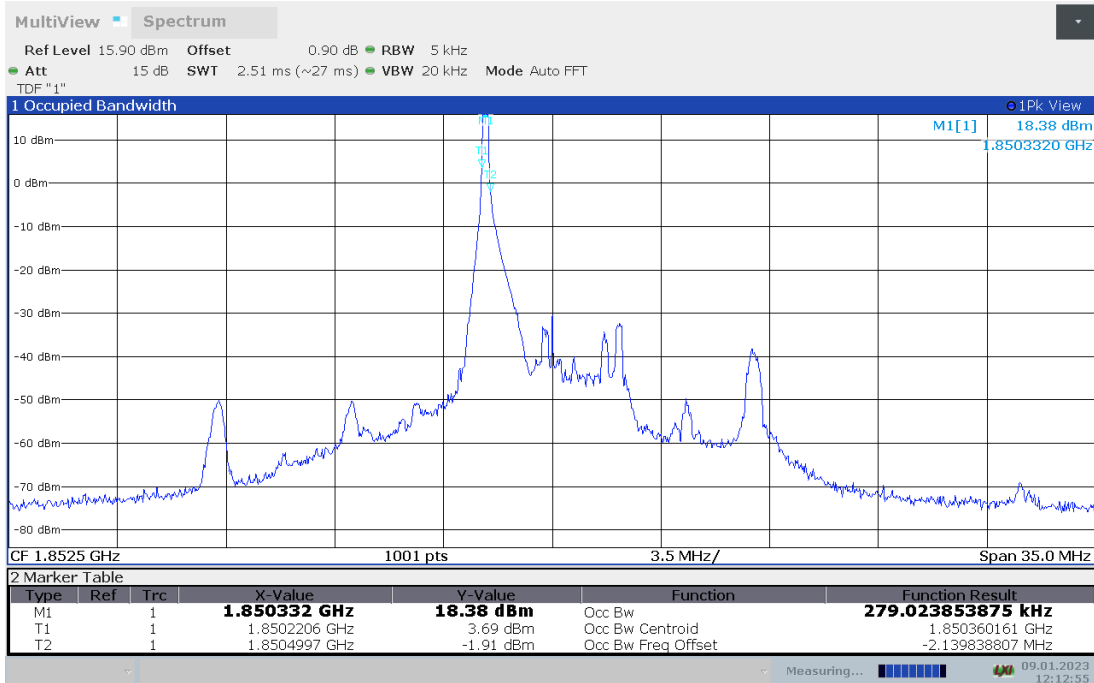from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43+10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

The spectrum analyzer readings are corrected by [10 log (1/duty cycle)] for the non-continuous transmitting scenario.

## A.5.2 Measurement Procedure

## Only worst case result is given below
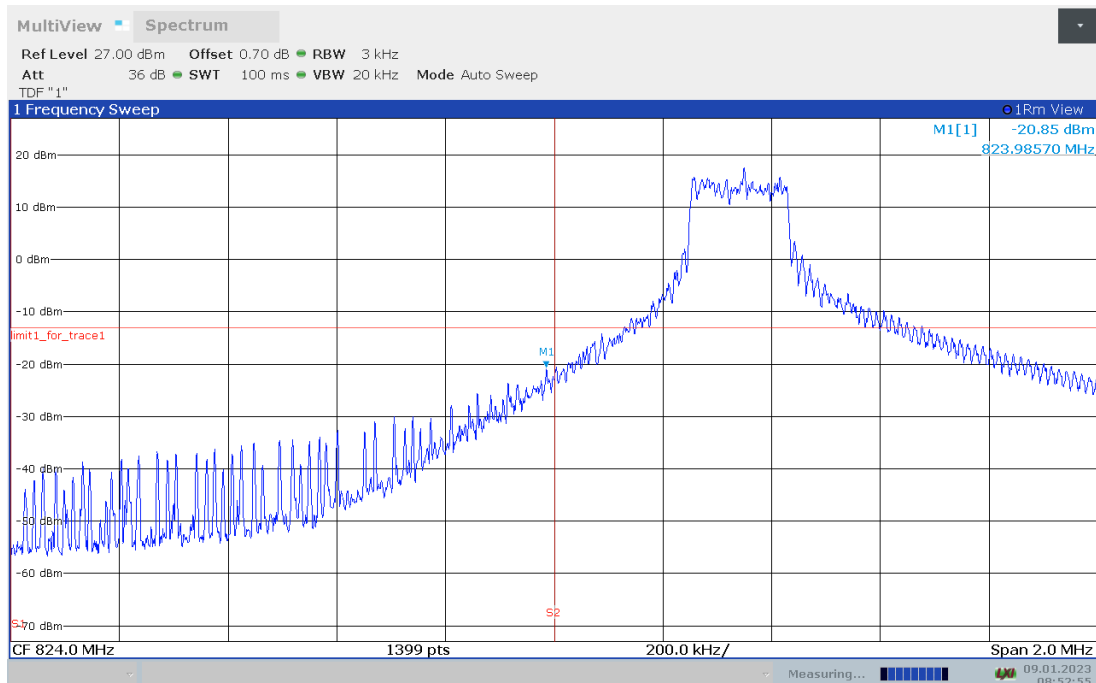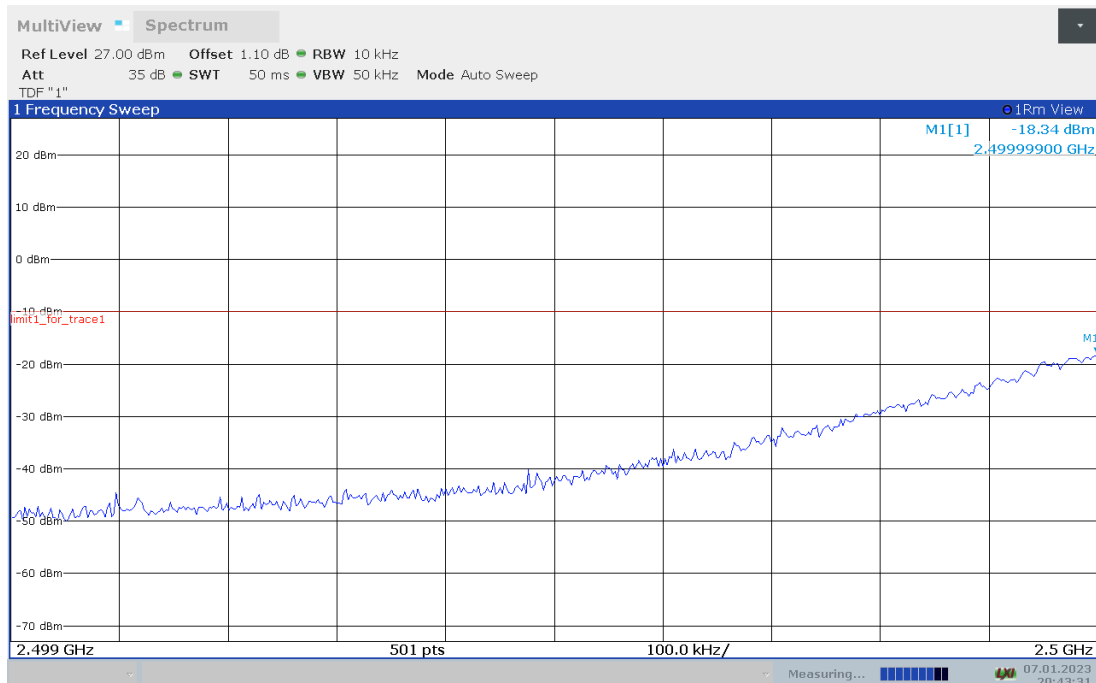
## LTE band 2

## OBW: 1RB-LOW_offset
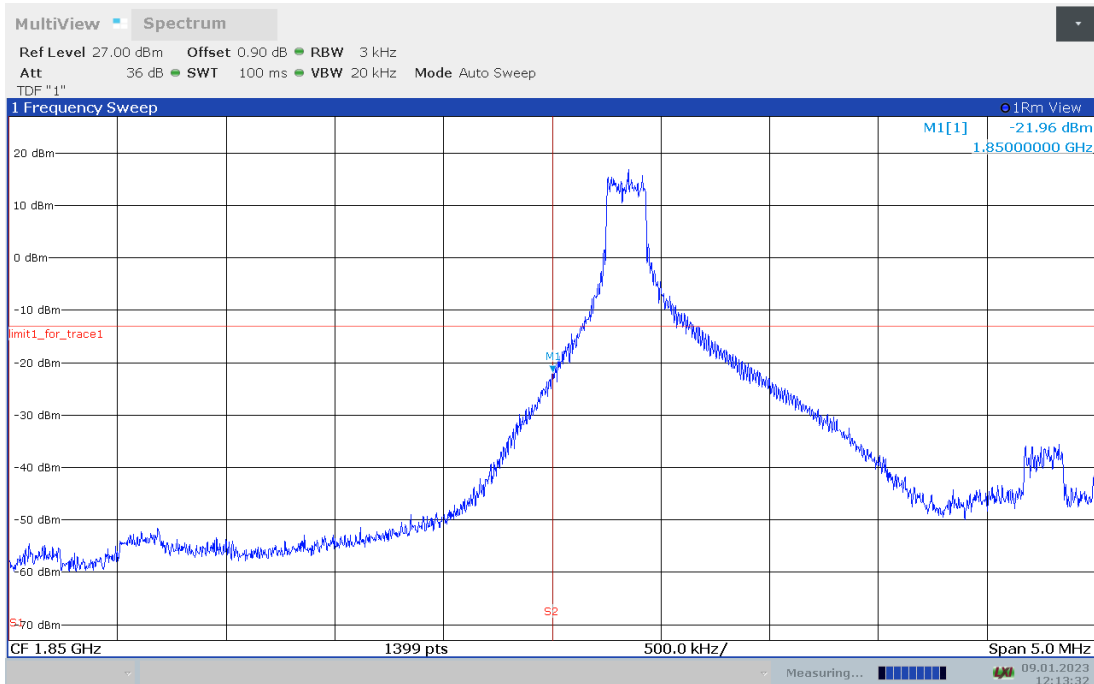


## LOW BAND EDGE BLOCK-1RB-LOW_offset

## OBW: 1RB-HIGH_offset



| Type | Ref | Trc | X-Value | Y-Value | Function | Function Result |
|------|-----|-----|---------|---------|----------|-----------------|
| M1 | | 1 | **1.909738 GHz** | **18.40 dBm** | Occ Bw | **277.335038242 kHz** |
| T1 | | 1 | 1.9095054 GHz | -2.15 dBm | Occ Bw Centroid | 1.909644057 GHz |
| T2 | | 1 | 1.9097827 GHz | 3.97 dBm | Occ Bw Freq Offset | 2.144056801 MHz |

## HIGH BAND EDGE BLOCK-1RB-HIGH_offset
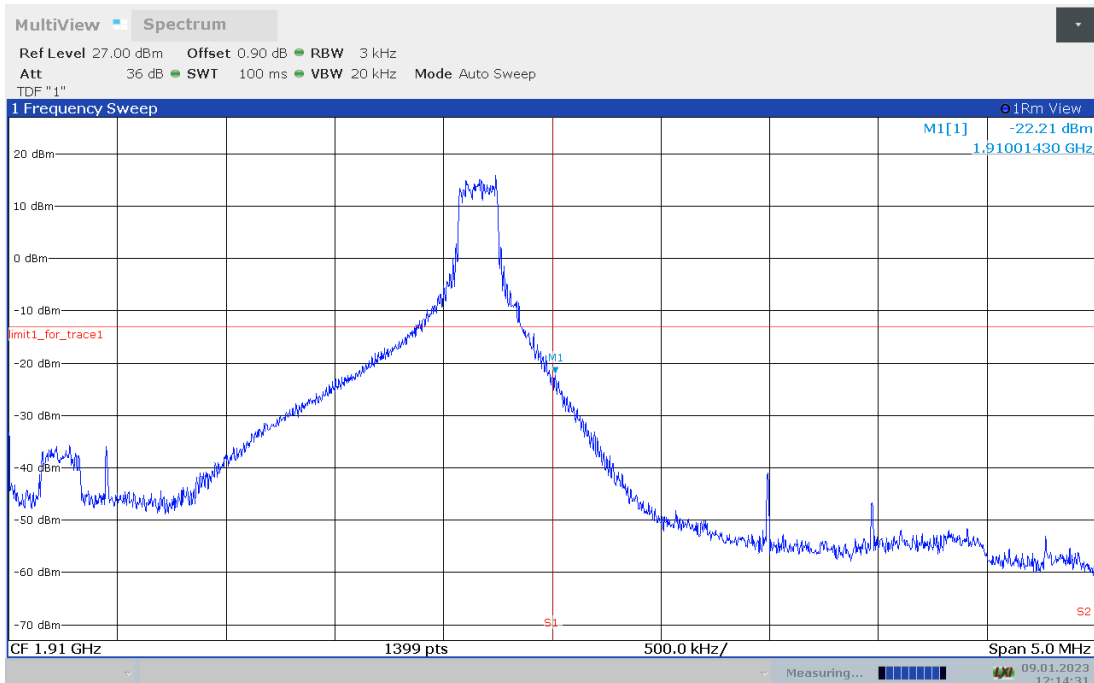
## LOW BAND EDGE BLOCK-20M-100%RB
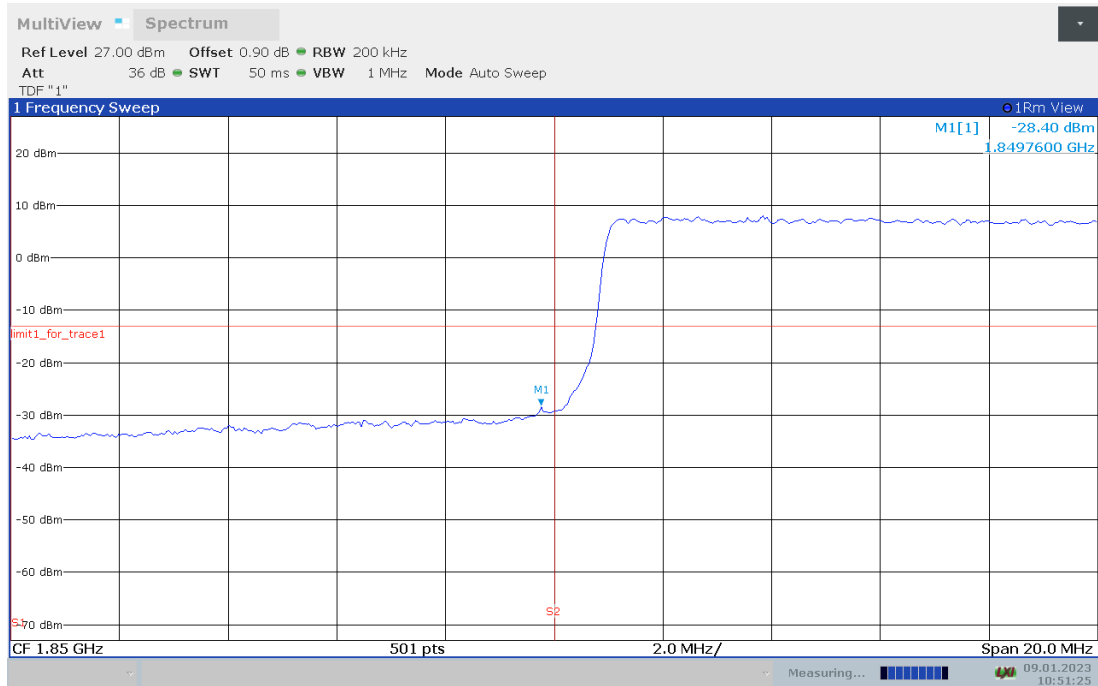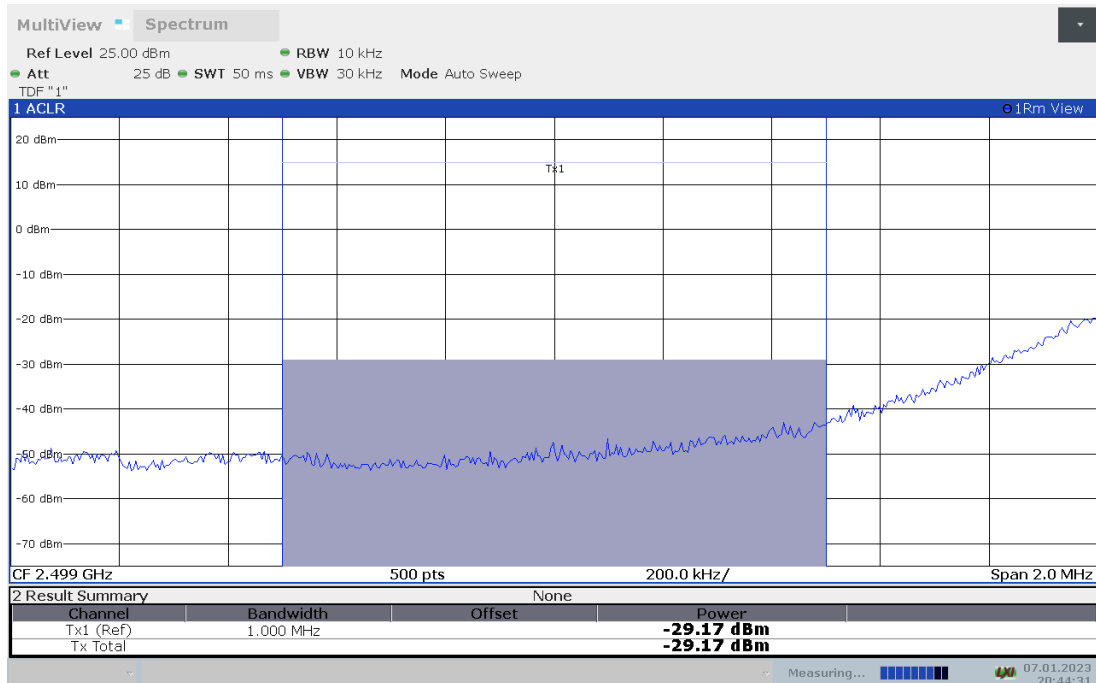


## HIGH BAND EDGE BLOCK-20M-100%RB
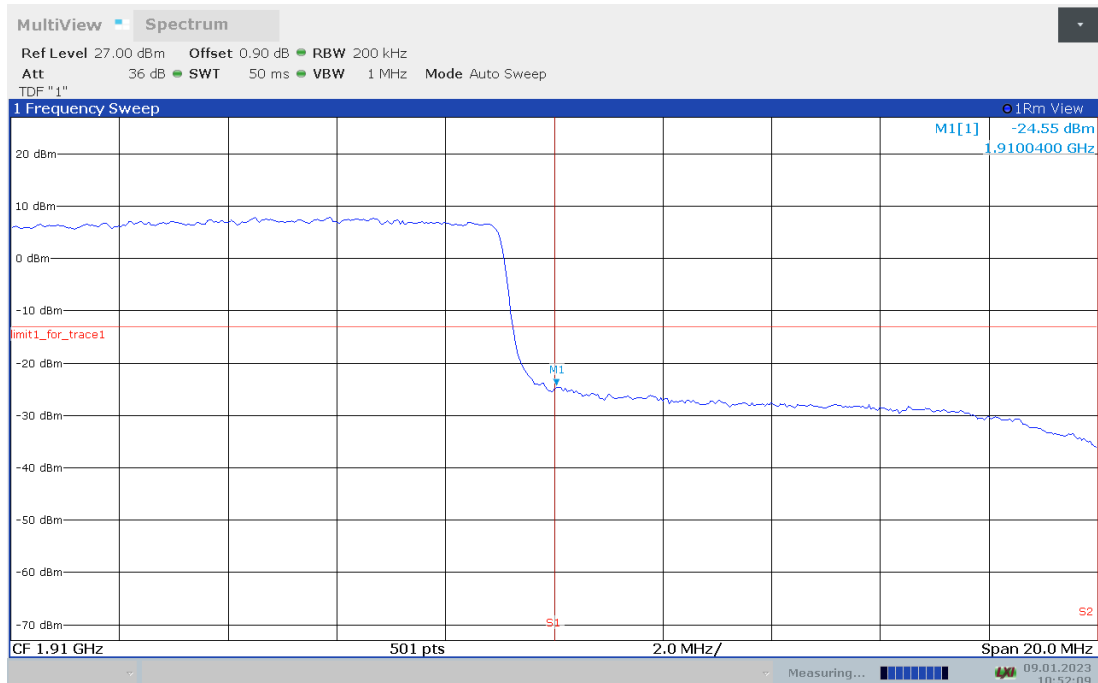
**LTE band 4**

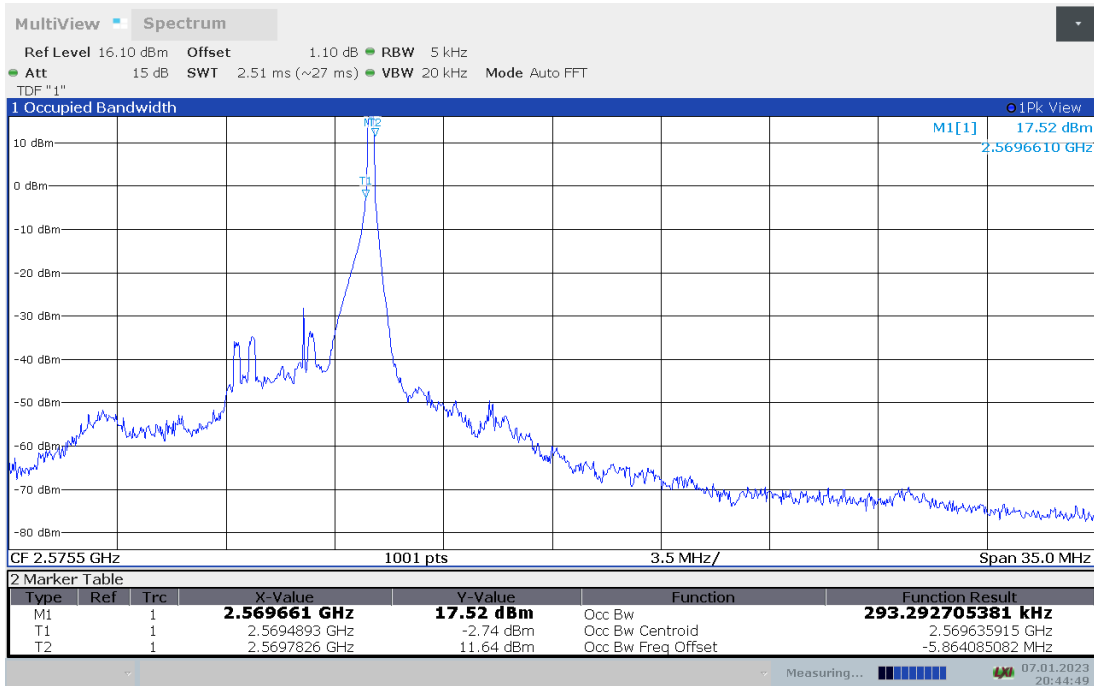**OBW: 1RB-LOW_offset**
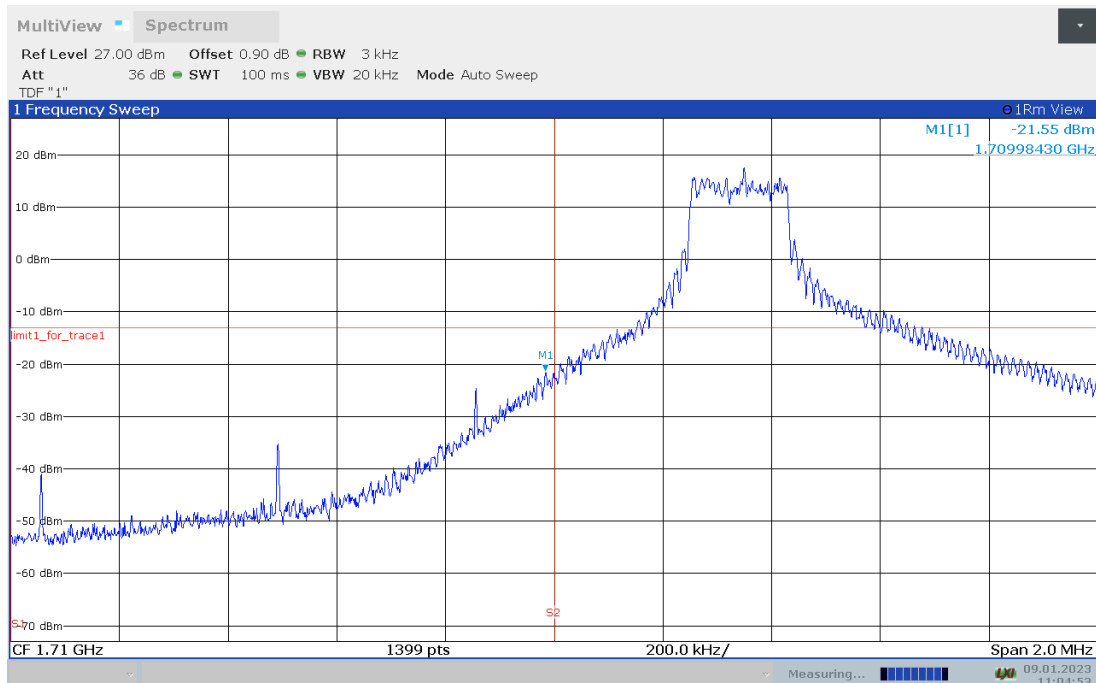


