MultiView   Spectrum

Ref Level 27.00 dBm   Offset 1.10 dB ● RBW 1 MHz
Att   35 dB ● SWT   50 ms ● VBW 5 MHz   Mode Auto Sweep
TDF "1"

1 Frequency Sweep   ●1Rm View

                                     M1[1]   3.63 dBm
                                           2.5710000 GHz

limit1_for_trace1

2.571 GHz   501 pts   900.0 kHz/   2.58 GHz

Measuring...   21.11.2022 23:37:43

Channel power

MultiView   Spectrum

Ref Level 25.00 dBm   ● RBW 10 kHz
● Att   25 dB ● SWT 50 ms ● VBW 30 kHz   Mode Auto Sweep
TDF "1"

1 ACLR   ●1Rm View

                              Tx1

CF 2.571 GHz   500 pts   None   200.0 kHz/   Span 2.0 MHz

2 Result Summary

Channel	Bandwidth	Offset	Power
Tx1 (Ref)	1.000 MHz		-28.70 dBm
Tx Total			-28.70 dBm

Measuring...   21.11.2022 23:38:00

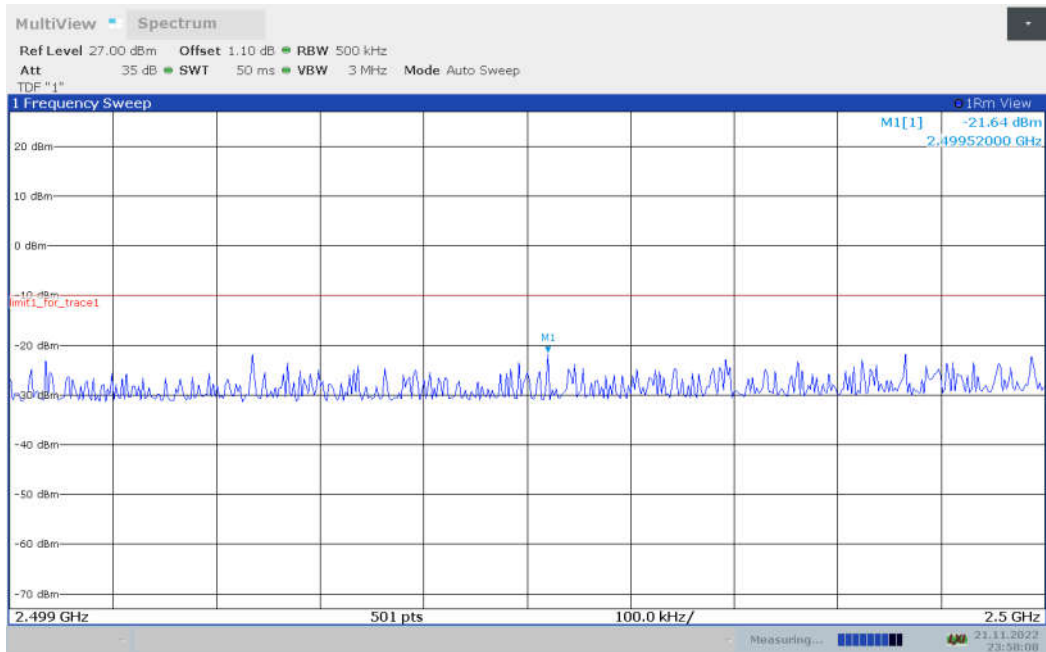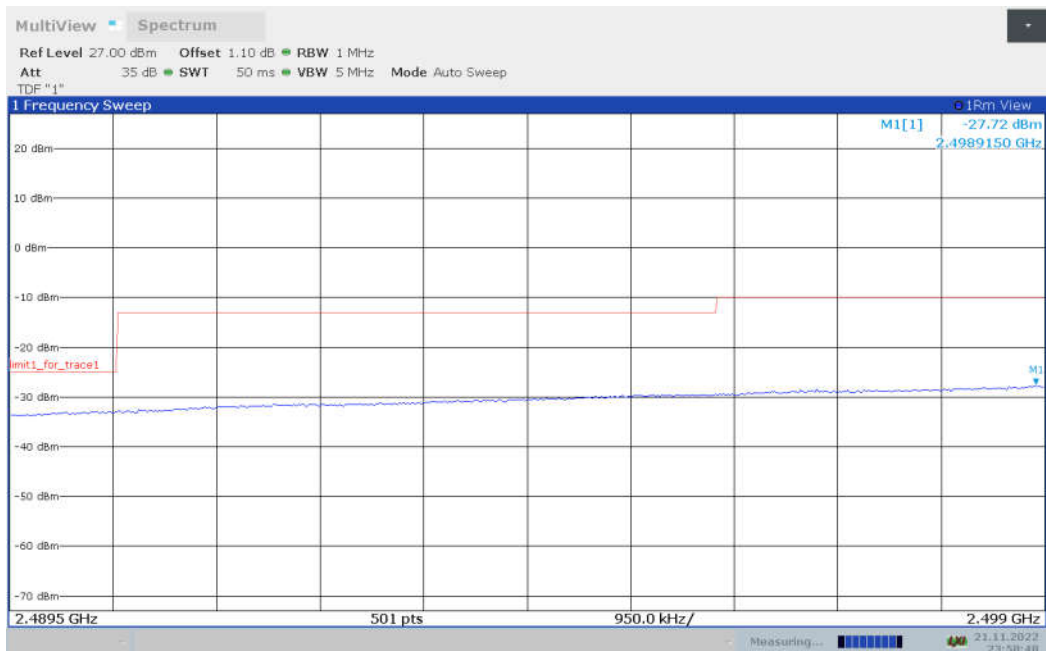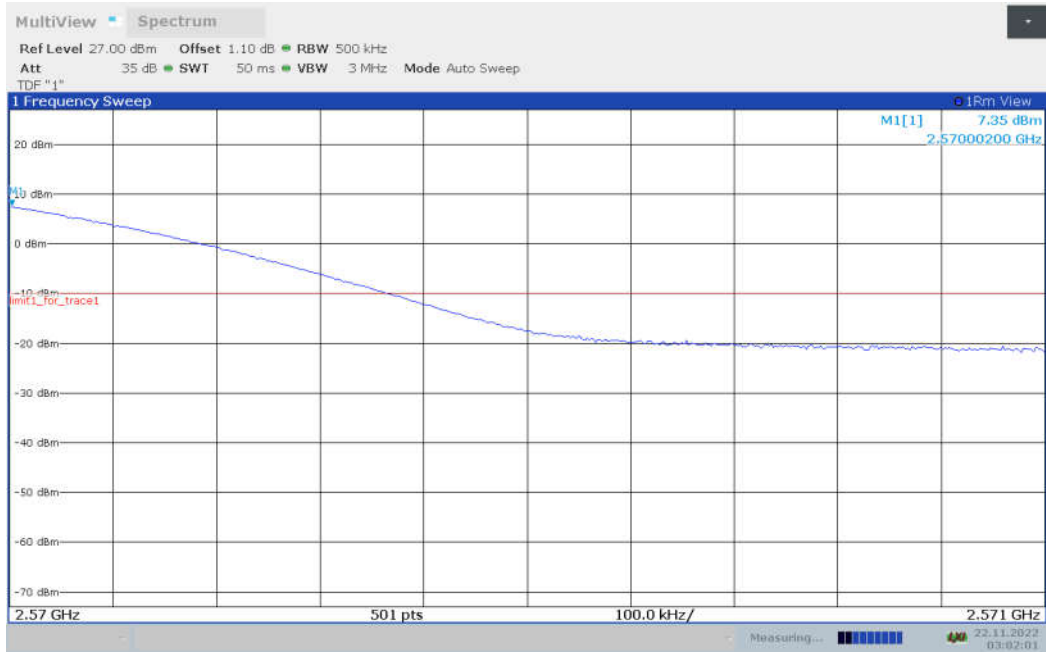**LOW BAND EDGE BLOCK-20M-100%RB**
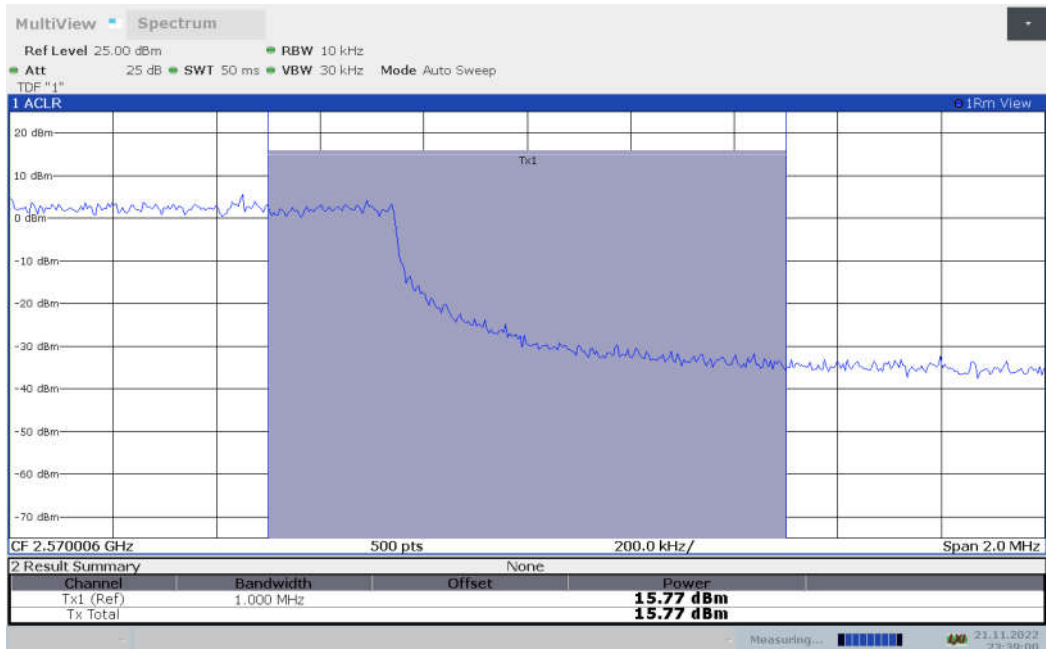

