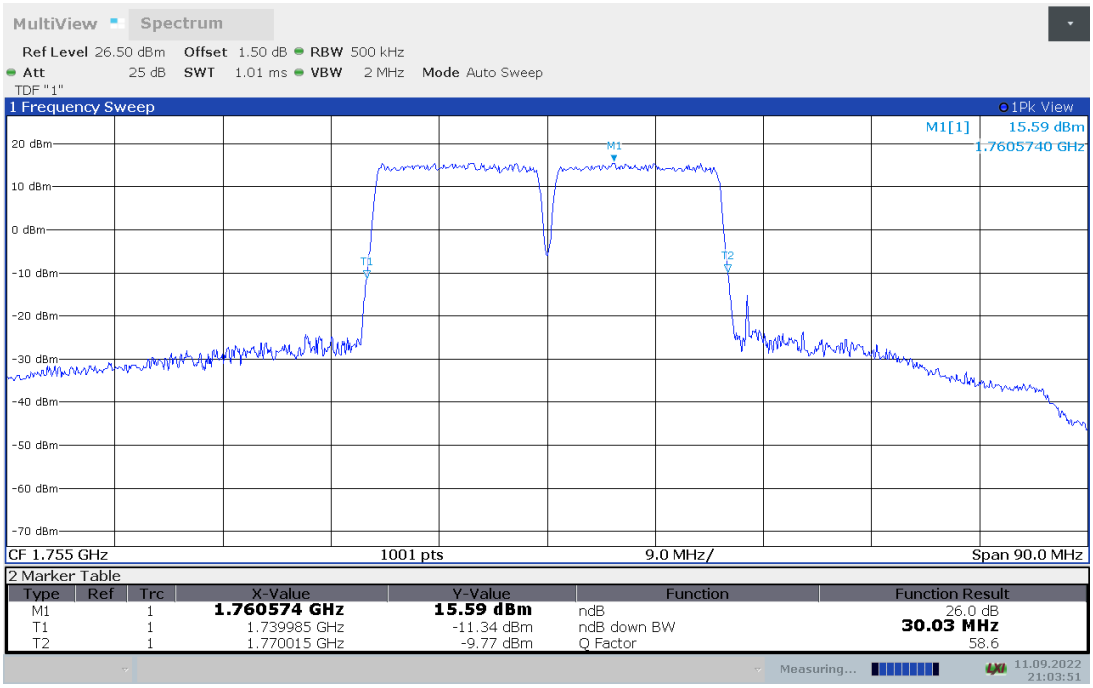
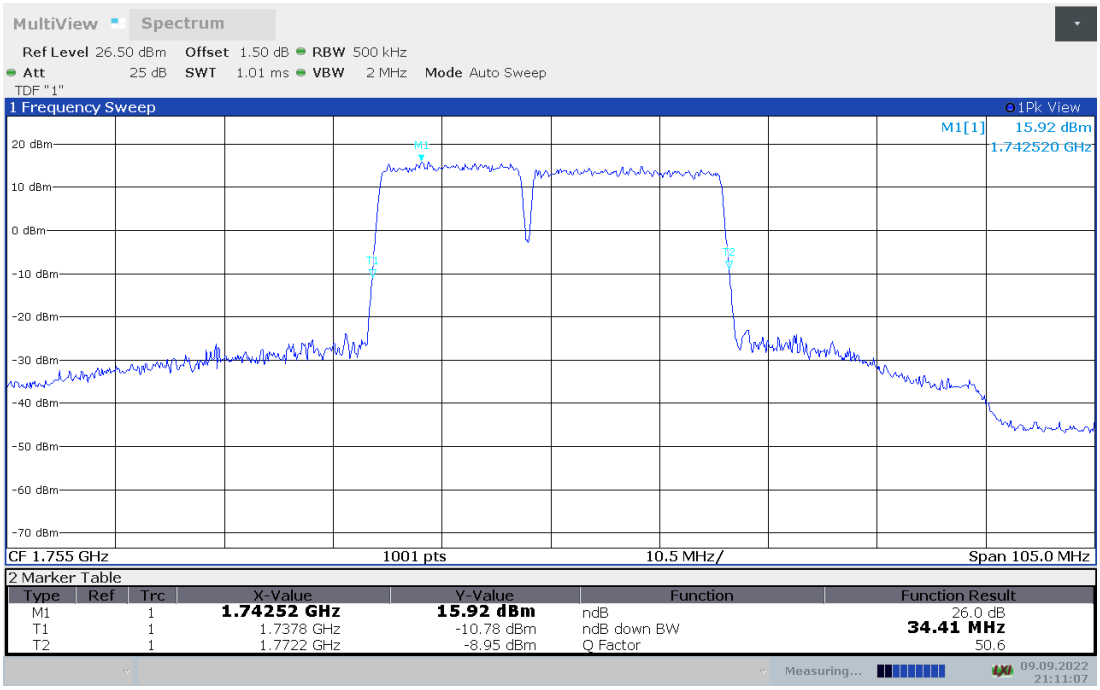
LTE CA_66C , 15MHz+15MHz Bandwidth, 64QAM (-26dBc BW)



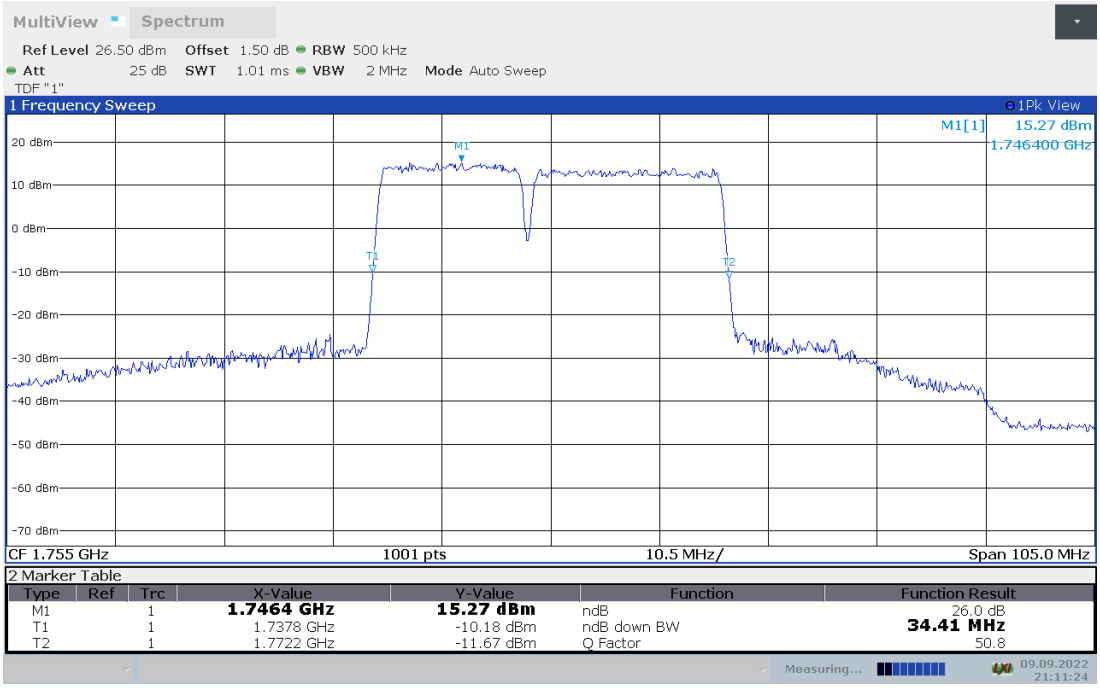
LTE CA_66C,15MHz+20MHz (-26dBc BW)

Frequency (MHz)	Emission Bandwidth (-26dBc) (MHz)		
	QPSK	16QAM	64QAM
1755	34.41	34.41	34.51

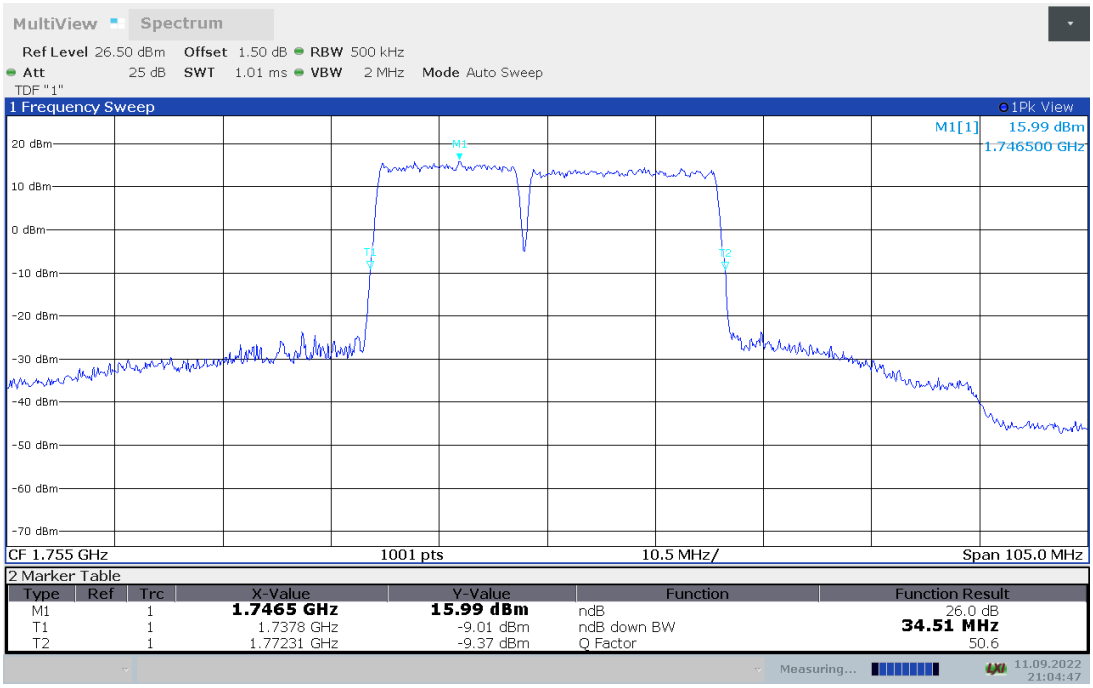
LTE CA_66C , 15MHz+20MHz Bandwidth,QPSK (-26dBc BW)



LTE CA_66C , 15MHz+20MHz Bandwidth,16QAM (-26dBc BW)



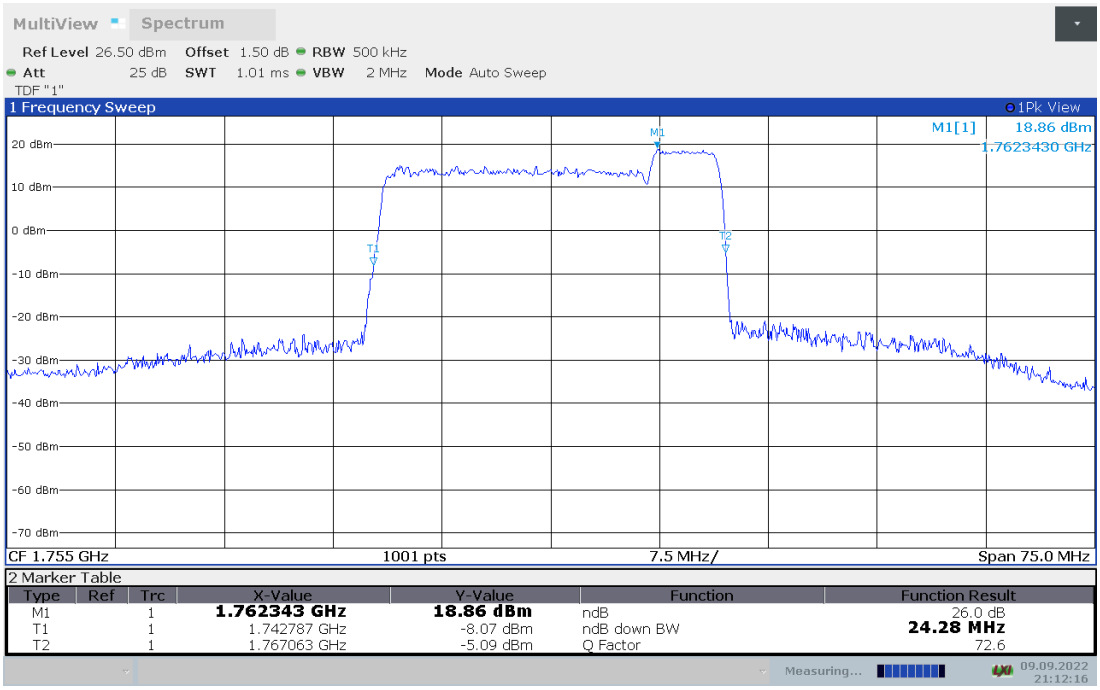
LTE CA_66C , 15MHz+20MHz Bandwidth, 64QAM (-26dBc BW)



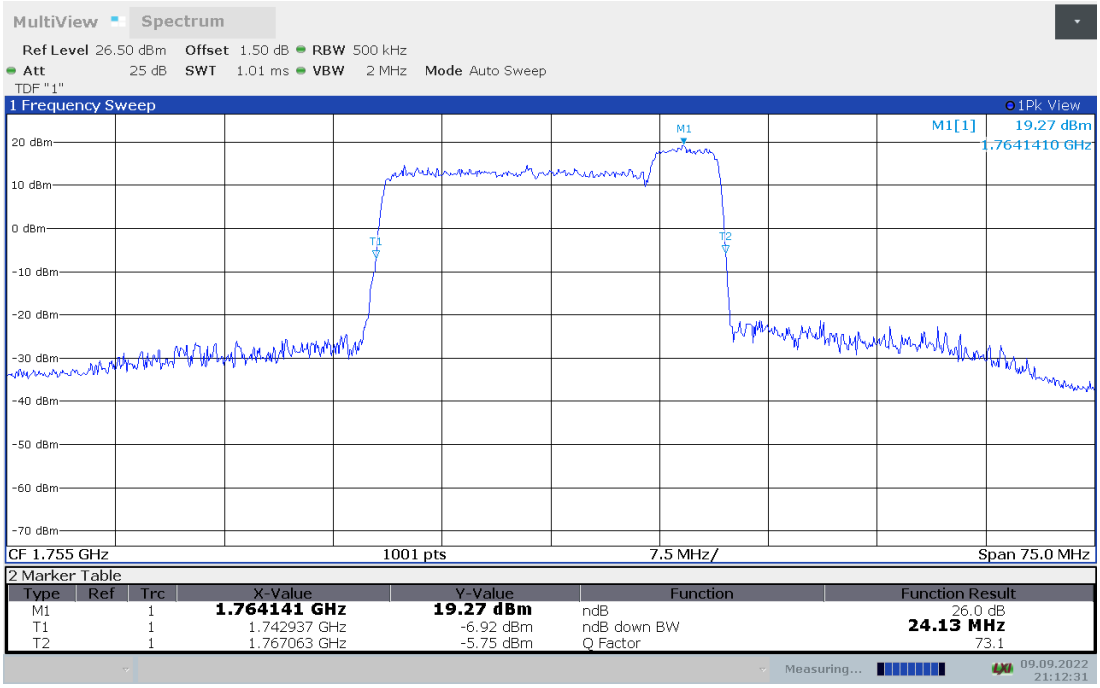
LTE CA_66C,20MHz+5MHz (-26dBc BW)

Frequency (MHz)	Emission Bandwidth (-26dBc) (MHz)		
	QPSK	16QAM	64QAM
1755	24.28	24.13	24.28

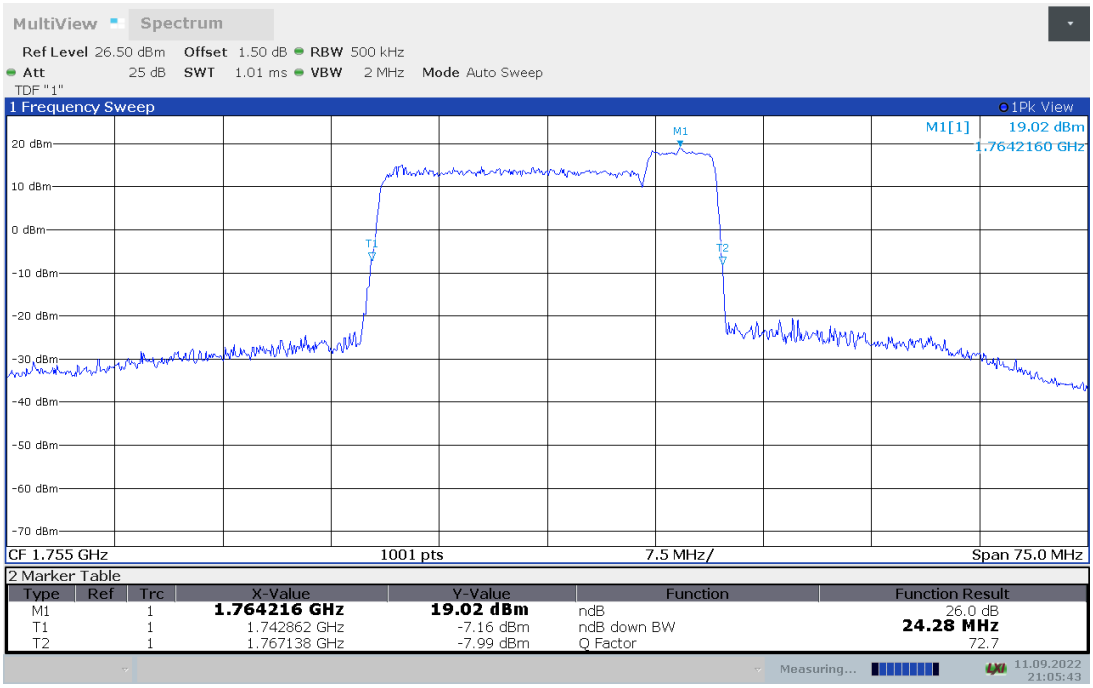
LTE CA_66C , 20MHz+5MHz Bandwidth,QPSK (-26dBc BW)



LTE CA_66C , 20MHz+5MHz Bandwidth,16QAM (-26dBc BW)



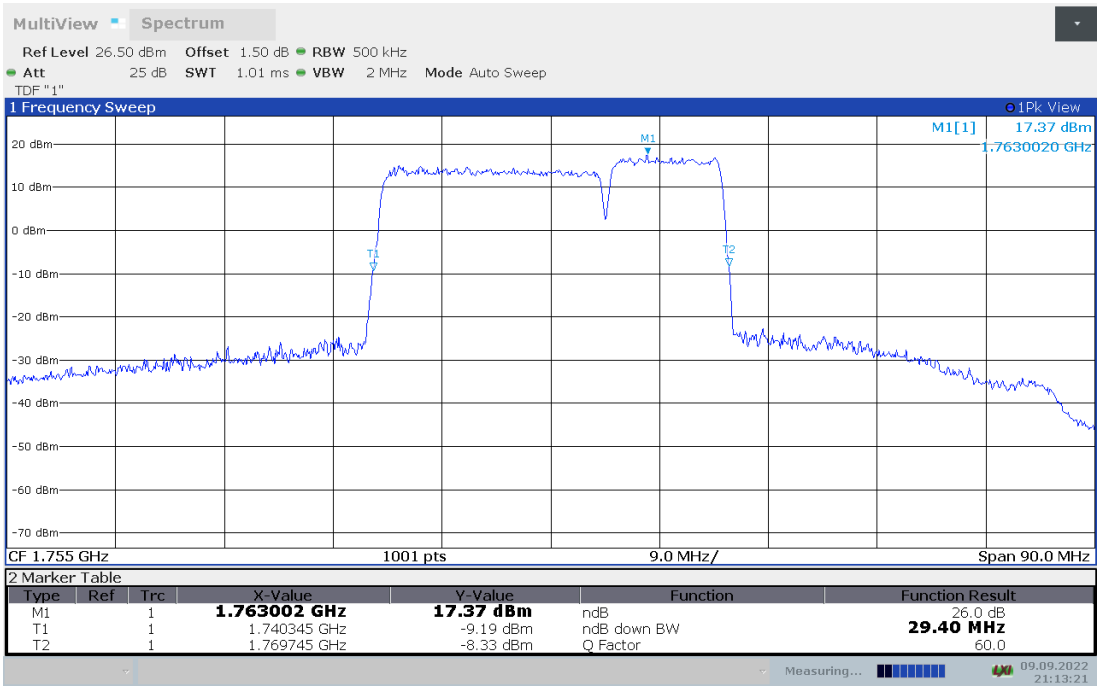
LTE CA_66C , 20MHz+5MHz Bandwidth, 64QAM (-26dBc BW)



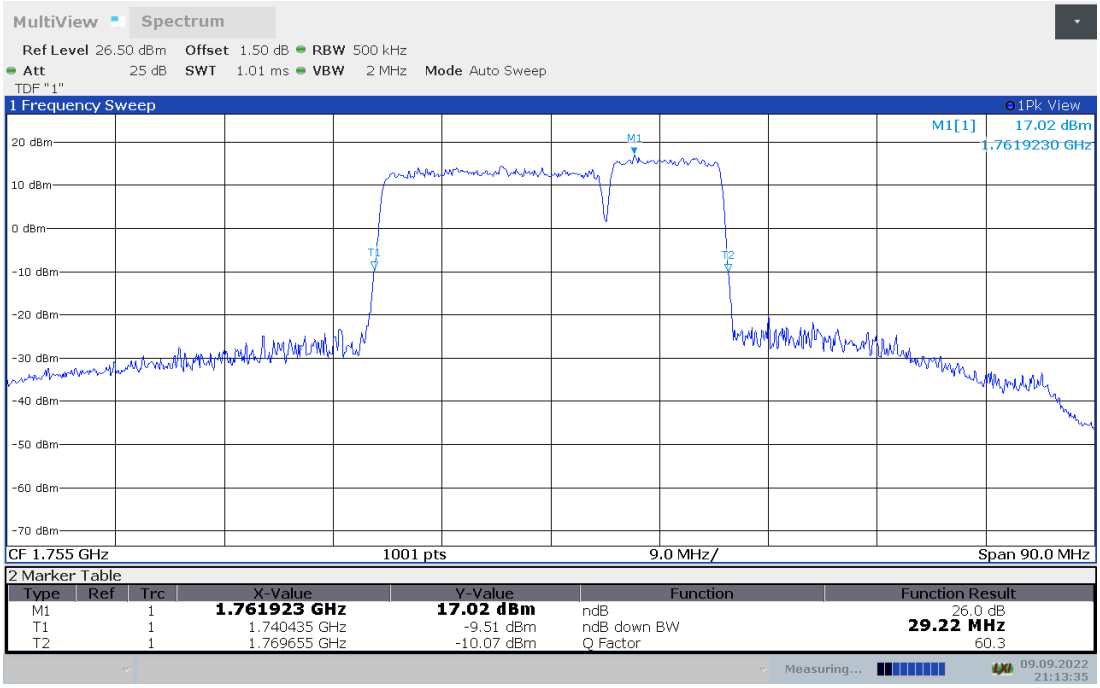
LTE CA_66C,20MHz+10MHz (-26dBc BW)

Frequency (MHz)	Emission Bandwidth (-26dBc) (MHz)		
	QPSK	16QAM	64QAM
1755	29.40	29.22	29.31

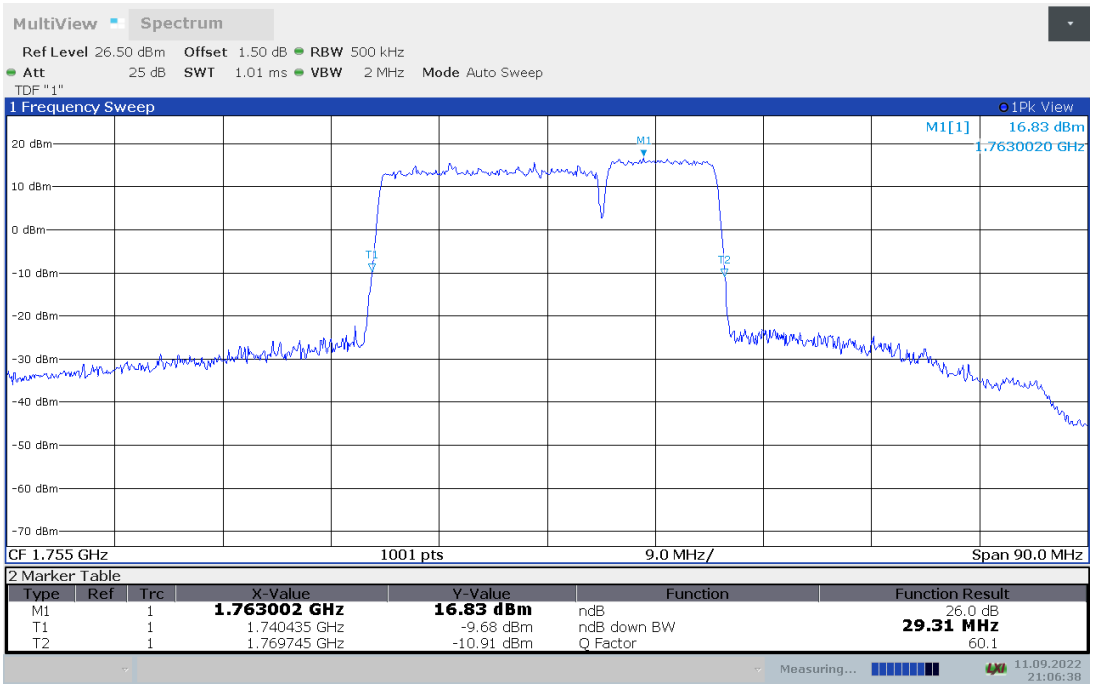
LTE CA_66C , 20MHz+10MHz Bandwidth,QPSK (-26dBc BW)



LTE CA_66C , 20MHz+10MHz Bandwidth,16QAM (-26dBc BW)



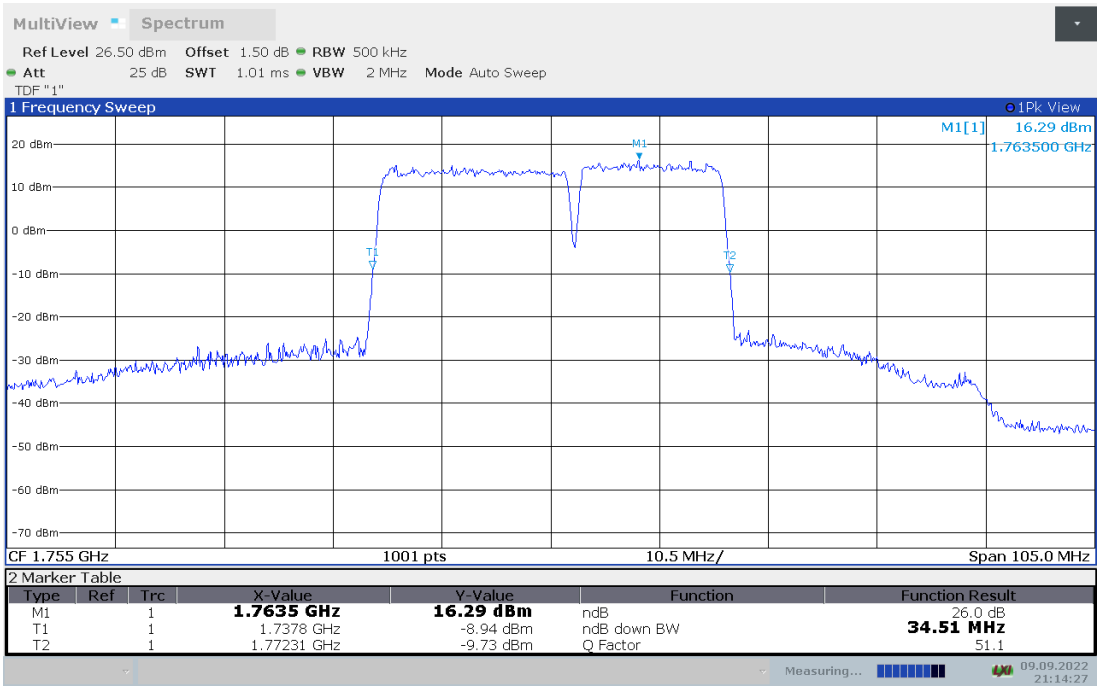
LTE CA_66C , 20MHz+10MHz Bandwidth, 64QAM (-26dBc BW)



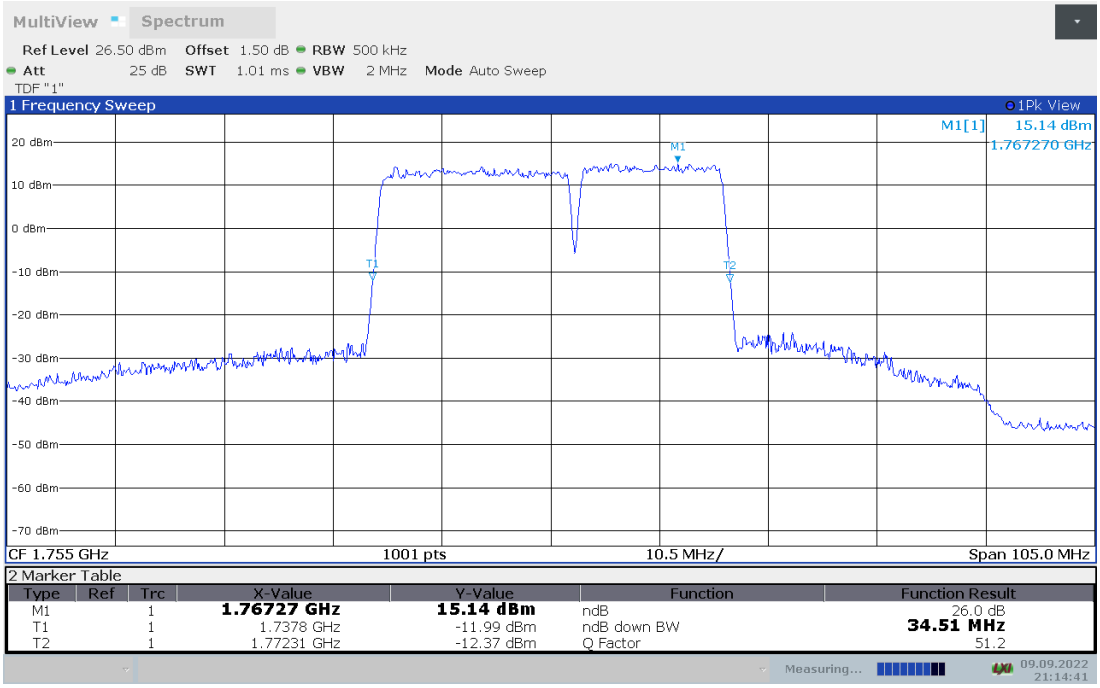
LTE CA_66C,20MHz+15MHz (-26dBc BW)

Frequency (MHz)	Emission Bandwidth (-26dBc) (MHz)		
	QPSK	16QAM	64QAM
1755	34.51	34.51	34.41

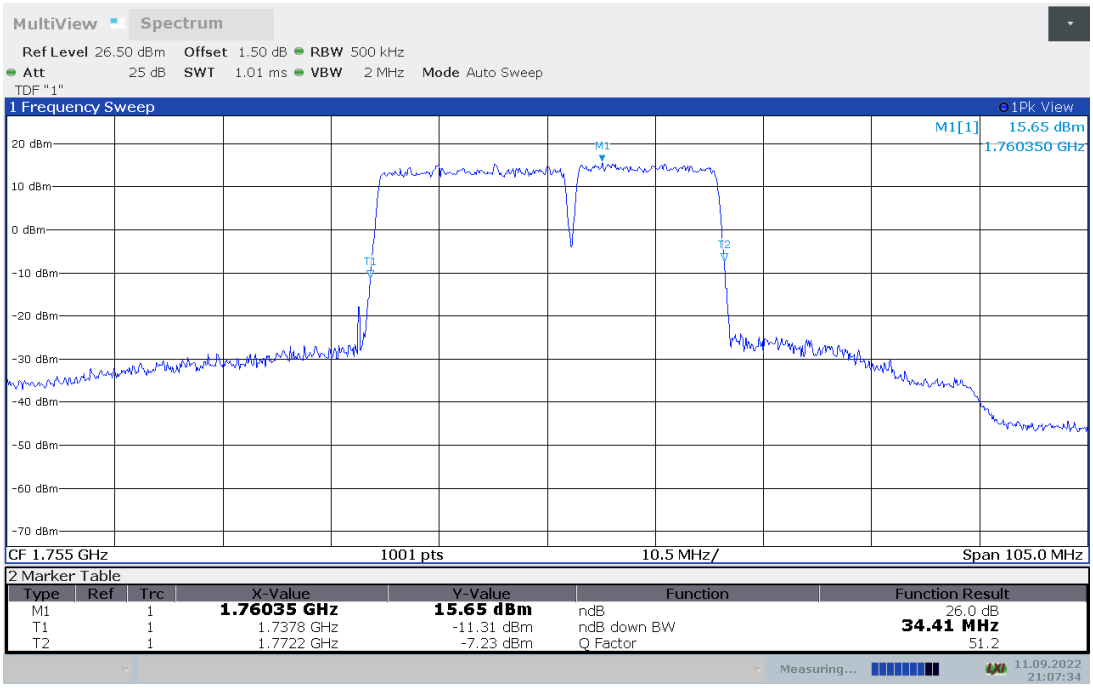
LTE CA_66C , 20MHz+15MHz Bandwidth,QPSK (-26dBc BW)



LTE CA_66C , 20MHz+15MHz Bandwidth,16QAM (-26dBc BW)



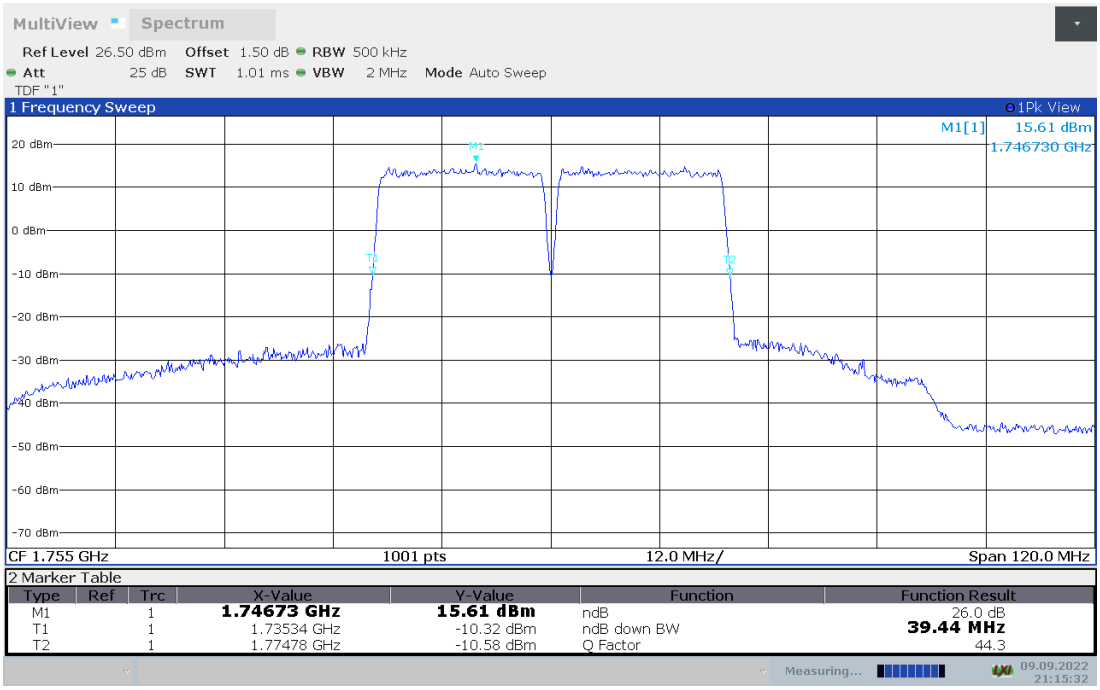
LTE CA_66C , 20MHz+15MHz Bandwidth, 64QAM (-26dBc BW)



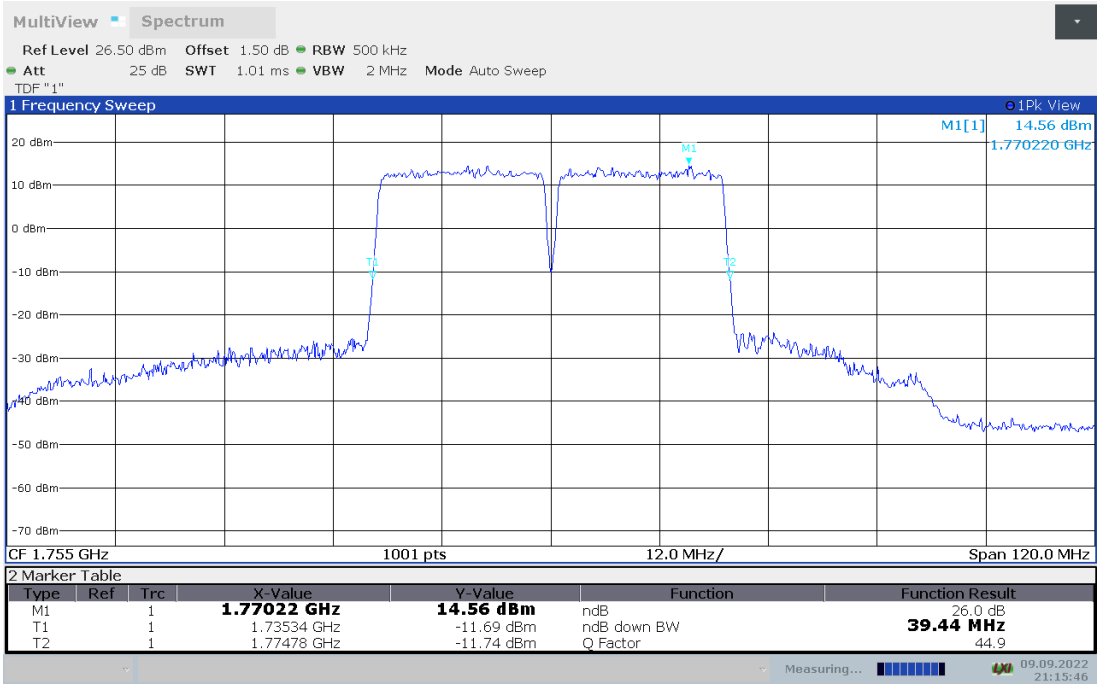
LTE CA_66C,20MHz+20MHz (-26dBc BW)

Frequency (MHz)	Emission Bandwidth (-26dBc) (MHz)		
	QPSK	16QAM	64QAM
1755	39.44	39.44	39.32

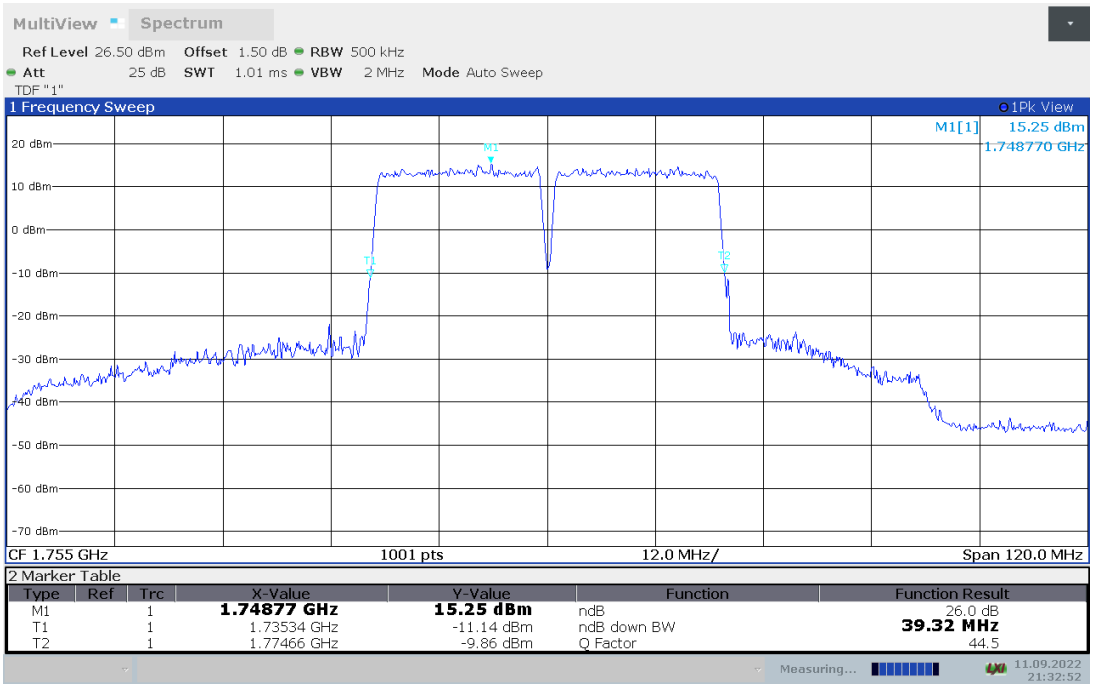
LTE CA_66C , 20MHz+20MHz Bandwidth,QPSK (-26dBc BW)



LTE CA_66C , 20MHz+20MHz Bandwidth,16QAM (-26dBc BW)



LTE CA_66C , 20MHz+20MHz Bandwidth, 64QAM (-26dBc BW)



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

A.5 BAND EDGE COMPLIANCE

Reference

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

A.5.1 Measurement limit

Part 22.917 For operations in the 824–849MHz band, the FCC limit is 43 +10 log (P)dB below the transmitter power(P) in a 100kHz bandwidth. However, in the 1MHz 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.

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.

A.5.2Measurement Procedure

The testing follows ANSI C63.26

a) The EUT was connected to spectrum analyzer and system simulator via a power divider.

b) The band edges of low and high channels for the highest RF powers were measured.

c) Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.

d) Set spectrum analyzer with RMS detector.

e) The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

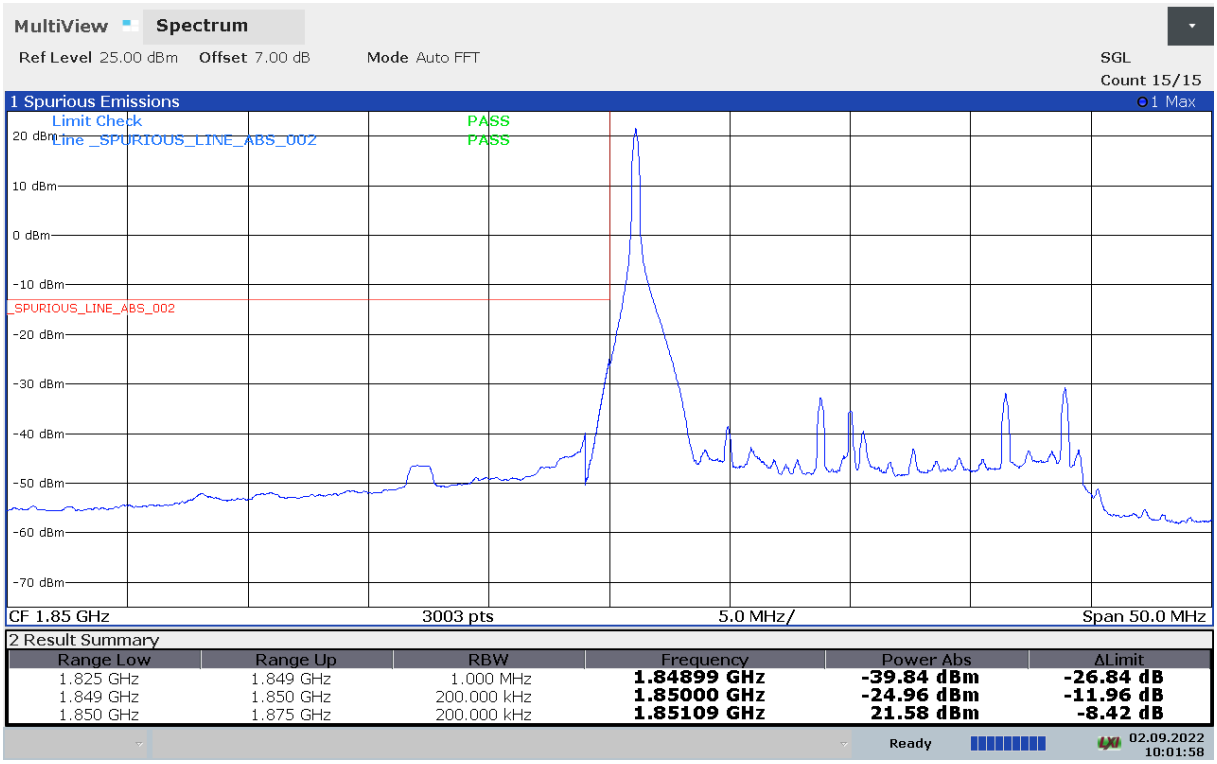
f) Checked that all the results comply with the emission limit line.