**LOW BAND EDGE BLOCK-1RB-LOW_offset**

## OBW: 1RB-HIGH_offset



## HIGH BAND EDGE BLOCK-1RB-HIGH_offset
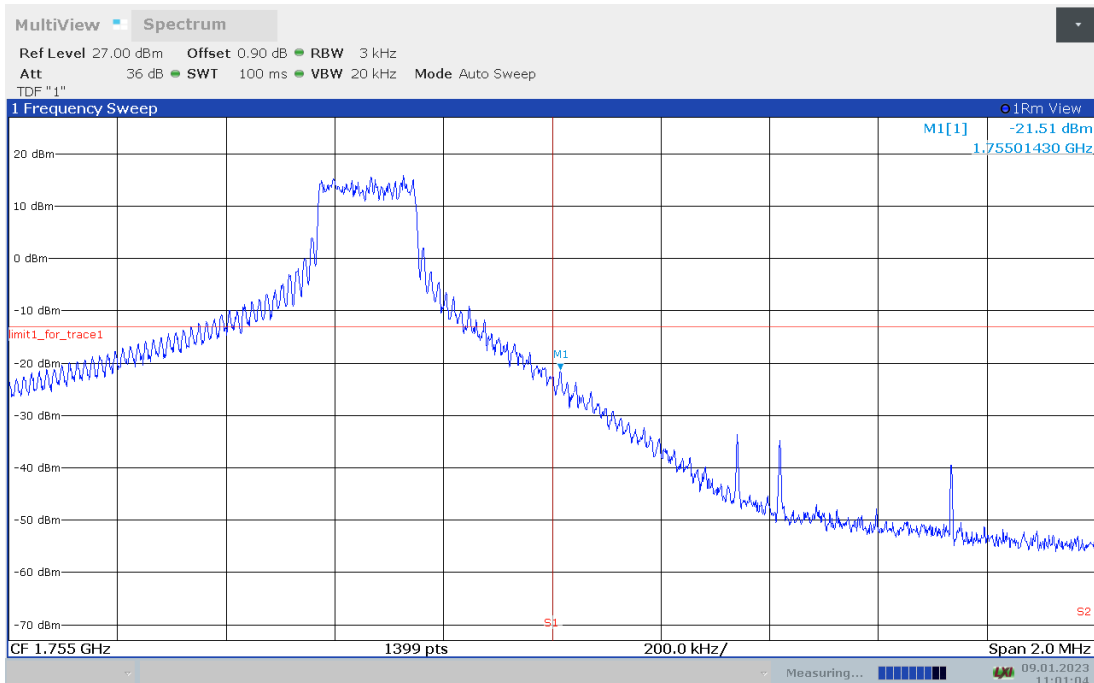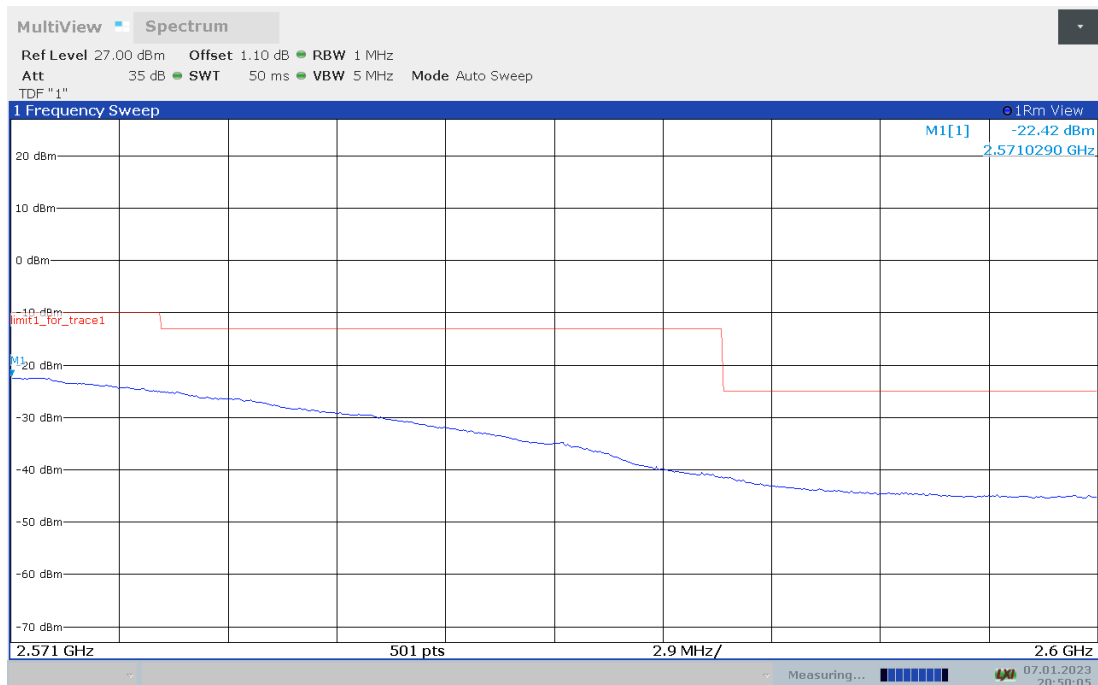
## LOW BAND EDGE BLOCK-20M-100%RB
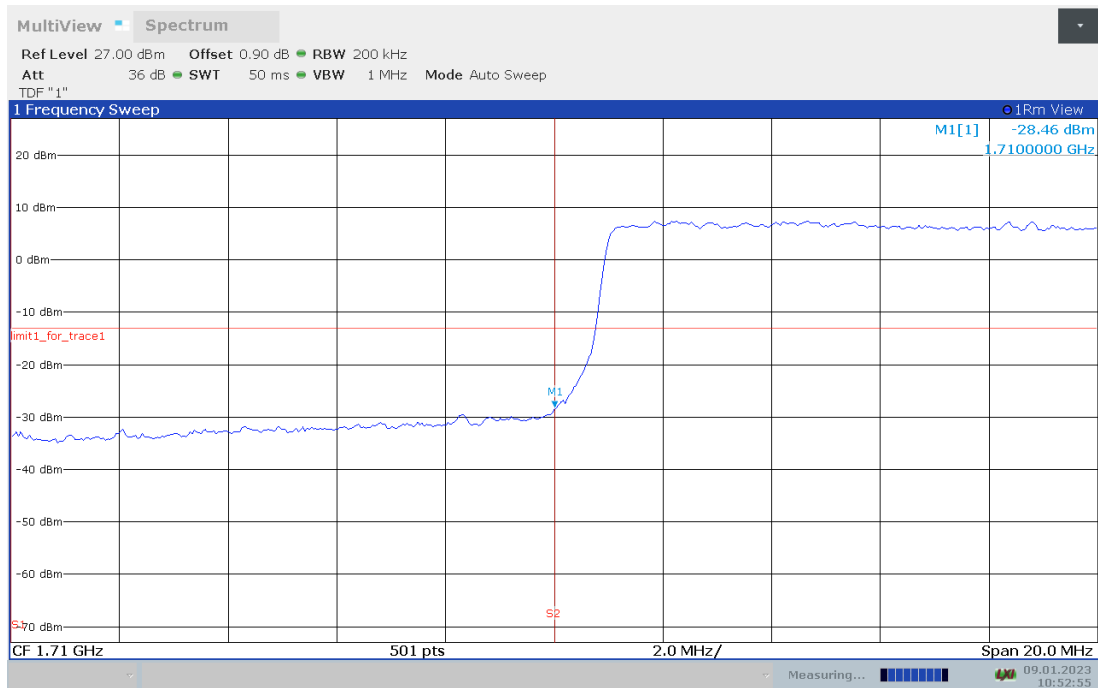


## HIGH BAND EDGE BLOCK-20M-100%RB
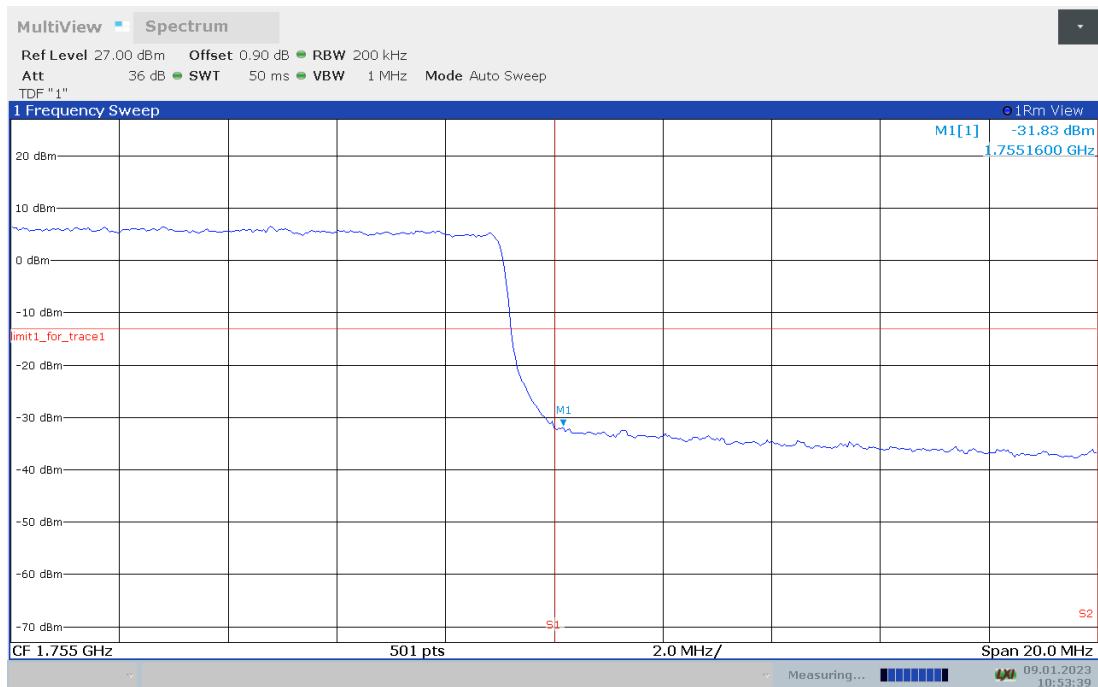
**LTE band 5**

**OBW: 1RB-LOW_offset**
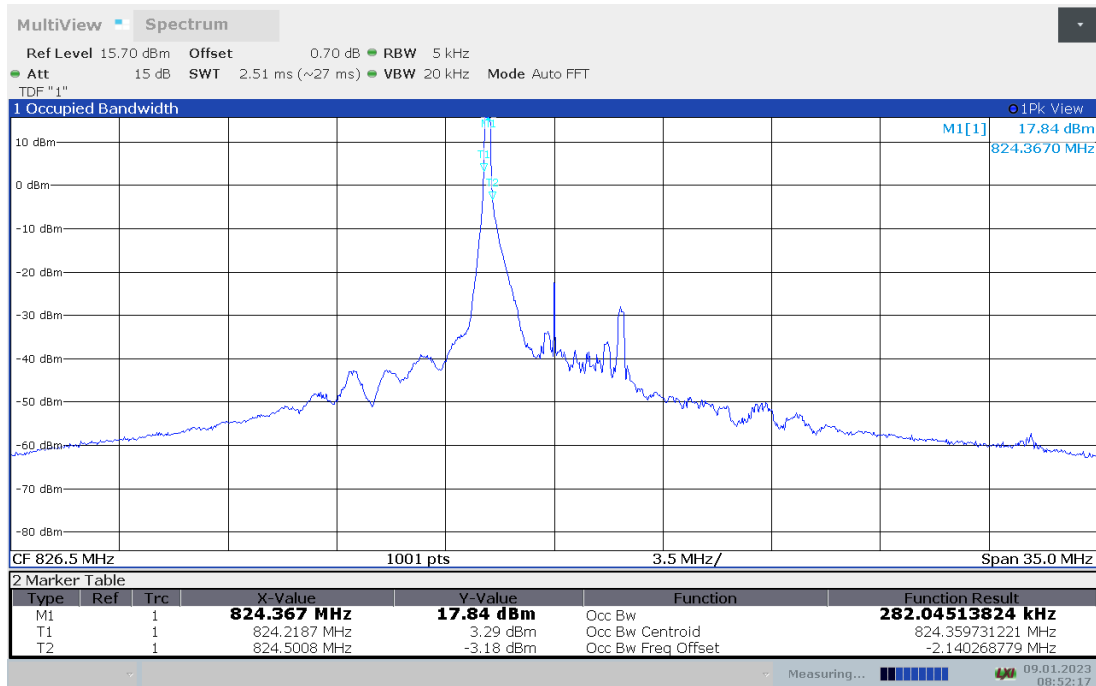


| Type | Ref | Trc | X-Value | Y-Value | Function | Function Result |
|------|-----|-----|---------|---------|----------|-----------------|
| M1 | | 1 | **824.367 MHz** | **17.84 dBm** | Occ Bw | **282.04513824 kHz** |
| T1 | | 1 | 824.2187 MHz | 3.29 dBm | Occ Bw Centroid | 824.359731221 MHz |
| T2 | | 1 | 824.5008 MHz | -3.18 dBm | Occ Bw Freq Offset | -2.140268779 MHz |

**LOW BAND EDGE BLOCK-1RB-LOW_offset**

## OBW: 1RB-HIGH_offset



## HIGH BAND EDGE BLOCK-1RB-HIGH_offset
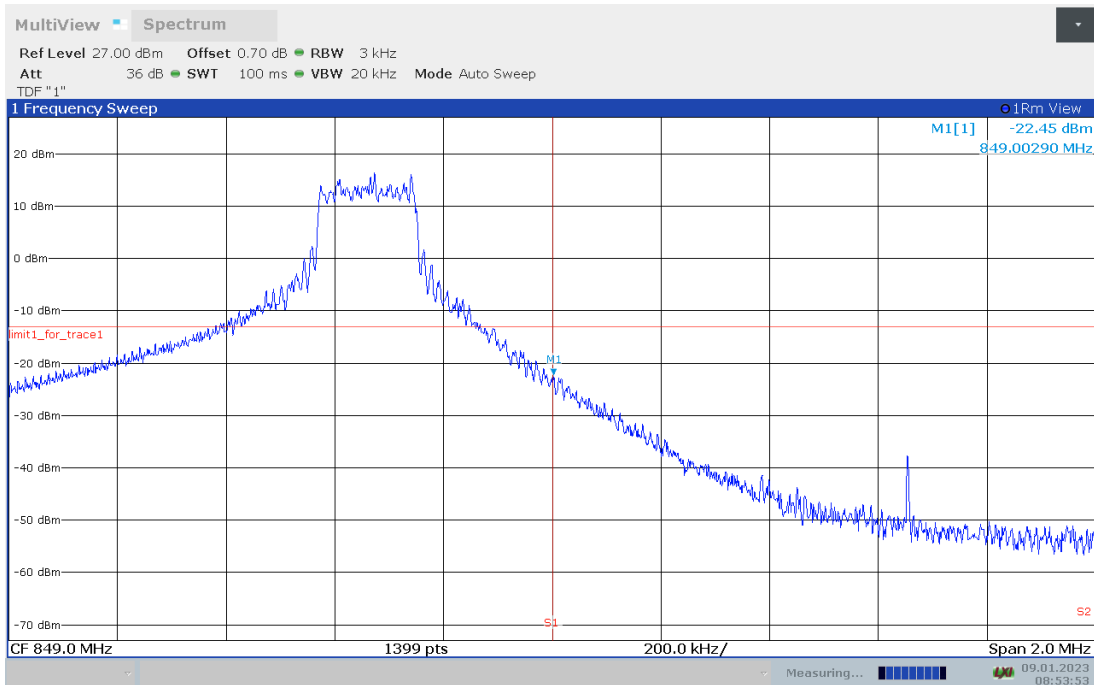
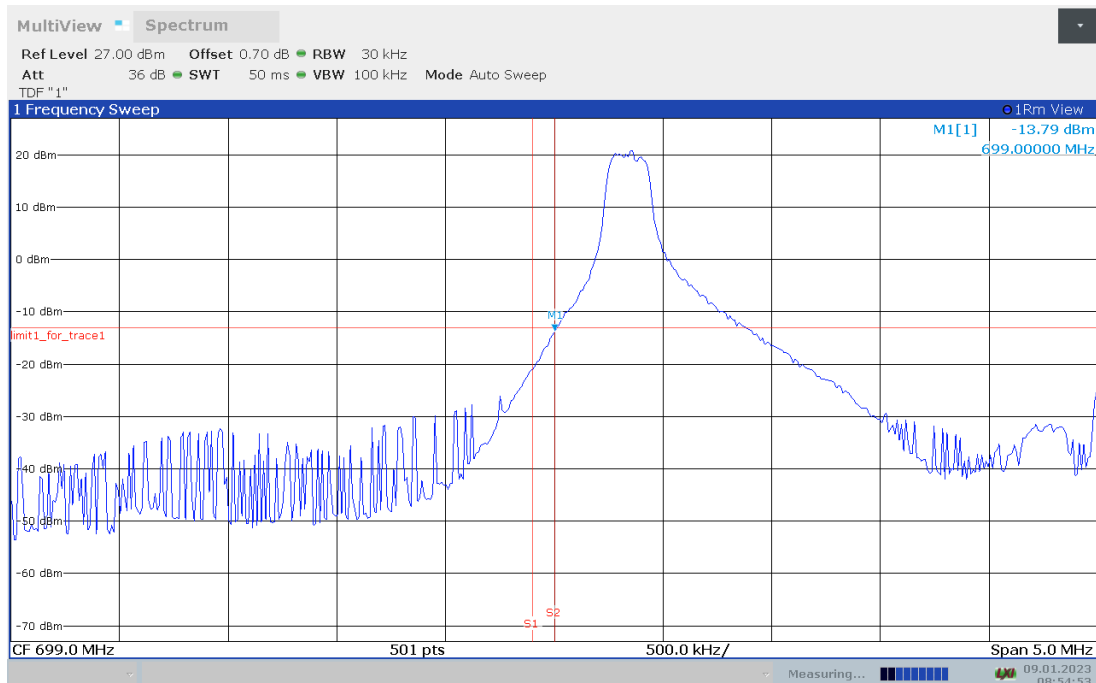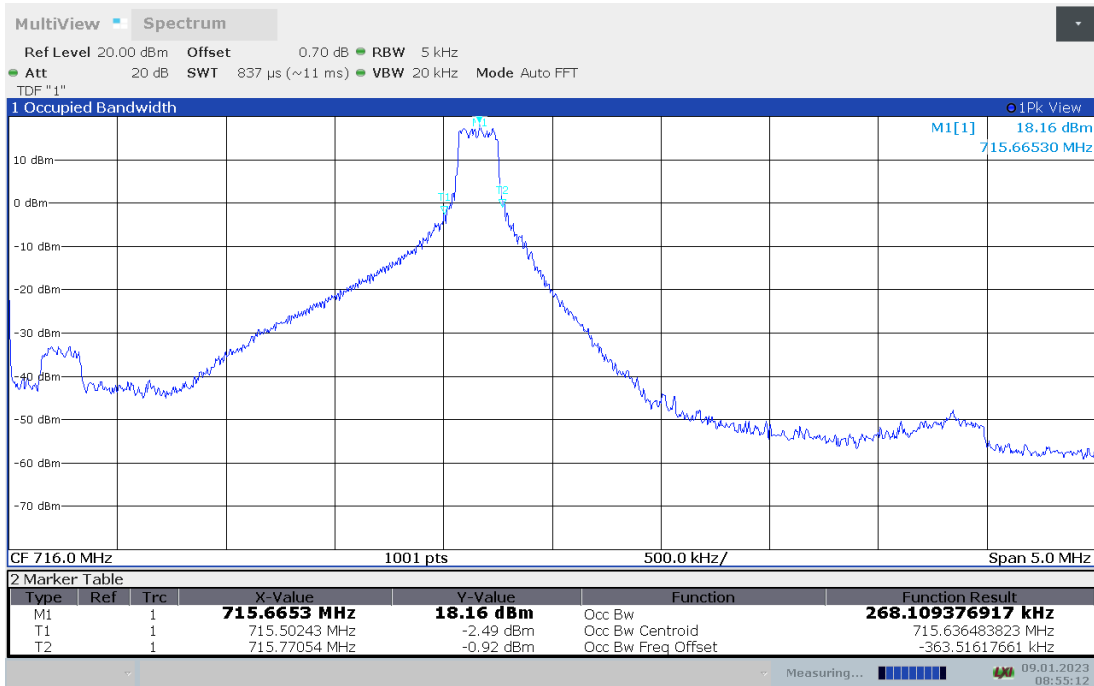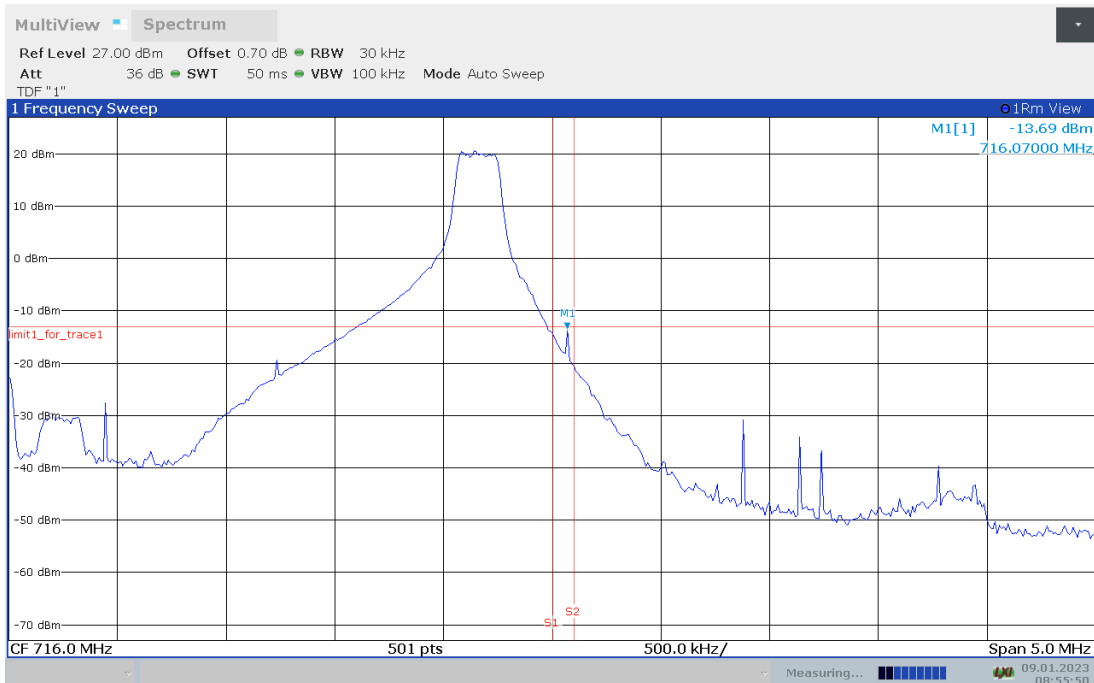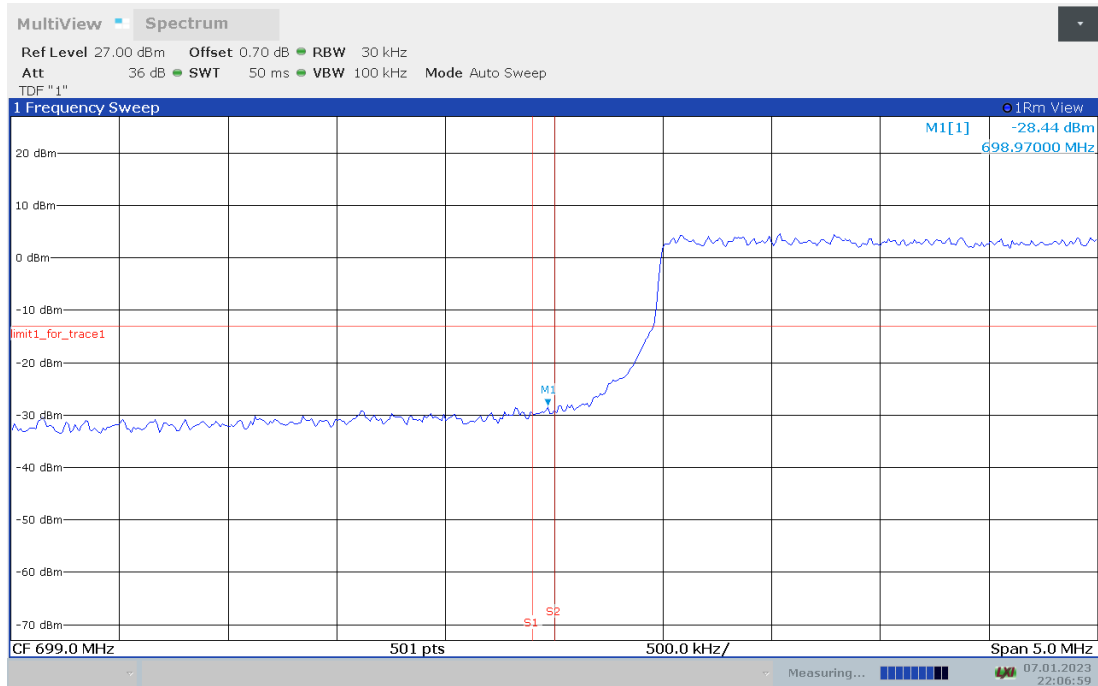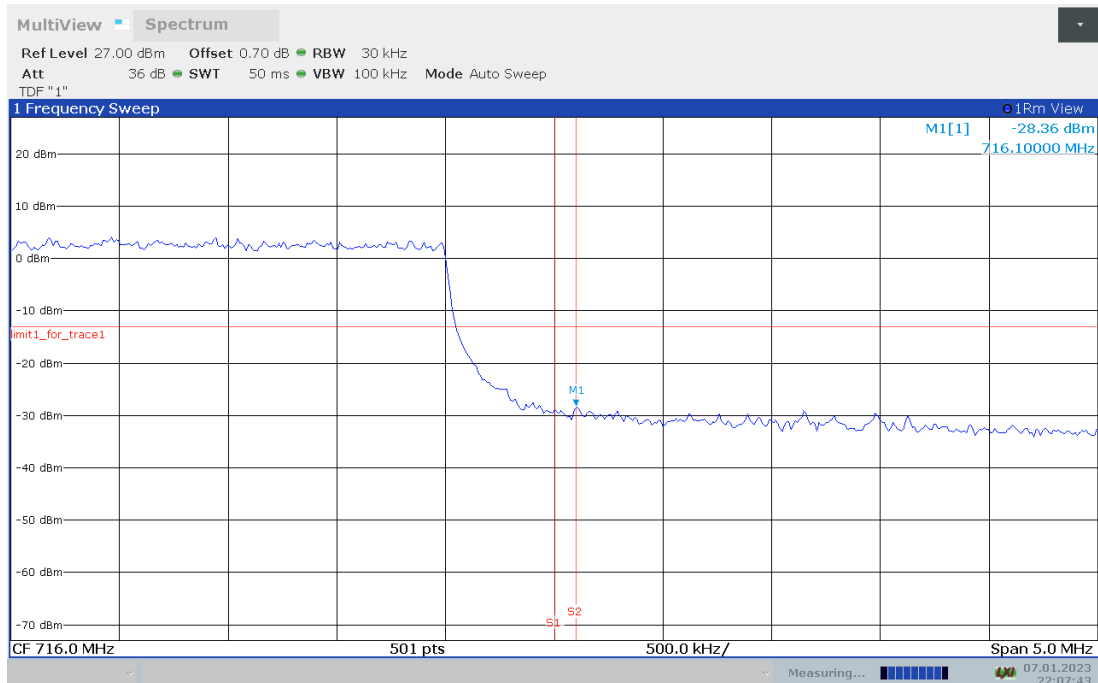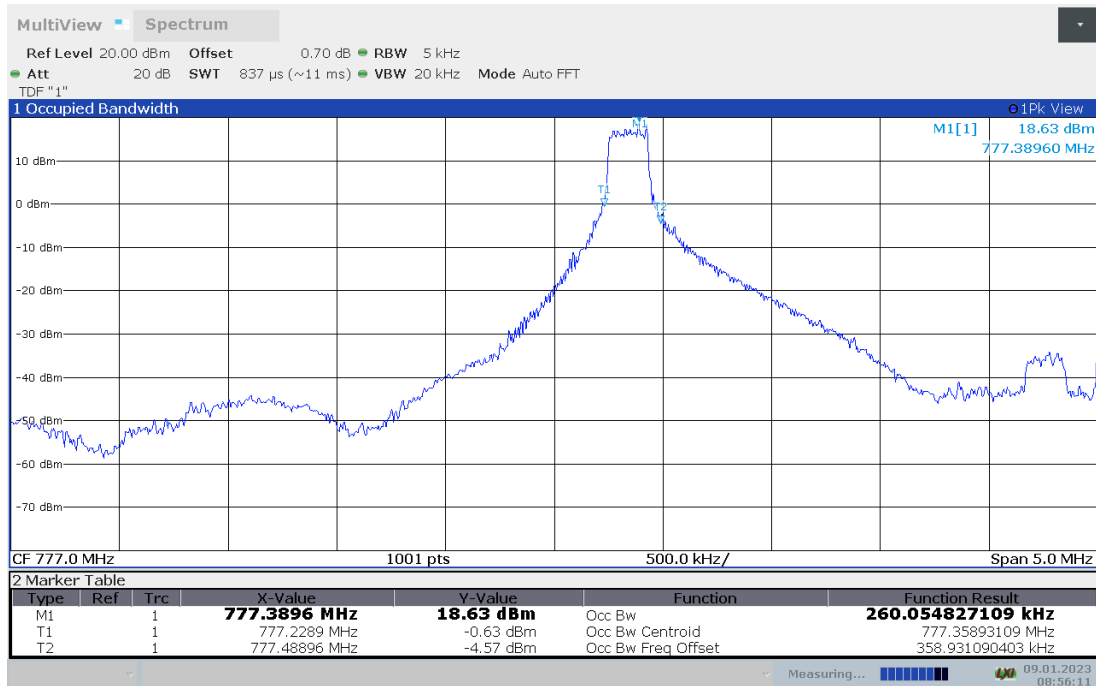## LOW BAND EDGE BLOCK-10M-100%RB
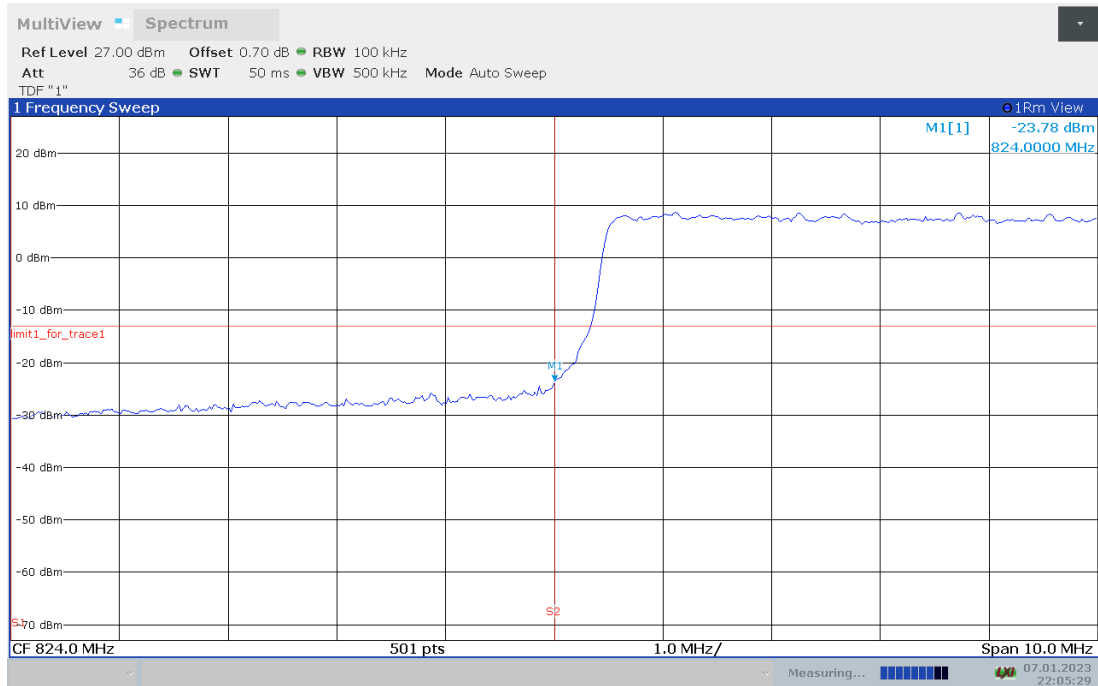