LOW BAND EDGE BLOCK-20M-100%RB

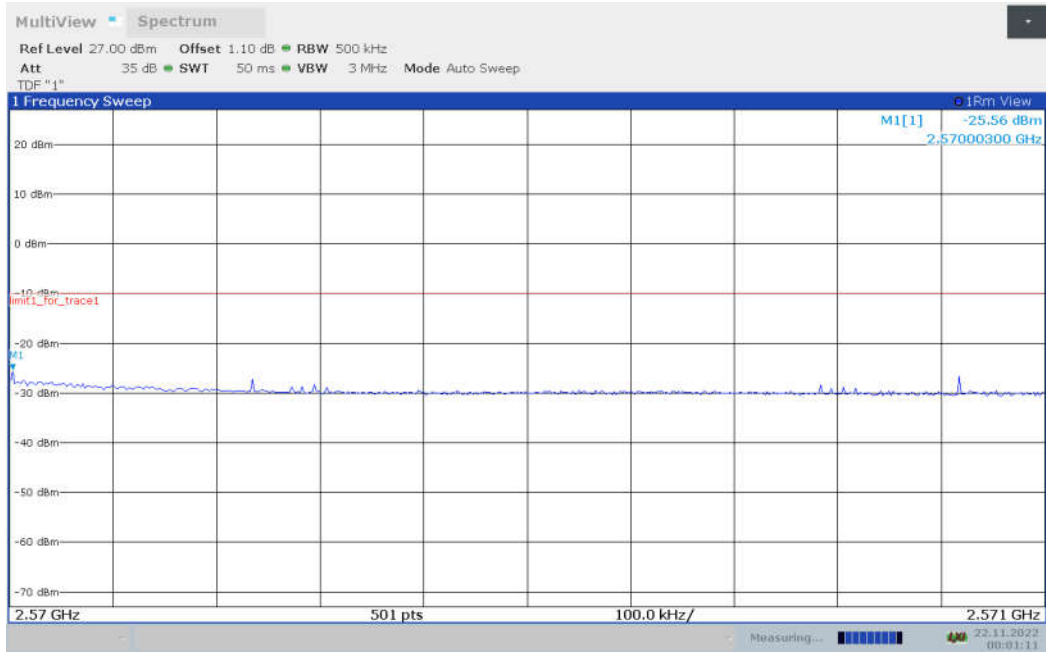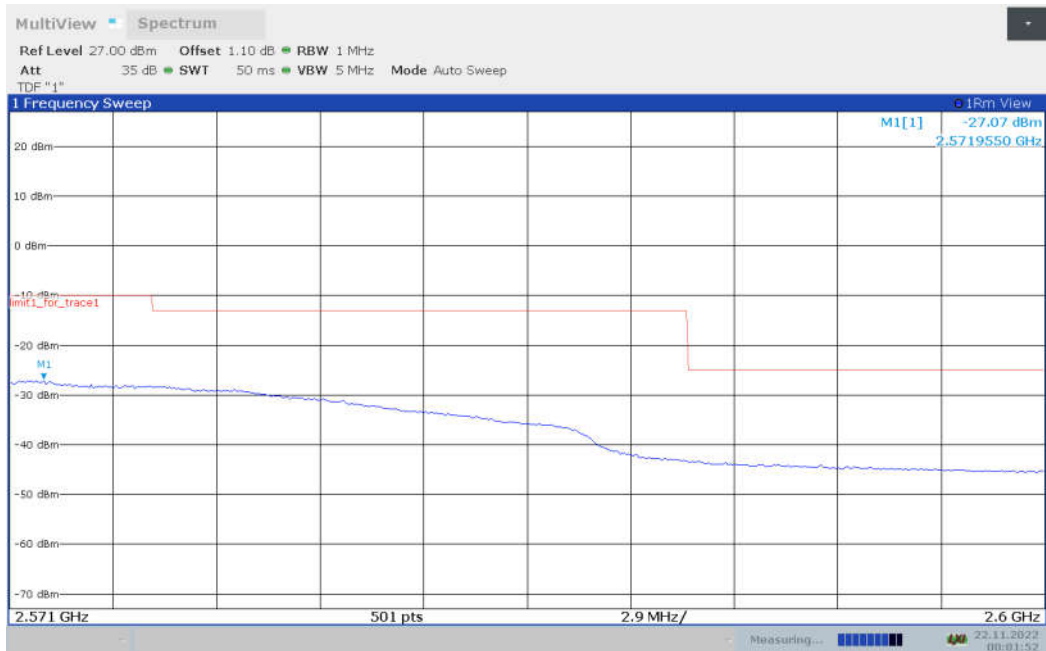**HIGH BAND EDGE BLOCK-5M-100%RB**

Channel power

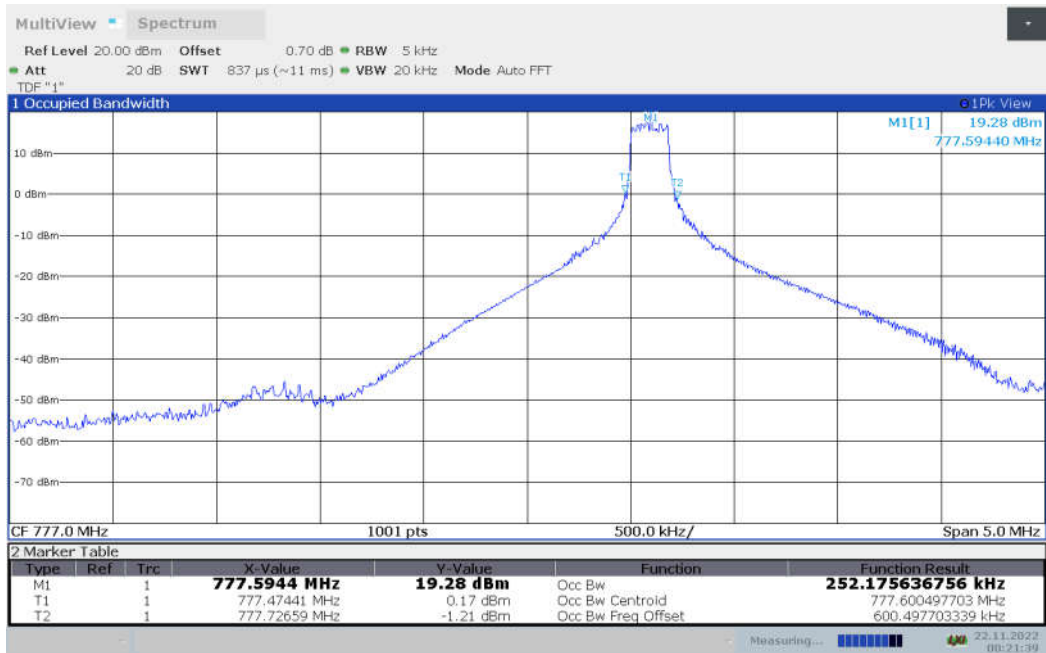**HIGH BAND EDGE BLOCK-20M-100%RB**
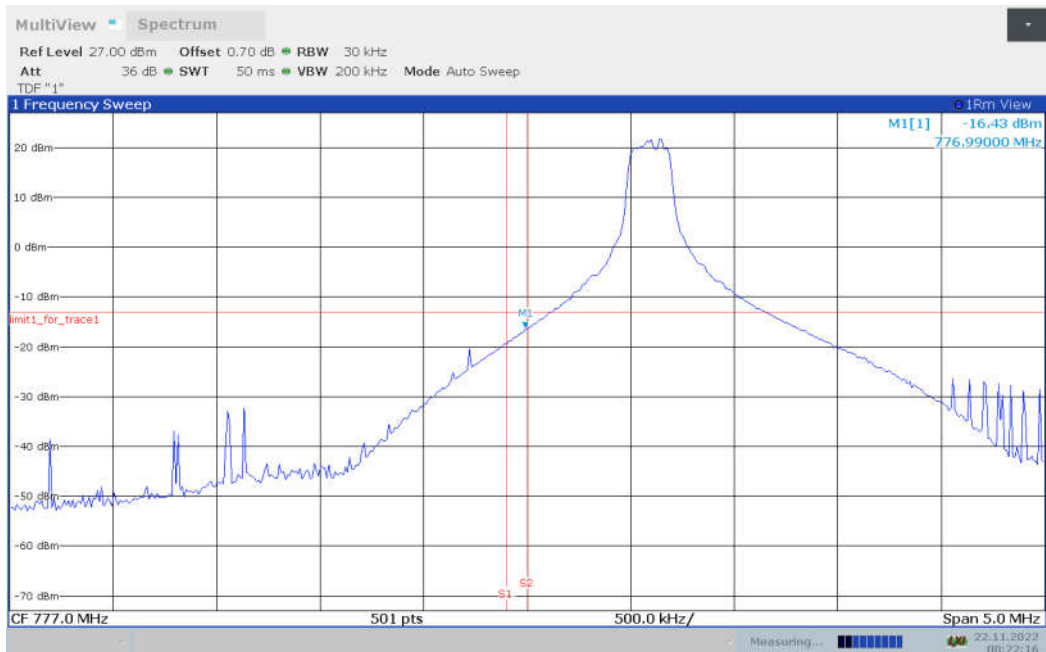