A.5.3 Measurement result

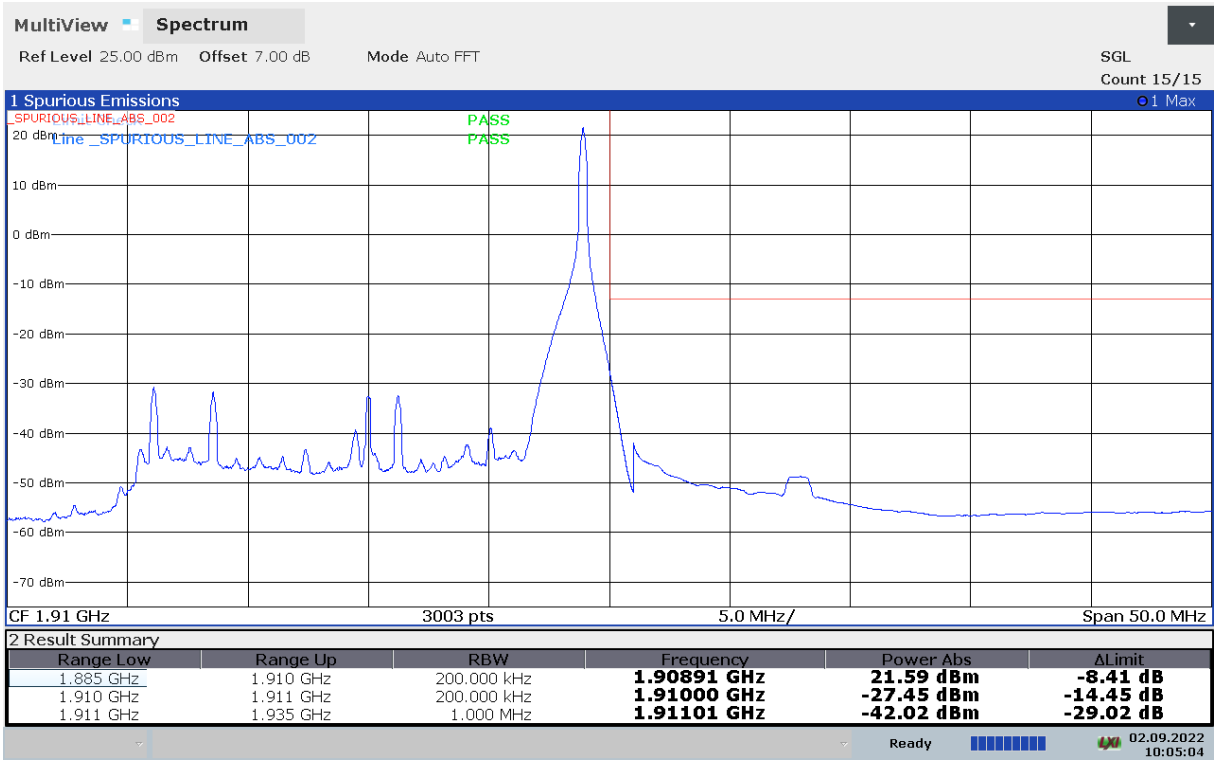
Only worst case result is given below

LTE band 2

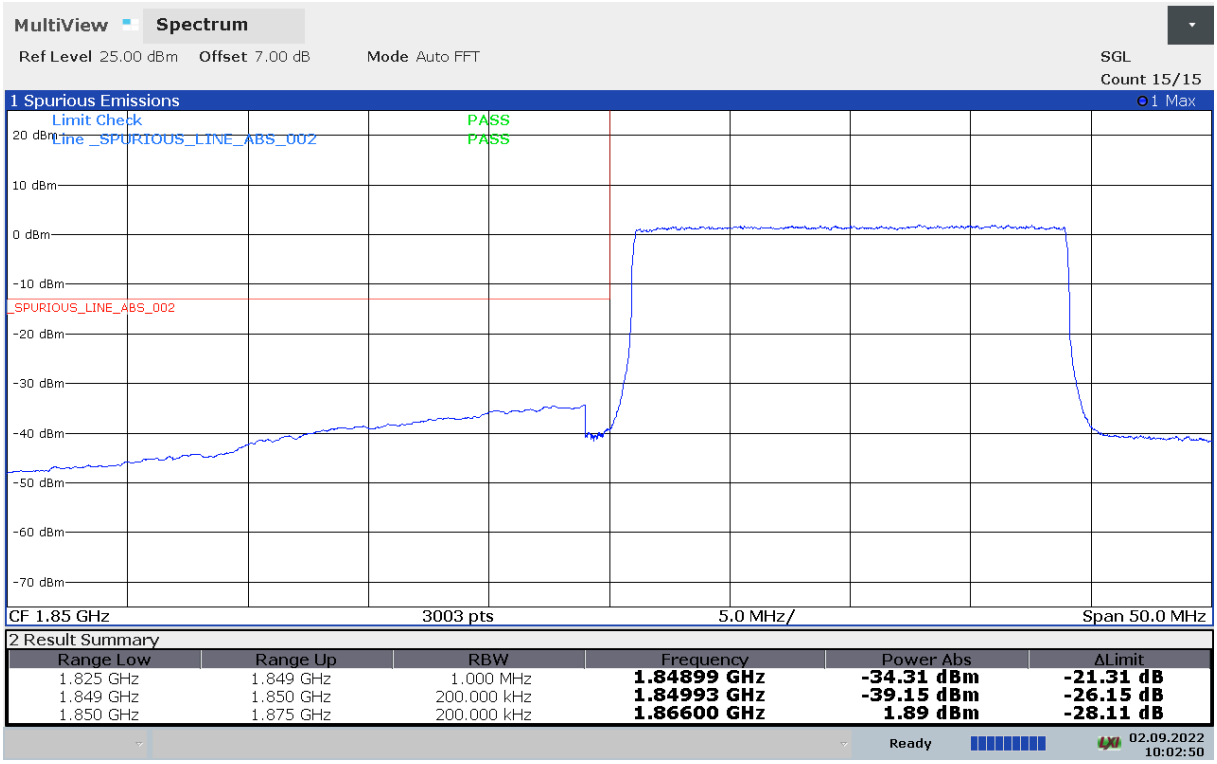
LOW BAND EDGE BLOCK-1RB-low_offset



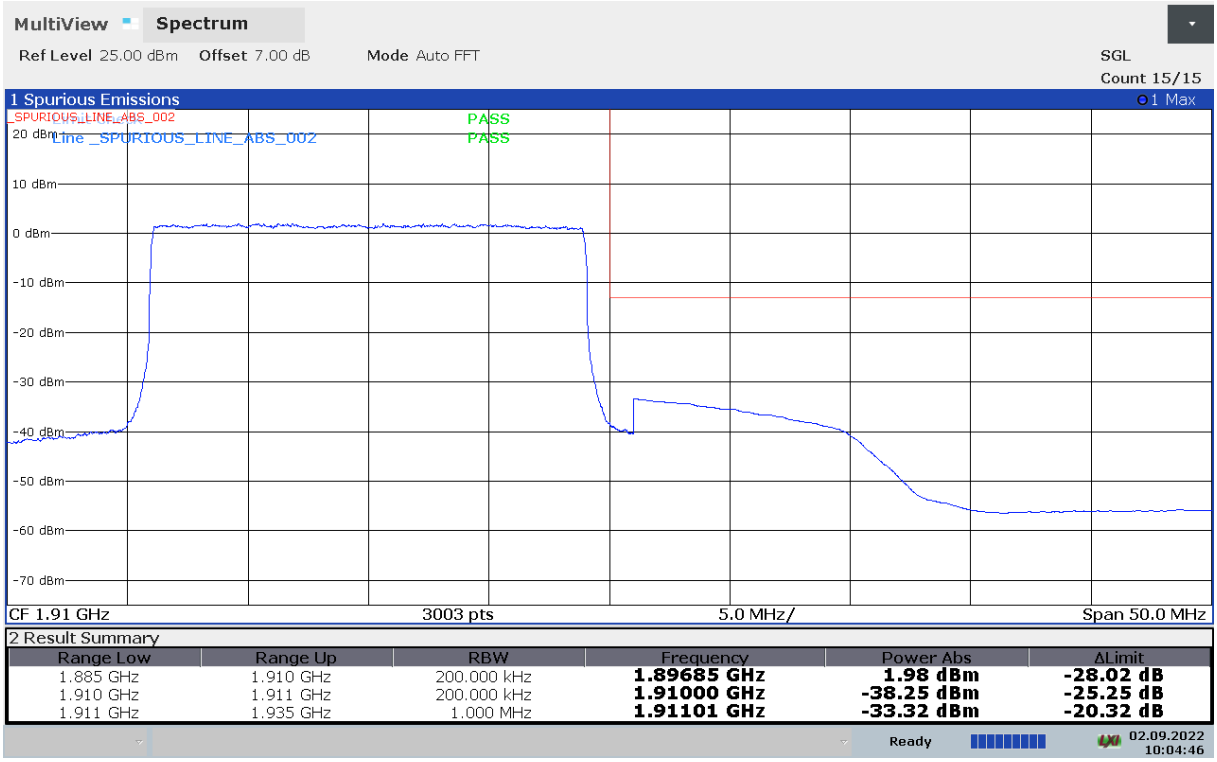
HIGH BAND EDGE BLOCK-1RB-high_offset



LOW BAND EDGE BLOCK-20MHz-100%RB

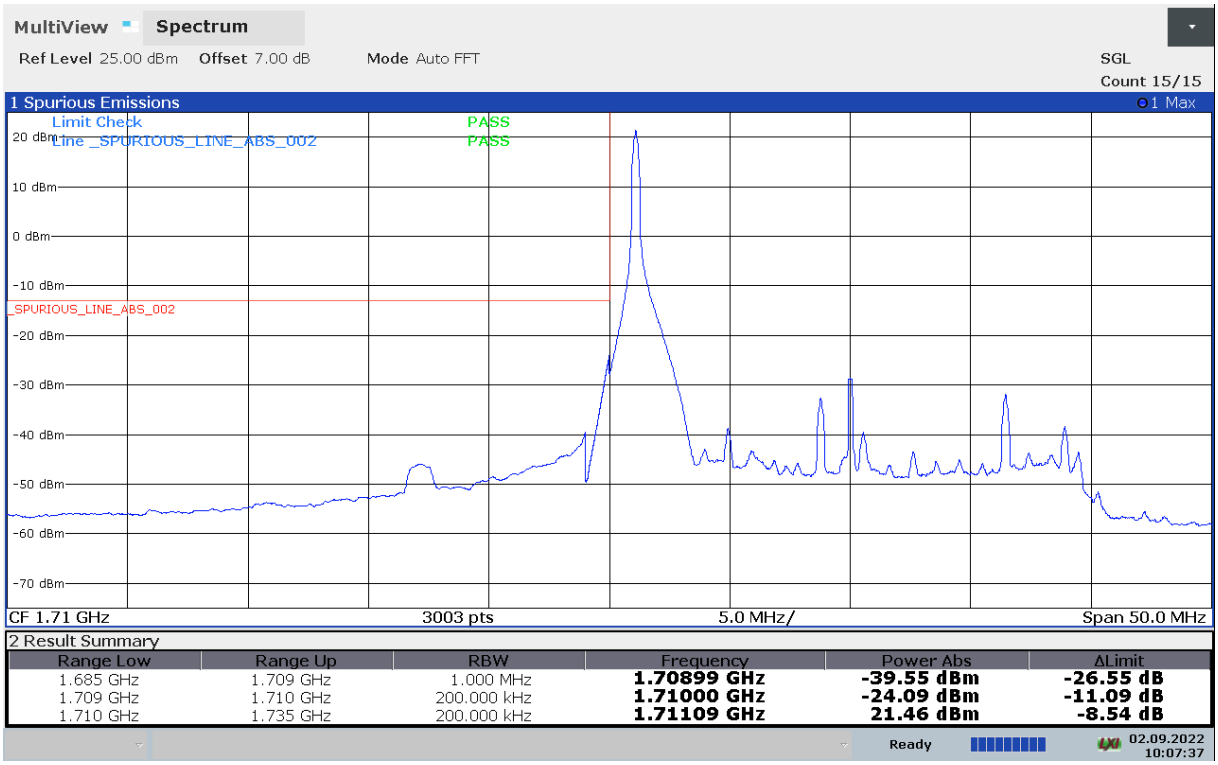


HIGH BAND EDGE BLOCK-20MHz-100%RB

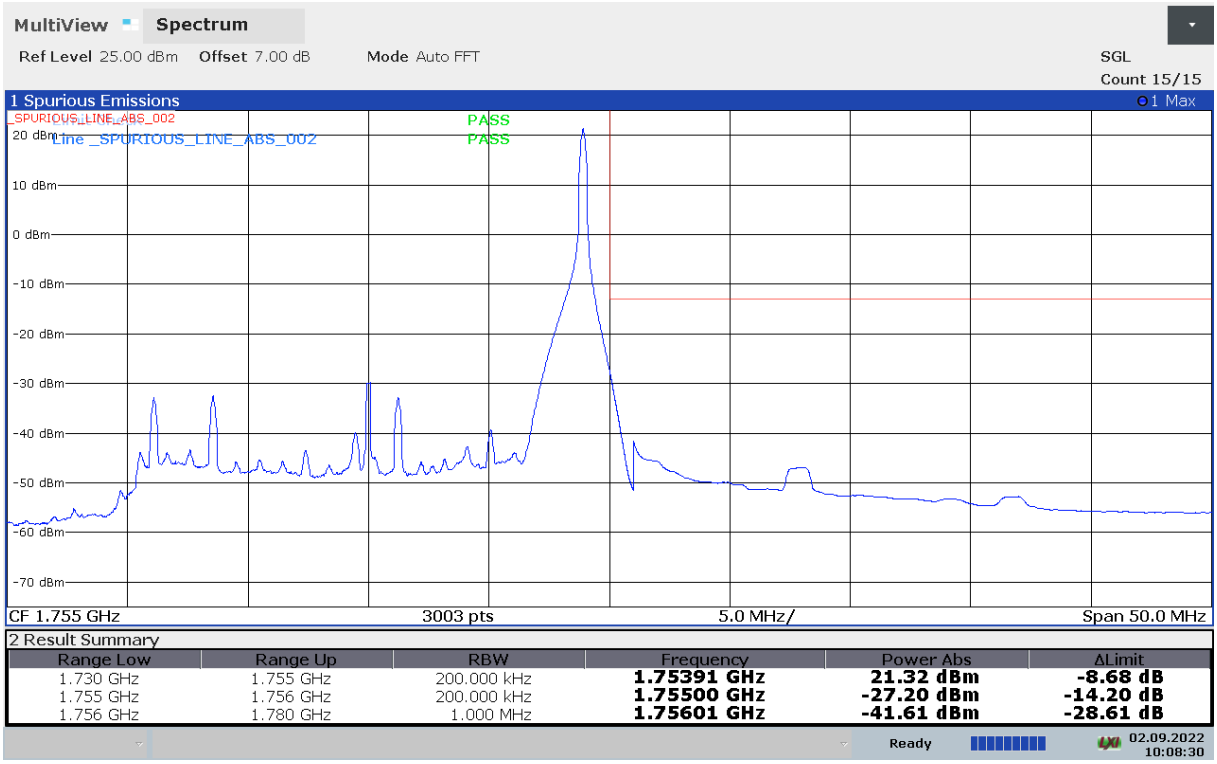


LTE band 4

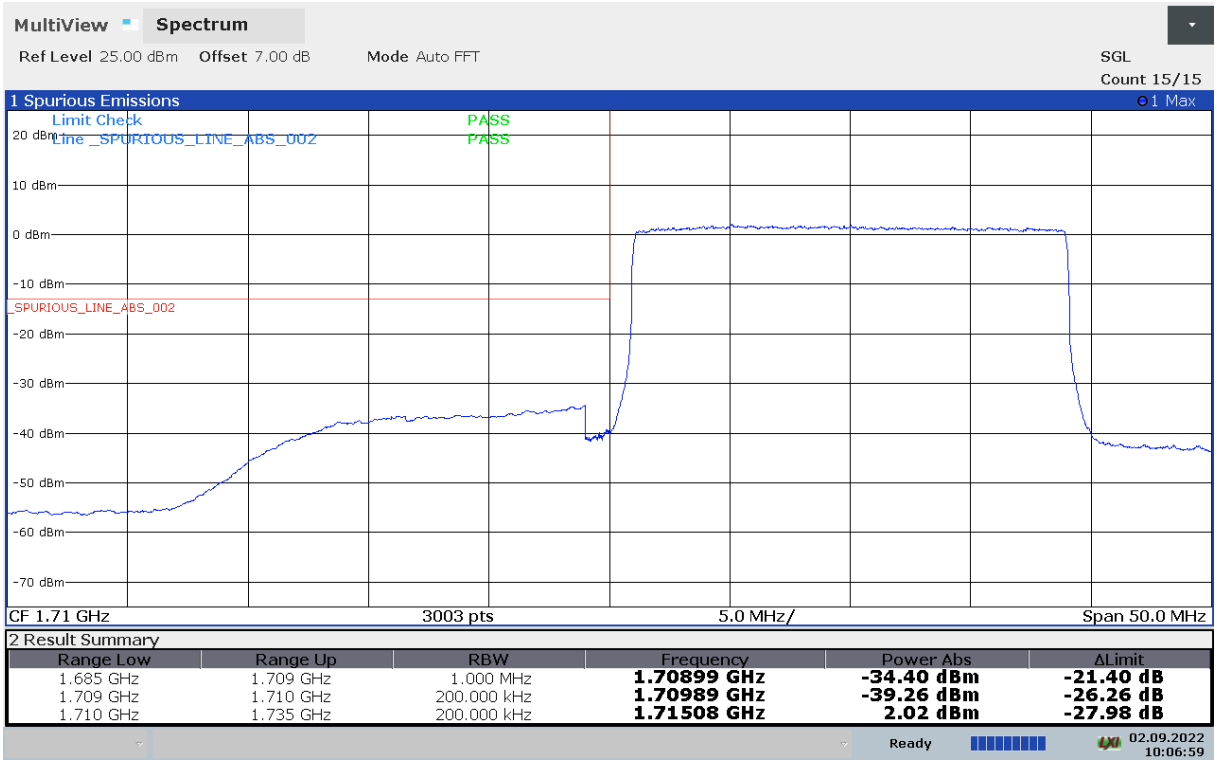
LOW BAND EDGE BLOCK-1RB-low_offset



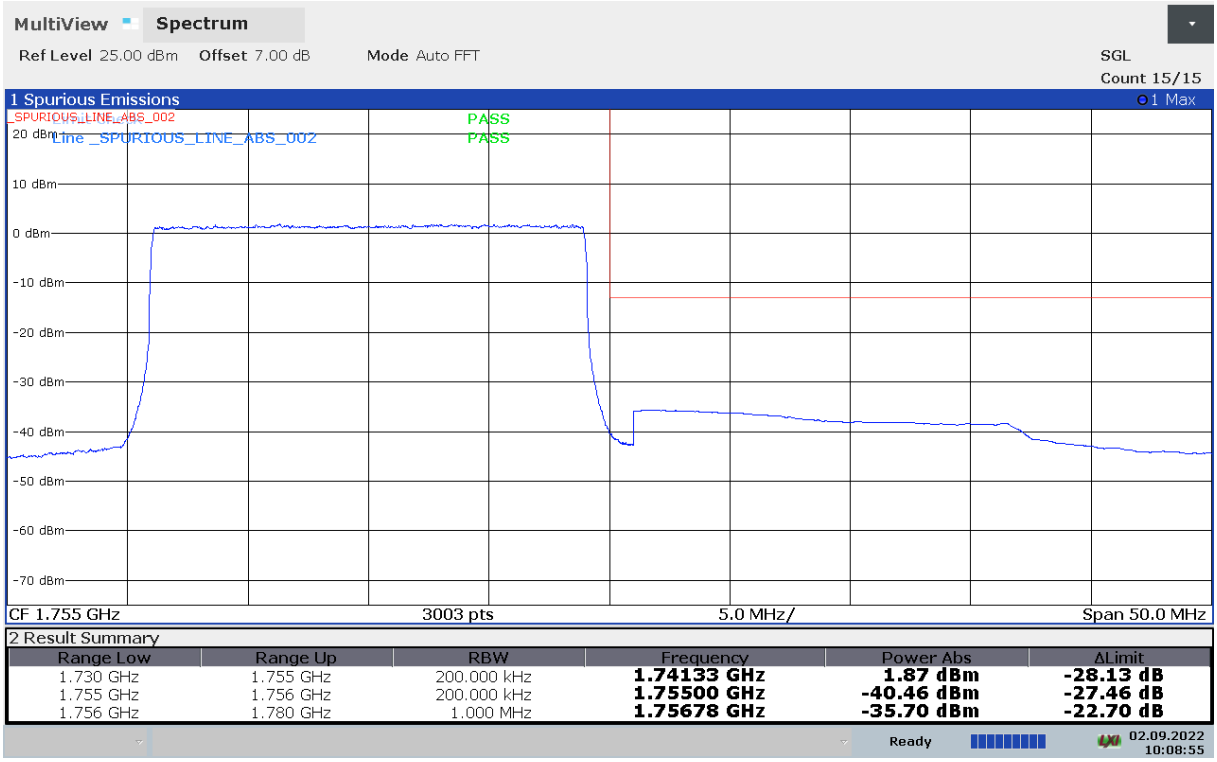
HIGH BAND EDGE BLOCK-1RB-high_offset



LOW BAND EDGE BLOCK-20MHz-100%RB

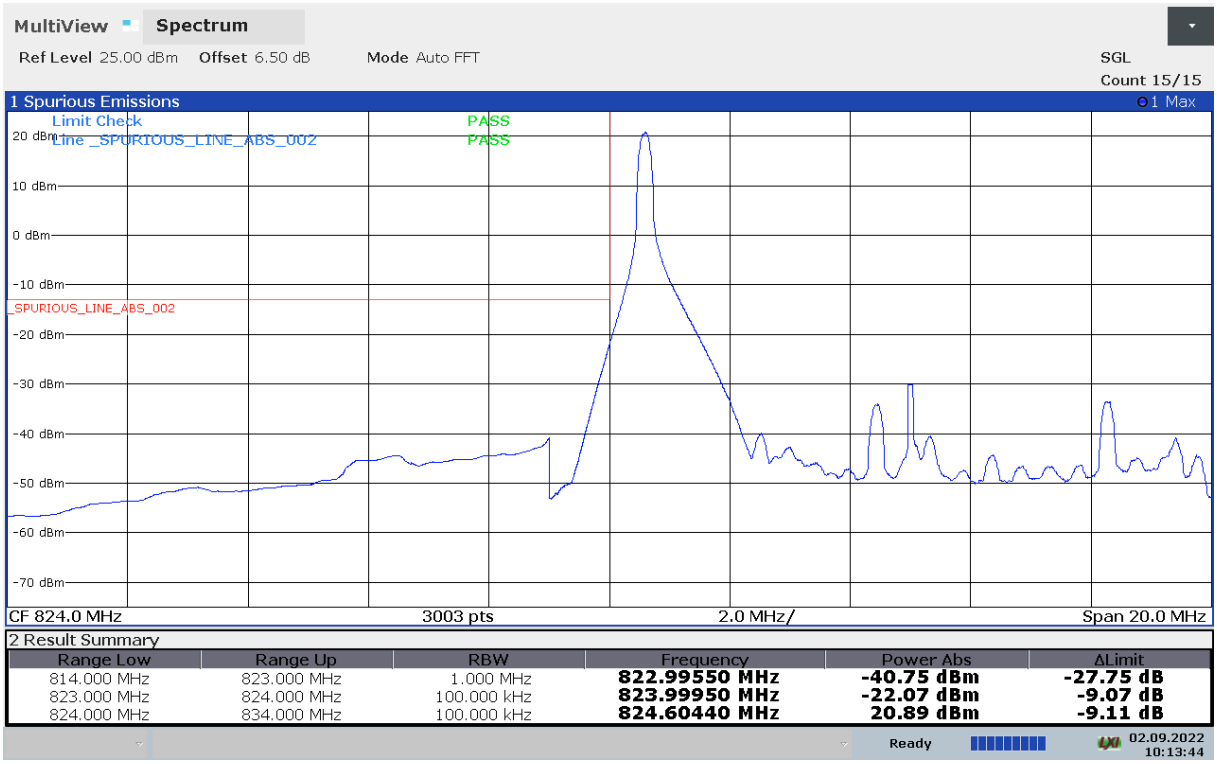


HIGH BAND EDGE BLOCK-20MHz-100%RB

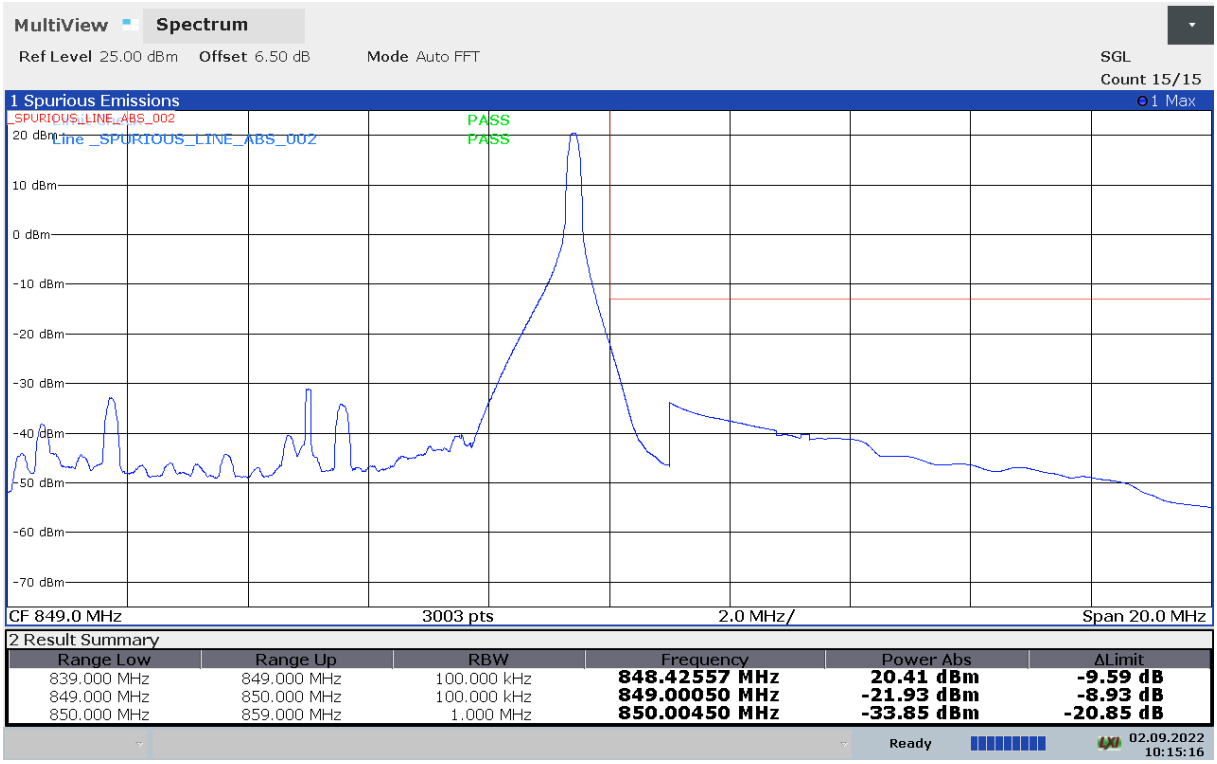


LTE band 5

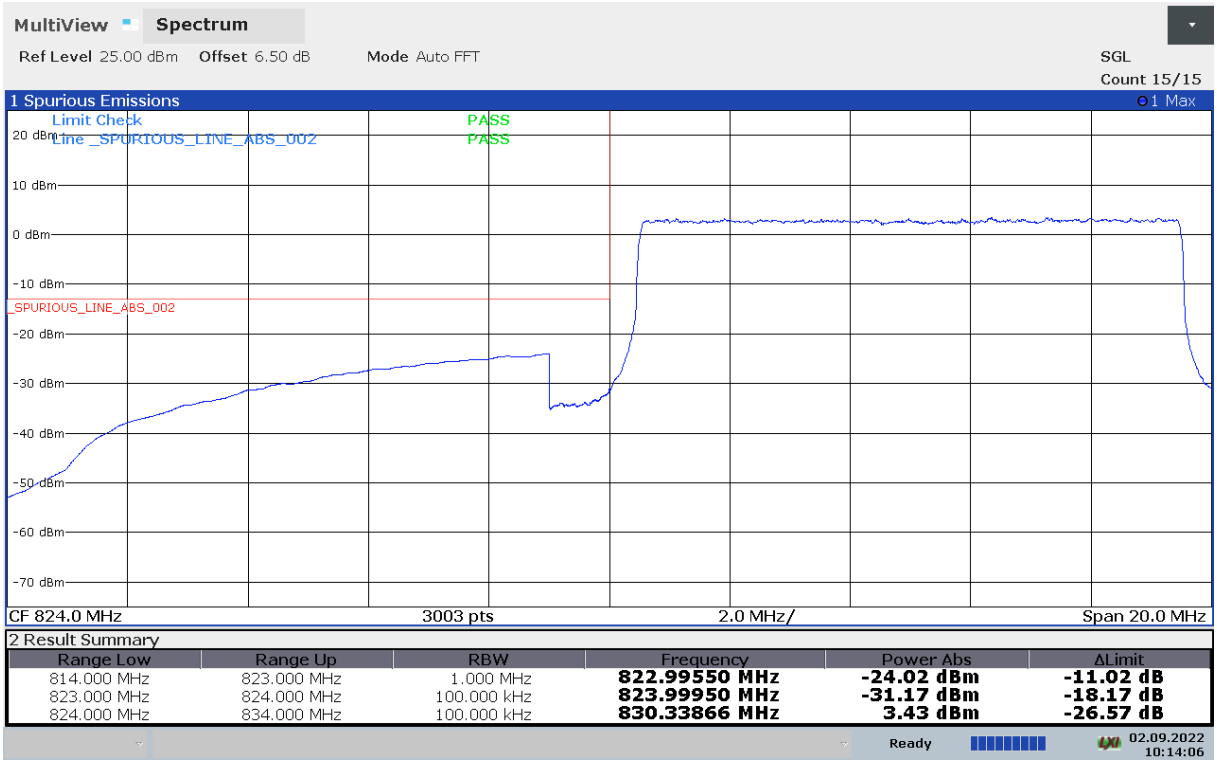
LOW BAND EDGE BLOCK-1RB-low_offset



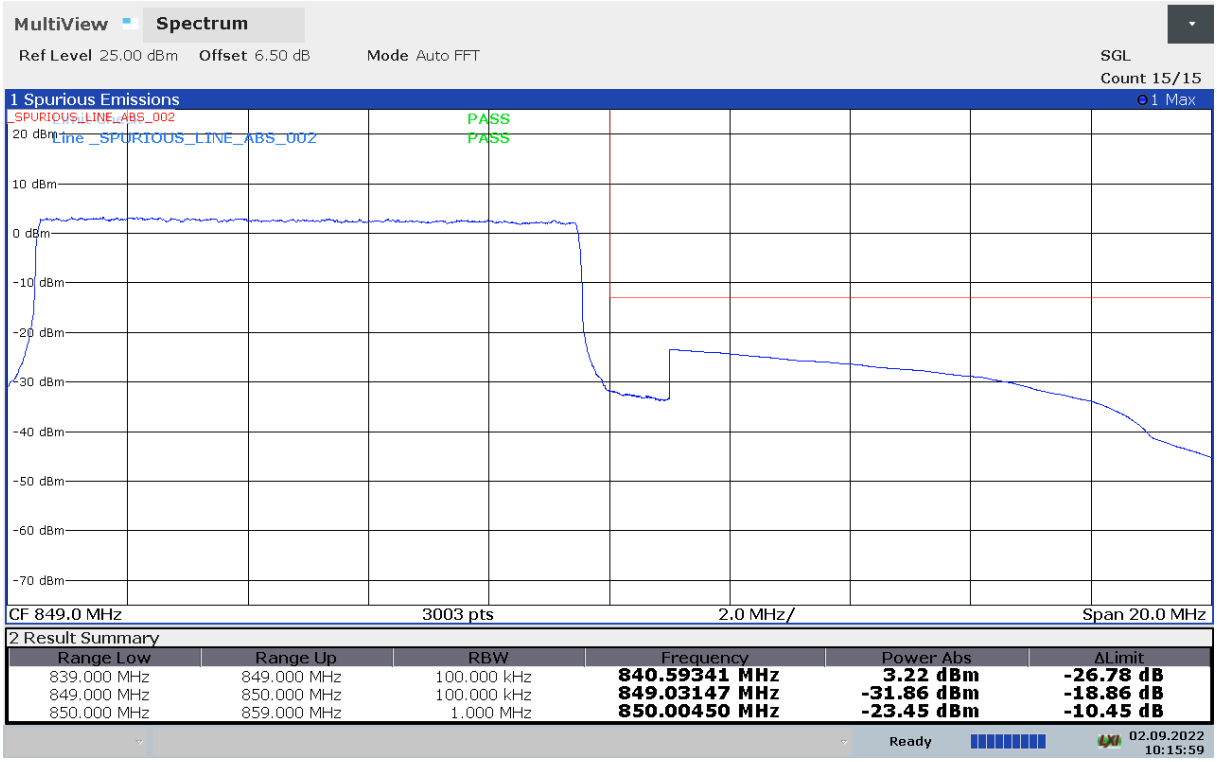
HIGH BAND EDGE BLOCK-1RB-high_offset



LOW BAND EDGE BLOCK-10MHz-100%RB

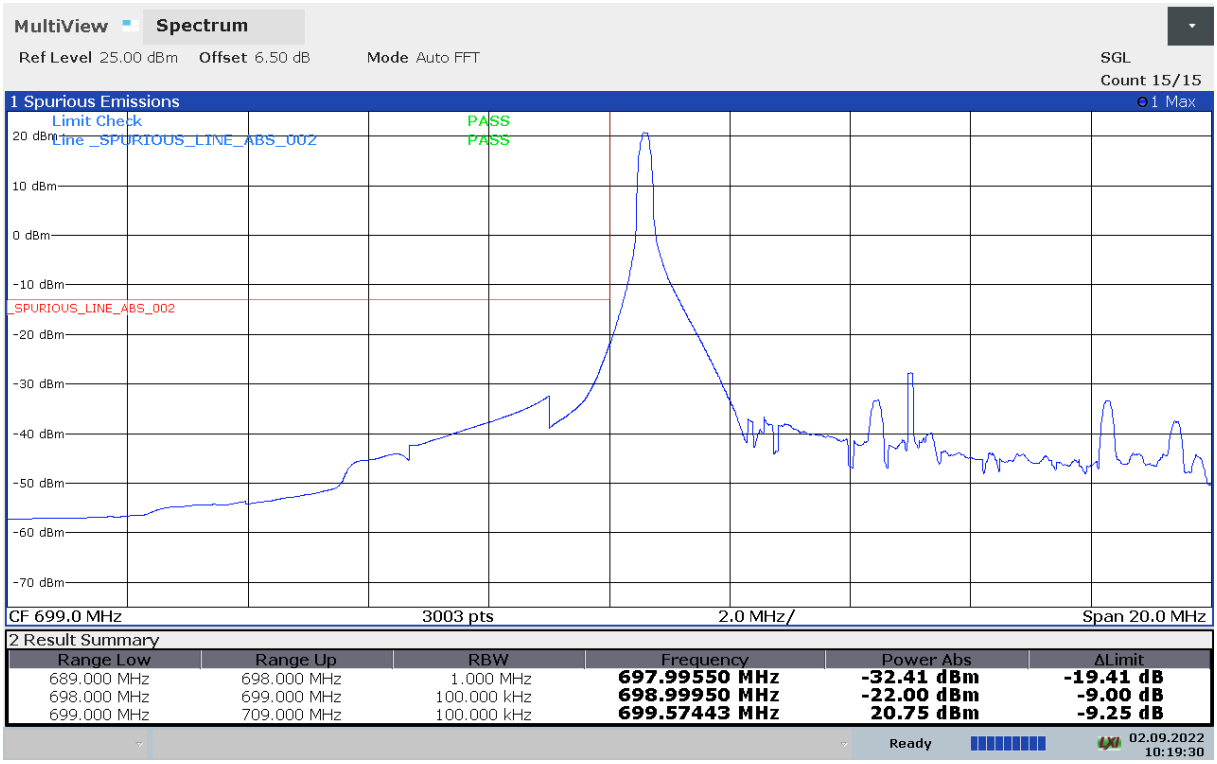


HIGH BAND EDGE BLOCK-10MHz-100%RB

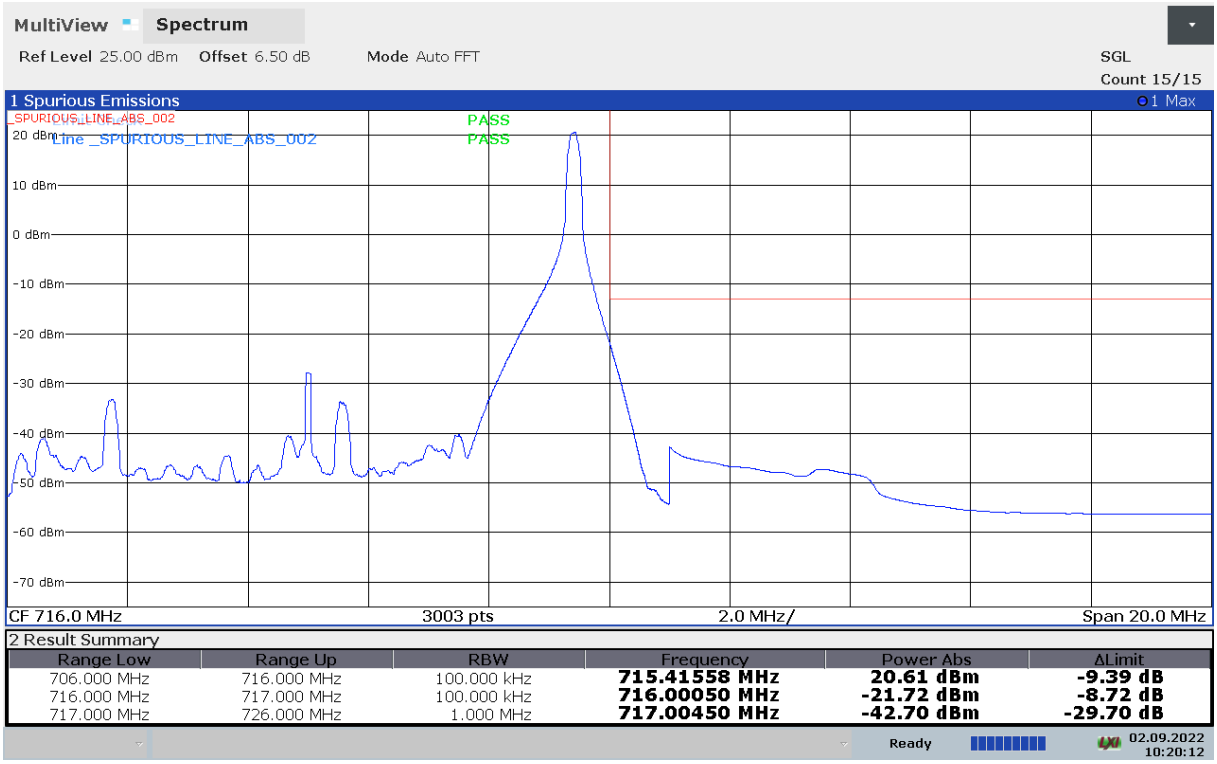


LTE band 12

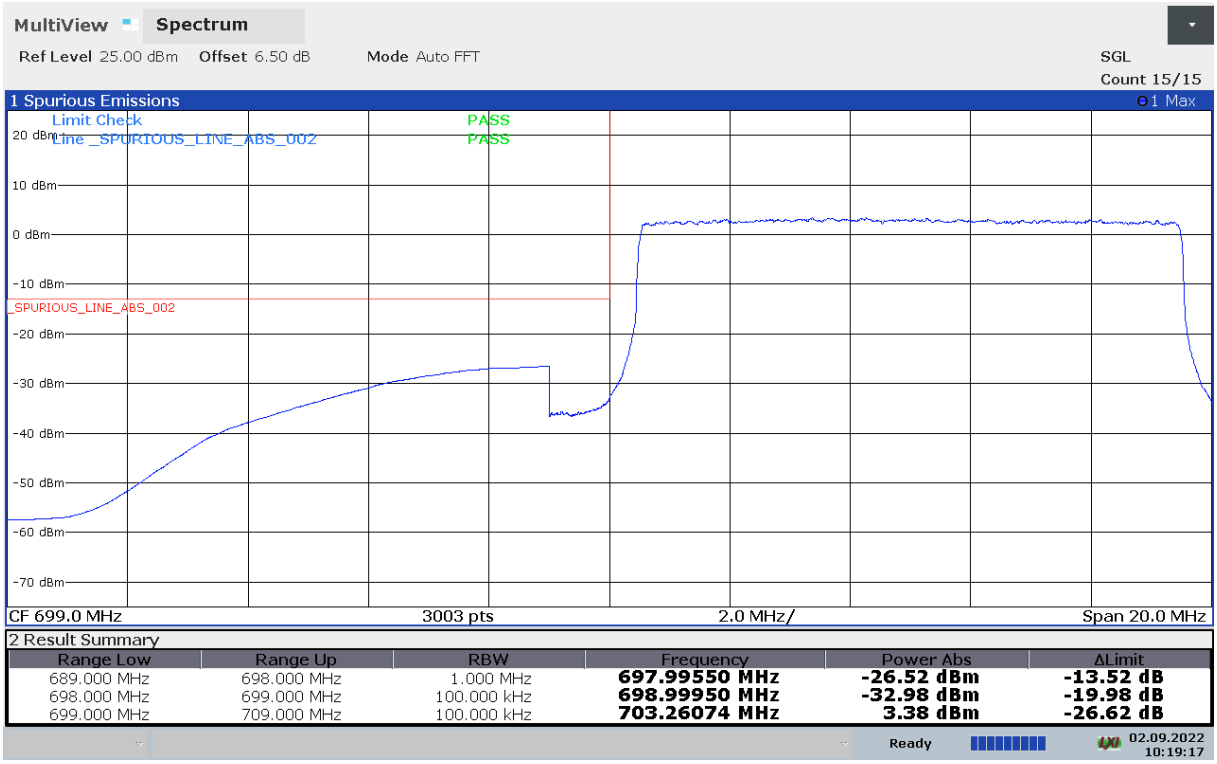
LOW BAND EDGE BLOCK-1RB-low_offset



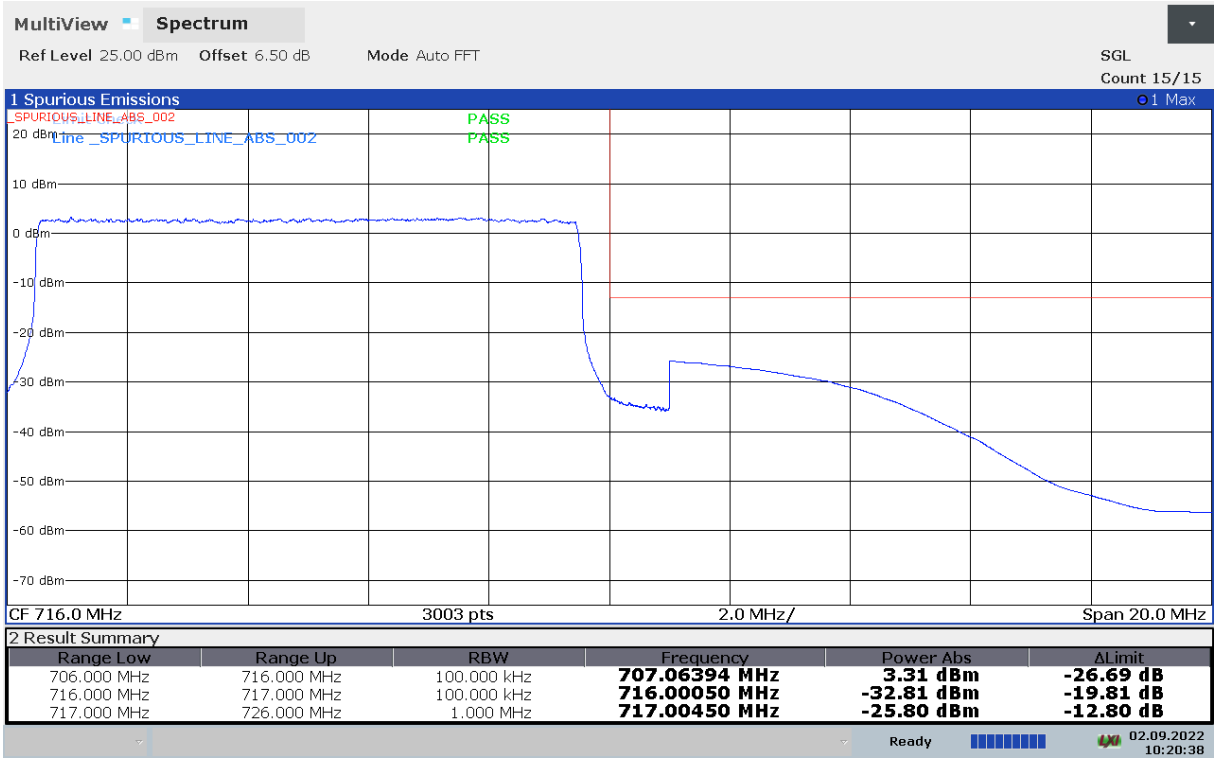
HIGH BAND EDGE BLOCK-1RB-high_offset