## HIGH BAND EDGE BLOCK-10M-100%RB
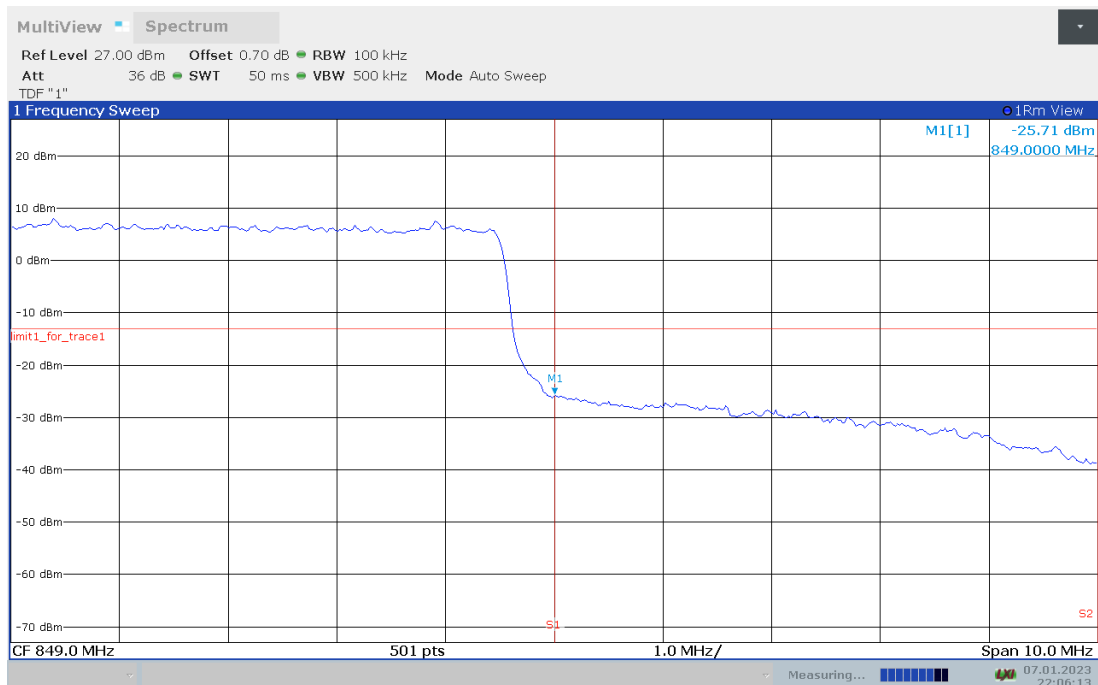
**LTE band 7**
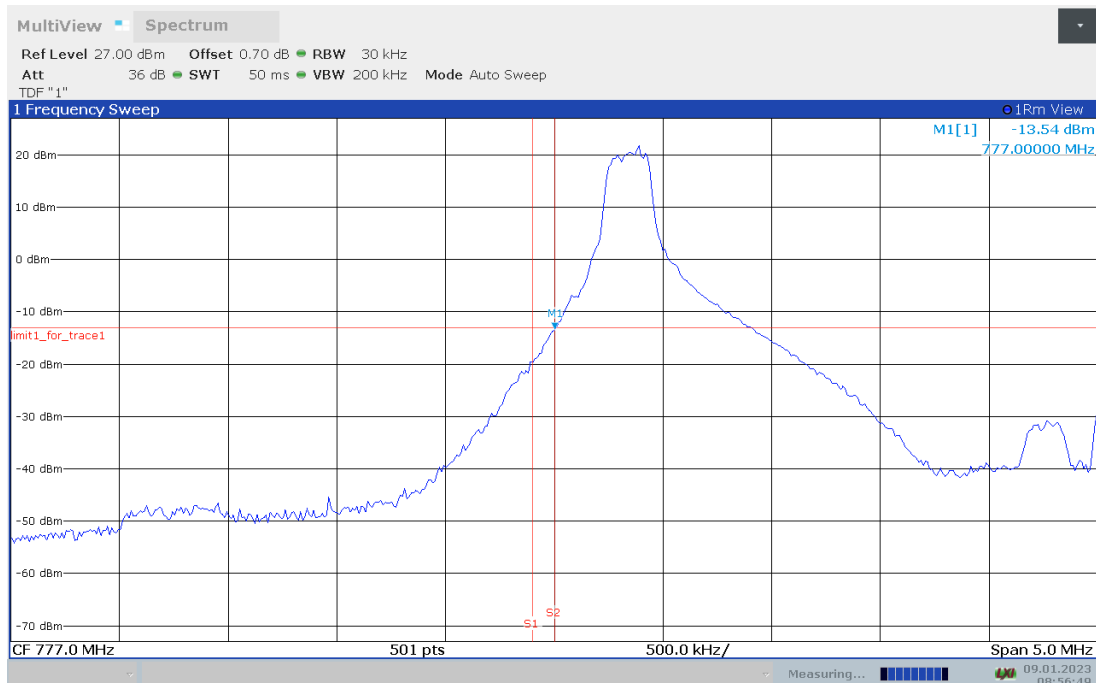
**OBW: 1RB-LOW_offset**



**LOW BAND EDGE BLOCK-1RB-LOW_offset**

## LOW BAND EDGE BLOCK-1RB-LOW_offset



## Channel power

## OBW: 1RB-HIGH_offset

MultiView ■ Spectrum

Ref Level 16.10 dBm   Offset        1.10 dB ● RBW  5 kHz
● Att        15 dB   SWT   2.51 ms (~27 ms) ● VBW 20 kHz   Mode Auto FFT
TDF "1"

1 Occupied Bandwidth                                          ○1Pk View

                                                   M1[1]    17.52 dBm
                                                           2.5696610 GHz
10 dBm

0 dBm

-10 dBm

-20 dBm

-30 dBm

-40 dBm

-50 dBm

-60 dBm

-70 dBm

-80 dBm

CF 2.5755 GHz            1001 pts          3.5 MHz/        Span 35.0 MHz

2 Marker Table

| Type | Ref | Trc | X-Value | Y-Value | Function | Function Result |
|------|-----|-----|---------|---------|----------|-----------------|
| M1 | | 1 | **2.569661 GHz** | **17.52 dBm** | Occ Bw | **293.292705381 kHz** |
| T1 | | 1 | 2.5694893 GHz | -2.74 dBm | Occ Bw Centroid | 2.569635915 GHz |
| T2 | | 1 | 2.5697826 GHz | 11.64 dBm | Occ Bw Freq Offset | -5.864085082 MHz |

Measuring... ▮▮▮▮▮▮▮    07.01.2023  20:44:49

## HIGH BAND EDGE BLOCK-1RB-HIGH_offset

MultiView ■ Spectrum

Ref Level 27.00 dBm   Offset 1.10 dB ● RBW 10 kHz
Att        35 dB ● SWT    50 ms ● VBW 50 kHz   Mode Auto Sweep
TDF "1"

1 Frequency Sweep                                           ○1Rm View

                                                   M1[1]   -18.57 dBm
                                                           2.57000100 GHz
20 dBm

10 dBm

0 dBm

-10 dBm
limit1_for_trace1
M1
-20 dBm

-30 dBm

-40 dBm

-50 dBm

-60 dBm

-70 dBm

2.57 GHz                501 pts          100.0 kHz/        2.571 GHz

Measuring... ▮▮▮▮▮▮▮    07.01.2023  20:45:30

## HIGH BAND EDGE BLOCK-1RB-HIGH_offset



## Channel power

## LOW BAND EDGE BLOCK-20M-100%RB



## LOW BAND EDGE BLOCK-20M-100%RB

## HIGH BAND EDGE BLOCK-20M-100%RB



## HIGH BAND EDGE BLOCK-20M-100%RB
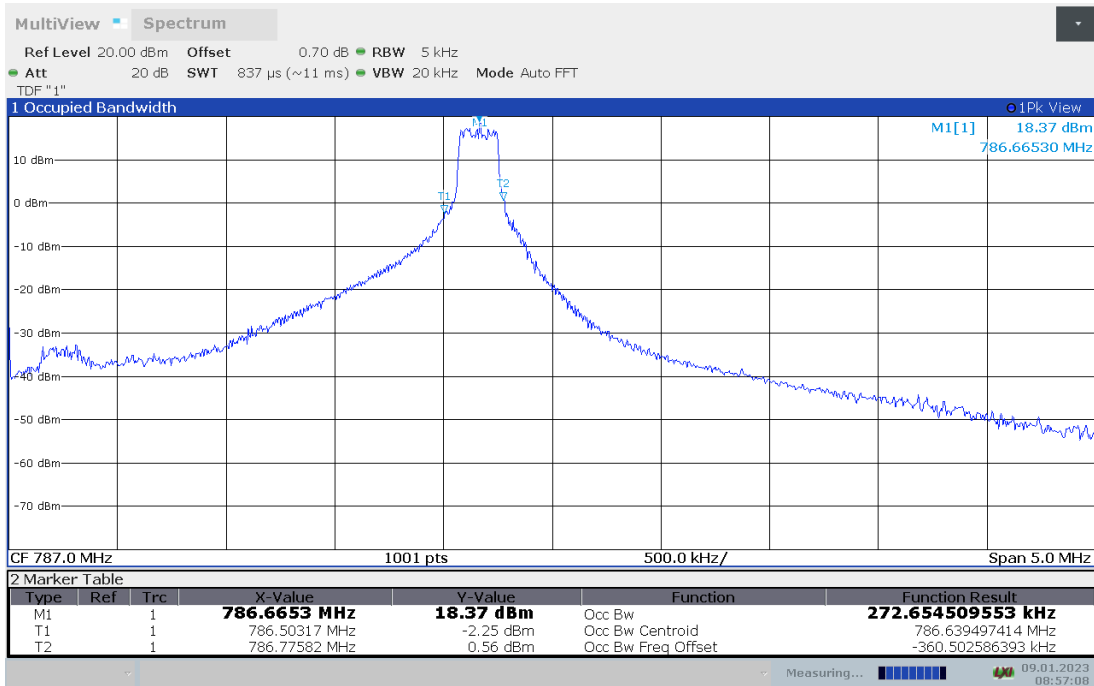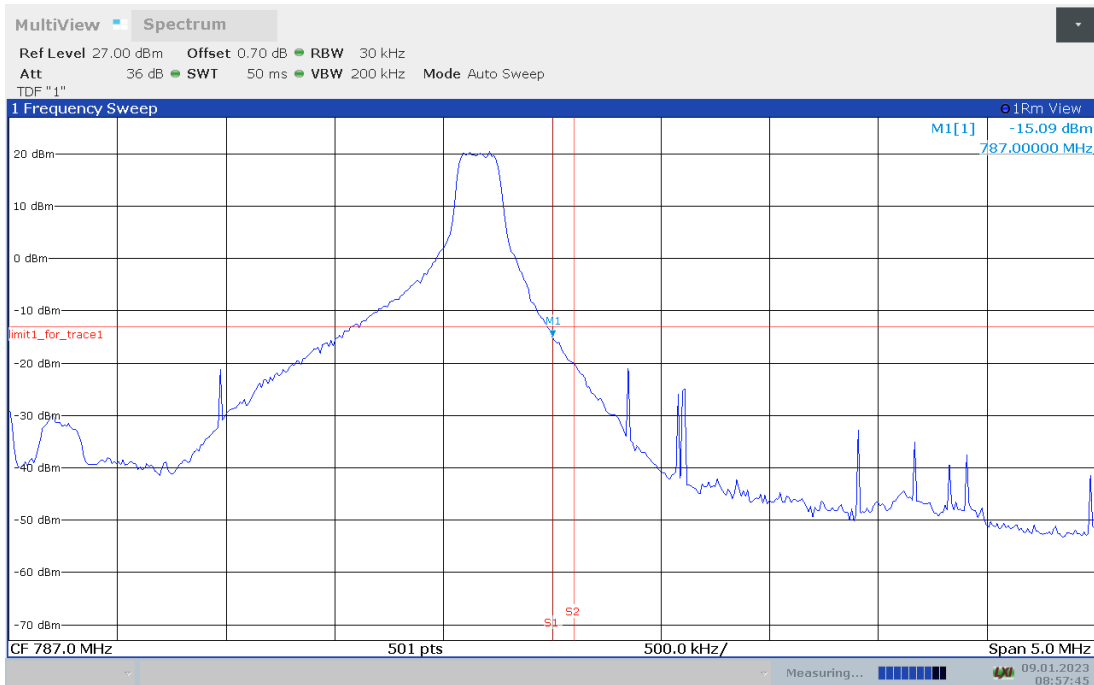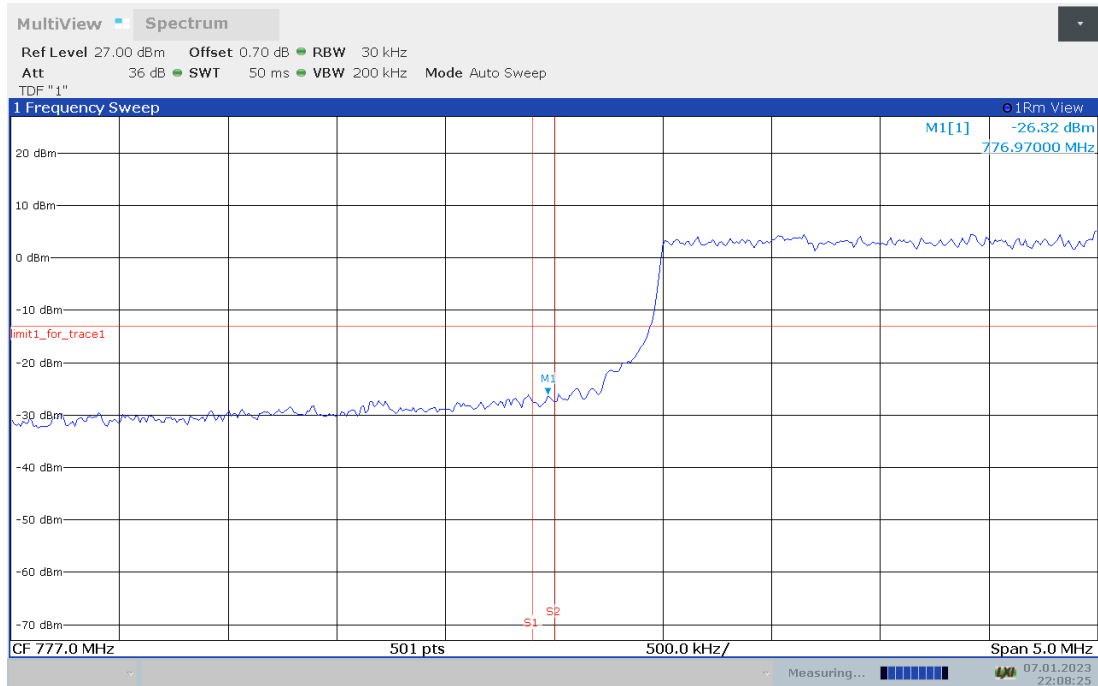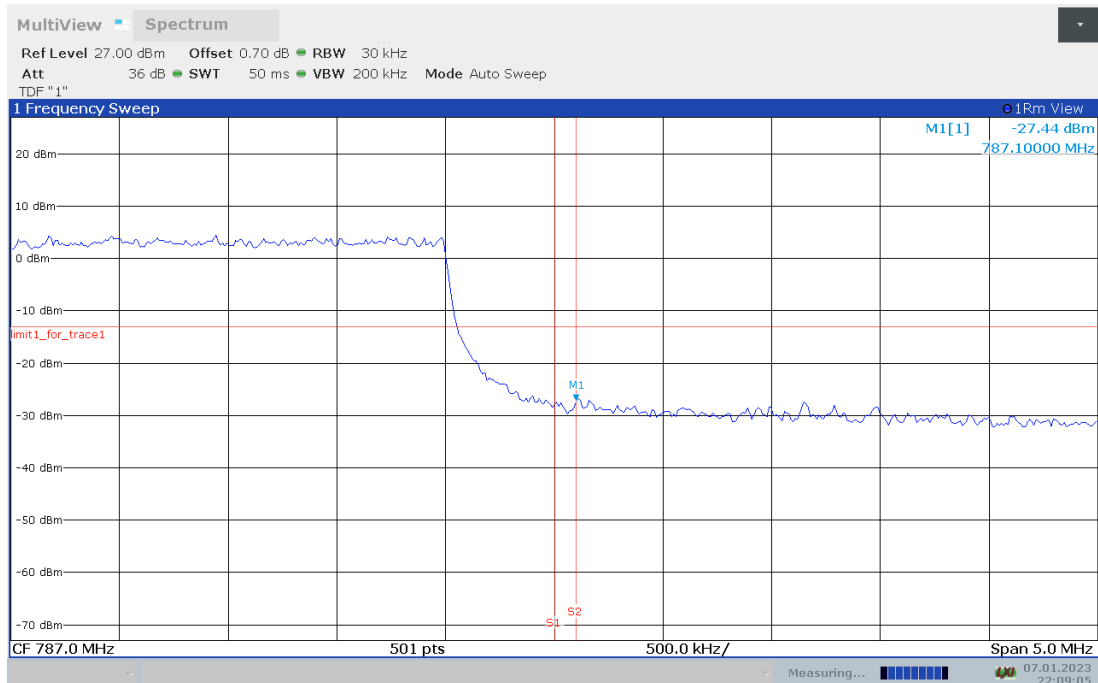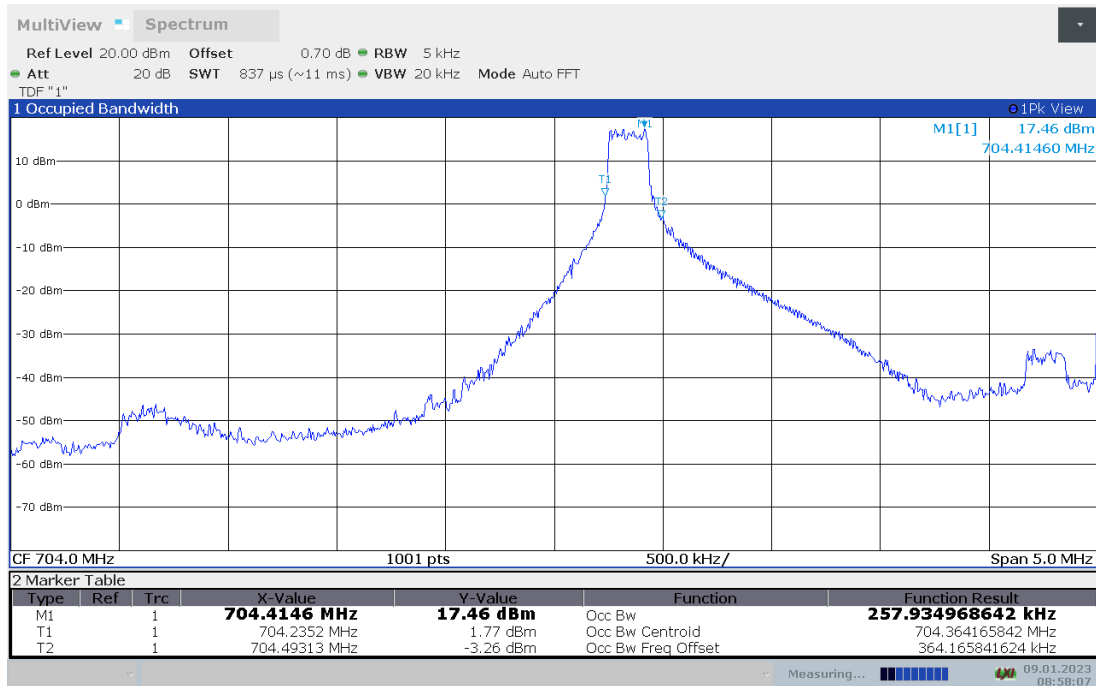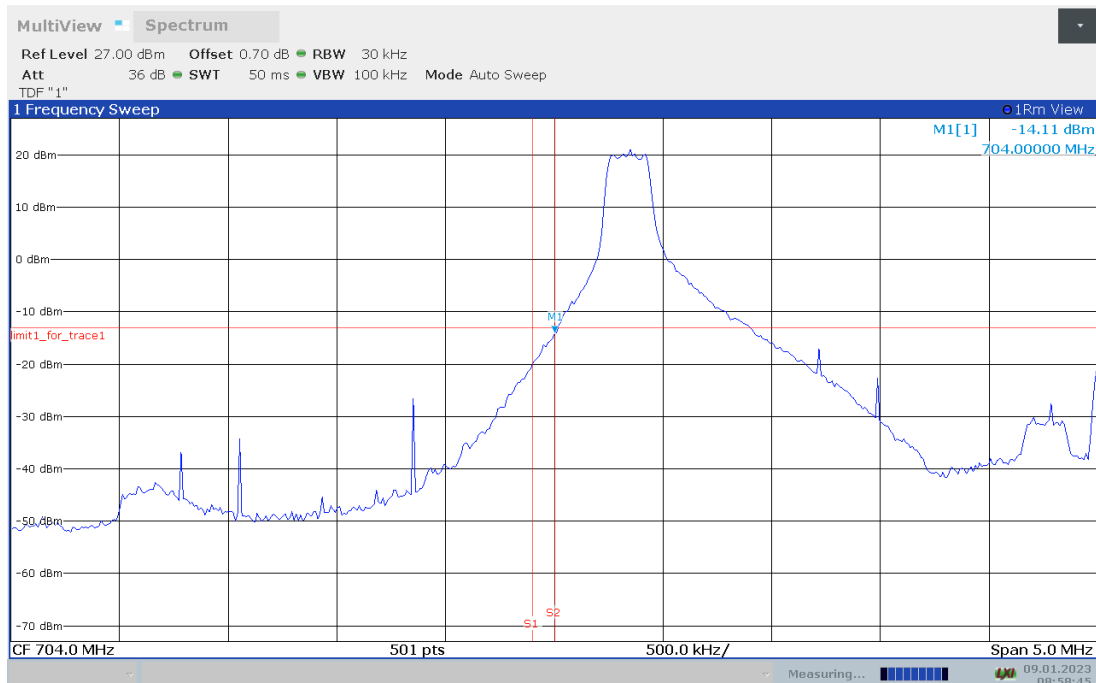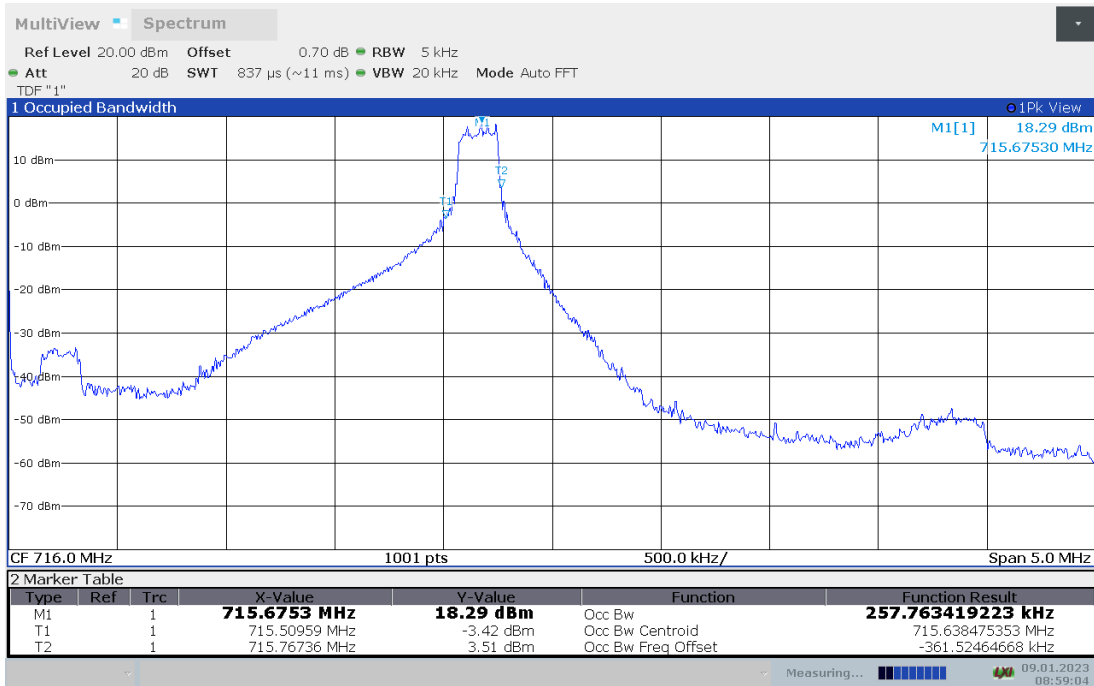
**LTE band 12**