HIGH BAND EDGE BLOCK-20M-100%RB

LTE band 13
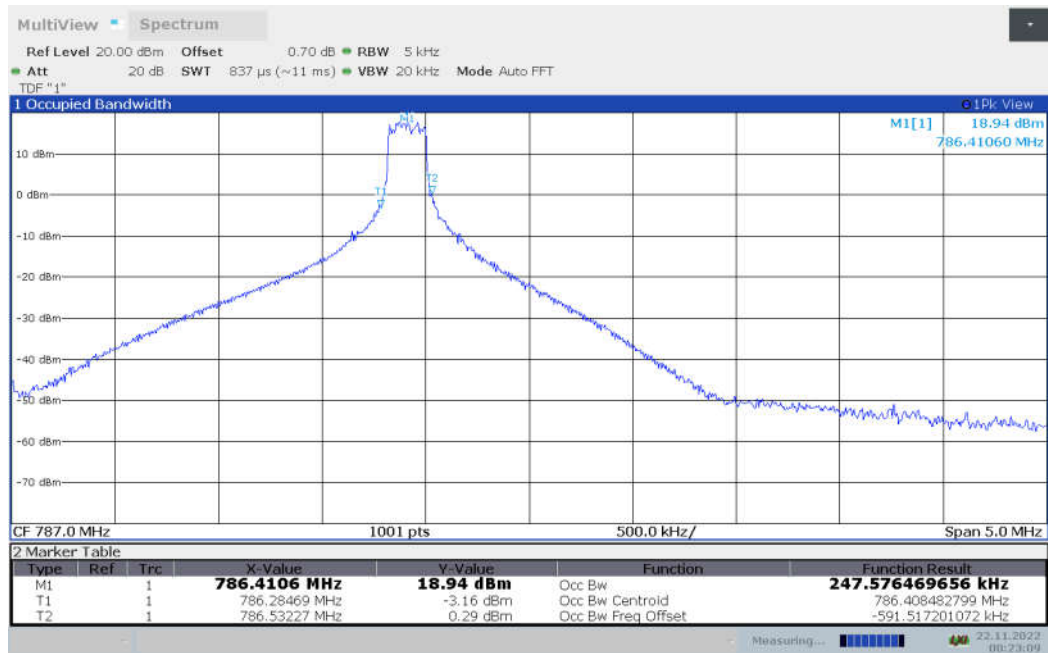
OBW: 1RB-LOW_offset
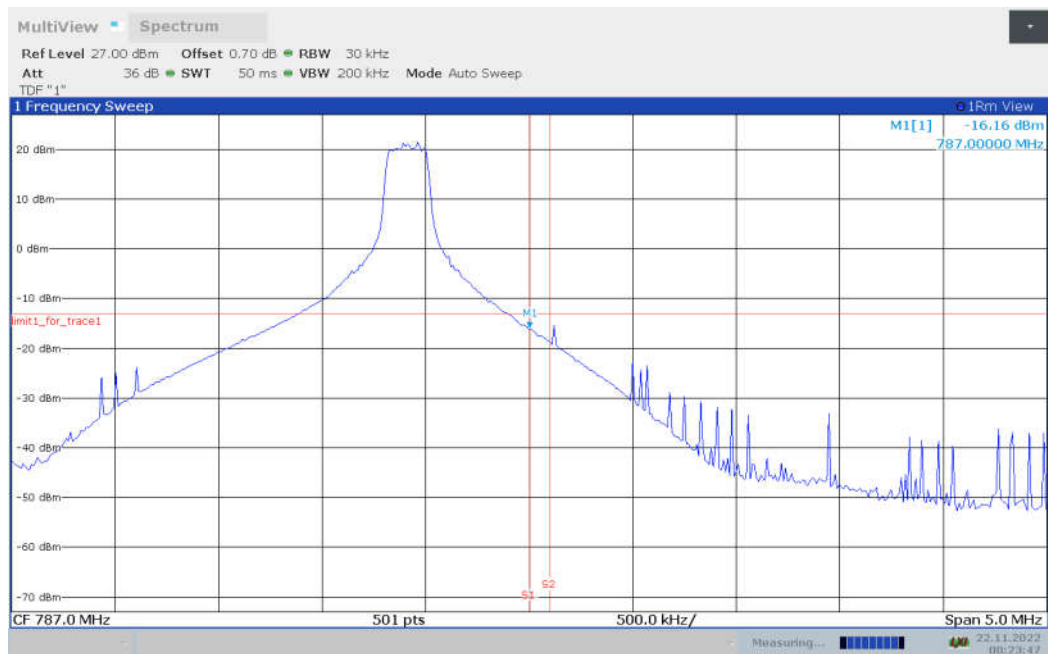

LOW BAND EDGE BLOCK-1RB-LOW_offset
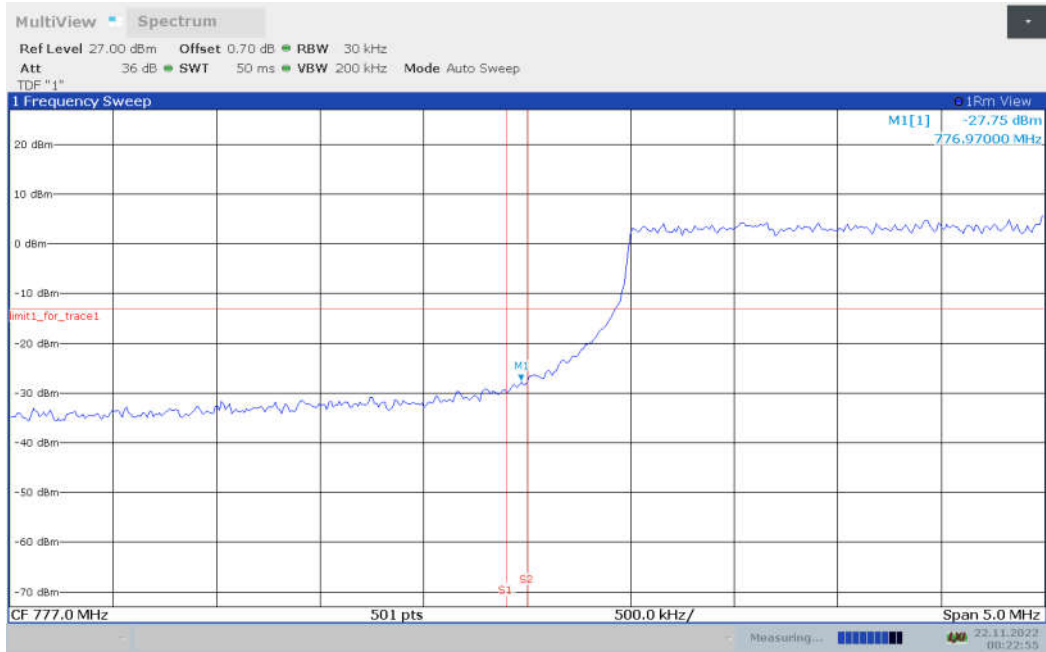
OBW: 1RB-HIGH_offset

