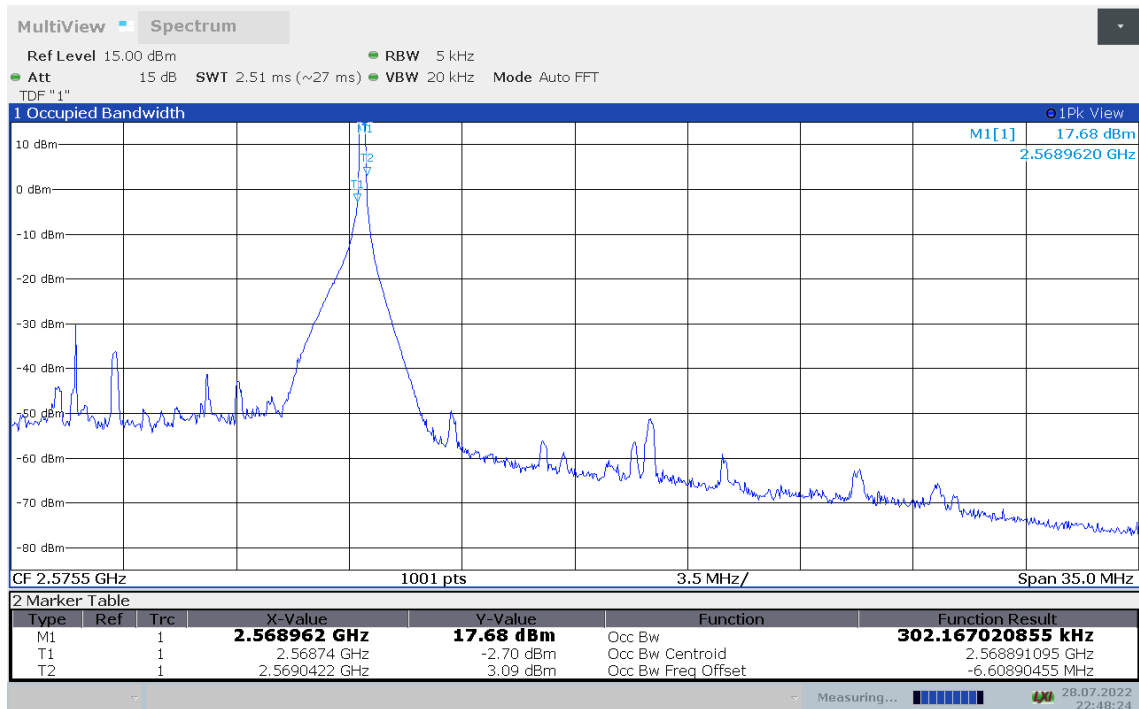
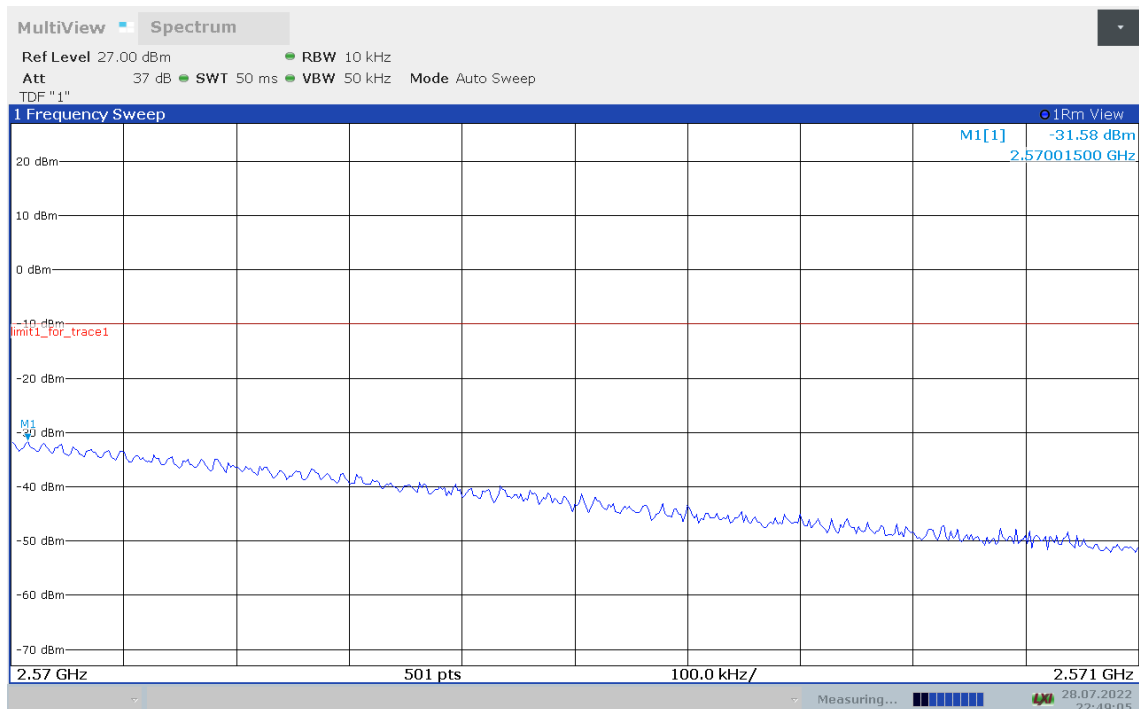


OBW: 1RB-HIGH_offset



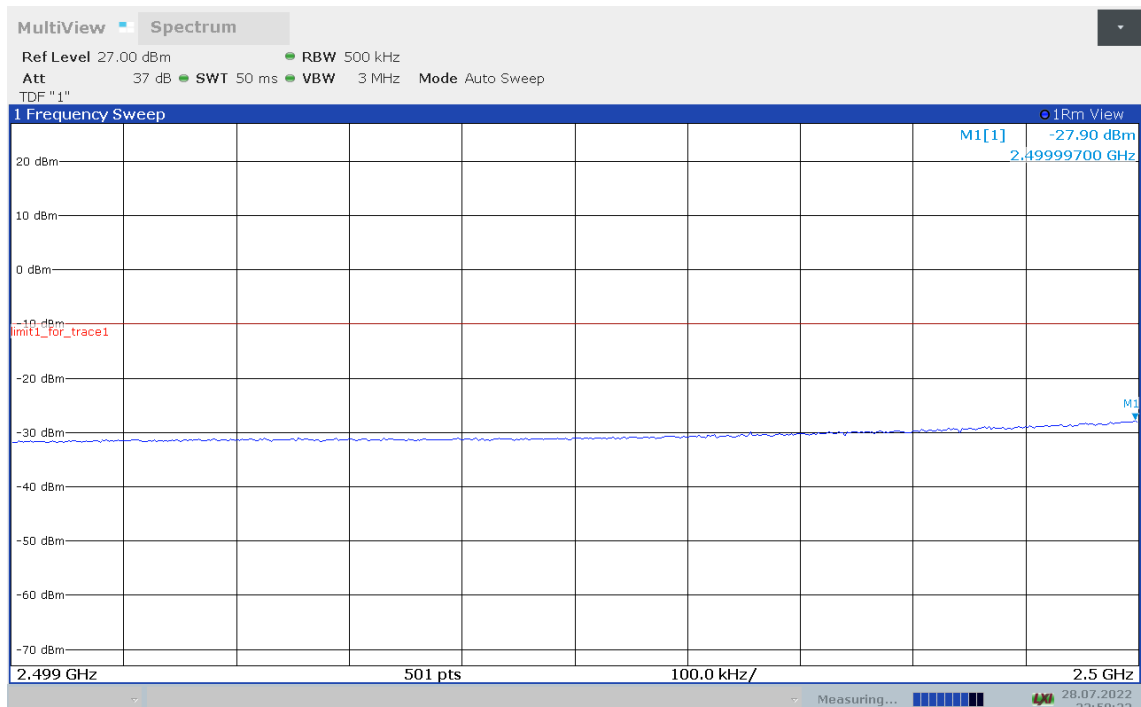
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



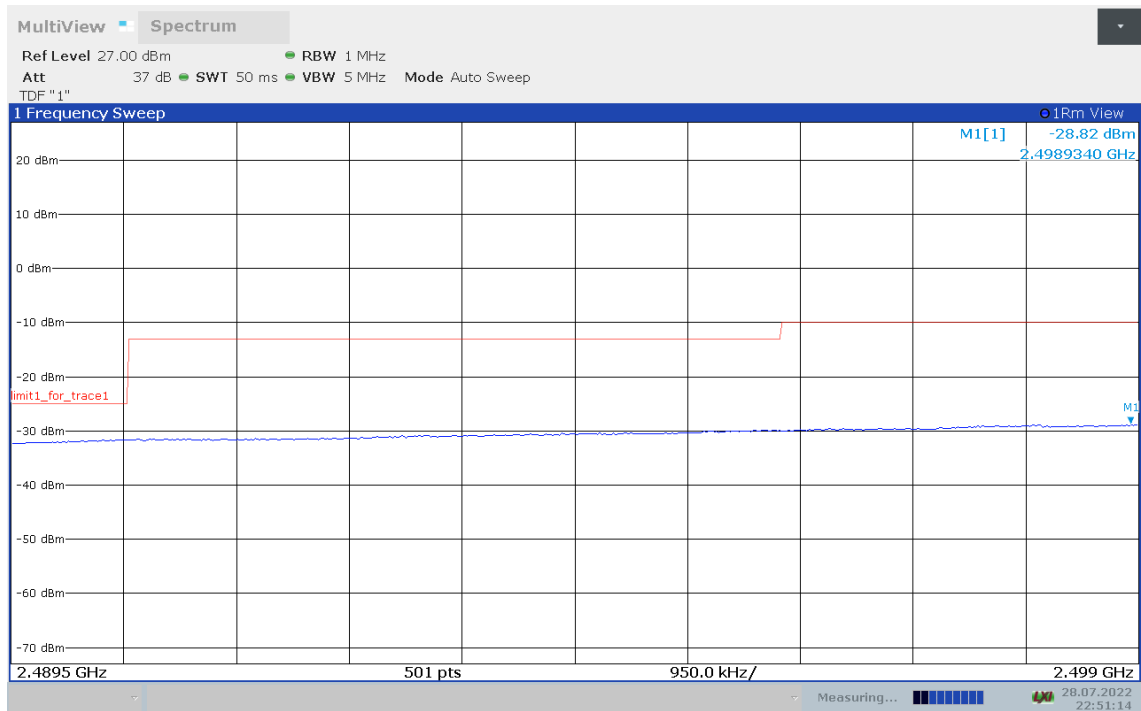
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



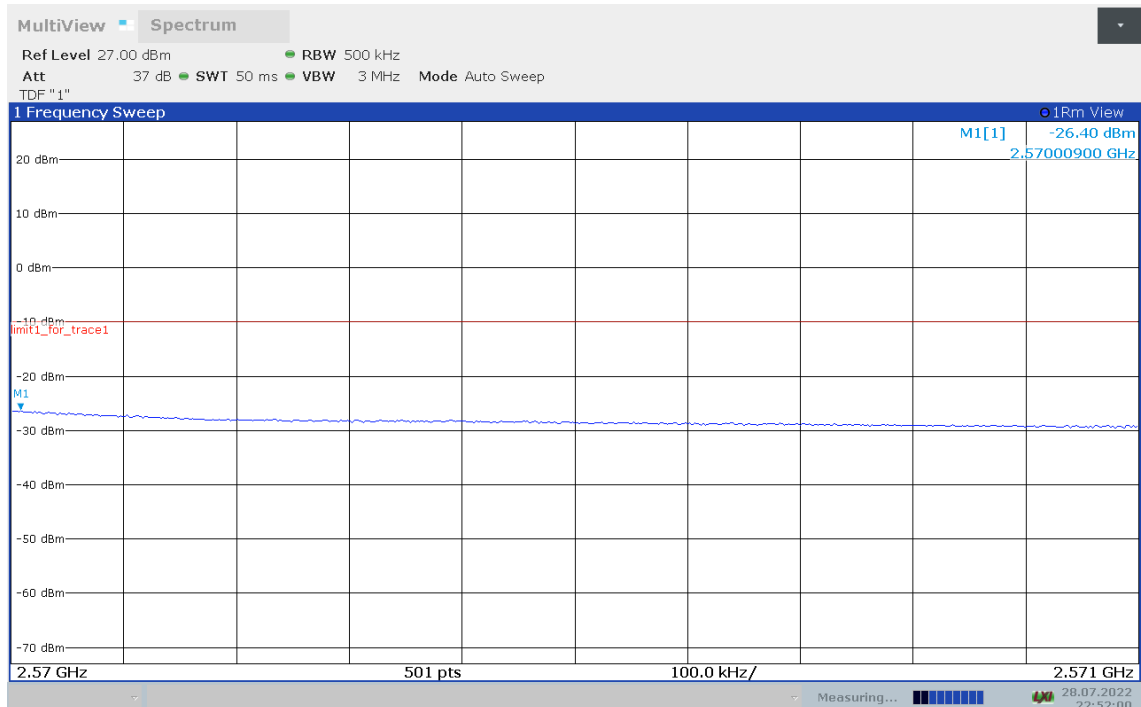
LOW BAND EDGE BLOCK-20M-100%RB



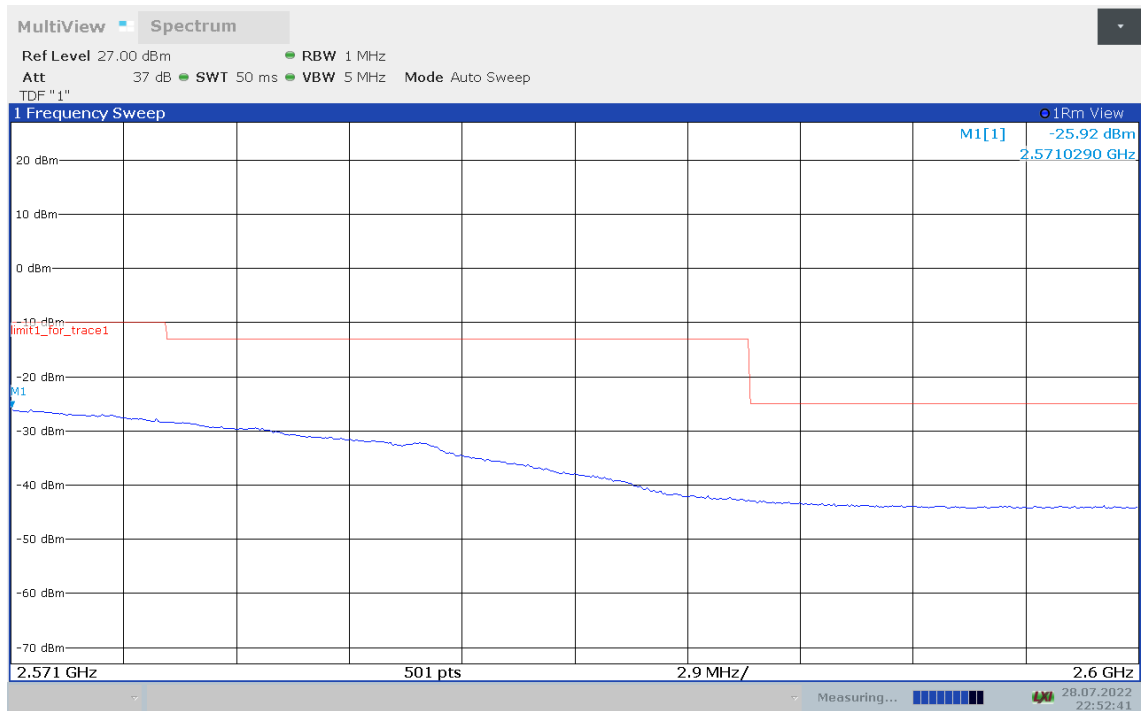
LOW BAND EDGE BLOCK-20M-100%RB



HIGH BAND EDGE BLOCK-20M-100%RB

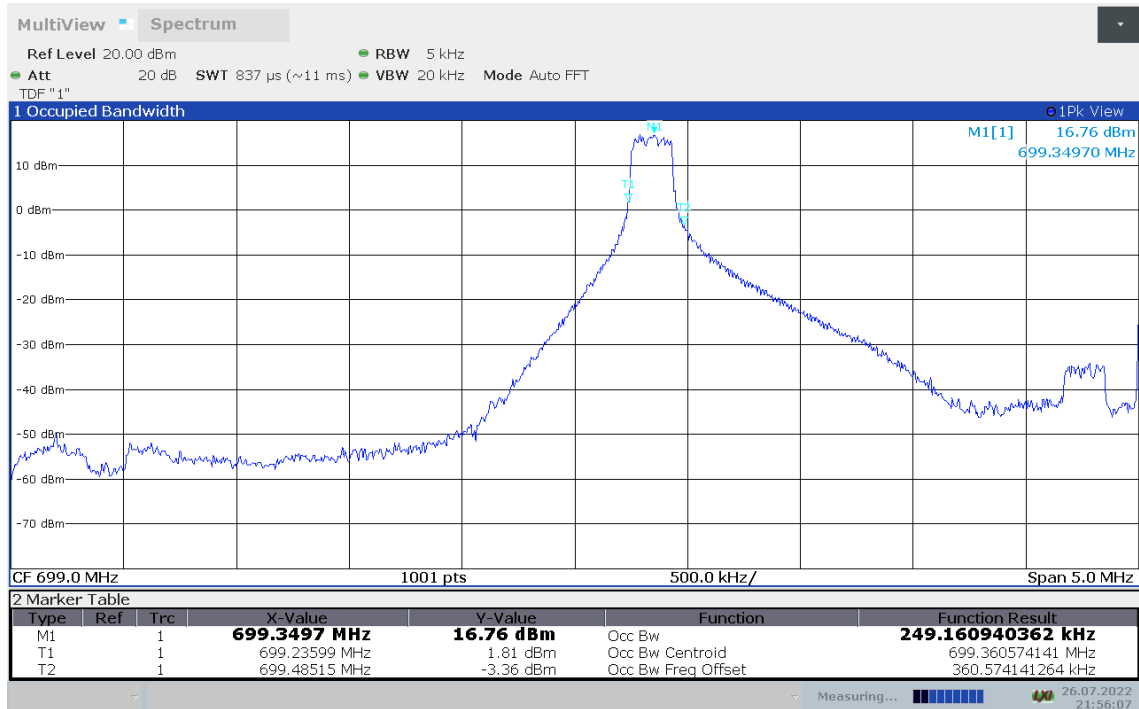


HIGH BAND EDGE BLOCK-20M-100%RB

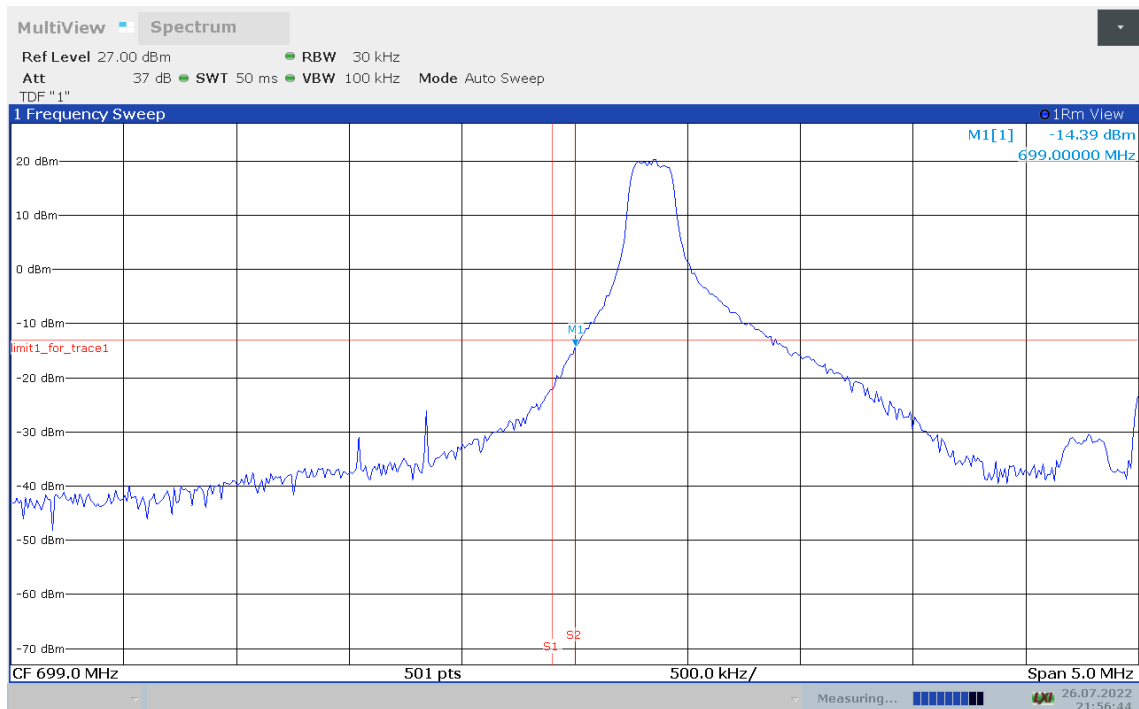


LTE band 12

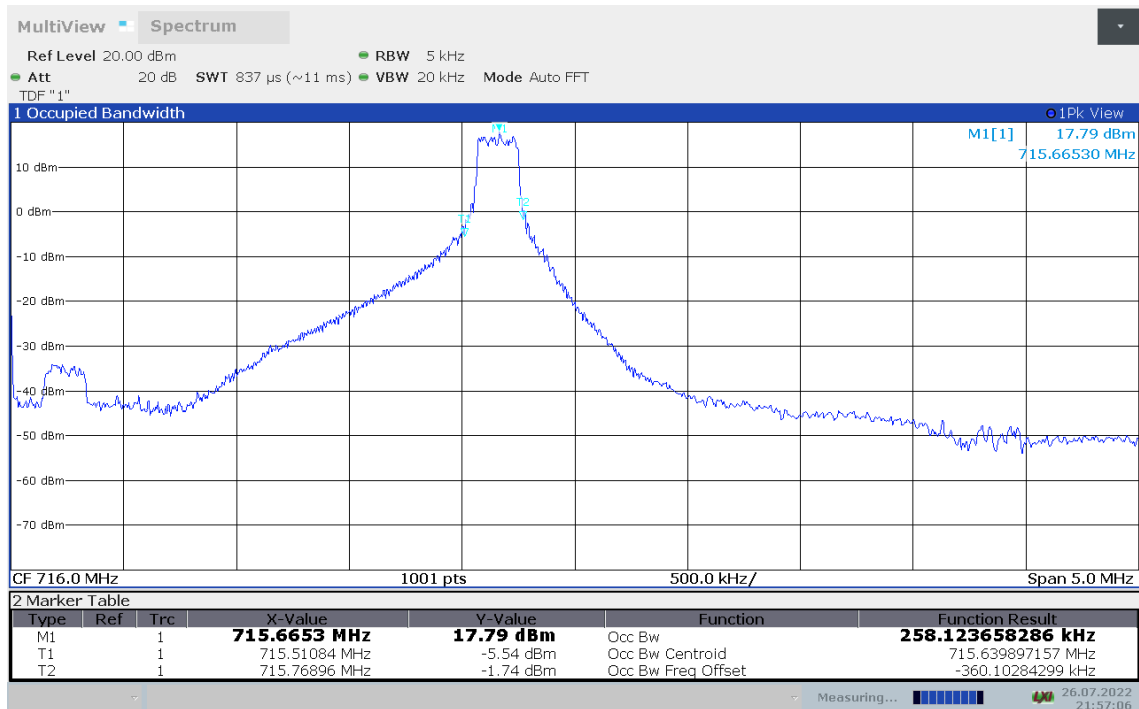
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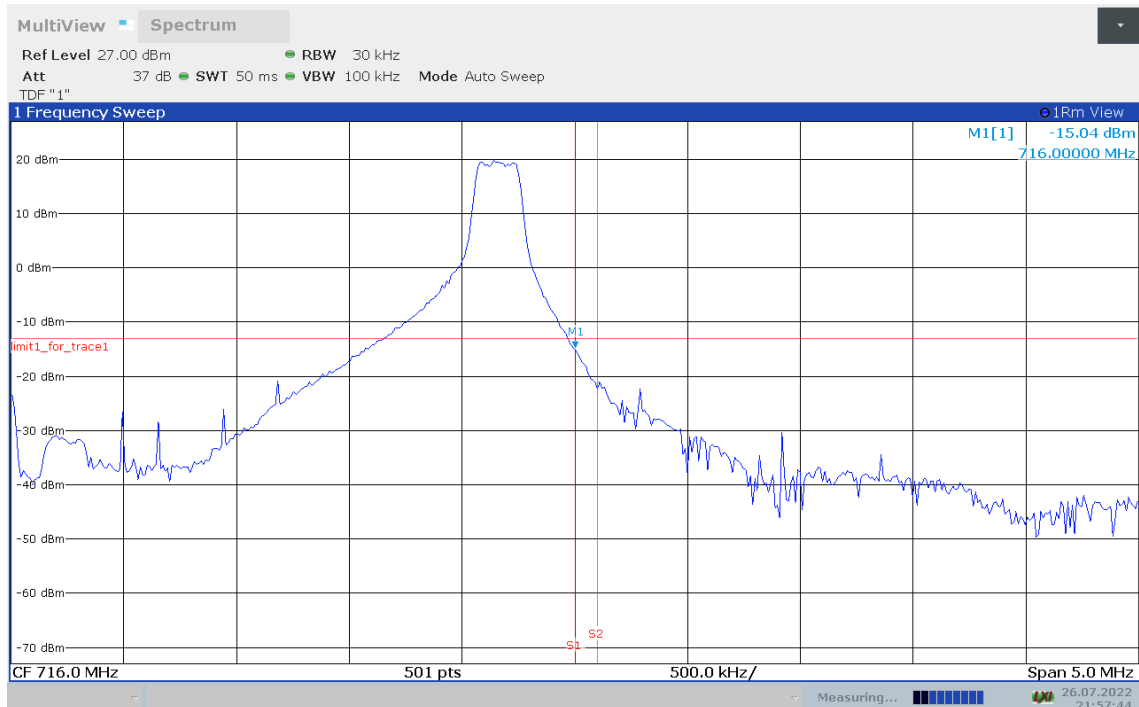
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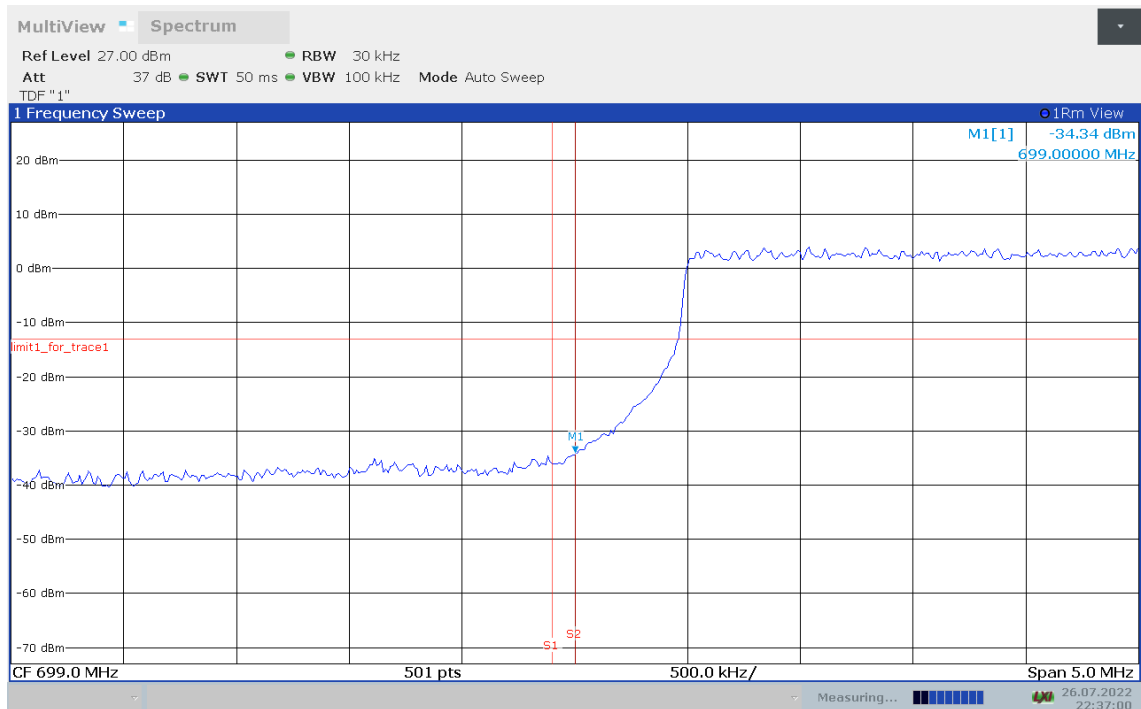
OBW: 1RB-HIGH_offset