LOW BAND EDGE BLOCK-10MHz-100%RB

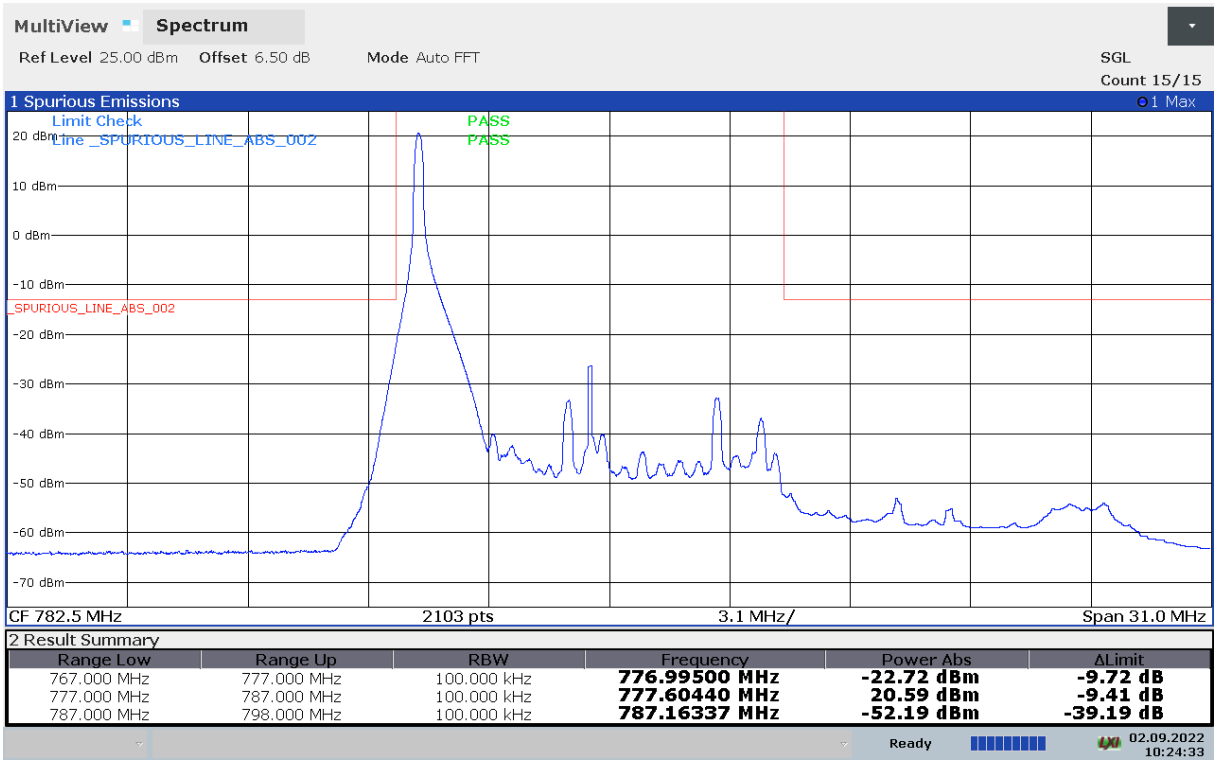


HIGH BAND EDGE BLOCK-10MHz-100%RB

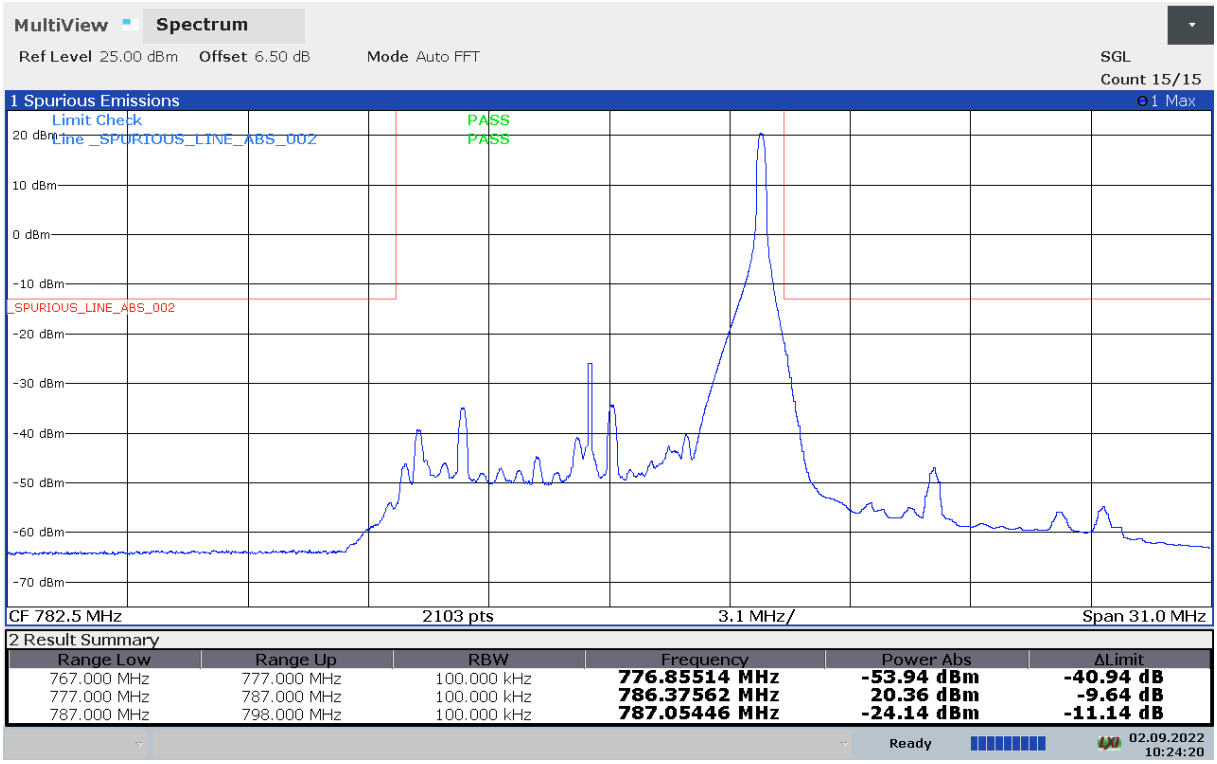


LTE band 13

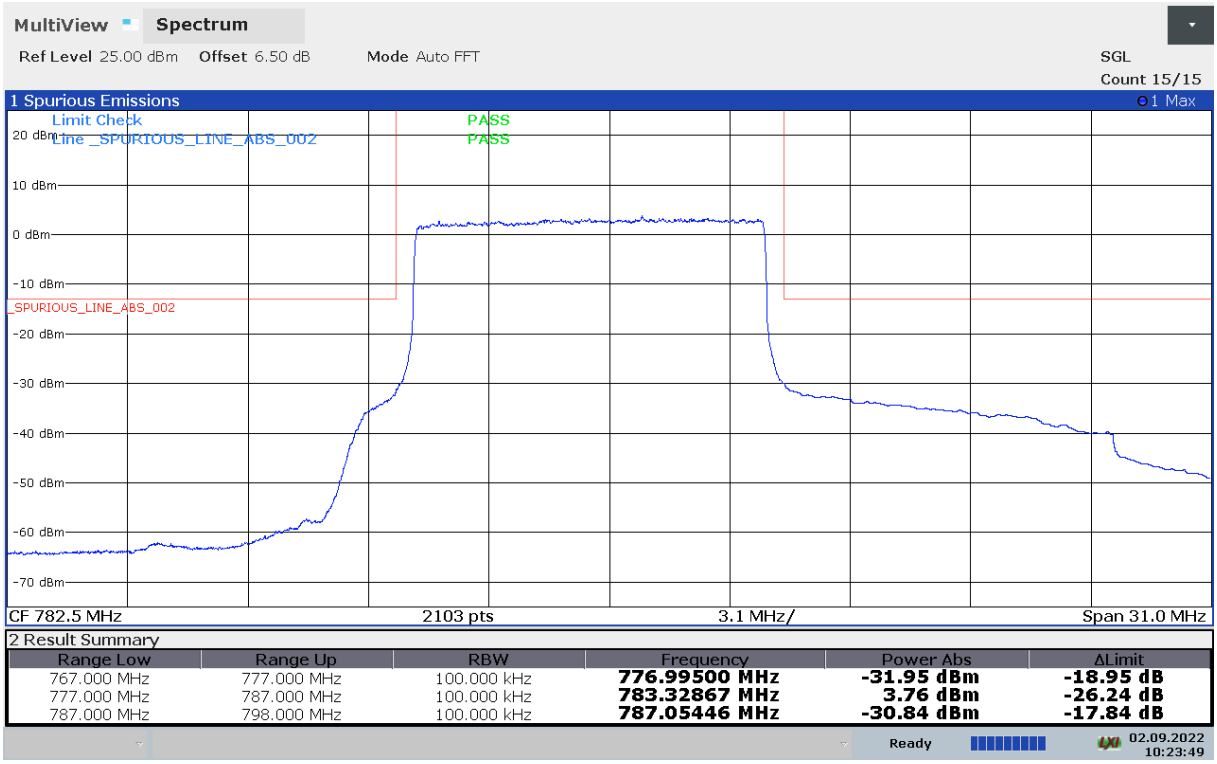
LOW BAND EDGE BLOCK-1RB-low_offset



HIGH BAND EDGE BLOCK-1RB-high_offset

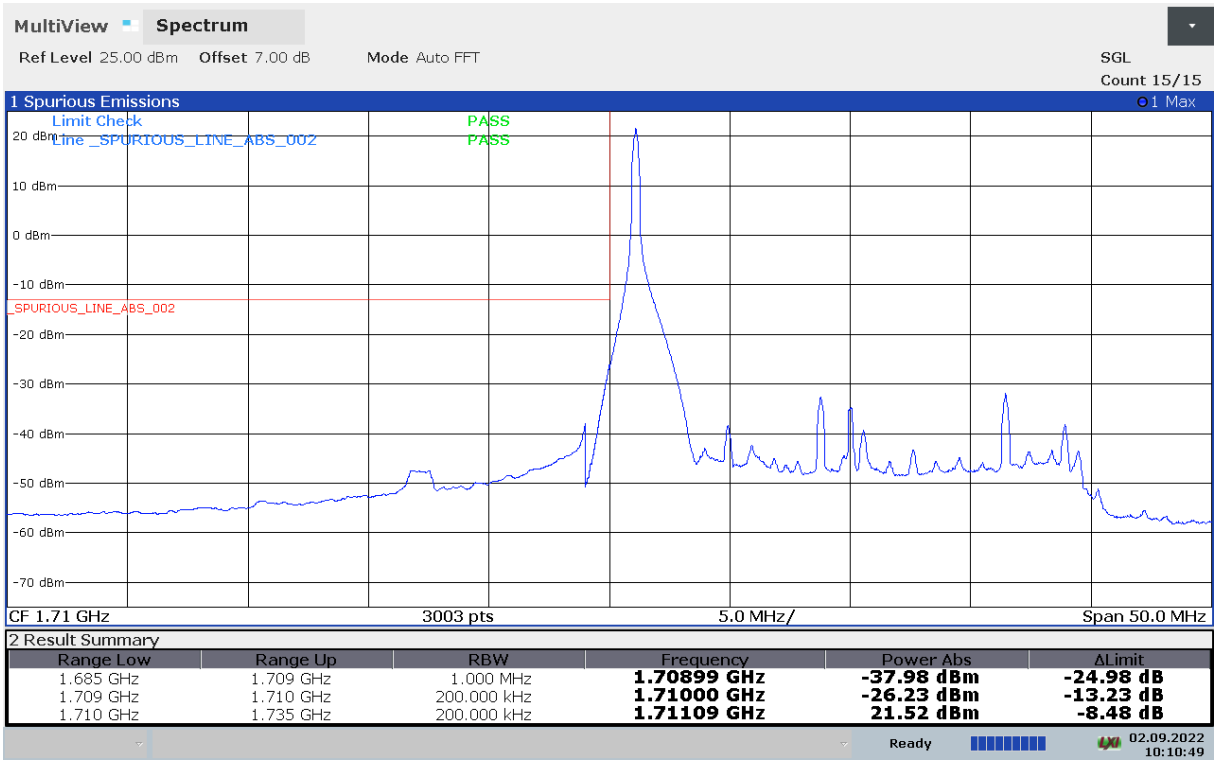


EDGE BLOCK-10MHz-100%RB

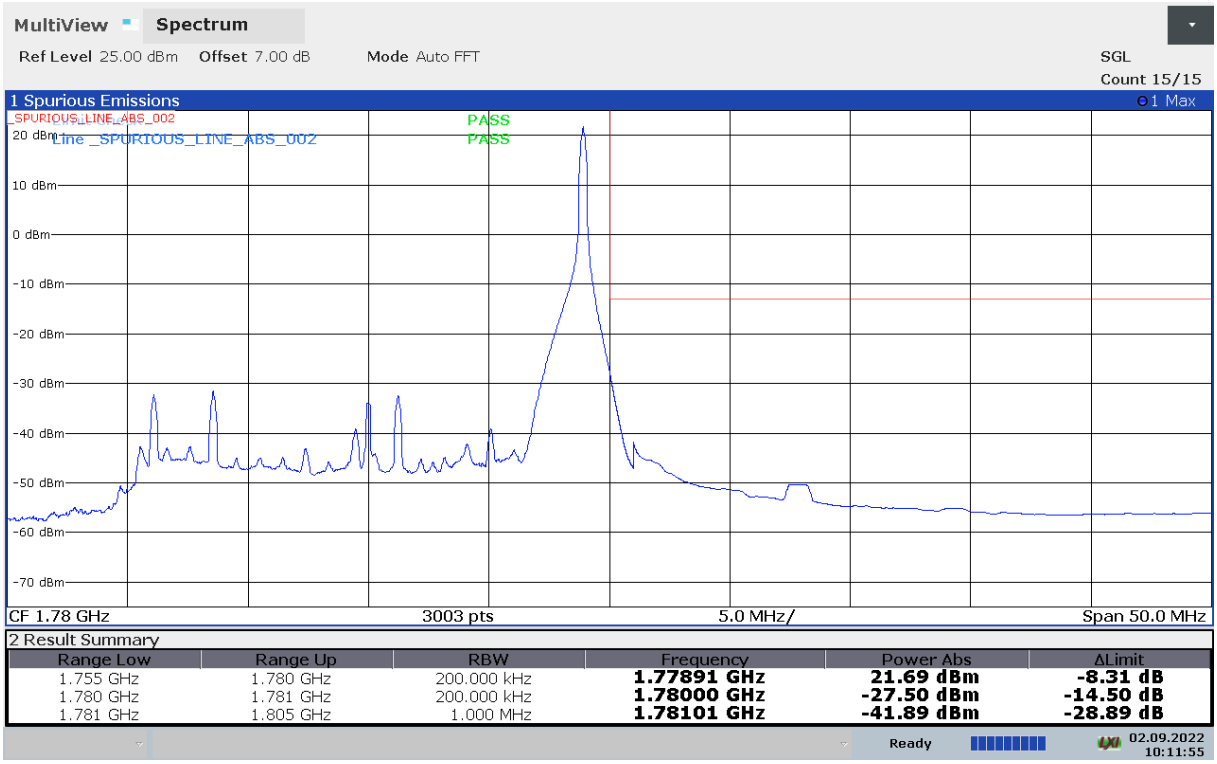


LTE band 66

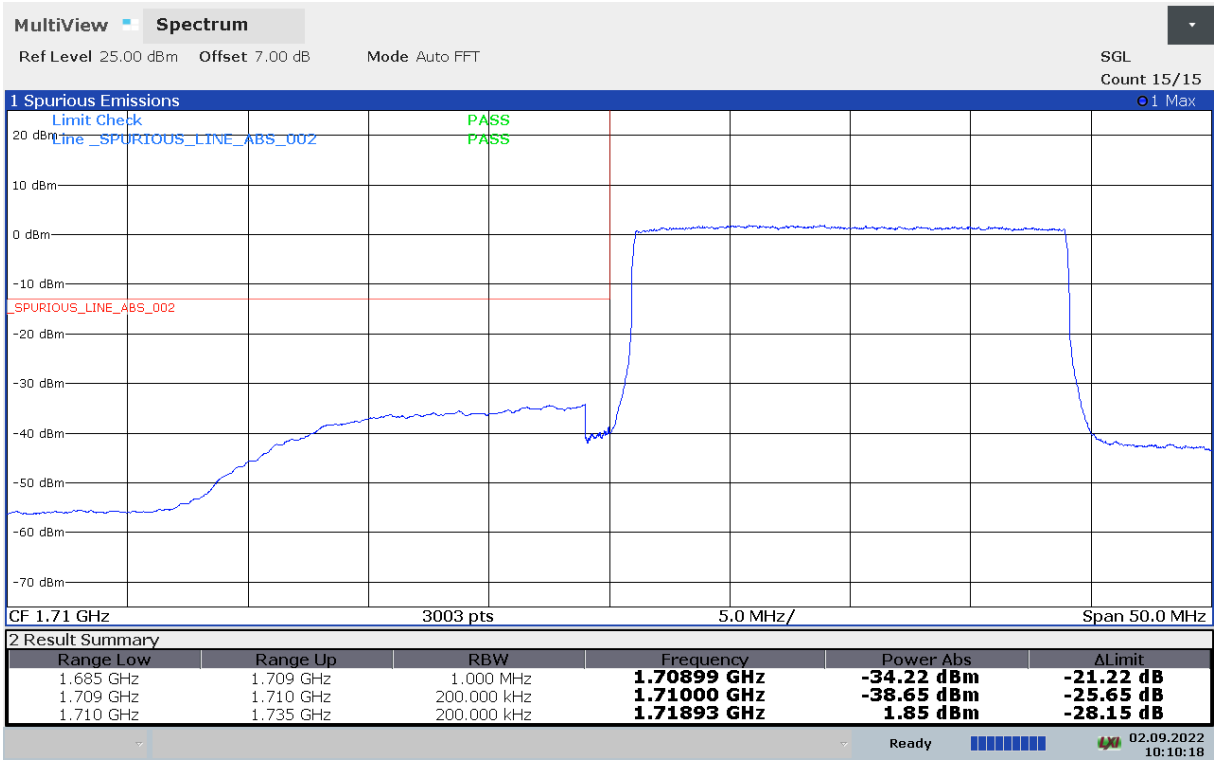
LOW BAND EDGE BLOCK-1RB-low_offset



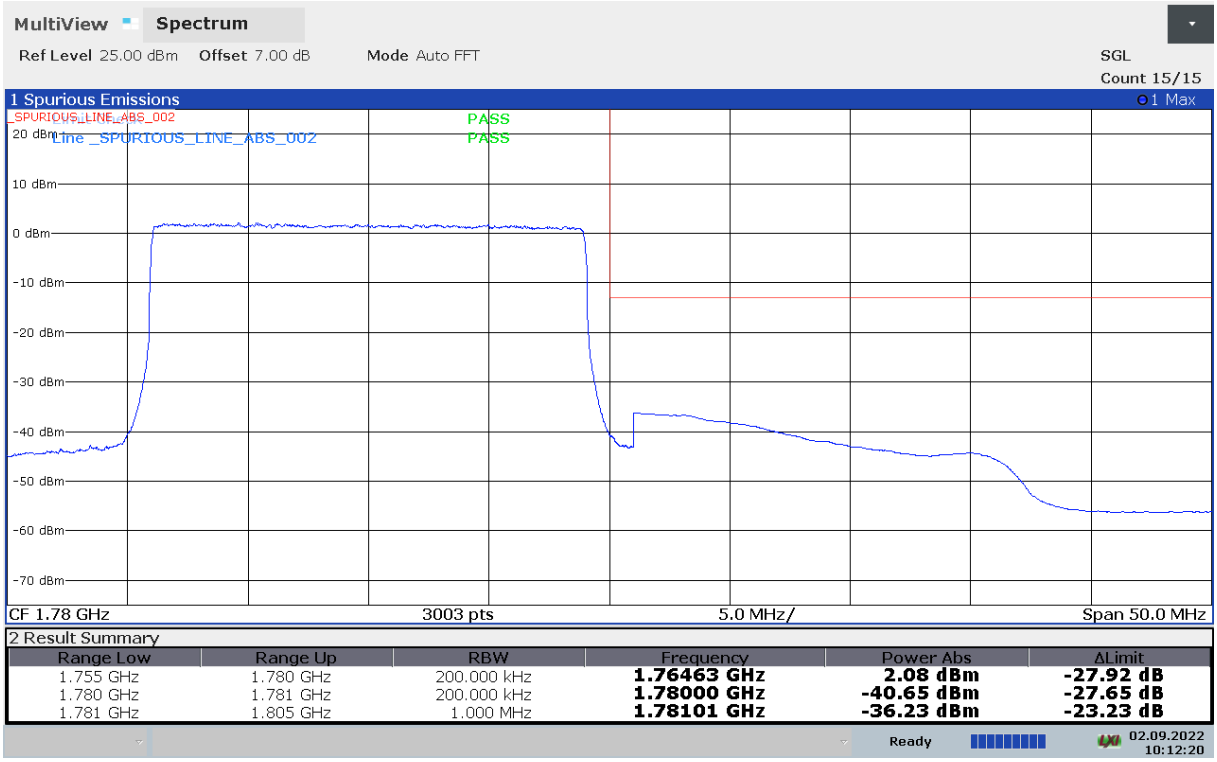
HIGH BAND EDGE BLOCK-1RB-high_offset



LOW BAND EDGE BLOCK-20MHz-100%RB

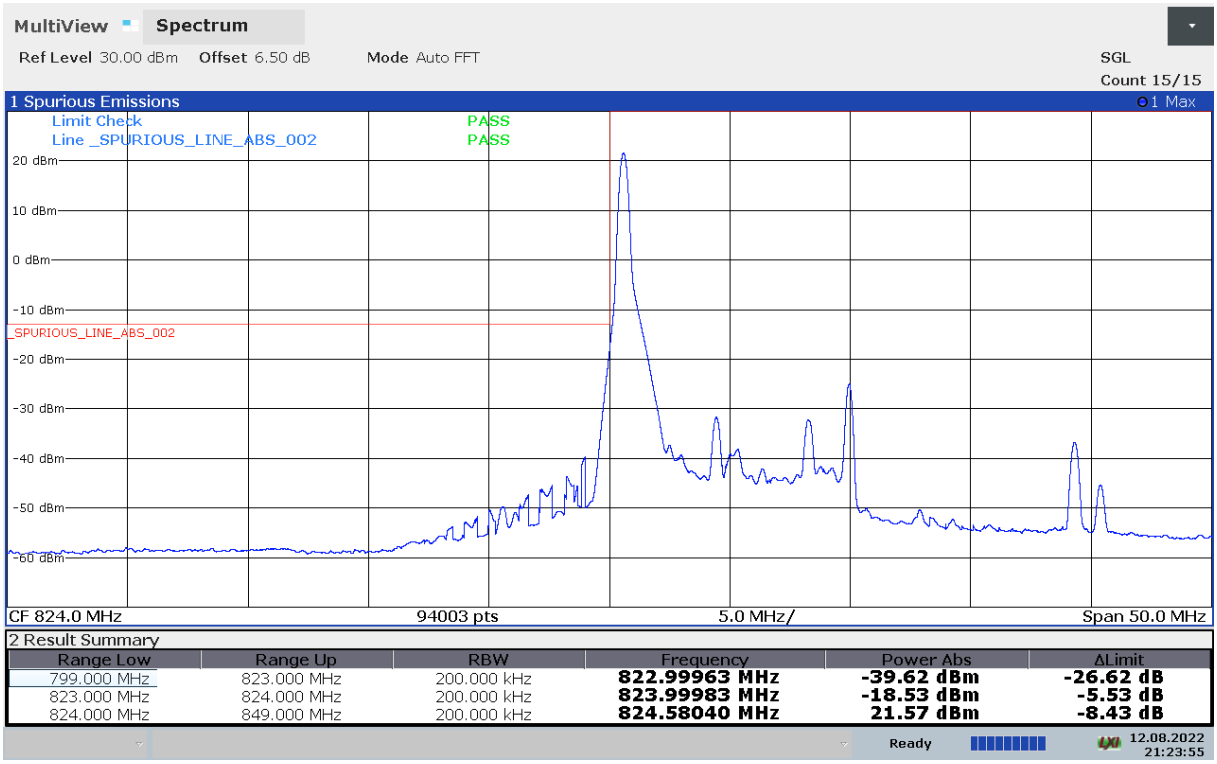


HIGH BAND EDGE BLOCK-20MHz-100%RB

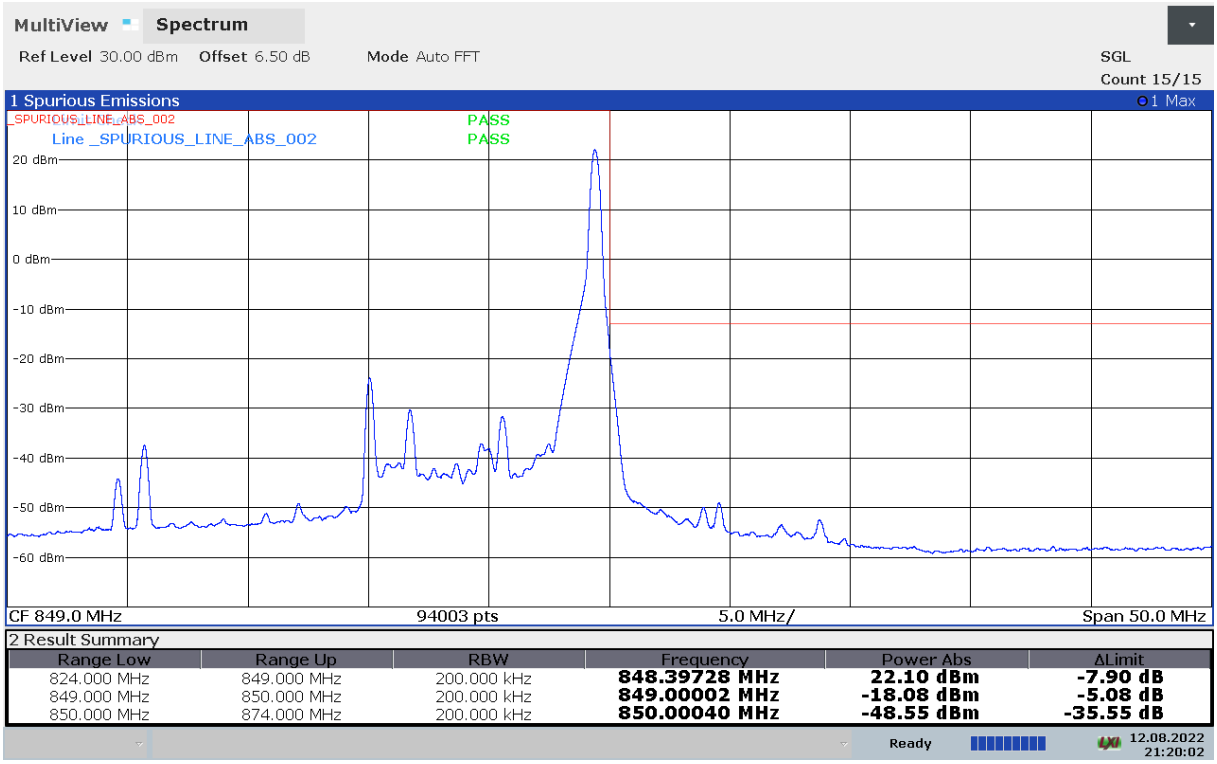


LTE CA_5B

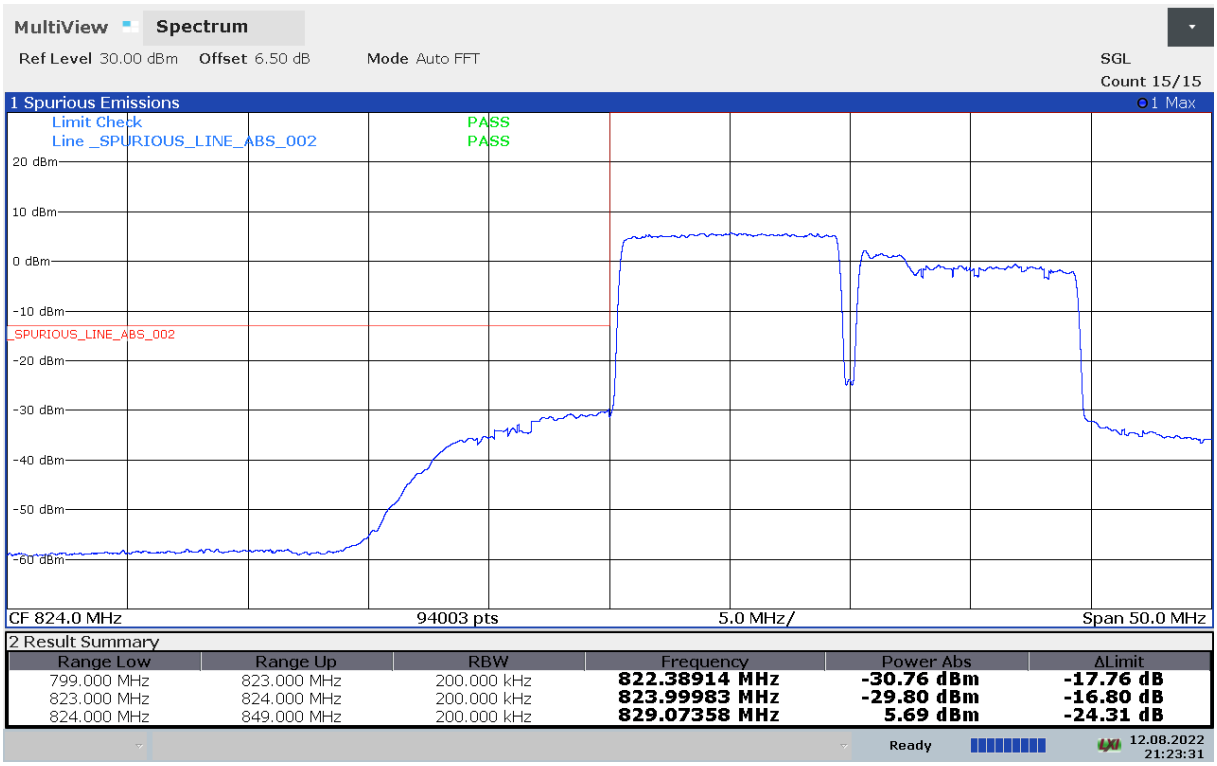
LOW BAND EDGE BLOCK-1RB-low_offset



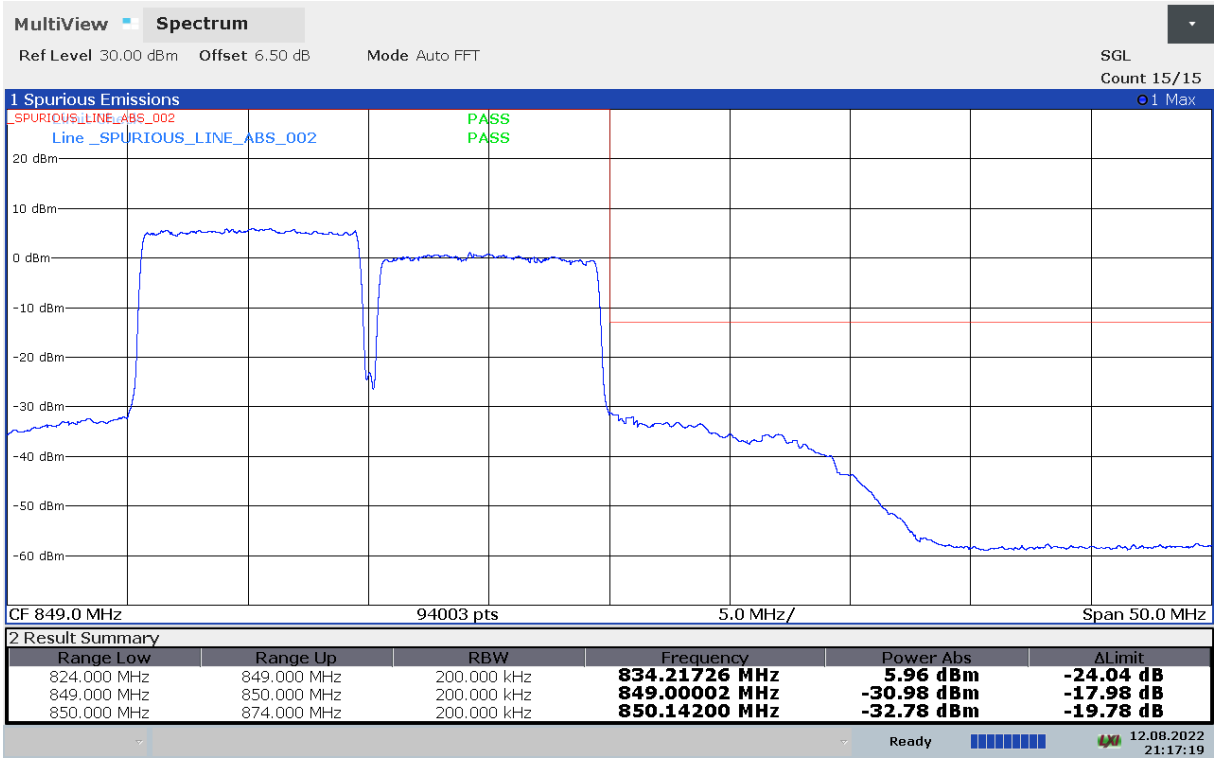
HIGH BAND EDGE BLOCK-1RB-high_offset



LOW BAND EDGE BLOCK-10MHz+10MHz -100%RB

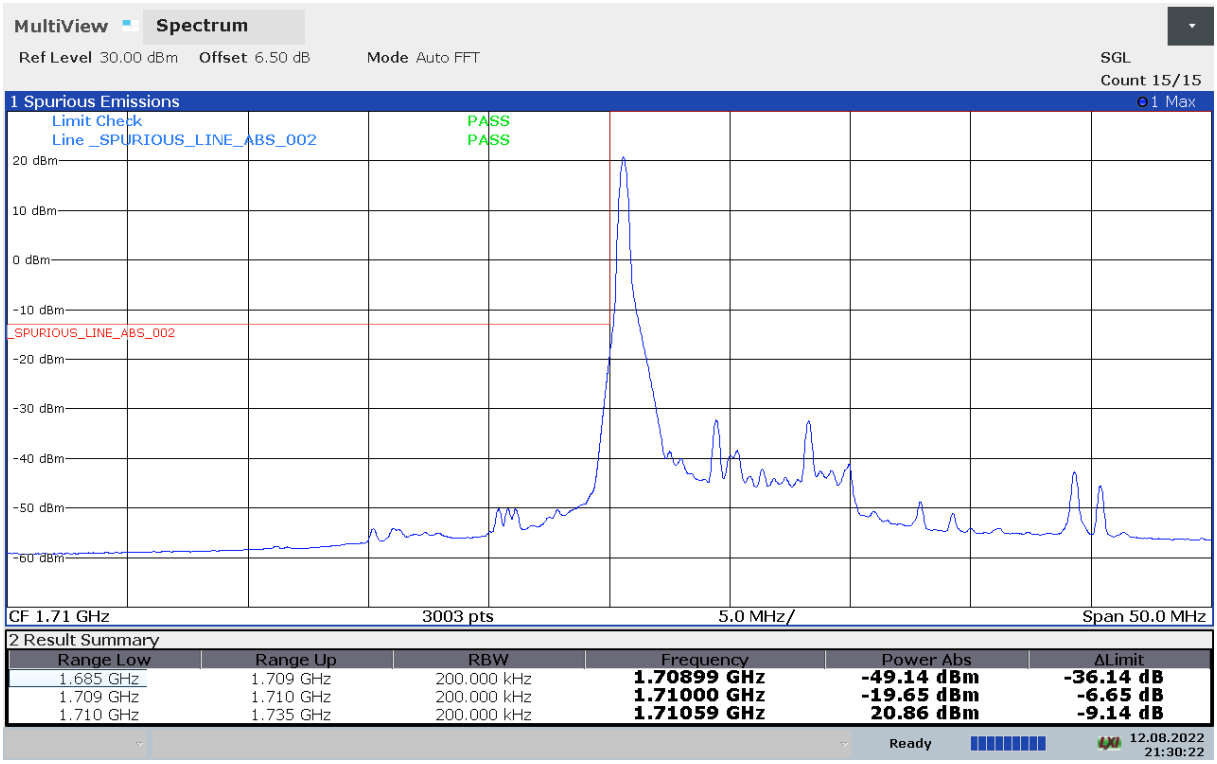


HIGH BAND EDGE BLOCK-10MHz+10MHz -100%RB

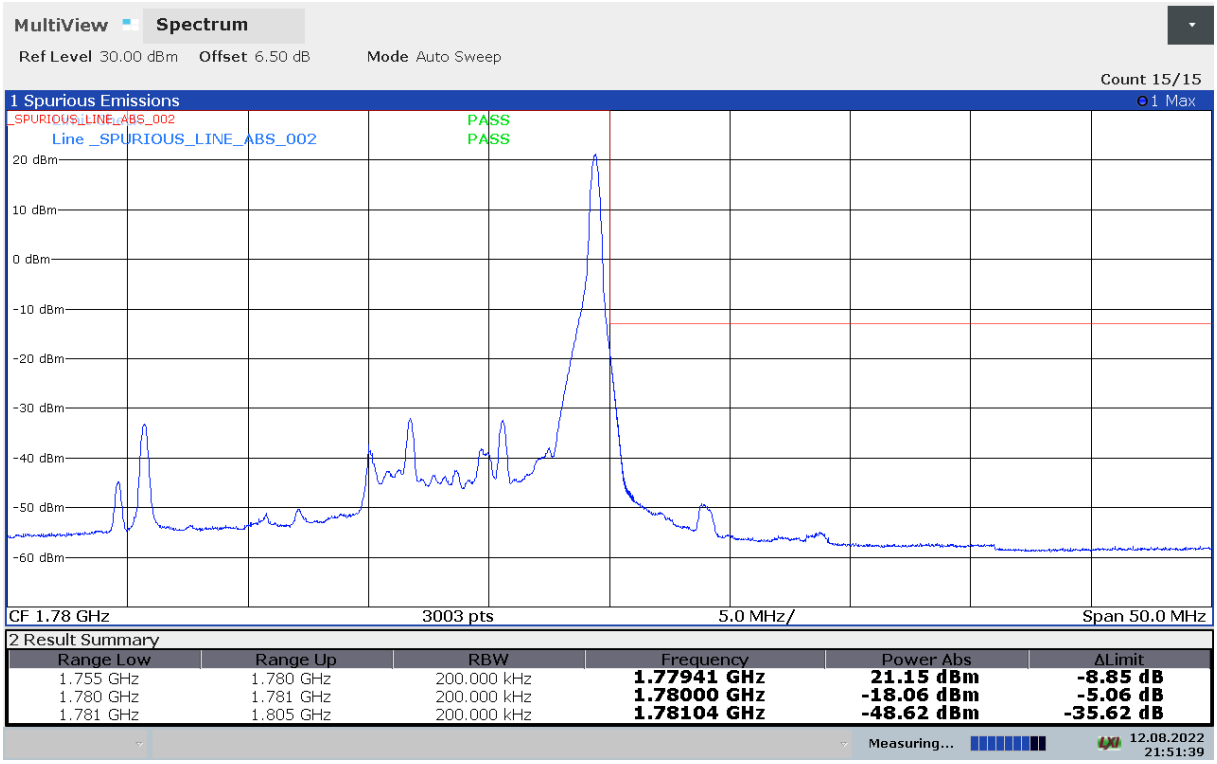


LTE CA_66B

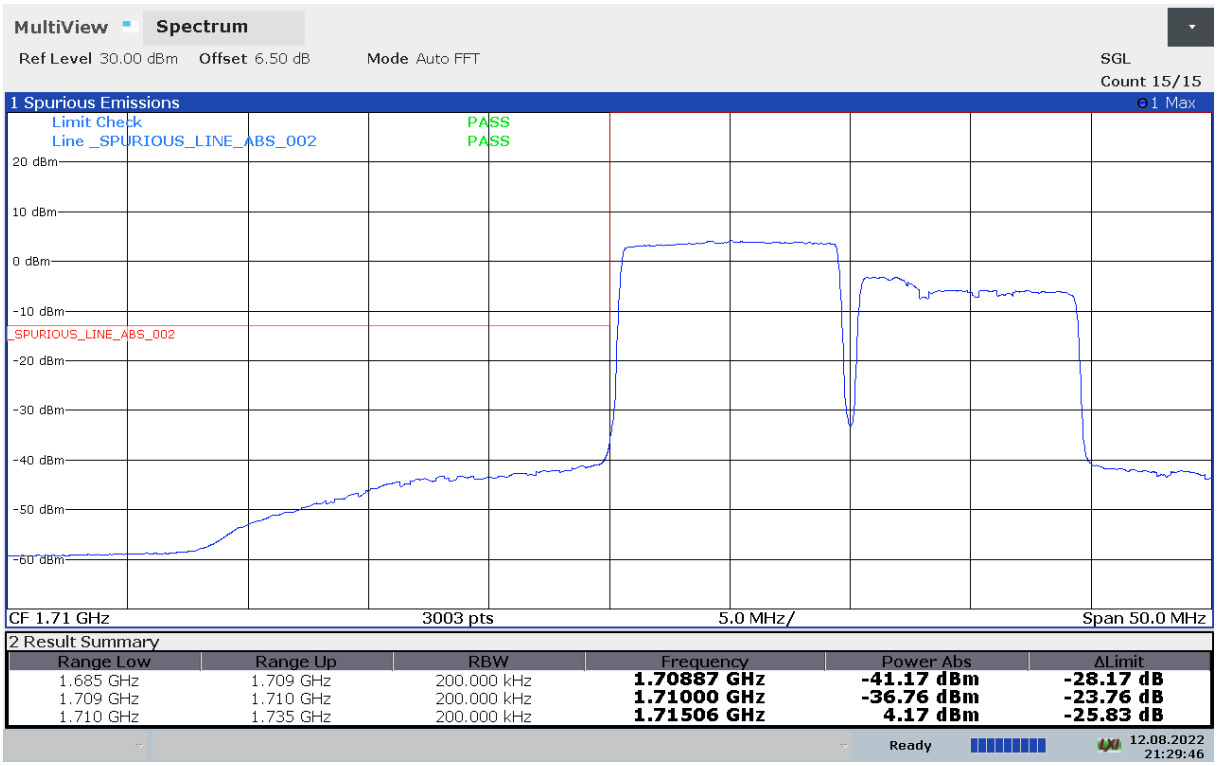
LOW BAND EDGE BLOCK-1RB-low_offset



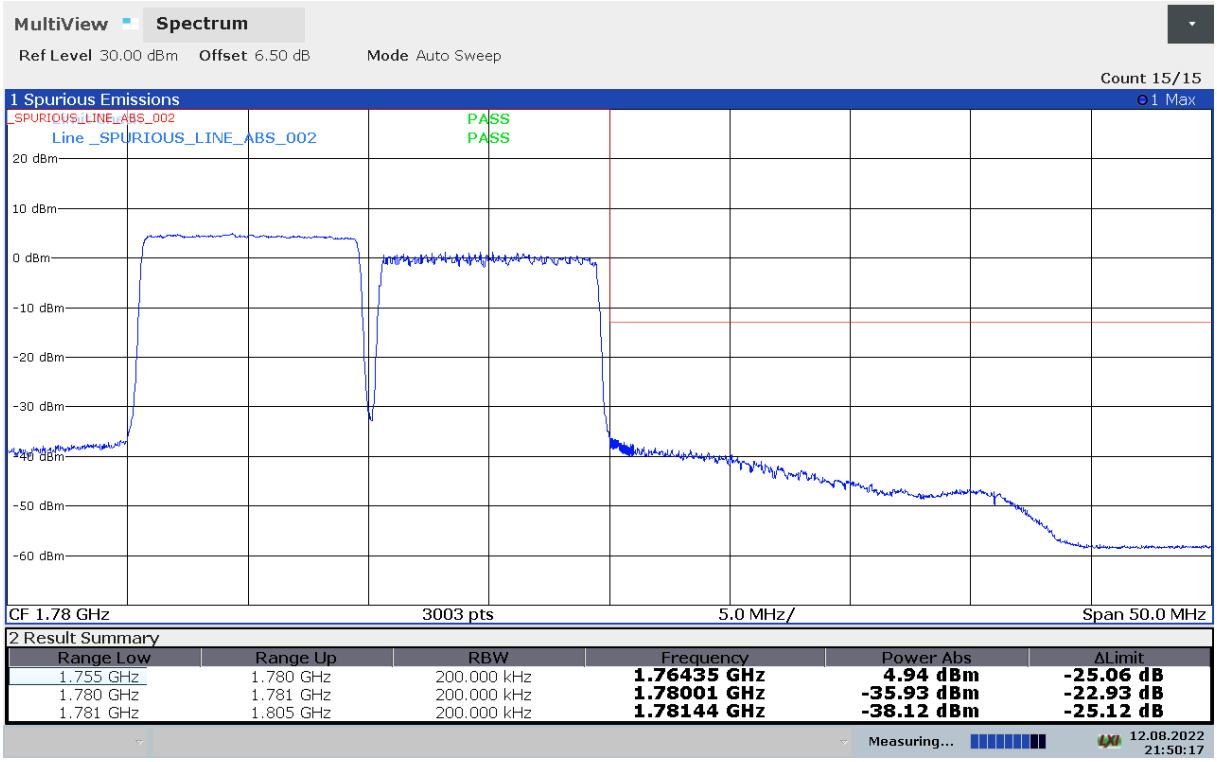
HIGH BAND EDGE BLOCK-1RB-high_offset



LOW BAND EDGE BLOCK-10MHz+10MHz -100%RB