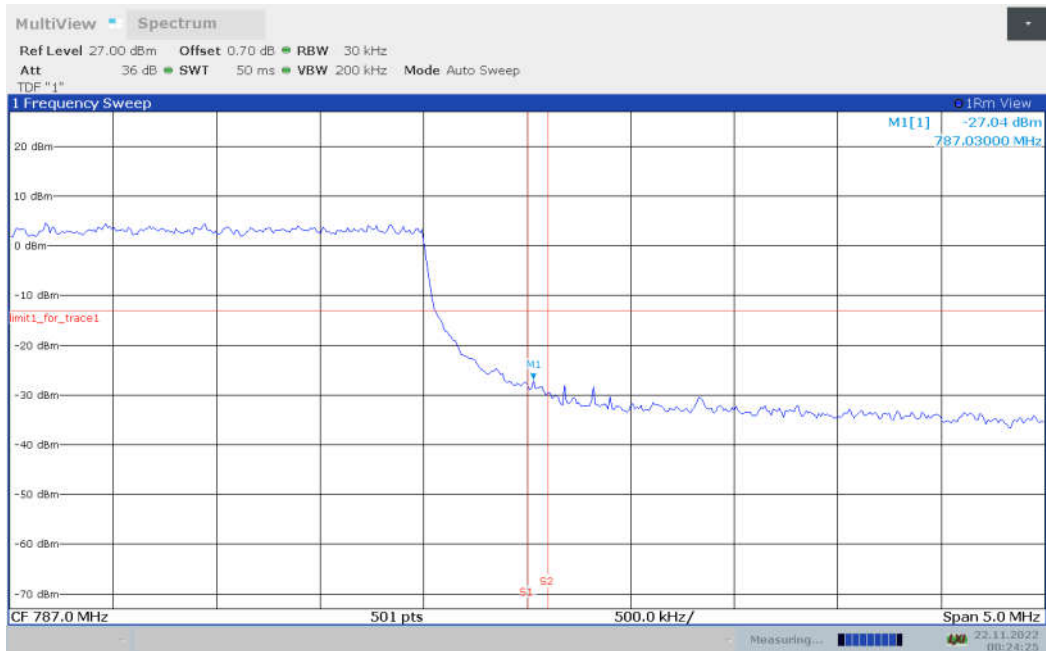**HIGH BAND EDGE BLOCK-1RB-HIGH_offset**

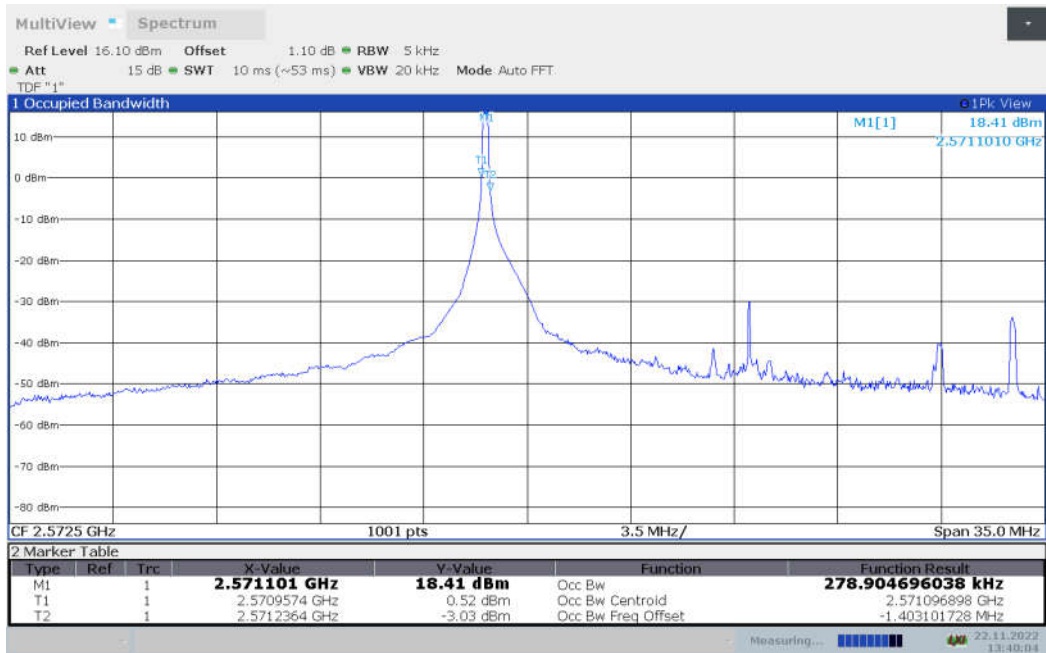**LOW BAND EDGE BLOCK-10M-100%RB**

HIGH BAND EDGE BLOCK-10M-100%RB

LTE band 38

OBW: 1RB-LOW_offset

LOW BAND EDGE BLOCK-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	**2.619003 GHz**	**17.12 dBm**	Occ Bw	**260.550554287 kHz**
T1		1	2.6187636 GHz	-3.55 dBm	Occ Bw Centroid	2.618893835 GHz
T2		1	2.6190241 GHz	-1.99 dBm	Occ Bw Freq Offset	1.393834579 MHz
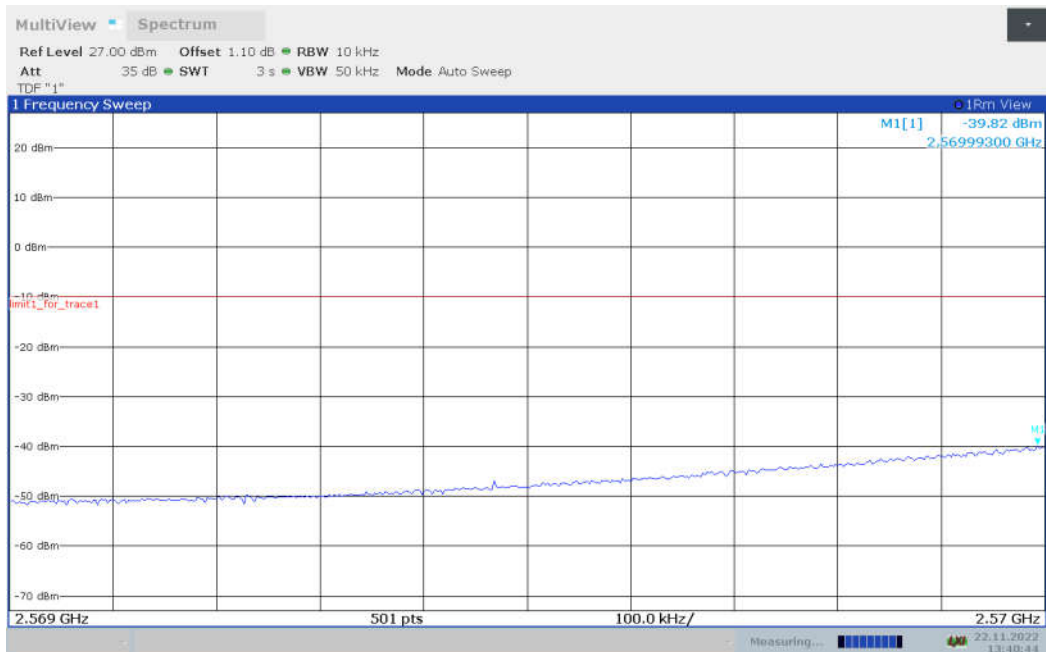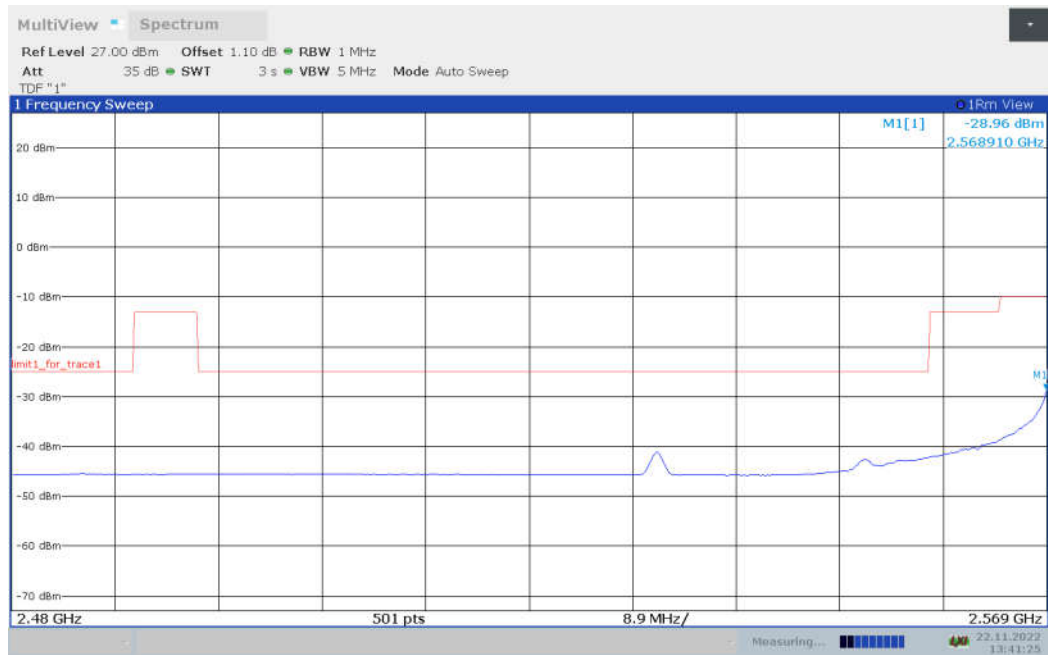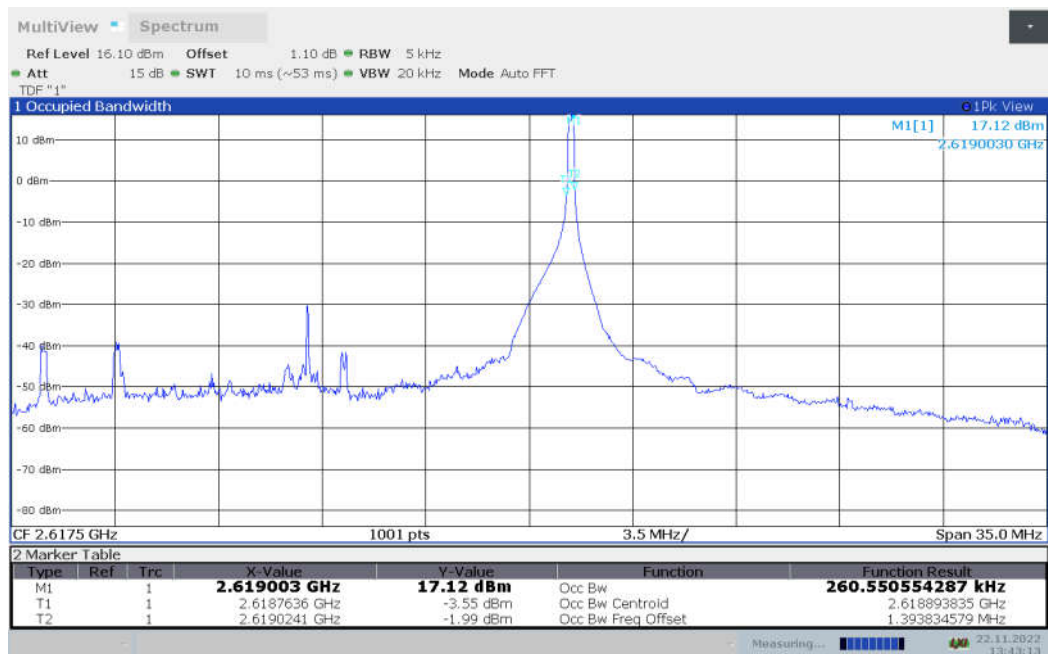
HIGH BAND EDGE BLOCK-1RB-HIGH_offset