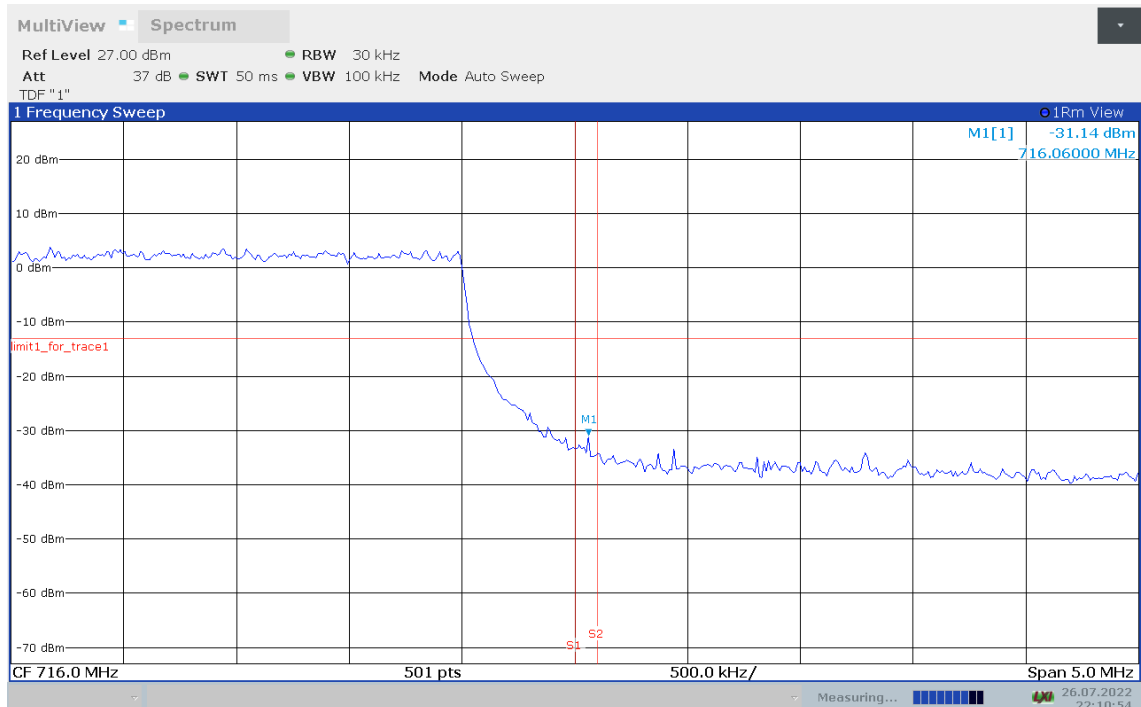
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



LOW BAND EDGE BLOCK-10M-100%RB



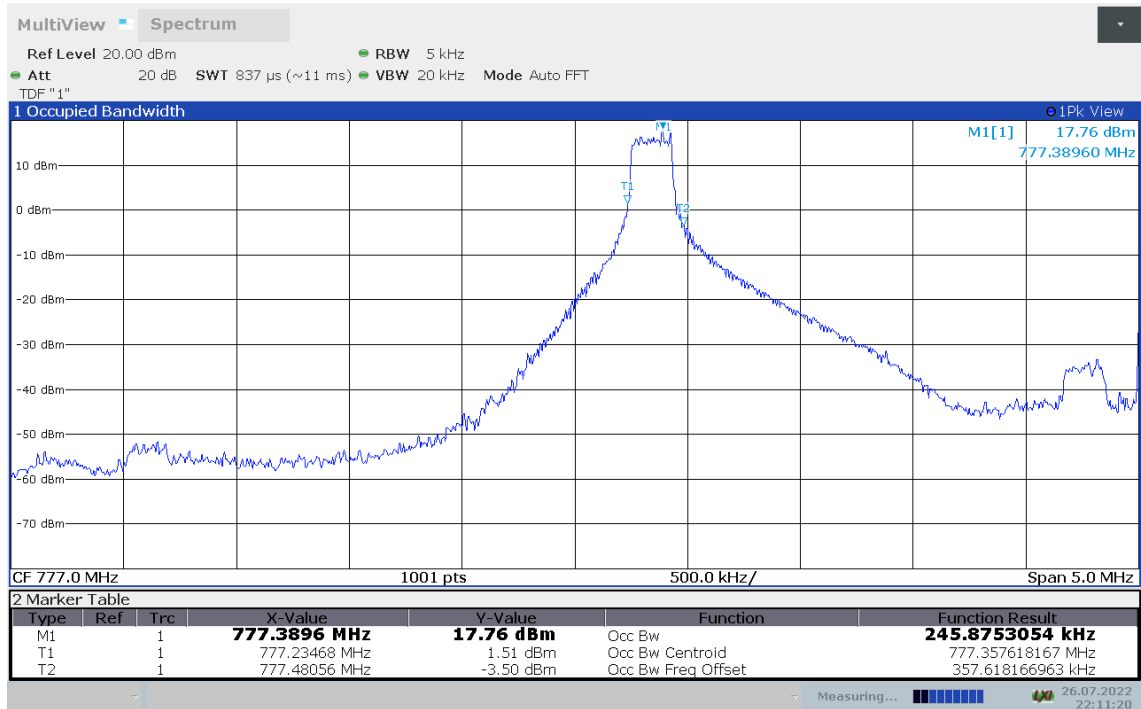
HIGH BAND EDGE BLOCK-10M-100%RB



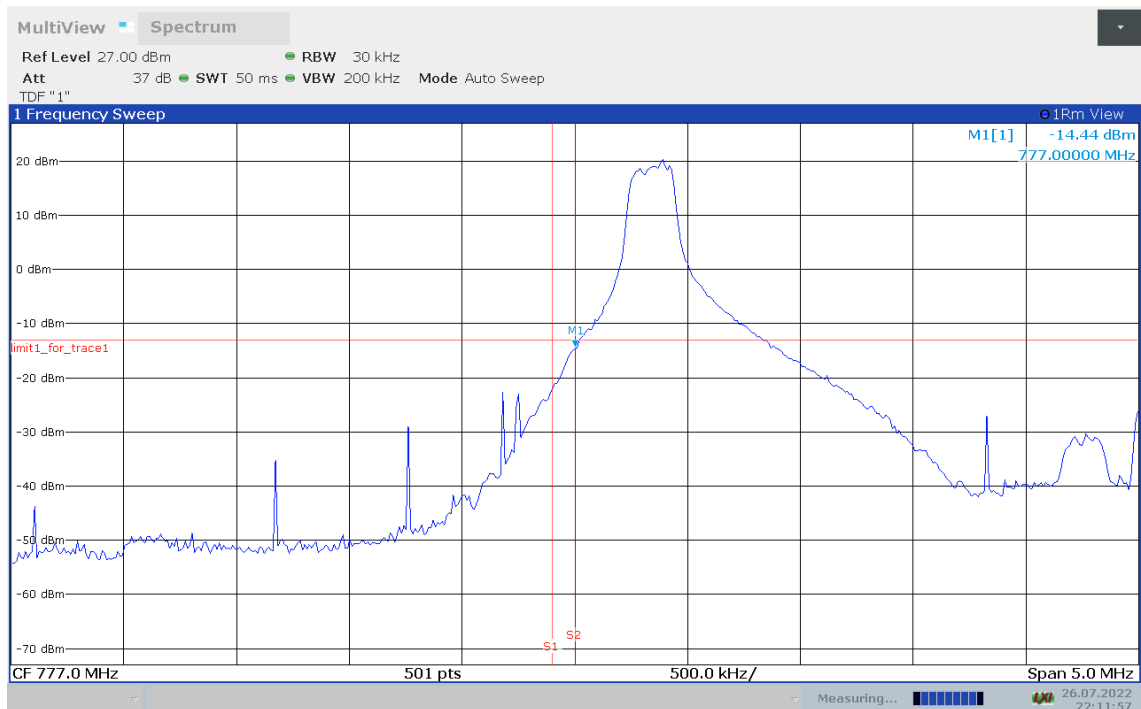


LTE band 13

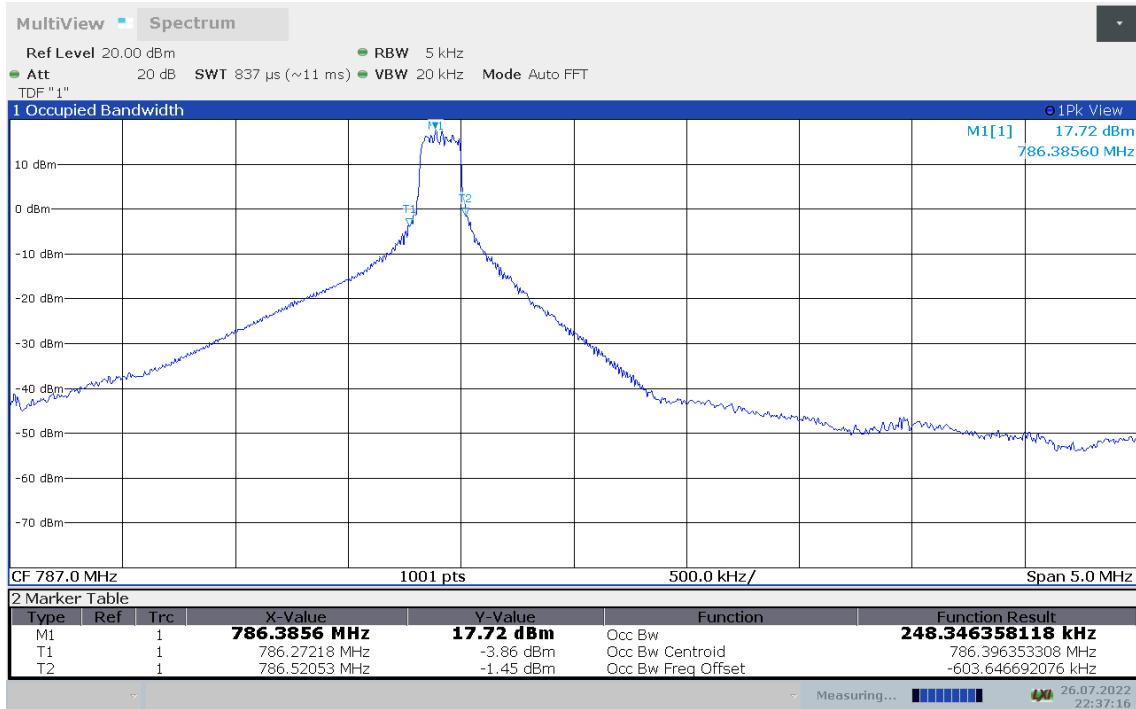
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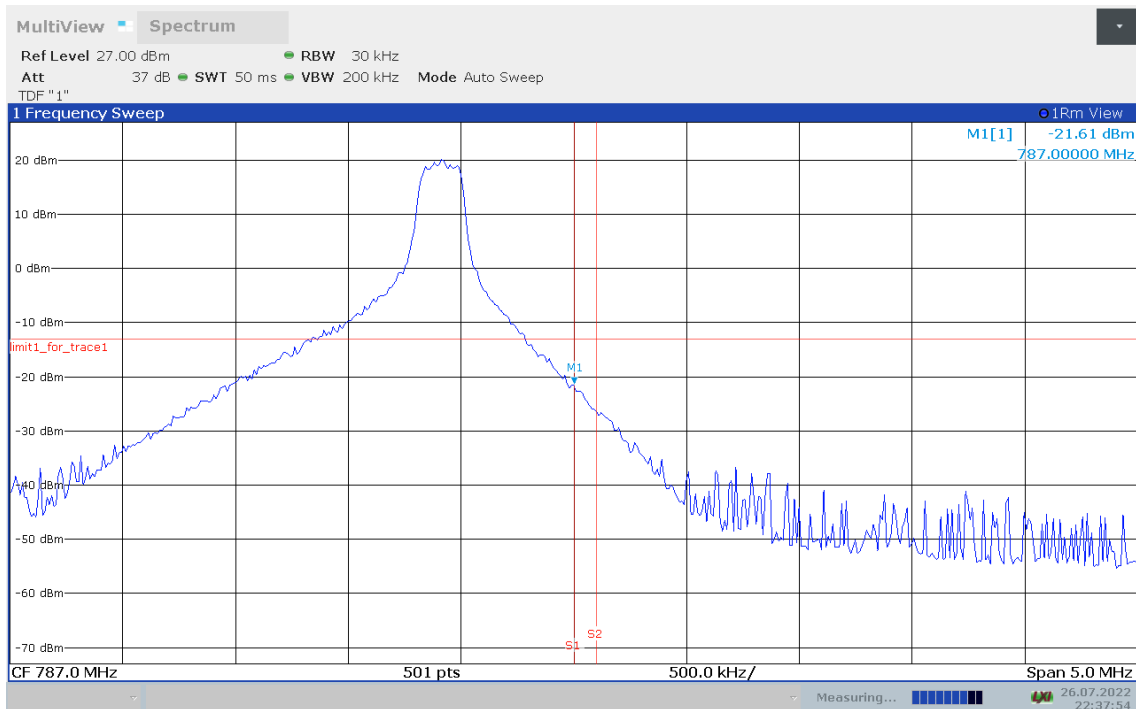
LOW BAND EDGE BLOCK-1RB-LOW_offset



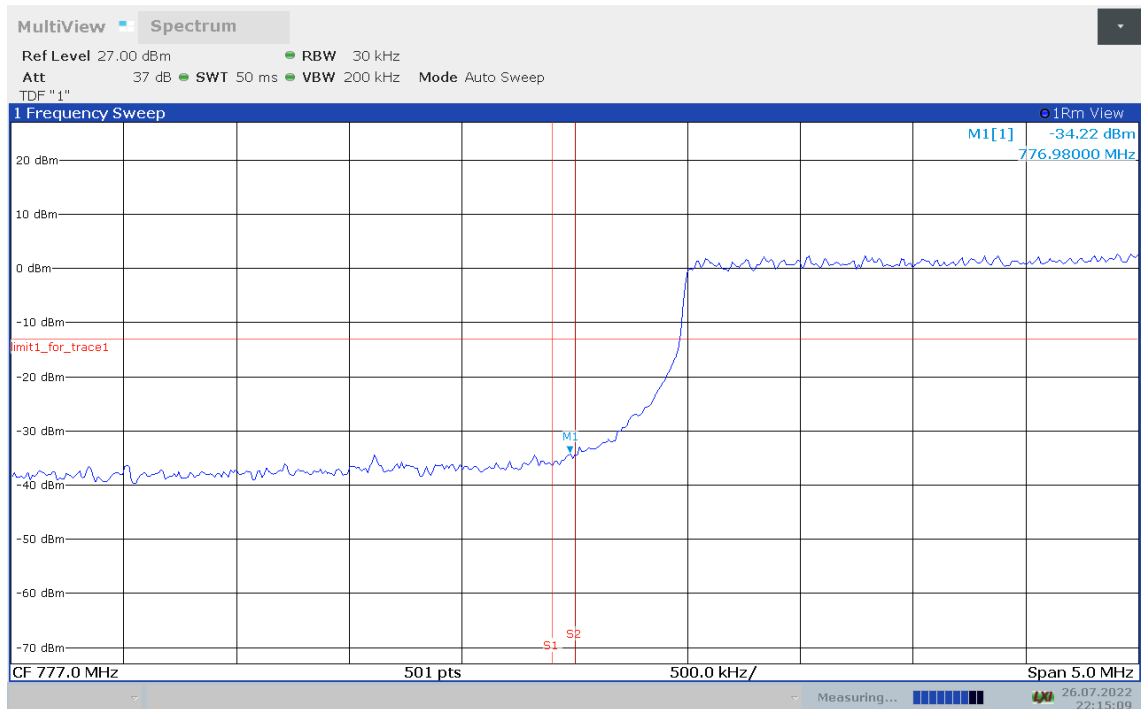
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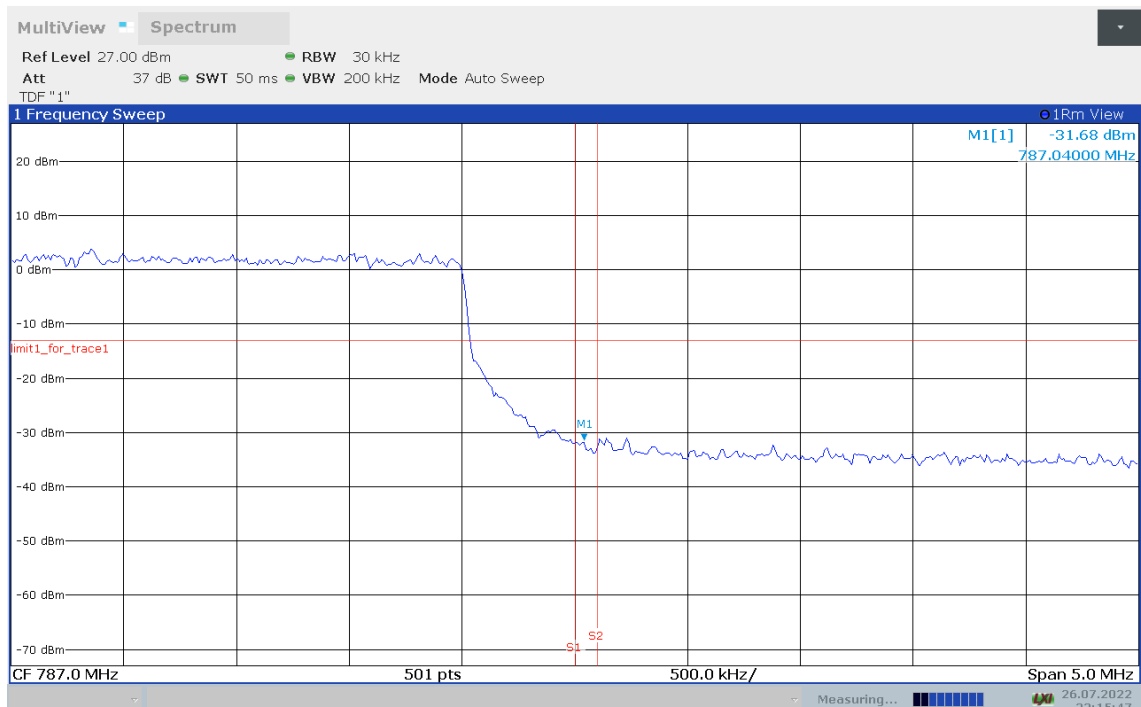
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LOW BAND EDGE BLOCK-10M-100%RB