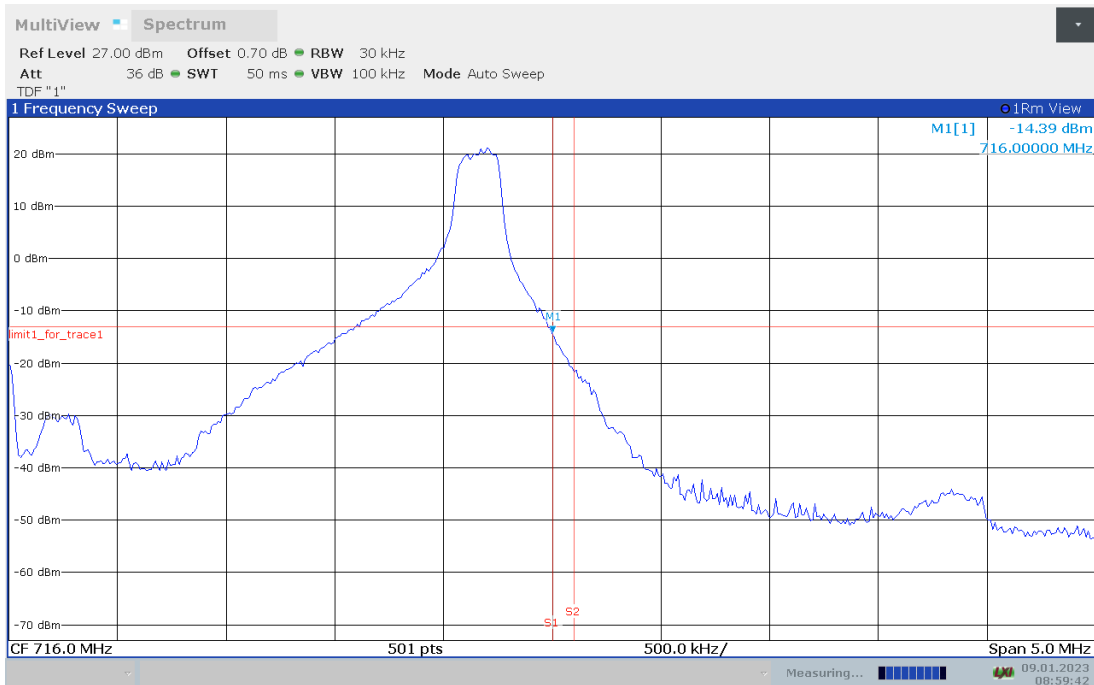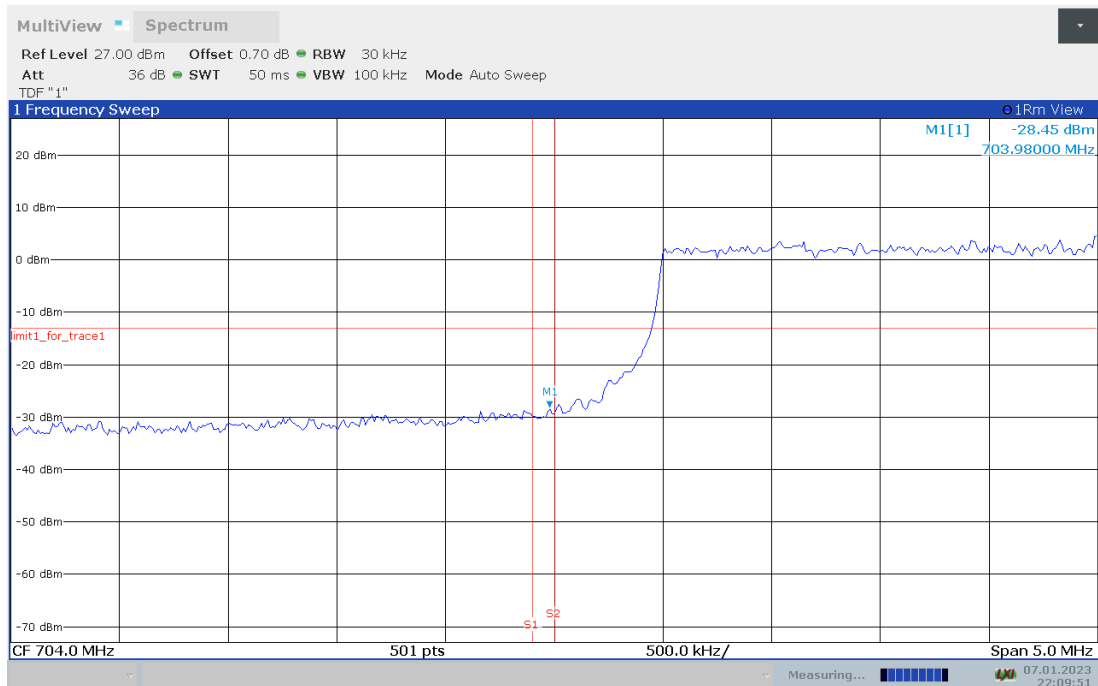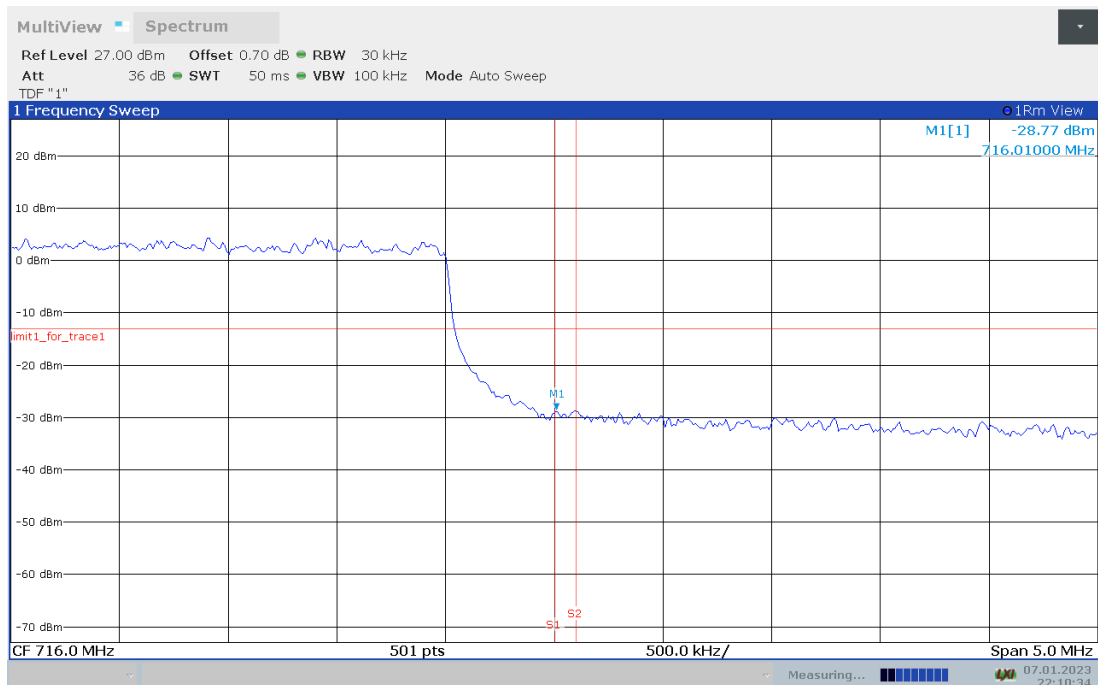**OBW: 1RB-LOW_offset**
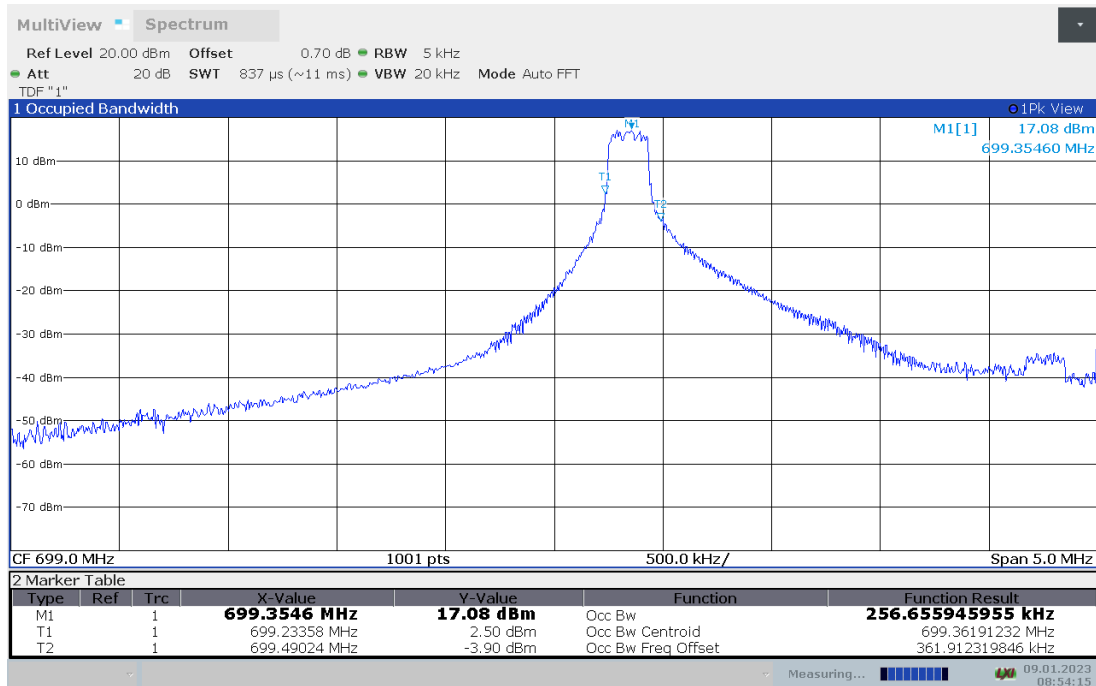