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 41

LOW BAND EDGE BLOCK-1RB-LOW_offset
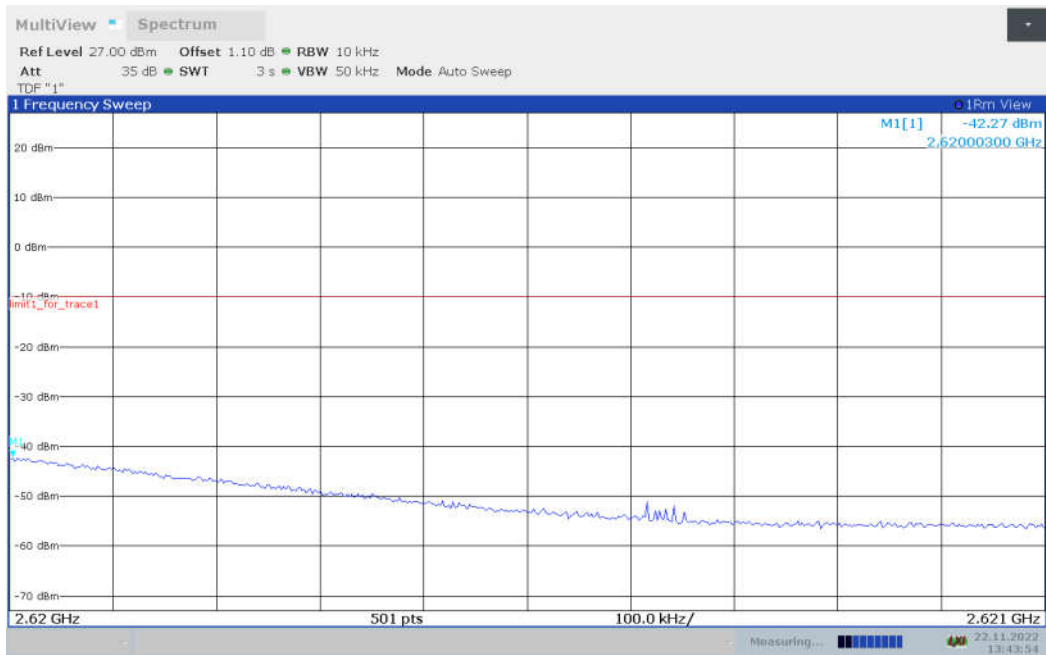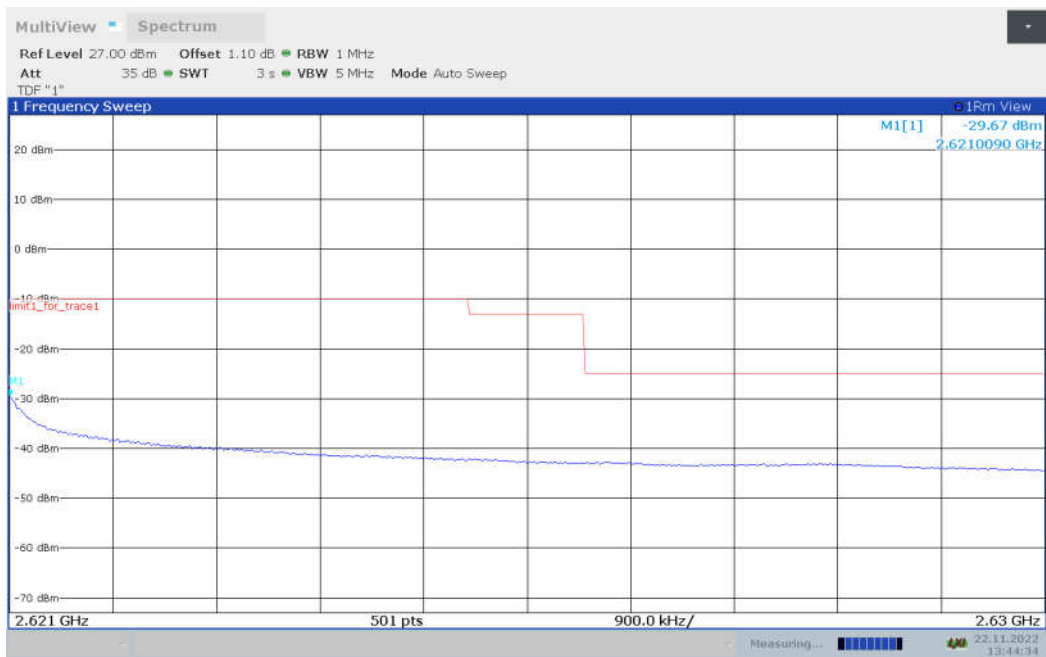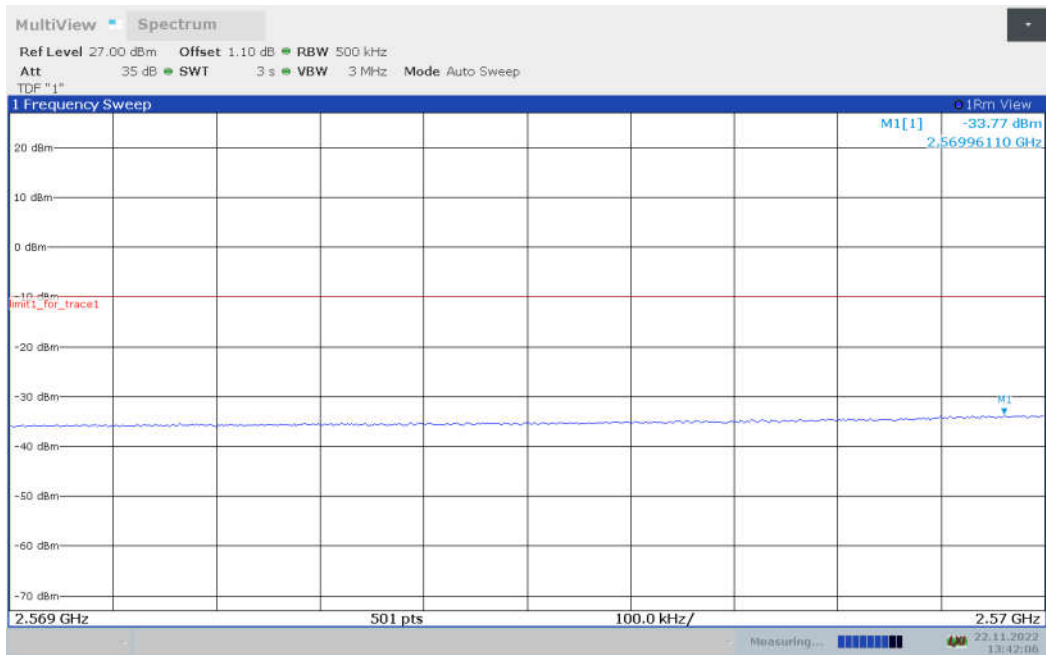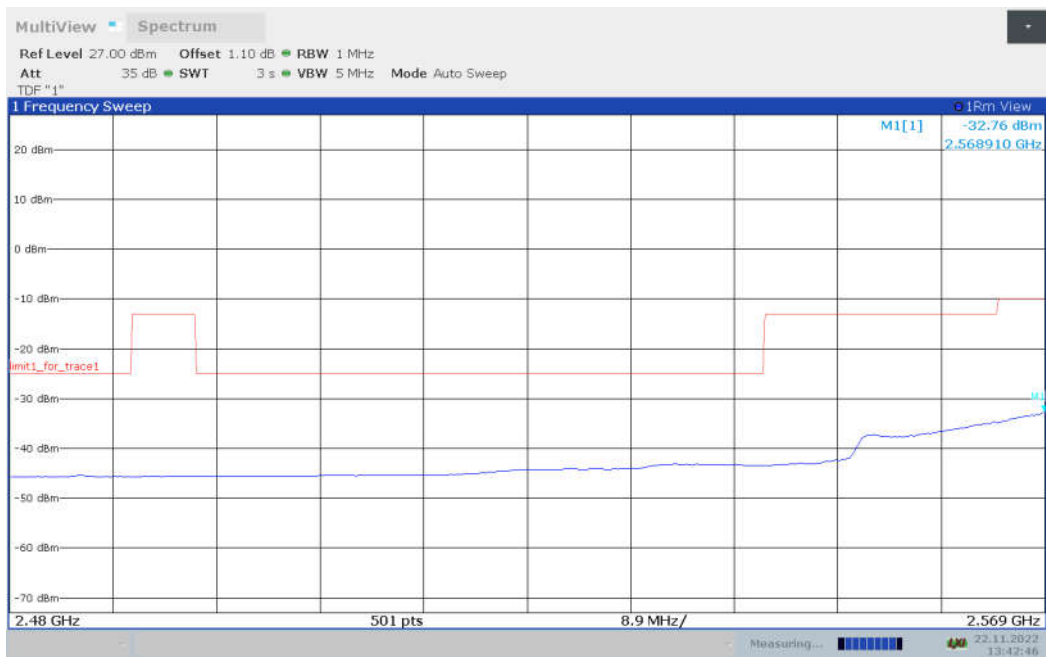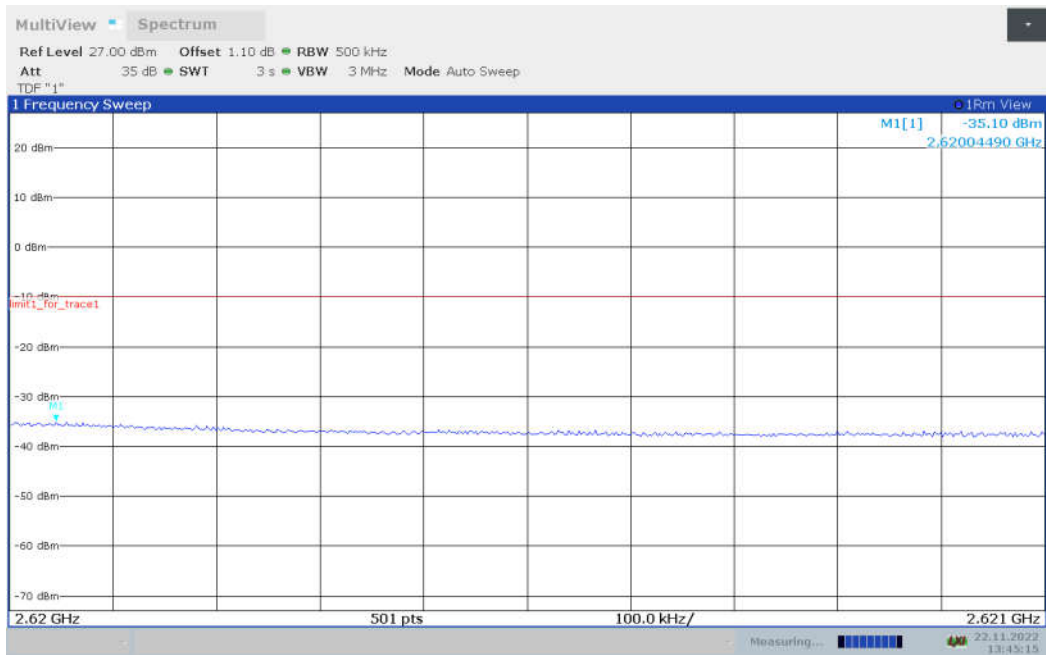