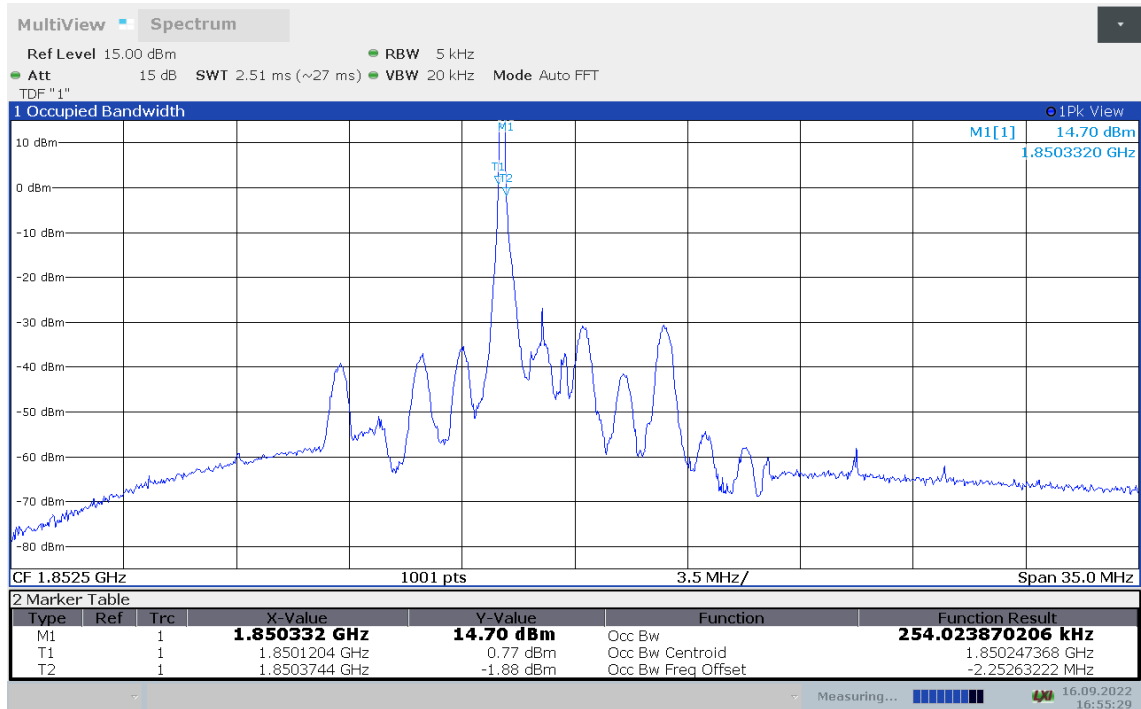
HIGH BAND EDGE BLOCK-10M-100%RB



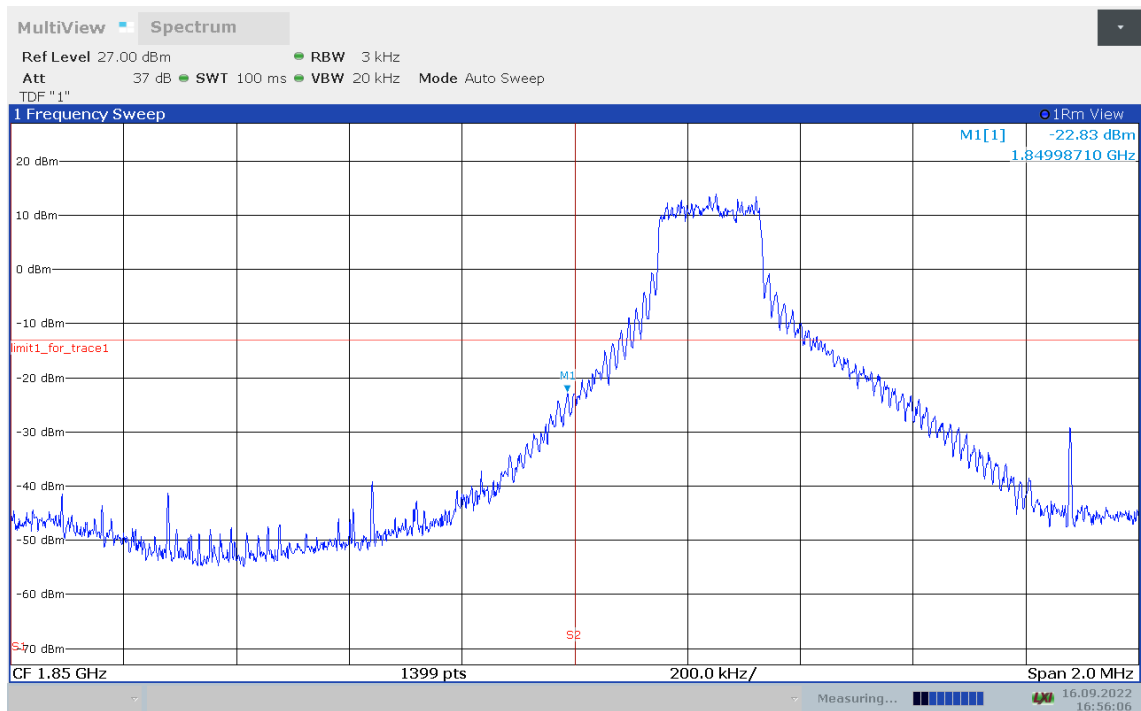


LTE band 25

OBW: 1RB-LOW_offset

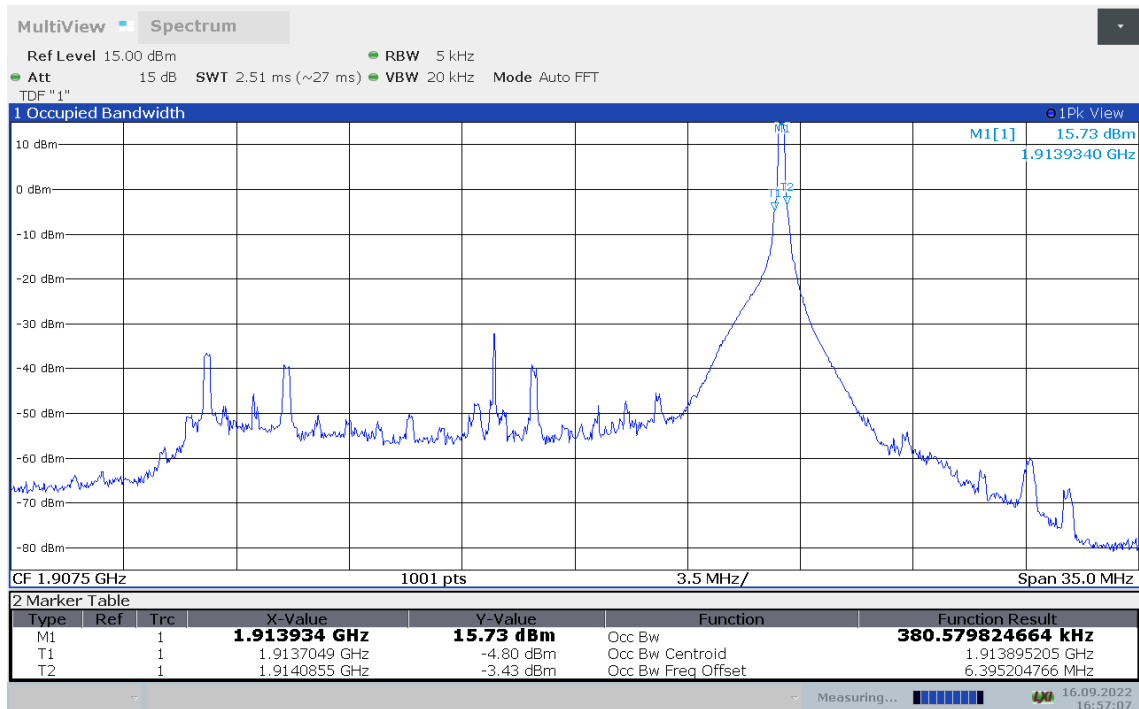


LOW BAND EDGE BLOCK-1RB-LOW_offset

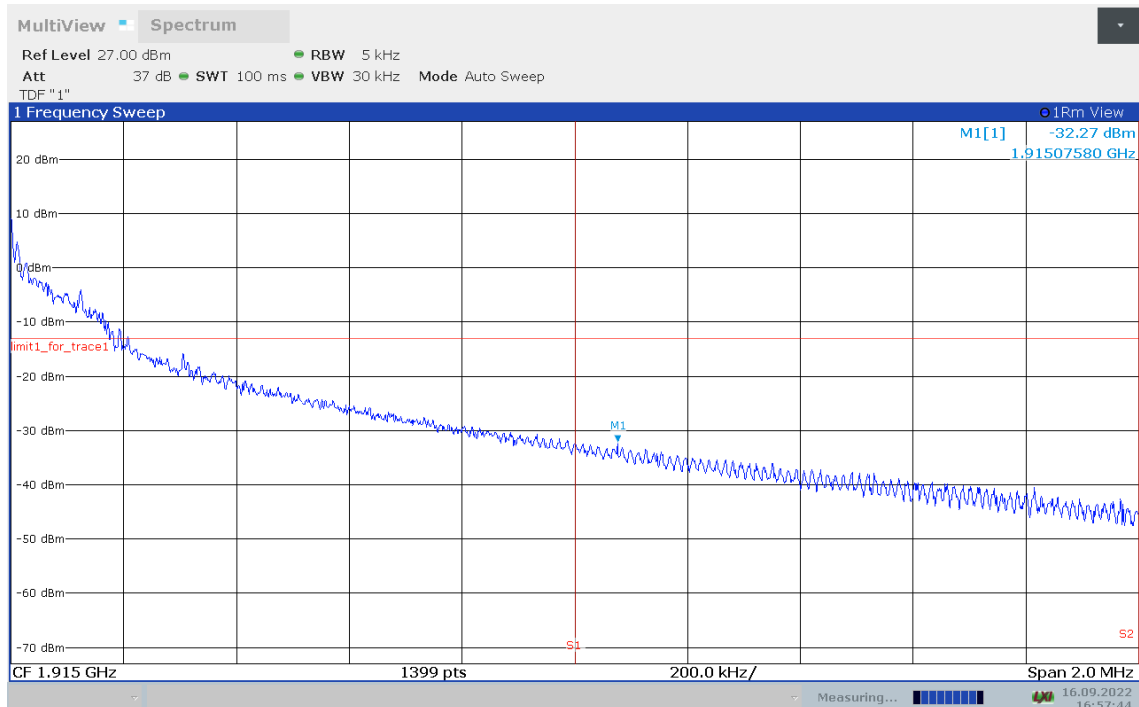




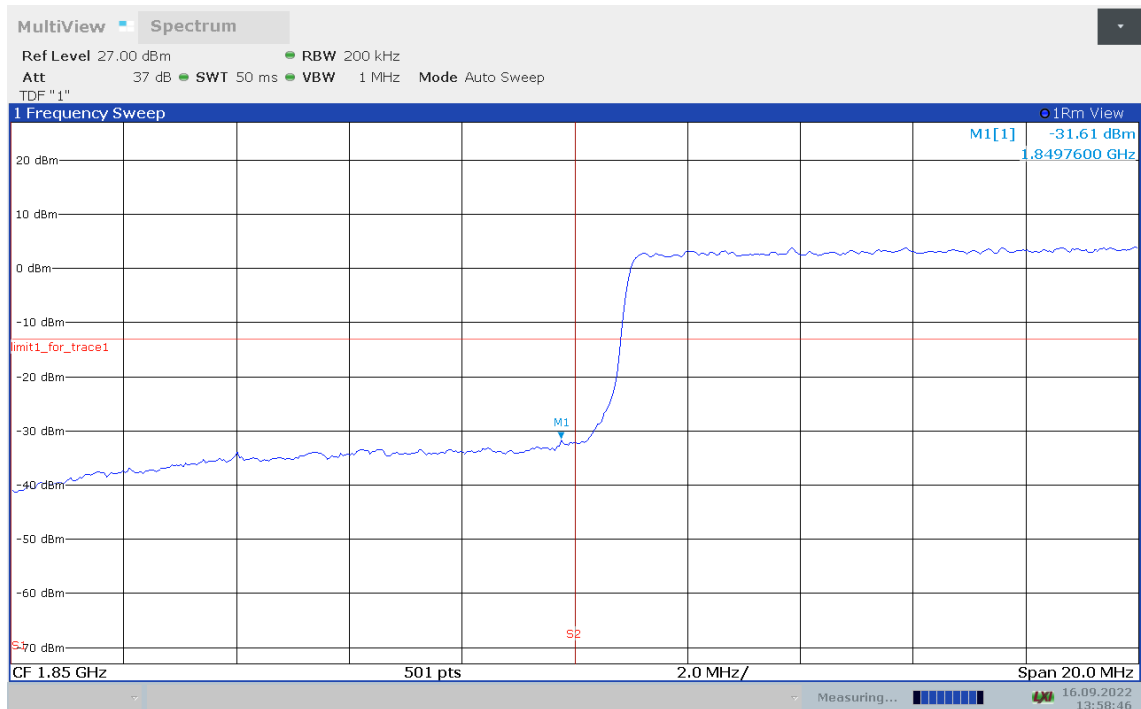
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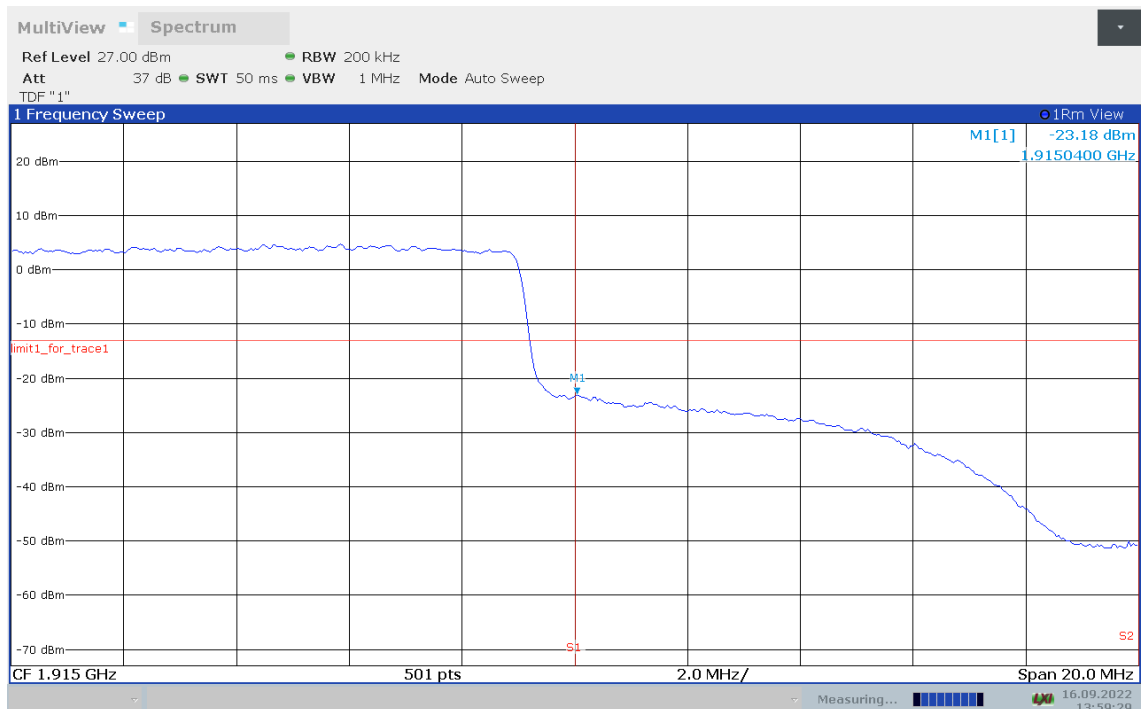
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



LOW BAND EDGE BLOCK-20M-100%RB



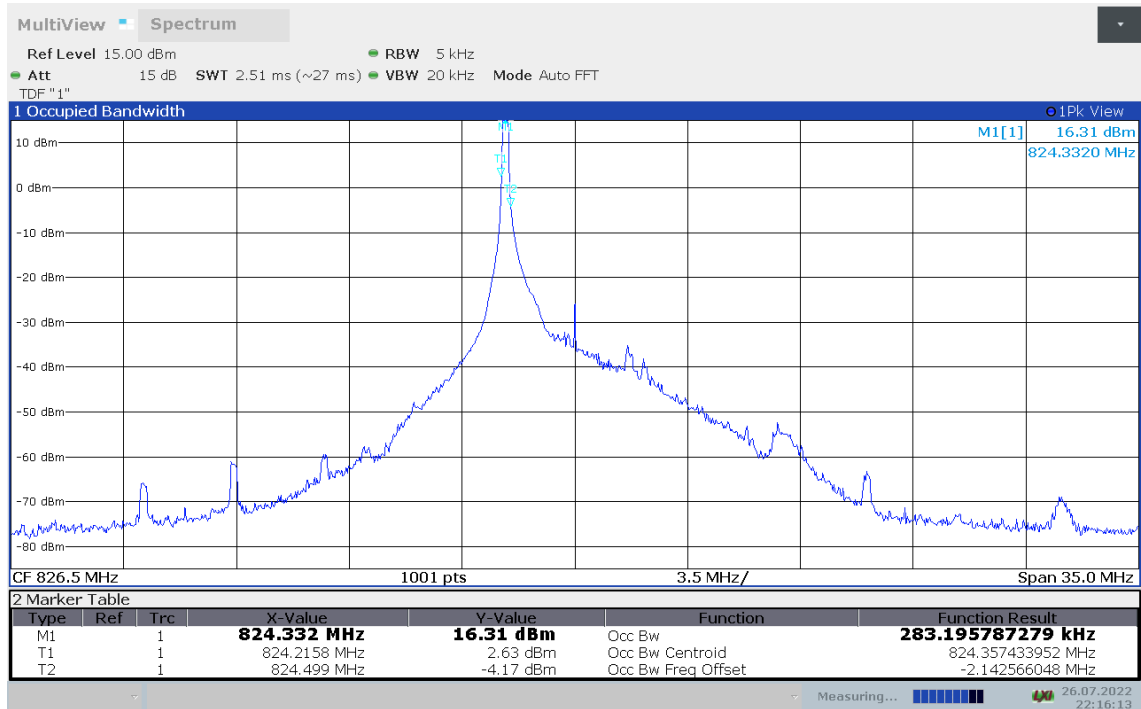
HIGH BAND EDGE BLOCK-20M-100%RB



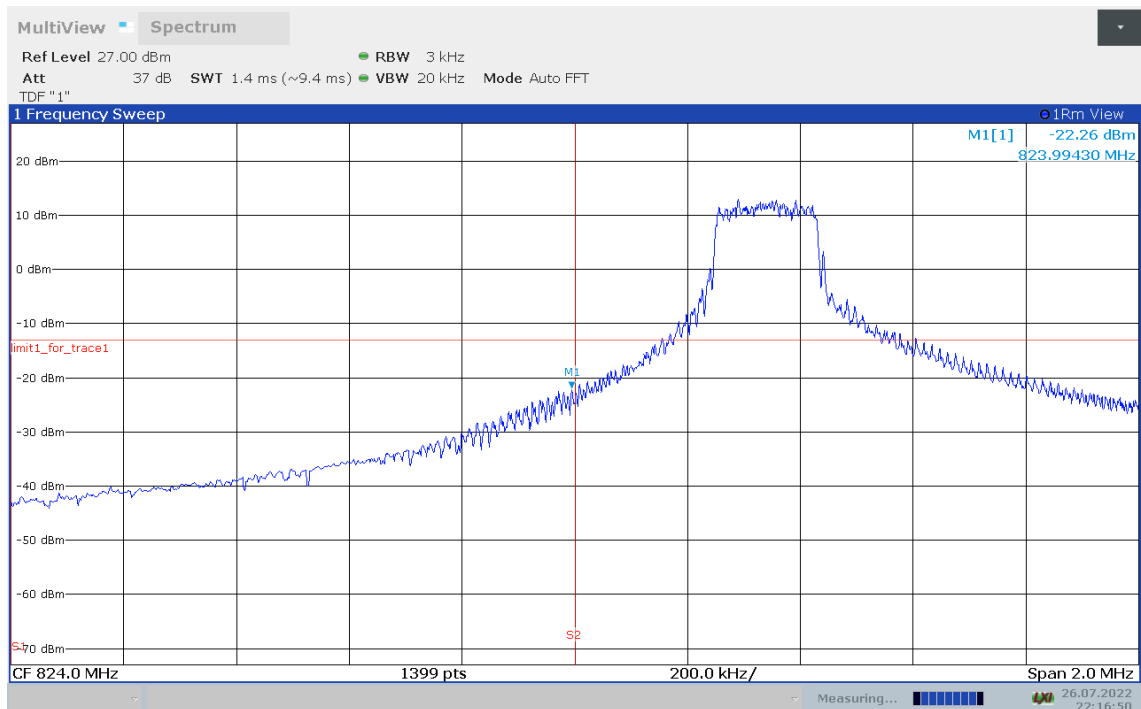


LTE band 26(824MHz-849MHz)

OBW: 1RB-LOW_offset



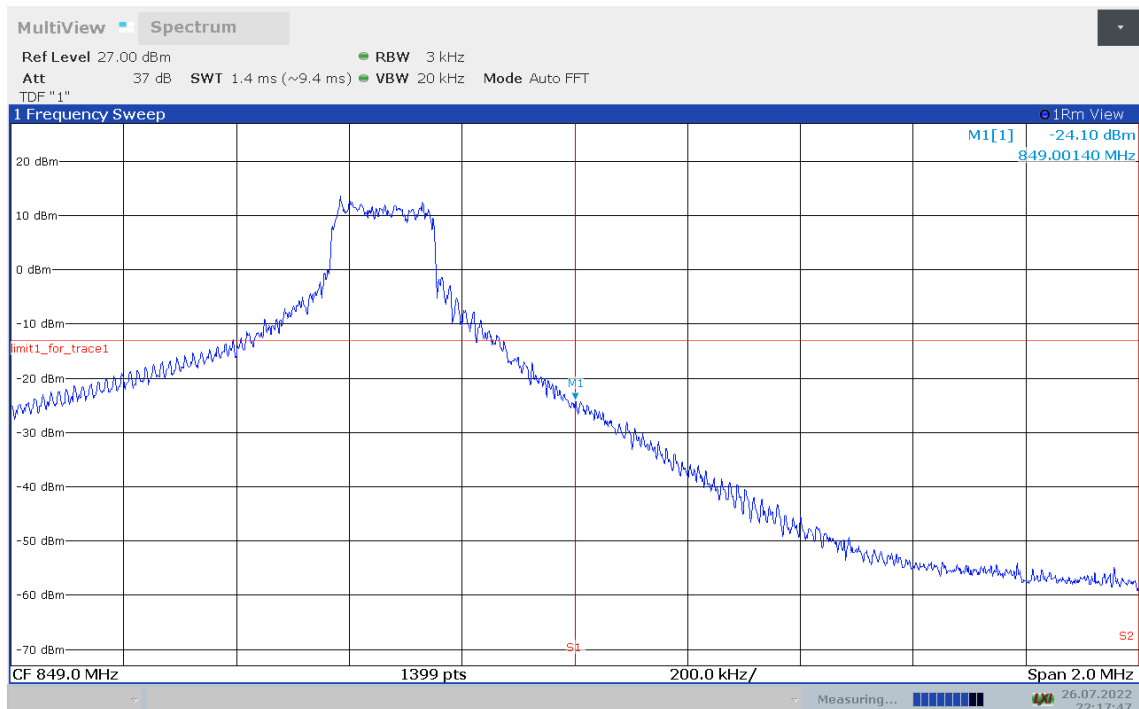
LOW BAND EDGE BLOCK-1RB-LOW_offset



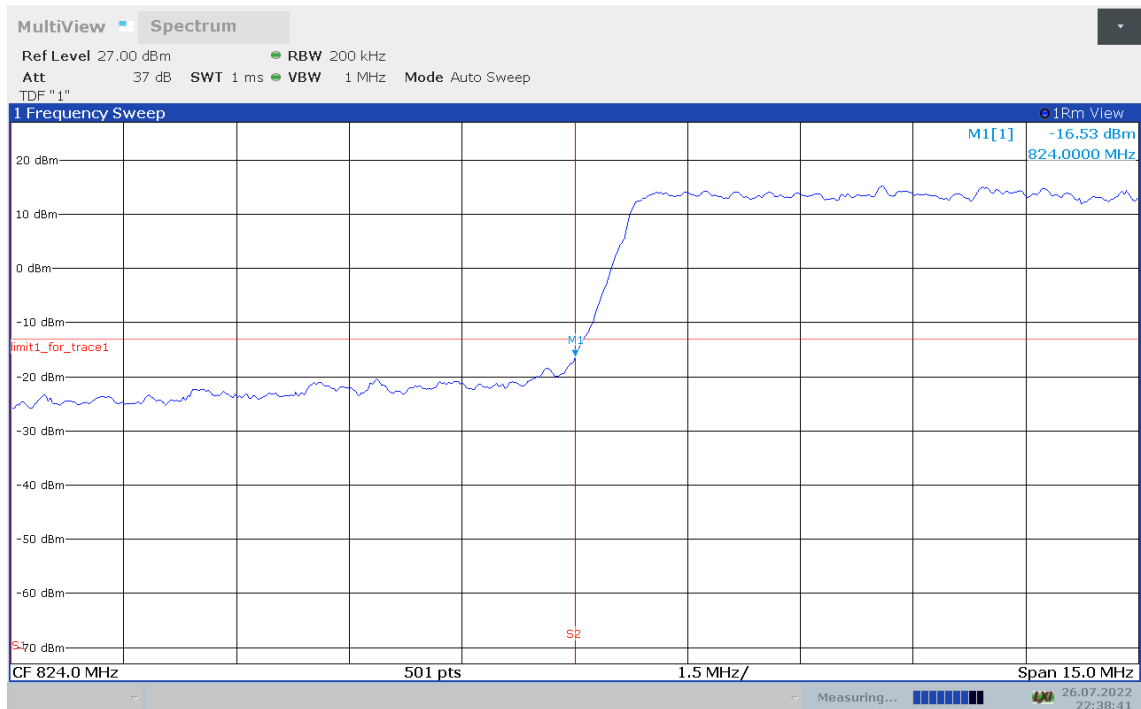
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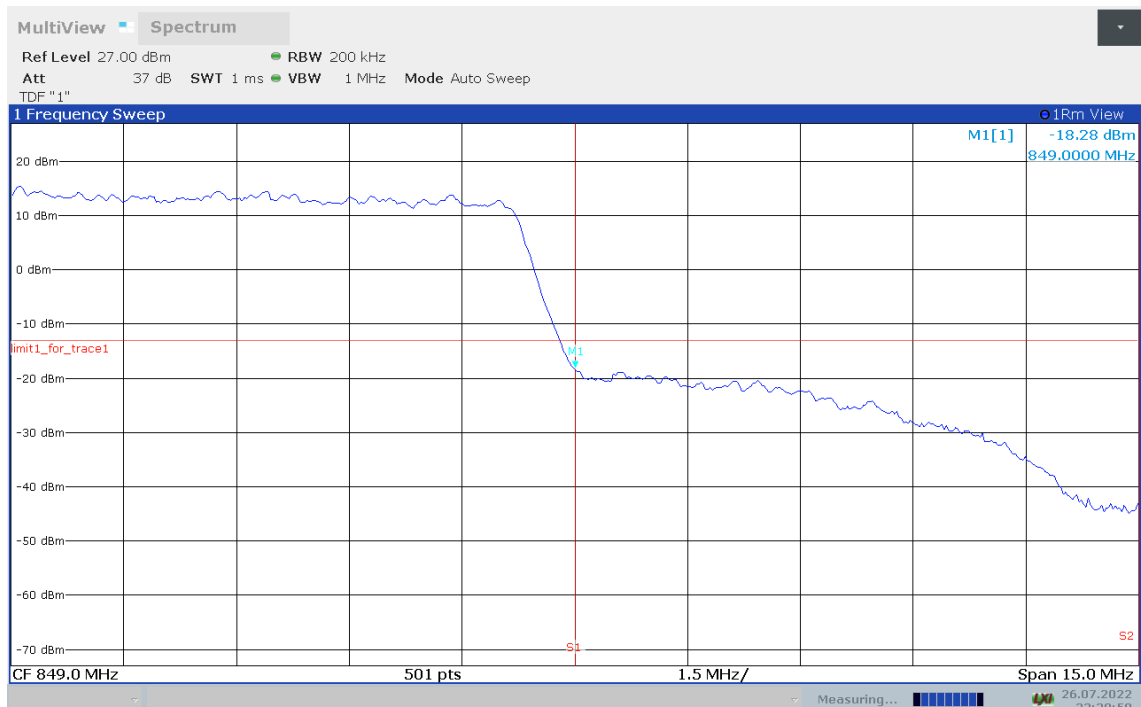
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



LOW BAND EDGE BLOCK-15M-100%RB



HIGH BAND EDGE BLOCK-15M-100%RB



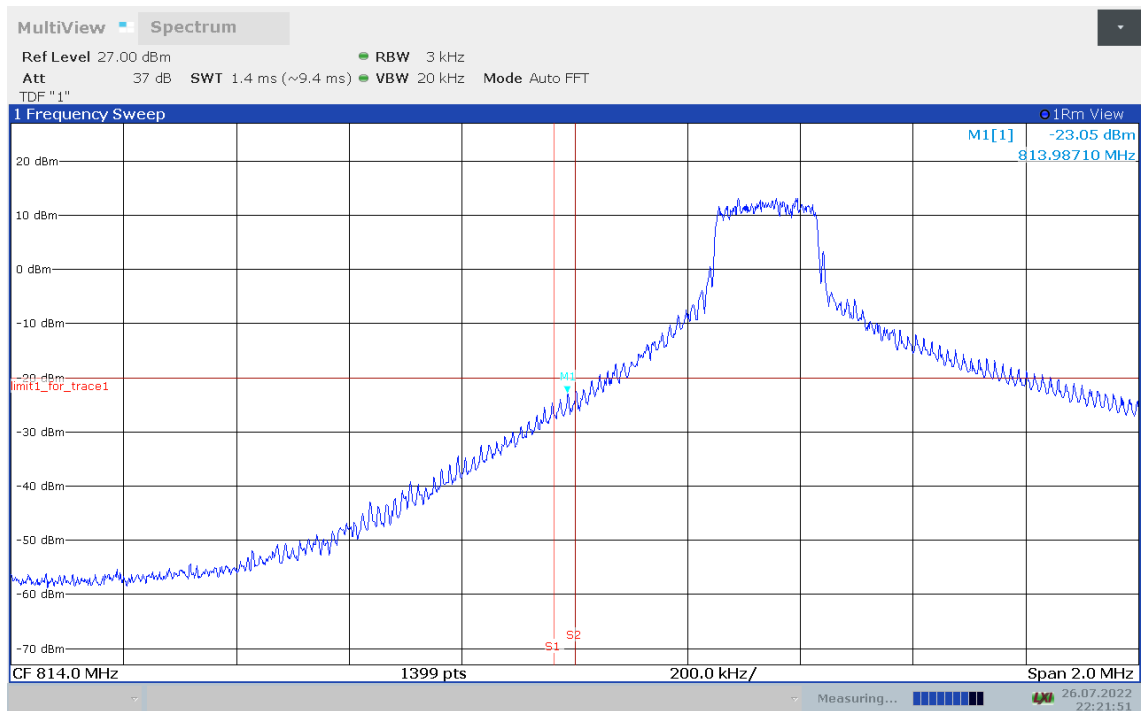


LTE band 26(814MHz-824MHz)