**LOW BAND EDGE BLOCK-1RB-LOW_offset**

## OBW: 1RB-HIGH_offset



## HIGH BAND EDGE BLOCK-1RB-HIGH_offset

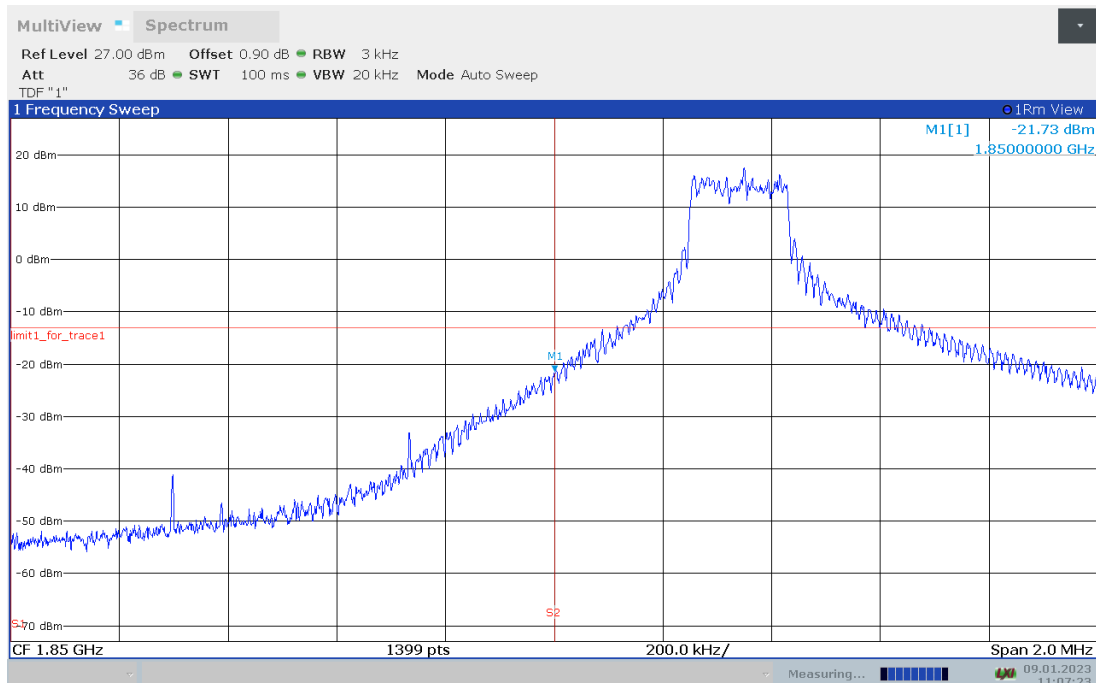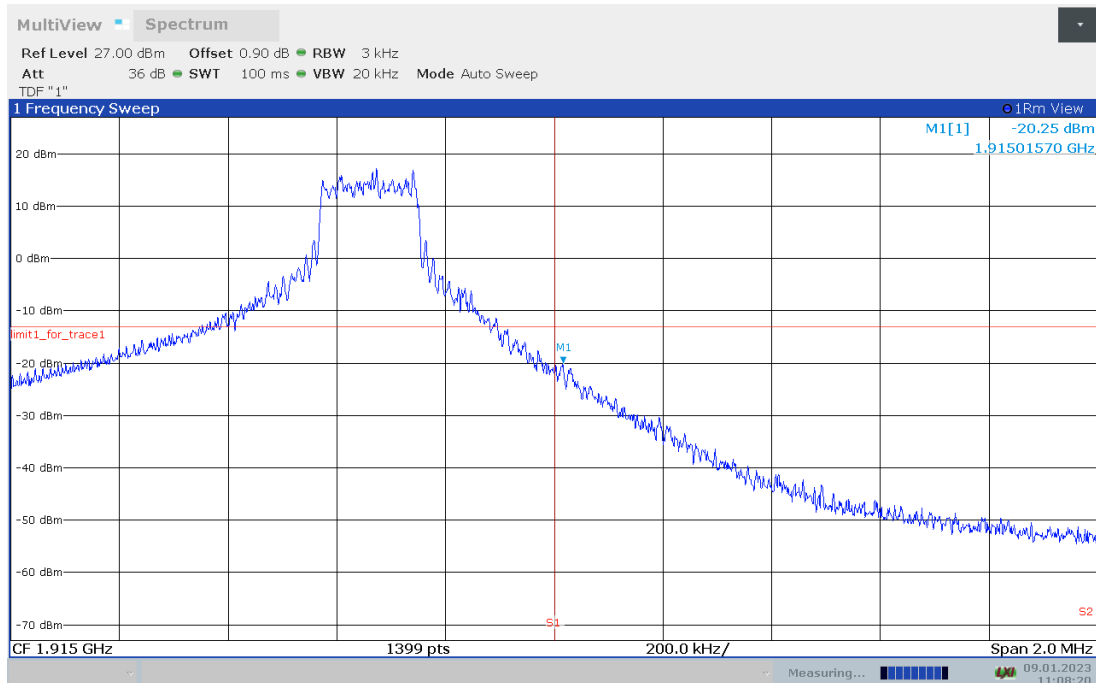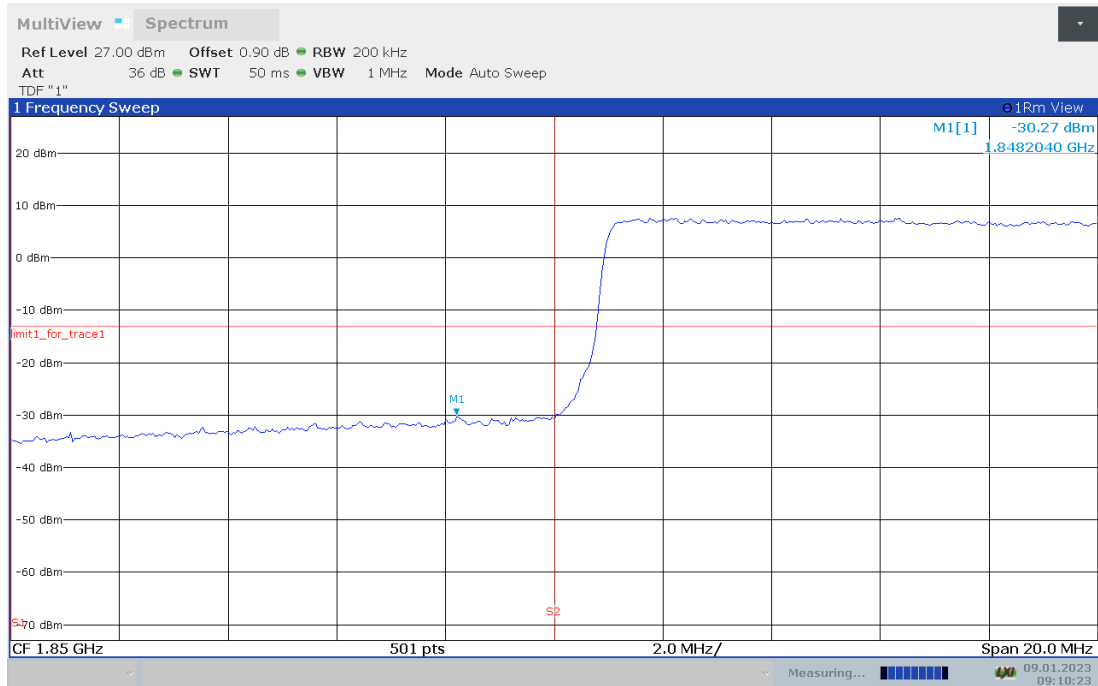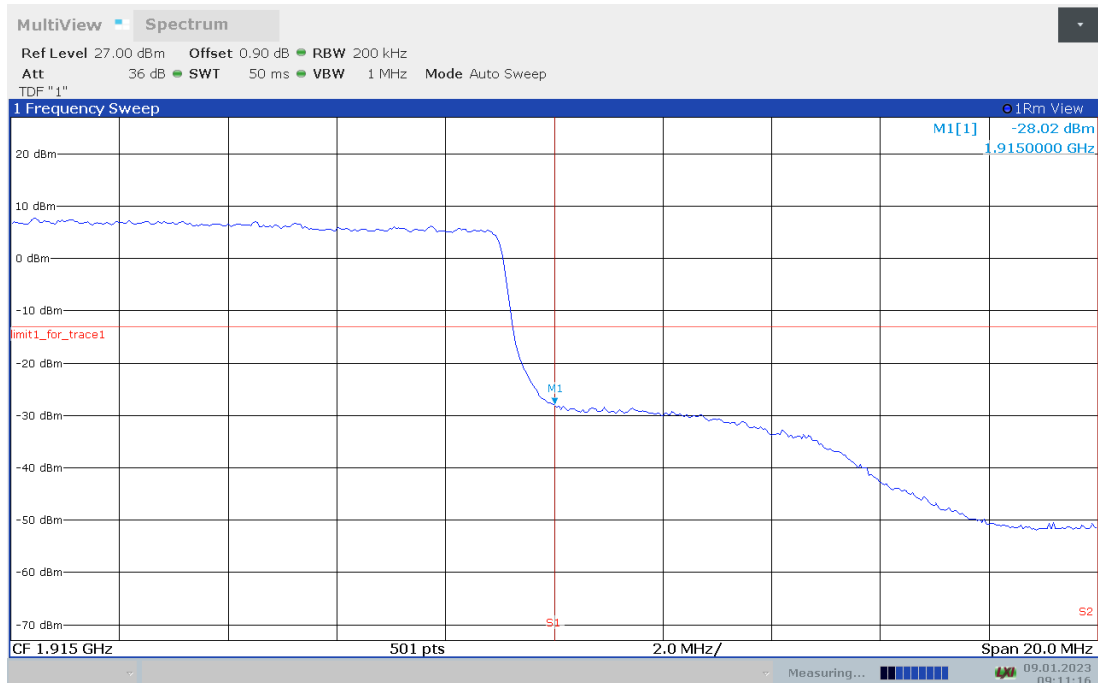## LOW BAND EDGE BLOCK-10M-100%RB
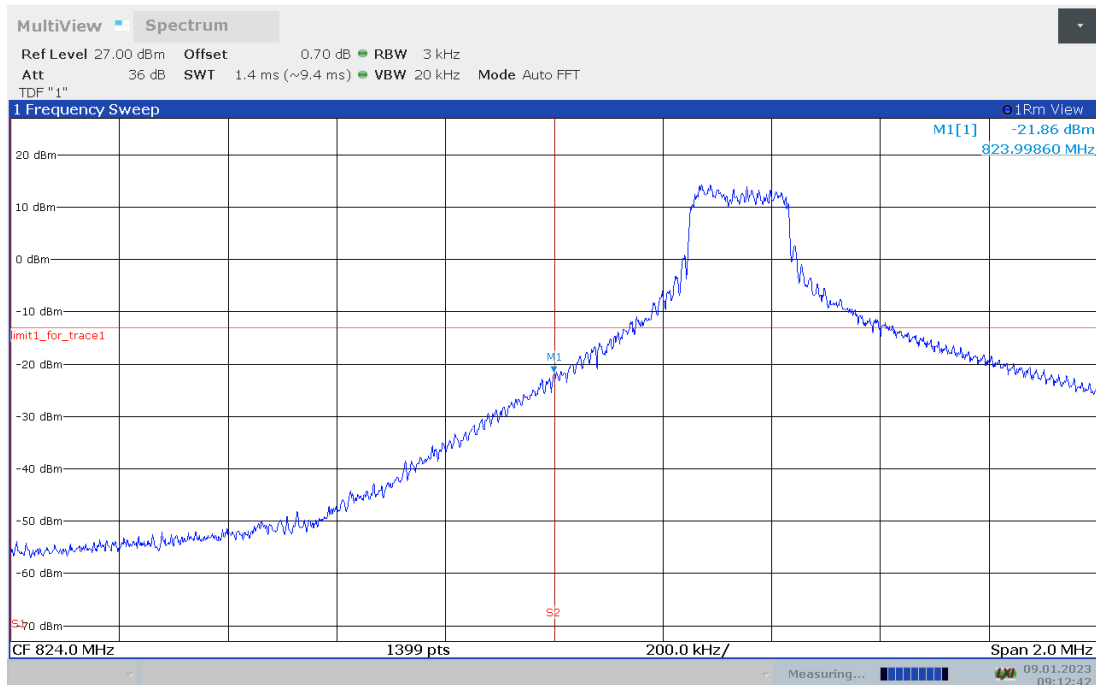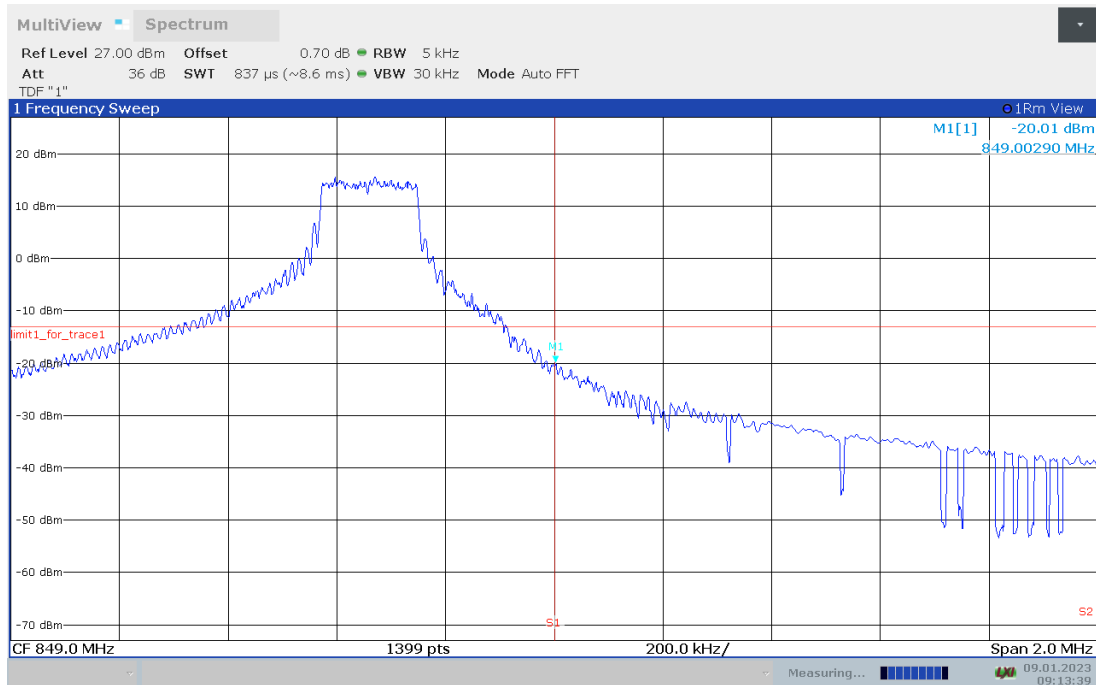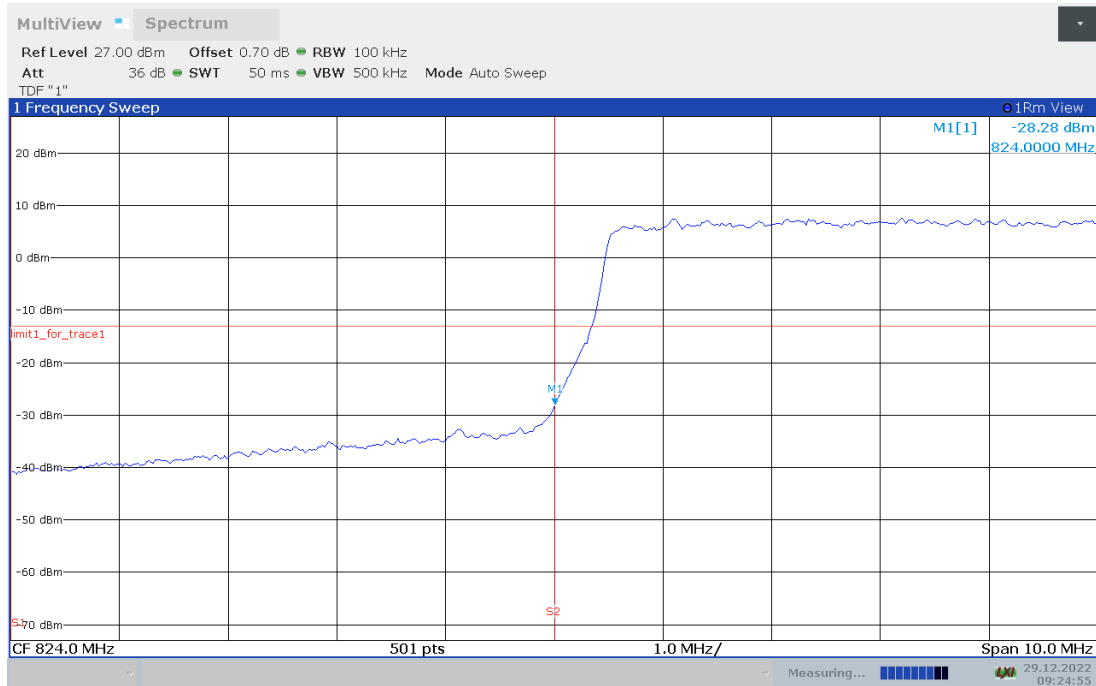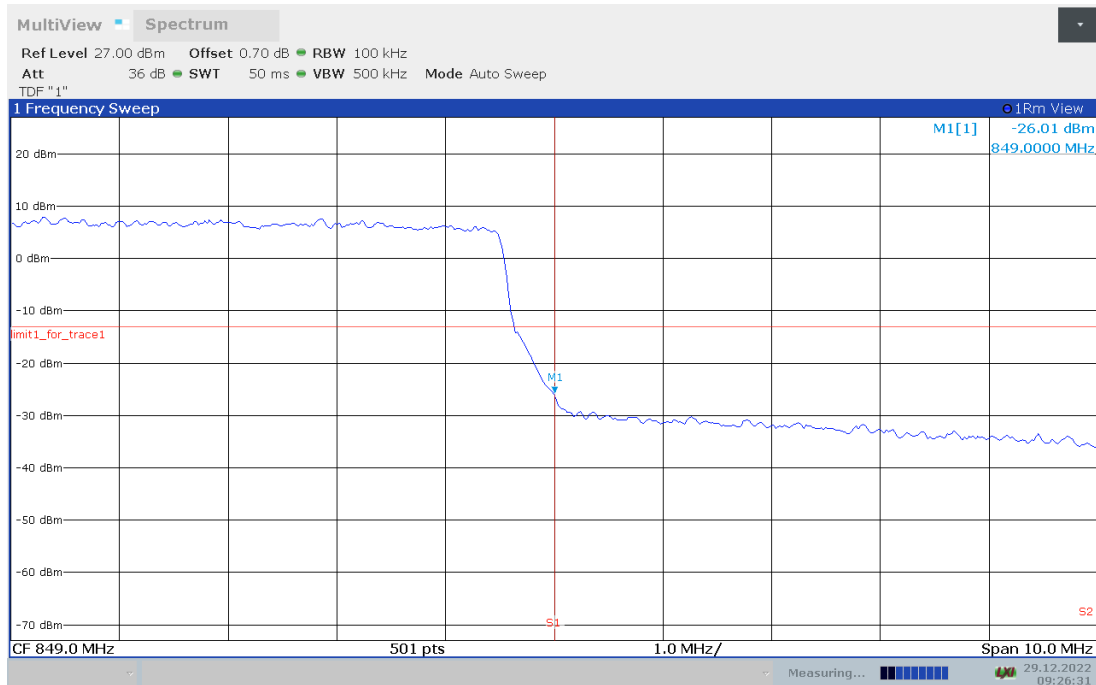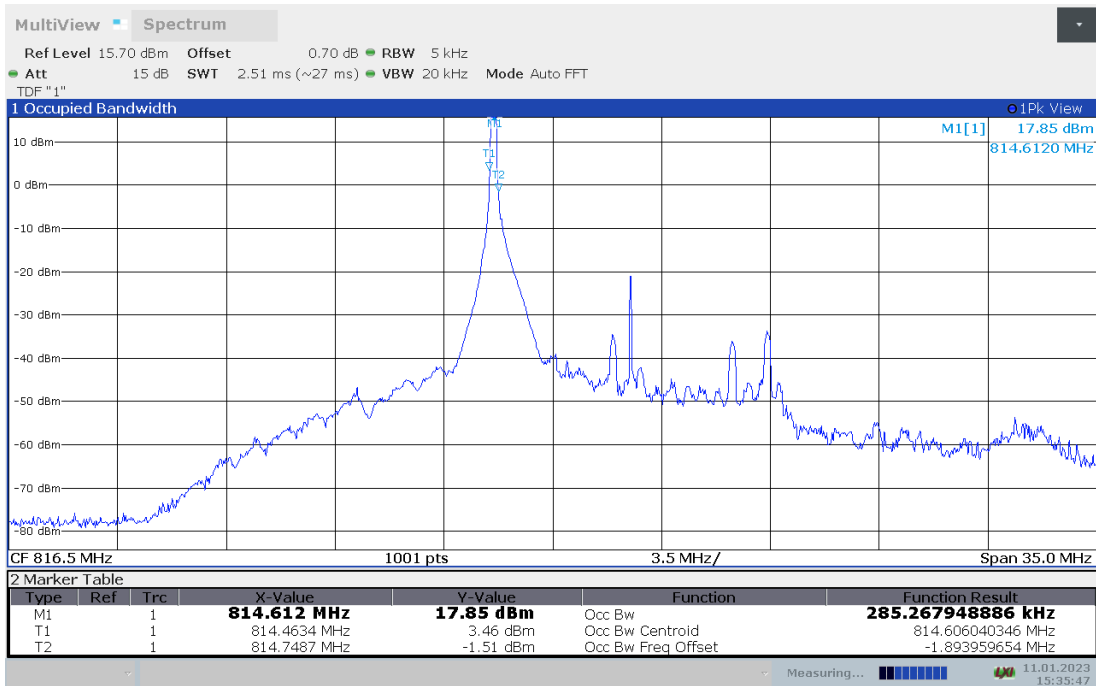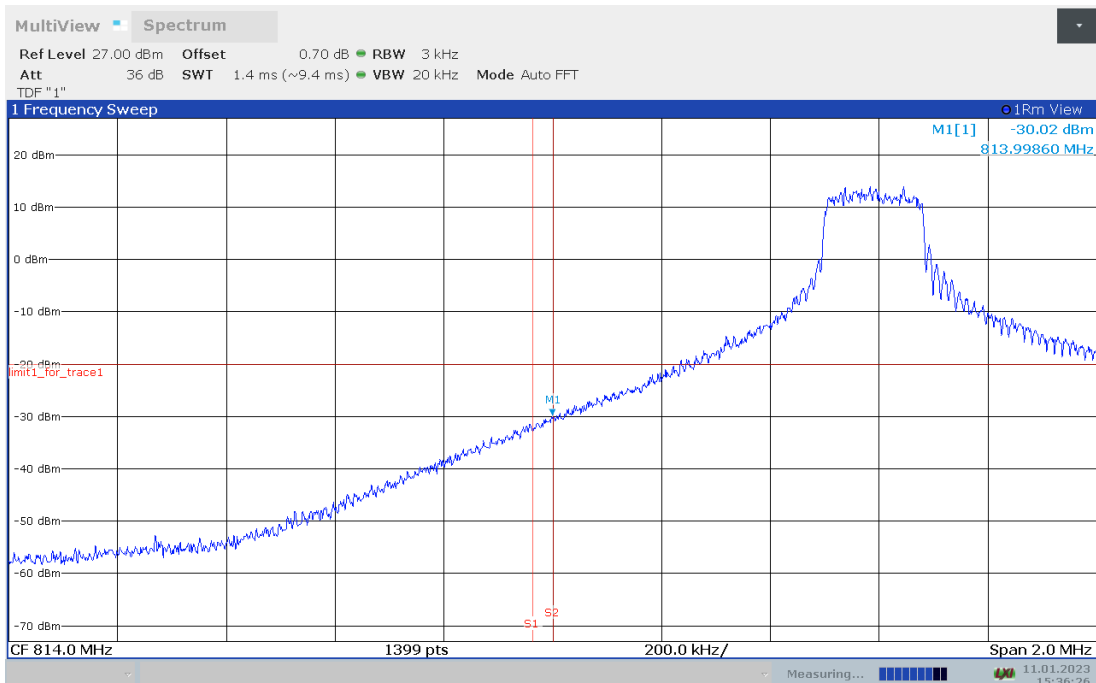


## HIGH BAND EDGE BLOCK-10M-100%RB

**LTE band 13**

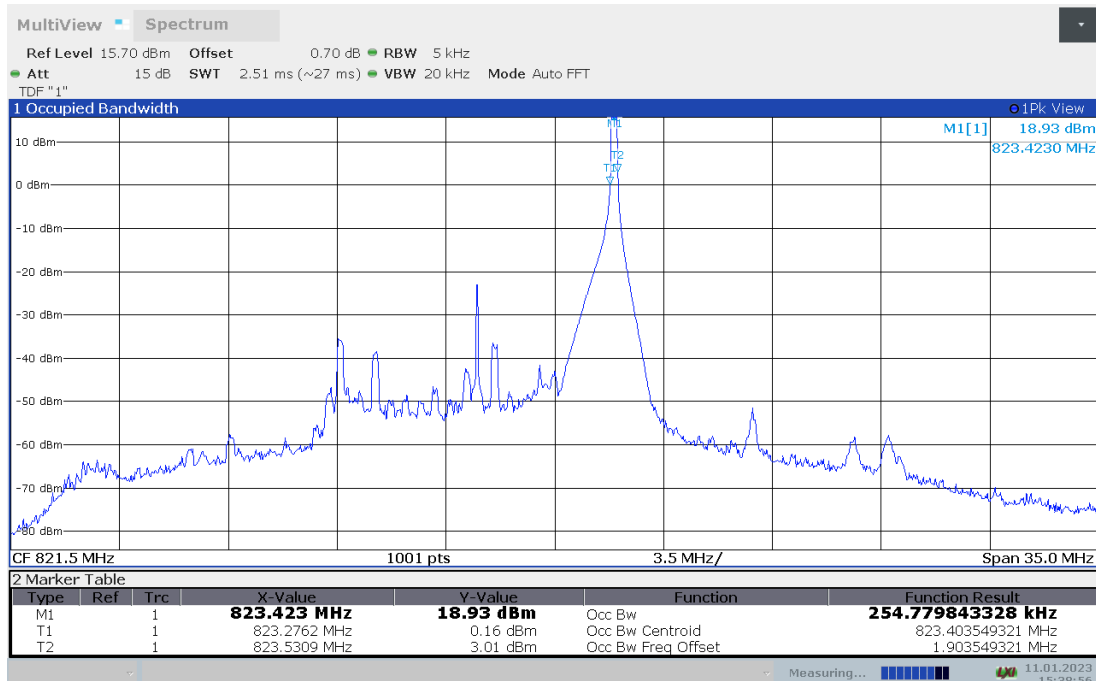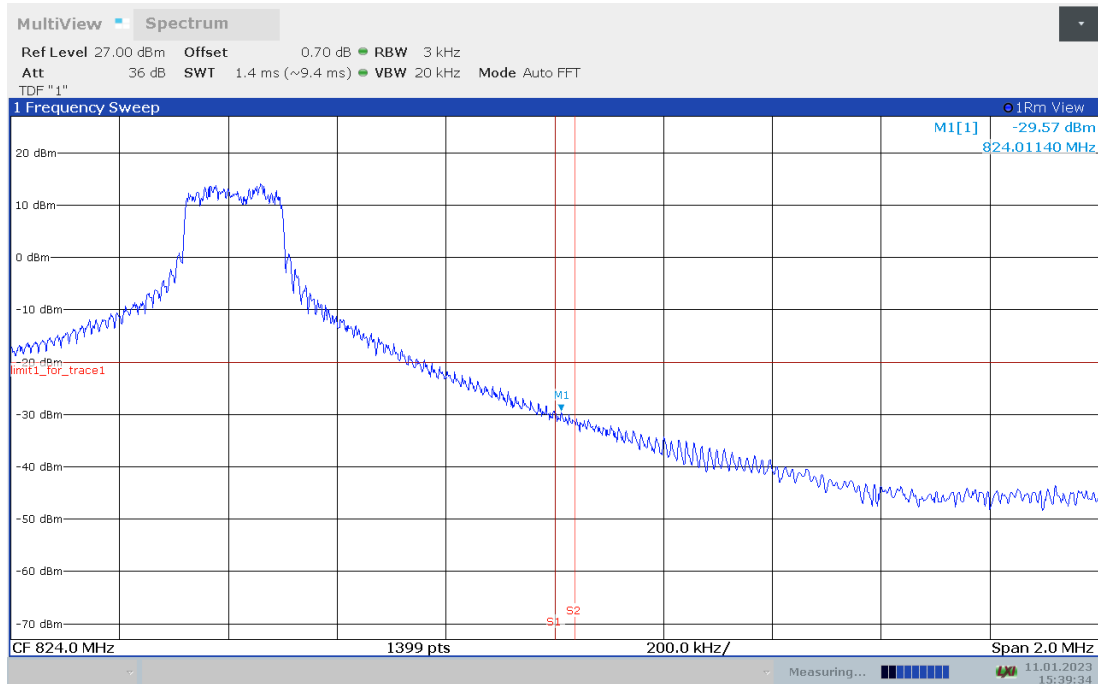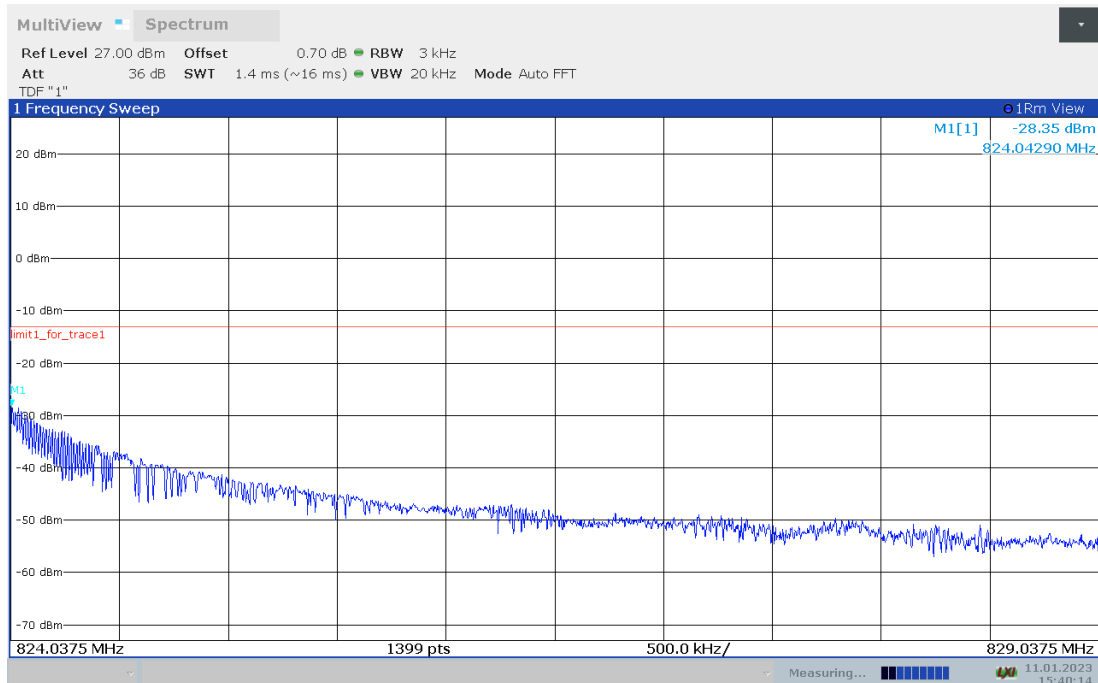**OBW: 1RB-LOW_offset**


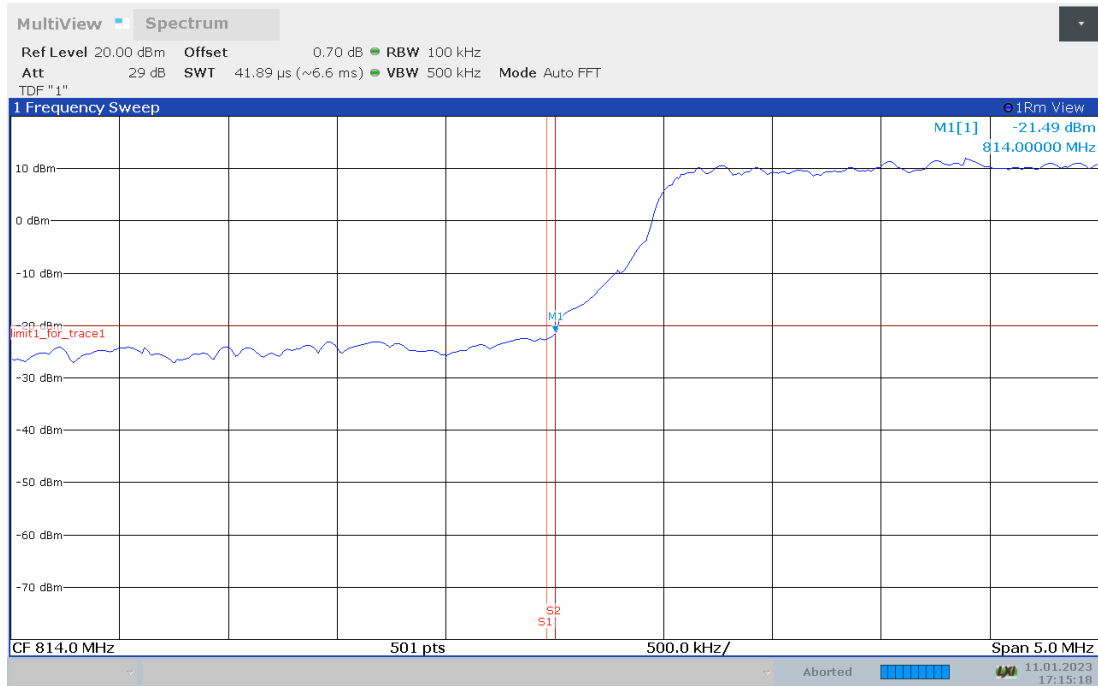
**LOW BAND EDGE BLOCK-1RB-LOW_offset**

## OBW: 1RB-HIGH_offset



MultiView · Spectrum

Ref Level 20.00 dBm   Offset      0.70 dB ● RBW   5 kHz
● Att        20 dB   SWT   837 µs (~11 ms) ● VBW   20 kHz   Mode Auto FFT
TDF "1"

1 Occupied Bandwidth                                                    ●1Pk View

M1[1]    18.37 dBm
786.66530 MHz

10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm

CF 787.0 MHz              1001 pts              500.0 kHz/              Span 5.0 MHz

2 Marker Table

| Type | Ref | Trc | X-Value | Y-Value | Function | Function Result |
|------|-----|-----|---------|---------|----------|-----------------|
| M1 | | 1 | **786.6653 MHz** | **18.37 dBm** | Occ Bw | **272.654509553 kHz** |
| T1 | | 1 | 786.50317 MHz | -2.25 dBm | Occ Bw Centroid | 786.639497414 MHz |
| T2 | | 1 | 786.77582 MHz | 0.56 dBm | Occ Bw Freq Offset | -360.502586393 kHz |

Measuring... ▮▮▮▮▮▮▮▮   09.01.2023 08:57:08

## HIGH BAND EDGE BLOCK-1RB-HIGH_offset



MultiView · Spectrum

Ref Level 27.00 dBm   Offset 0.70 dB ● RBW   30 kHz
Att        36 dB ● SWT    50 ms ● VBW 200 kHz   Mode Auto Sweep
TDF "1"