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.475 GHz	2.529 GHz	1.000 MHz	2.52881 GHz	-40.94 dBm	-15.94 dB
2.529 GHz	2.530 GHz	1.000 MHz	2.52999 GHz	-39.27 dBm	-26.27 dB
2.530 GHz	2.534 GHz	1.000 MHz	2.53397 GHz	-30.86 dBm	-20.86 dB
2.534 GHz	2.535 GHz	200.000 kHz	2.53500 GHz	-26.09 dBm	-16.09 dB
2.535 GHz	2.595 GHz	200.000 kHz	2.53605 GHz	22.40 dBm	-2.60 dB

LOW BAND EDGE BLOCK-20M-100%RB

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.475 GHz	2.529 GHz	1.000 MHz	2.52870 GHz	-33.23 dBm	-8.23 dB
2.529 GHz	2.530 GHz	1.000 MHz	2.52999 GHz	-32.35 dBm	-19.35 dB
2.530 GHz	2.534 GHz	1.000 MHz	2.53383 GHz	-29.74 dBm	-19.74 dB
2.534 GHz	2.535 GHz	200.000 kHz	2.53500 GHz	-34.52 dBm	-24.52 dB
2.535 GHz	2.595 GHz	200.000 kHz	2.53749 GHz	4.64 dBm	-20.36 dB

HIGH BAND EDGE BLOCK-1RB-HIGH_offset

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.595 GHz	2.655 GHz	200.000 kHz	2.65389 GHz	21.03 dBm	-3.97 dB
2.655 GHz	2.656 GHz	200.000 kHz	2.65501 GHz	-25.82 dBm	-15.82 dB
2.656 GHz	2.660 GHz	1.000 MHz	2.65601 GHz	-28.94 dBm	-18.94 dB
2.660 GHz	2.661 GHz	1.000 MHz	2.66000 GHz	-38.09 dBm	-25.09 dB
2.661 GHz	2.715 GHz	1.000 MHz	2.66103 GHz	-39.46 dBm	-14.46 dB

HIGH BAND EDGE BLOCK-20M-100%RB

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.595 GHz	2.655 GHz	200.000 kHz	2.65125 GHz	6.46 dBm	-18.54 dB
2.655 GHz	2.656 GHz	200.000 kHz	2.65502 GHz	-38.57 dBm	-28.57 dB
2.656 GHz	2.660 GHz	1.000 MHz	2.65675 GHz	-33.91 dBm	-23.91 dB
2.660 GHz	2.661 GHz	1.000 MHz	2.66004 GHz	-35.56 dBm	-22.56 dB
2.661 GHz	2.715 GHz	1.000 MHz	2.66119 GHz	-36.04 dBm	-11.04 dB