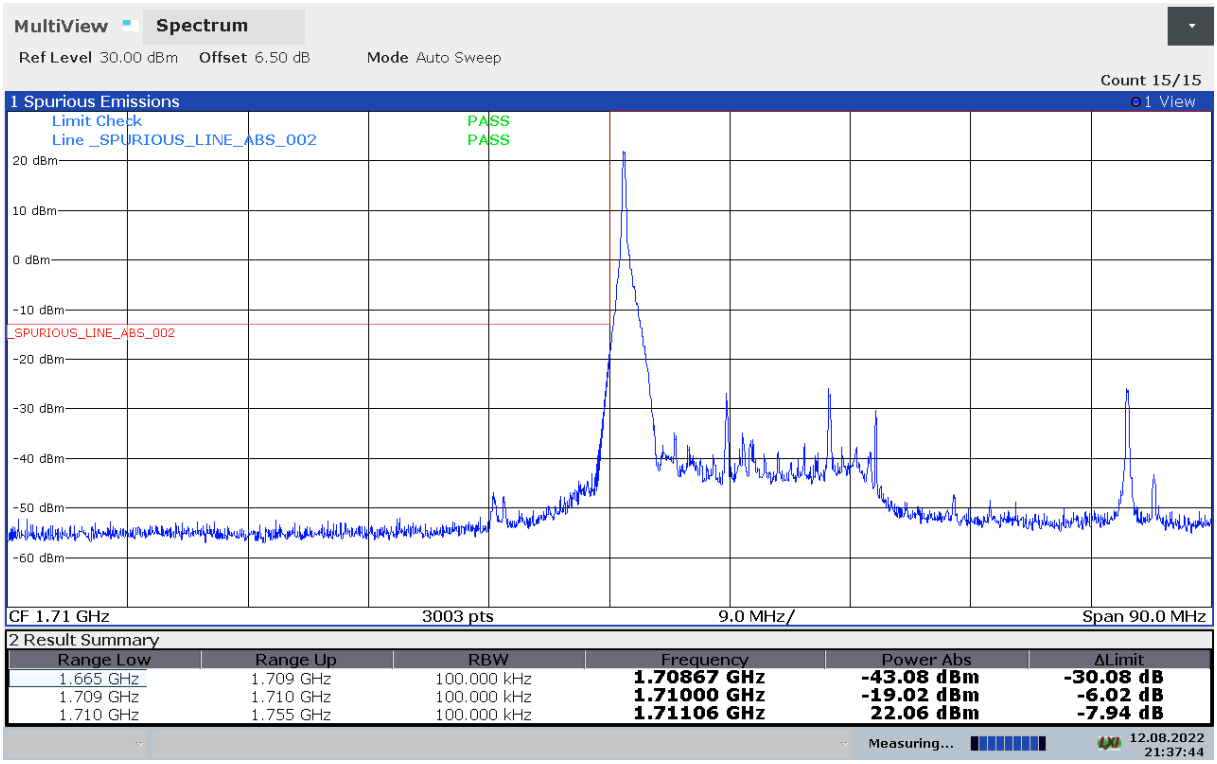


HIGH BAND EDGE BLOCK-10MHz+10MHz -100%RB

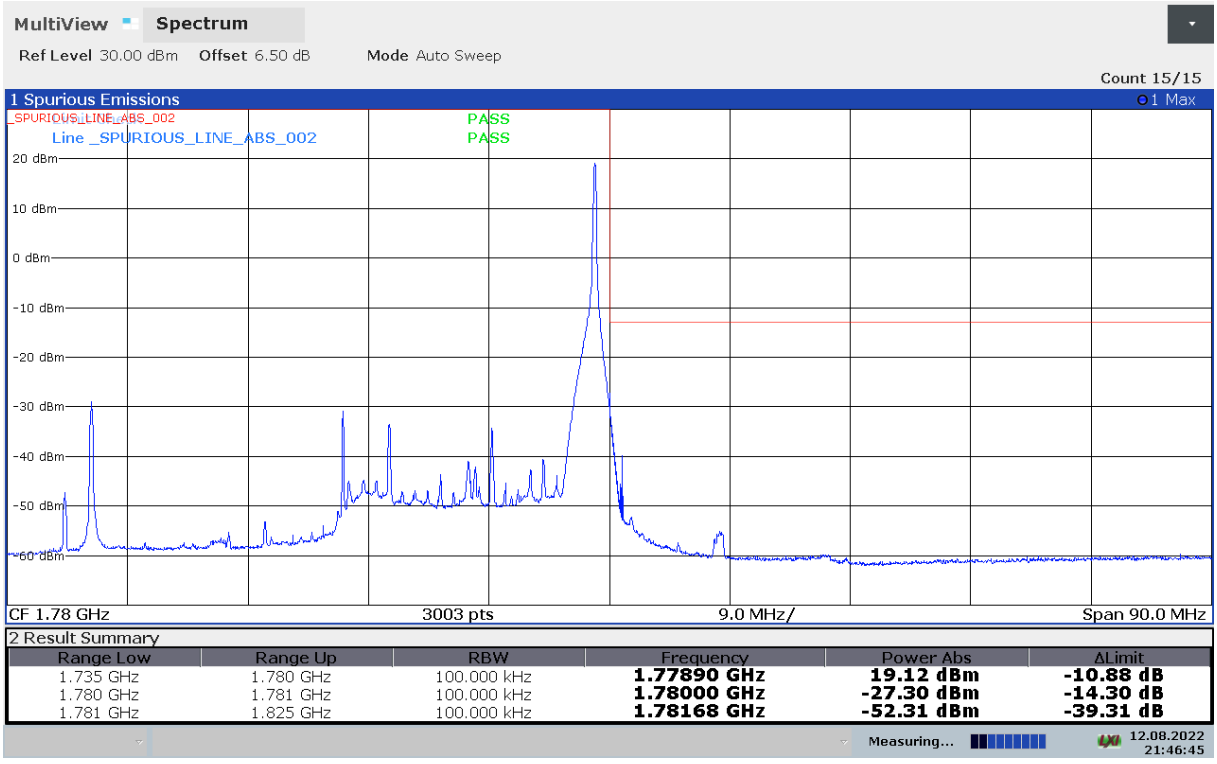


LTE CA_66C

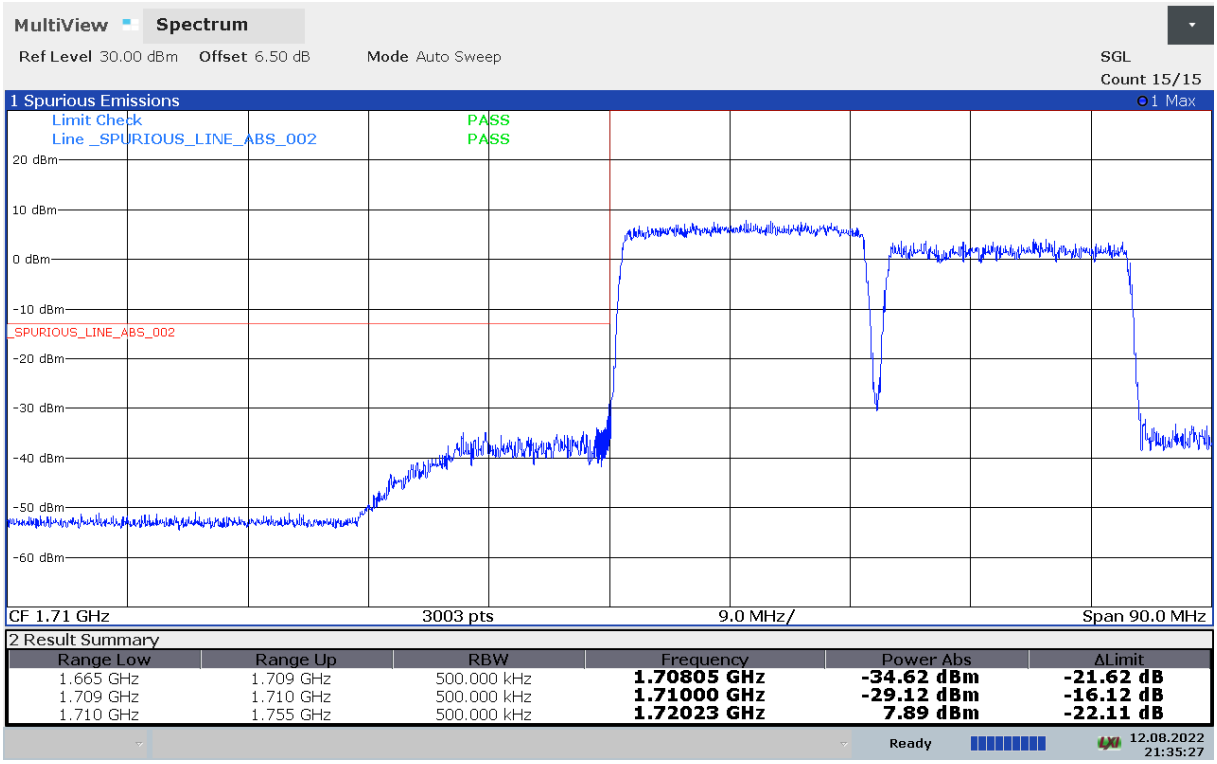
LOW BAND EDGE BLOCK-1RB-low_offset



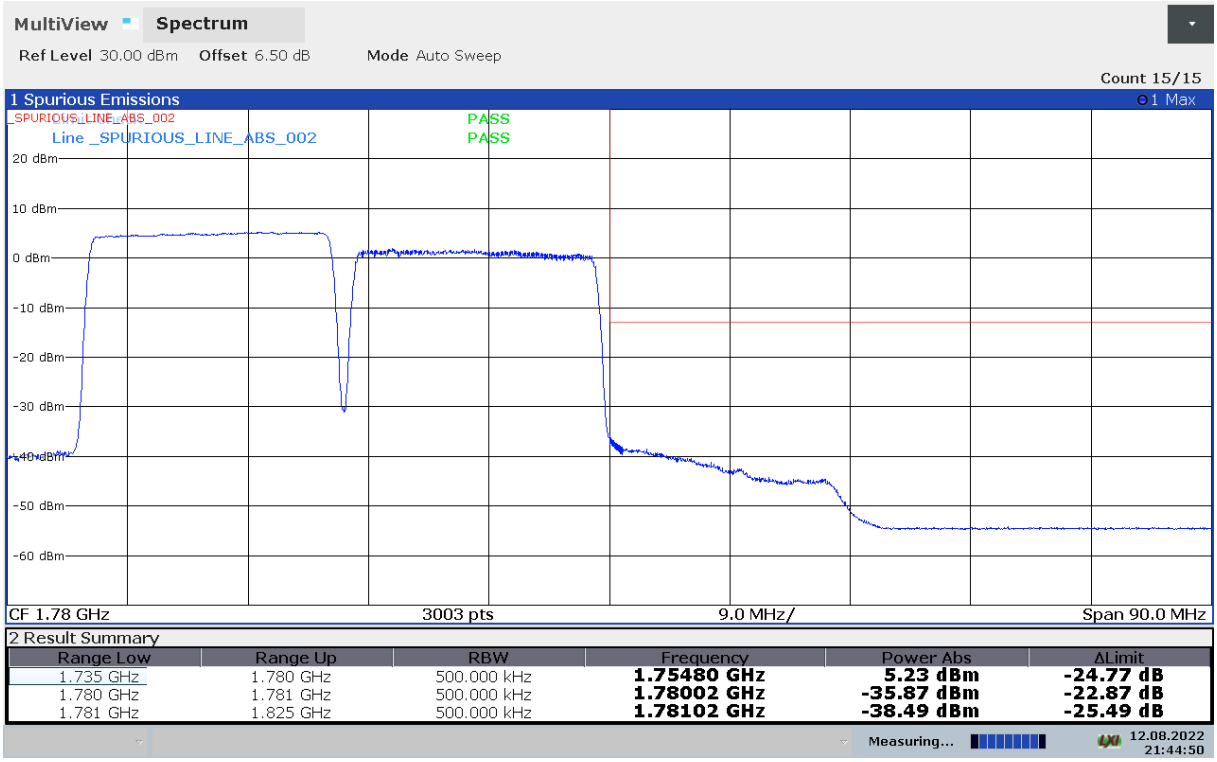
HIGH BAND EDGE BLOCK-1RB-high_offset



LOW BAND EDGE BLOCK-20MHz+20MHz -100%RB

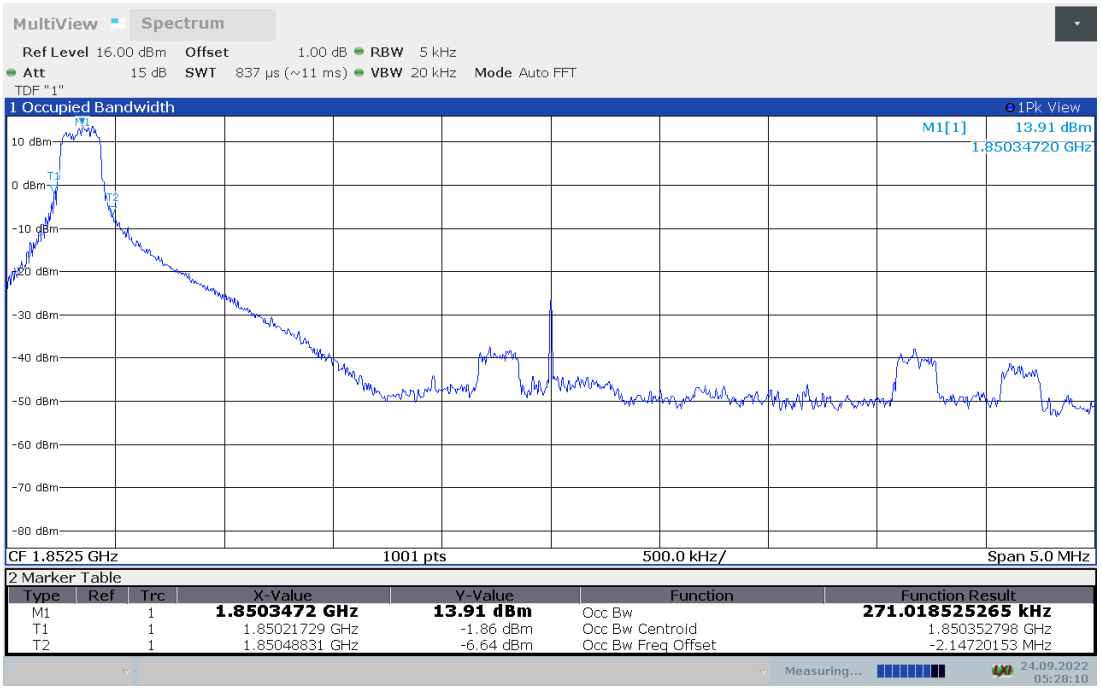


HIGH BAND EDGE BLOCK-20MHz+20MHz -100%RB

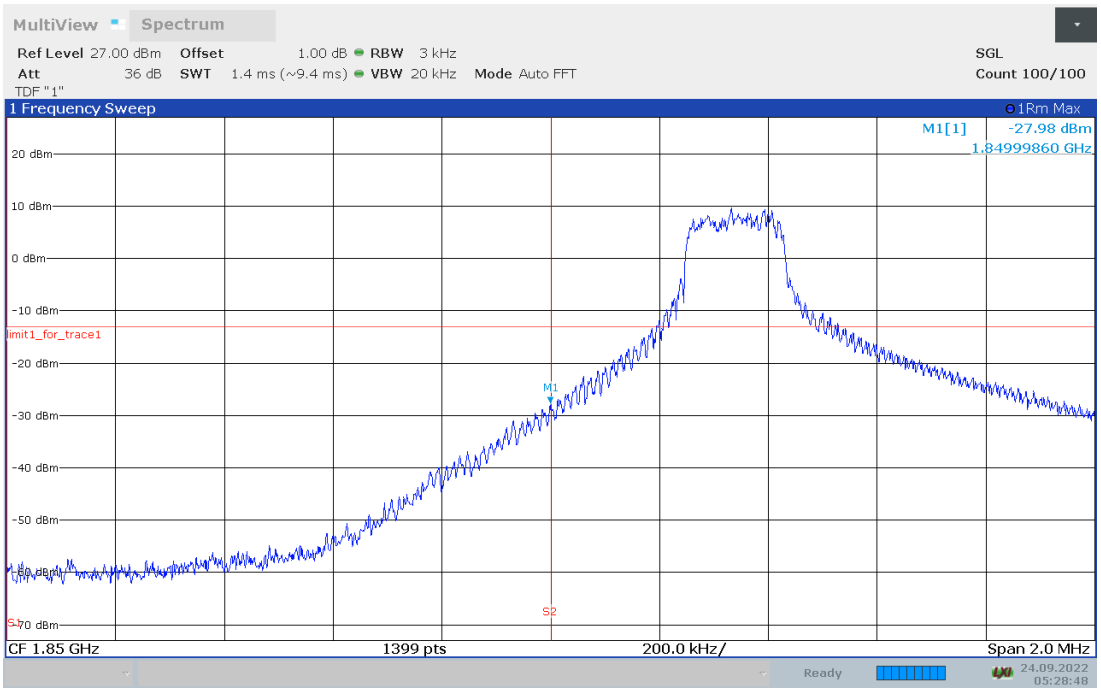


LTE band 2@CA_2A-5A

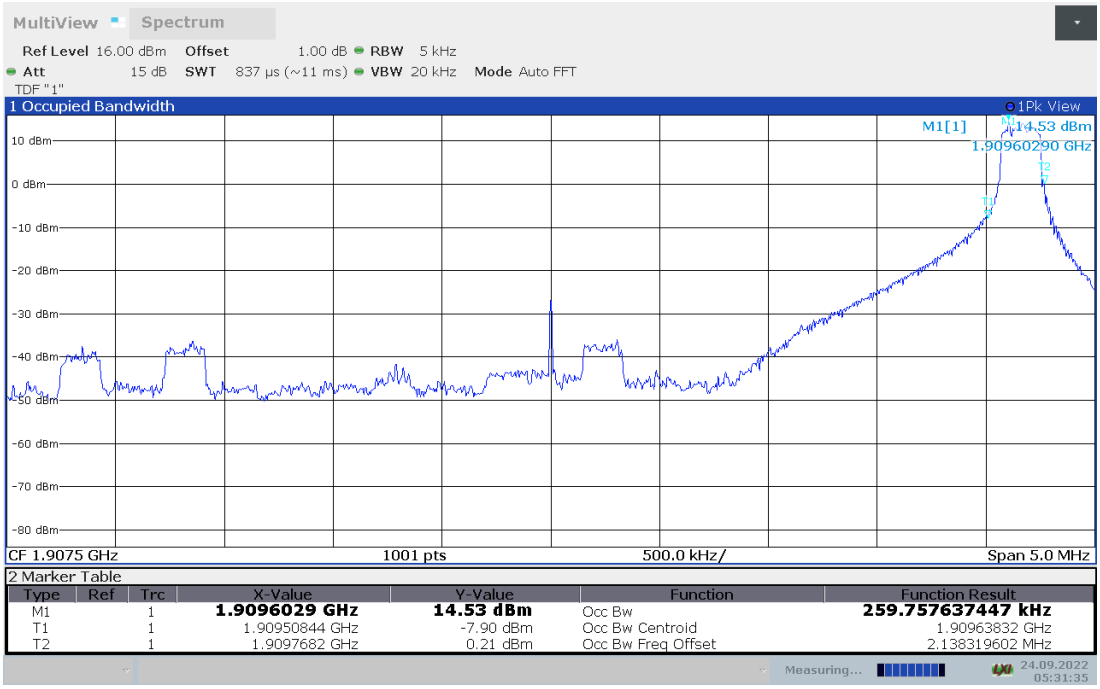
OBW: 1RB-LOW_offset



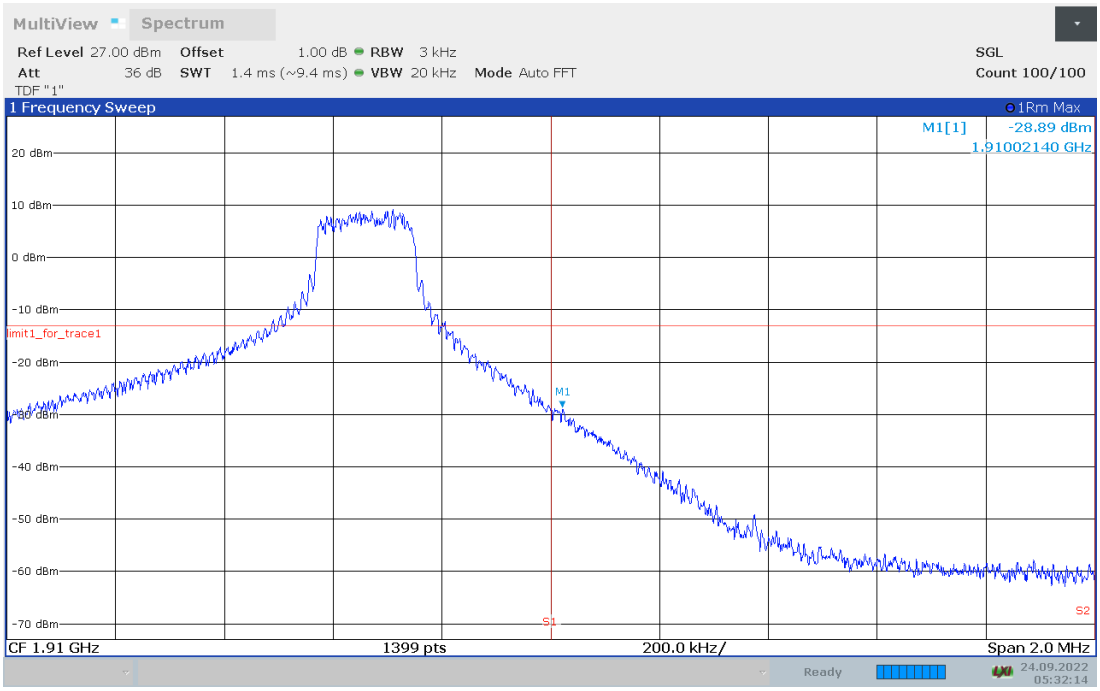
LOW BAND EDGE BLOCK-1RB-LOW_offset



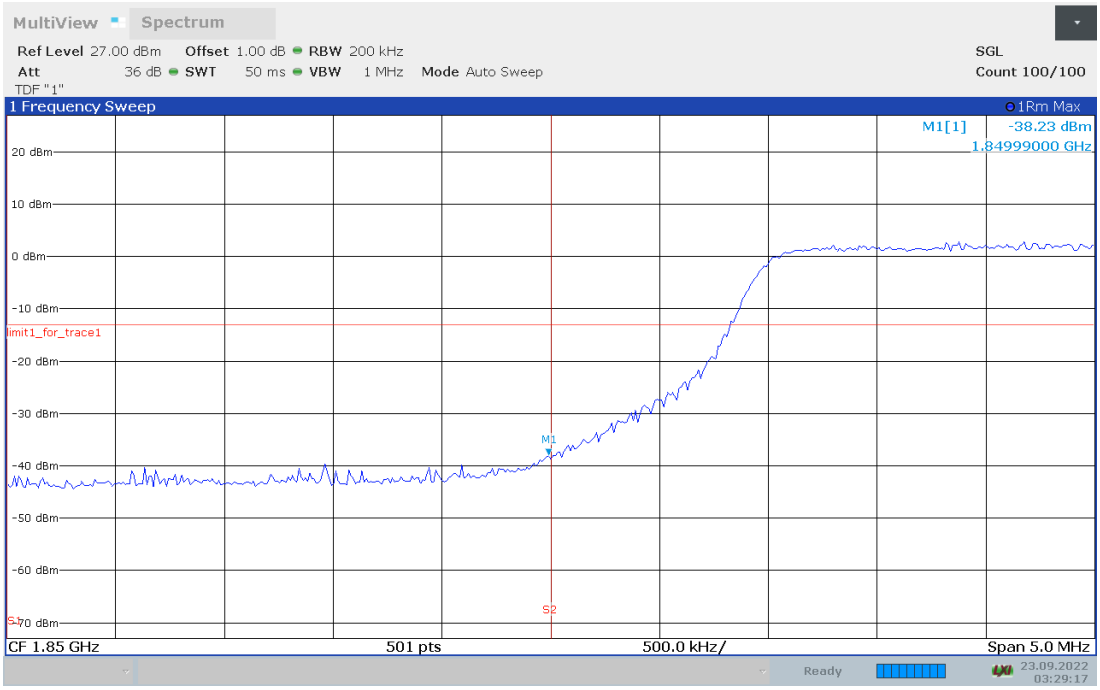
OBW: 1RB-HIGH_offset



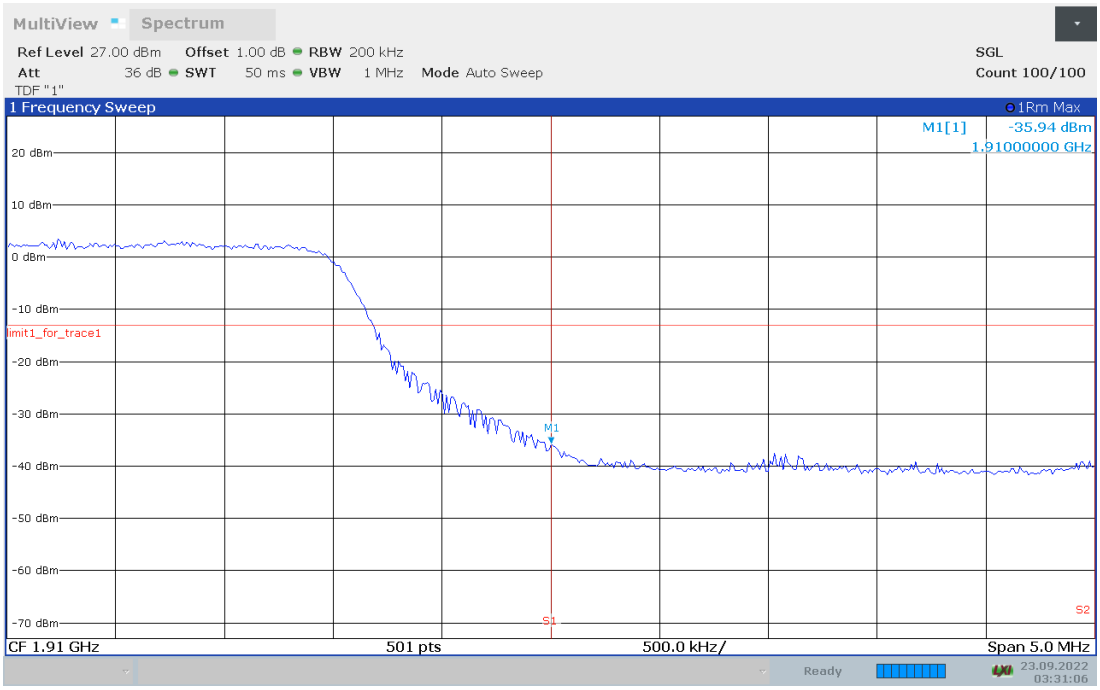
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



LOW BAND EDGE BLOCK-20MHz+10MHz-100%RB

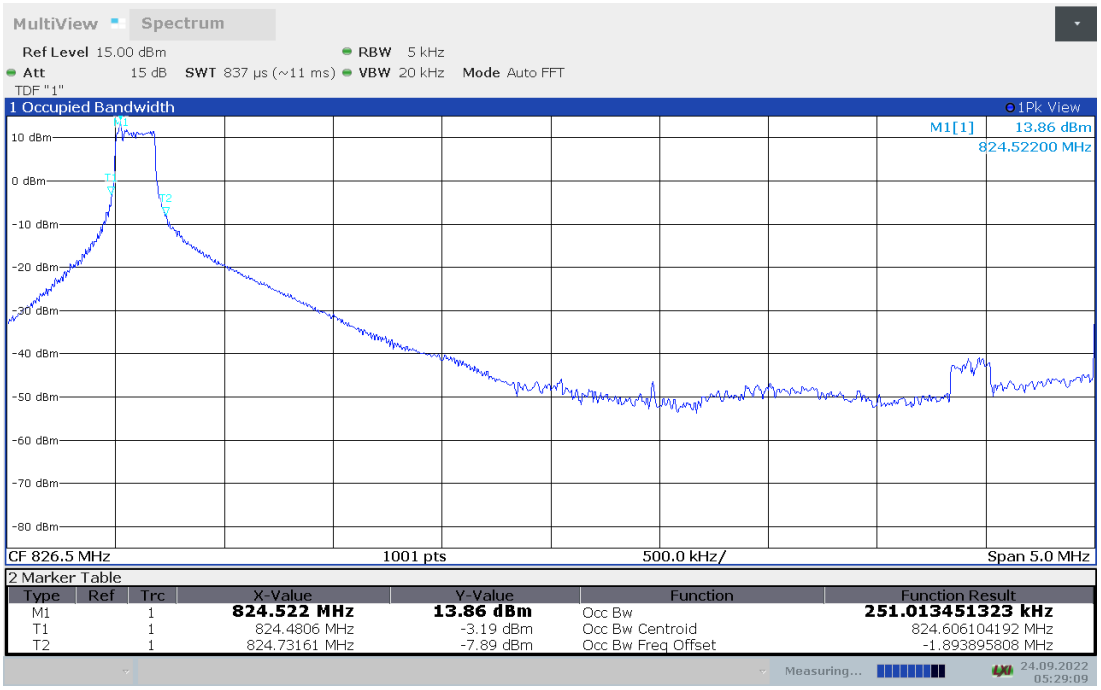


HIGH BAND EDGE BLOCK-20MHz+10MHz-100%RB

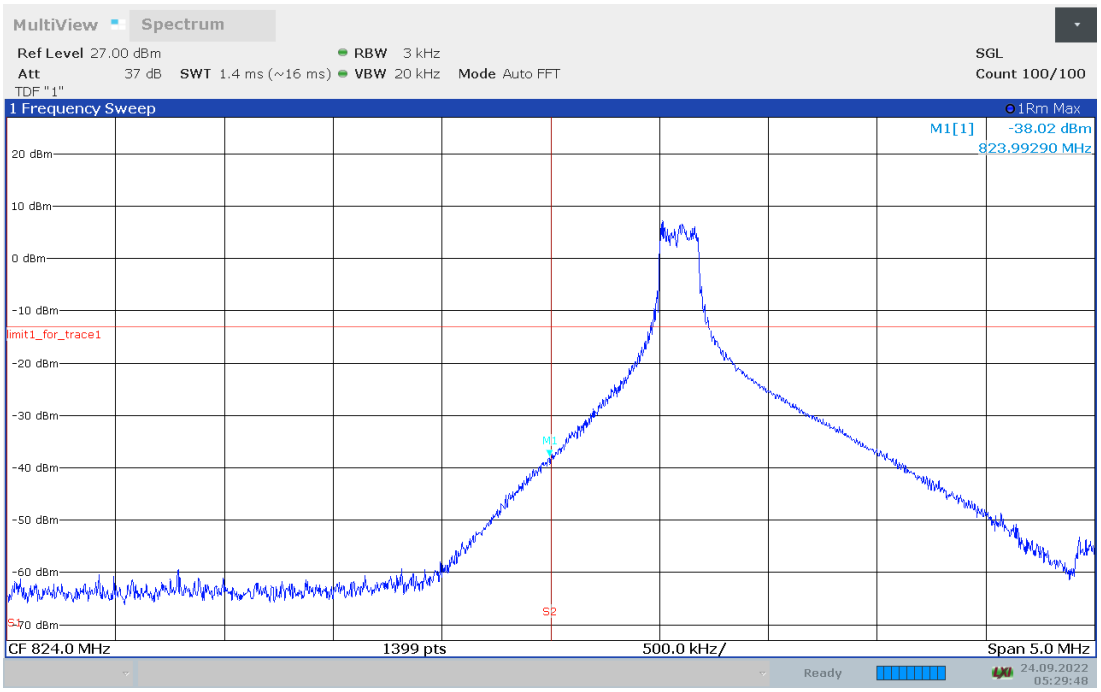


LTE band 5@CA_2A-5A

OBW: 1RB-LOW_offset

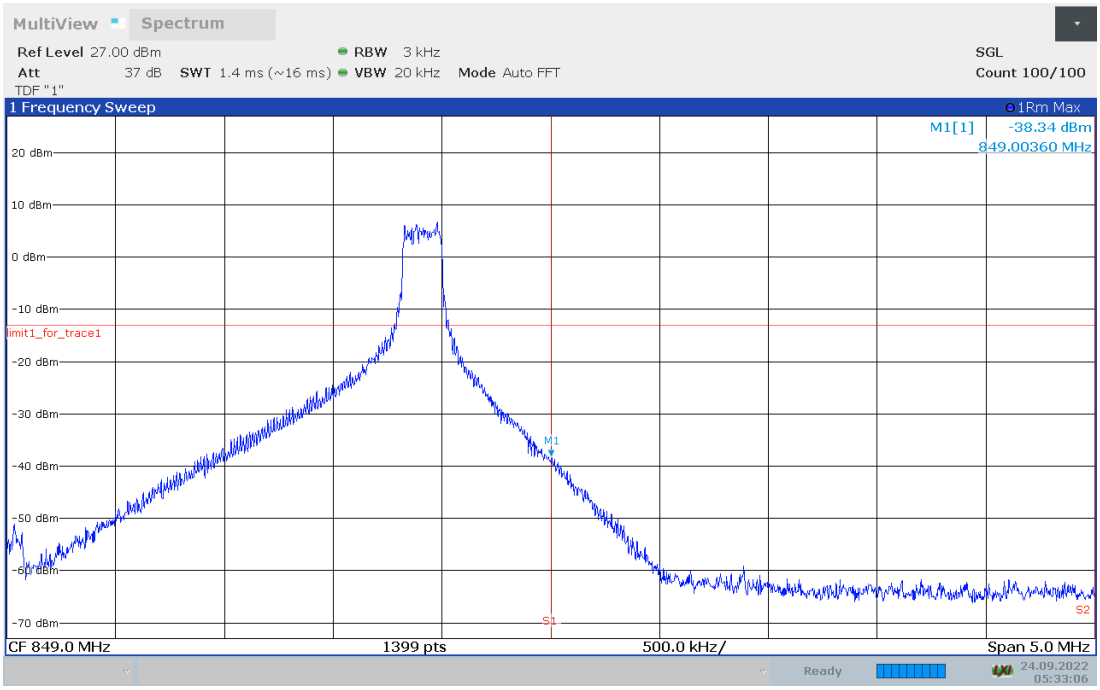


LOW BAND EDGE BLOCK-1RB-LOW_offset

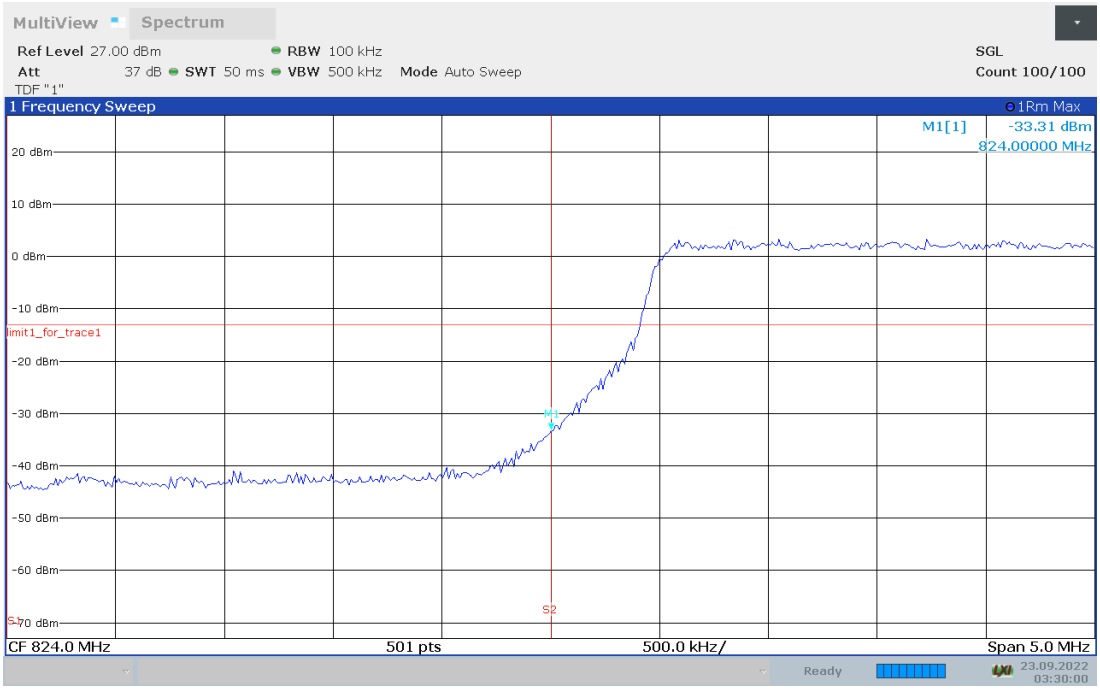


OBW: 1RB-HIGH_offset

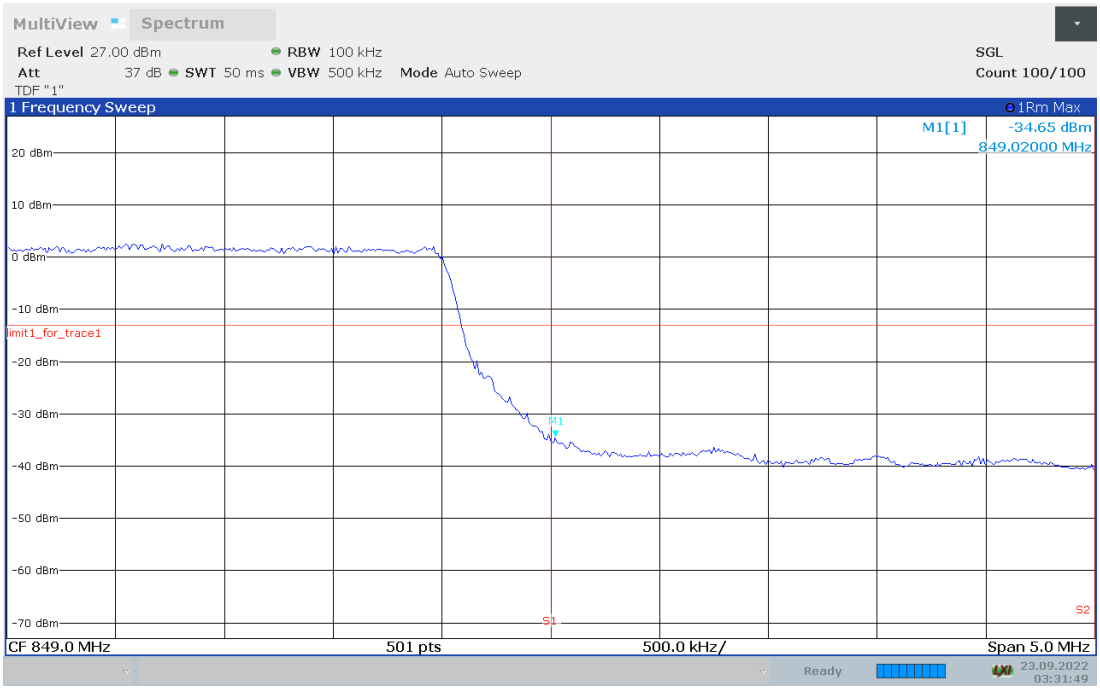
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