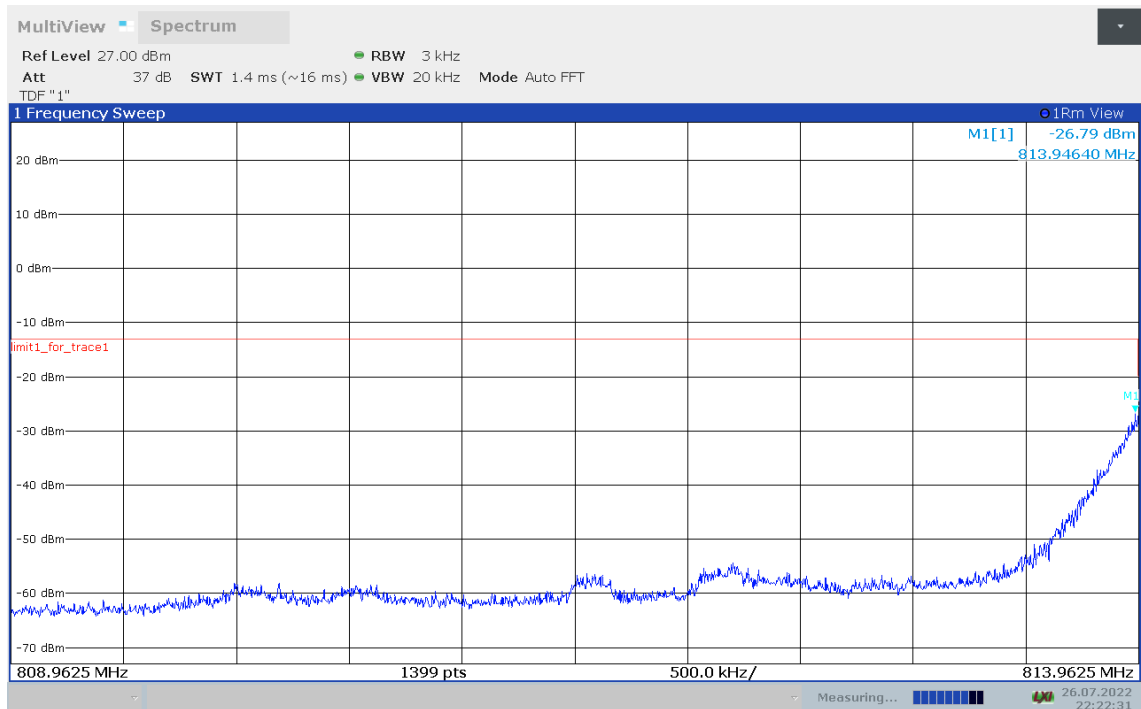
OBW: 1RB-LOW_offset



LOW BAND EDGE BLOCK-1RB-LOW_offset



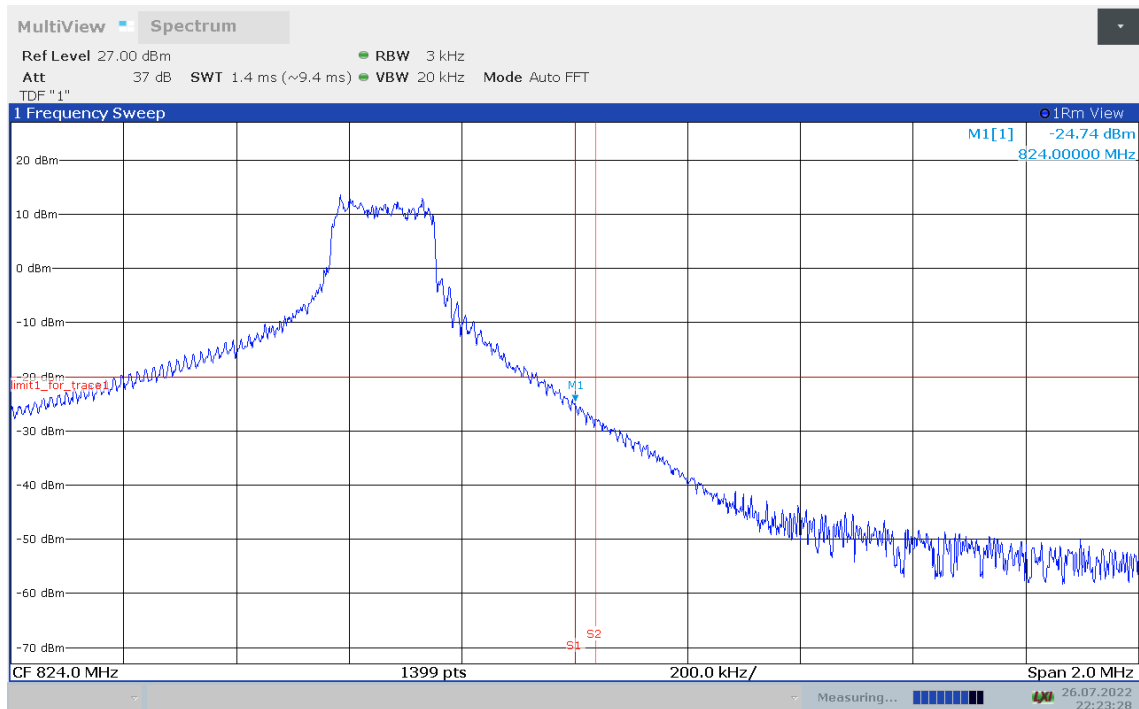
LOW BAND EDGE BLOCK-1RB-LOW_offset



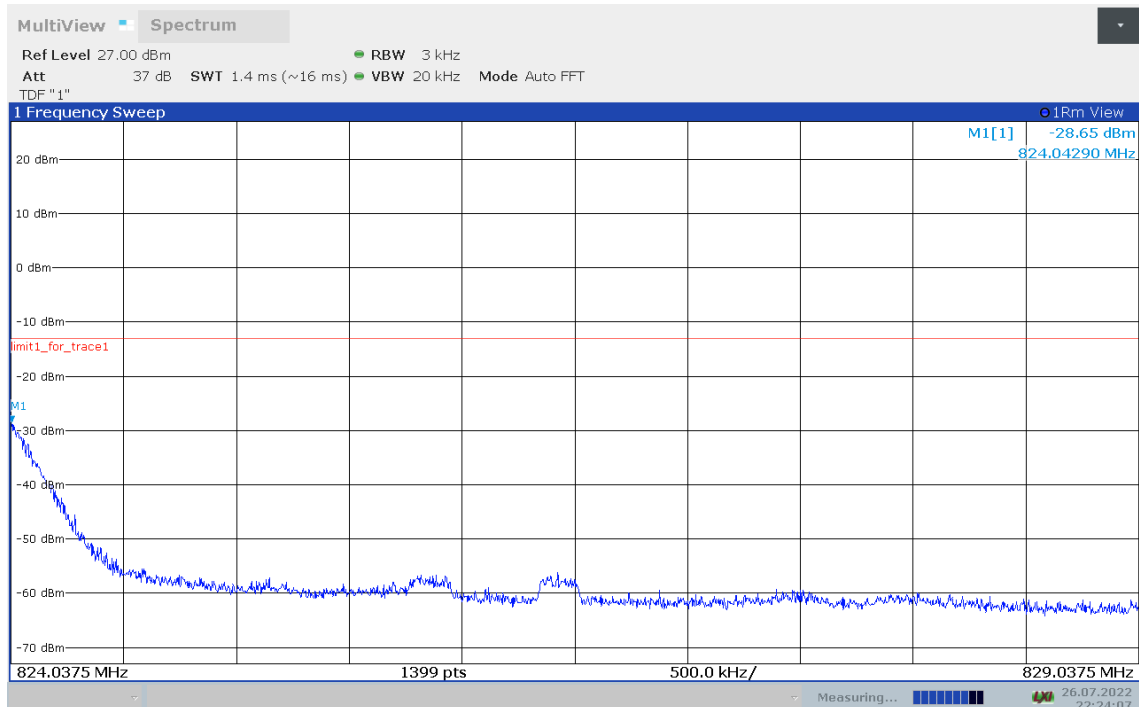
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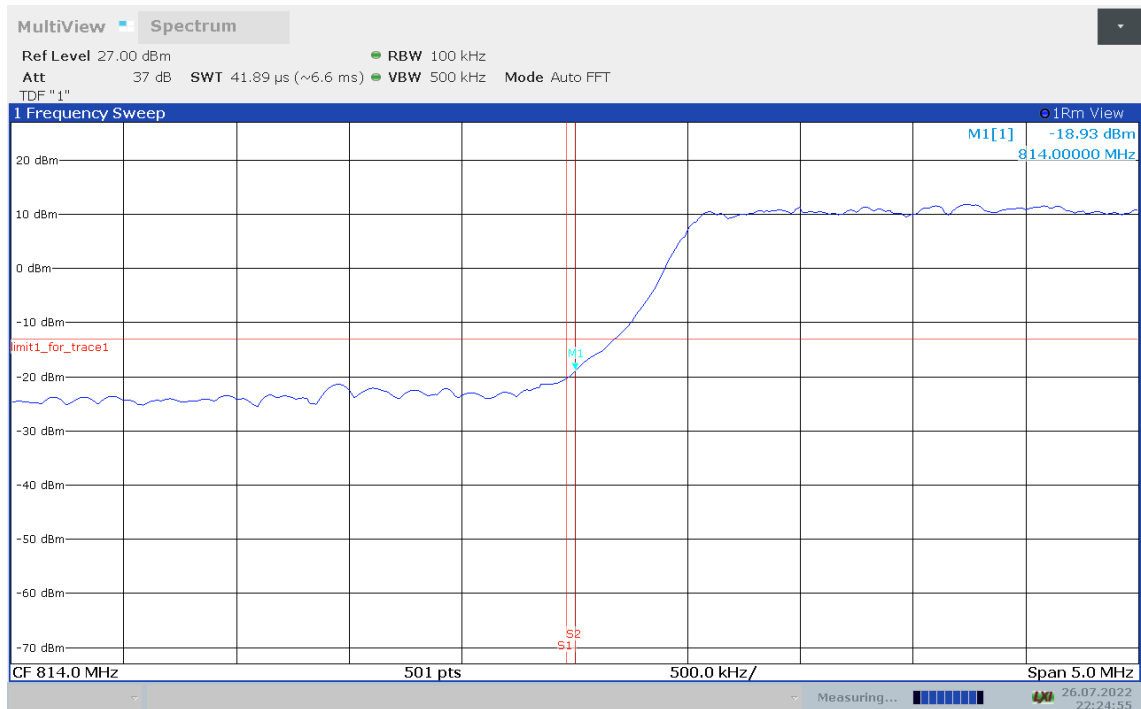
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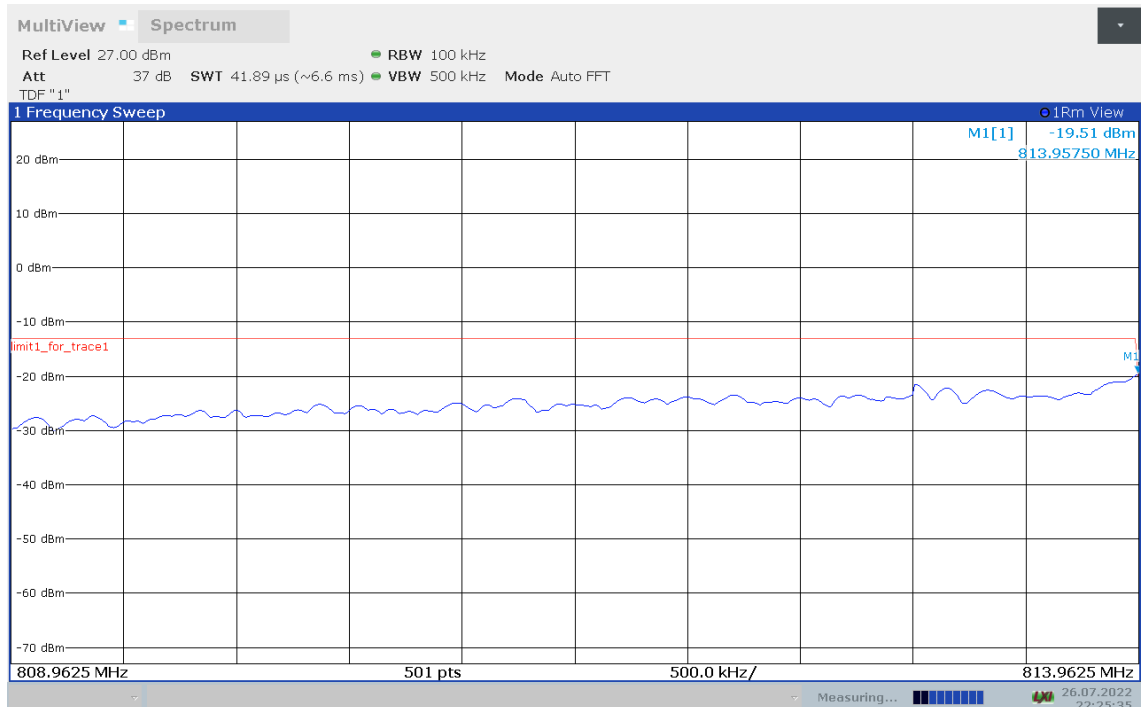
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



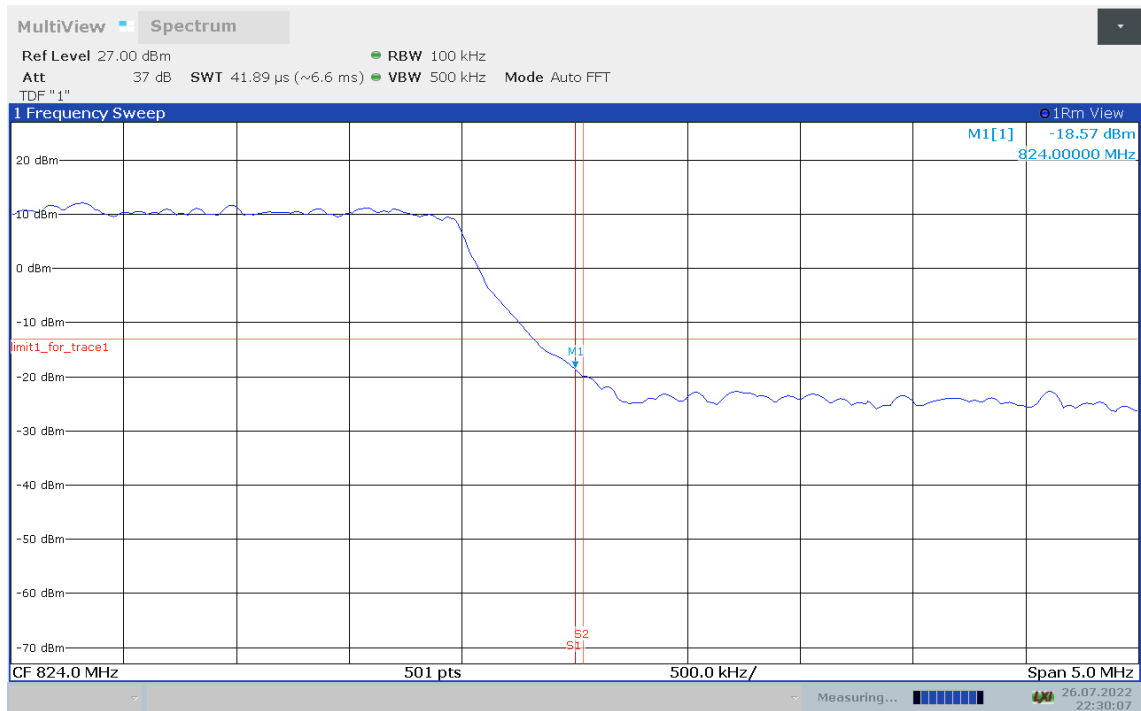
LOW BAND EDGE BLOCK-10M-100%RB



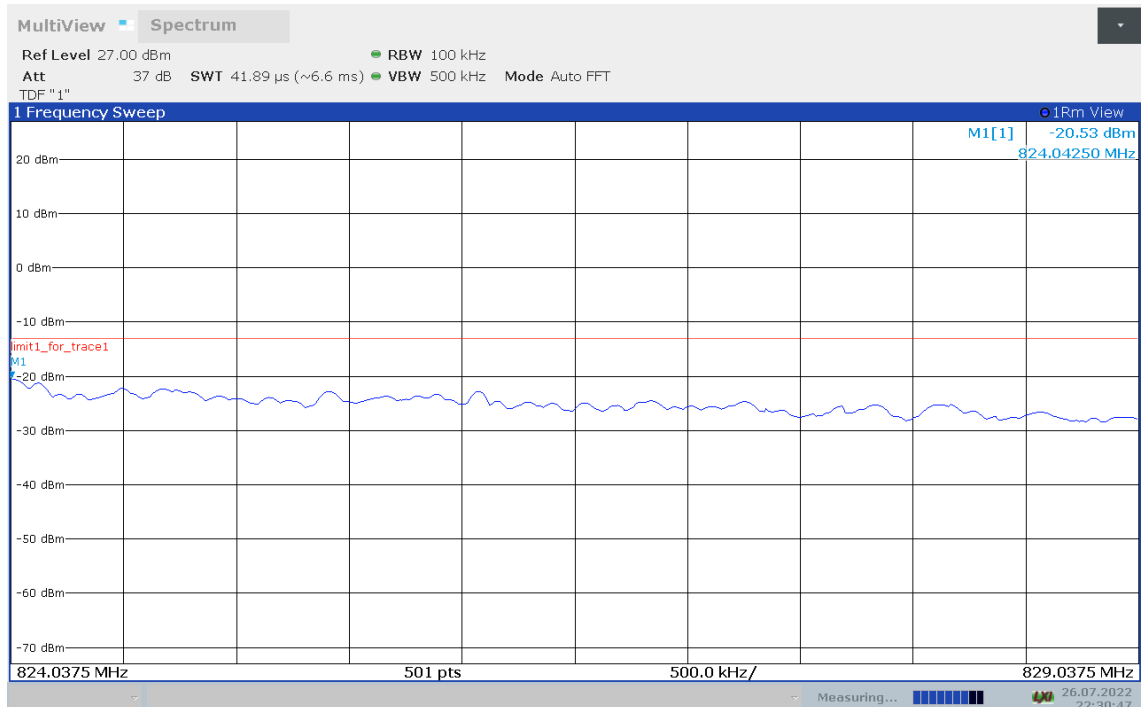
LOW BAND EDGE BLOCK-10M-100%RB



HIGH BAND EDGE BLOCK-10M-100%RB

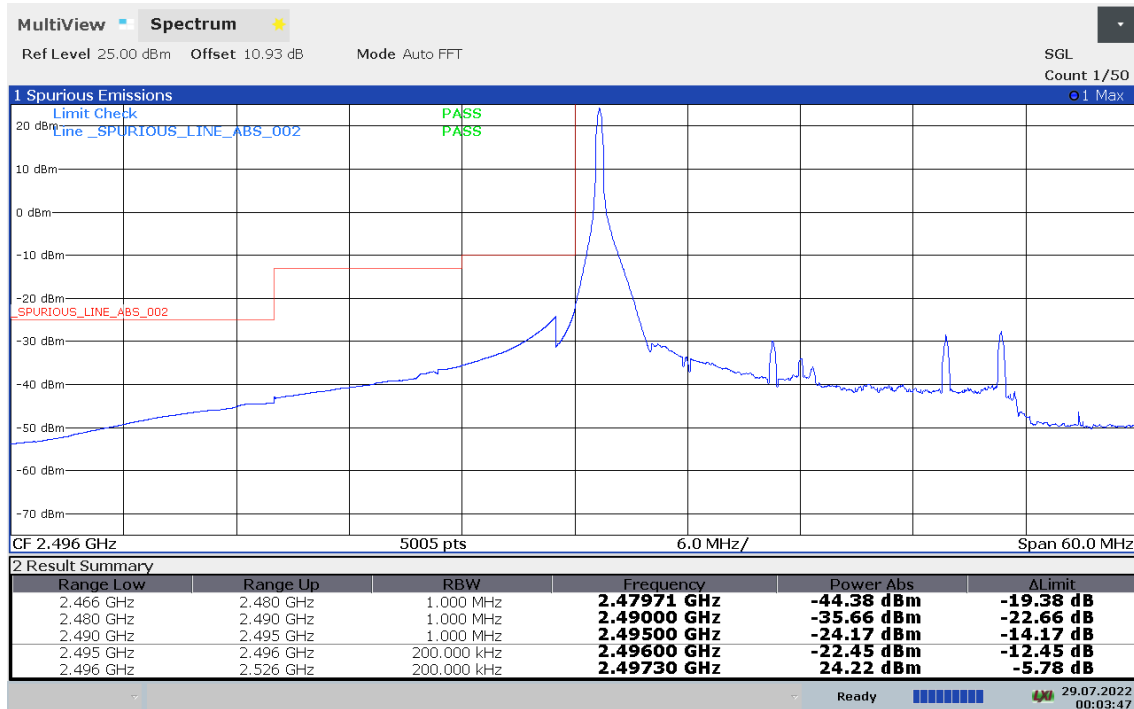


HIGH BAND EDGE BLOCK-10M-100%RB

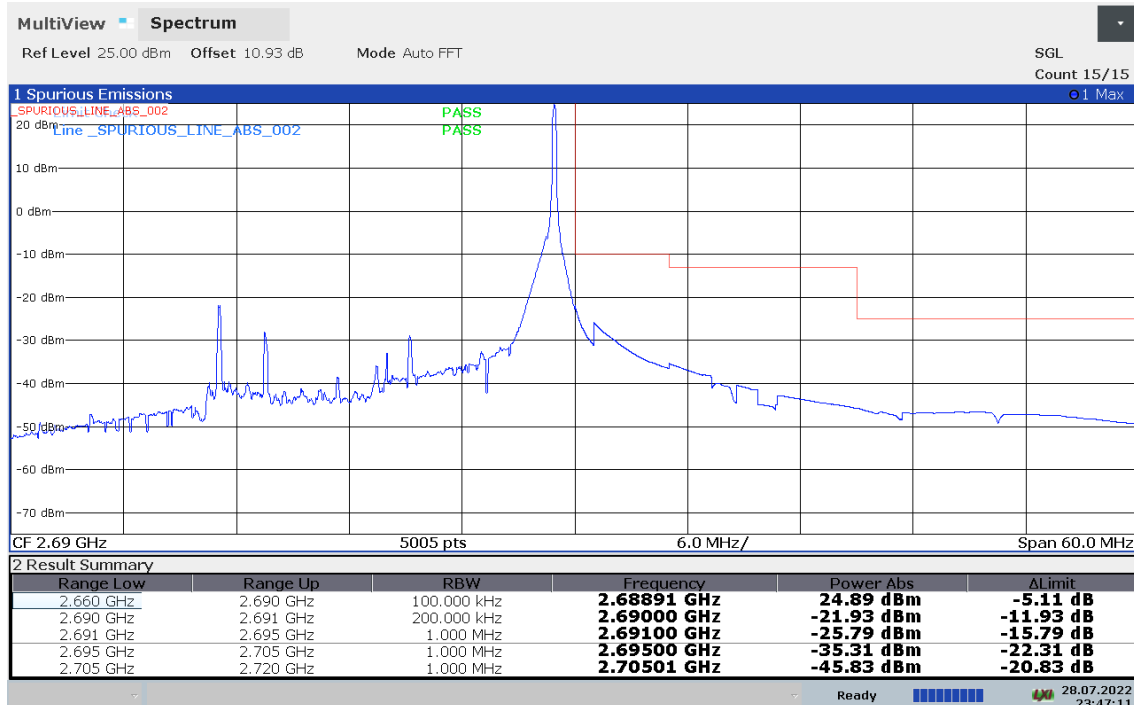


LTE band 41

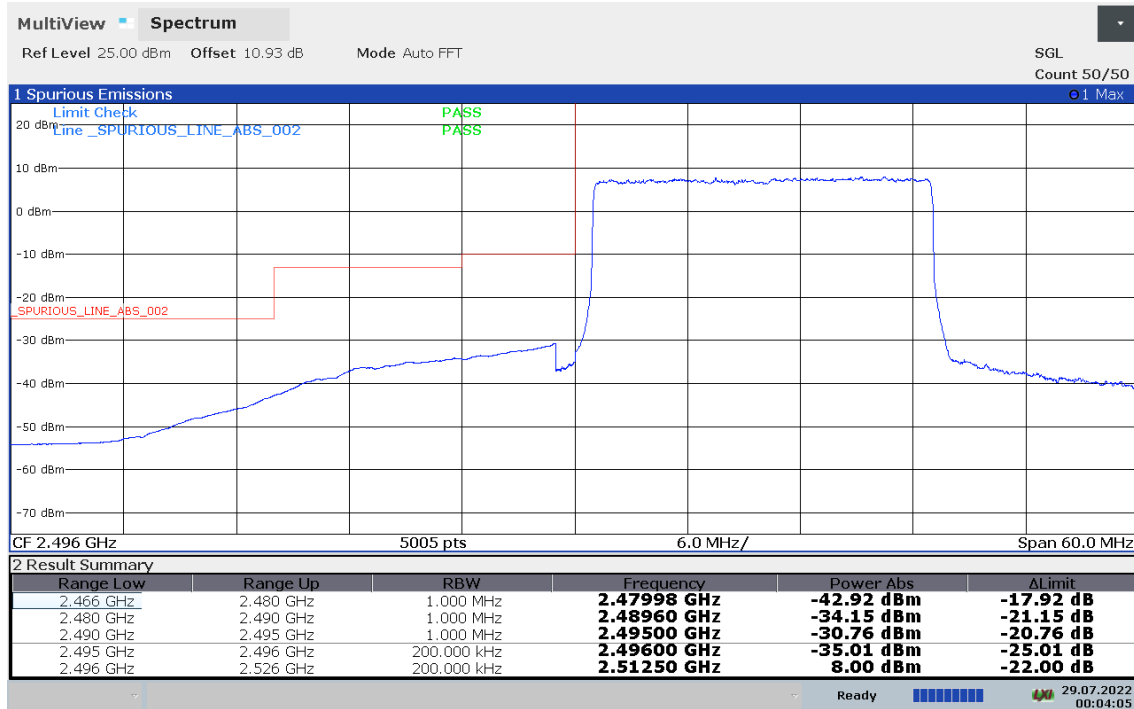
LOW BAND EDGE BLOCK-1RB-low_offset



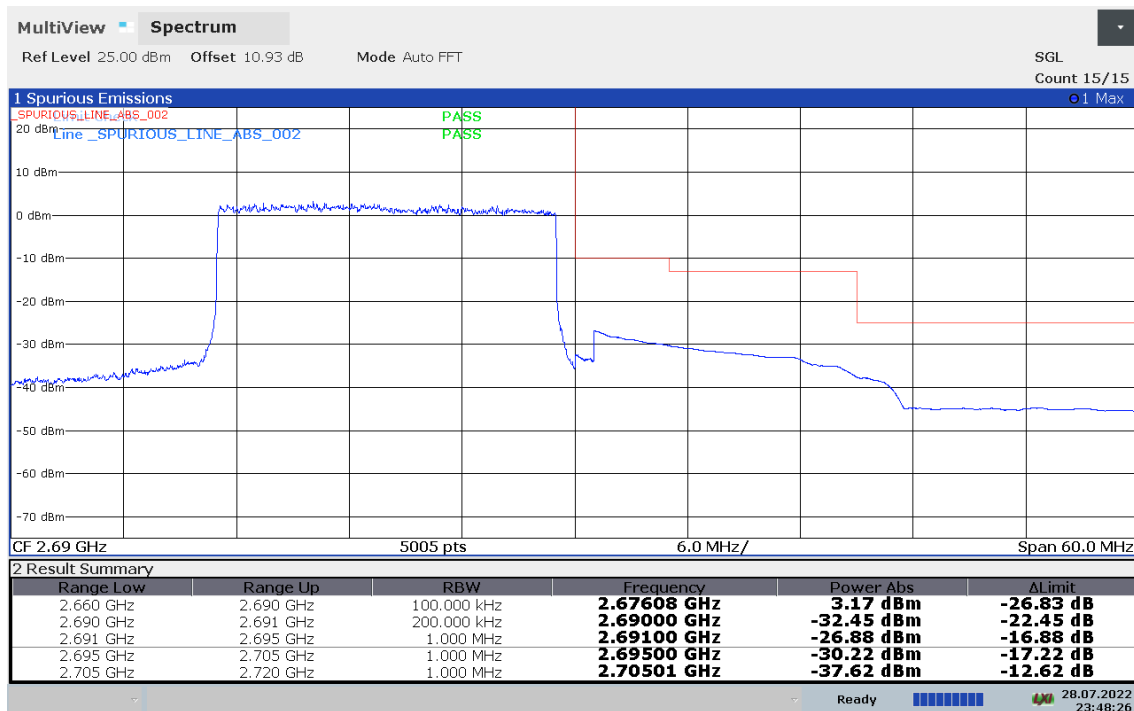
HIGH BAND EDGE BLOCK-1RB-high_offset



LOW BAND EDGE BLOCK-20MHz-100%RB



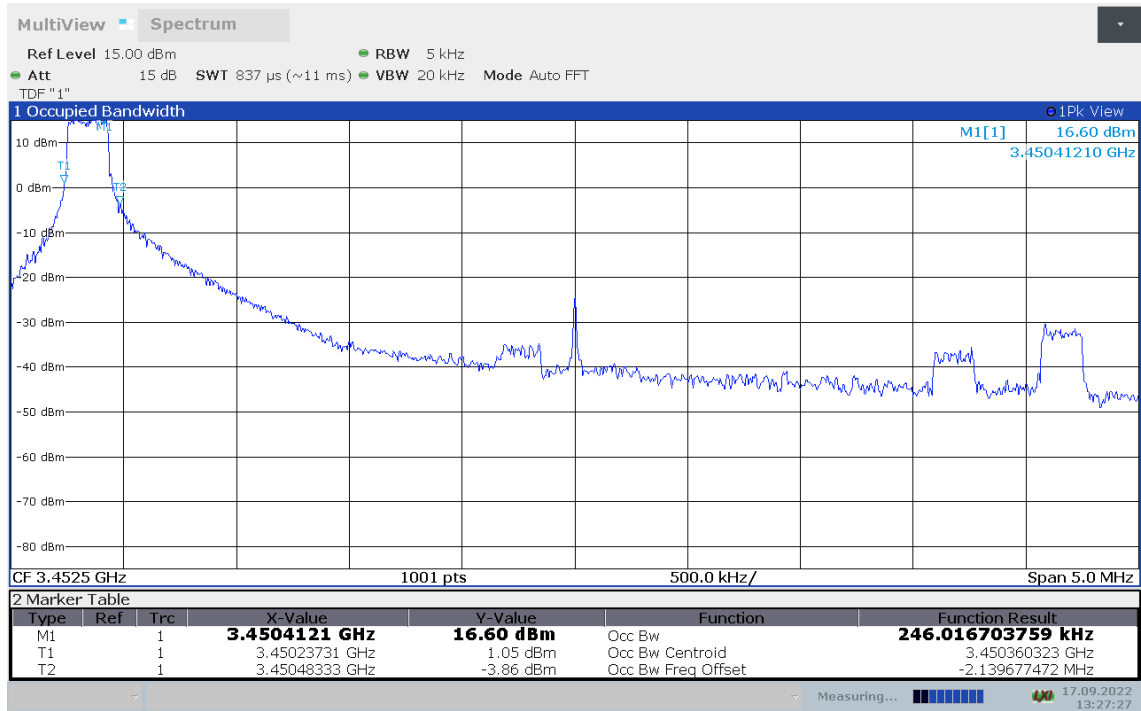
HIGH BAND EDGE BLOCK-20MHz-100%RB



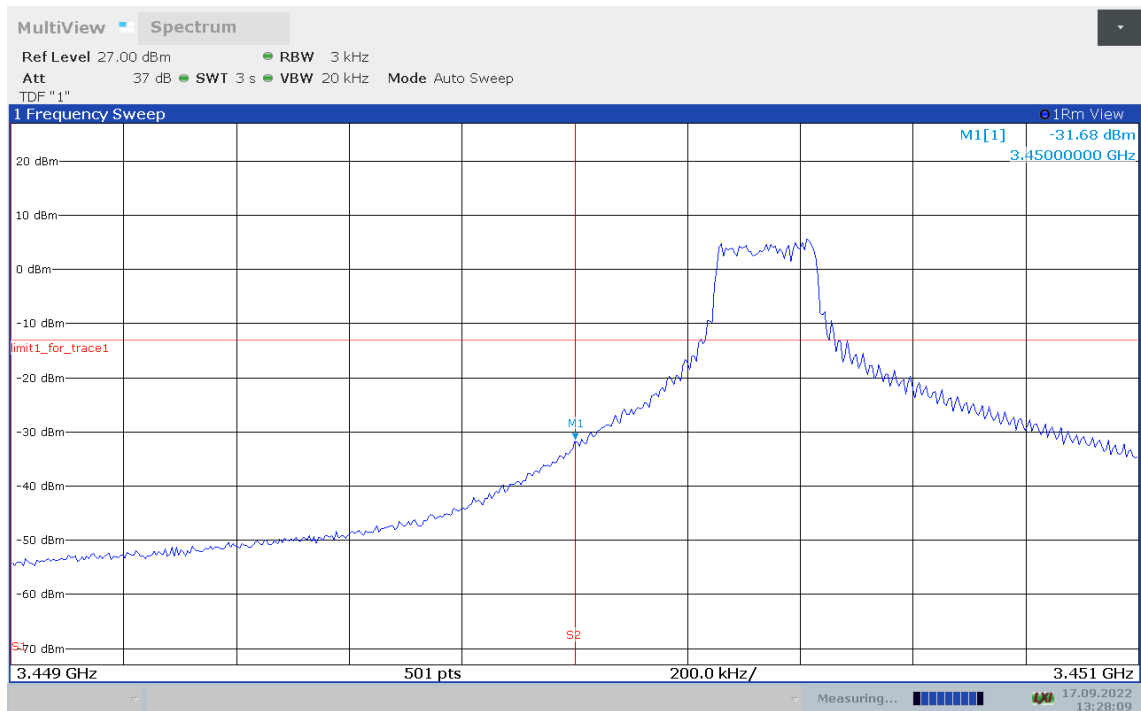


LTE band 42(3450MHz-3550MHz)