LTE band 66
OBW: 1RB-LOW_offset

LOW BAND EDGE BLOCK-1RB-LOW_offset

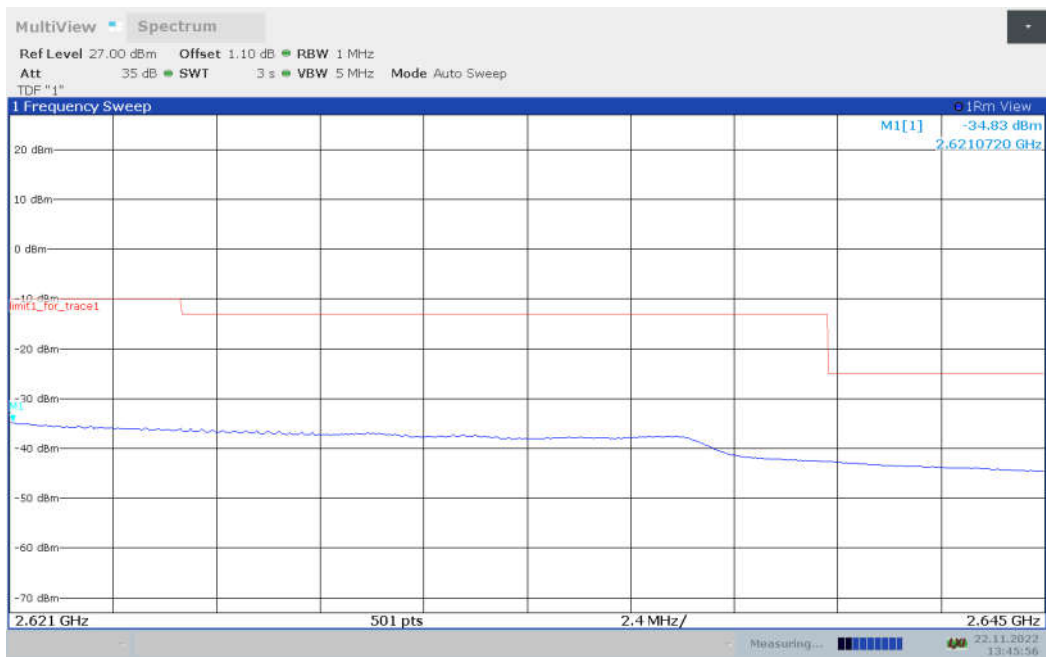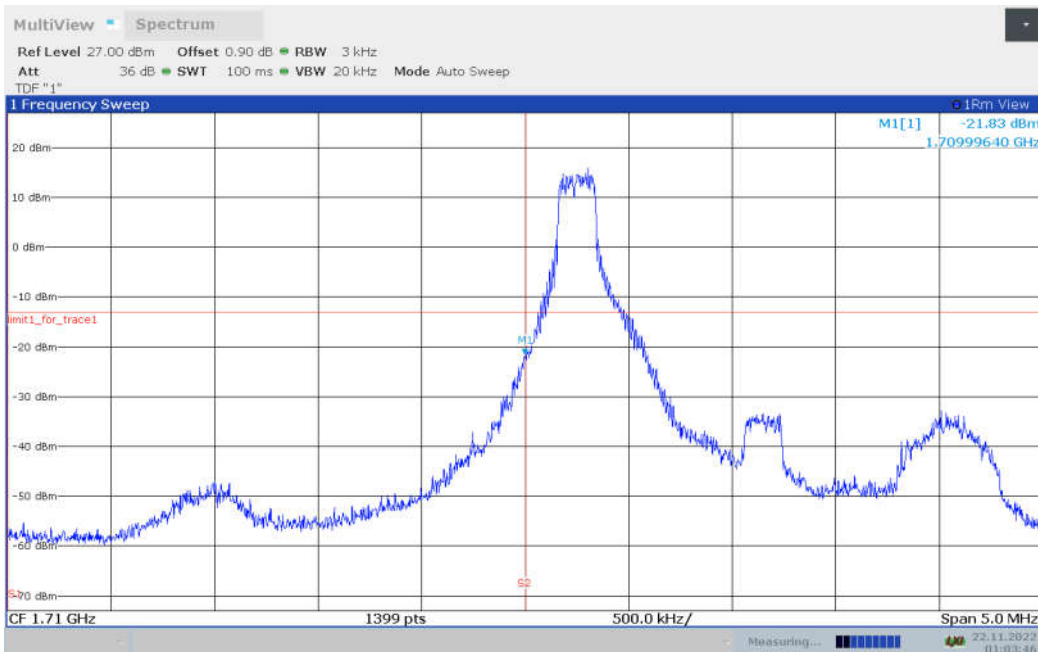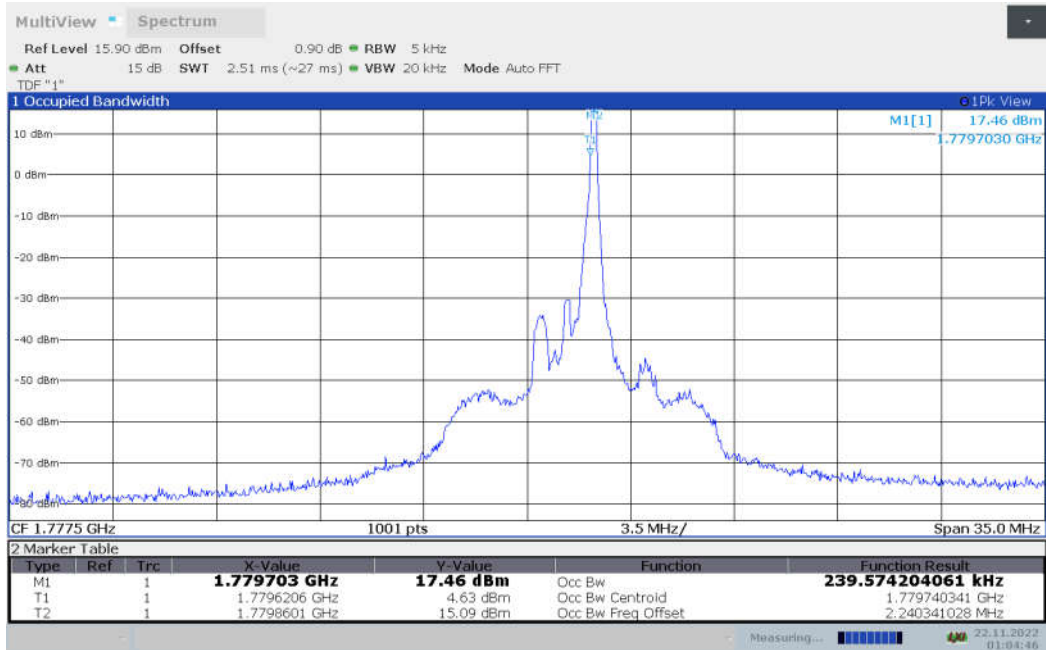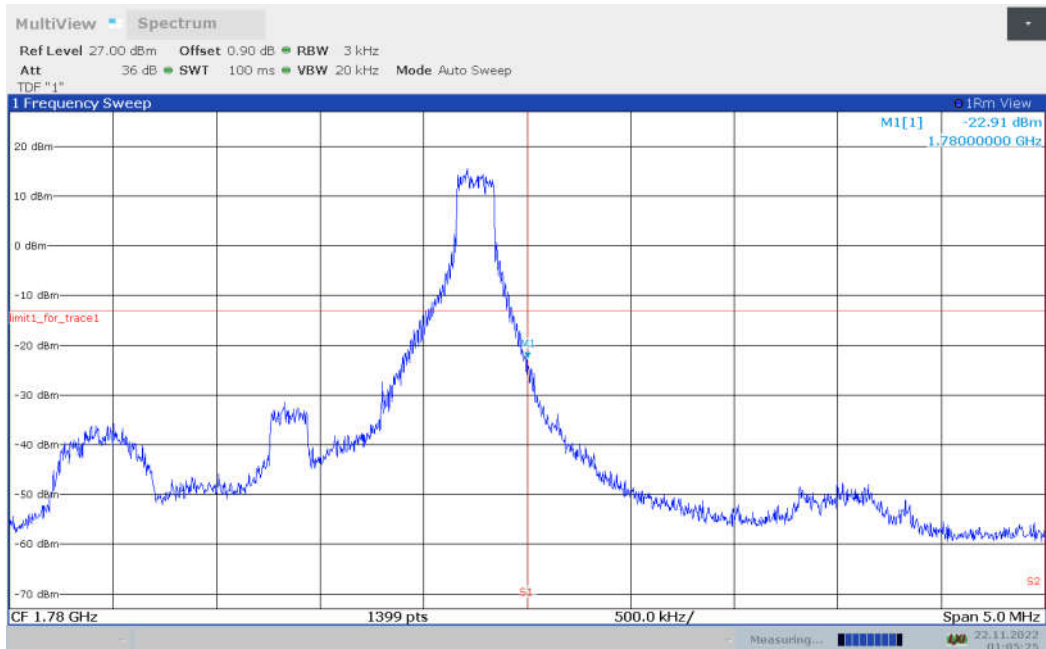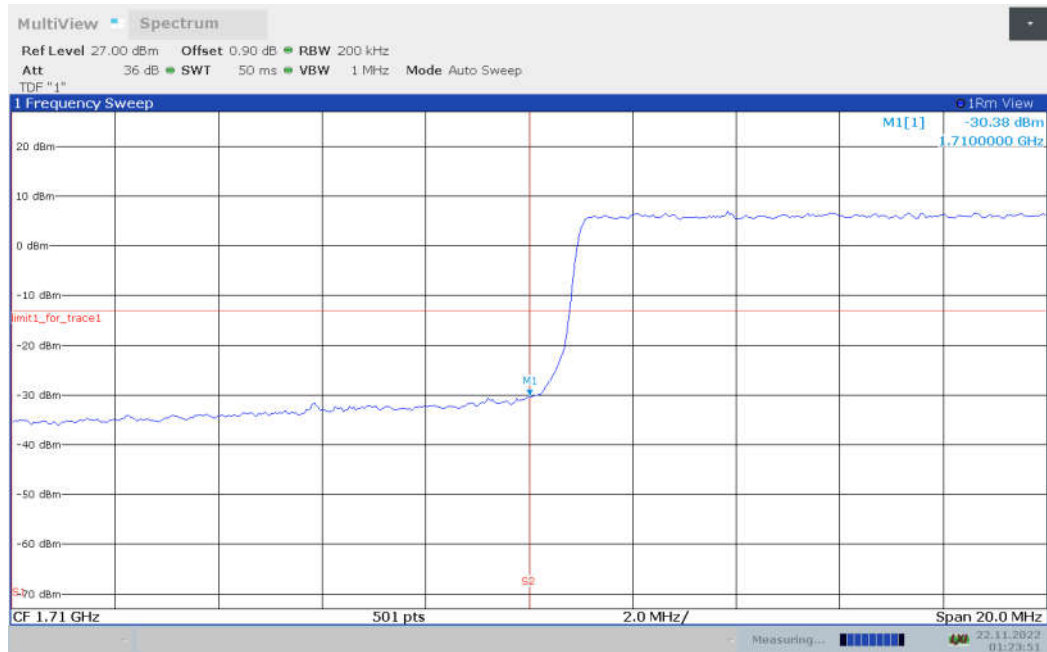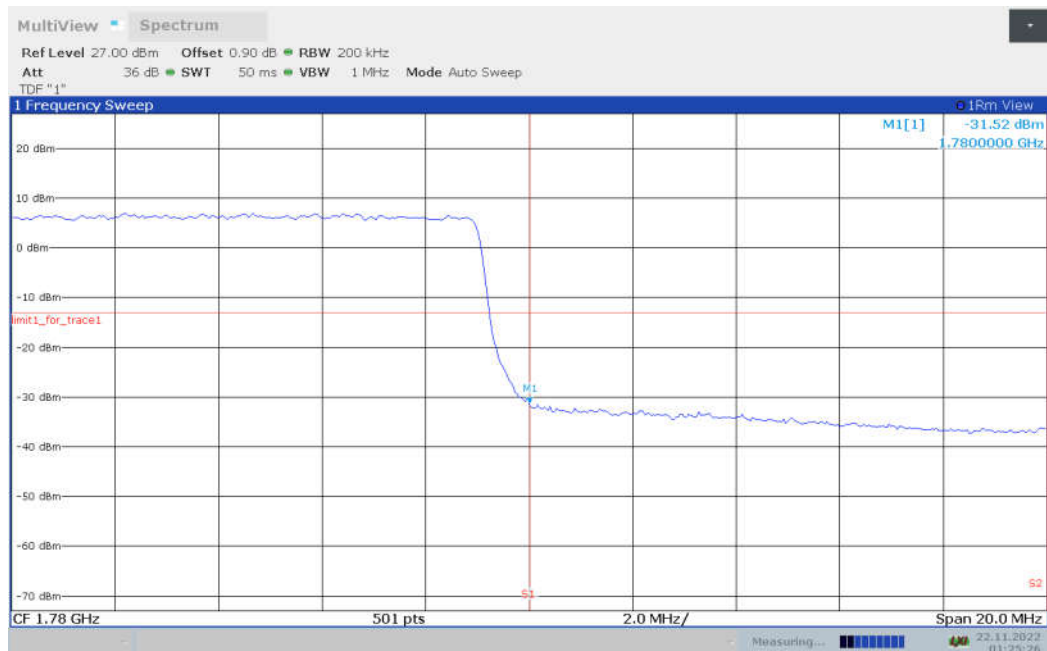**OBW: 1RB-HIGH_offset**