1 Frequency Sweep                                                      ●1Rm View

M1[1]    -15.09 dBm
787.00000 MHz

20 dBm
10 dBm
0 dBm
-10 dBm
limit1_for_trace1
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm

CF 787.0 MHz              501 pts              500.0 kHz/              Span 5.0 MHz

Measuring... ▮▮▮▮▮▮▮   09.01.2023 08:57:45

## LOW BAND EDGE BLOCK-10M-100%RB



## HIGH BAND EDGE BLOCK-10M-100%RB

**LTE band 17**

**OBW: 1RB-LOW_offset**



**LOW BAND EDGE BLOCK-1RB-LOW_offset**
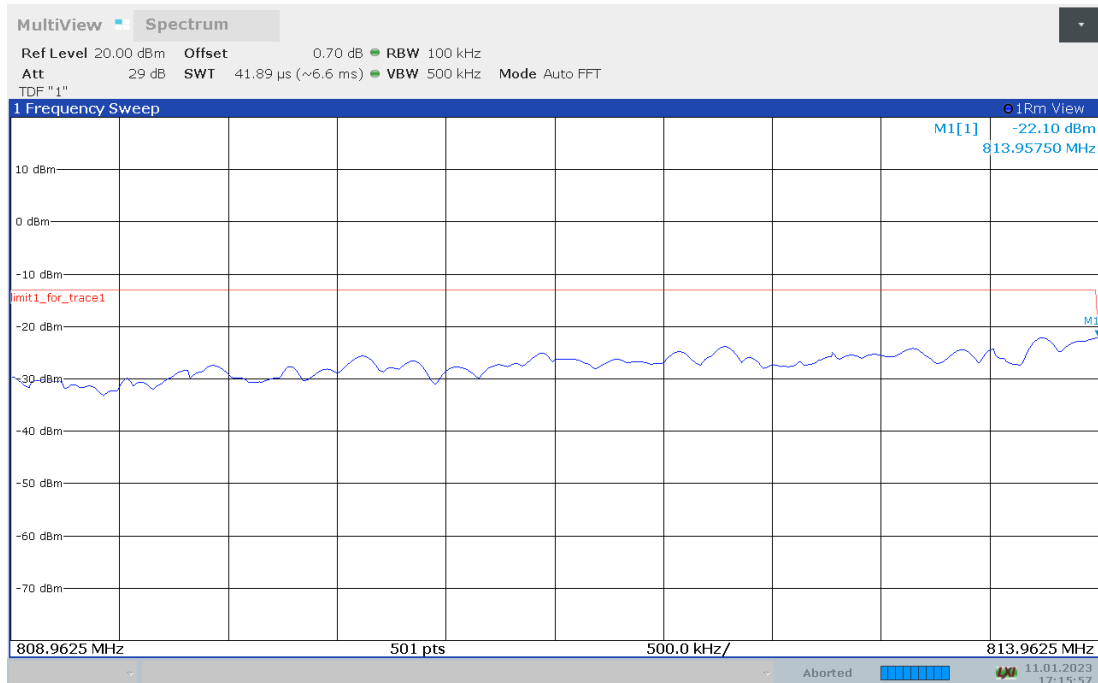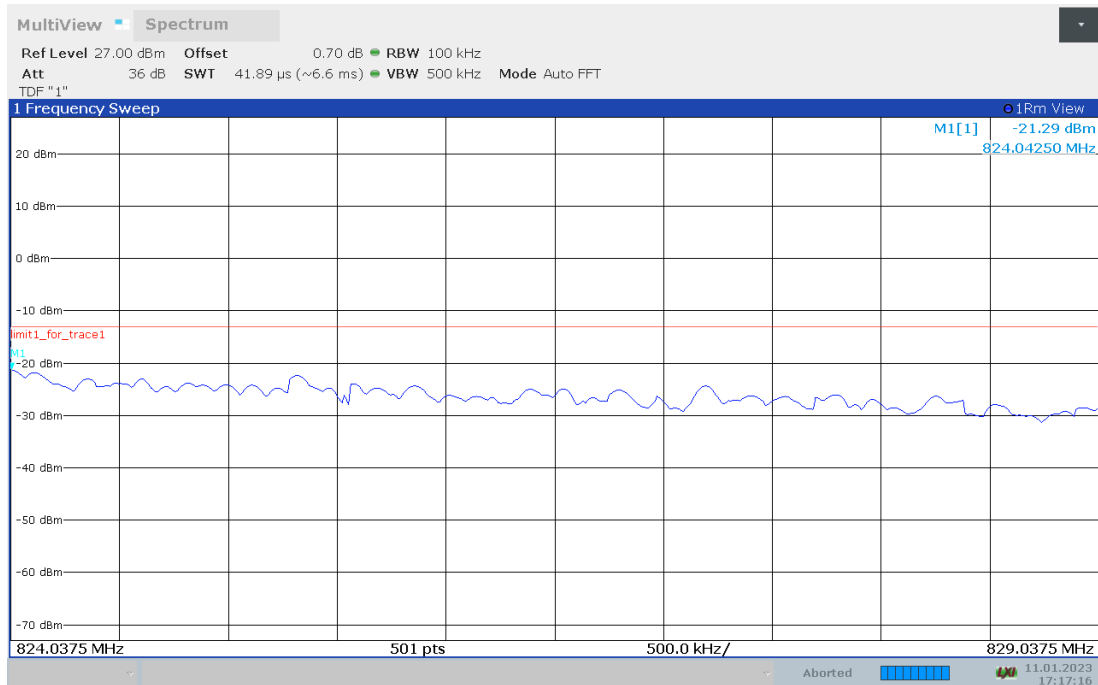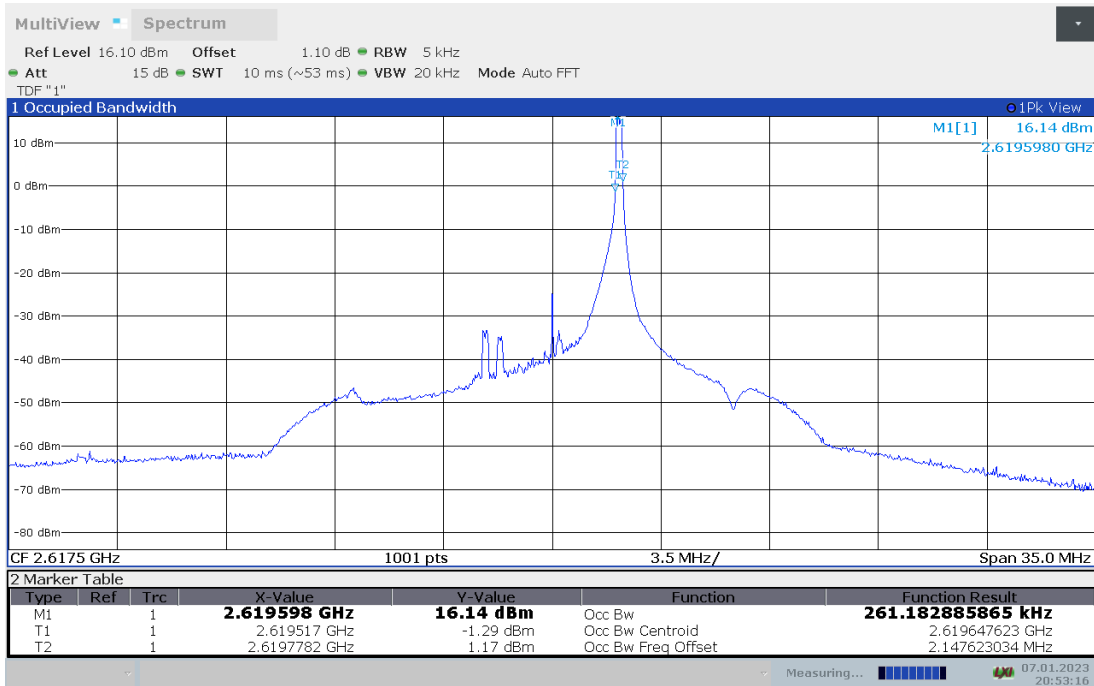
## OBW: 1RB-HIGH_offset



## HIGH BAND EDGE BLOCK-1RB-HIGH_offset

## LOW BAND EDGE BLOCK-10M-100%RB



## HIGH BAND EDGE BLOCK-10M-100%RB

**LTE band 25**

**OBW: 1RB-LOW_offset**



**LOW BAND EDGE BLOCK-1RB-LOW_offset**

## OBW: 1RB-HIGH_offset



## HIGH BAND EDGE BLOCK-1RB-HIGH_offset

## LOW BAND EDGE BLOCK-20M-100%RB



## HIGH BAND EDGE BLOCK-20M-100%RB

**LTE band 26(824MHz-849MHz)**

**OBW: 1RB-LOW_offset**



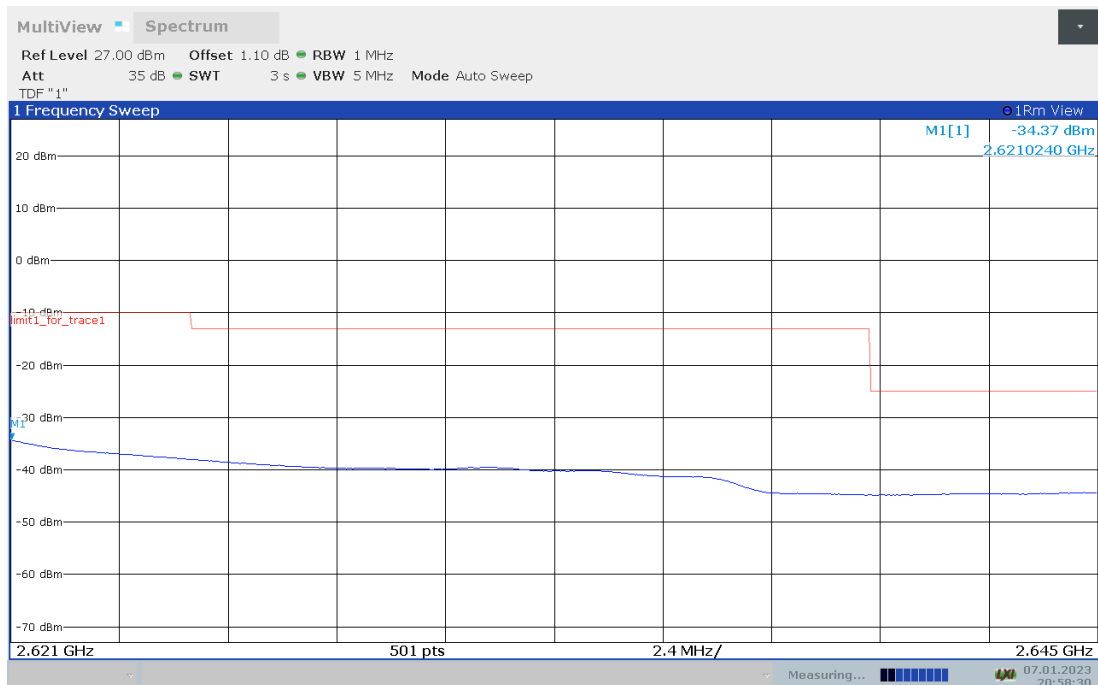**LOW BAND EDGE BLOCK-1RB-LOW_offset**

## OBW: 1RB-HIGH_offset



## HIGH BAND EDGE BLOCK-1RB-HIGH_offset

## LOW BAND EDGE BLOCK-10M-100%RB



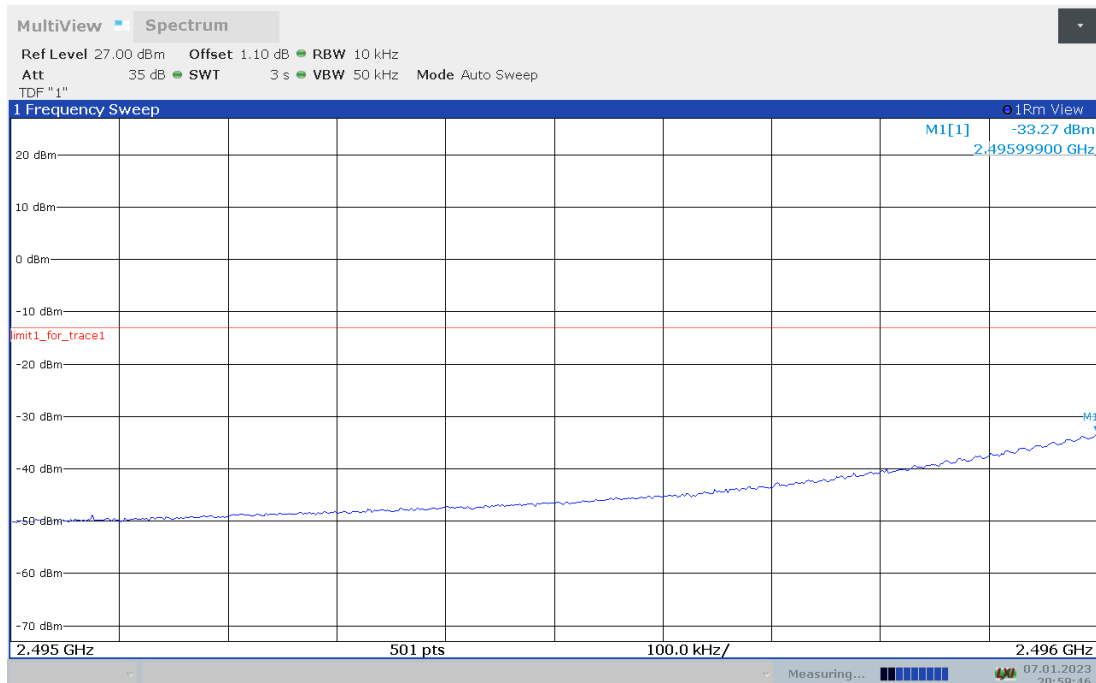## HIGH BAND EDGE BLOCK-10M-100%RB

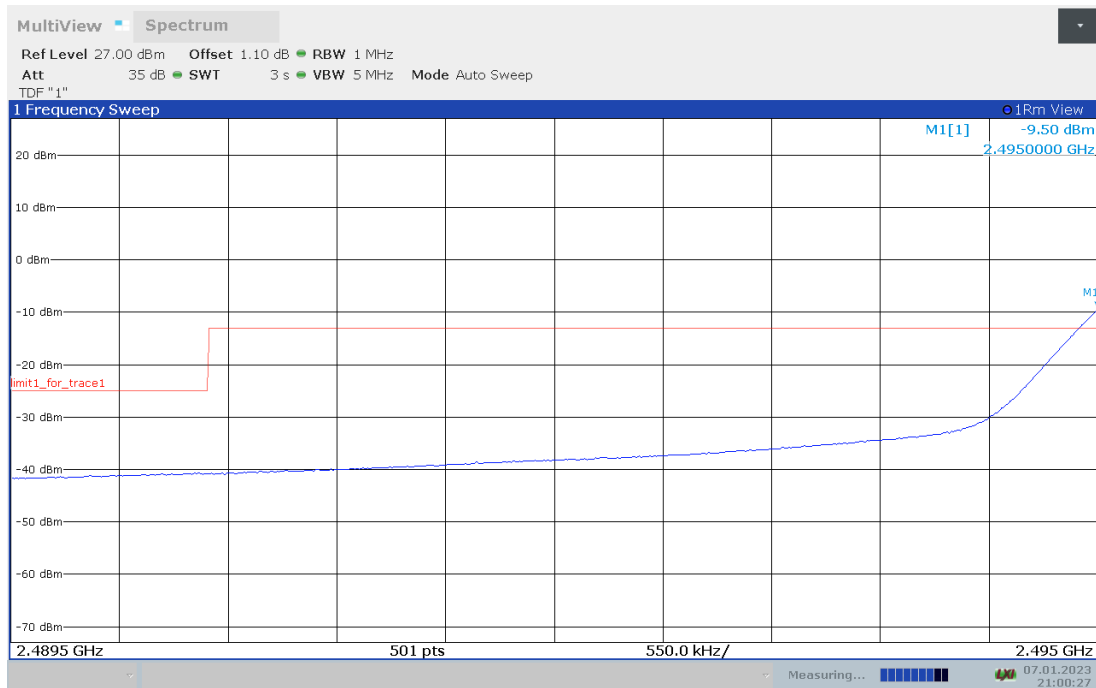**LTE band 26(814MHz-824MHz)**

**OBW: 1RB-LOW_offset**
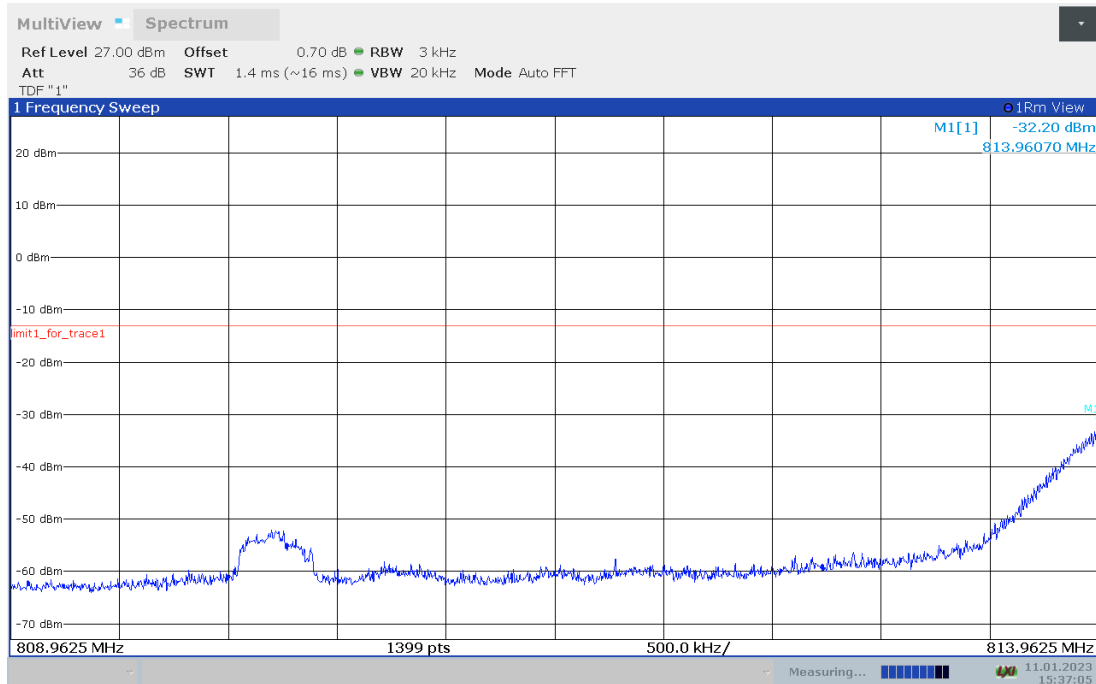


**LOW BAND EDGE BLOCK-1RB-LOW_offset**

## LOW BAND EDGE BLOCK-1RB-LOW_offset



## OBW: 1RB-HIGH_offset

## HIGH BAND EDGE BLOCK-1RB-HIGH_offset



## HIGH BAND EDGE BLOCK-1RB-HIGH_offset

## LOW BAND EDGE BLOCK-10M-100%RB



## LOW BAND EDGE BLOCK-10M-100%RB

## HIGH BAND EDGE BLOCK-10M-100%RB
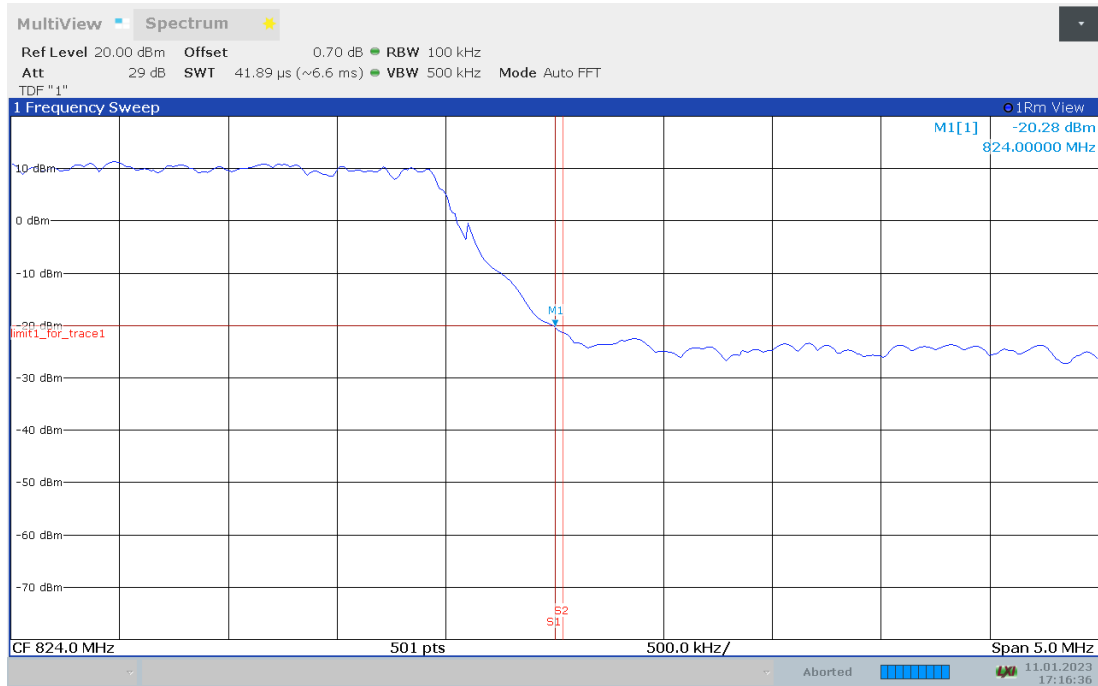


## HIGH BAND EDGE BLOCK-10M-100%RB

**LTE band 38**

**OBW: 1RB-LOW_offset**
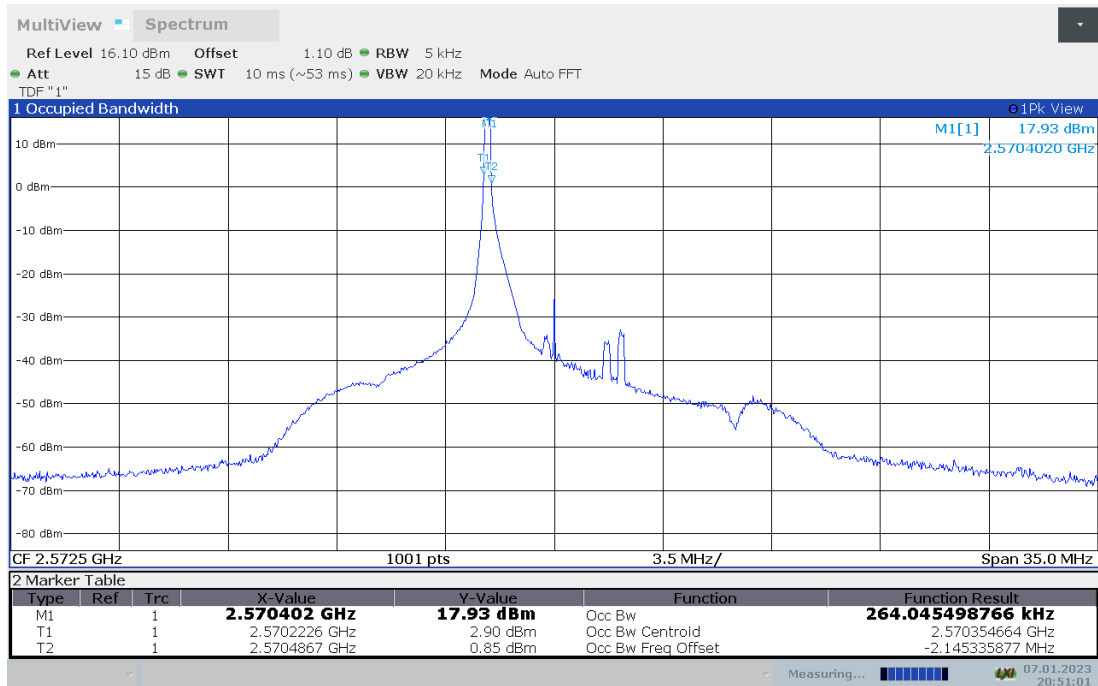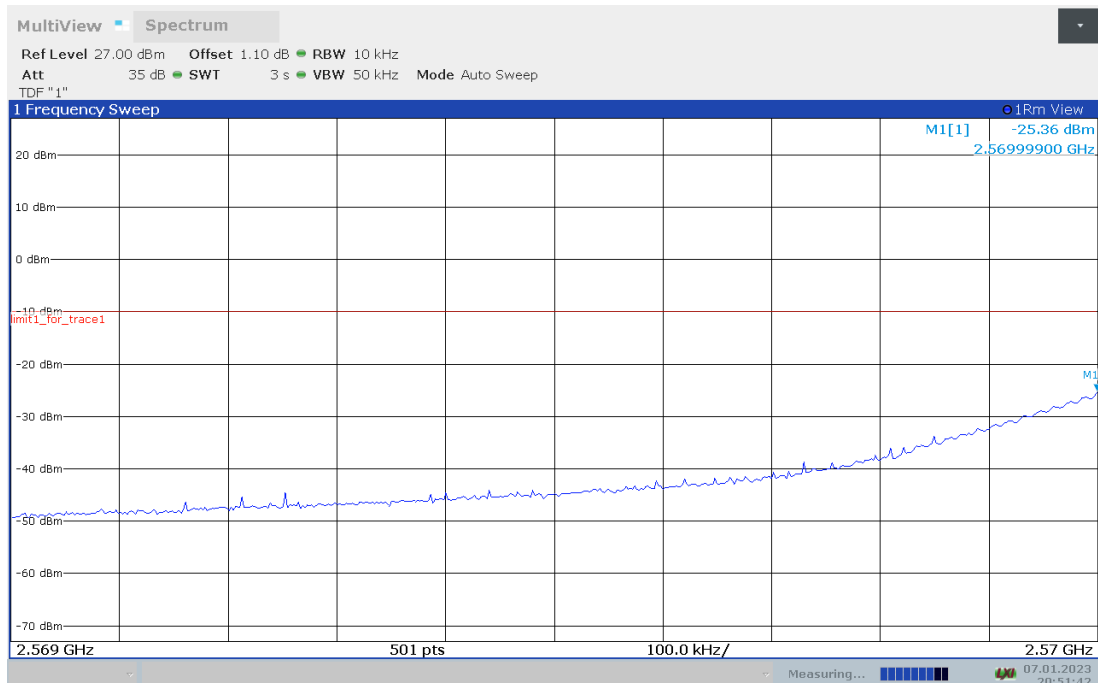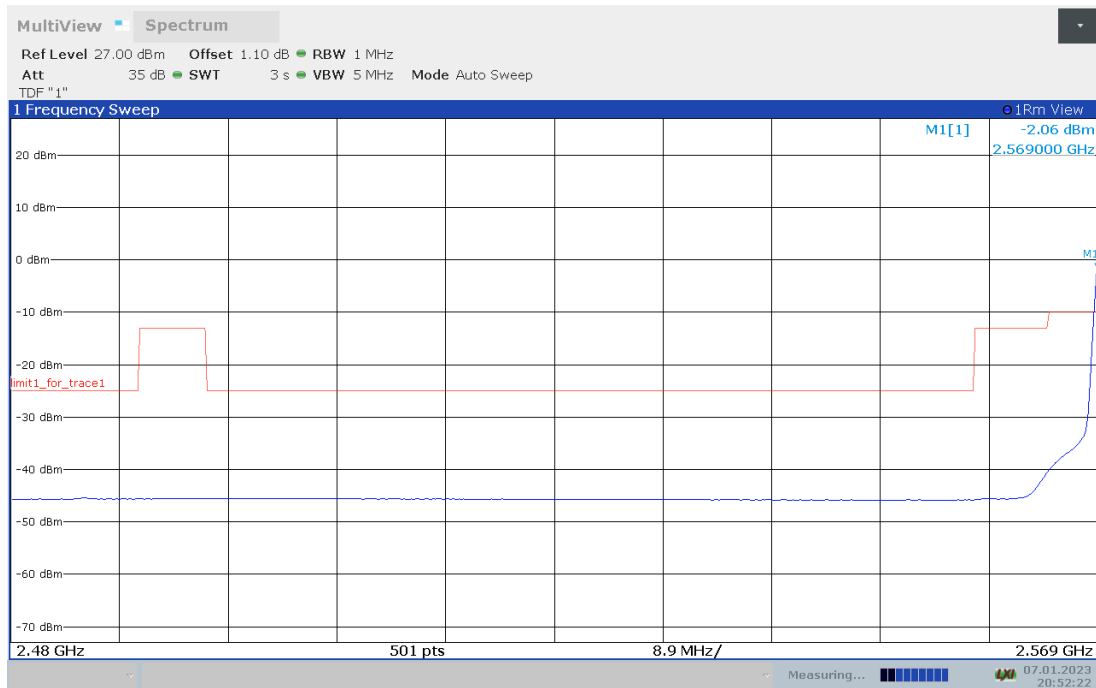