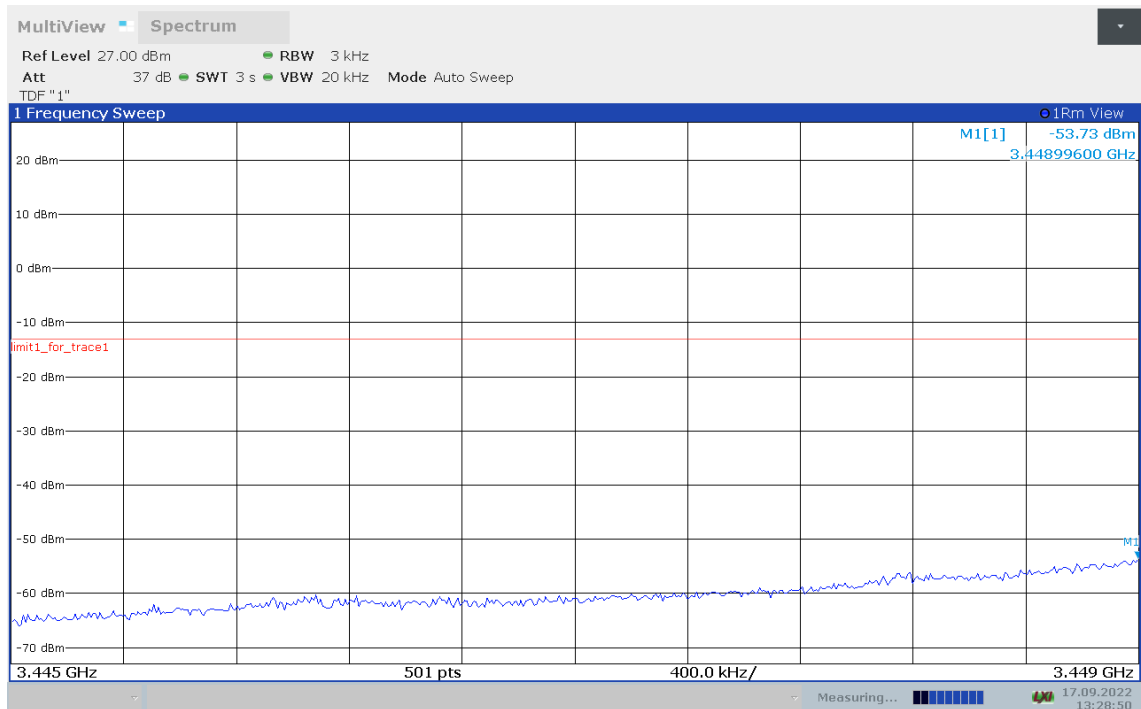
OBW: 1RB-LOW_offset



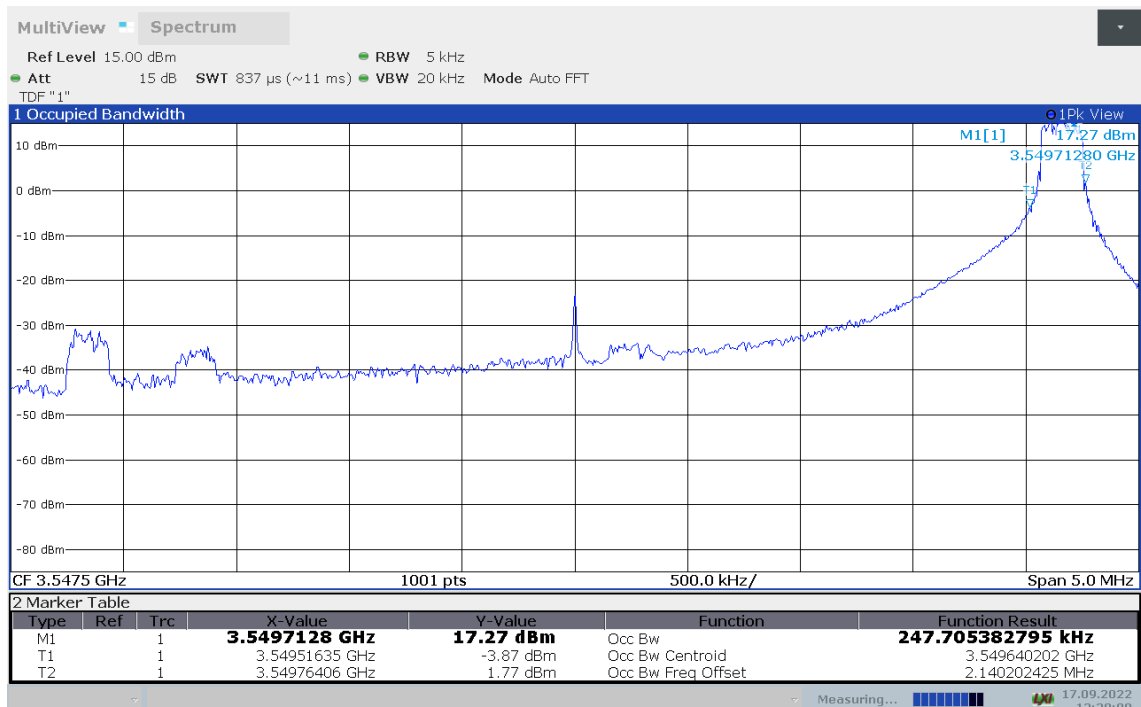
LOW BAND EDGE BLOCK-1RB-LOW_offset



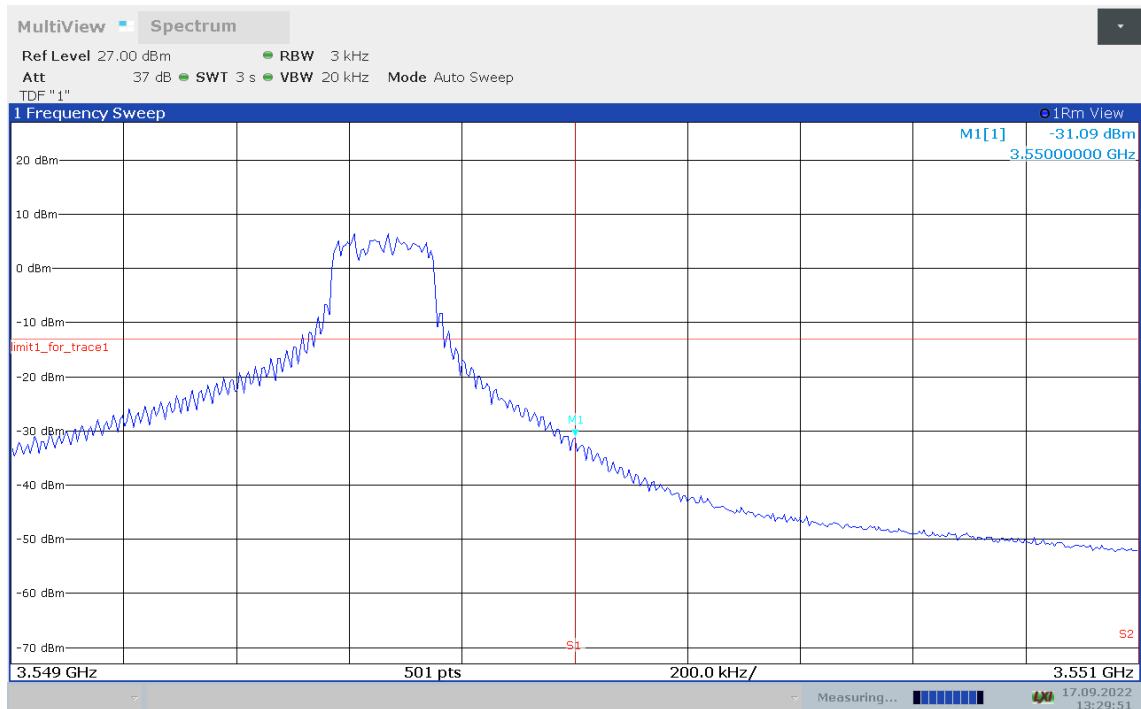
LOW BAND EDGE BLOCK-1RB-LOW_offset



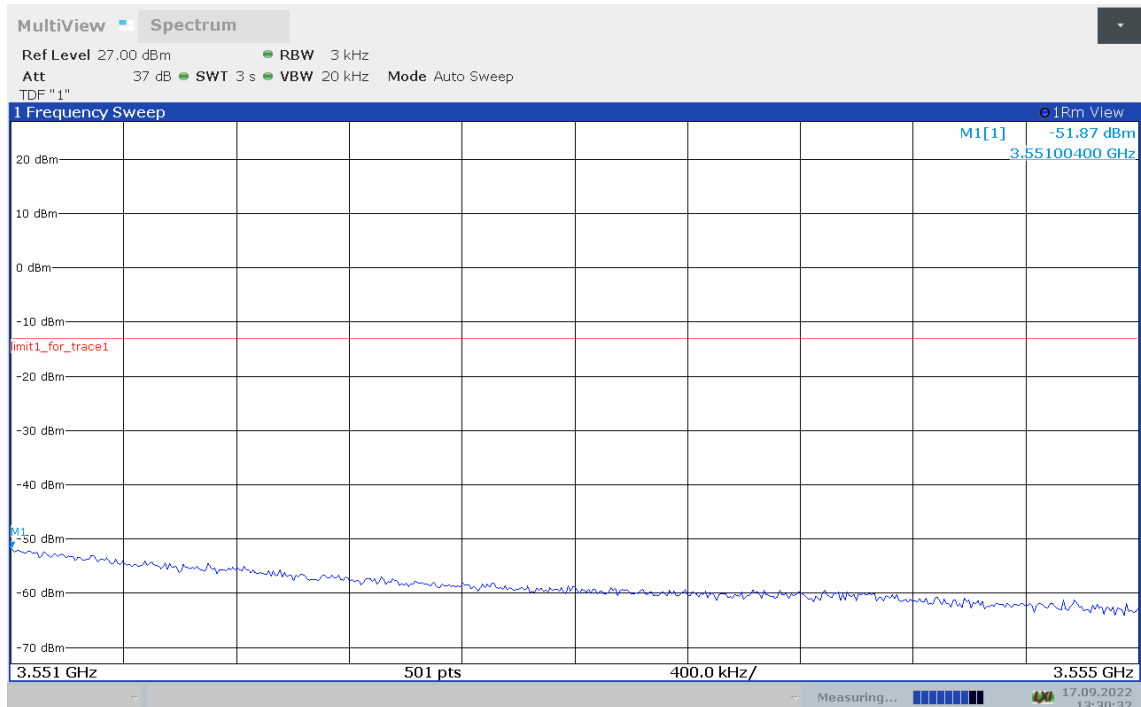
OBW: 1RB-HIGH_offset



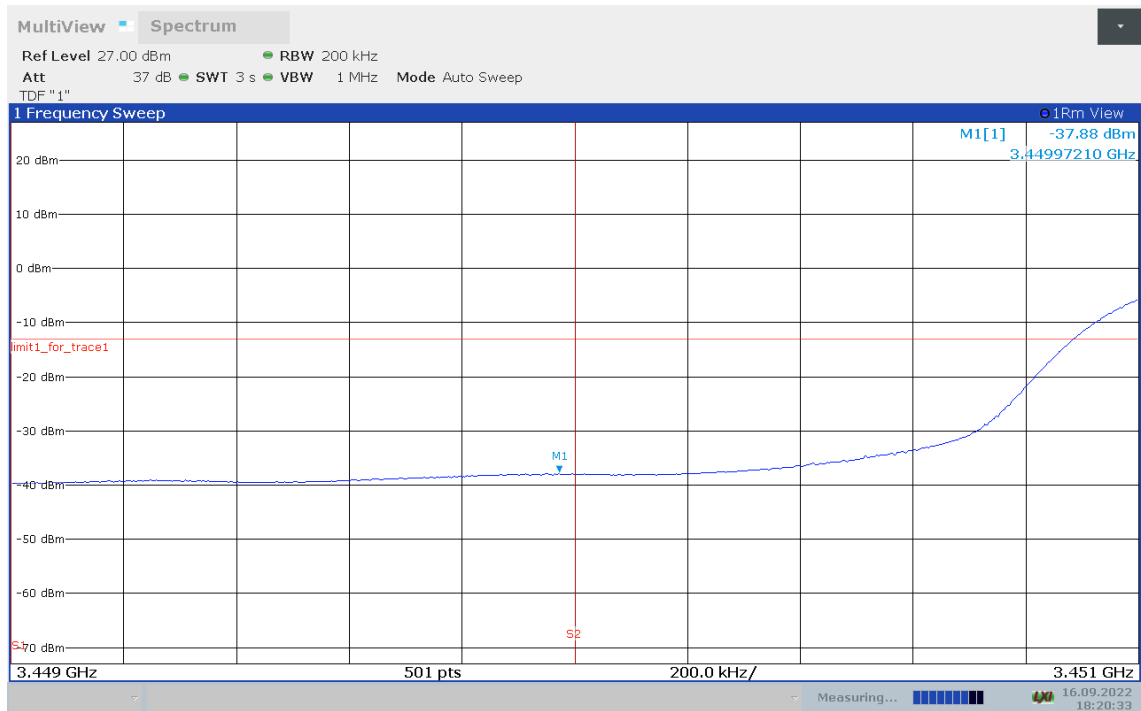
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



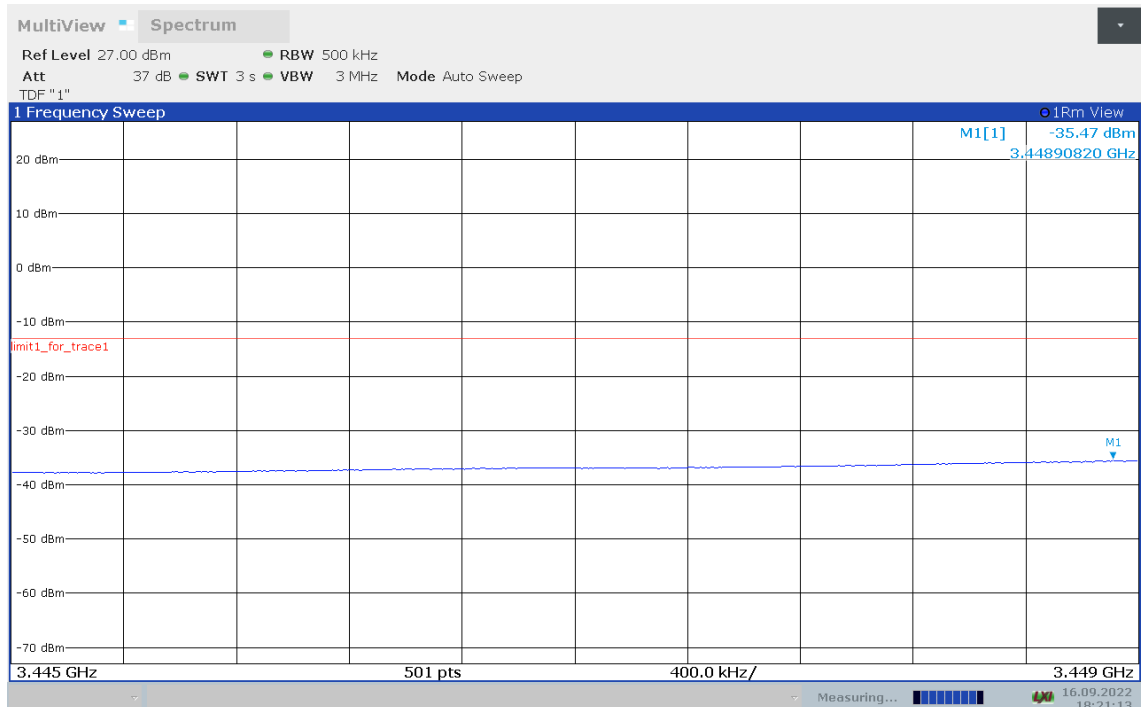
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