LOW BAND EDGE BLOCK-20MHz+10MHz-100%RB

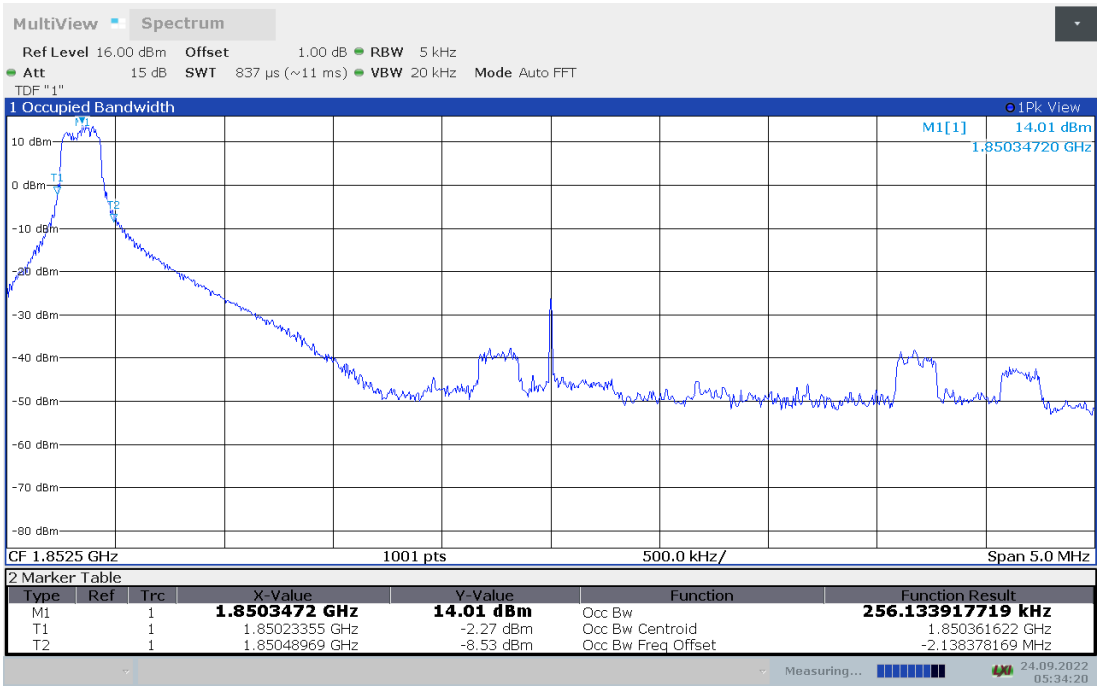


HIGH BAND EDGE BLOCK-20MHz+10MHz-100%RB

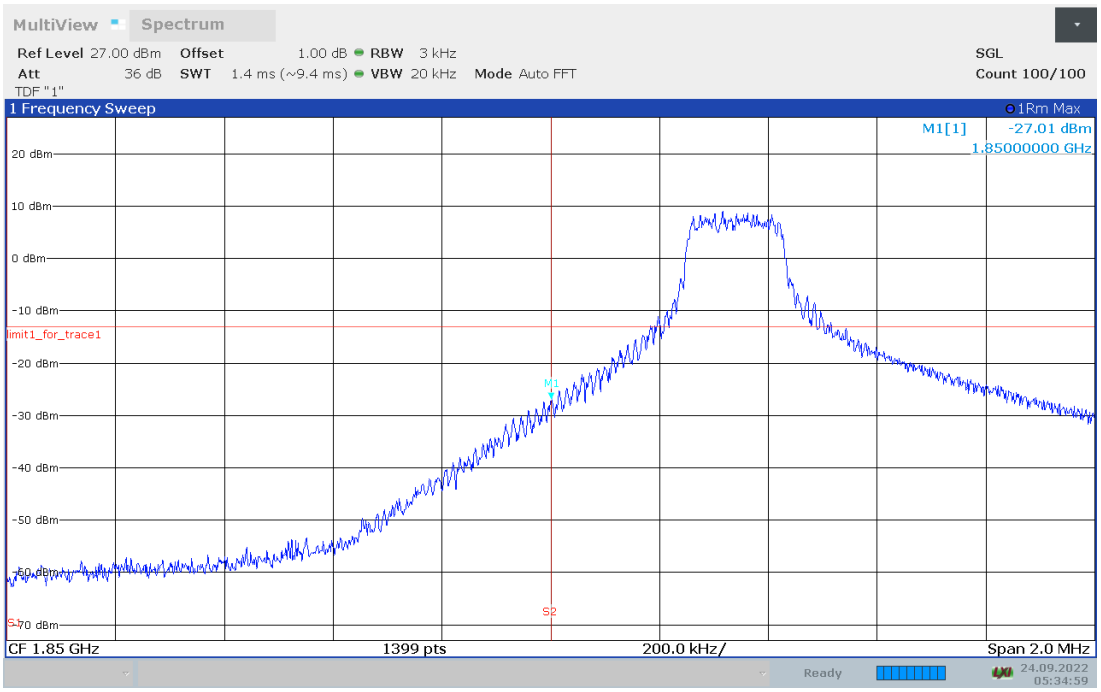


LTE band 2@CA_2A-13A

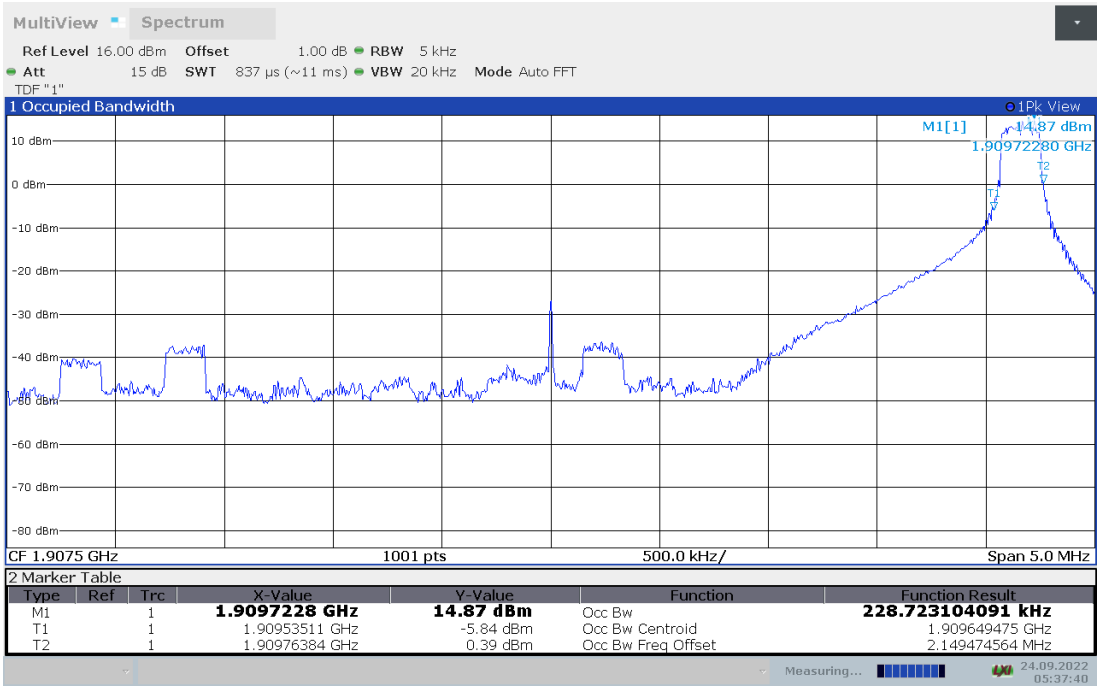
OBW: 1RB-LOW_offset



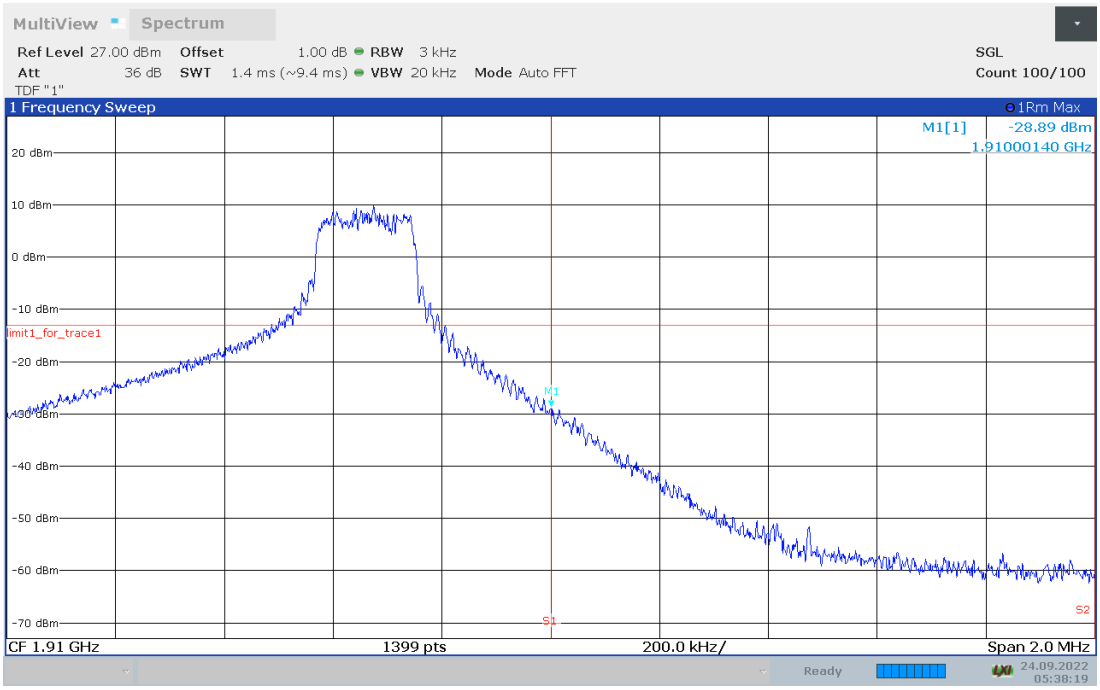
LOW BAND EDGE BLOCK-1RB-LOW_offset



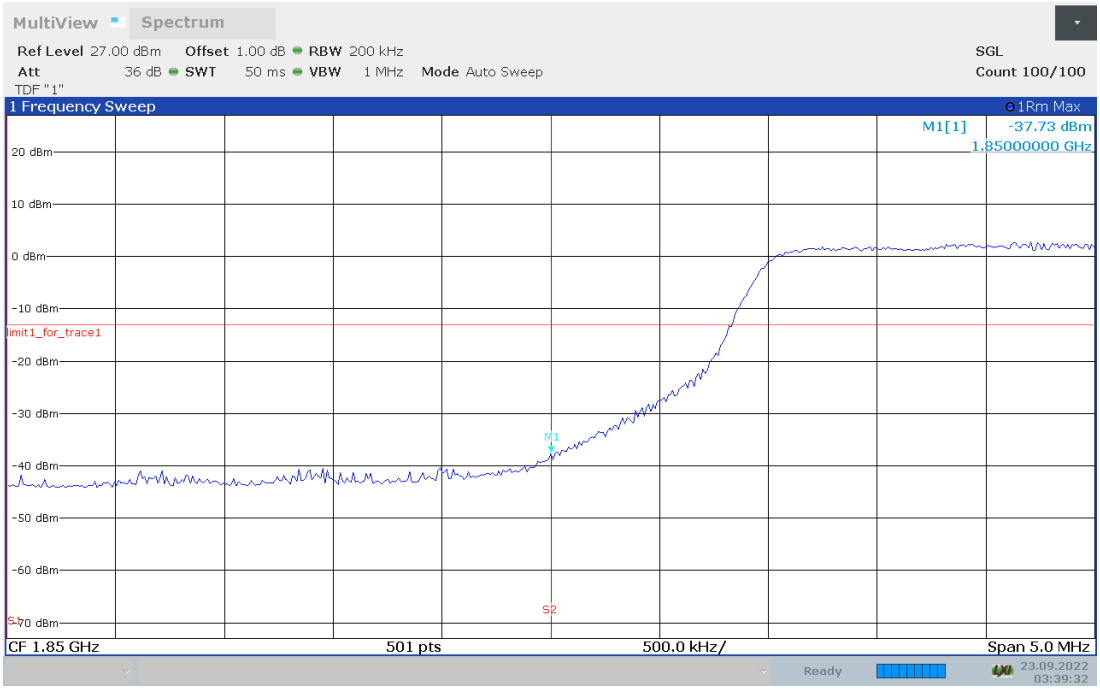
OBW: 1RB-HIGH_offset



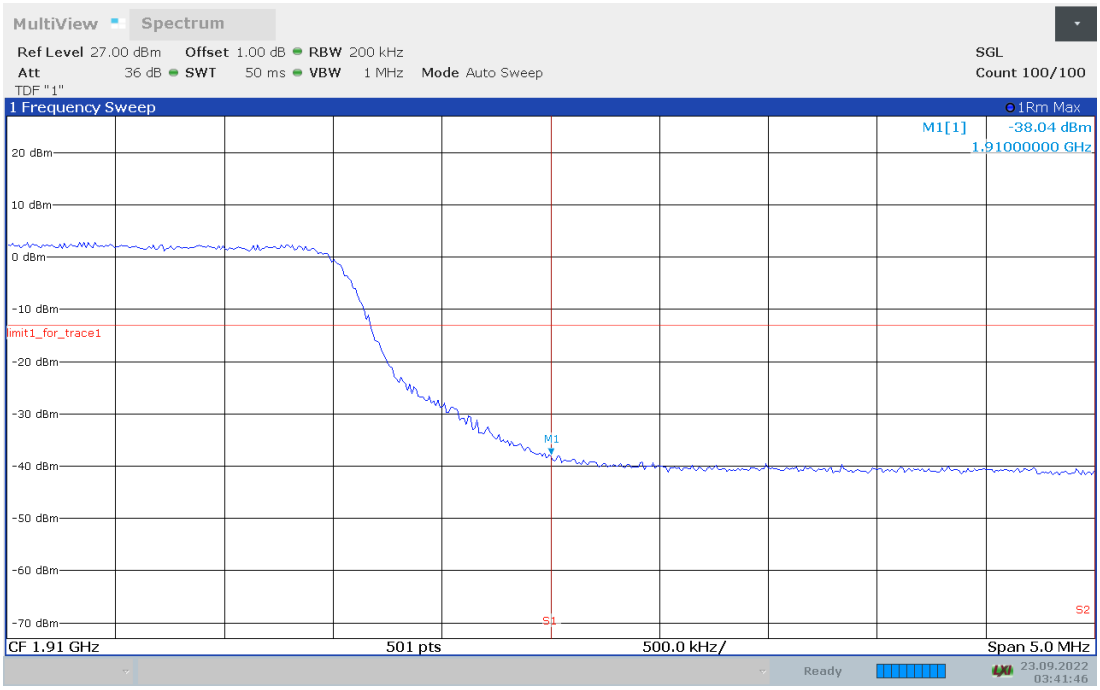
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



LOW BAND EDGE BLOCK-20MHz+10MHz-100%RB

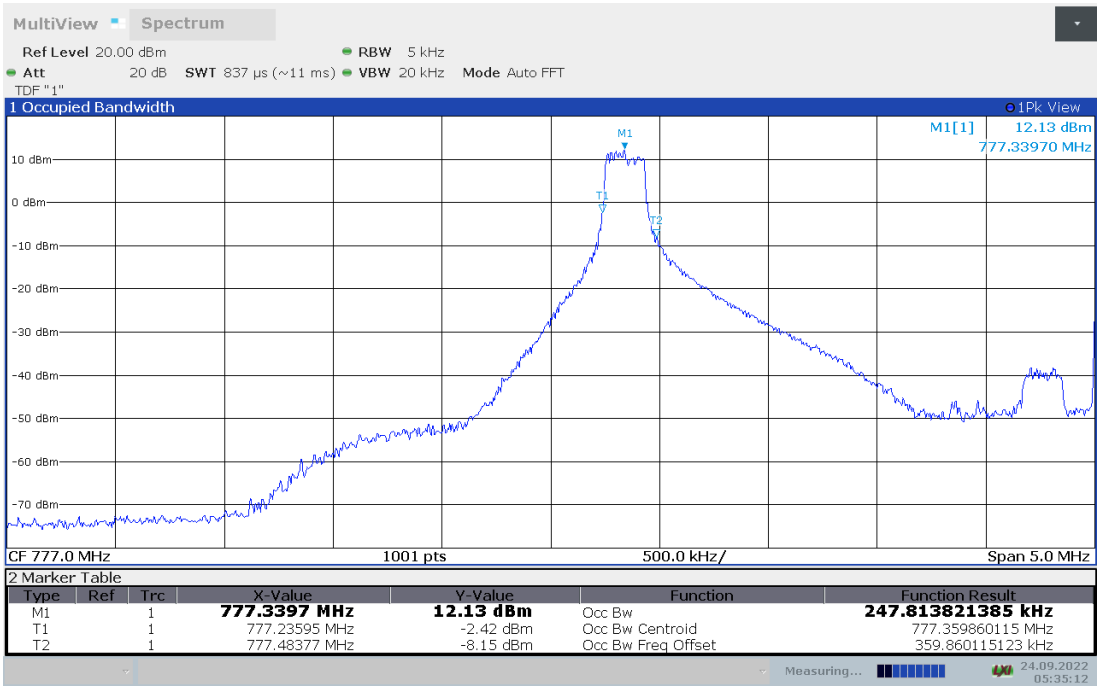


HIGH BAND EDGE BLOCK-20MHz+10MHz-100%RB

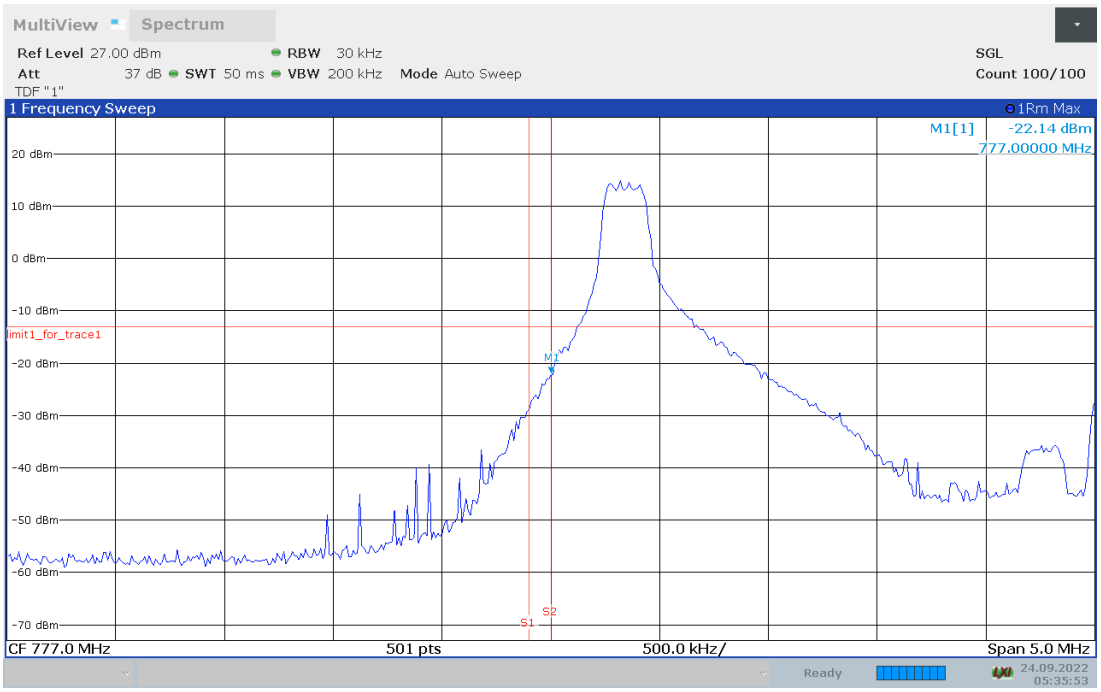


LTE band 13@CA_2A-13A

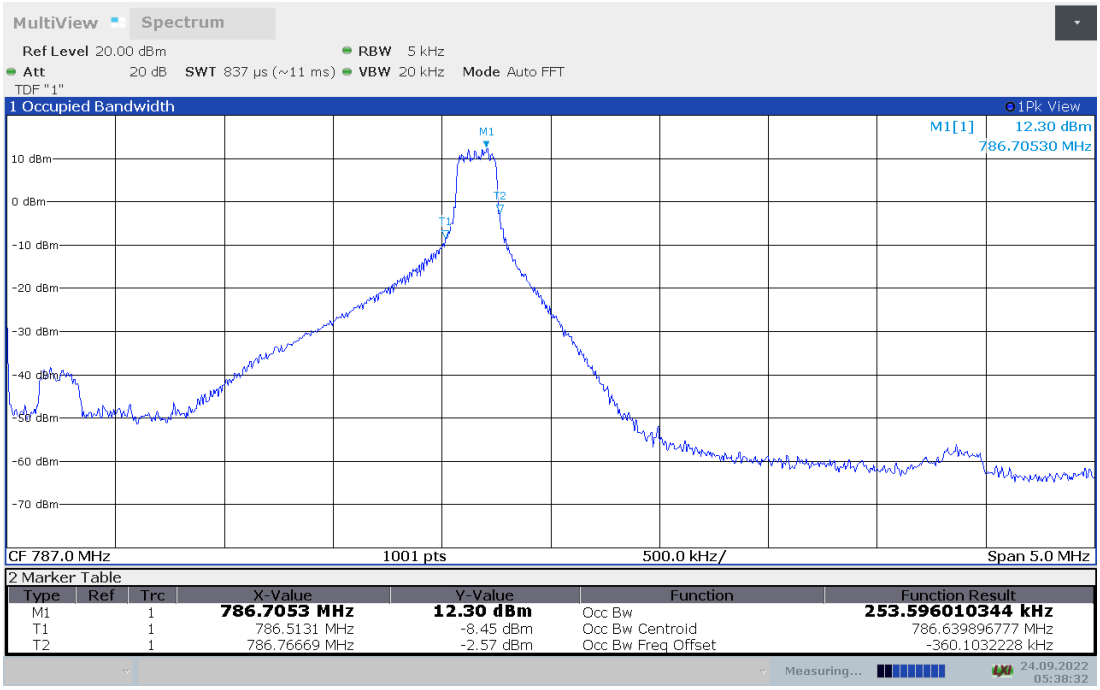
OBW: 1RB-LOW_offset



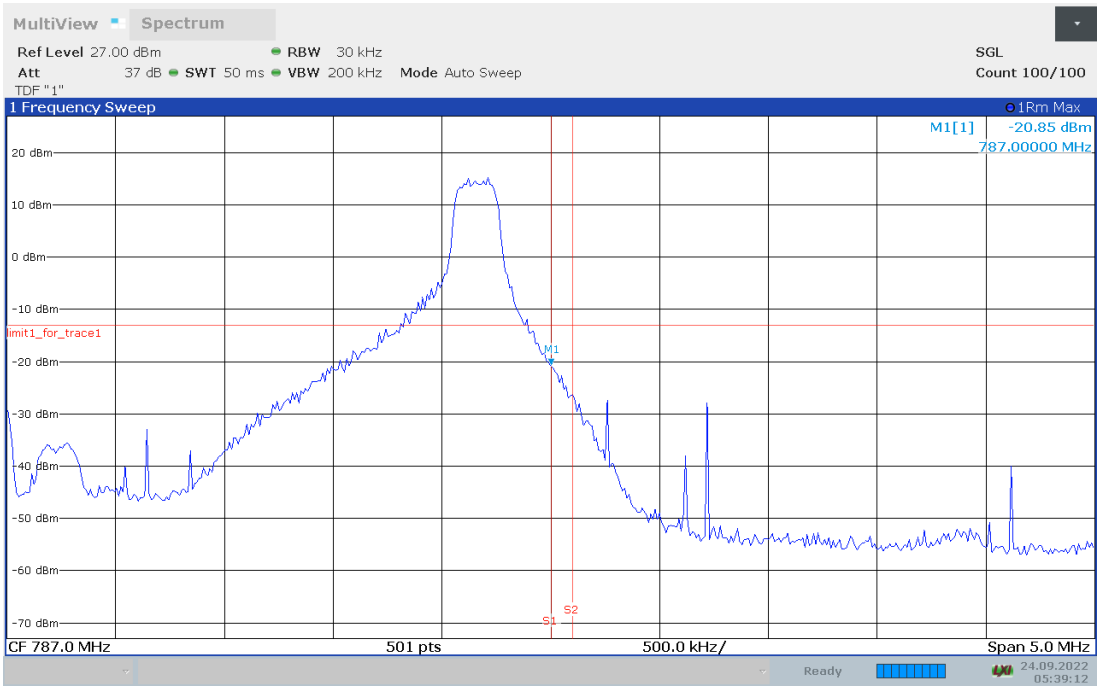
LOW BAND EDGE BLOCK-1RB-LOW_offset



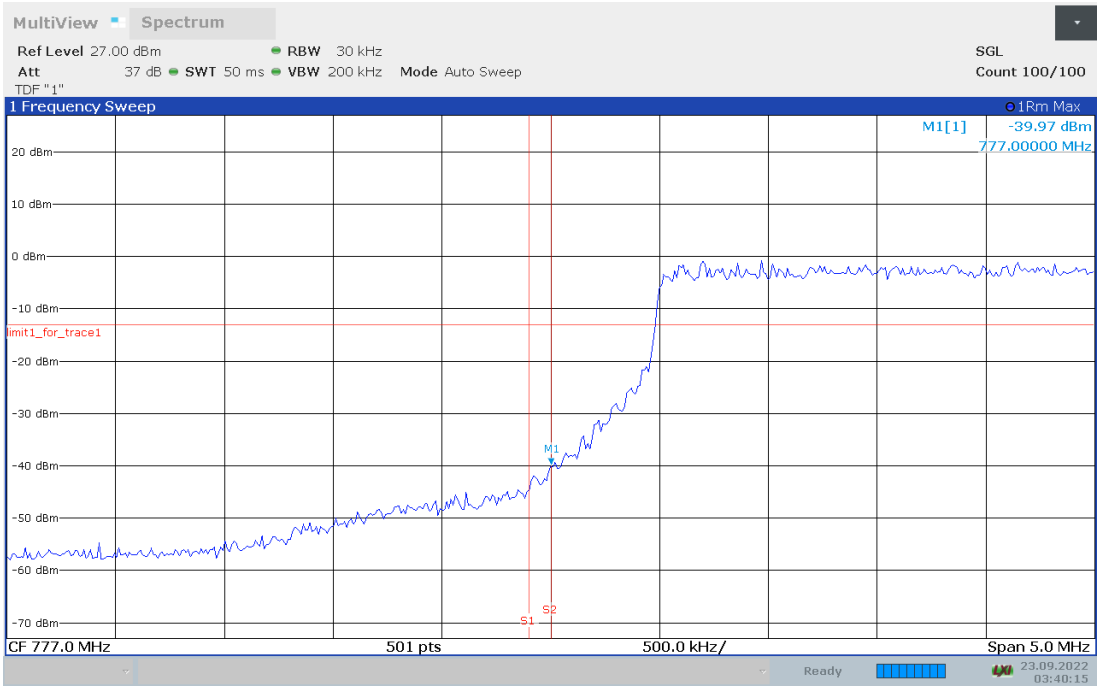
OBW: 1RB-HIGH_offset



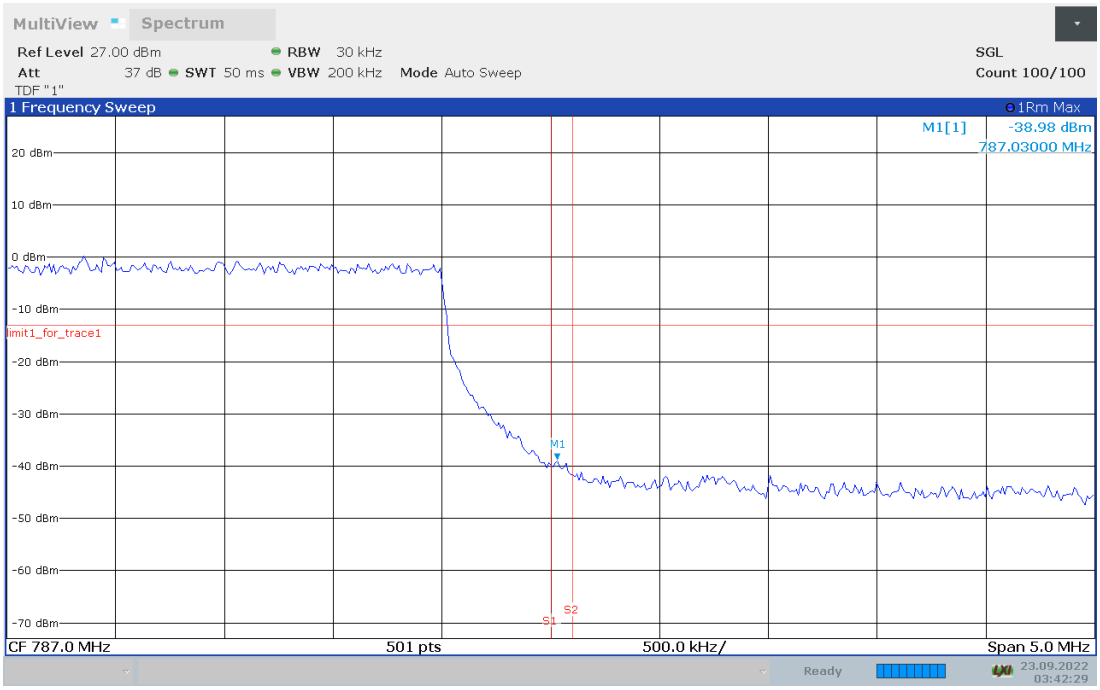
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



LOW BAND EDGE BLOCK-20MHz+10MHz-100%RB

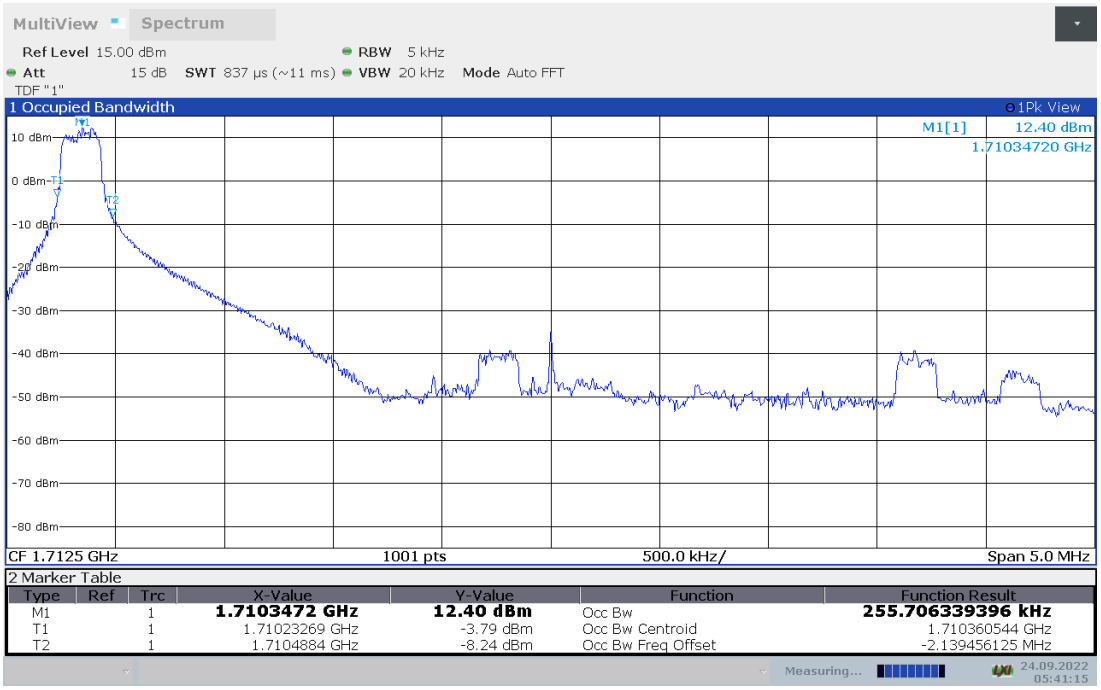


HIGH BAND EDGE BLOCK-20MHz+10MHz-100%RB

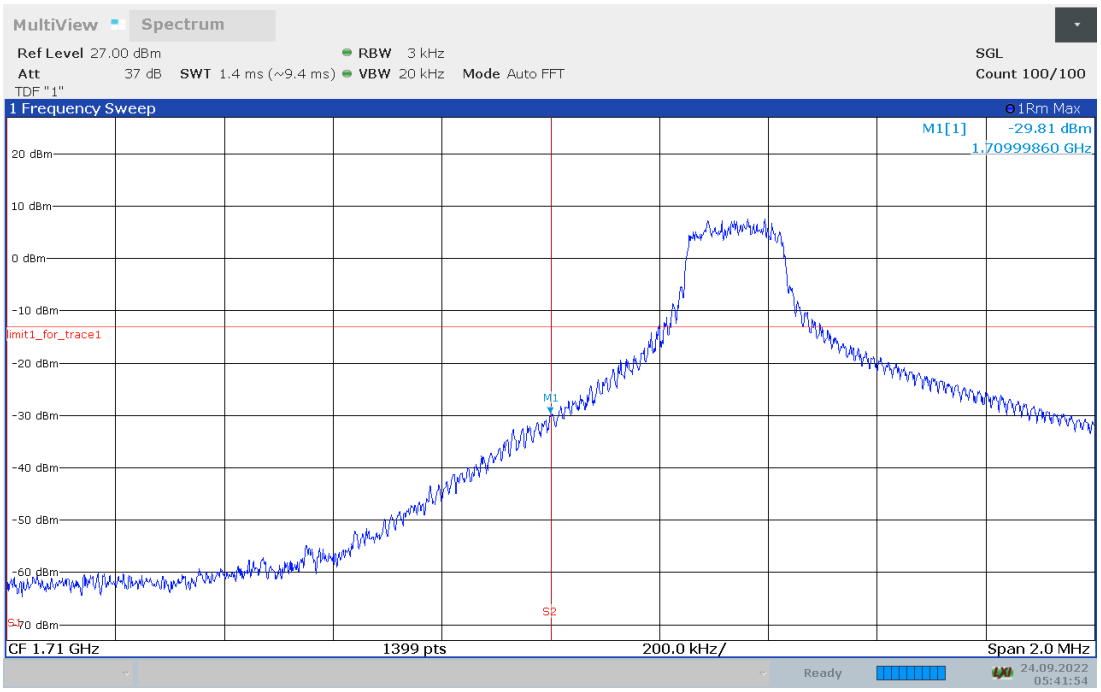


LTE band 4@CA_4A-13A

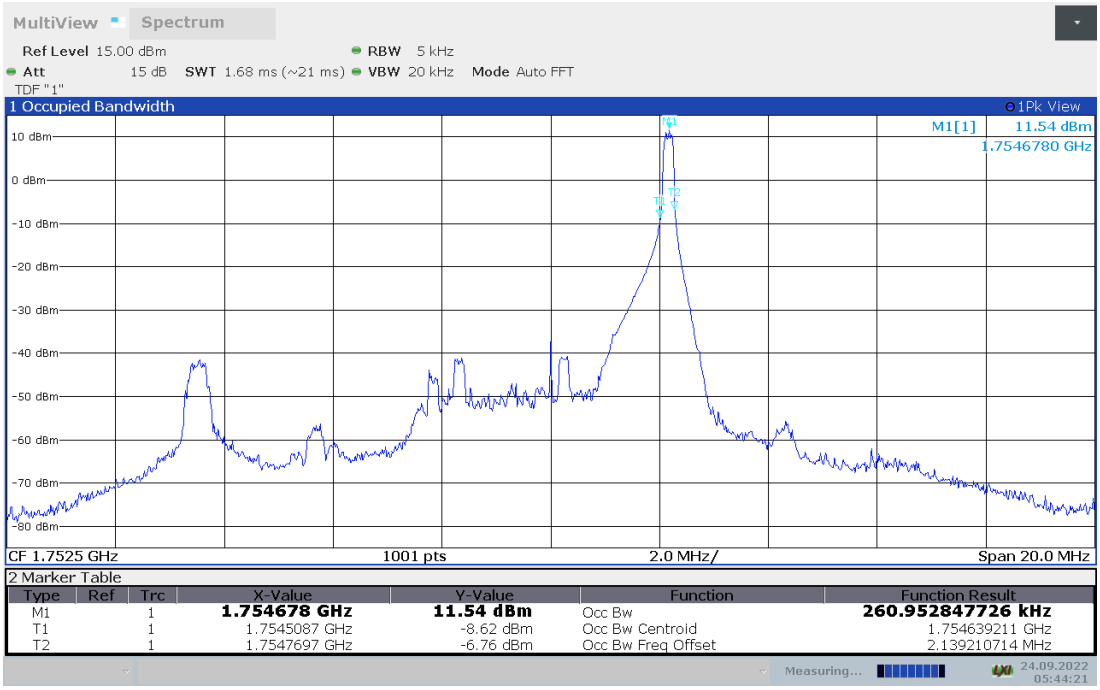
OBW: 1RB-LOW_offset



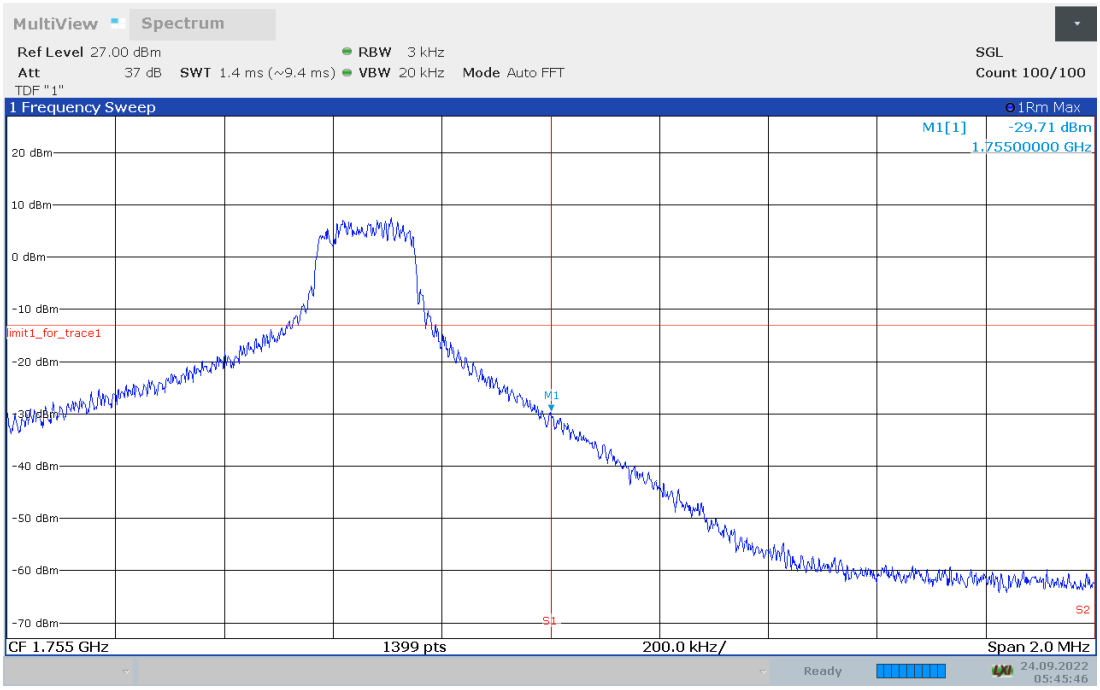
LOW BAND EDGE BLOCK-1RB-LOW_offset



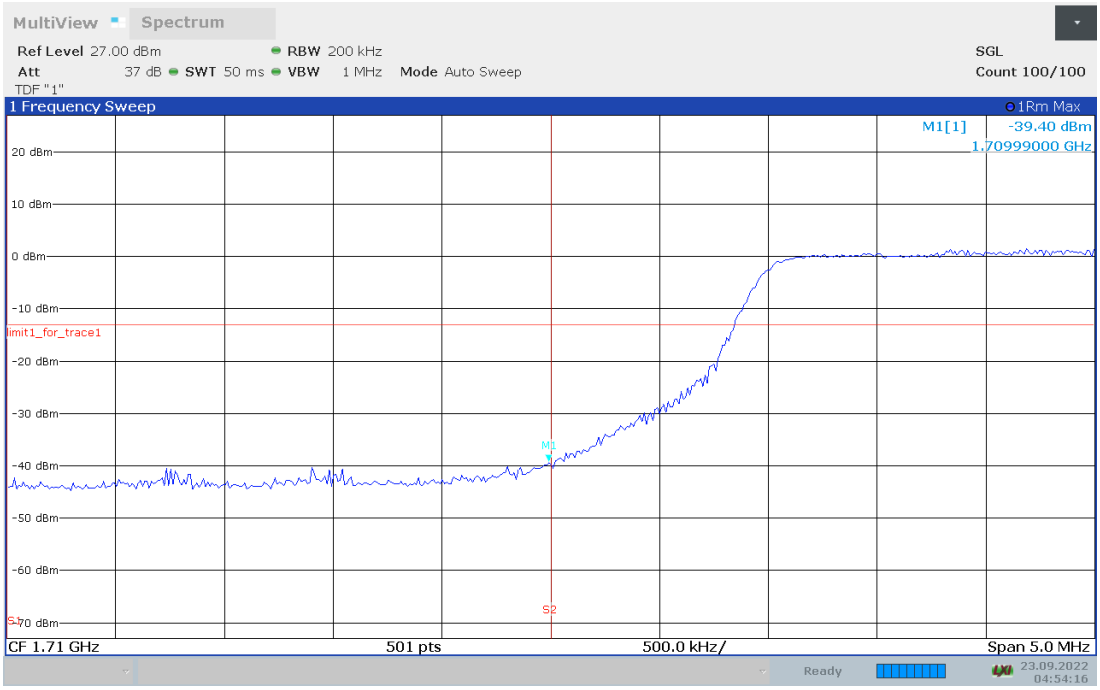
OBW: 1RB-HIGH_offset



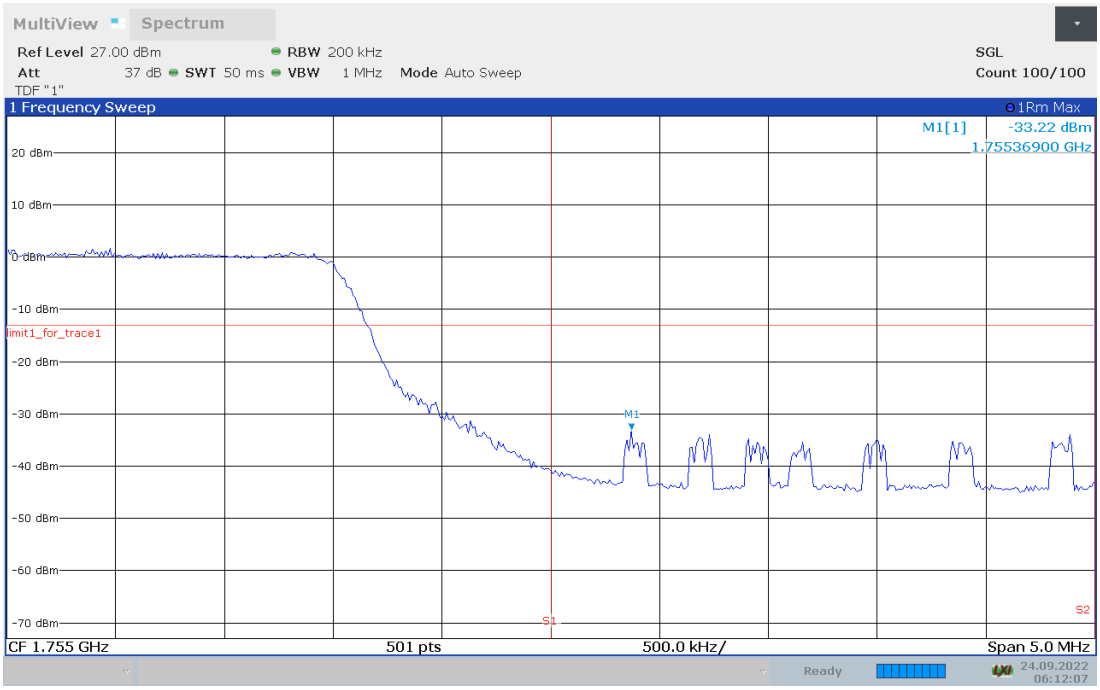
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



LOW BAND EDGE BLOCK-20MHz+10MHz-100%RB

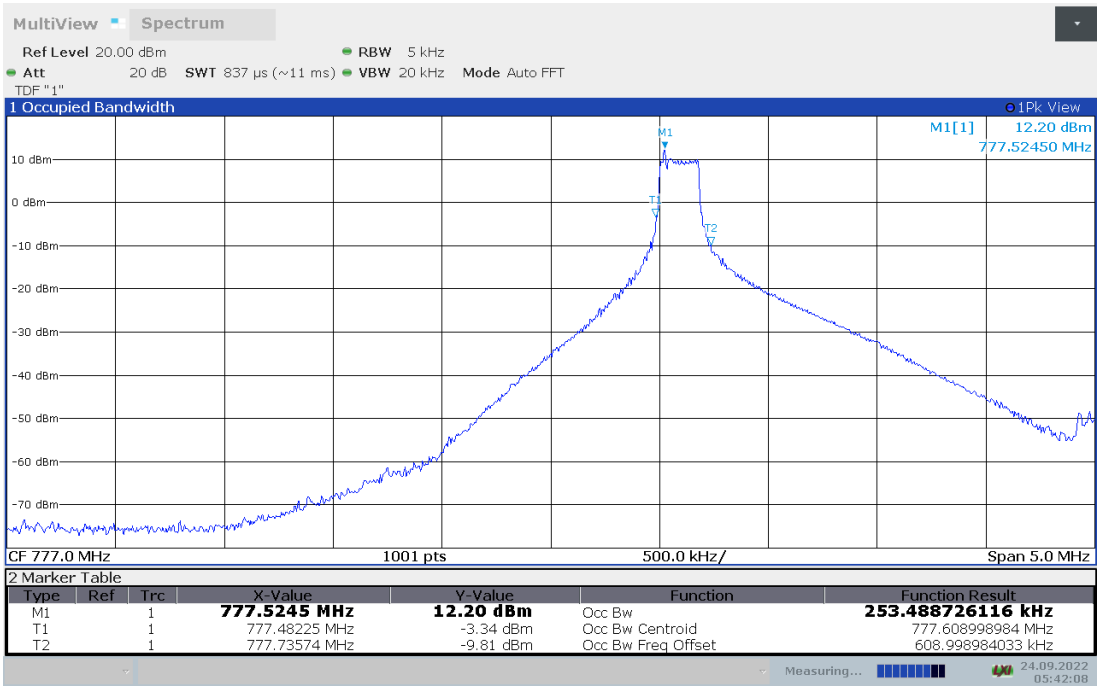


HIGH BAND EDGE BLOCK-20MHz+10MHz-100%RB

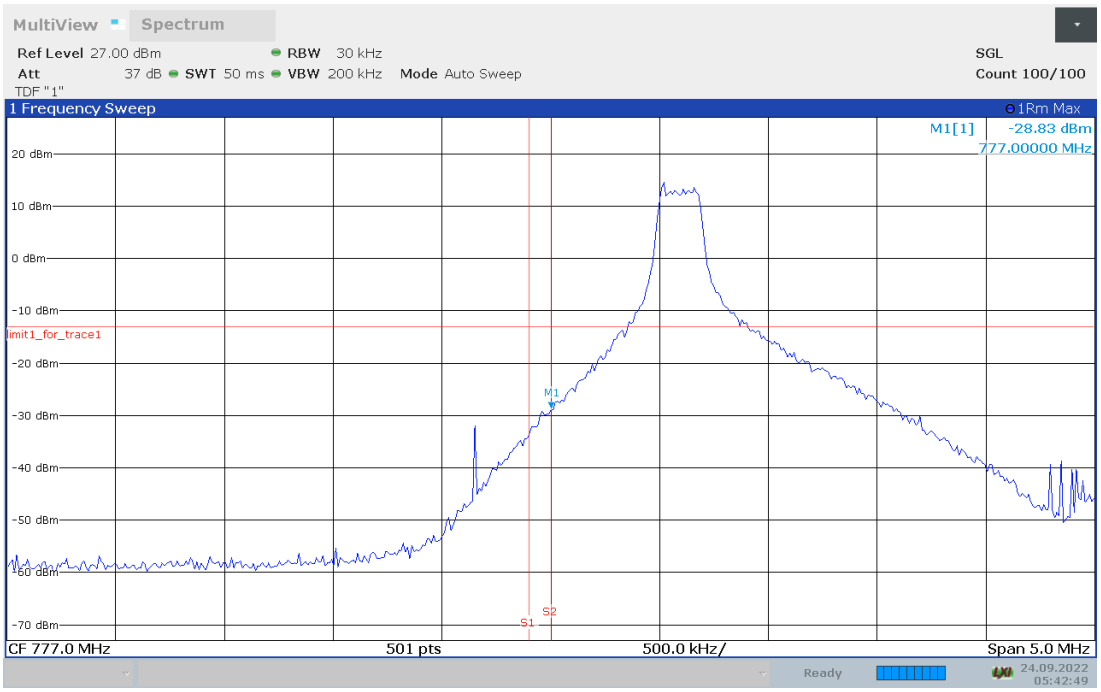


LTE band 13@CA_4A-13A

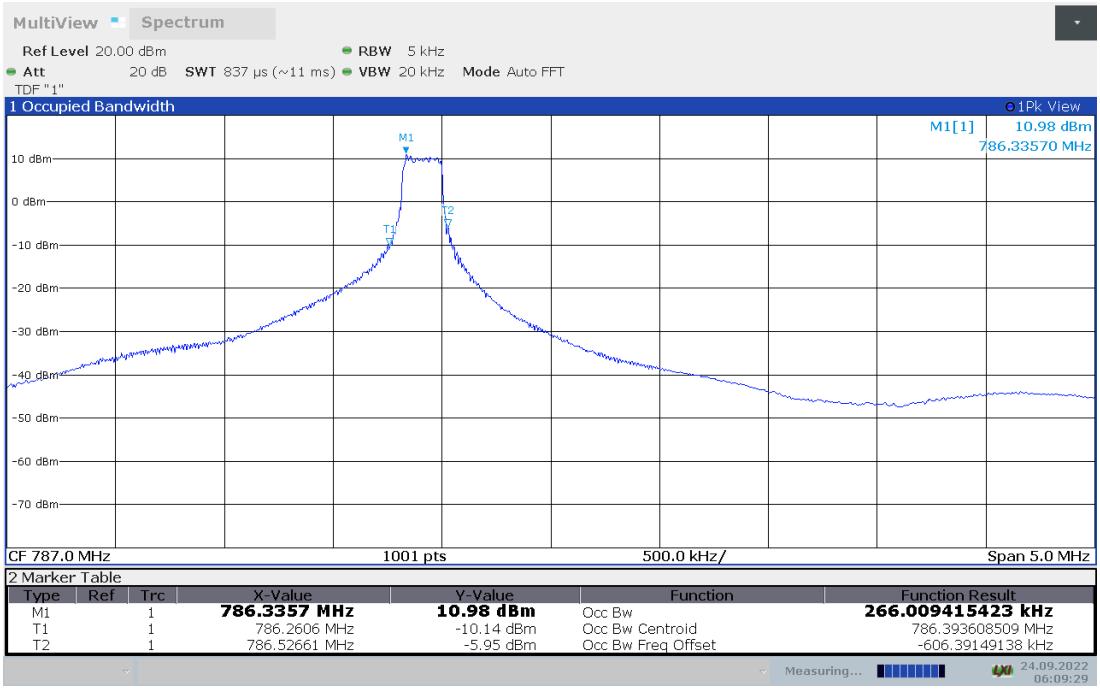
OBW: 1RB-LOW_offset



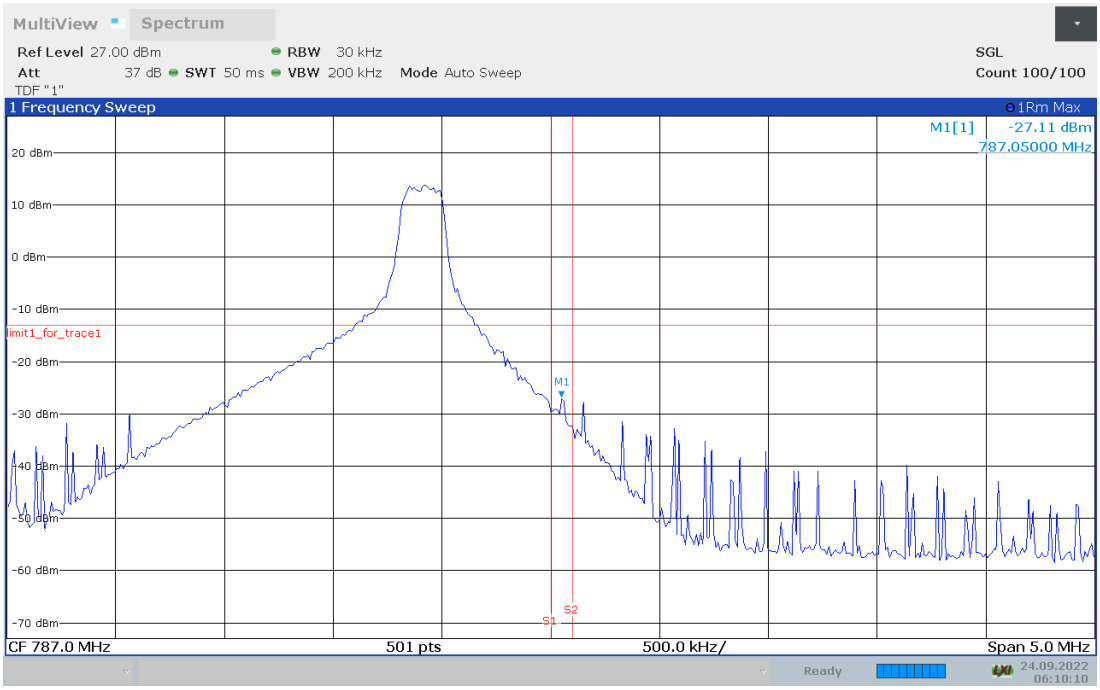
LOW BAND EDGE BLOCK-1RB-LOW_offset



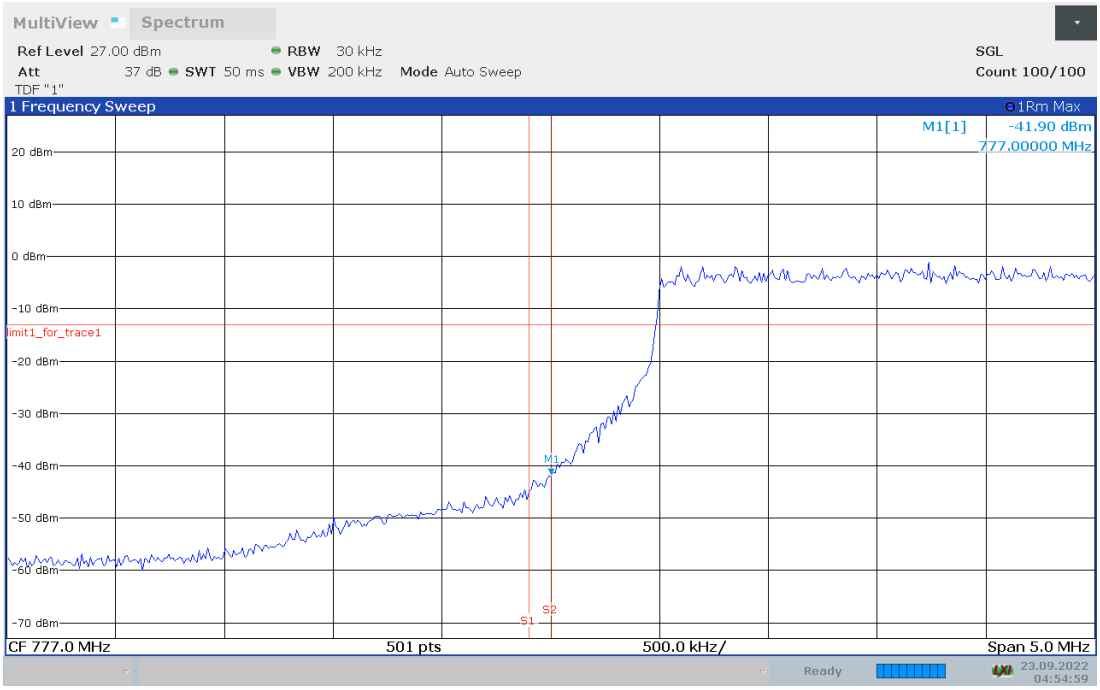
OBW: 1RB-HIGH_offset



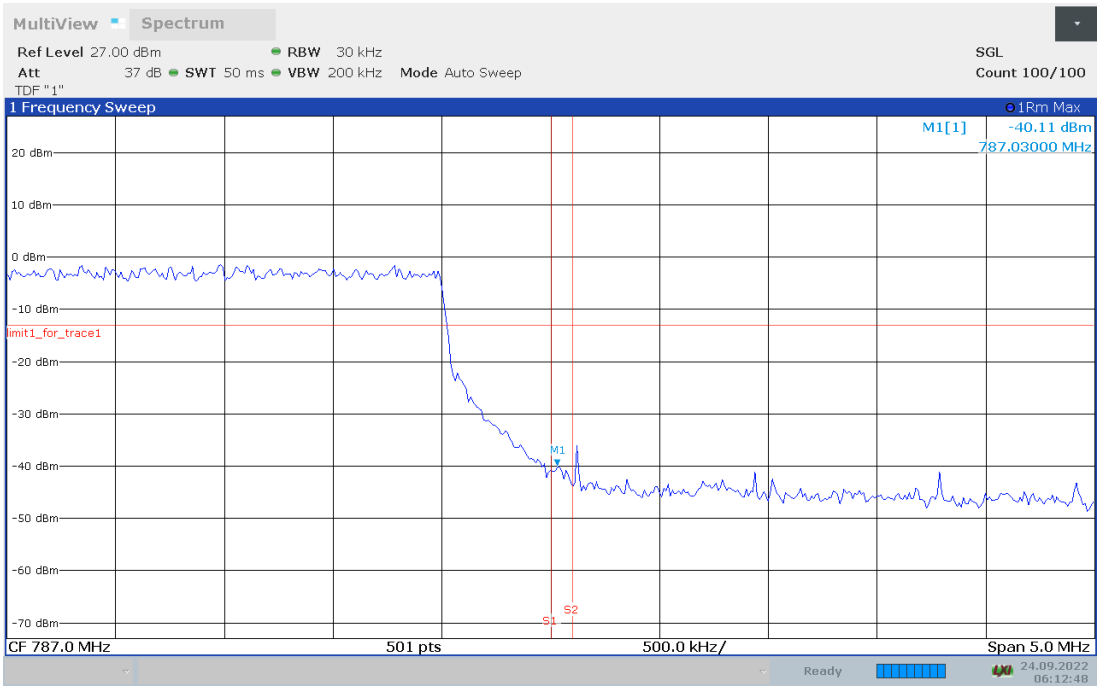
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