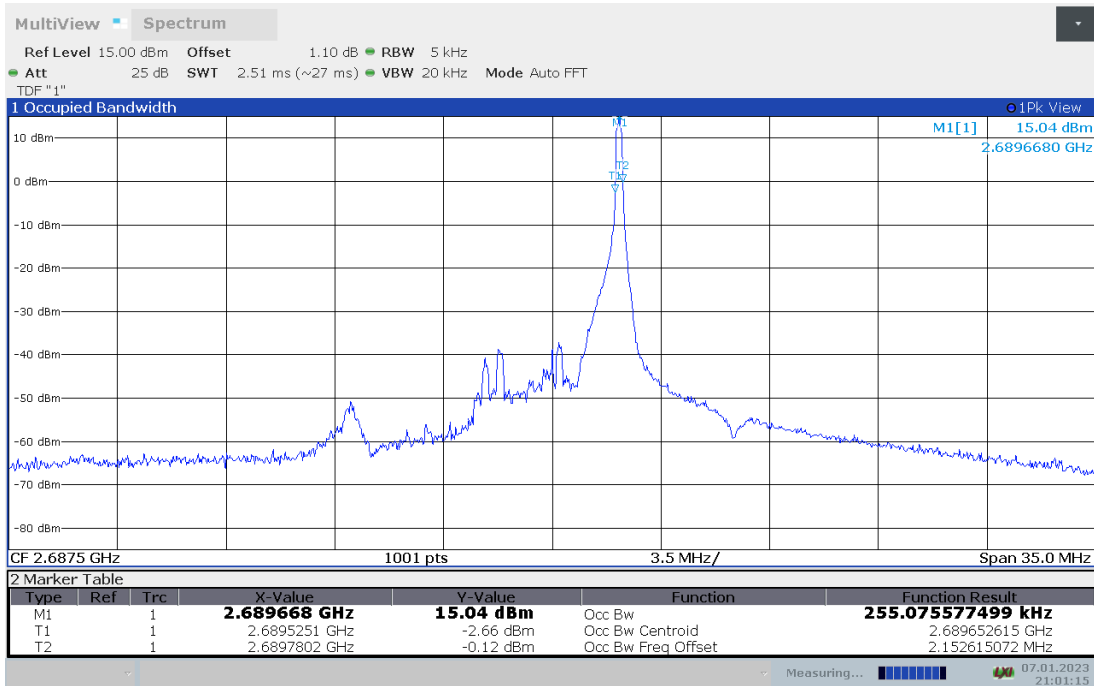**LOW BAND EDGE BLOCK-1RB-LOW_offset**

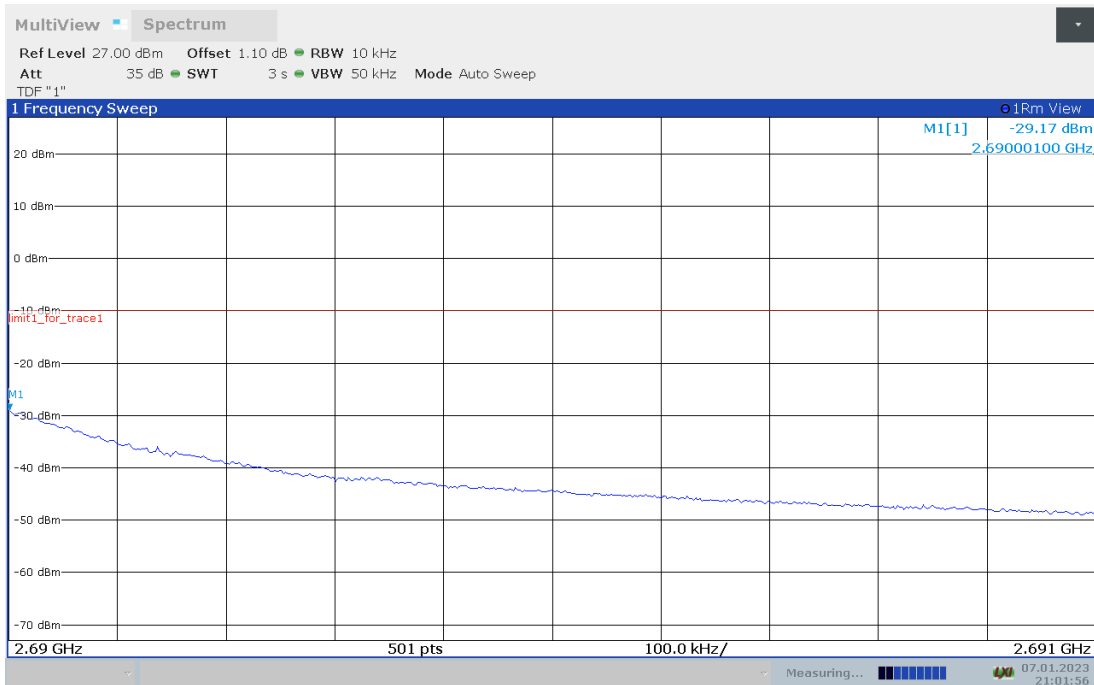## LOW BAND EDGE BLOCK-1RB-LOW_offset
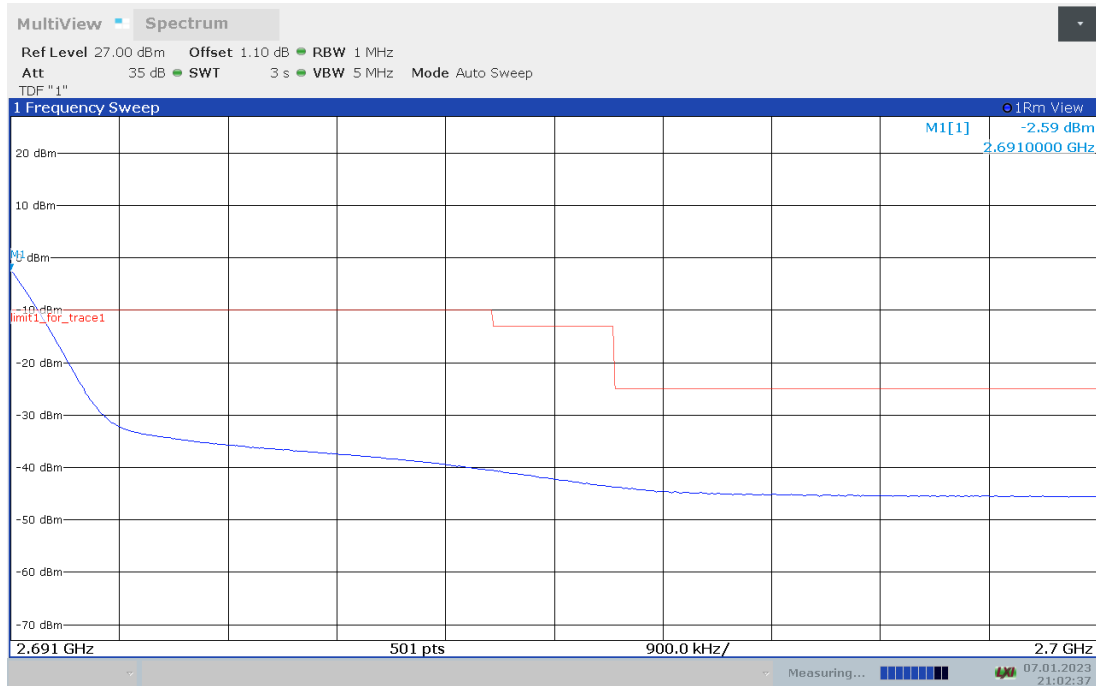


## Channel power

## OBW: 1RB-HIGH_offset



## HIGH BAND EDGE BLOCK-1RB-HIGH_offset

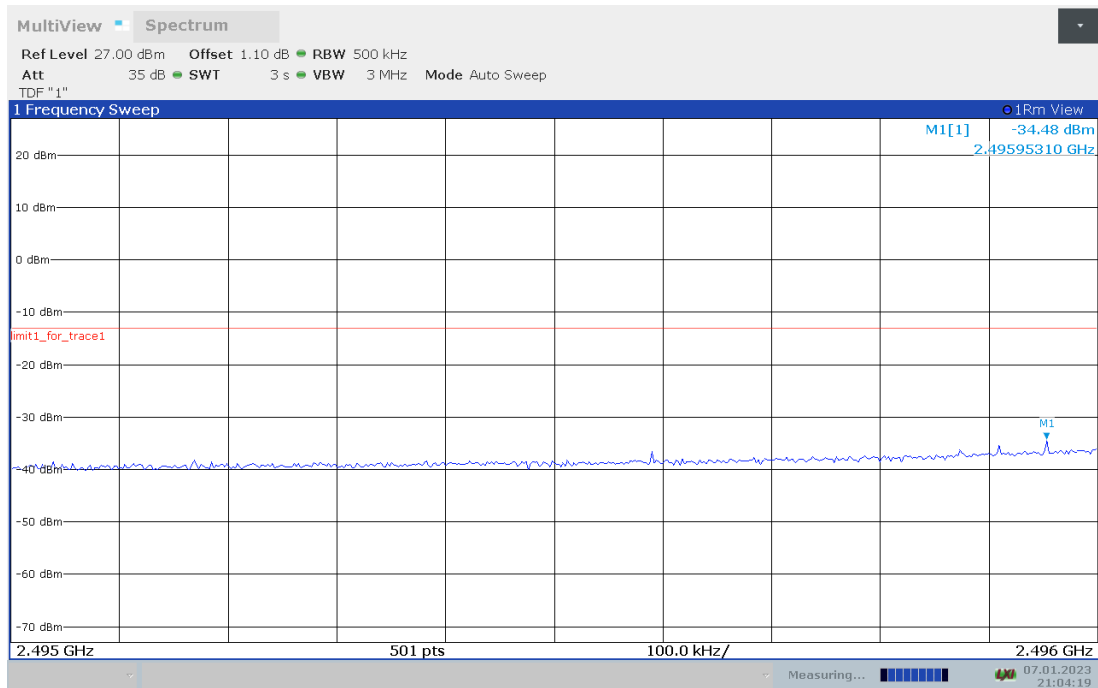## HIGH BAND EDGE BLOCK-1RB-HIGH_offset
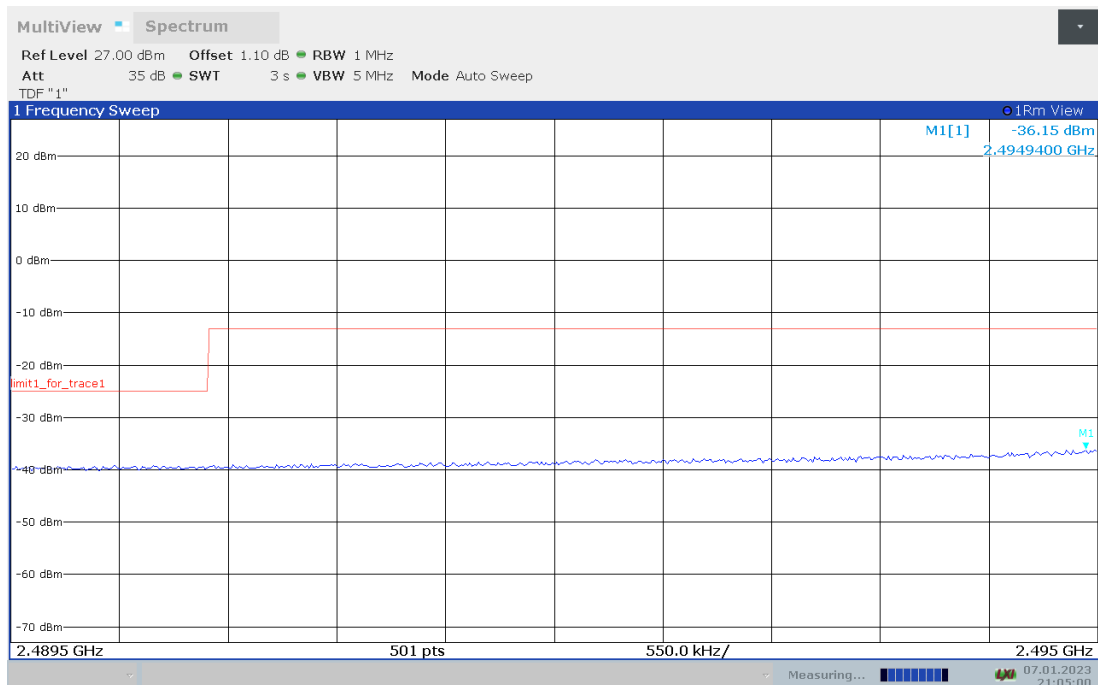


## Channel power

## LOW BAND EDGE BLOCK-20M-100%RB



## LOW BAND EDGE BLOCK-20M-100%RB

## HIGH BAND EDGE BLOCK-20M-100%RB



## HIGH BAND EDGE BLOCK-20M-100%RB



*Page 217 of 256*
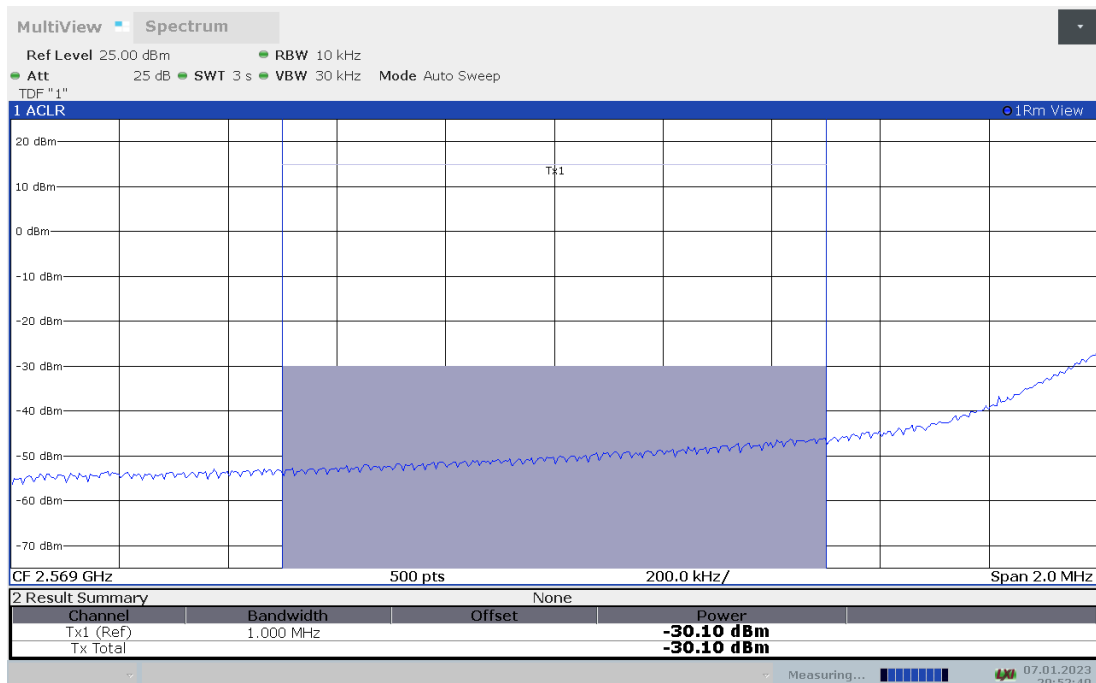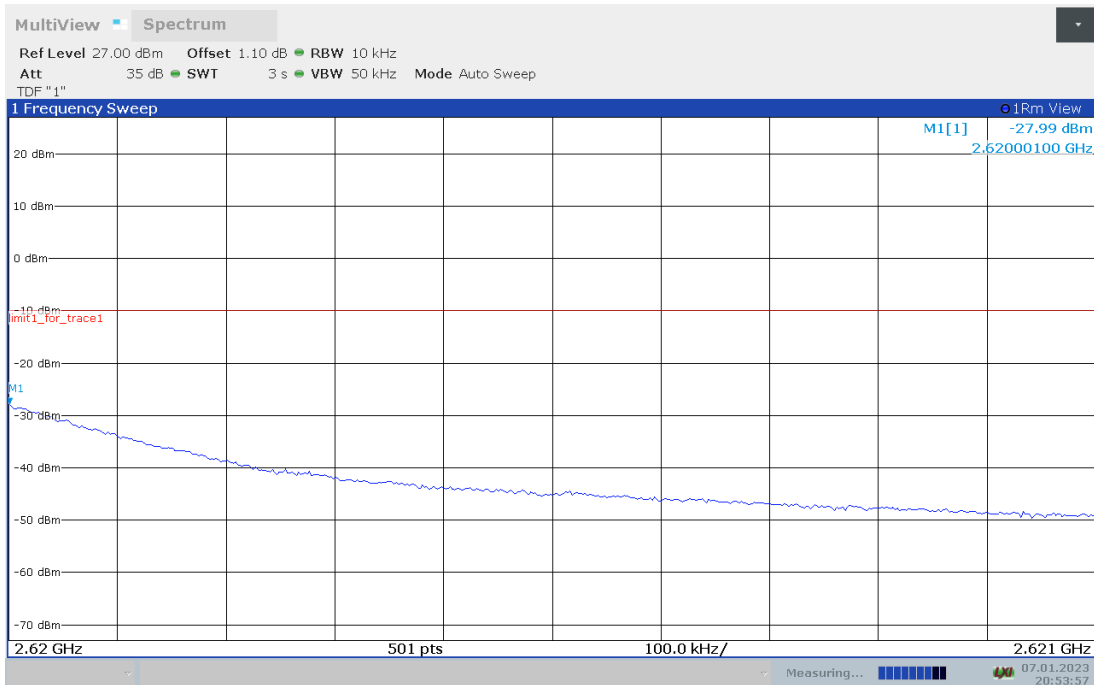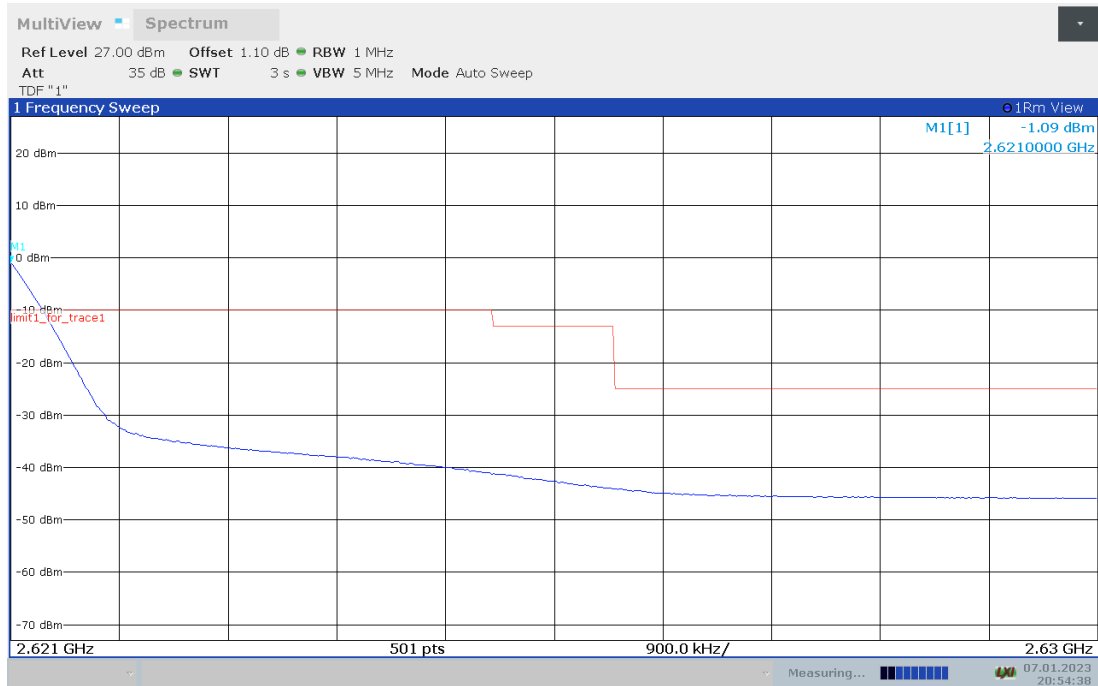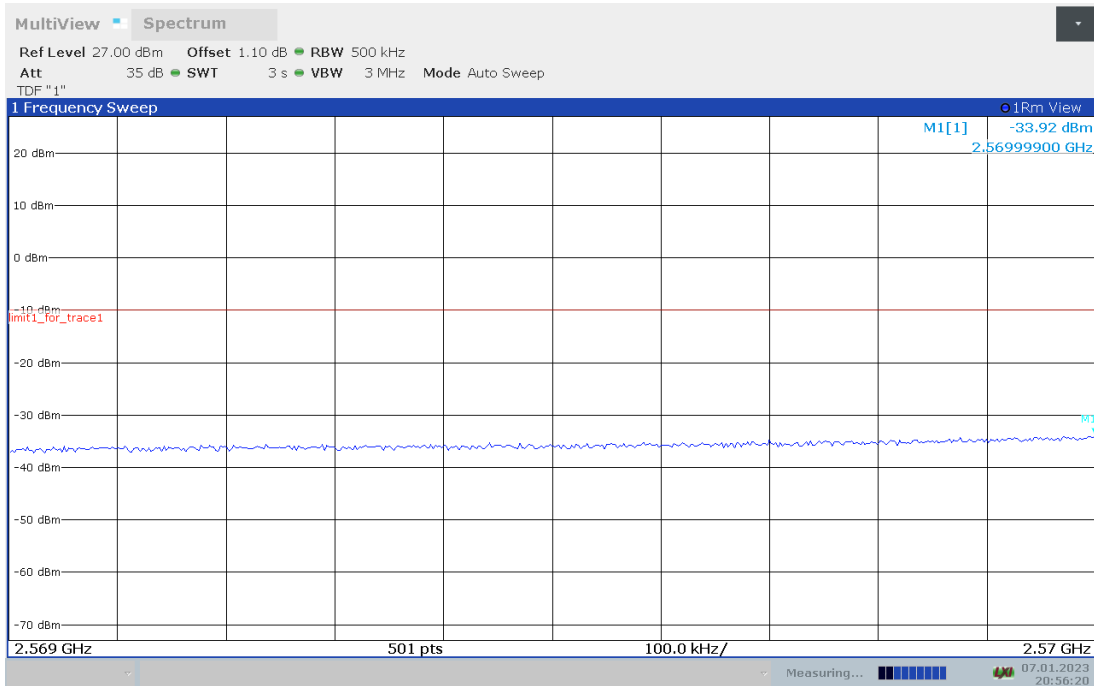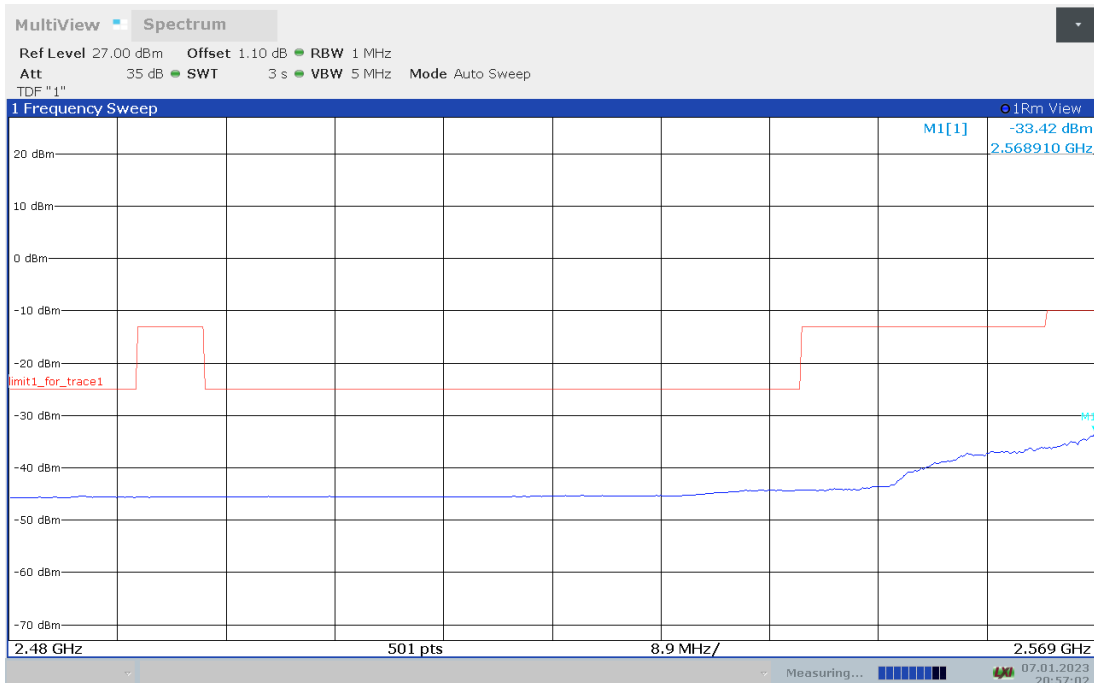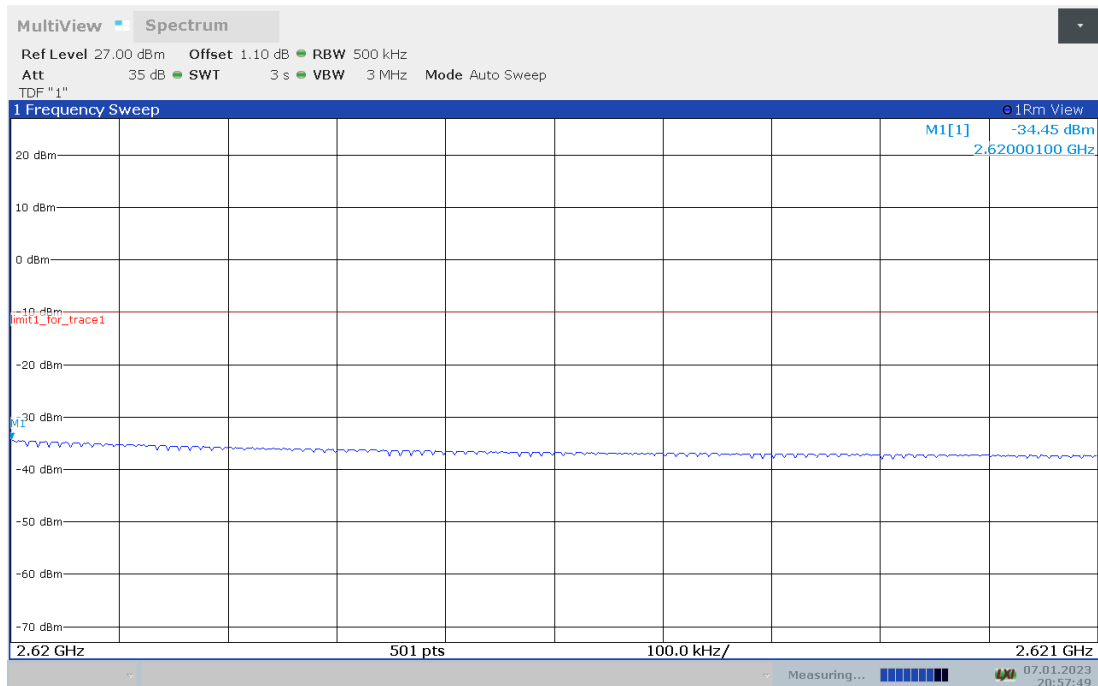
**LTE band 41**