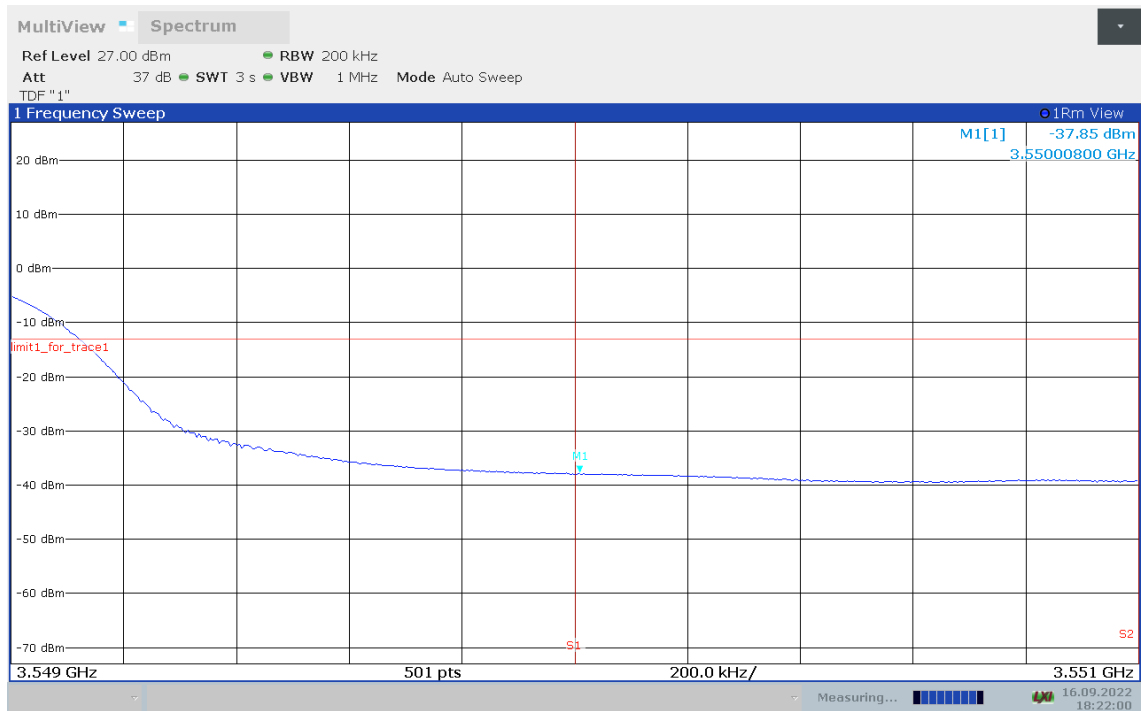
LOW BAND EDGE BLOCK-20M-100%RB



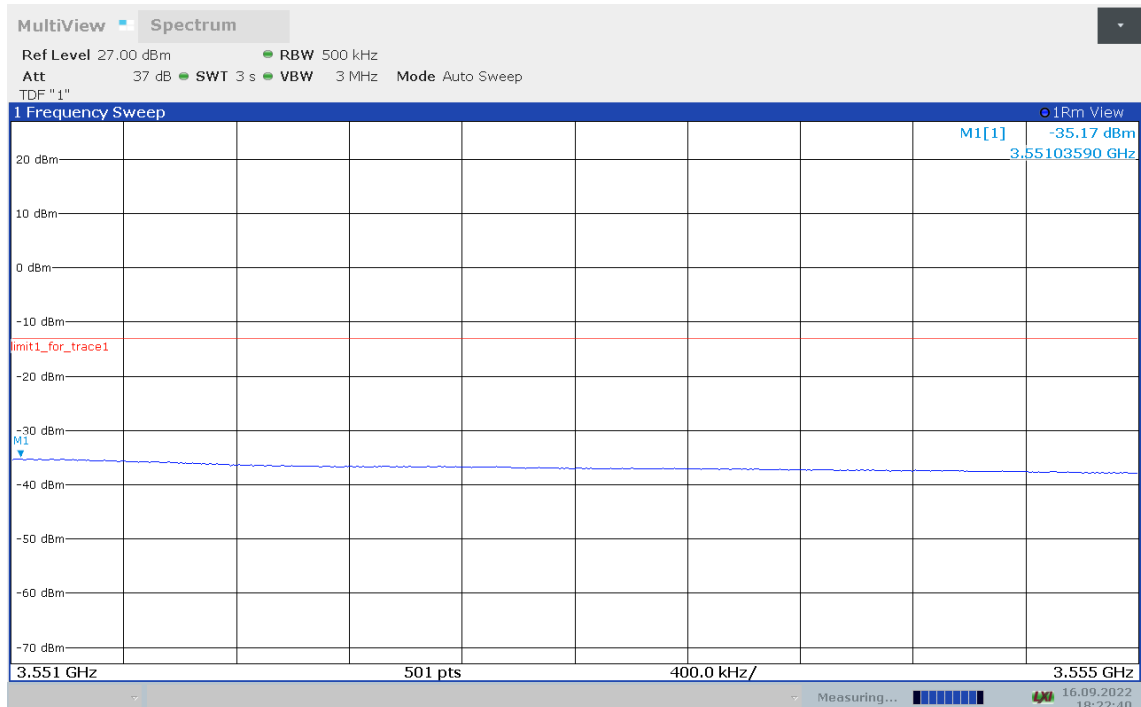
LOW BAND EDGE BLOCK-20M-100%RB



HIGH BAND EDGE BLOCK-20M-100%RB



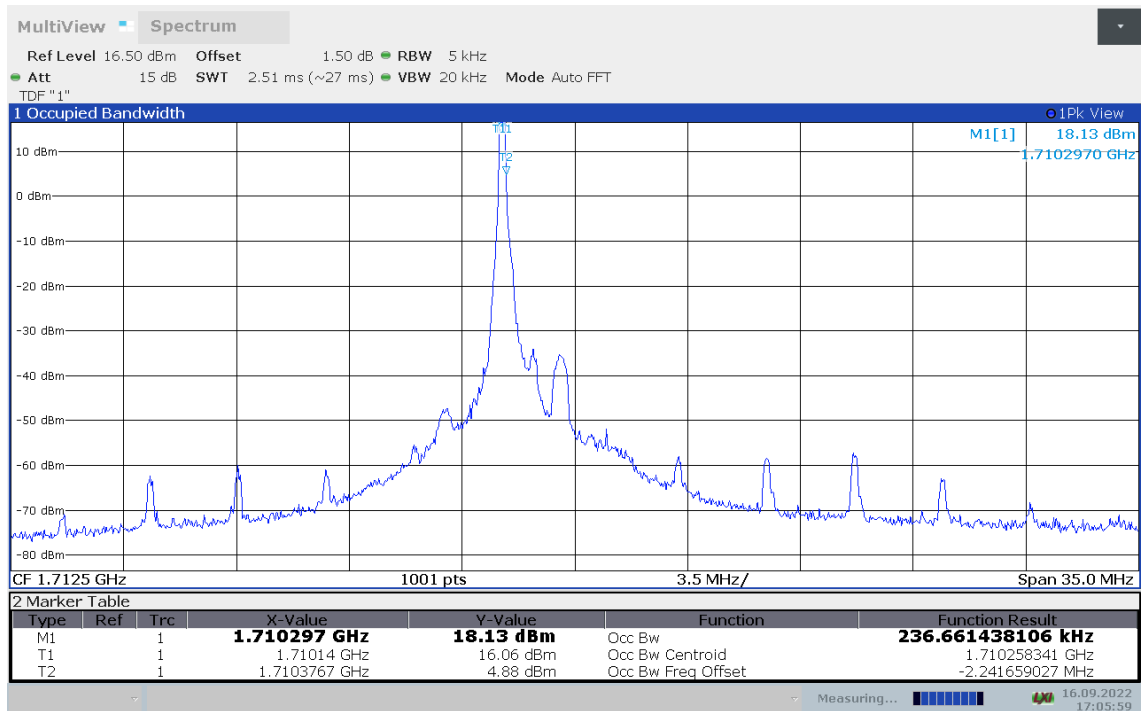
HIGH BAND EDGE BLOCK-20M-100%RB



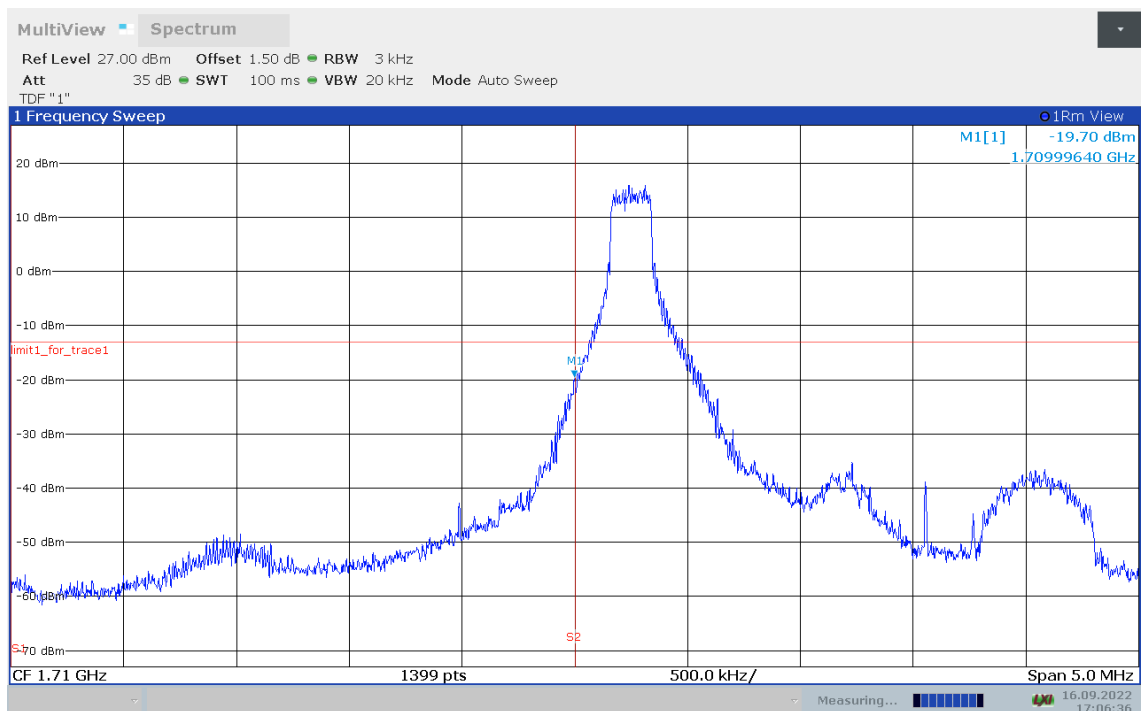


LTE band 66

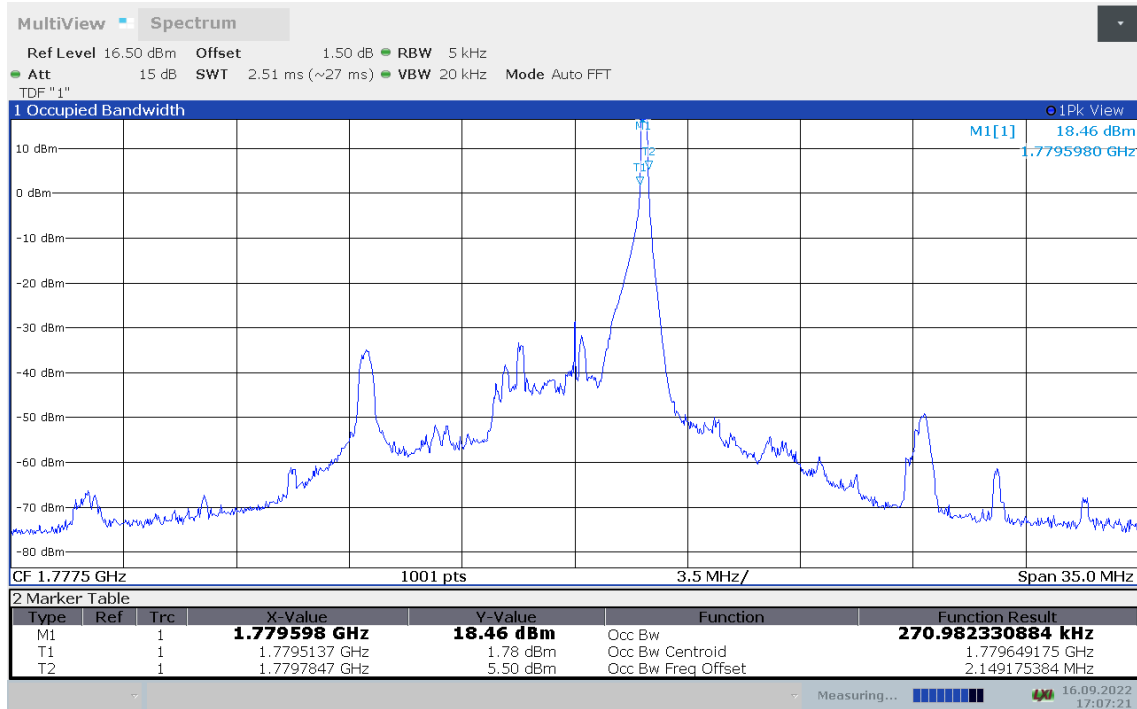
OBW: 1RB-LOW_offset



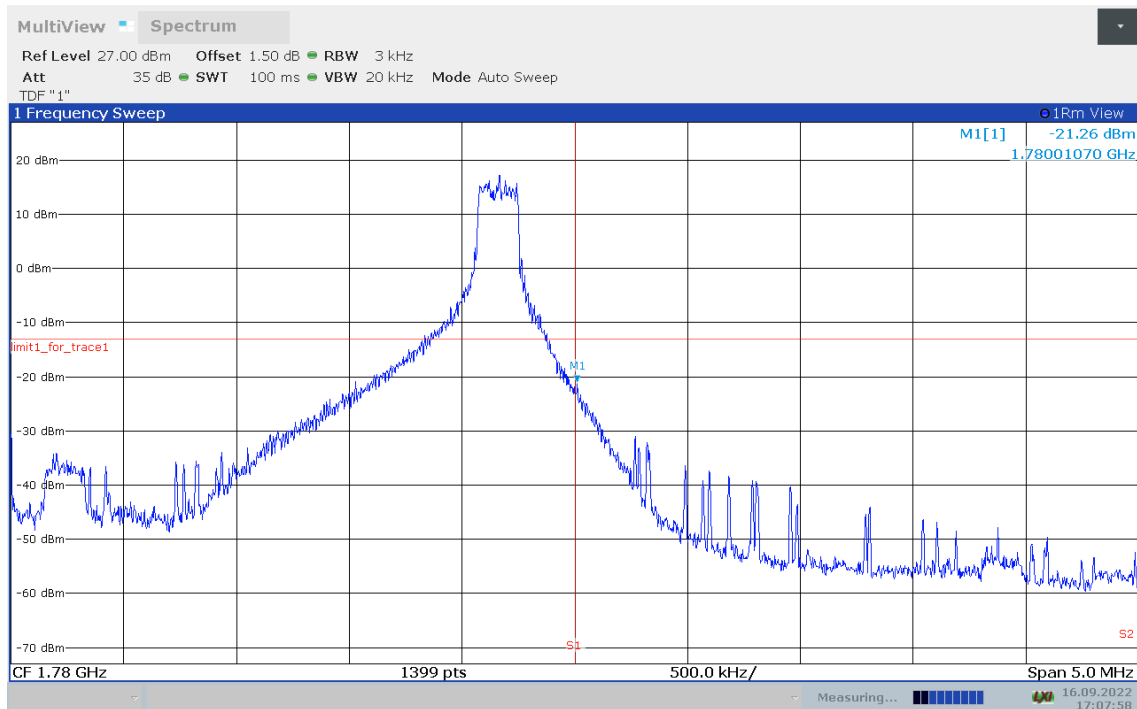
LOW BAND EDGE BLOCK-1RB-LOW_offset



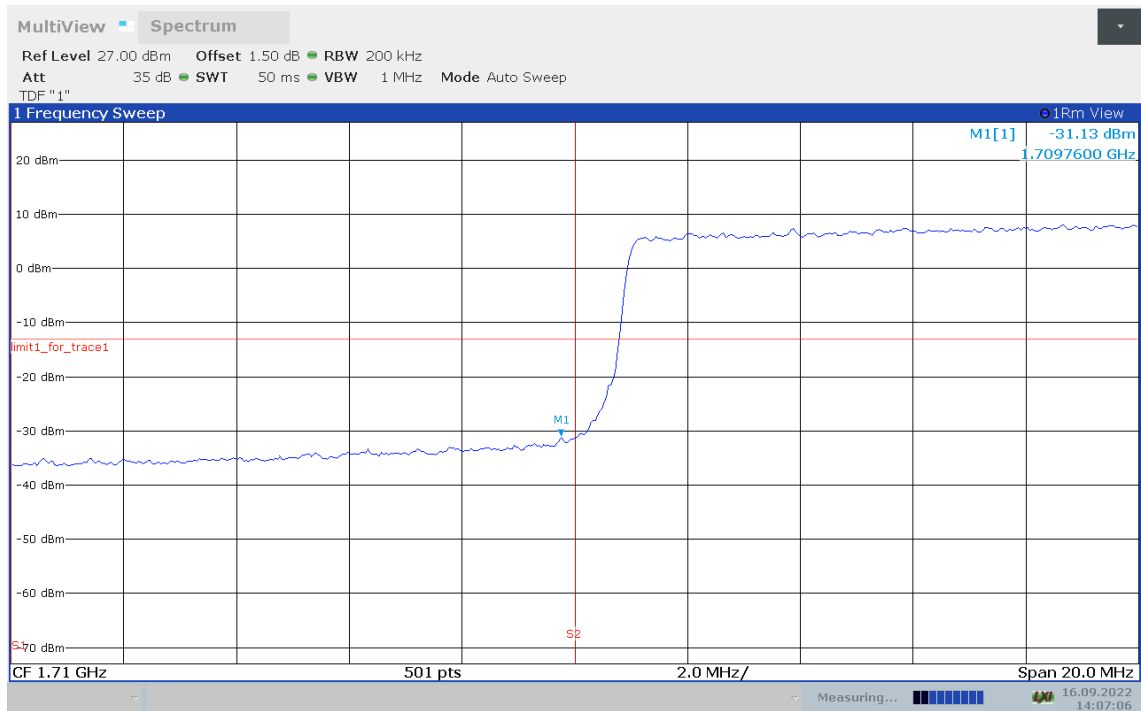
OBW: 1RB-HIGH_offset



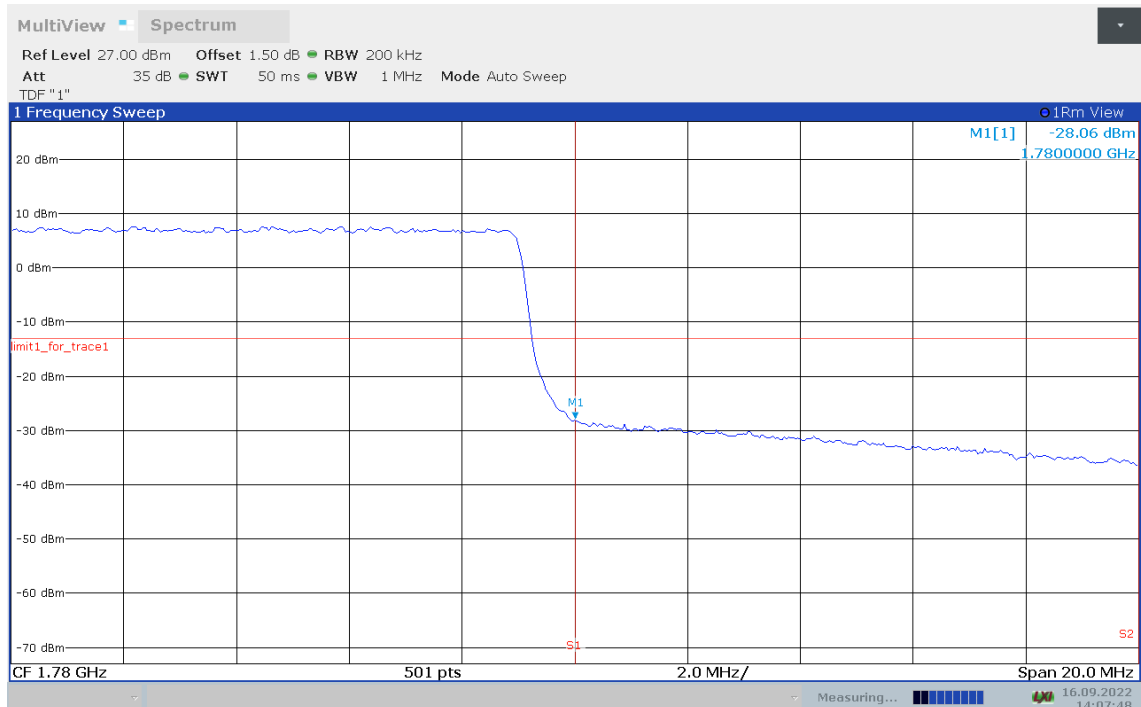
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



LOW BAND EDGE BLOCK-20M-100%RB



HIGH BAND EDGE BLOCK-20M-100%RB



Note: Expanded measurement uncertainty is $U = 0.49\text{dB}(100\text{KHz}-2\text{GHz})/1.21\text{dB}(2\text{GHz}-26.5\text{GHz})$, $k = 1.96$

A.7 CONDUCTED SPURIOUS EMISSION

Reference

FCC: CFR Part 2.1051, 22.917, 24.238, 27.53, 90.691, 96.41.

A.7.1 Measurement Method

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1. Determine frequency range for measurements: From CFR 2.1051 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the mobile station equipment tested, this equates to a frequency range of 13 MHz to 9 GHz, data taken from 10 MHz to 25 GHz.
2. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.
3. The number of sweep points of spectrum analyzer is set to 30001 which is greater than span/RBW.

A. 7.2 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.

The specification that emissions shall be attenuated below the transmitter power (P) by at least $43 + 10 \log(P)$ dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

Part 27.53(m)(4) 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 than $43 + 10 \log(P)$ 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(a) states for mobile and portable stations operating in the 2305–2315 MHz and 2350–2360 MHz bands: By a factor of not less than: $43 + 10 \log(P)$ dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than $55 + 10 \log(P)$ dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than $61 + 10 \log(P)$ dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than $67 + 10 \log(P)$ dB on all frequencies between 2328 and 2337 MHz; By a factor of not less than $43 + 10 \log(P)$ dB on all frequencies between 2300 and 2305 MHz, 55

+ 10 log (P) dB on all frequencies between 2296 and 2300MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296 MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292 MHz, and 70 + 10 log (P) dB below 2288 MHz; By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

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.

Part 27.53(n) states for base station operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with the provisions of this paragraph (n)(1) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed, but limited to a maximum of 200 kHz. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. Notwithstanding the channel edge requirement of -13 dBm per megahertz, for base station operations in the 3450-3550 MHz band, the conducted power of any emission below 3440 MHz or above 3560 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3430 MHz or above 3570 MHz shall not exceed -40 dBm/MHz.

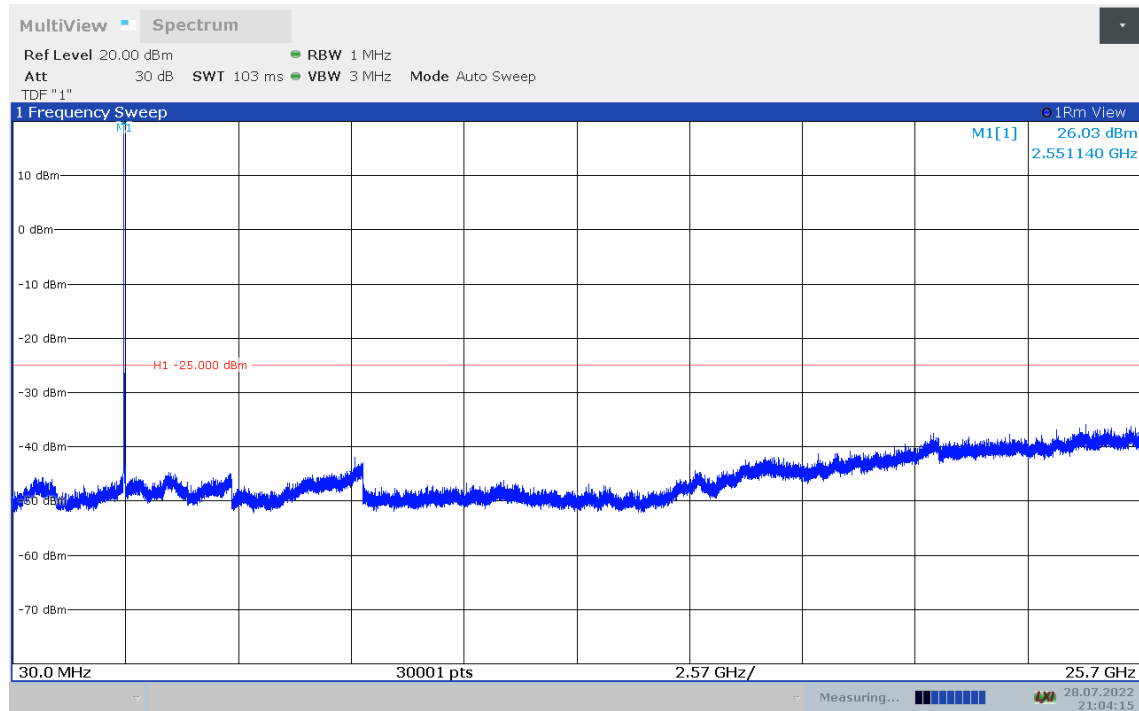
A. 7.3 Measurement result

Only worst case result is given below

LTE band 7 20MHz QPSK: 30MHz – 25.7GHz

Spurious emission limit –25dBm.

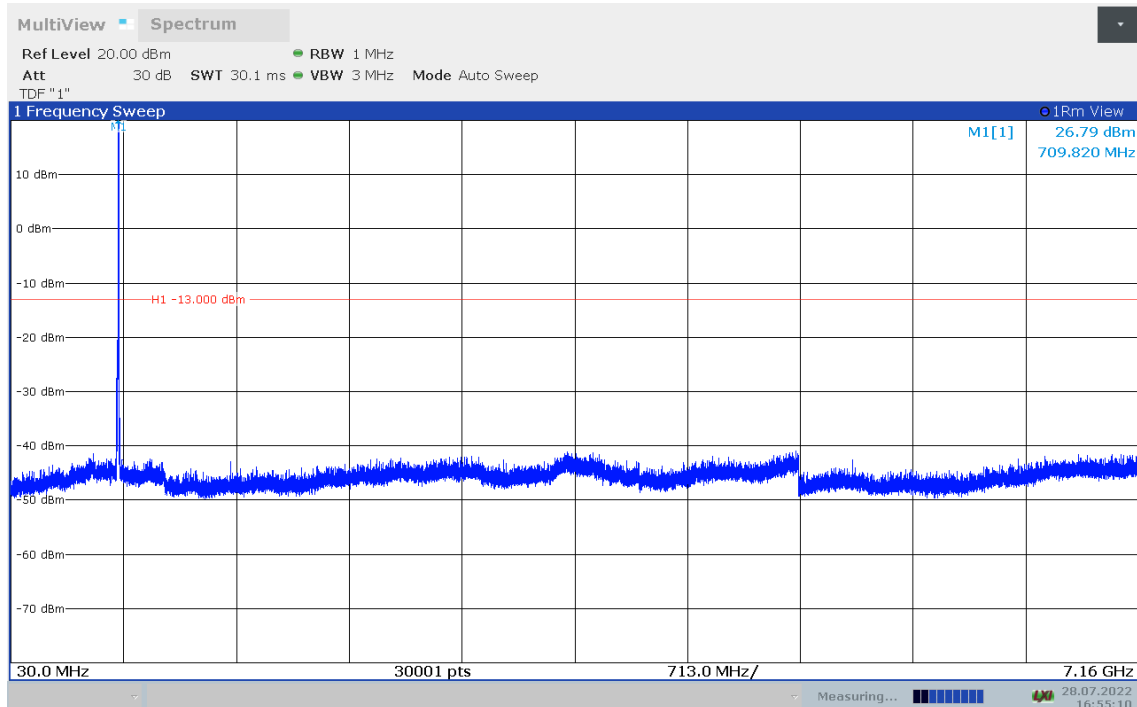
NOTE: peak above the limit line is the carrier frequency.



LTE band 12: 30MHz – 7.16GHz

Spurious emission limit –13dBm.

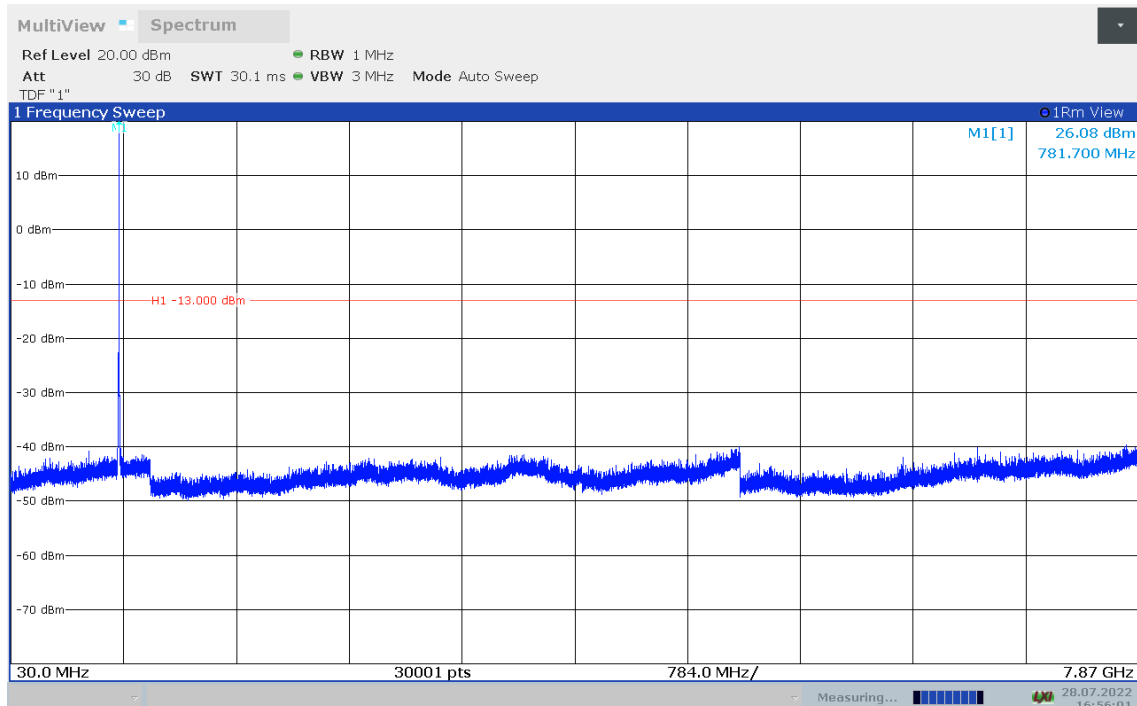
NOTE: peak above the limit line is the carrier frequency.



LTE band 13: 30MHz – 7.87GHz

Spurious emission limit –13dBm.

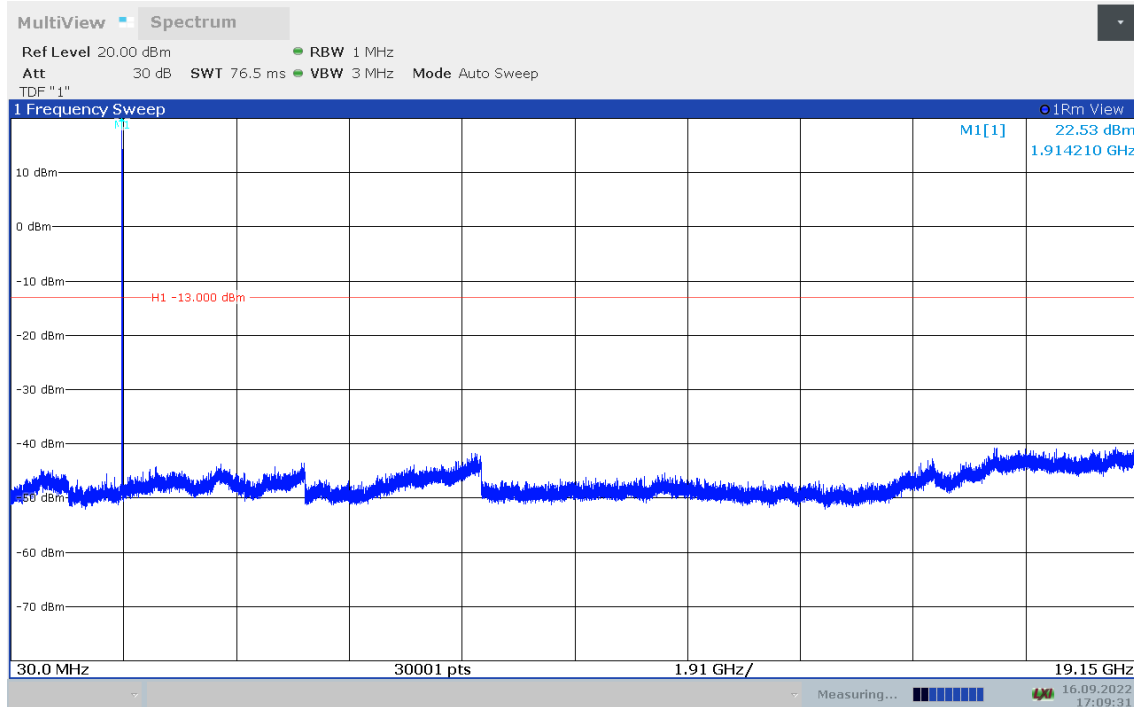
NOTE: peak above the limit line is the carrier frequency.



LTE band 25: 30MHz – 19.15GHz

Spurious emission limit –13dBm.

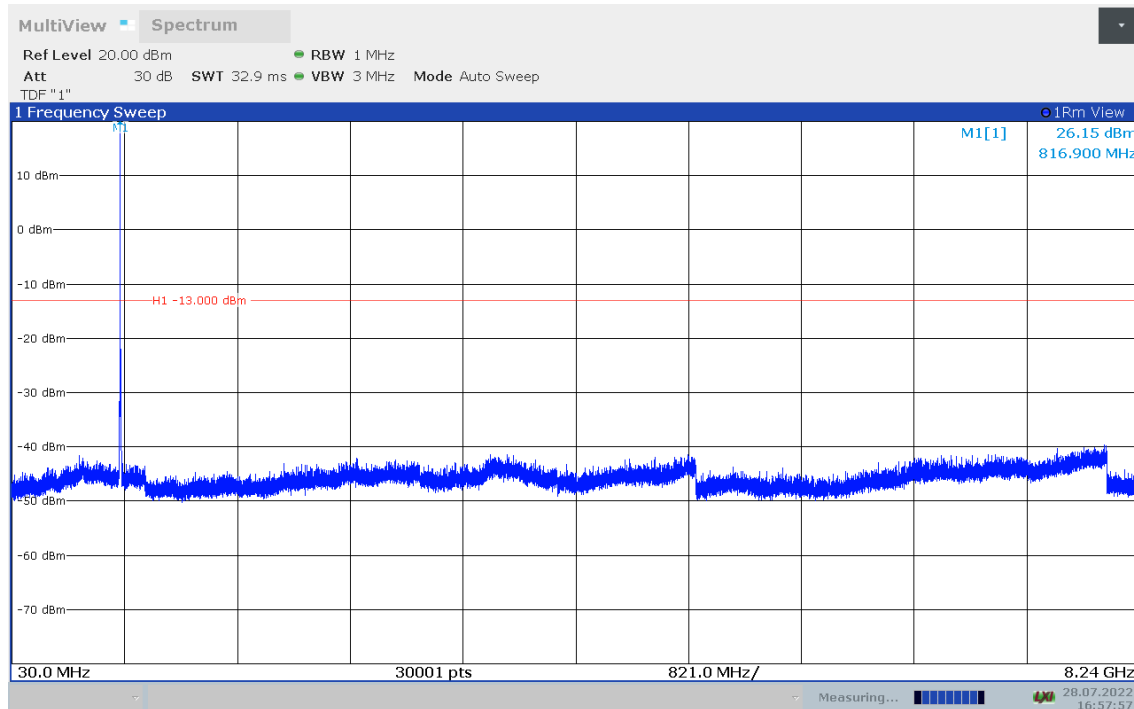
NOTE: peak above the limit line is the carrier frequency.



LTE band 26(814MHz-824MHz): 30MHz – 8.24GHz

Spurious emission limit –13dBm.

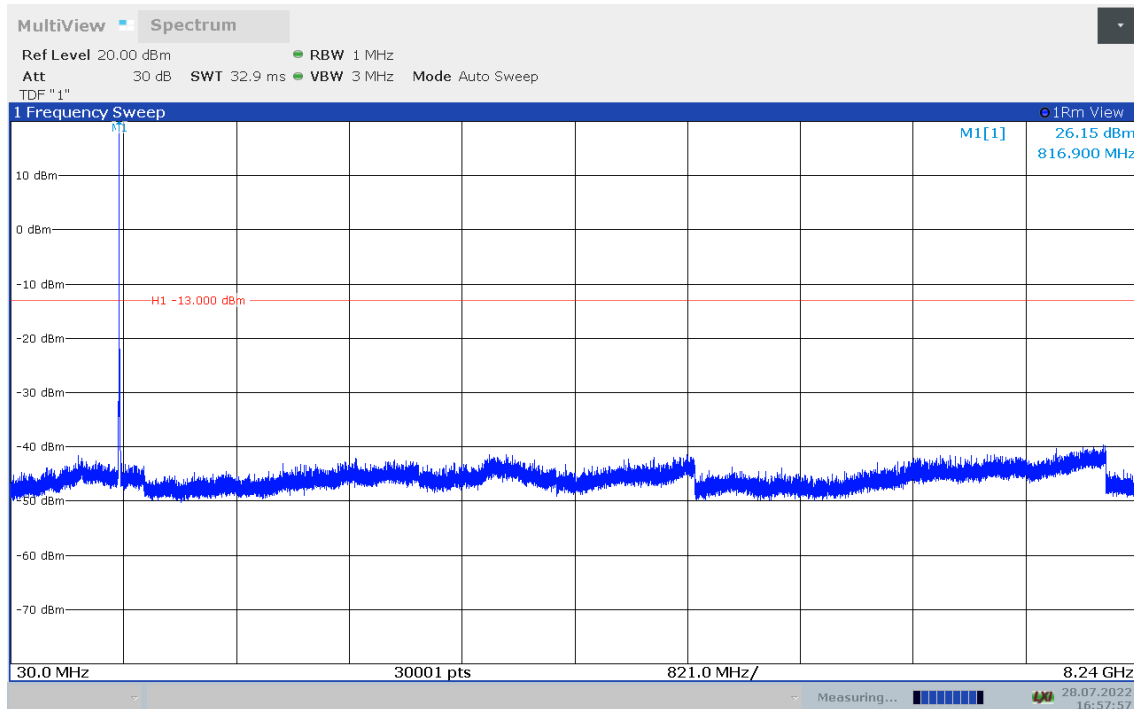
NOTE: peak above the limit line is the carrier frequency.



LTE band 26(824MHz-849MHz): 30MHz – 8.49GHz

Spurious emission limit –13dBm.

NOTE: peak above the limit line is the carrier frequency.

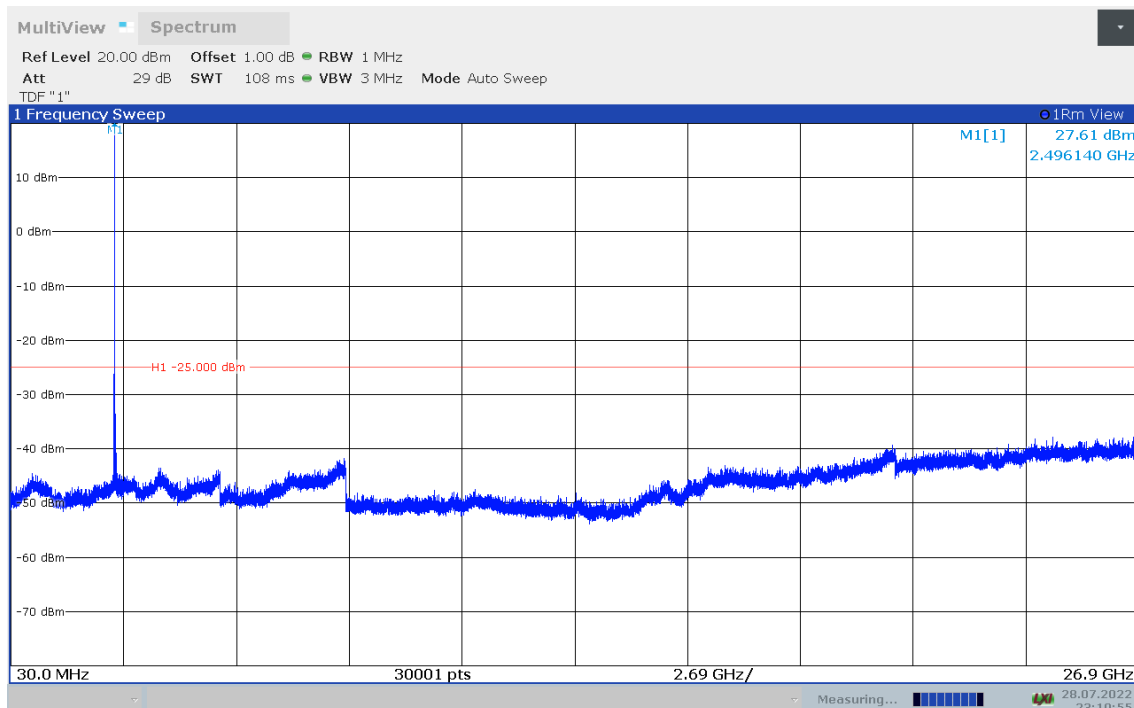


LTE

band 41: 30MHz – 26.9GHz

Spurious emission limit –25dBm.