LOW BAND EDGE BLOCK-20MHz+10MHz-100%RB

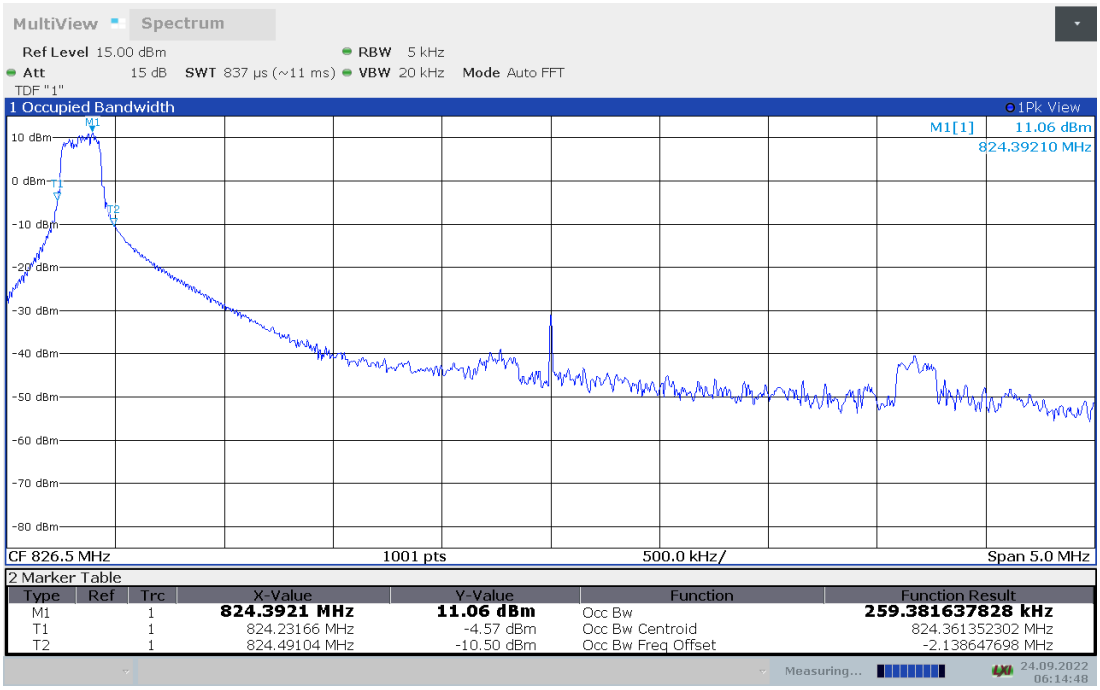


HIGH BAND EDGE BLOCK-20MHz+10MHz-100%RB

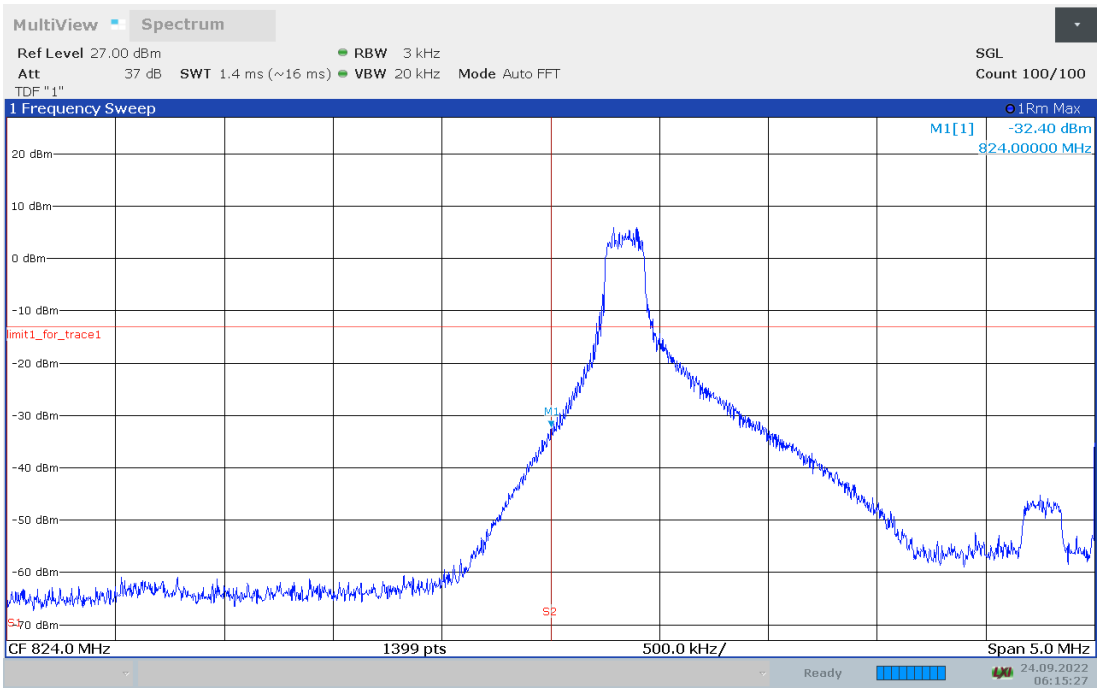


LTE band 5@CA_5A-66A

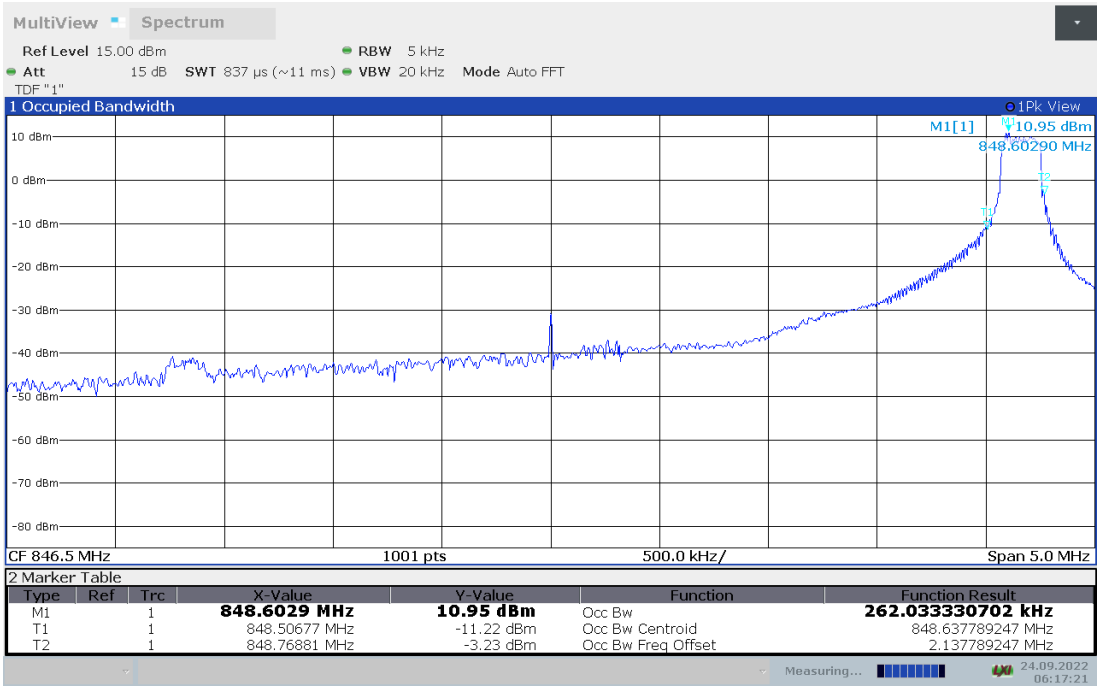
OBW: 1RB-LOW_offset



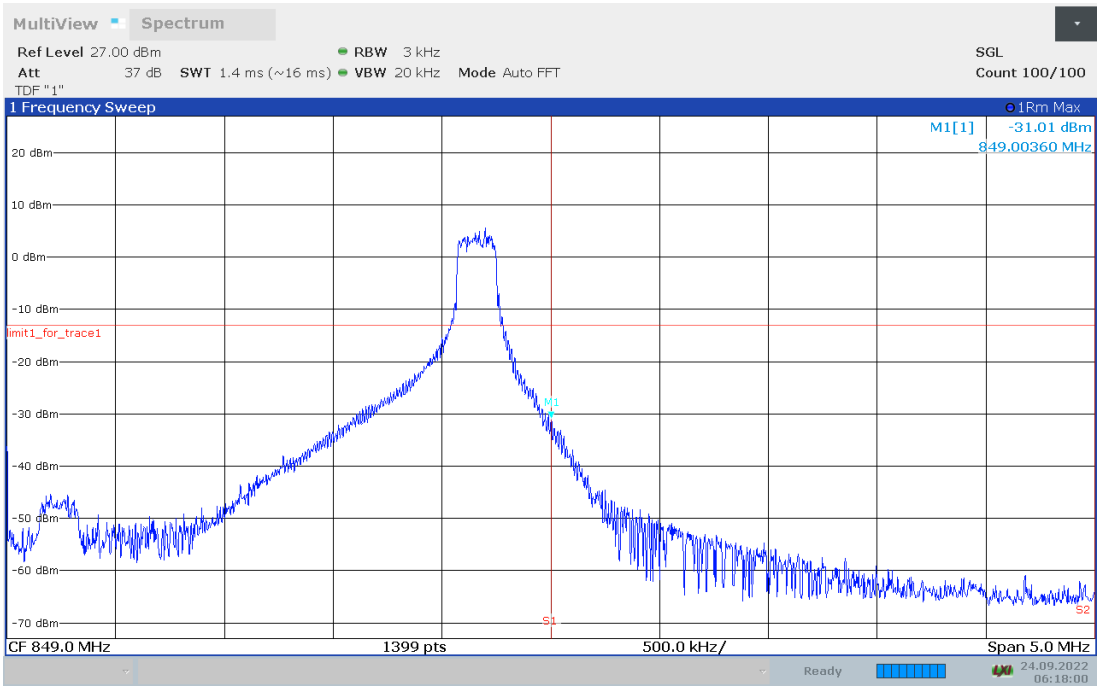
LOW BAND EDGE BLOCK-1RB-LOW_offset



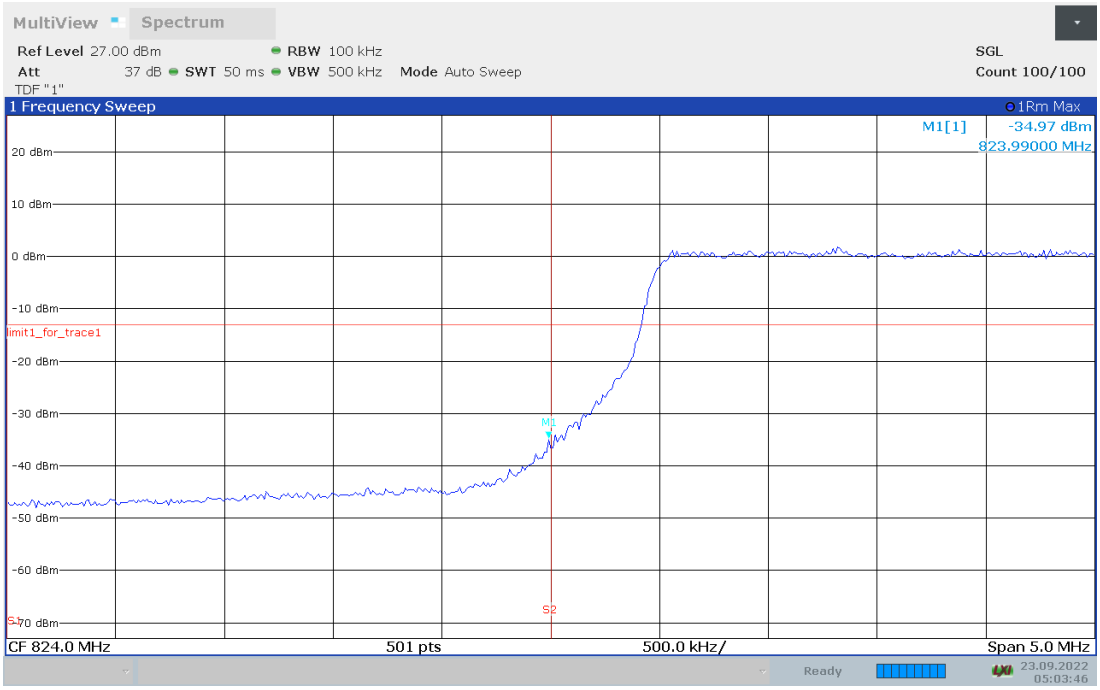
OBW: 1RB-HIGH_offset



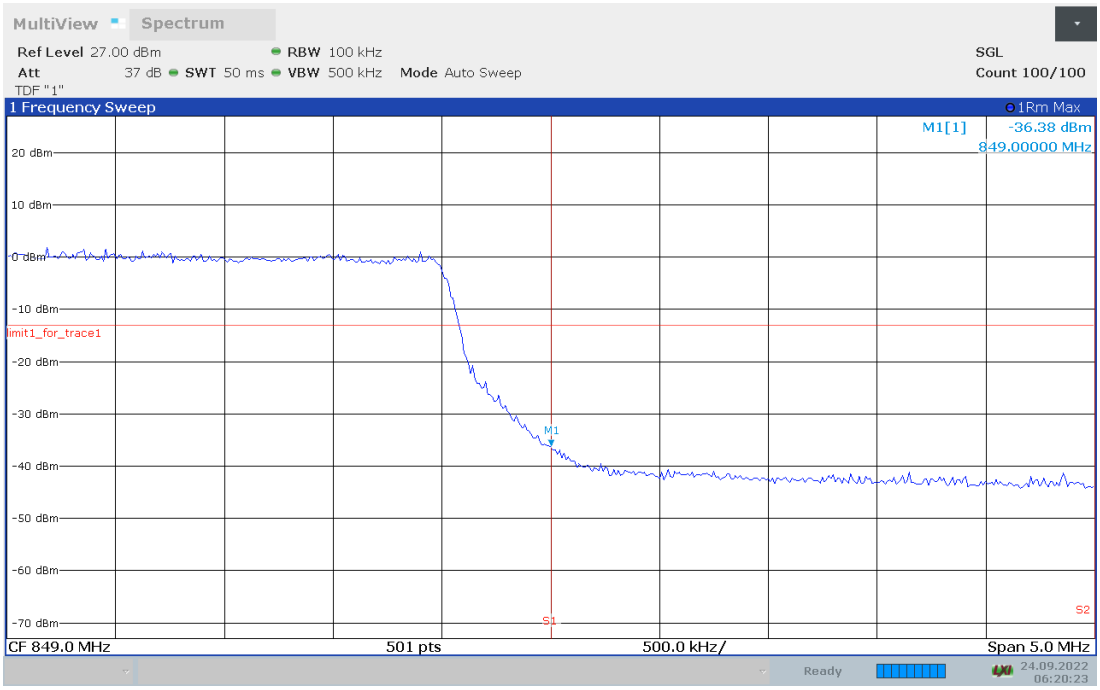
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



LOW BAND EDGE BLOCK-10MHz+20MHz-100%RB

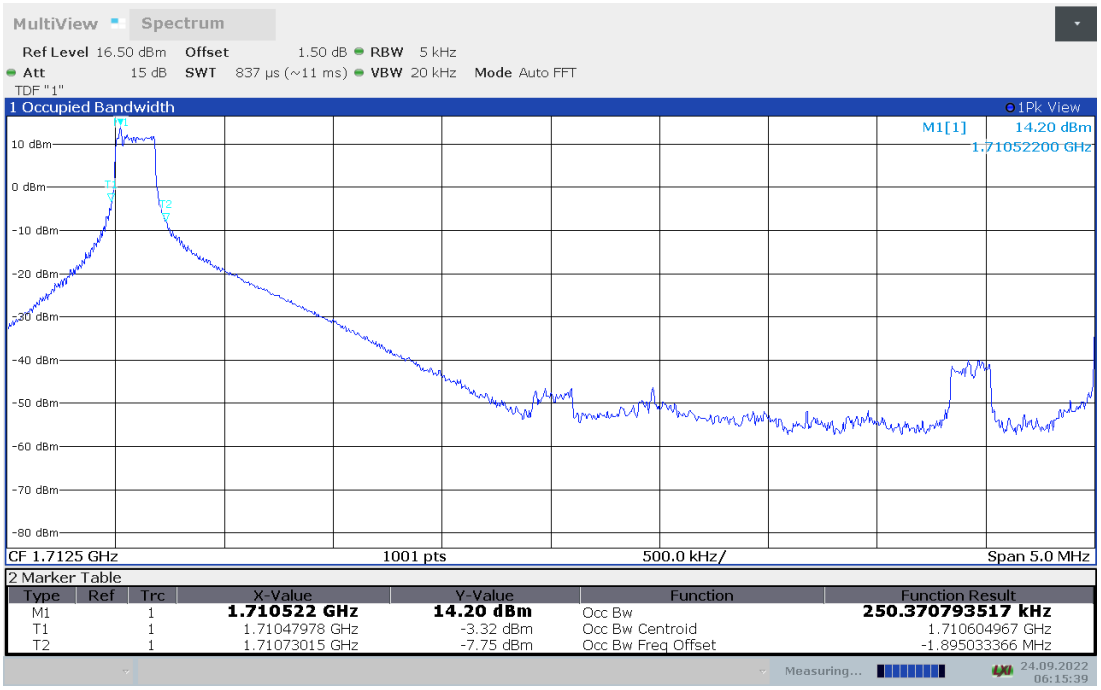


HIGH BAND EDGE BLOCK-10MHz+20MHz-100%RB

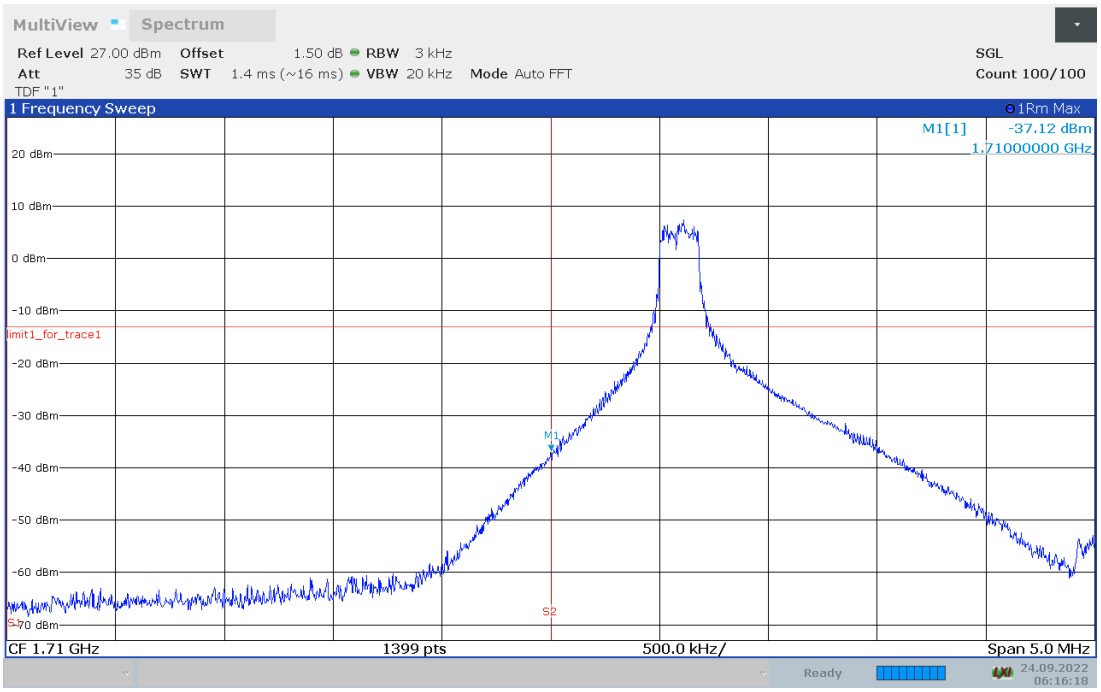


LTE band 66@CA_5A-66A

OBW: 1RB-LOW_offset

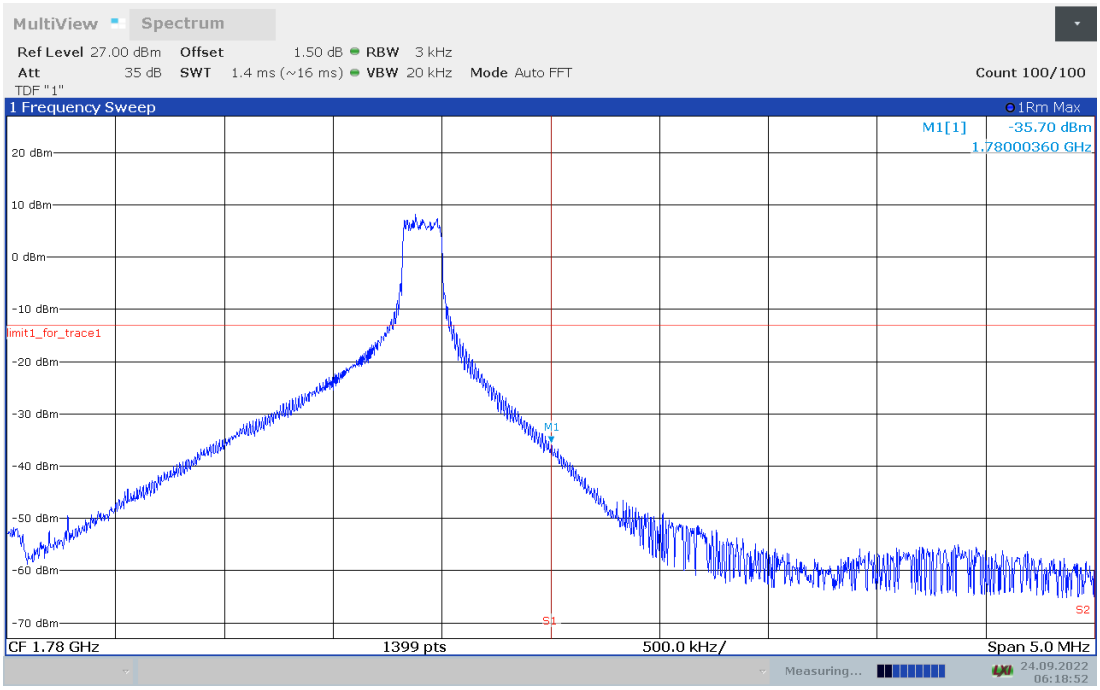


LOW BAND EDGE BLOCK-1RB-LOW_offset

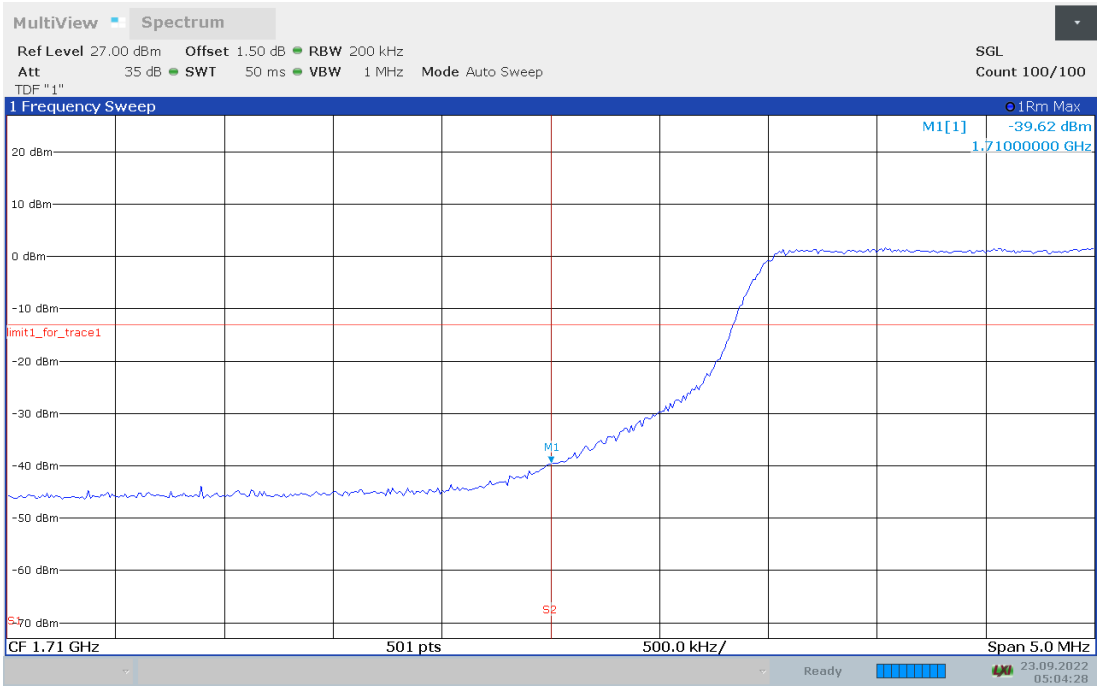


OBW: 1RB-HIGH_offset

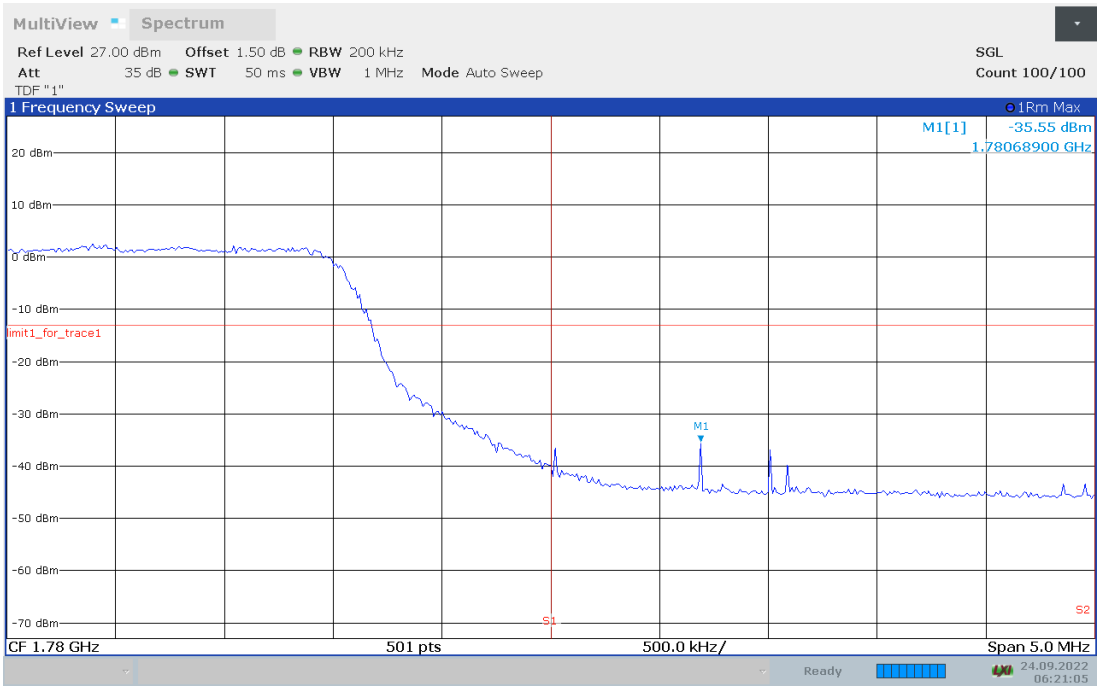
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



LOW BAND EDGE BLOCK-10MHz+20MHz-100%RB

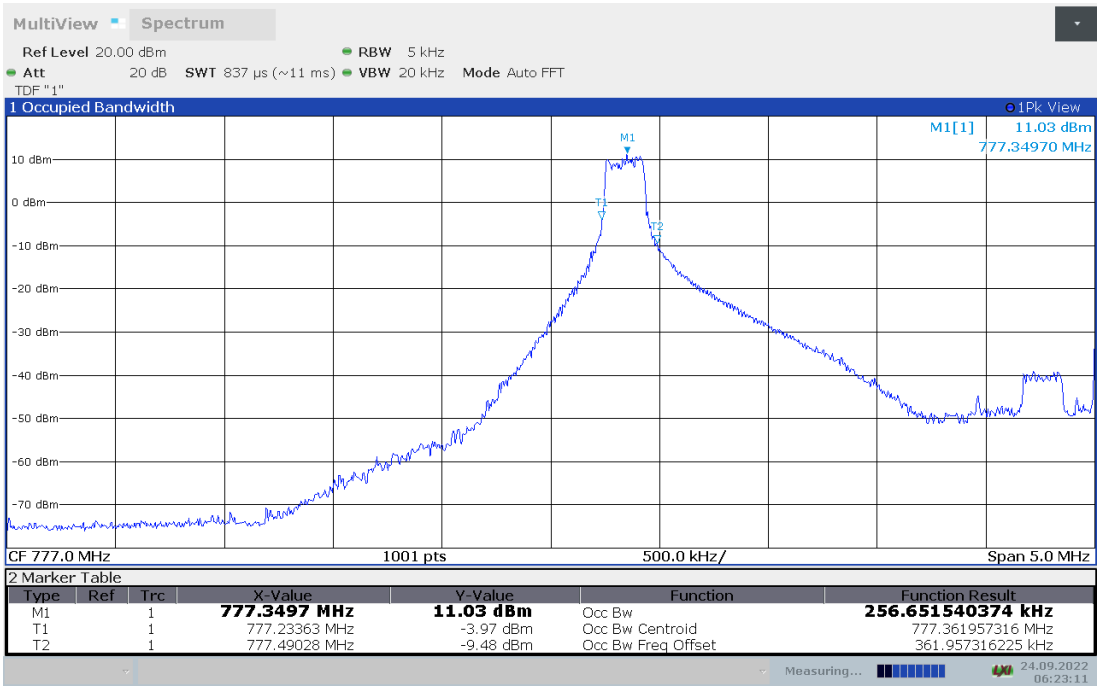


HIGH BAND EDGE BLOCK-10MHz+20MHz-100%RB

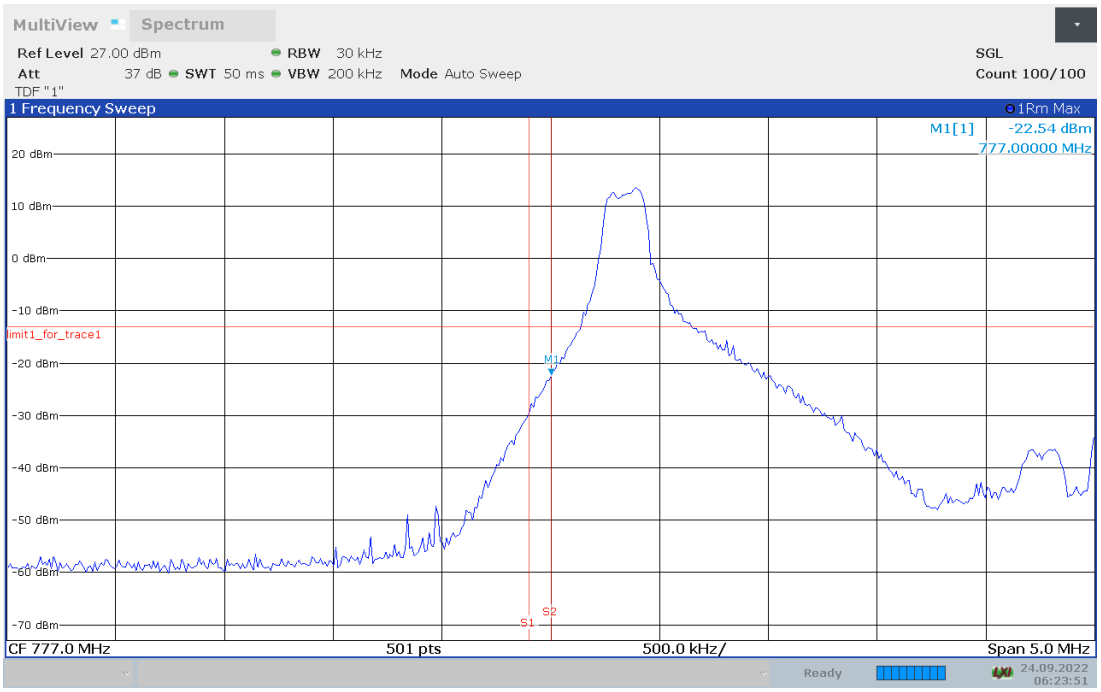


LTE band 13@CA_13A-66A

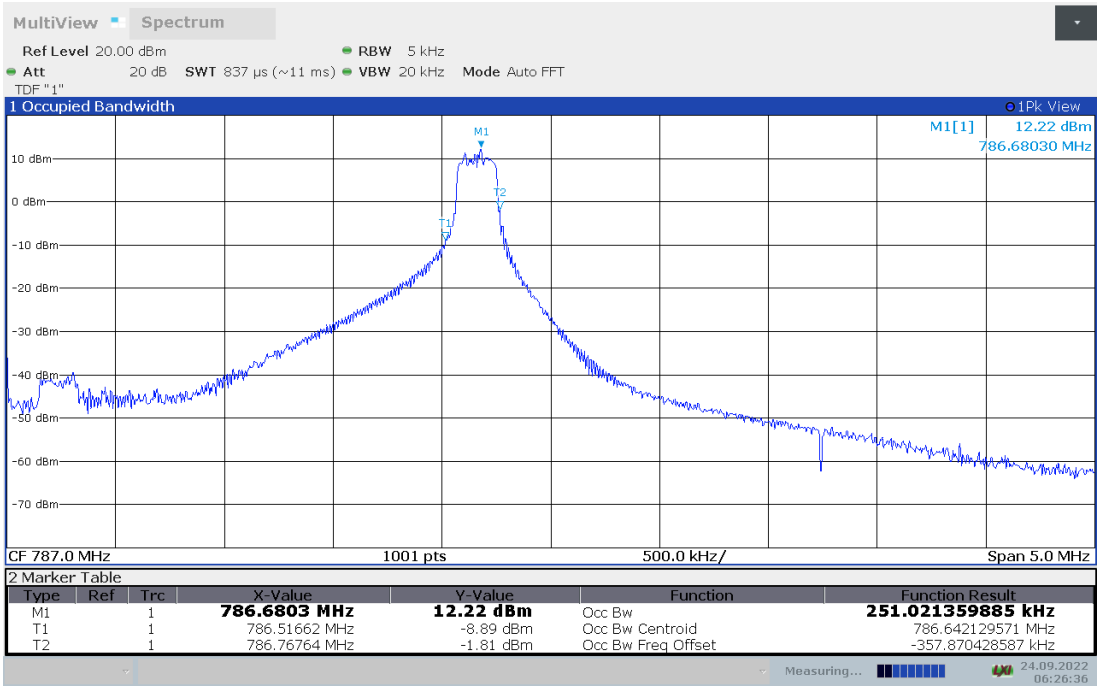
OBW: 1RB-LOW_offset



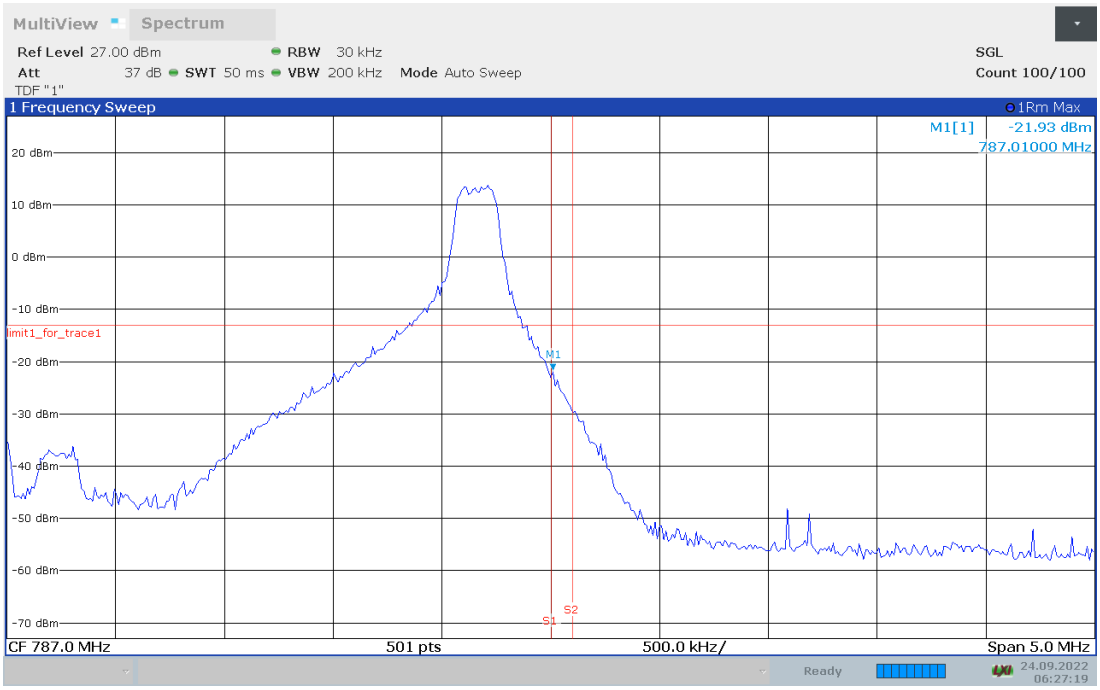
LOW BAND EDGE BLOCK-1RB-LOW_offset



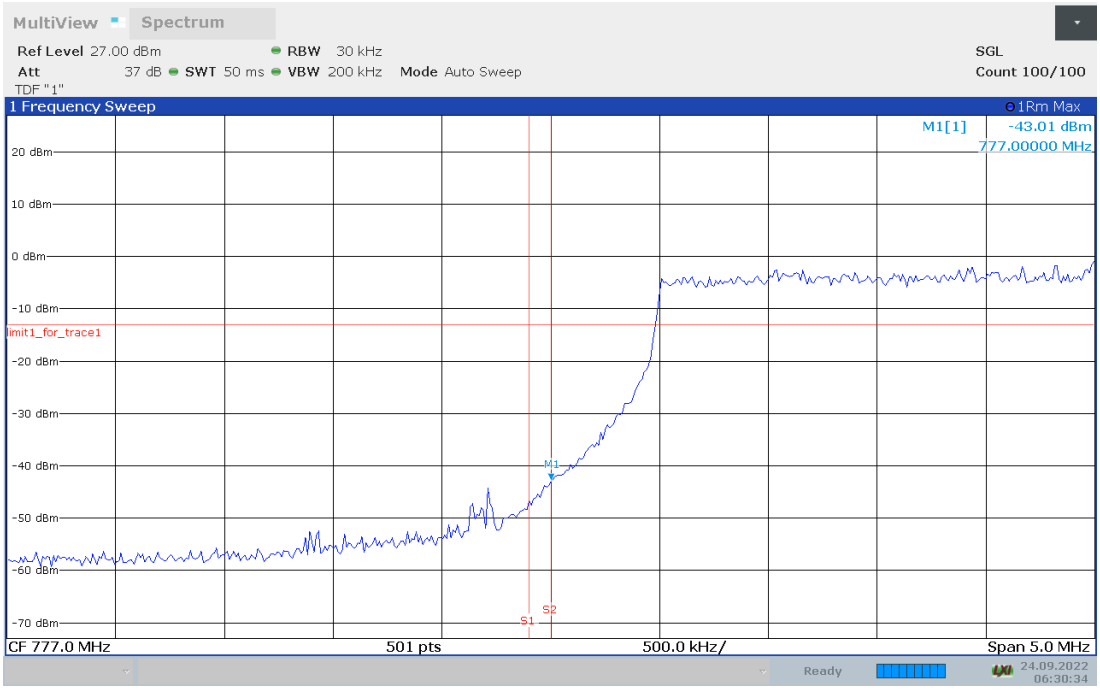
OBW: 1RB-HIGH_offset



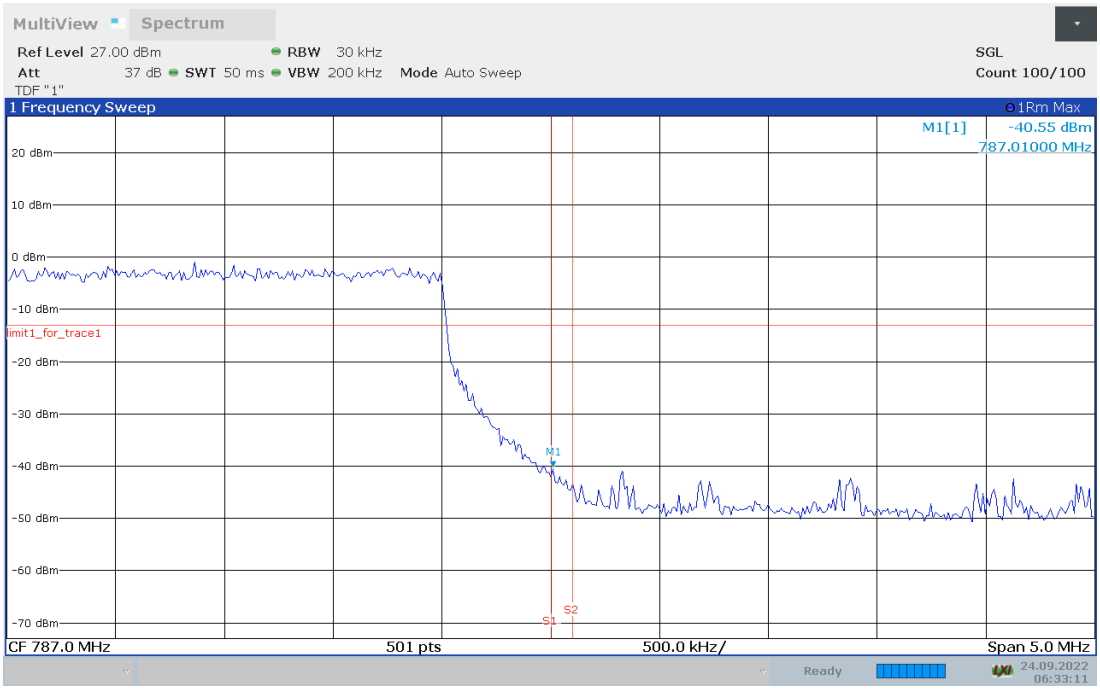
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