**OBW: 1RB-LOW_offset**
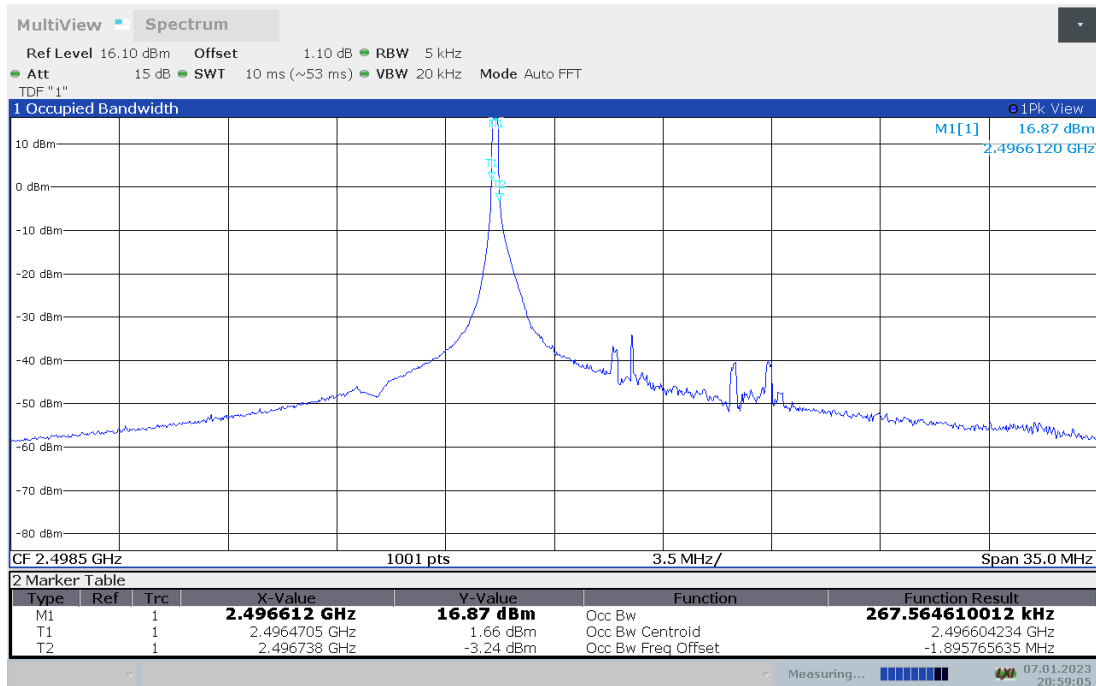


**LOW BAND EDGE BLOCK-1RB-LOW_offset**

## LOW BAND EDGE BLOCK-1RB-LOW_offset



## Channel power

## OBW: 1RB-HIGH_offset



## HIGH BAND EDGE BLOCK-1RB-HIGH_offset

## HIGH BAND EDGE BLOCK-1RB-HIGH_offset



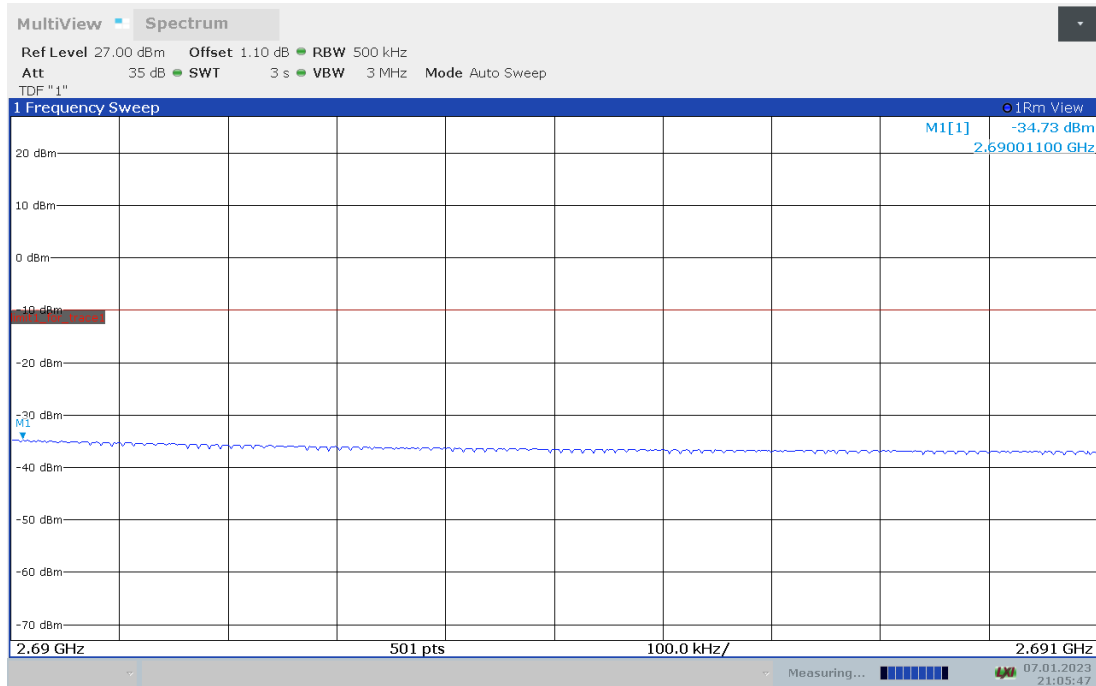## Channel power

## LOW BAND EDGE BLOCK-20M-100%RB



## LOW BAND EDGE BLOCK-20M-100%RB

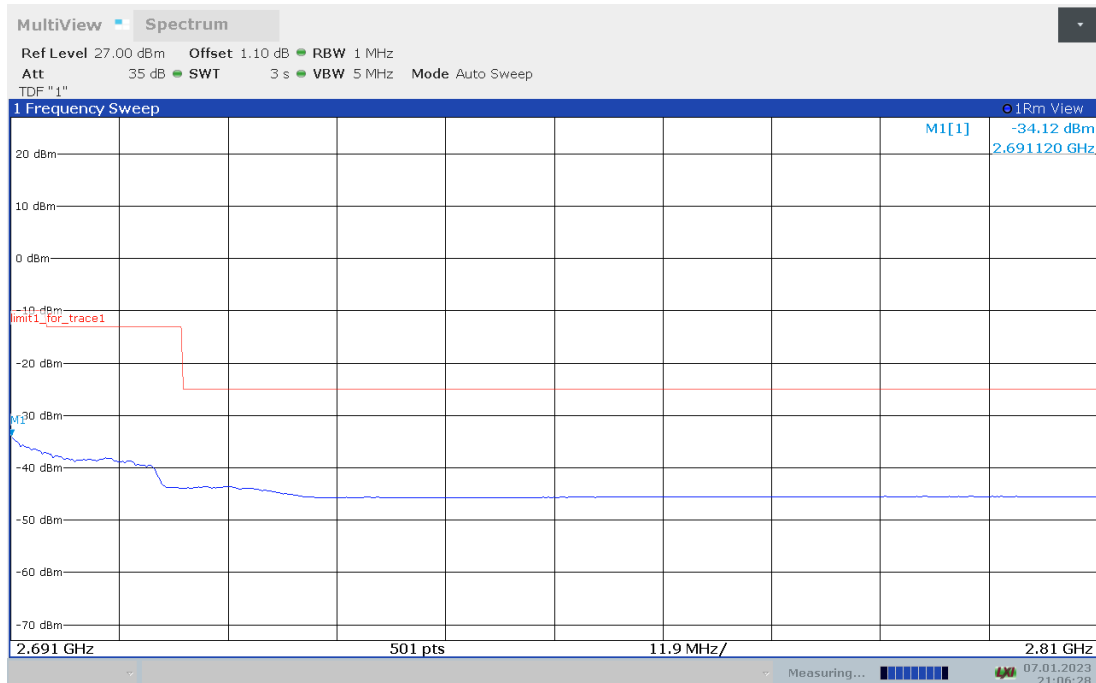## HIGH BAND EDGE BLOCK-20M-100%RB



## HIGH BAND EDGE BLOCK-20M-100%RB
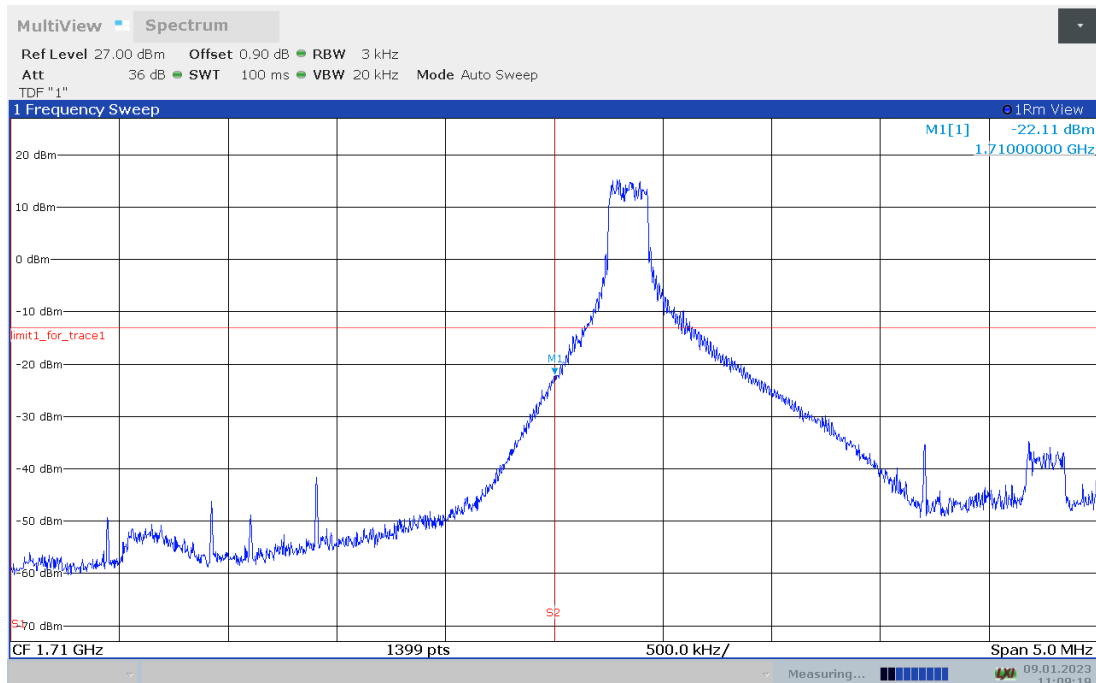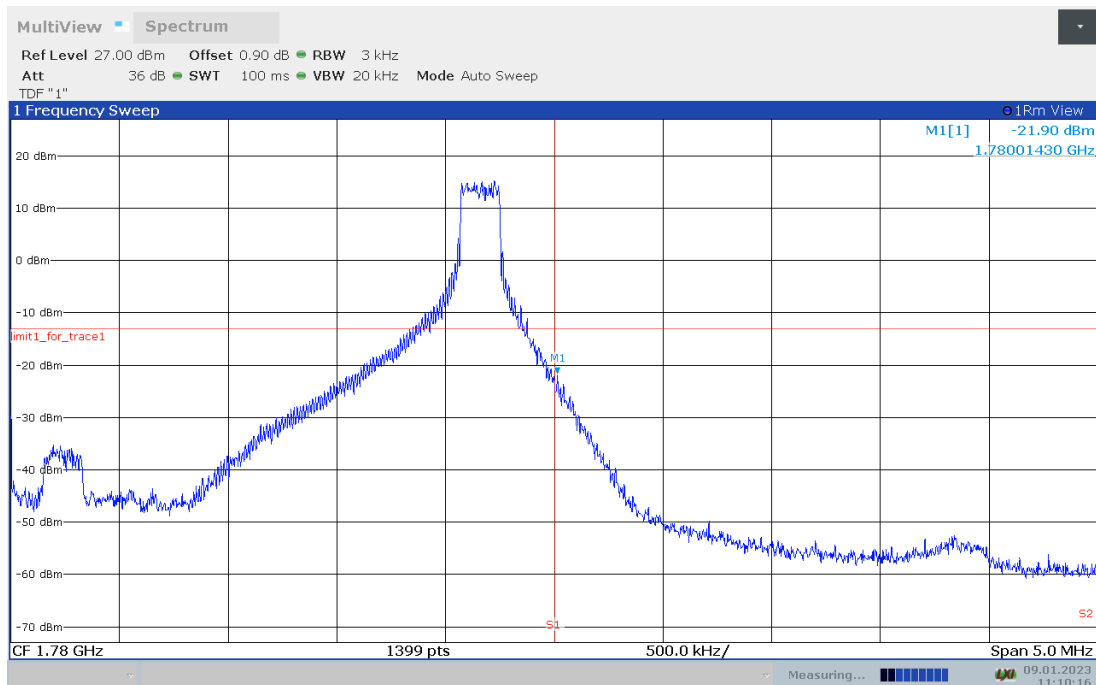
**LTE band 66**

**OBW: 1RB-LOW_offset**



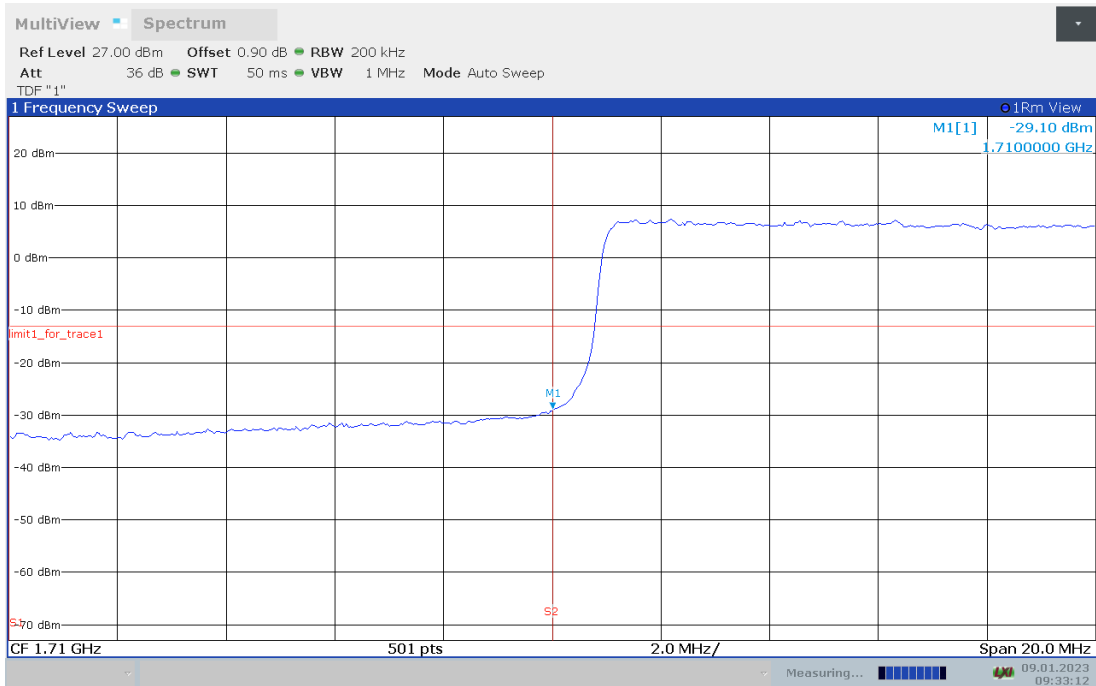**LOW BAND EDGE BLOCK-1RB-LOW_offset**

## OBW: 1RB-HIGH_offset



## HIGH BAND EDGE BLOCK-1RB-HIGH_offset

## LOW BAND EDGE BLOCK-20M-100%RB



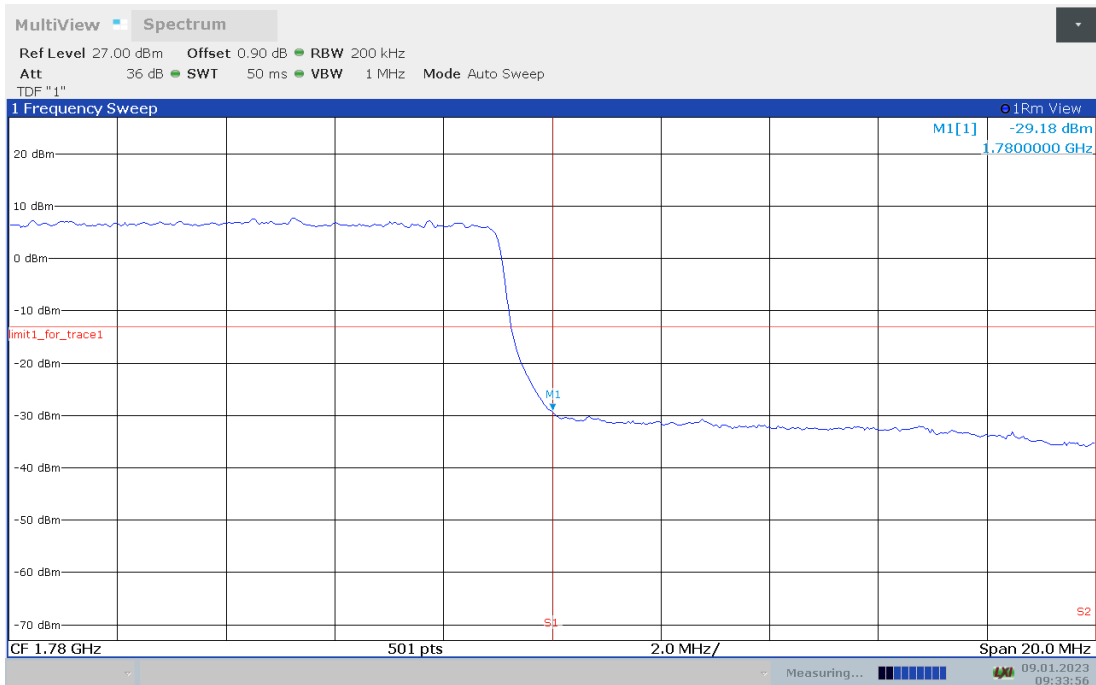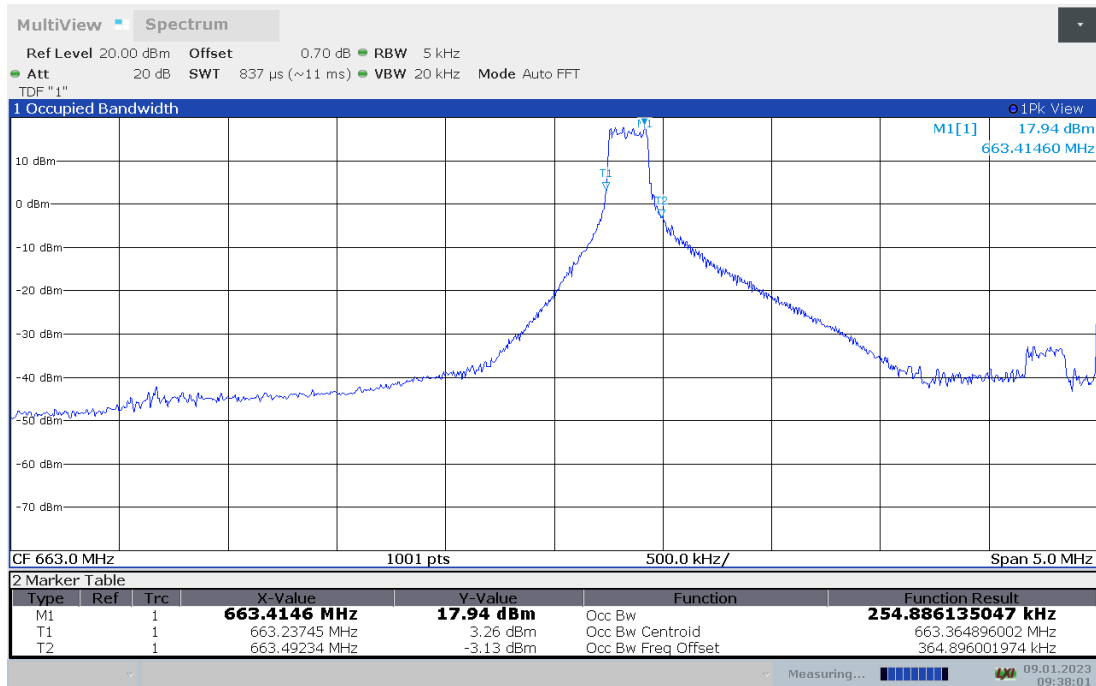## HIGH BAND EDGE BLOCK-20M-100%RB

**LTE band 71**

**OBW: 1RB-LOW_offset**



**LOW BAND EDGE BLOCK-1RB-LOW_offset**