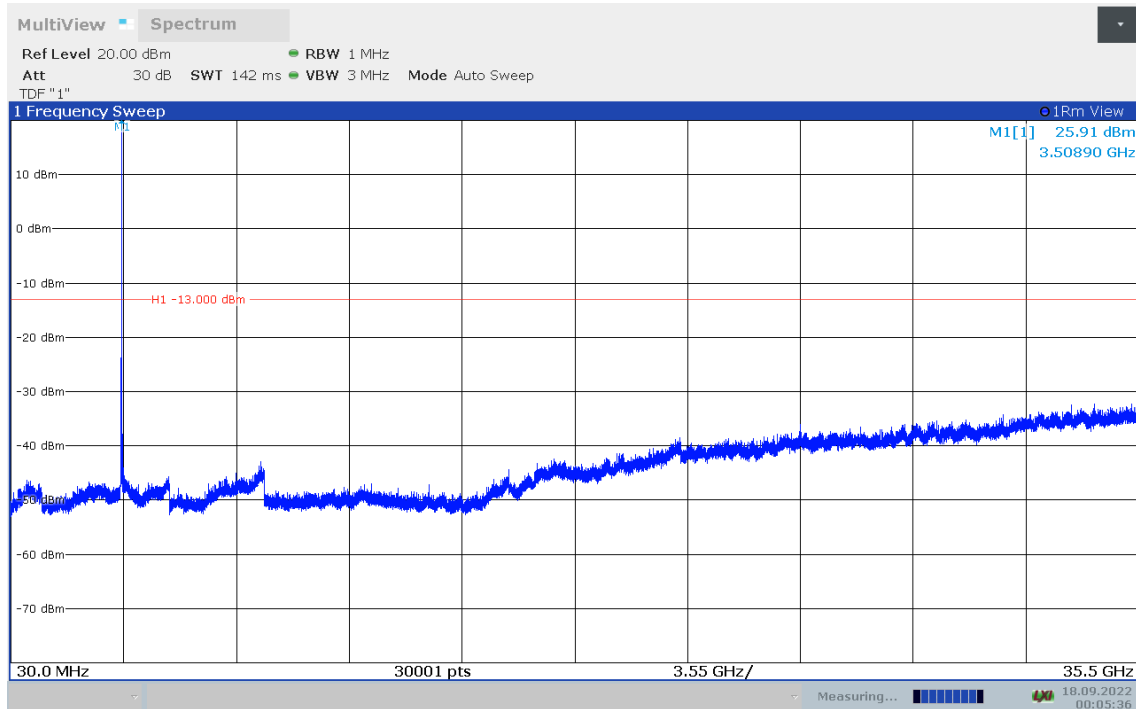
NOTE: peak above the limit line is the carrier frequency.



LTE band 42(3450MHz-3550MHz): 30MHz – 35.5GHz

Spurious emission limit –13dBm.

NOTE: peak above the limit line is the carrier frequency.

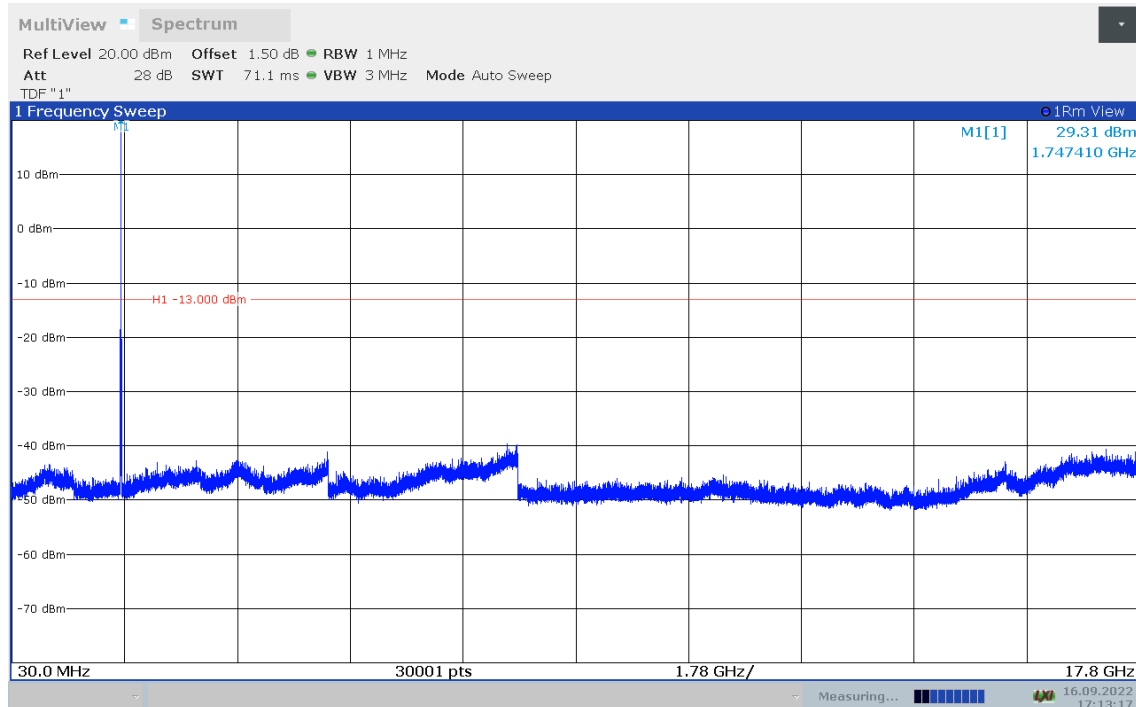




LTE Band 66: 30MHz – 17.8GHz

Spurious emission limit –13dBm.

NOTE: peak above the limit line is the carrier frequency.



A.8 PEAK-TO-AVERAGE POWER RATIO

Reference

FCC: CFR Part 24.232, 27.50(d), KDB971168 D01(5.7).

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

a) Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;

b) Set resolution/measurement bandwidth \geq signal's occupied bandwidth;

c) Set the number of counts to a value that stabilizes the measured CCDF curve;

d) Set the measurement interval to 1 ms

e) Record the maximum PAPR level associated with a probability of 0.1%

A.8.1 Measurement limit

not exceed 13 dB

A.8.2 Measurement results

Only worst case result is given below

LTE band 7

| Frequency(MHz) | Bandwidth(MHz) | PAPR(dB) | | |
|----------------|----------------|----------|-------|-------|
| | | QPSK | 16QAM | 64QAM |
| 2535.0 | 20 | 4.92 | 5.88 | 5.86 |

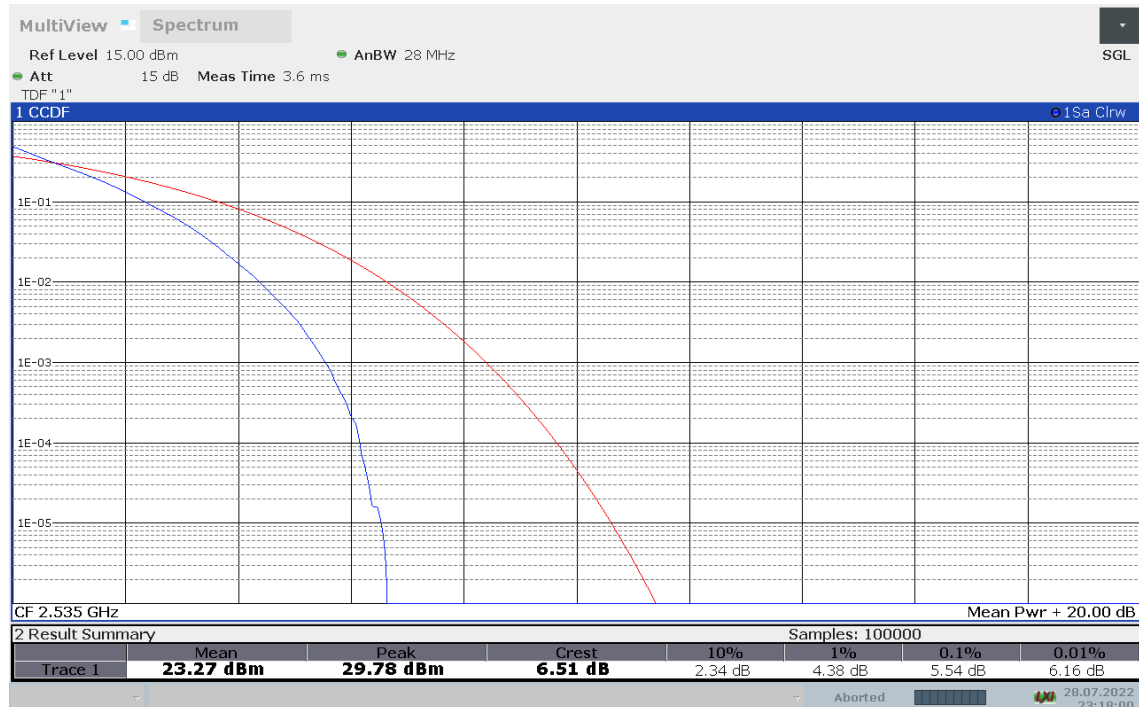
LTE band 7, 20MHz Bandwidth, QPSK (PAPR)



LTE band 7, 20MHz Bandwidth, 16QAM (PAPR)



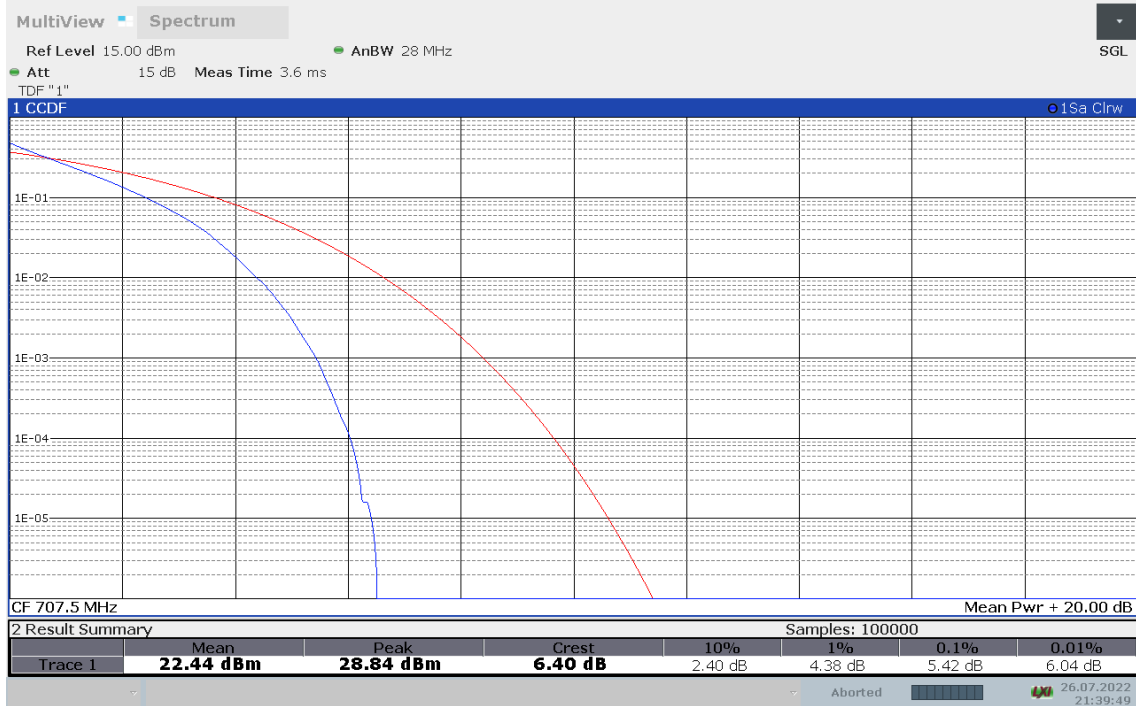
LTE band 7, 20MHz Bandwidth, 64QAM (PAPR)



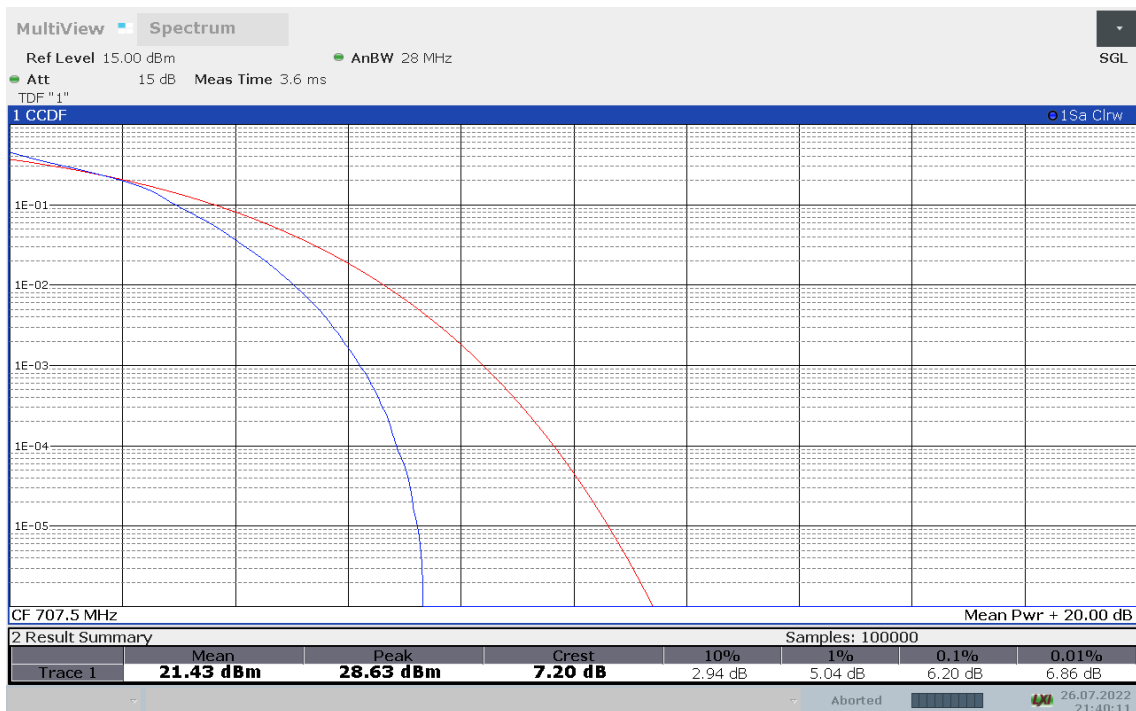
LTE band 12

| Frequency(MHz) | Bandwidth(MHz) | PAPR(dB) | | |
|----------------|----------------|----------|-------|-------|
| | | QPSK | 16QAM | 64QAM |
| 707.5 | 10 | 4.92 | 5.88 | 5.86 |

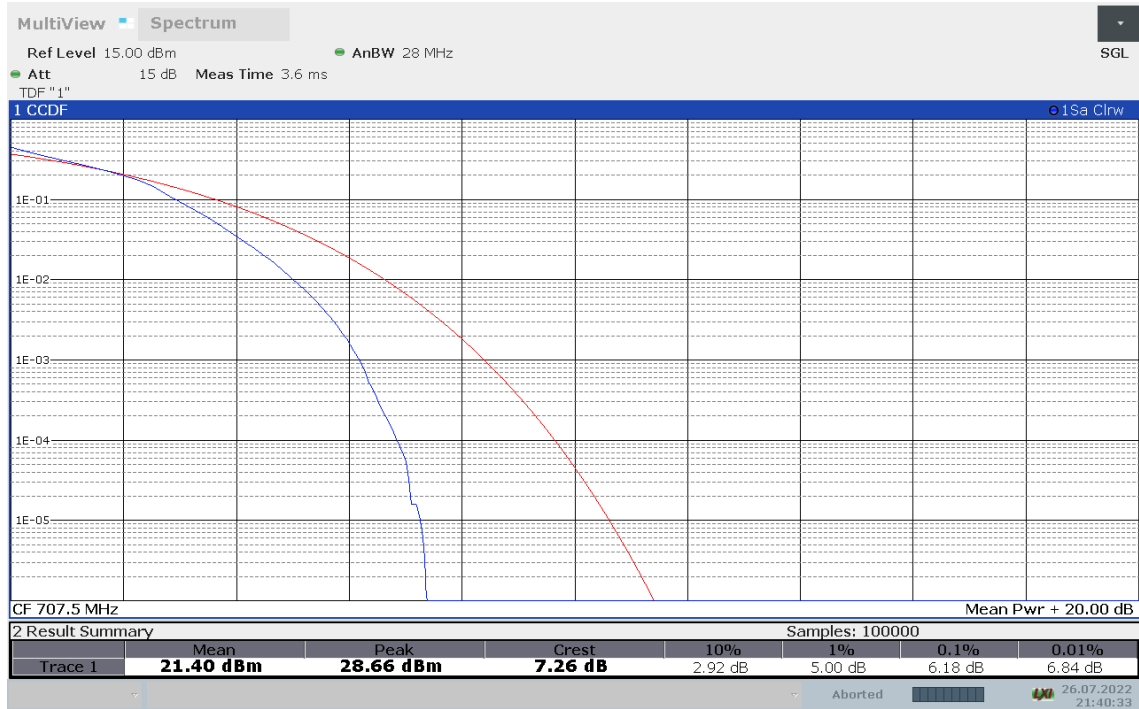
LTE band 12, 10MHz Bandwidth, QPSK (PAPR)



LTE band 12, 10MHz Bandwidth, 16QAM (PAPR)



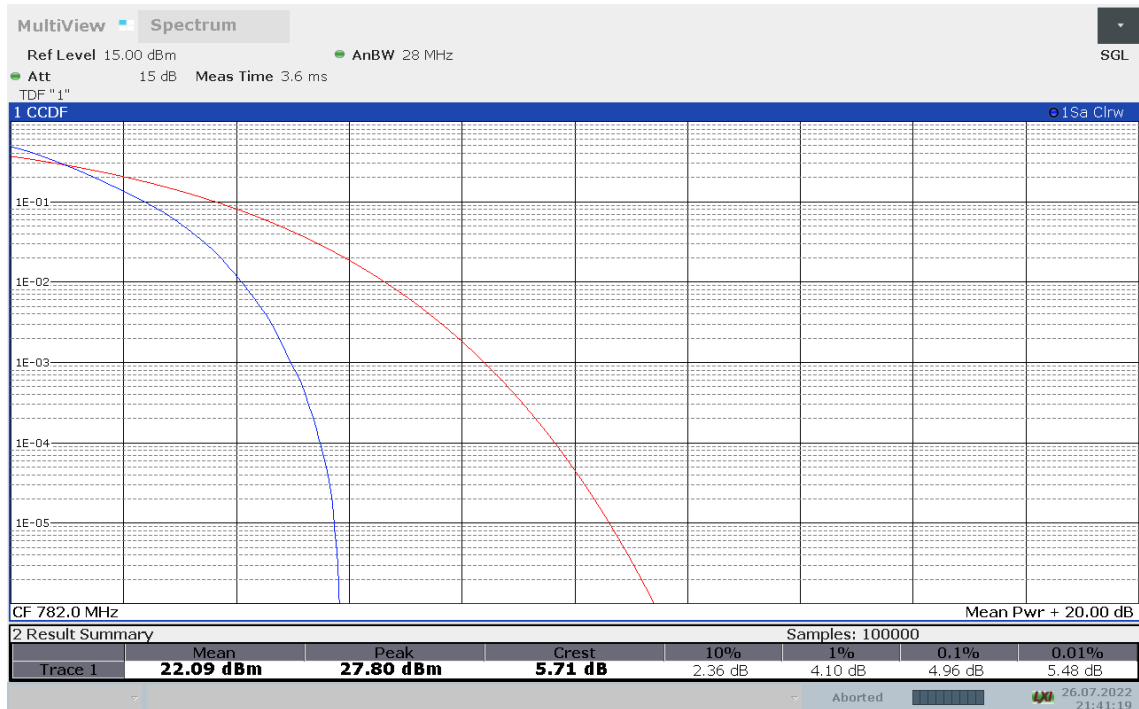
LTE band 12, 10MHz Bandwidth, 64QAM (PAPR)



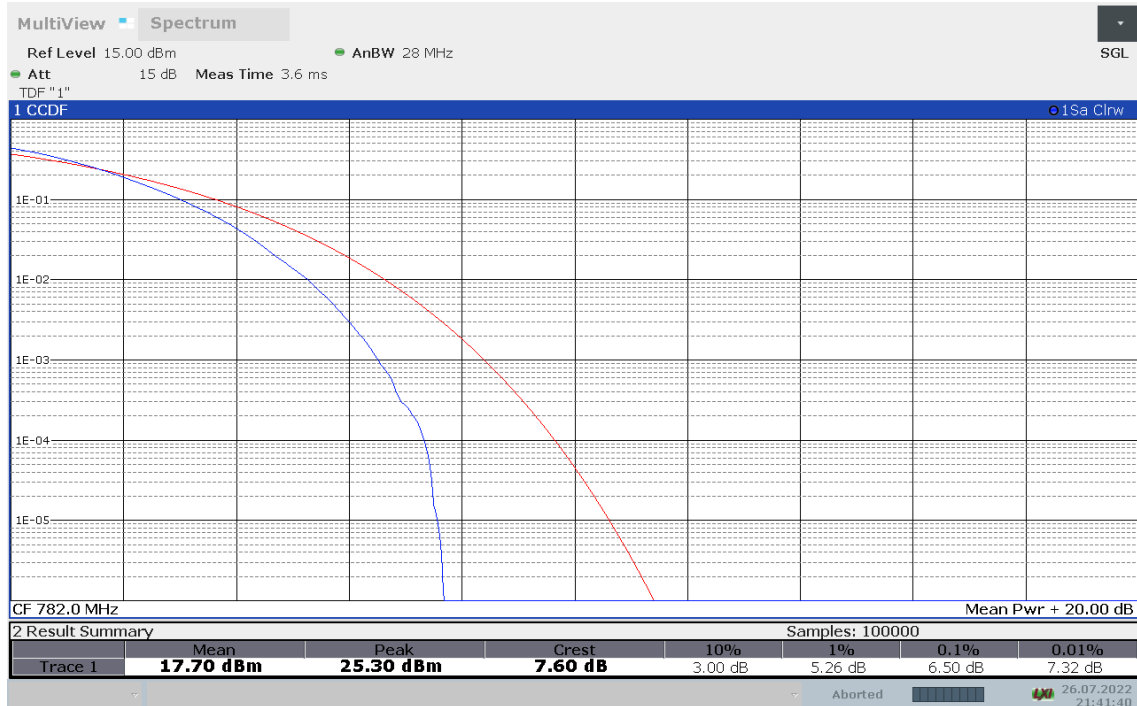
LTE band 13

| Frequency(MHz) | Bandwidth(MHz) | PAPR(dB) | | |
|----------------|----------------|----------|-------|-------|
| | | QPSK | 16QAM | 64QAM |
| 782.0 | 10 | 4.92 | 5.88 | 5.86 |

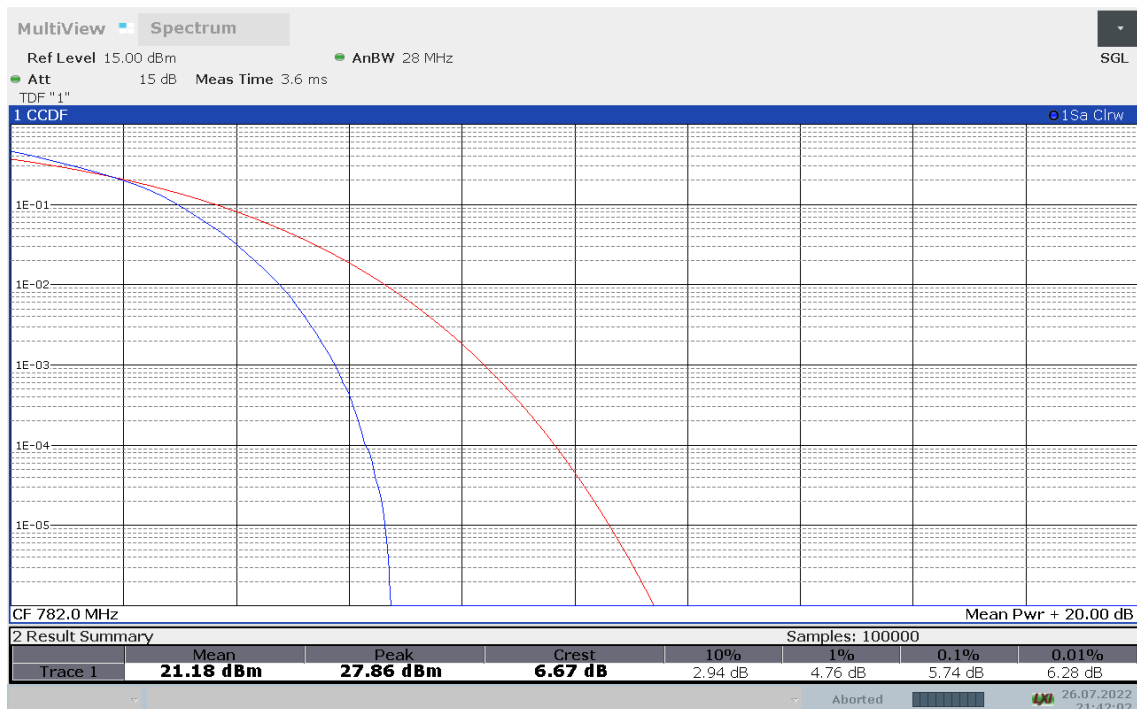
LTE band 13, 10MHz Bandwidth, QPSK (PAPR)



LTE band 13, 10MHz Bandwidth, 16QAM (PAPR)



LTE band 13, 10MHz Bandwidth, 64QAM (PAPR)



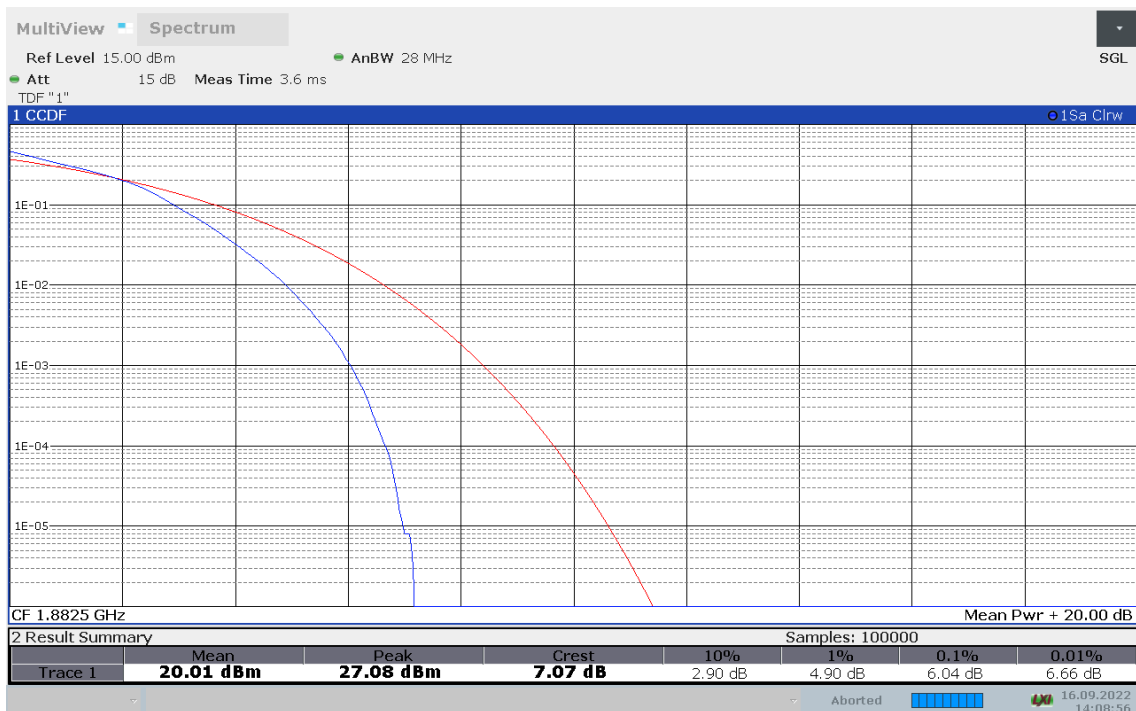
LTE band 25

| Frequency(MHz) | Bandwidth(MHz) | PAPR(dB) | | |
|----------------|----------------|----------|-------|-------|
| | | QPSK | 16QAM | 64QAM |
| 1882.5 | 20 | 4.96 | 5.82 | 5.86 |