LOW BAND EDGE BLOCK-10MHz+20MHz-100%RB

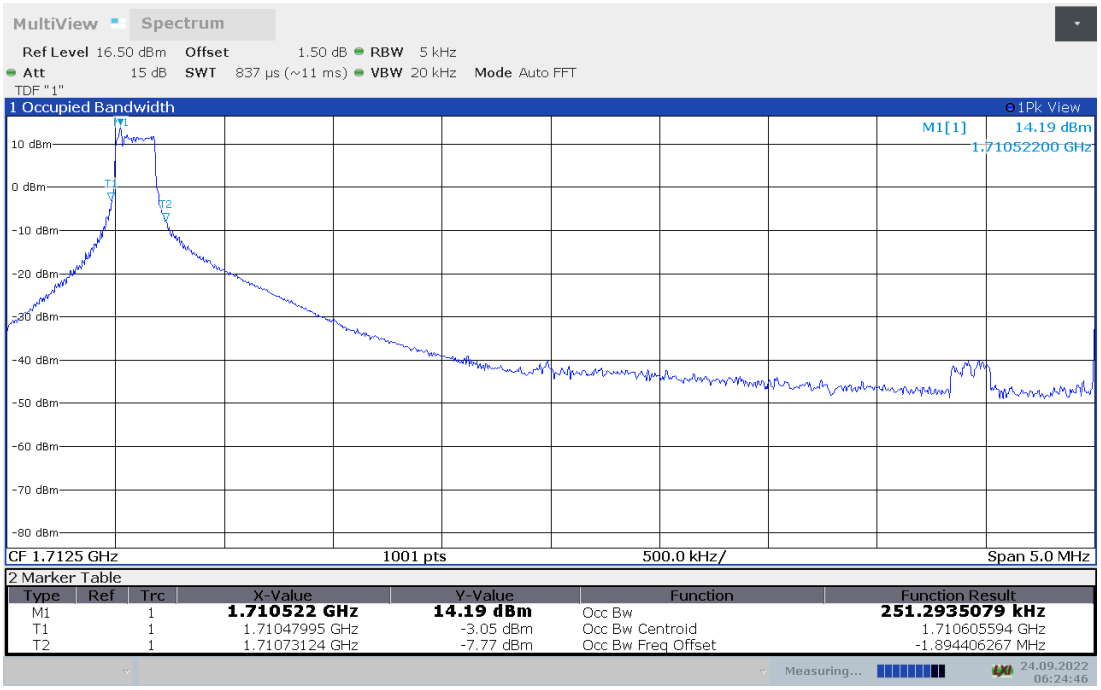


HIGH BAND EDGE BLOCK-10MHz+20MHz-100%RB

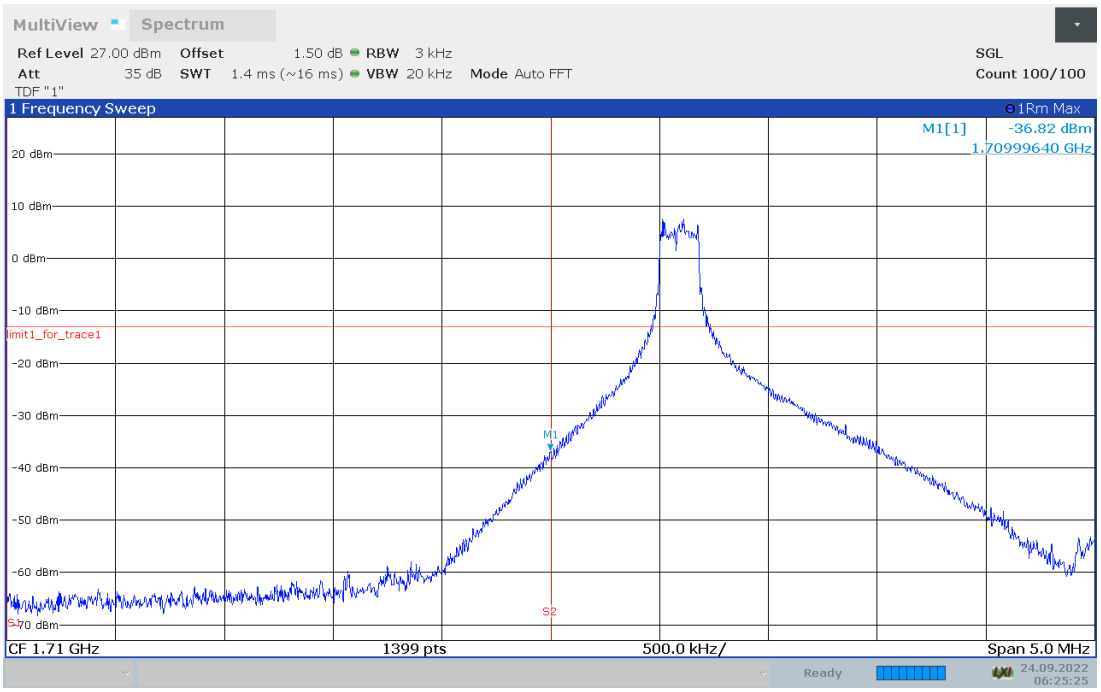


LTE band 66@CA_13A-66A

OBW: 1RB-LOW_offset

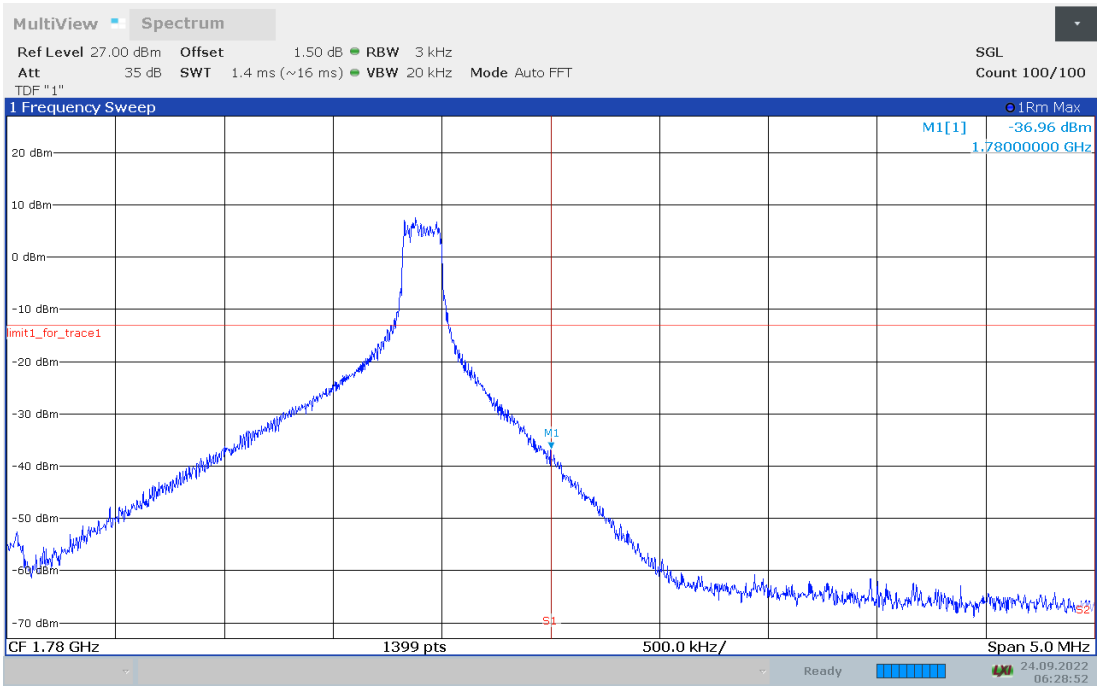


LOW BAND EDGE BLOCK-1RB-LOW_offset

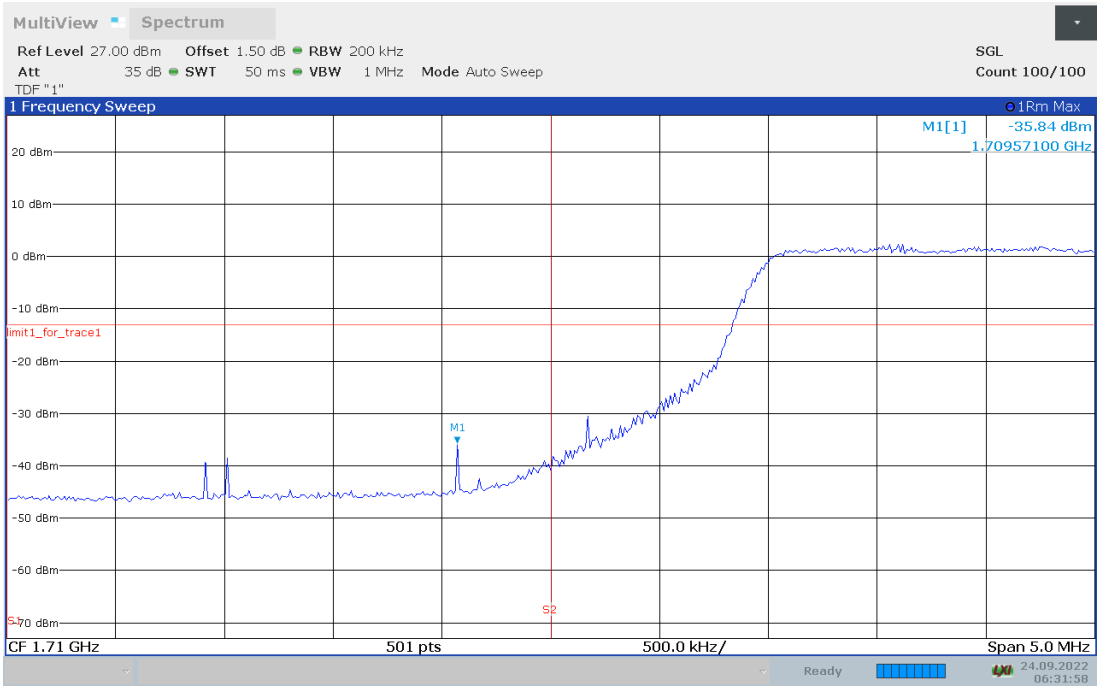


OBW: 1RB-HIGH_offset

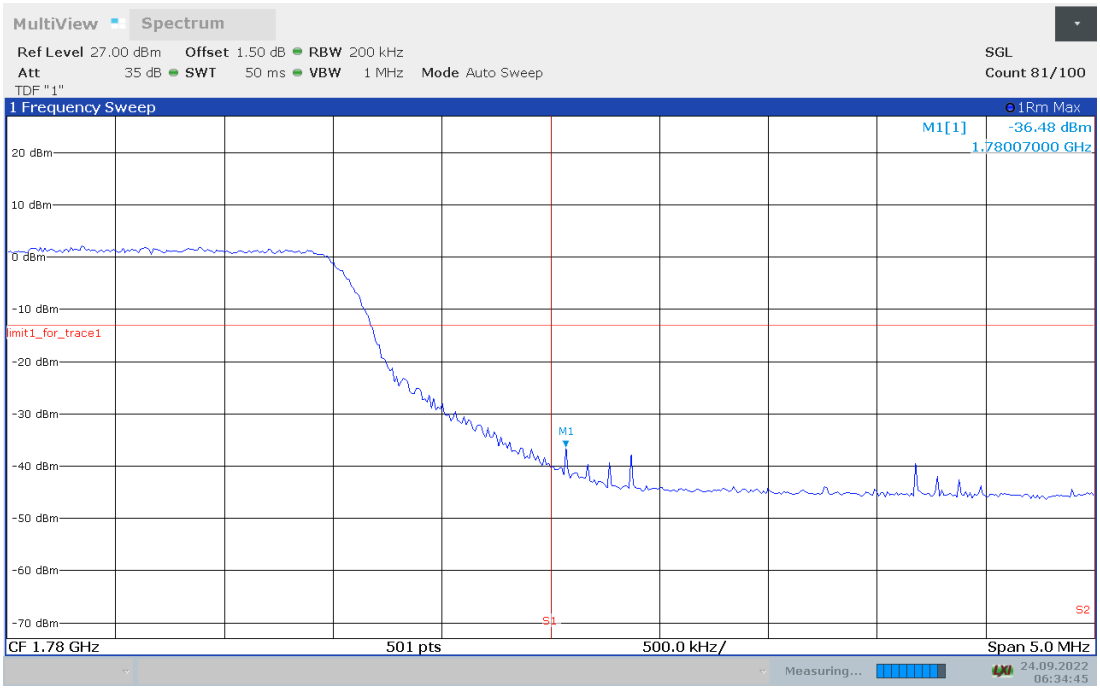
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



LOW BAND EDGE BLOCK-10MHz+20MHz-100%RB



HIGH BAND EDGE BLOCK-10MHz+20MHz-100%RB



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

A.6 CONDUCTED SPURIOUS EMISSION

Reference

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

A.6.1 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. 6.2 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 that 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 onall frequencies between 2328 and 2337MHz; 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.

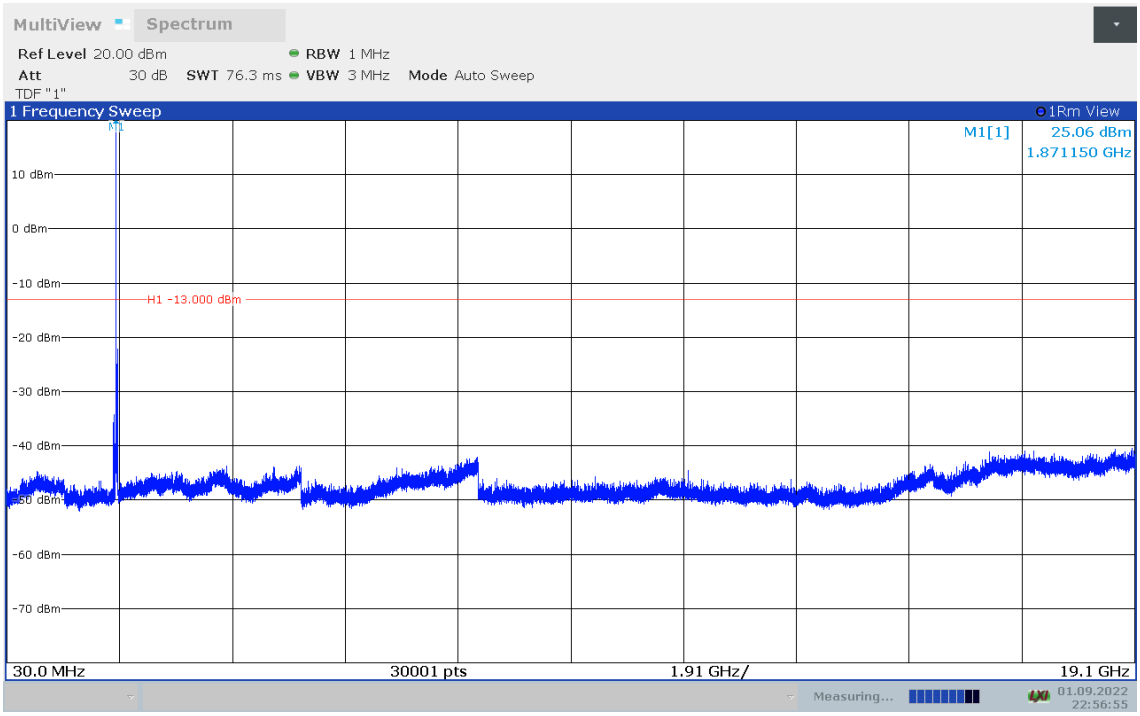
A. 6.3 Measurement result

Only worst case result is given below

LTE band 2 : 30MHz – 19.1GHz

Spurious emission limit –13dBm.

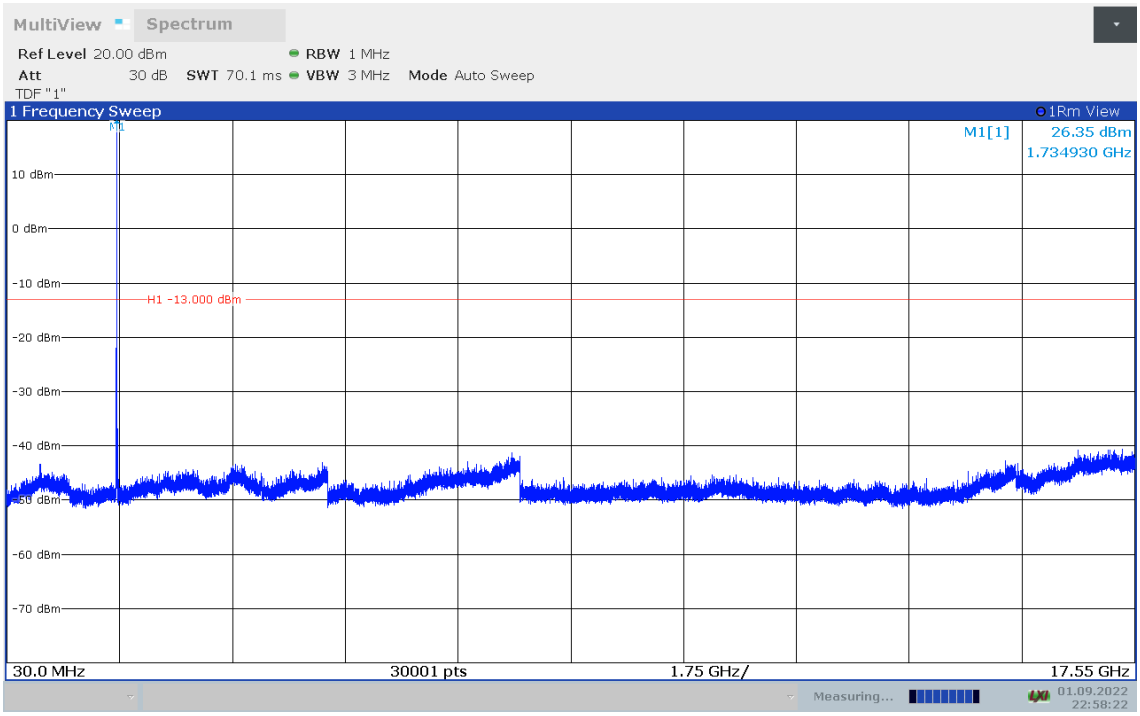
NOTE: peak above the limit line is the carrier frequency.



LTE band 4 : 30MHz – 17.55GHz

Spurious emission limit –13dBm.

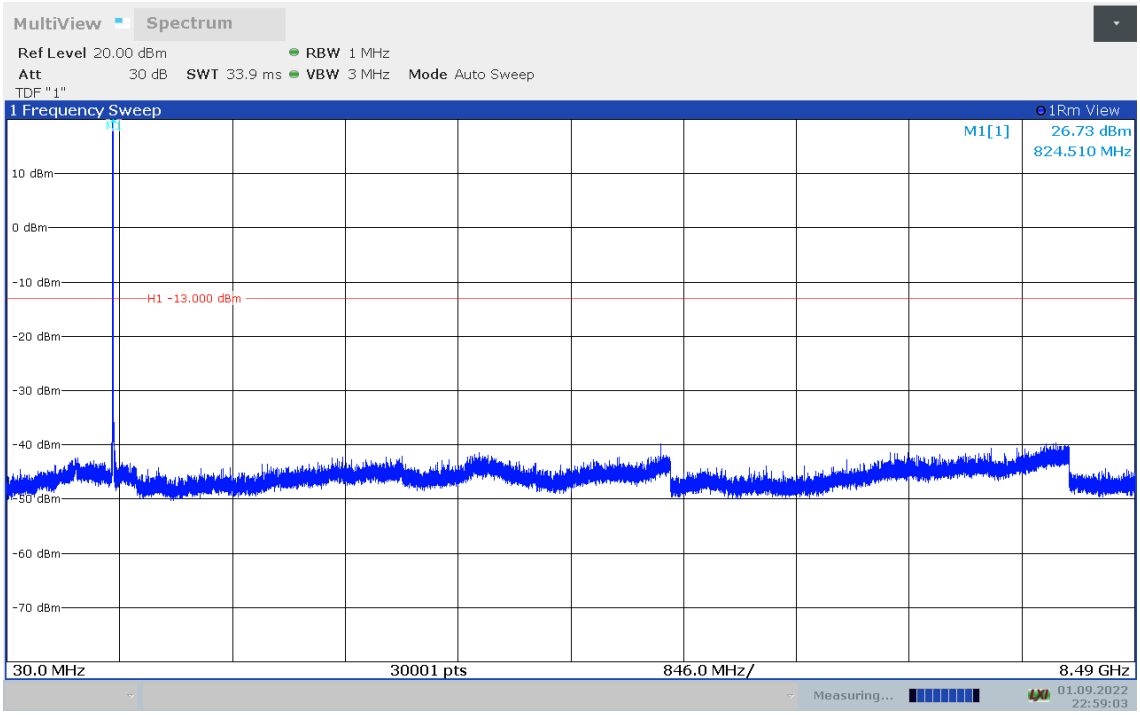
NOTE: peak above the limit line is the carrier frequency.



LTE band 5: 30MHz – 8.49GHz

Spurious emission limit –25dBm.

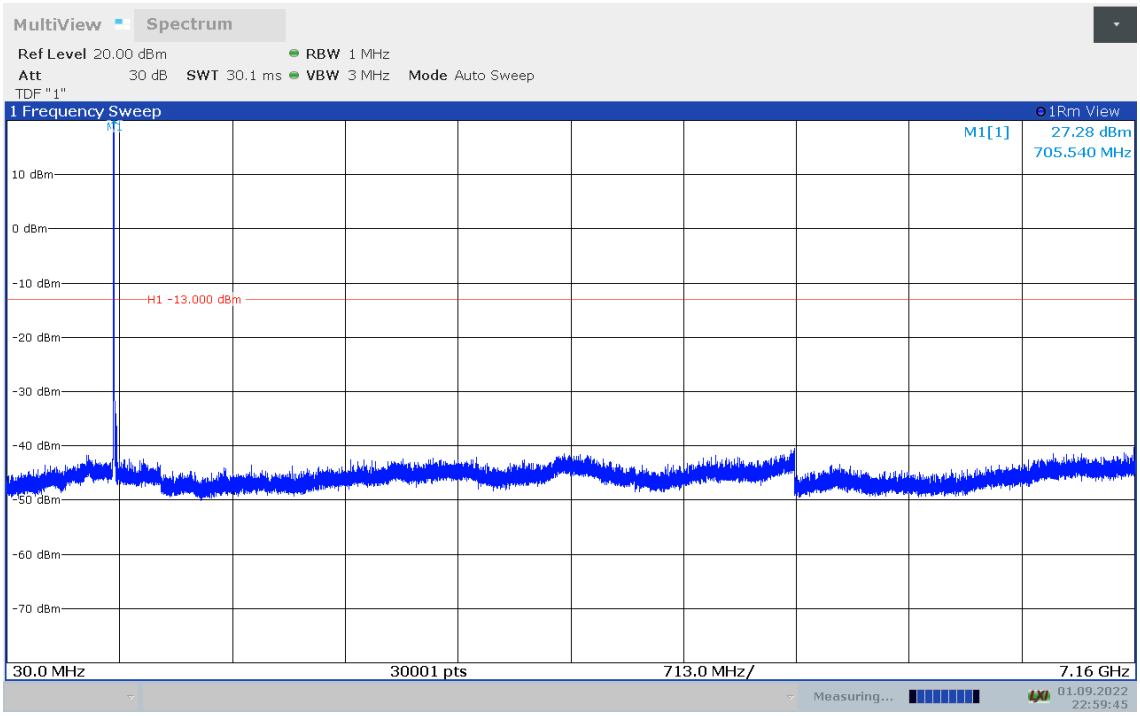
NOTE: peak above the limit line is the carrier frequency.



LTE band 12: 30MHz – 7.16GHz

Spurious emission limit –13dBm.

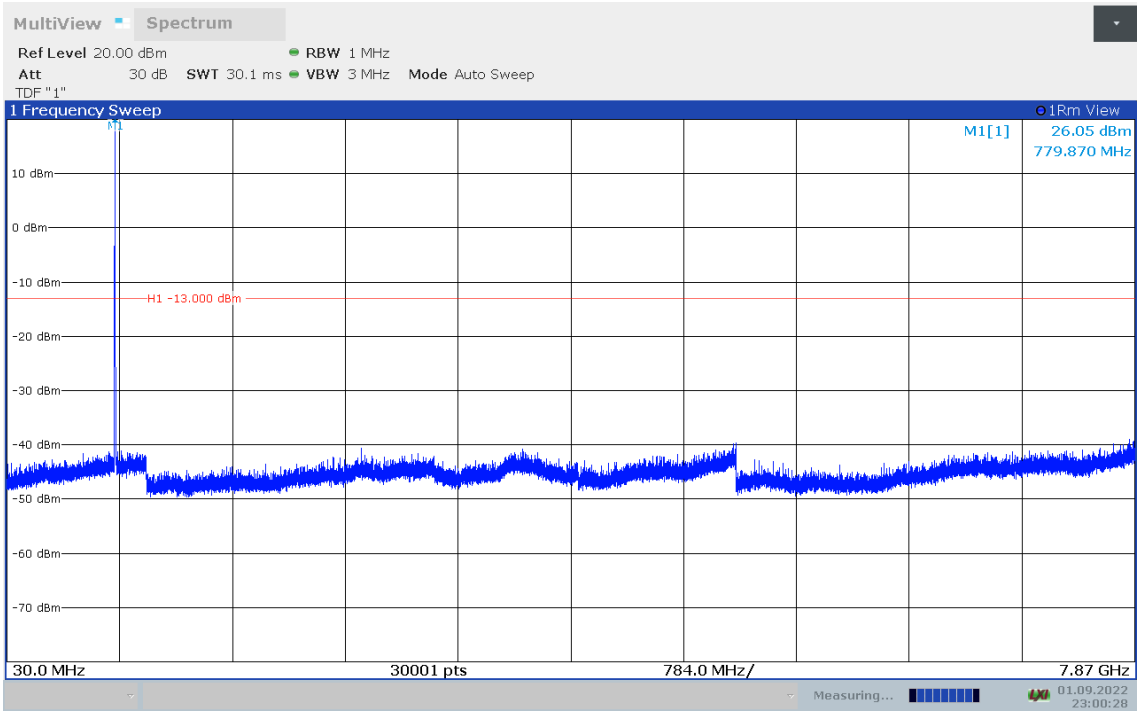
NOTE: peak above the limit line is the carrier frequency.



LTE band 13: 30MHz – 7.87GHz

Spurious emission limit –13dBm.

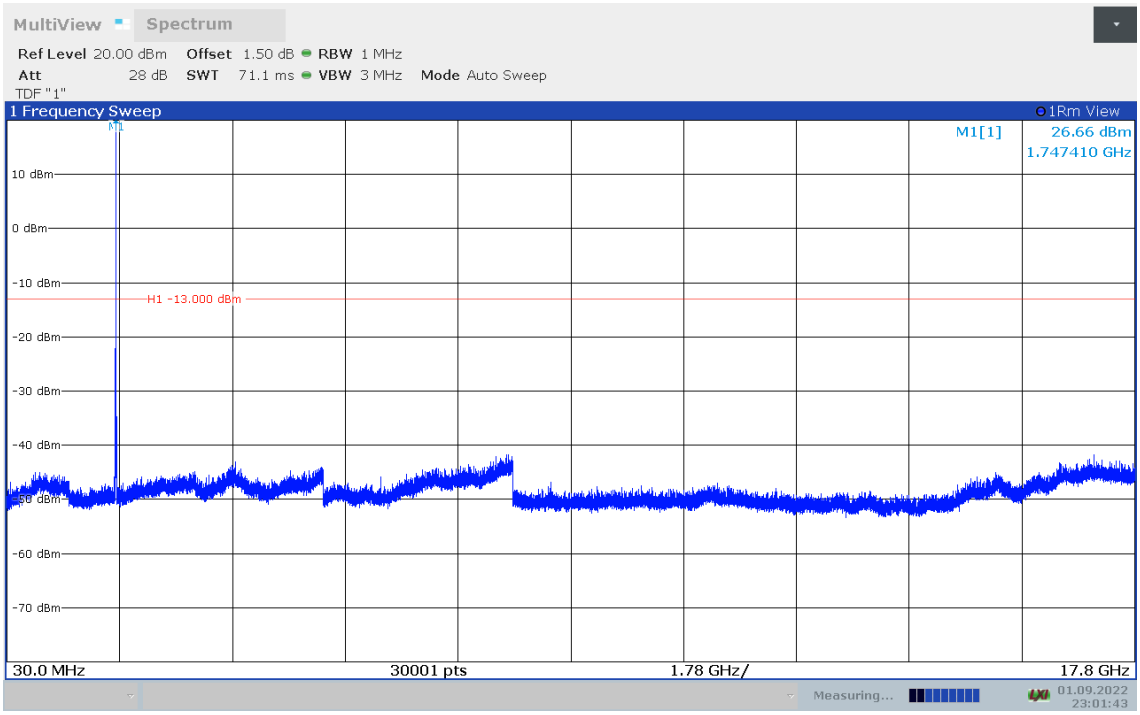
NOTE: peak above the limit line is the carrier frequency.



LTE band **66: 30MHz – 17.8GHz**

Spurious emission limit –13dBm.

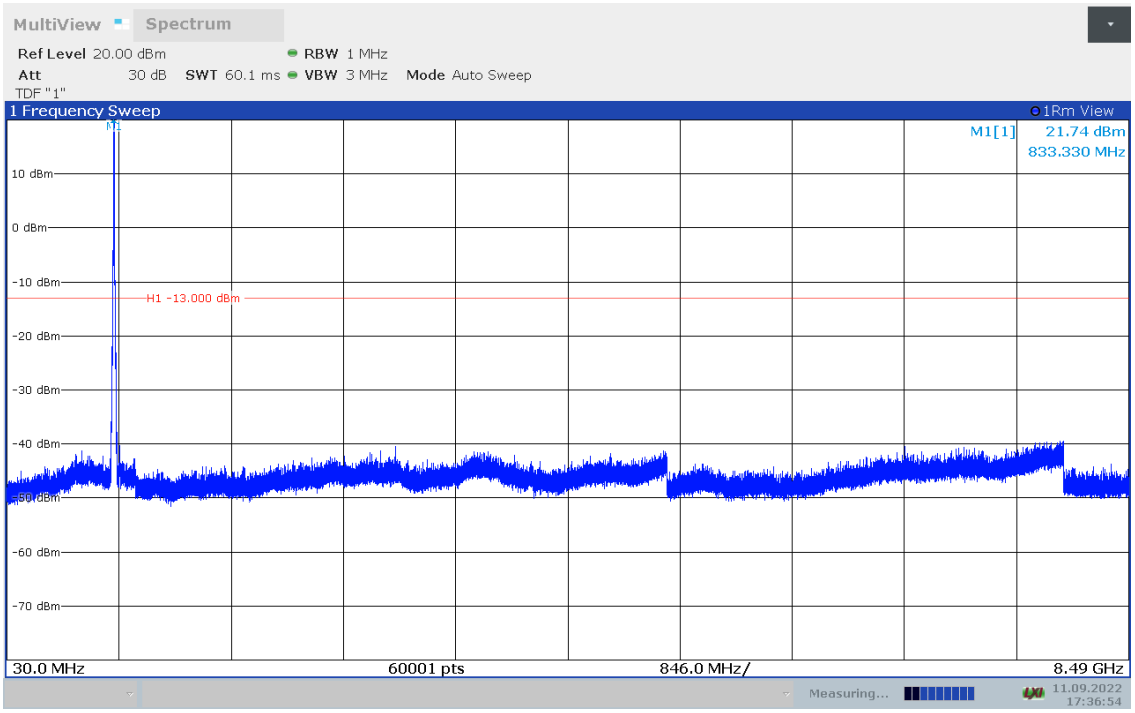
NOTE: peak above the limit line is the carrier frequency.



LTE CA_5B: 30MHz – 8.49GHz

Spurious emission limit –13dBm.

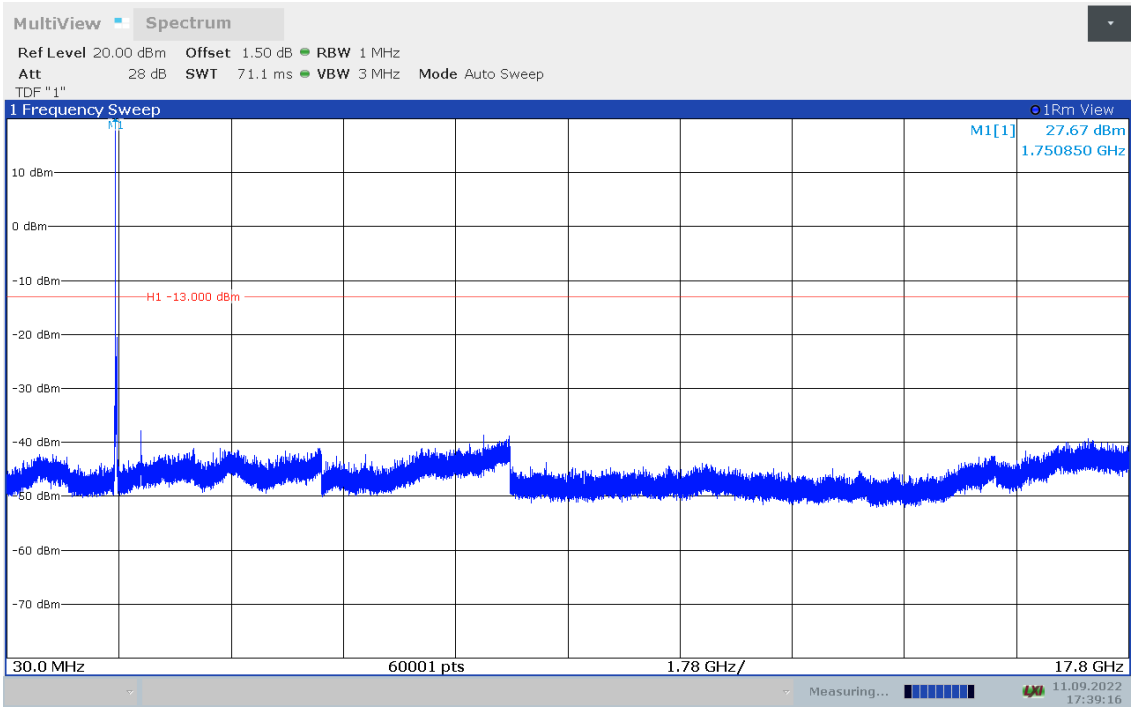
NOTE: peak above the limit line is the carrier frequency.



LTE CA_66B: 30MHz – 17.8GHz

Spurious emission limit –13dBm.

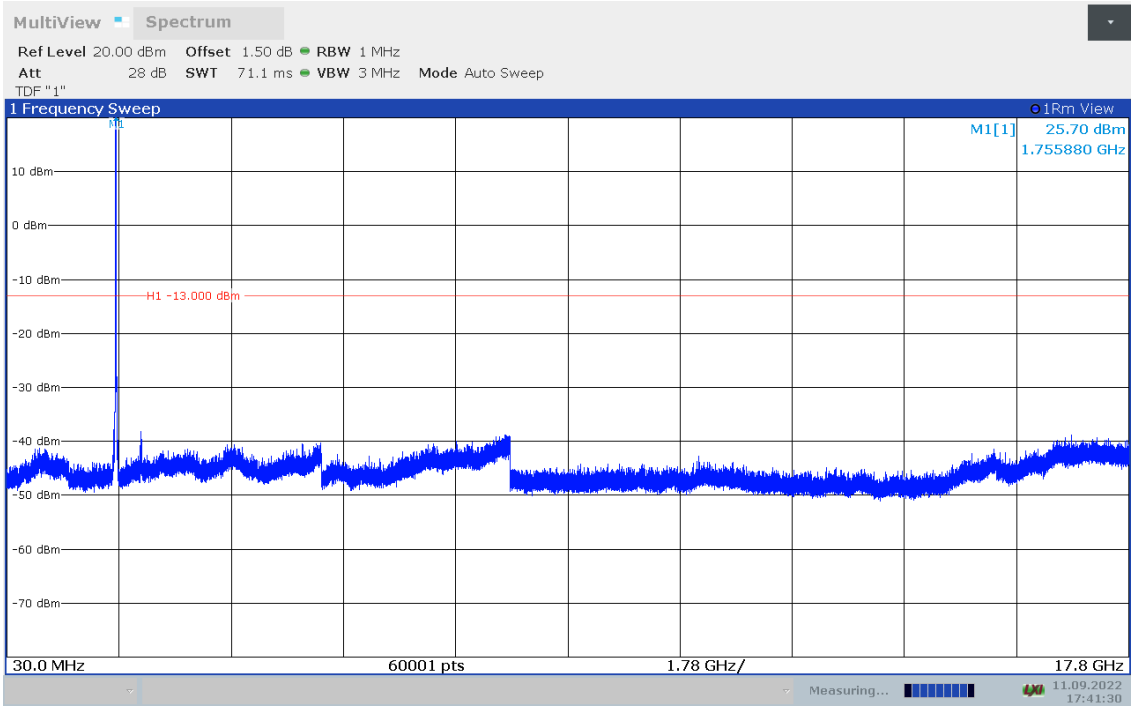
NOTE: peak above the limit line is the carrier frequency.



LTE CA_66C: 30MHz – 17.8GHz

Spurious emission limit –13dBm.

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



A.7 PEAK-TO-AVERAGE POWER RATIO

Reference

FCC: CFR Part 24.232, 27.50, KDB971168 D01.

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 ≥ 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.7.1 Measurement limit

not exceed 13 dB

A.7.2 Measurement results

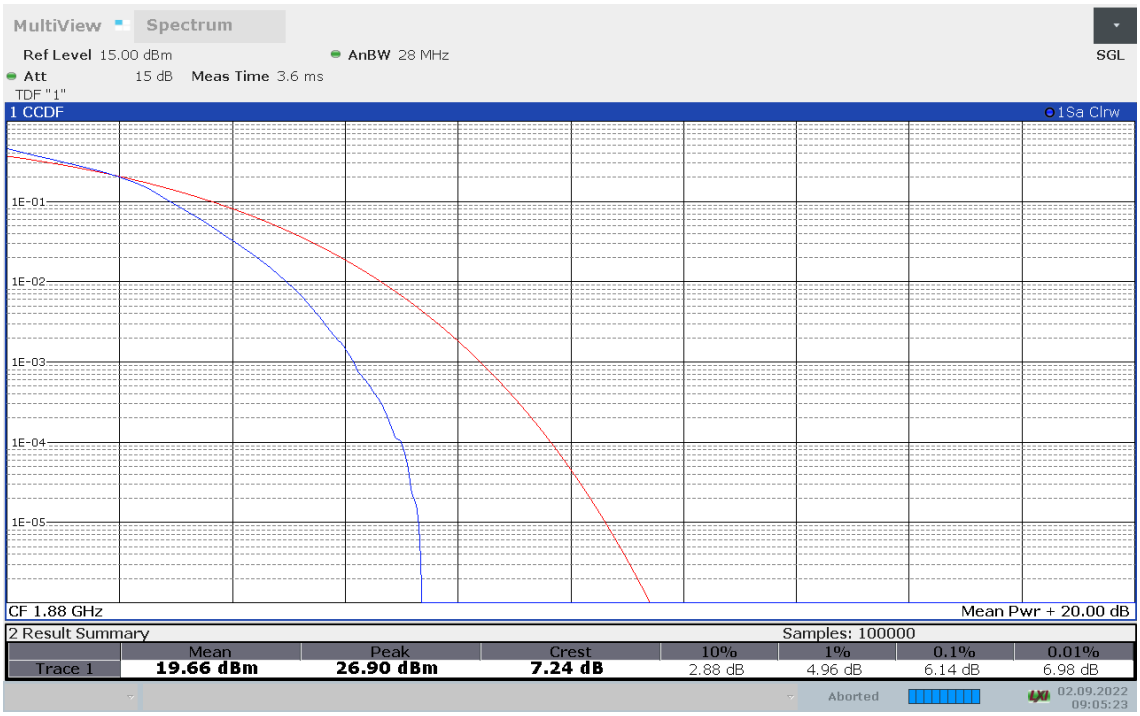
Only worst case result is given below

LTE band 2

Frequency(MHz)	Bandwidth(MHz)	PAPR(dB)		
		QPSK	16QAM	64QAM
1880.0	20	5.42	6.14	6.14

LTE band 2, 20MHz Bandwidth, QPSK (PAPR)

LTE band 2, 20MHz Bandwidth, 16QAM (PAPR)

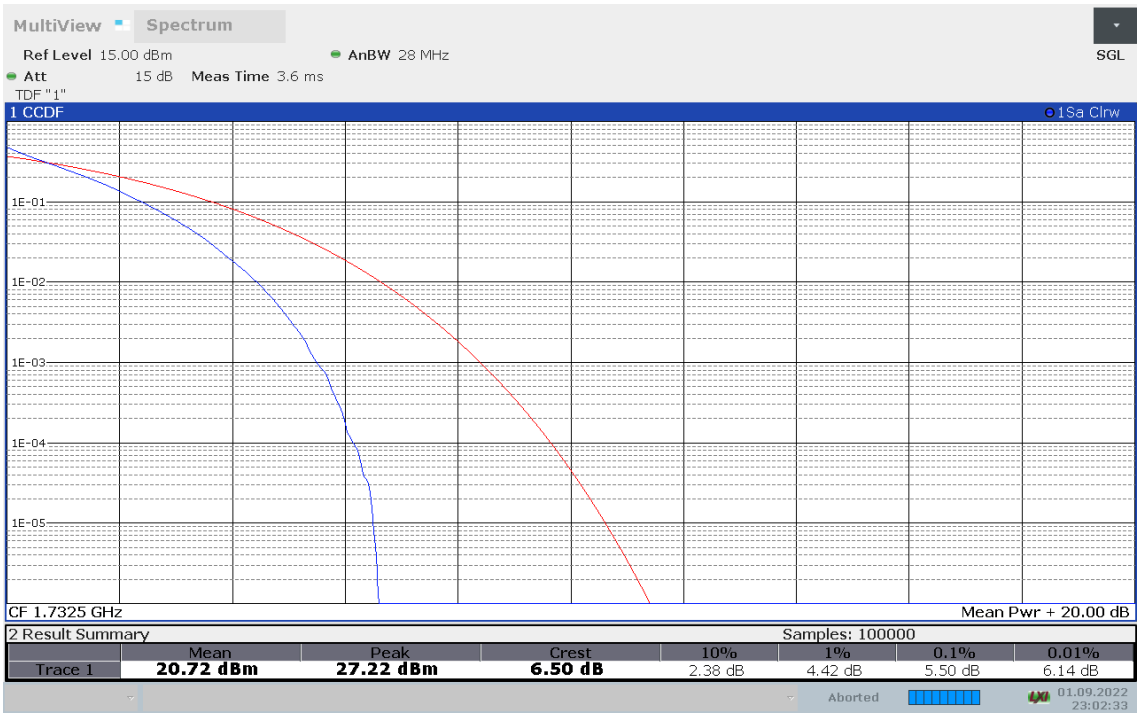


LTE band 2, 20MHz Bandwidth, 64QAM (PAPR)

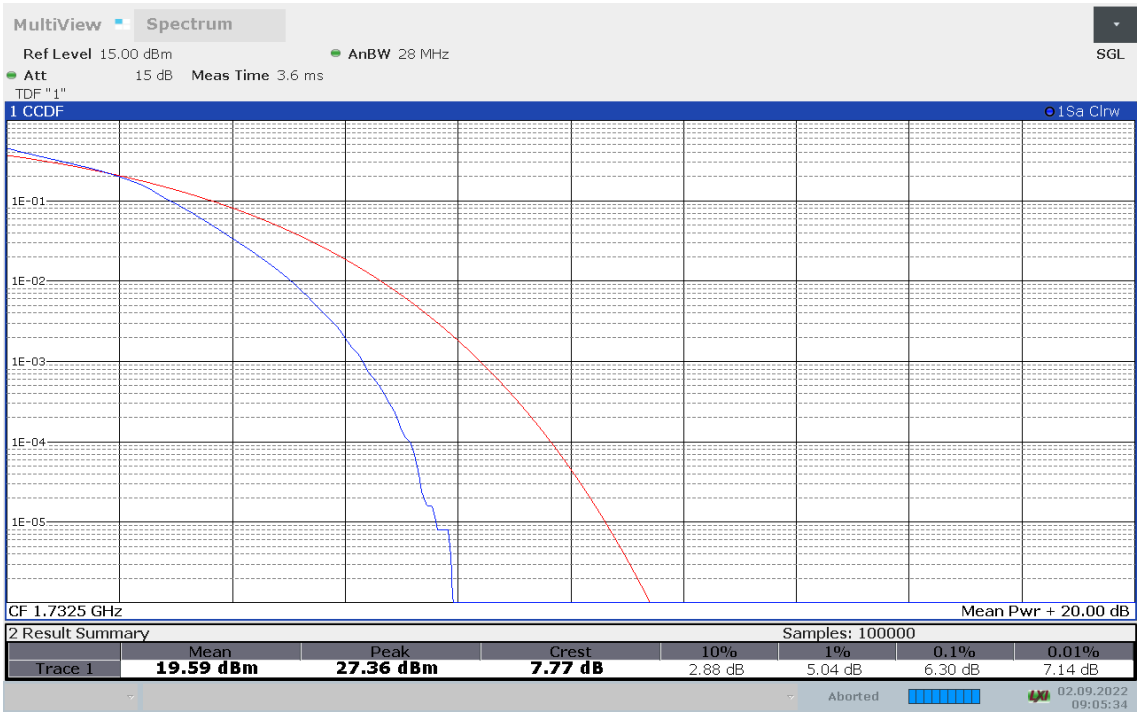
LTE band 4

Frequency(MHz)	Bandwidth(MHz)	PAPR(dB)		
		QPSK	16QAM	64QAM
1732.5	20	5.50	6.30	6.32

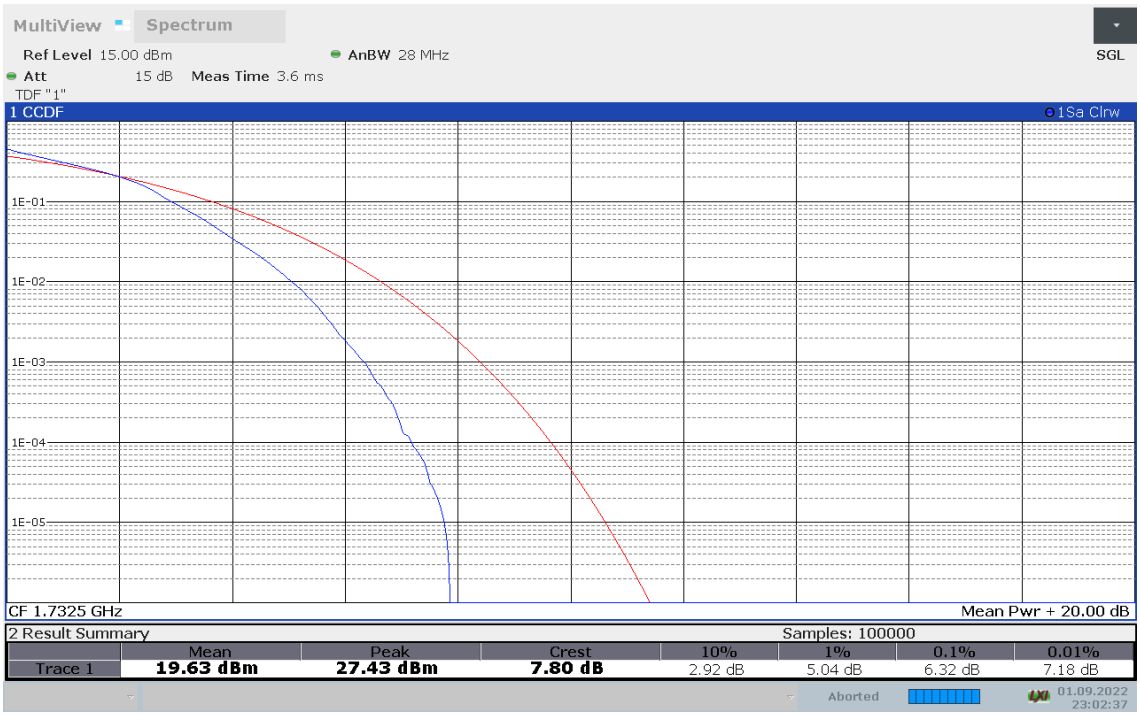
LTE band 4, 20MHz Bandwidth, QPSK (PAPR)



LTE band 4, 20MHz Bandwidth, 16QAM (PAPR)



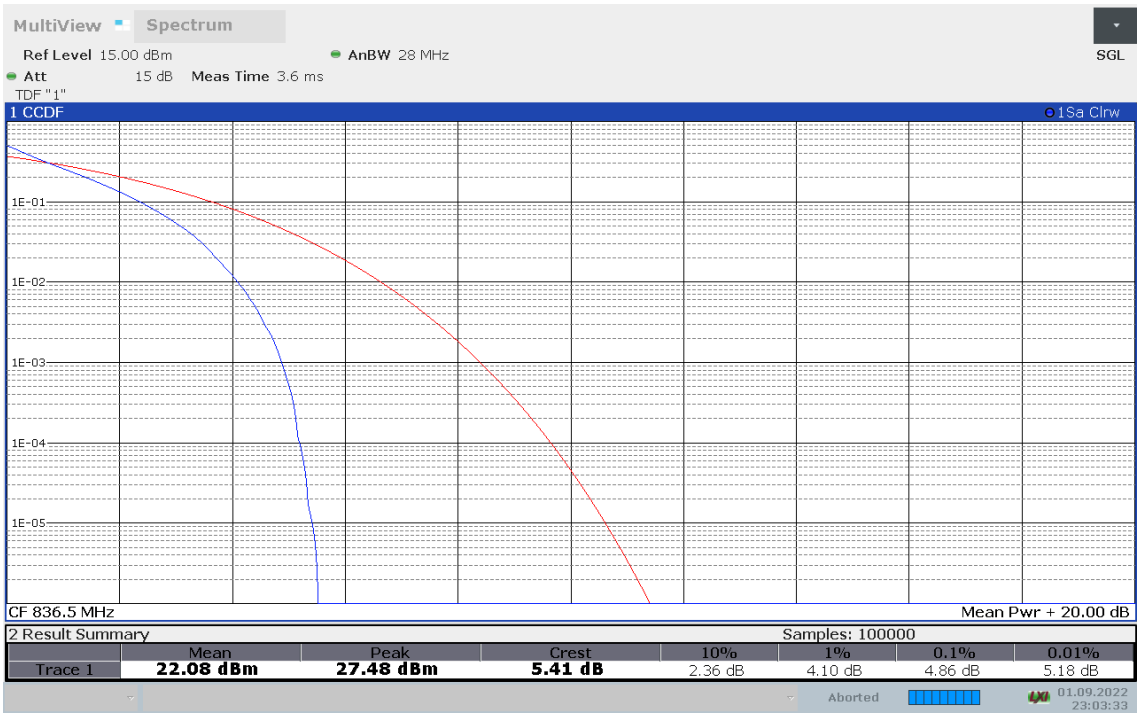
LTE band 4, 20MHz Bandwidth, 64QAM (PAPR)



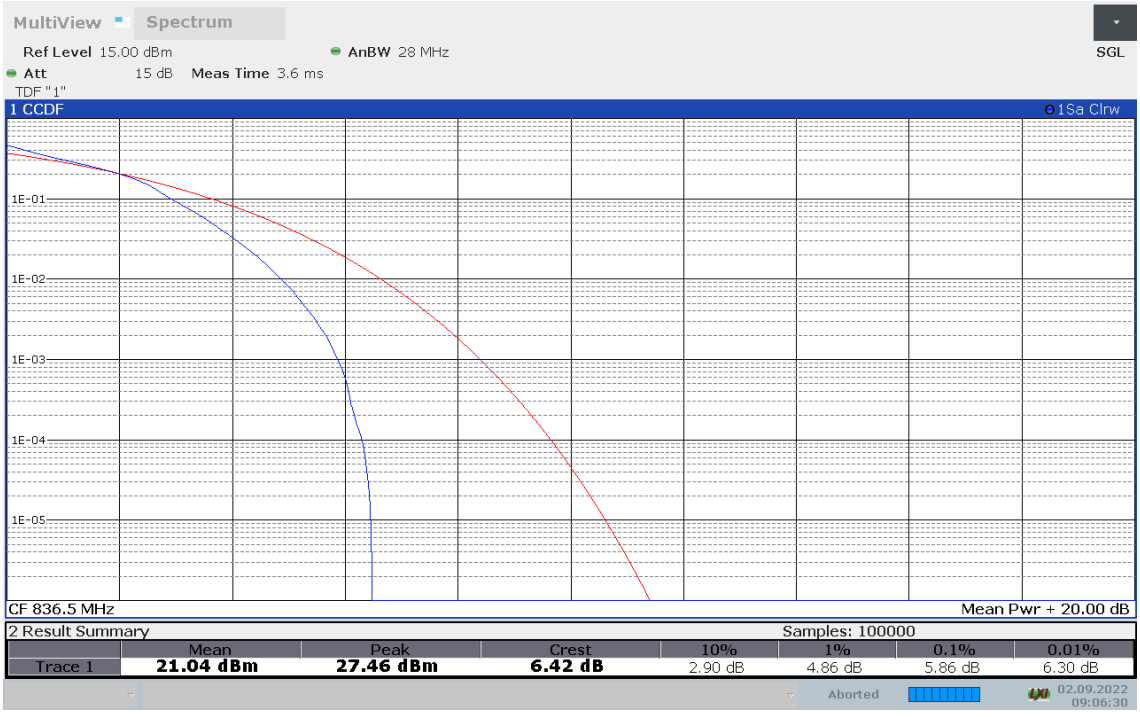
LTE band 5

Frequency(MHz)	Bandwidth(MHz)	PAPR(dB)		
		QPSK	16QAM	64QAM
826.5	10	4.86	5.06	5.74

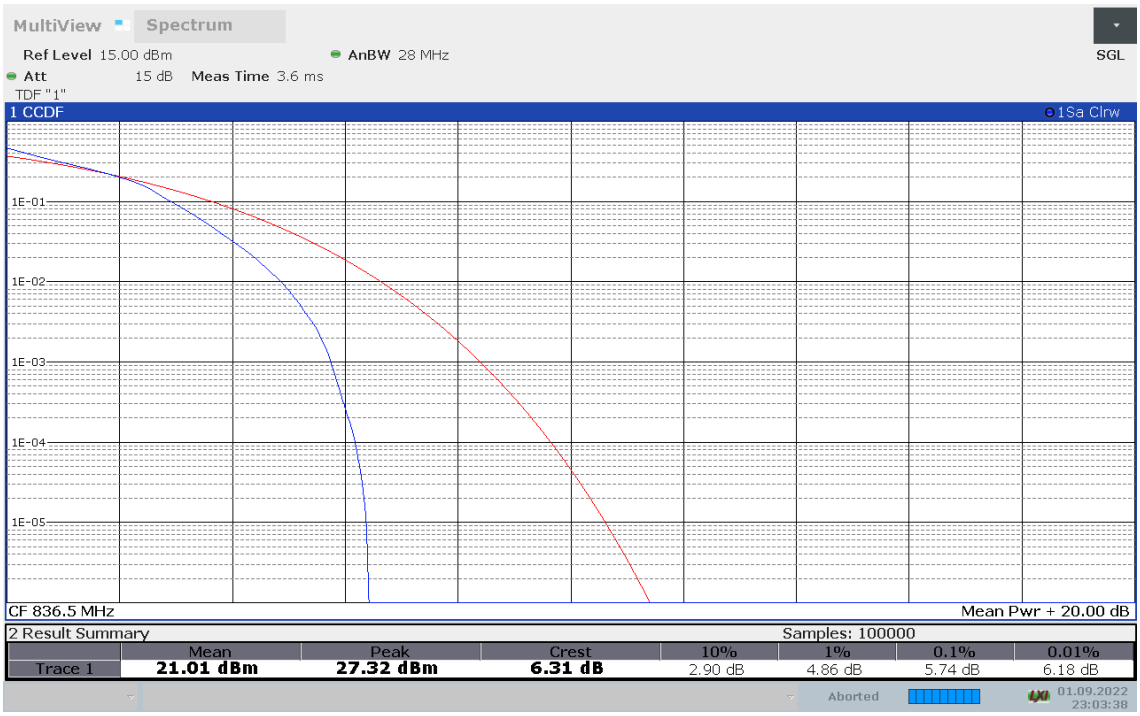
LTE band 5, 10MHz Bandwidth, QPSK (PAPR)



LTE band 5, 10MHz Bandwidth, 16QAM (PAPR)



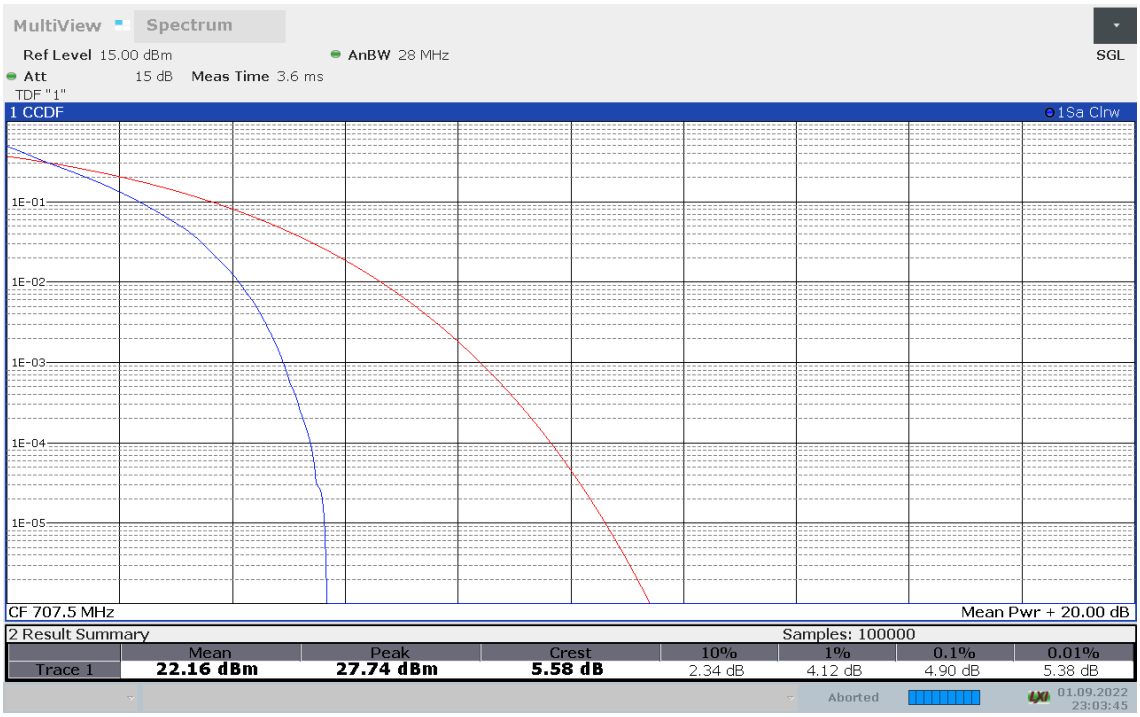
LTE band 5, 10MHz Bandwidth, 64QAM (PAPR)



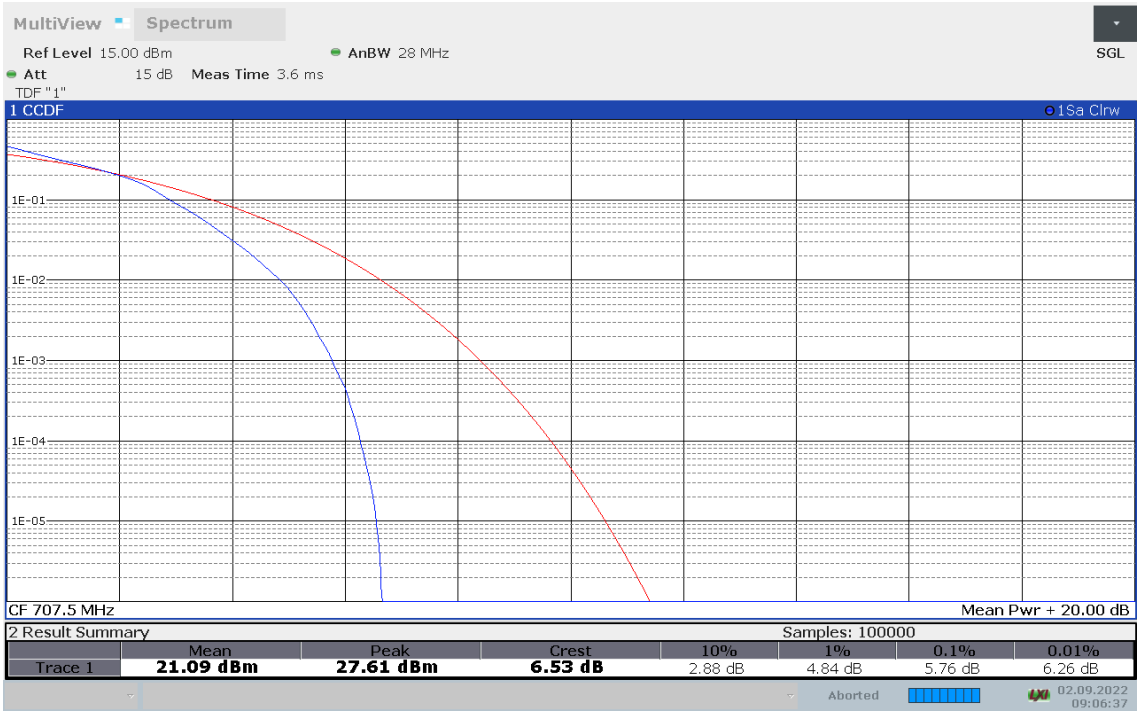
LTE band 12

Frequency(MHz)	Bandwidth(MHz)	PAPR(dB)		
		QPSK	16QAM	64QAM
707.5	10	4.90	5.76	5.74

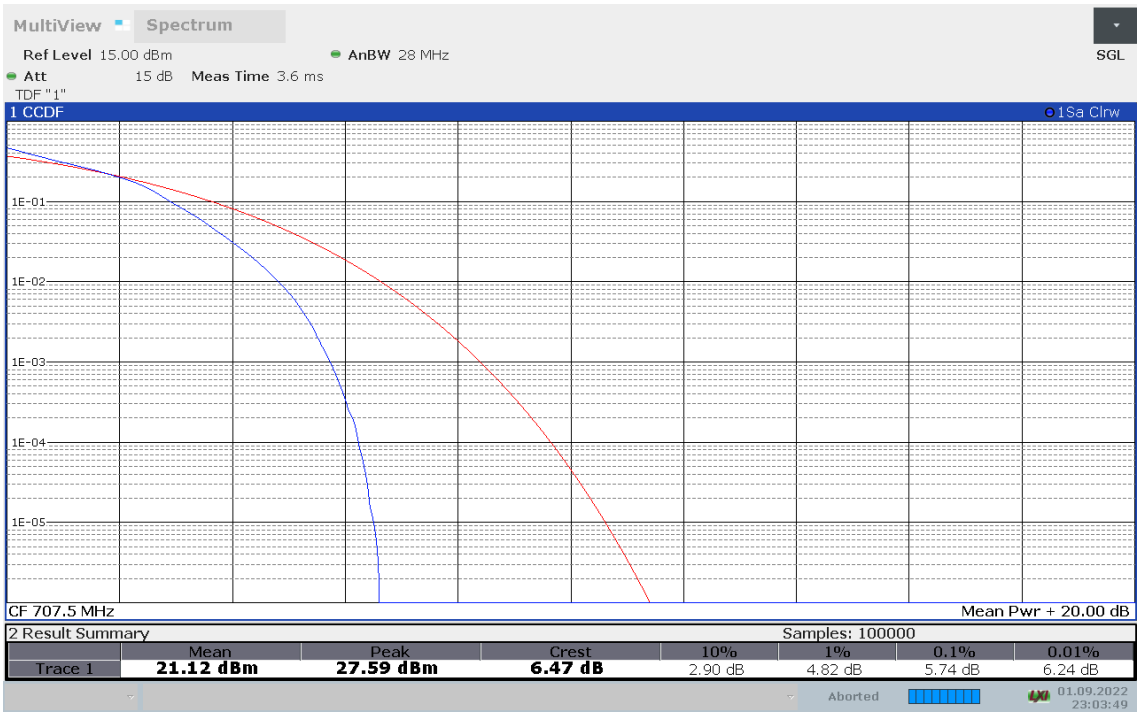
LTE band 12, 10MHz Bandwidth, QPSK (PAPR)



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



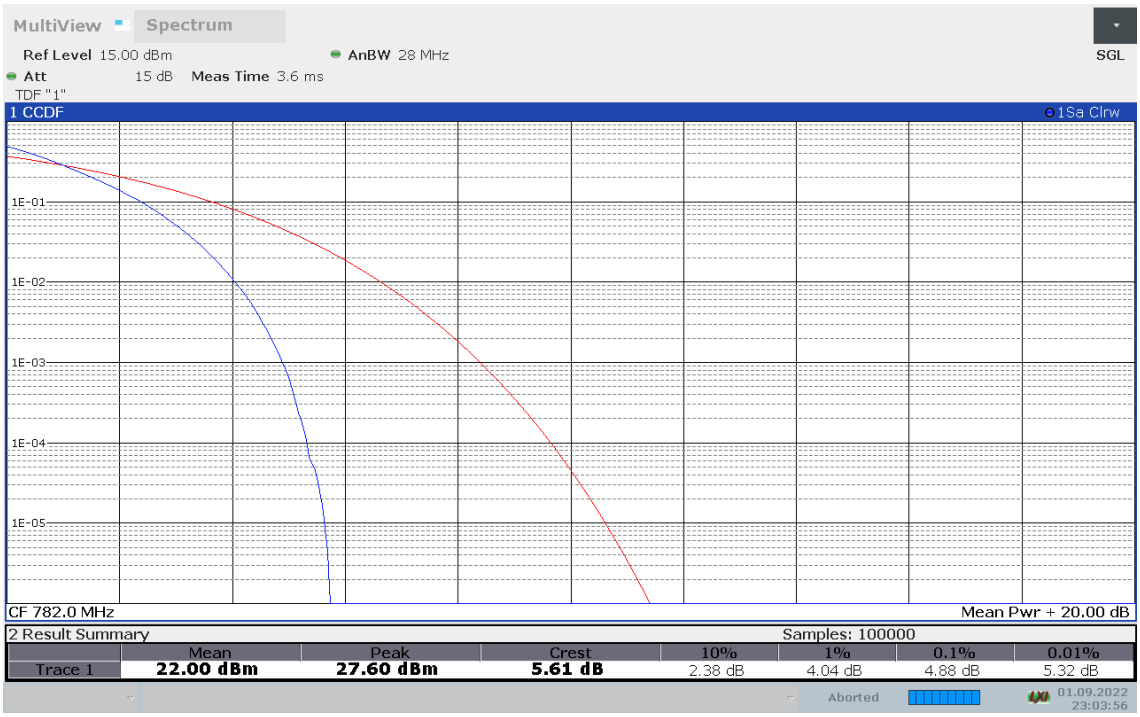
LTE band 12, 10MHz Bandwidth, 64QAM (PAPR)



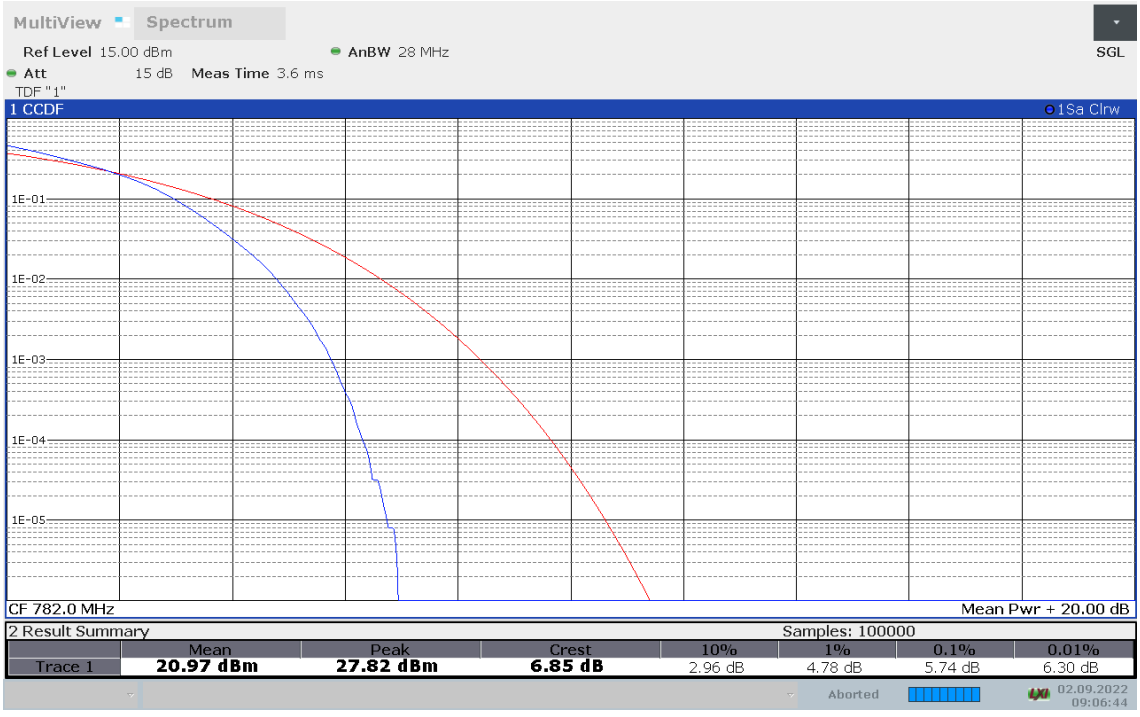
LTE band 13

Frequency(MHz)	Bandwidth(MHz)	PAPR(dB)		
		QPSK	16QAM	64QAM
782.0	10	4.88	5.74	5.68

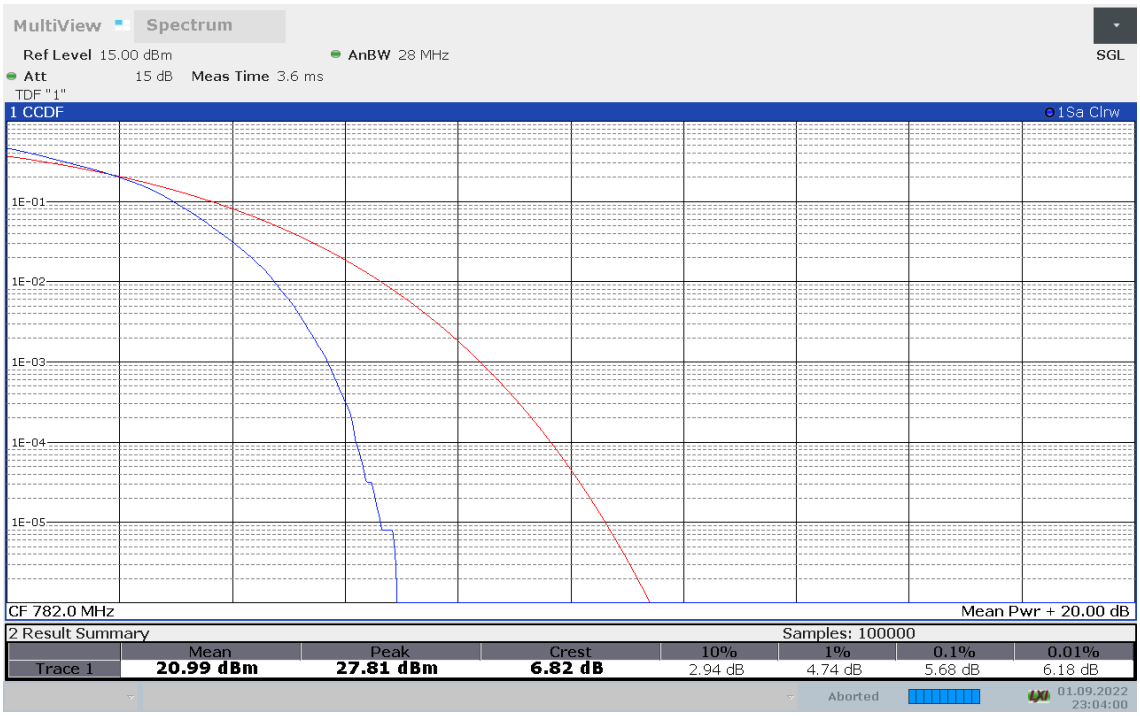
LTE band 13, 10MHz Bandwidth, QPSK (PAPR)



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



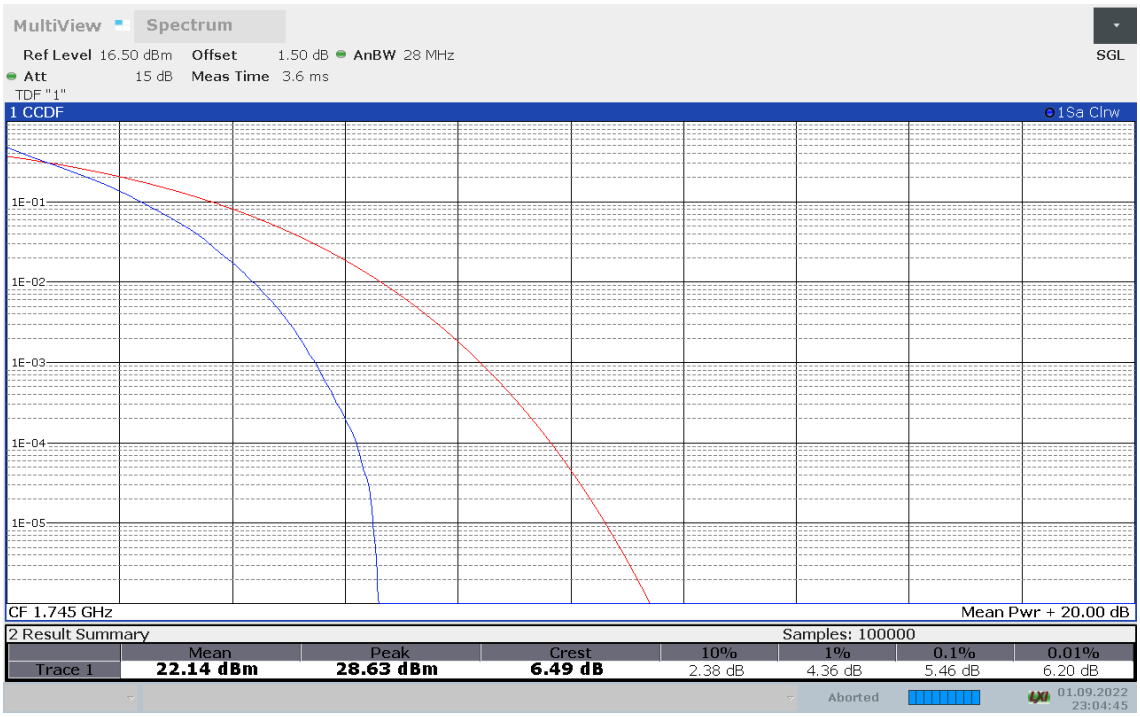
LTE band 13, 10MHz Bandwidth, 64QAM (PAPR)



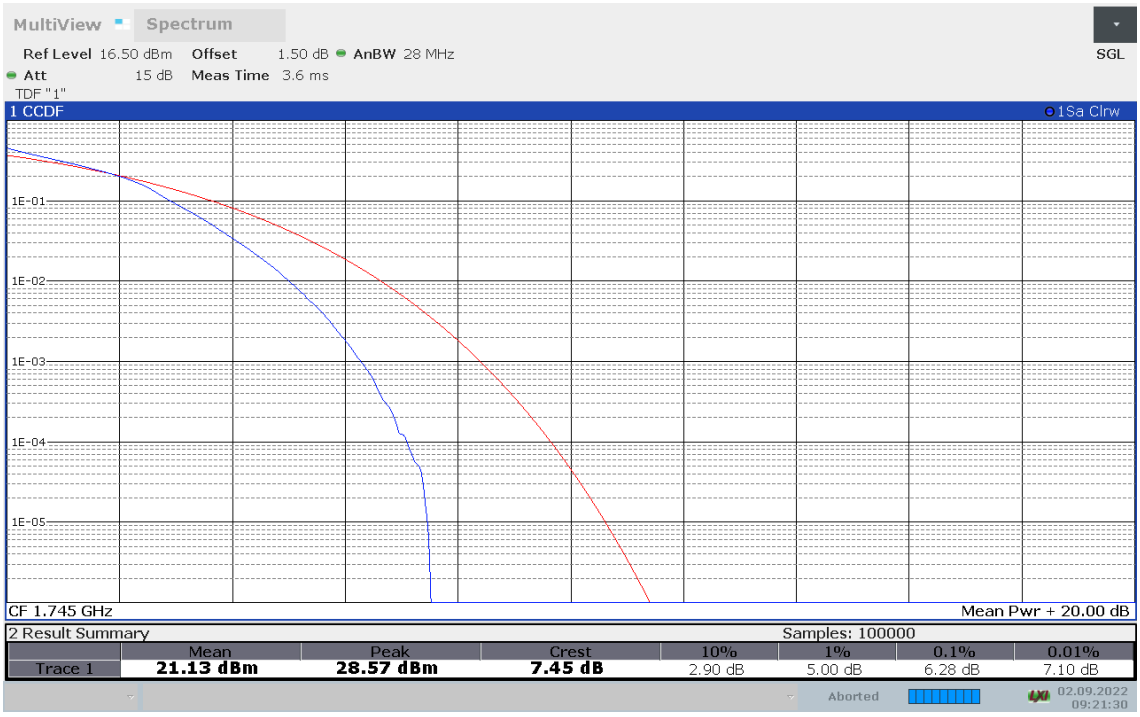
LTE band 66

Frequency(MHz)	Bandwidth(MHz)	PAPR(dB)		
		QPSK	16QAM	64QAM
1745.0	20	5.46	6.28	6.18

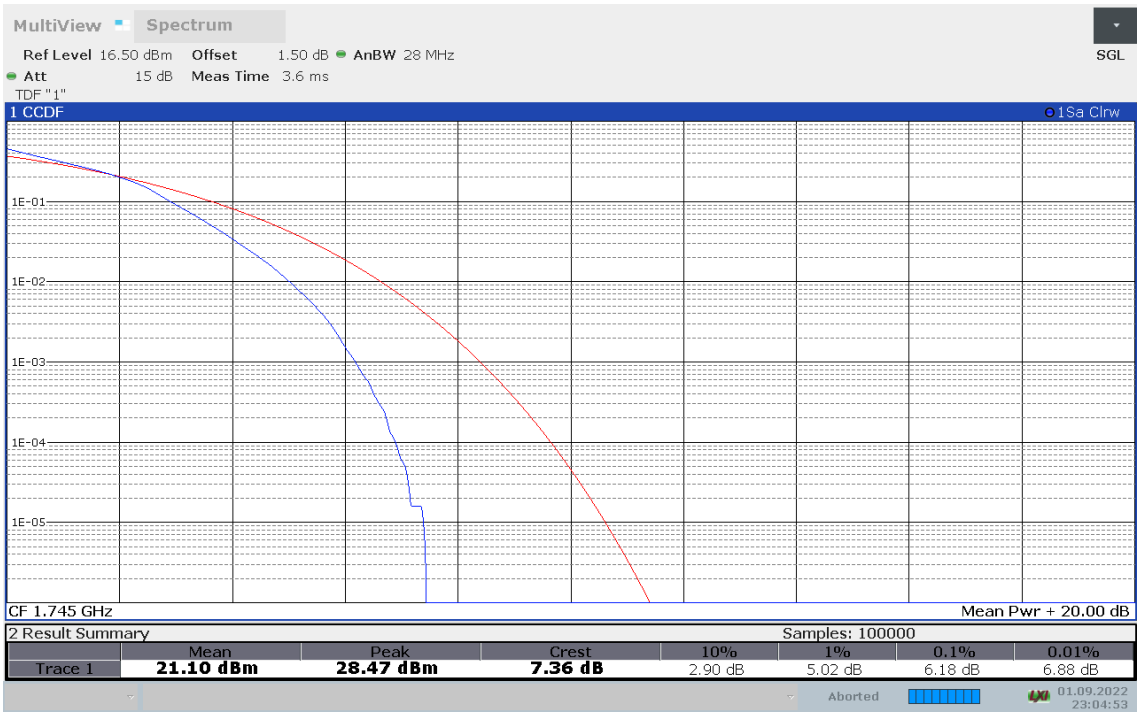
LTE band 66, 20MHz Bandwidth, QPSK (PAPR)



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



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



LTE CA_5B,10MHz+10MHz

Frequency (MHz)	PAPR (dB)		
	QPSK	16QAM	64QAM
836.5	6.06	6.76	6.76

LTE CA_5B, QPSK (PAPR)

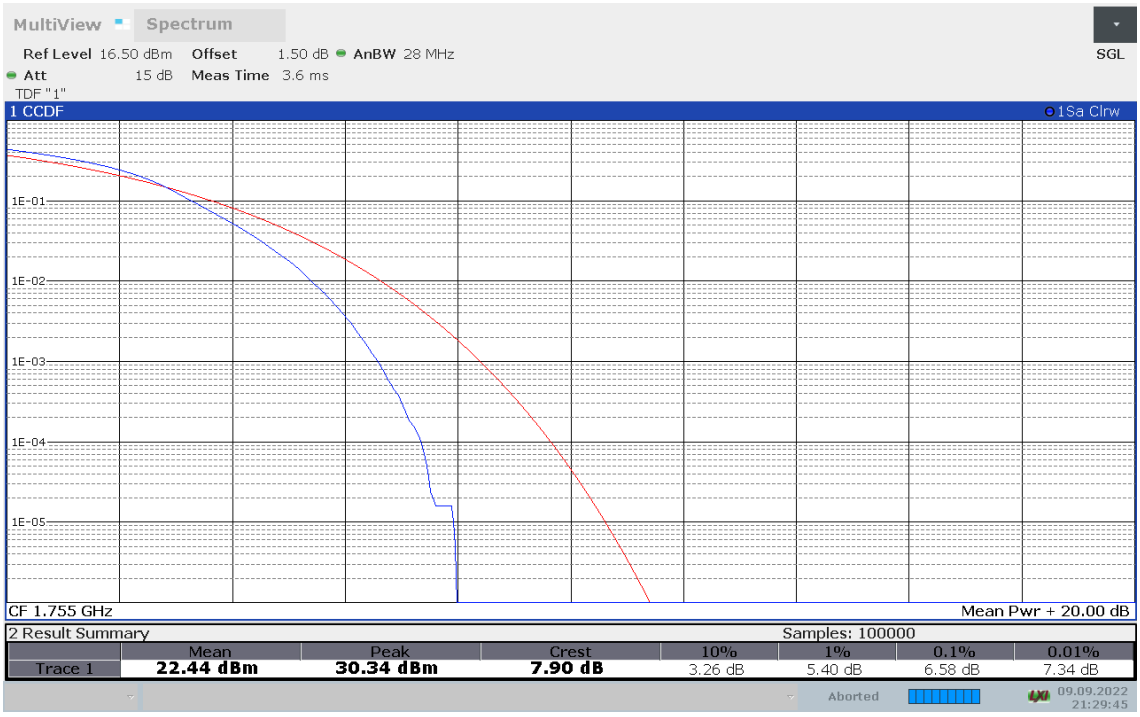
LTE CA_5B, 16QAM (PAPR)

LTE CA_5B, 64QAM (PAPR)

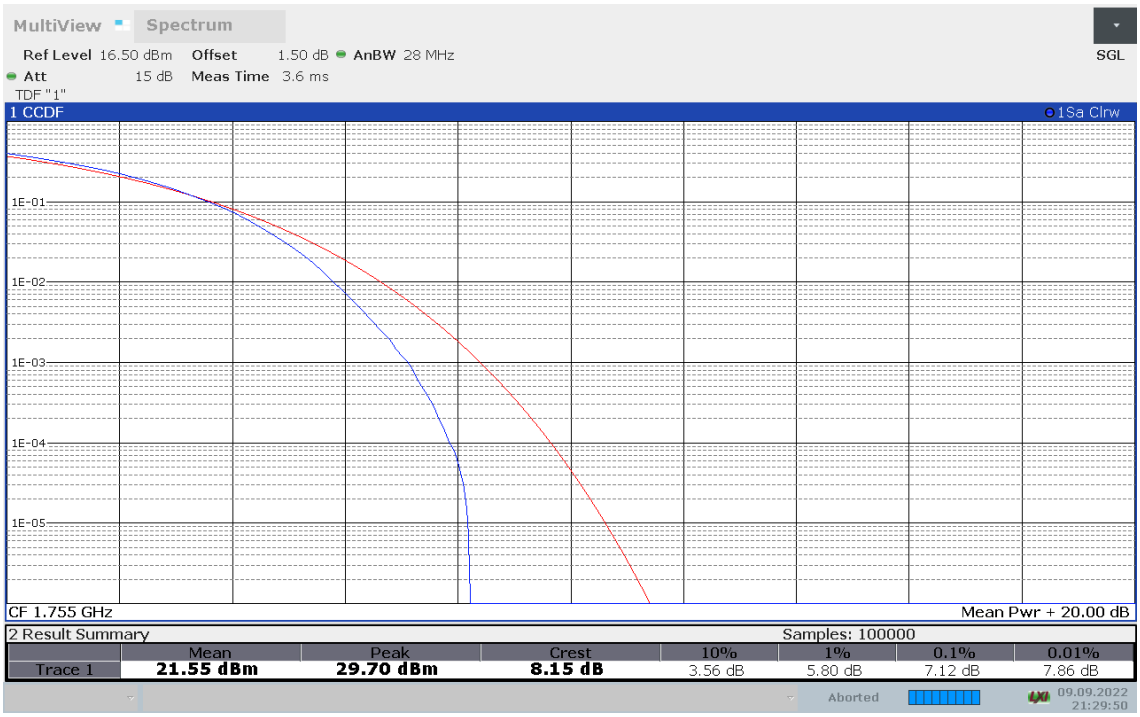
LTE CA_66B,10MHz+10MHz

Frequency (MHz)	PAPR (dB)		
	QPSK	16QAM	64QAM
1755	6.58	7.12	7.04

LTE CA_66B, QPSK (PAPR)



LTE CA_66B 16QAM (PAPR)

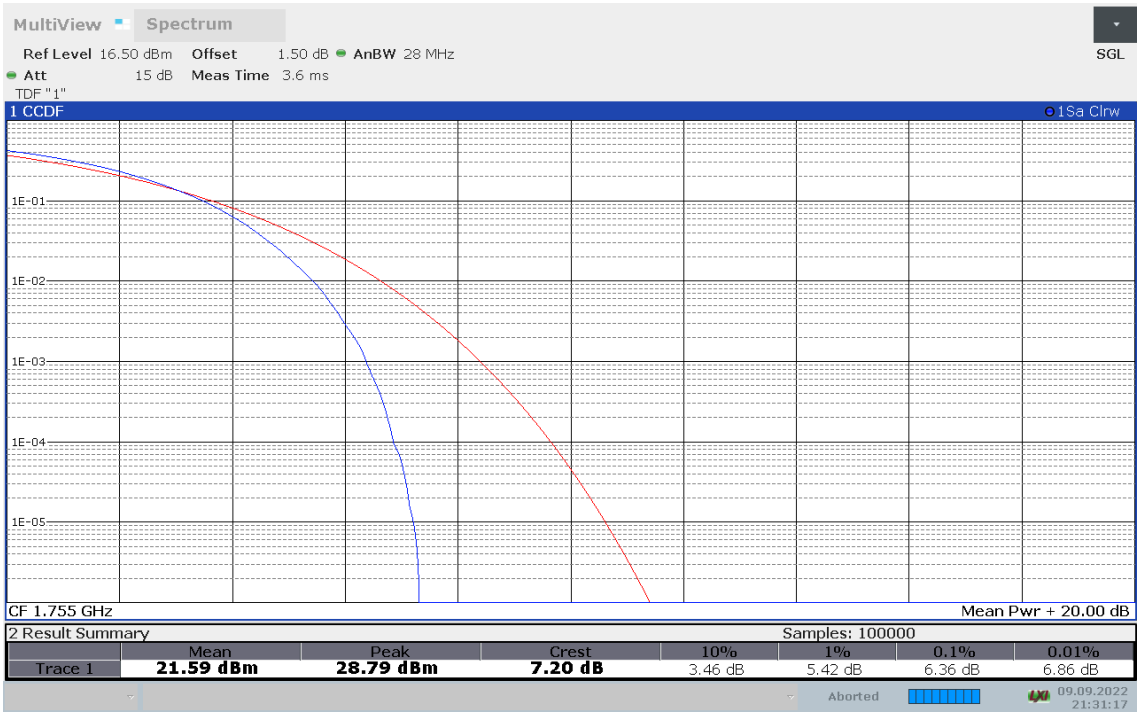


LTE CA_66B, 64QAM (PAPR)

LTE CA_66C,20MHz+20MHz

Frequency (MHz)	PAPR (dB)		
	QPSK	16QAM	64QAM
1755	6.36	7.14	7.12

LTE CA_66C, QPSK (PAPR)



LTE CA_66C 16QAM (PAPR)

LTE CA_66C, 64QAM (PAPR)

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

*****END OF REPORT*****