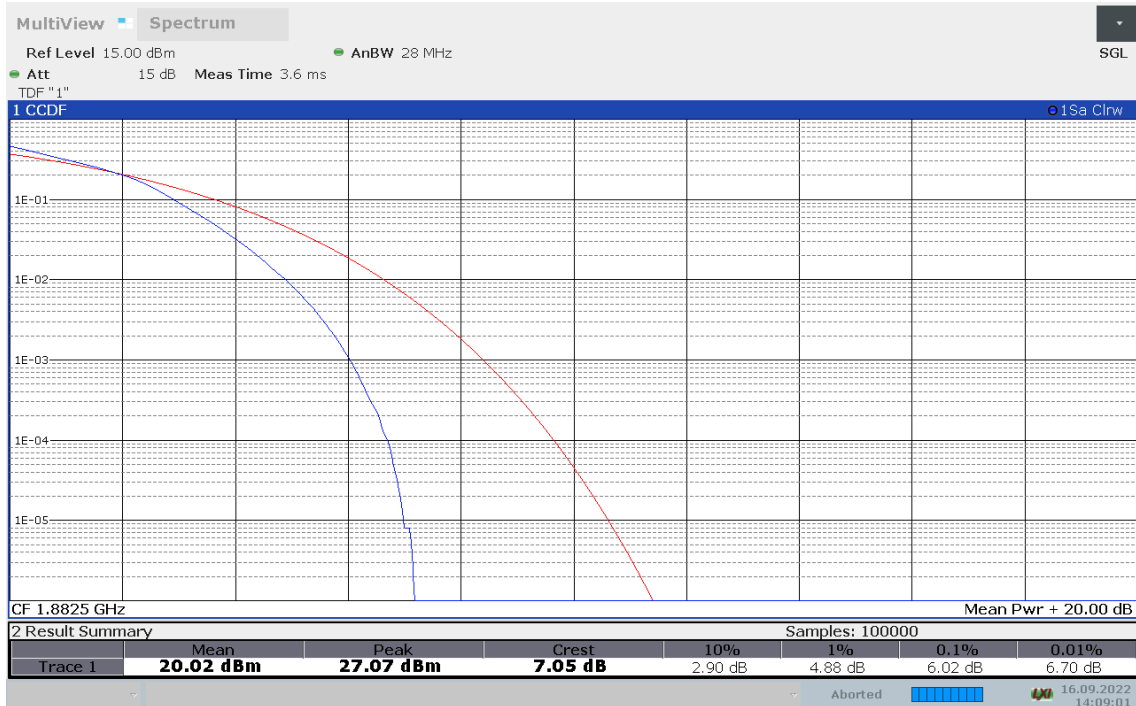
LTE band 25, 20MHz Bandwidth, QPSK (PAPR)



LTE band 25, 20MHz Bandwidth, 16QAM (PAPR)



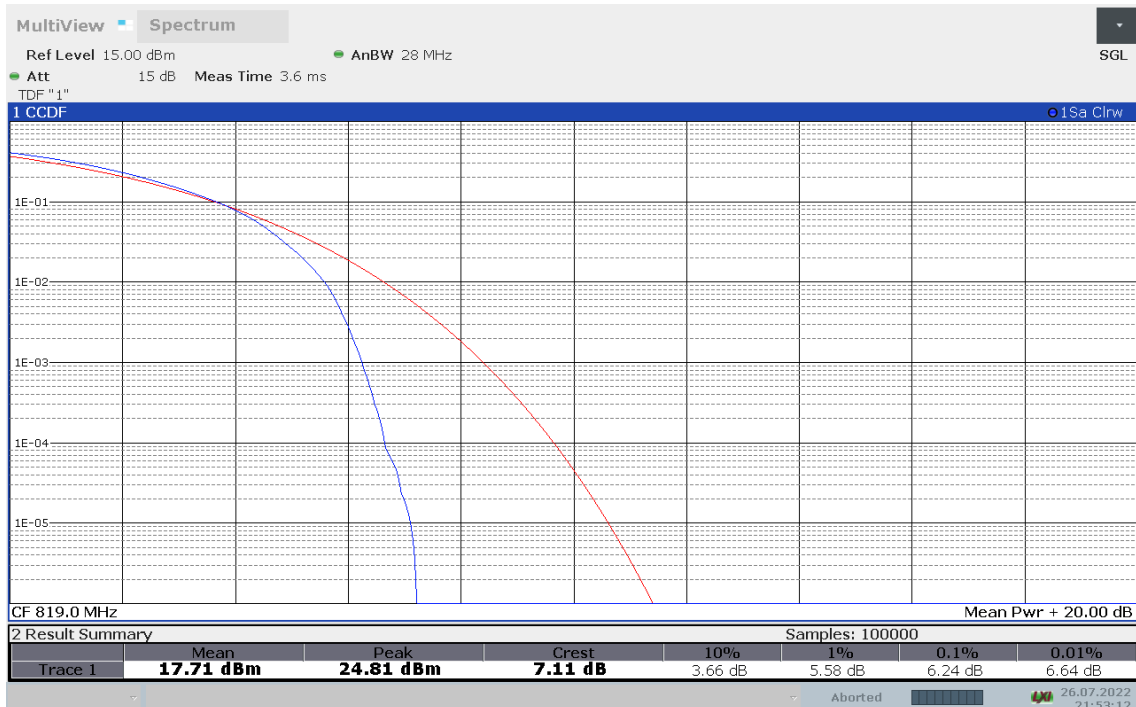
LTE band 25, 20MHz Bandwidth, 64QAM (PAPR)



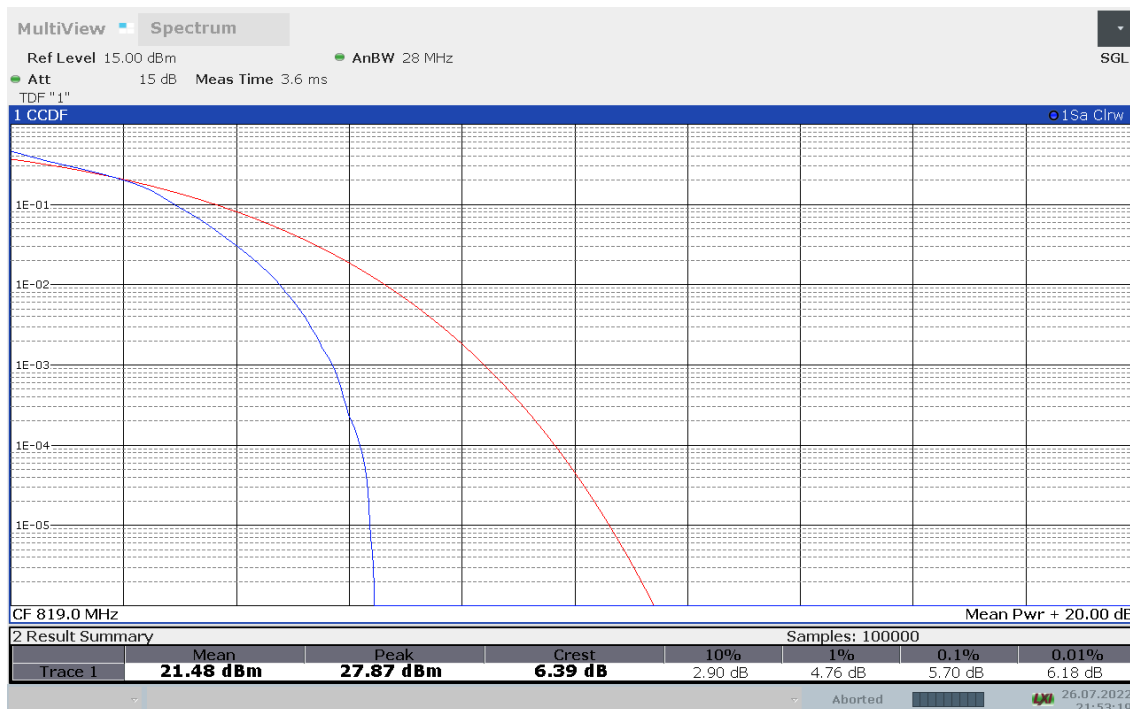
LTE band 26(814MHz -824MHz)

| Frequency(MHz) | Bandwidth(MHz) | PAPR(dB) | | |
|----------------|----------------|----------|-------|-------|
| | | QPSK | 16QAM | 64QAM |
| 819.0 | 10 | 4.92 | 5.88 | 5.86 |

LTE band 26(814MHz -824MHz), 10MHz Bandwidth, QPSK (PAPR)



LTE band 26(814MHz -824MHz), 10MHz Bandwidth, 16QAM (PAPR)



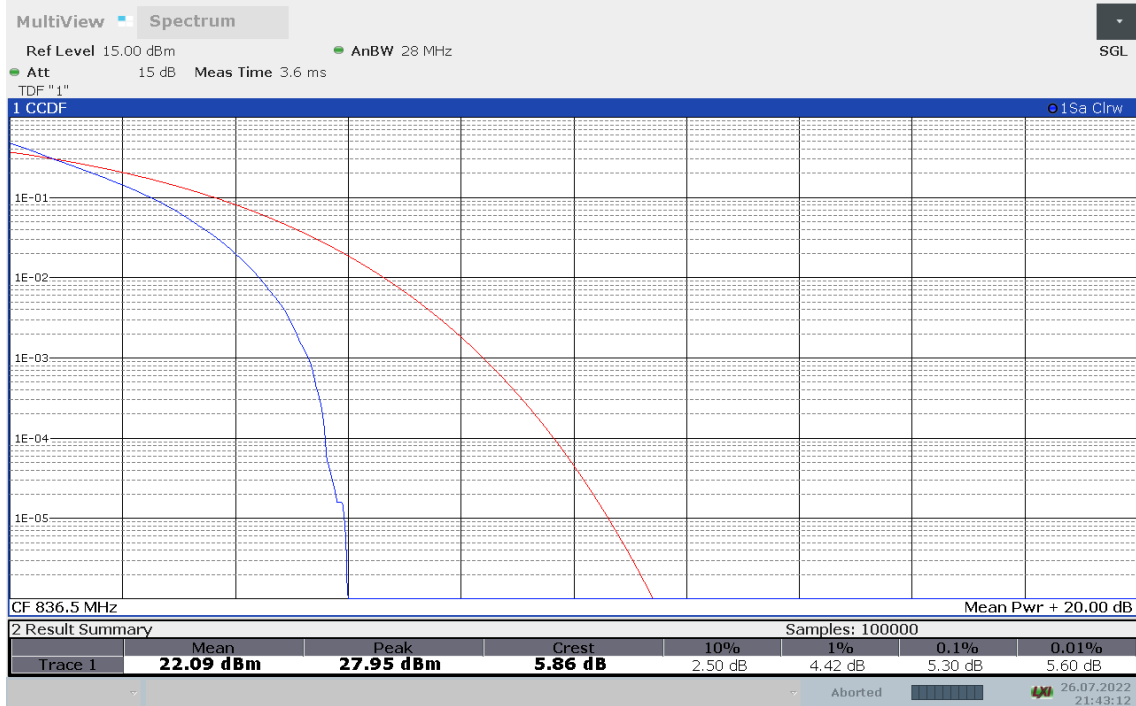
LTE band 26(814MHz -824MHz), 10MHz Bandwidth, 64QAM (PAPR)



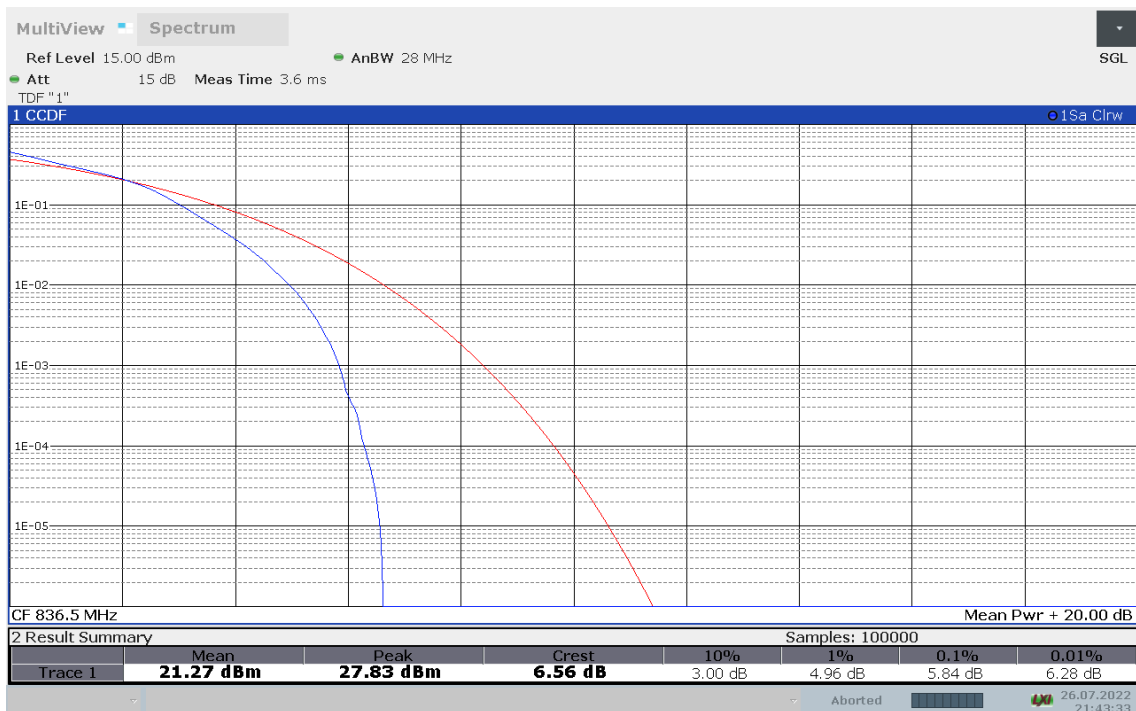
LTE band 26(824MHz -849MHz)

| Frequency(MHz) | Bandwidth(MHz) | PAPR(dB) | | |
|----------------|----------------|----------|-------|-------|
| | | QPSK | 16QAM | 64QAM |
| 836.5 | 15 | 4.92 | 5.88 | 5.86 |

LTE band 26(824MHz -849MHz), 15MHz Bandwidth, QPSK (PAPR)



LTE band 26(824MHz -849MHz), 15MHz Bandwidth, 16QAM (PAPR)



LTE band 26(824MHz -849MHz), 15MHz Bandwidth, 64QAM (PAPR)



LTE band 41

| Frequency(MHz) | Bandwidth(MHz) | PAPR(dB) | | |
|----------------|----------------|----------|-------|-------|
| | | QPSK | 16QAM | 64QAM |
| 2335 | 20 | 4.92 | 5.88 | 5.86 |

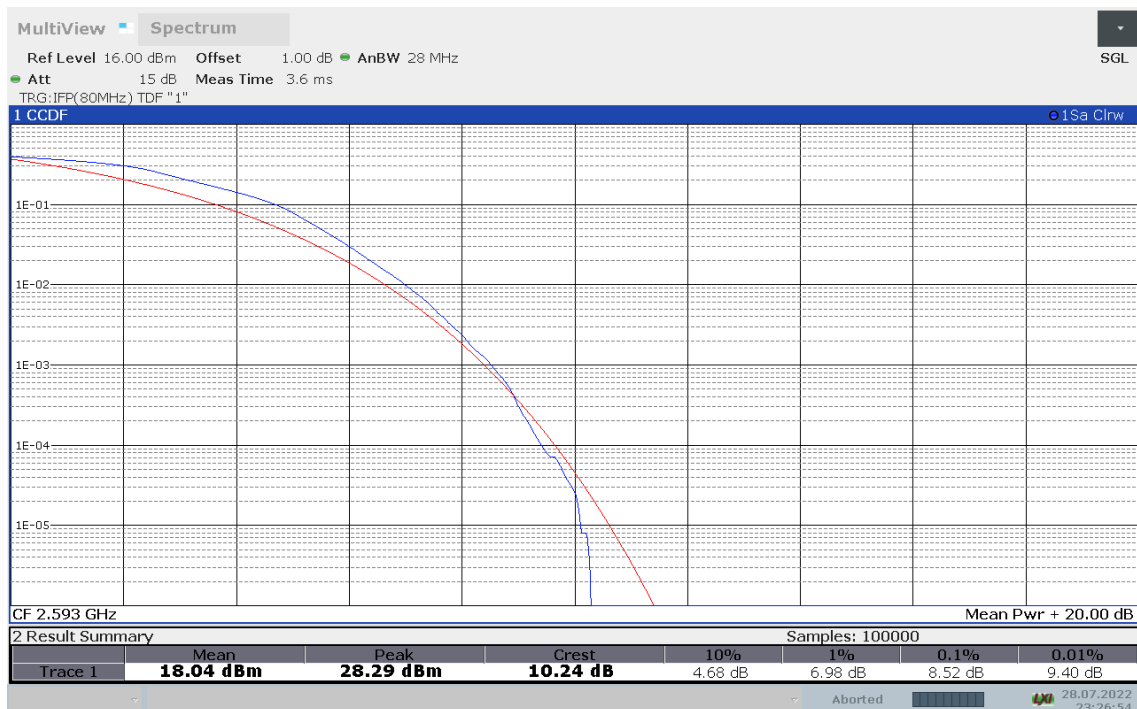
LTE band 41, 20MHz Bandwidth, QPSK (PAPR)



LTE band 41, 20MHz Bandwidth, 16QAM (PAPR)



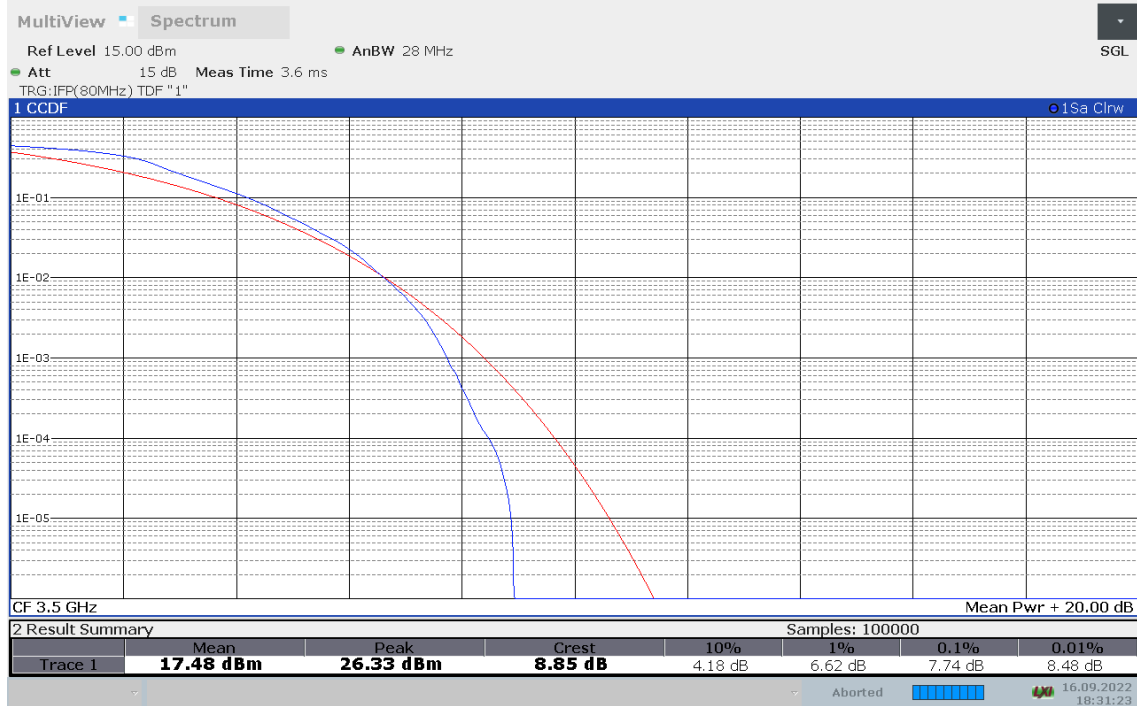
LTE band 41, 20MHz Bandwidth, 64QAM (PAPR)



LTE band 42(3450MHz-3550MHz)

| Frequency(MHz) | Bandwidth(MHz) | PAPR(dB) | | |
|----------------|----------------|----------|-------|-------|
| | | QPSK | 16QAM | 64QAM |
| 3500 | 20 | 4.92 | 5.88 | 5.86 |

LTE band 42(3450MHz-3550MHz), 20MHz Bandwidth, QPSK (PAPR)



LTE band 42(3450MHz-3550MHz), 20MHz Bandwidth, 16QAM (PAPR)



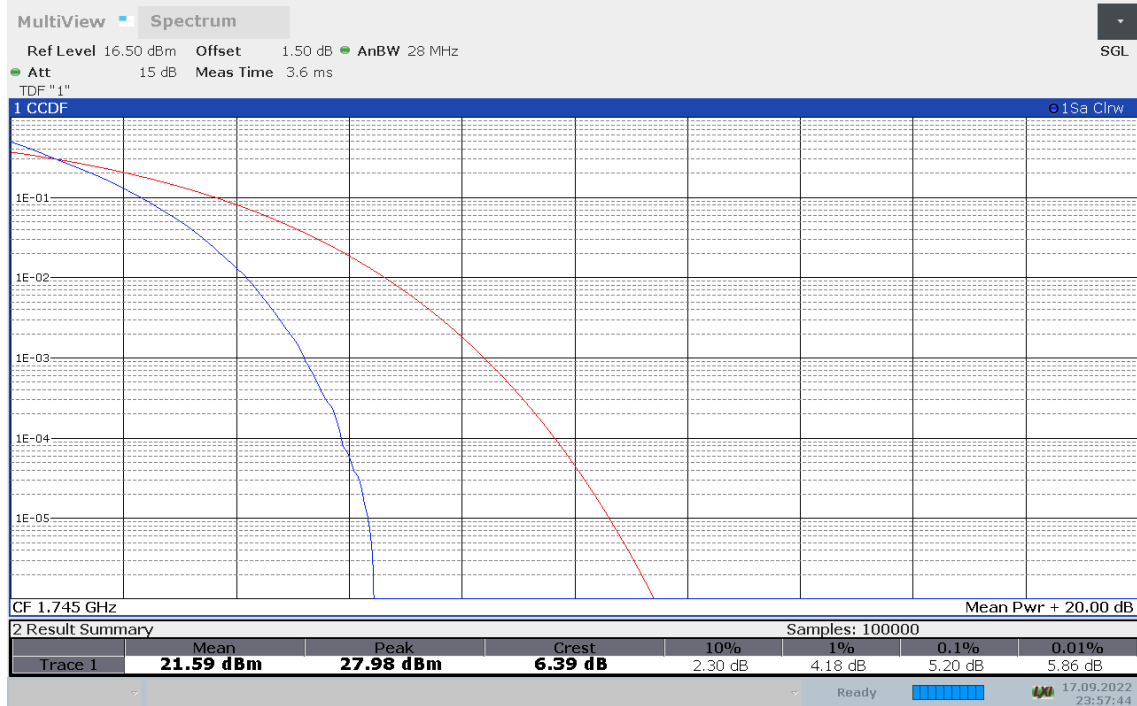
LTE band 42(3450MHz-3550MHz), 20MHz Bandwidth, 64QAM (PAPR)



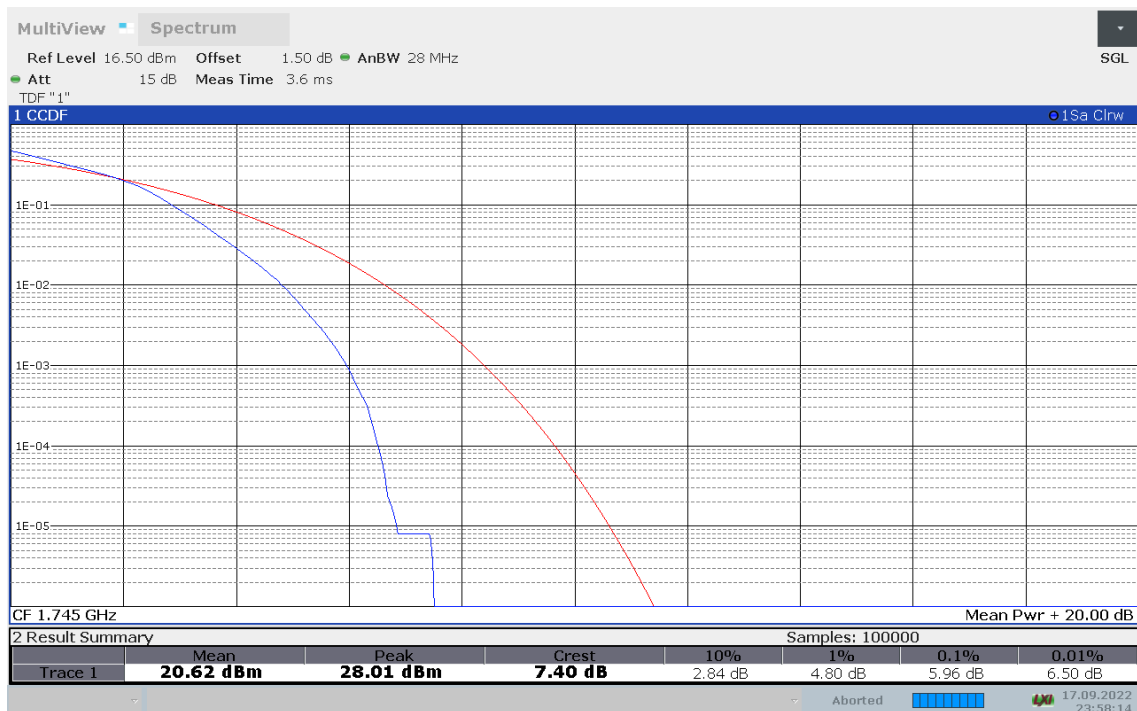
LTE band 66

| Frequency(MHz) | Bandwidth(MHz) | PAPR(dB) | | |
|----------------|----------------|----------|-------|-------|
| | | QPSK | 16QAM | 64QAM |
| 1745.0 | 20 | 4.92 | 5.88 | 5.86 |

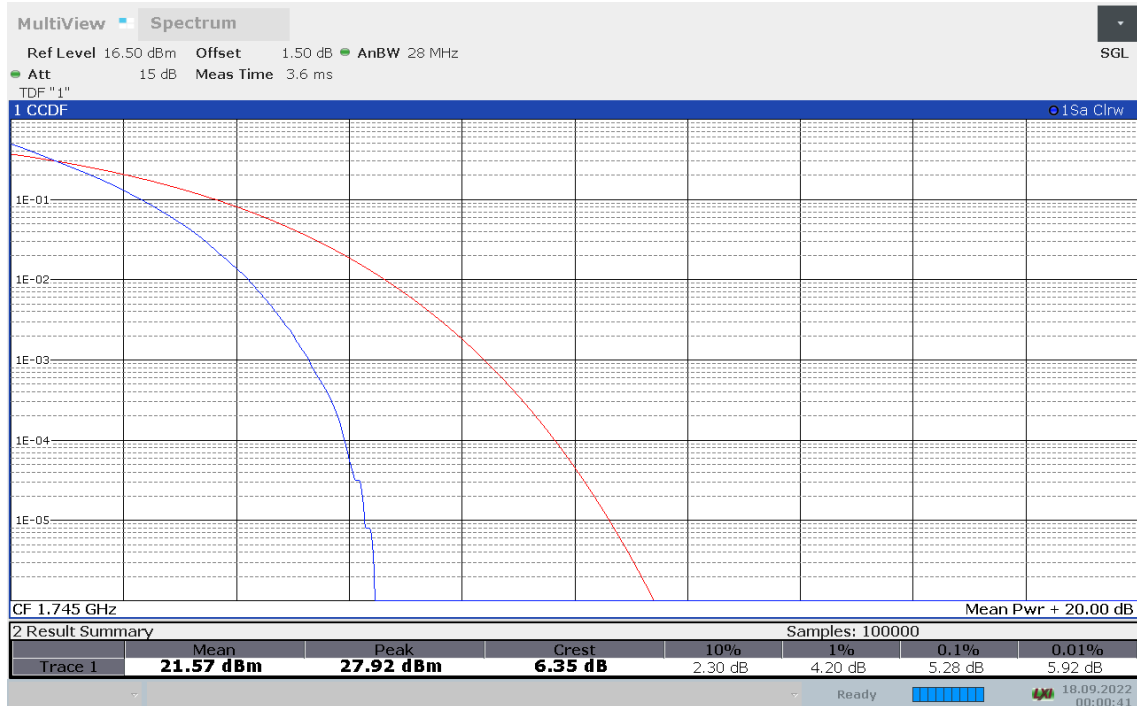
LTE band 66, 20MHz Bandwidth, QPSK (PAPR)



LTE band 66, 20MHz Bandwidth, 16QAM (PAPR)



LTE band 66, 20MHz Bandwidth, 64QAM (PAPR)



Note: Expanded measurement uncertainty is $U = 0.48$, $k = 2$

END OF REPORT