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 = 0.49dB(100KHz-2GHz)/1.21dB(2GHz-26.5GHz), k = 1.96

A.7 CONDUCTED SPURIOUS EMISSION

Reference

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

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 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.

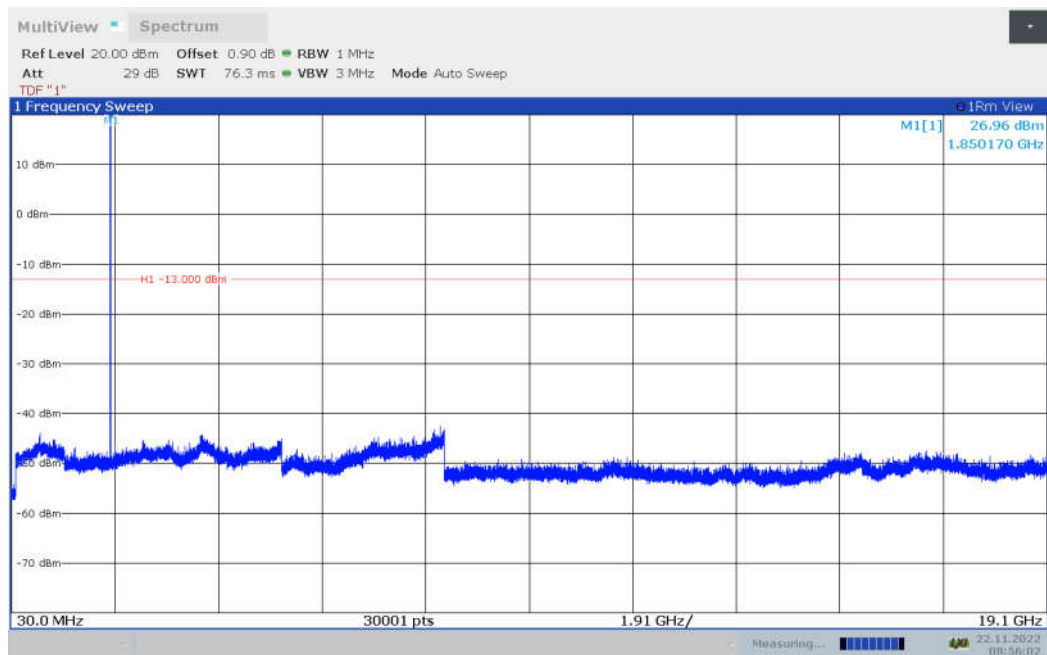**A. 7.3 Measurement result**

Only worst case result is given below

LTE band 2 : 30MHz – 19.1GHz

Spurious emission limit –13dBm.
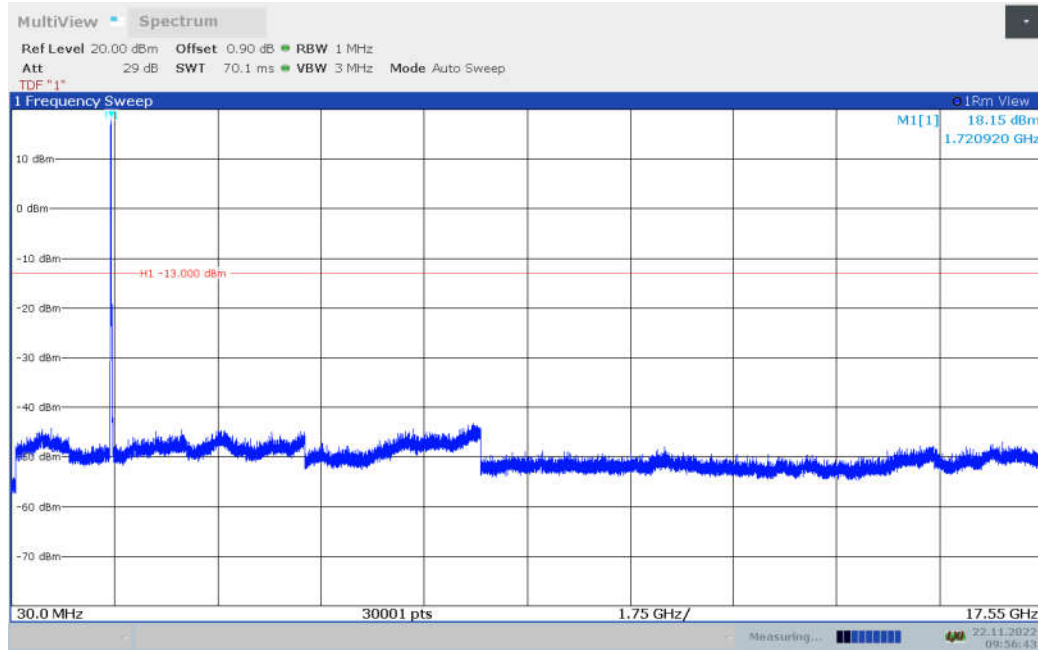
NOTE: peak above the limit line is the carrier frequency.

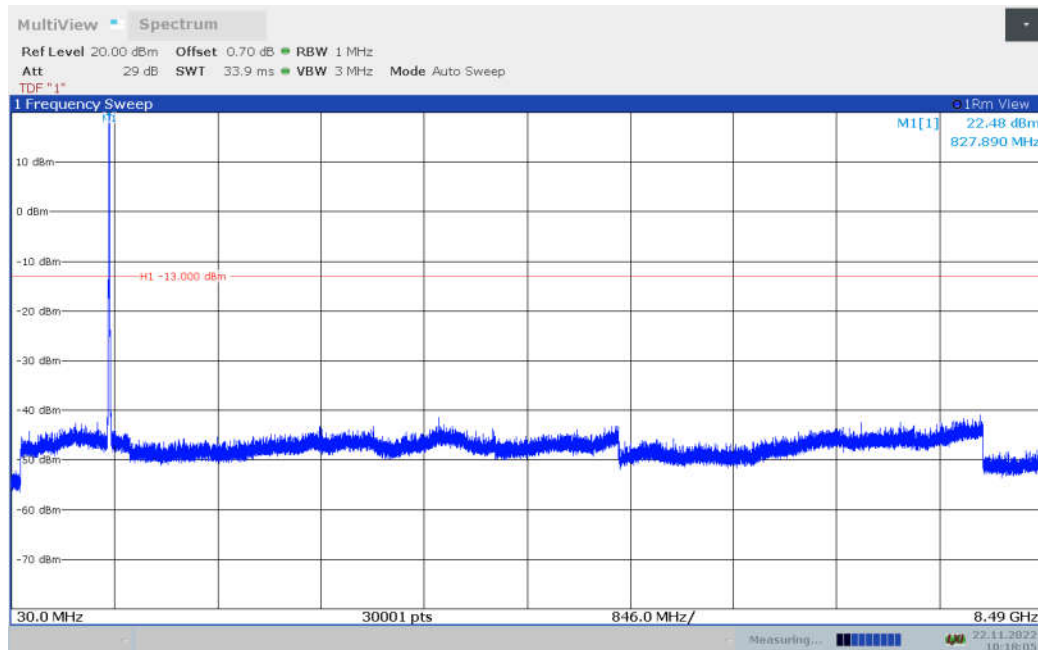**LTE band 4 : 30MHz – 17.55GHz**

Spurious emission limit –13dBm.

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

LTE band 5 20MHz QPSK: 30MHz – 8.49GHz

Spurious emission limit –25dBm.
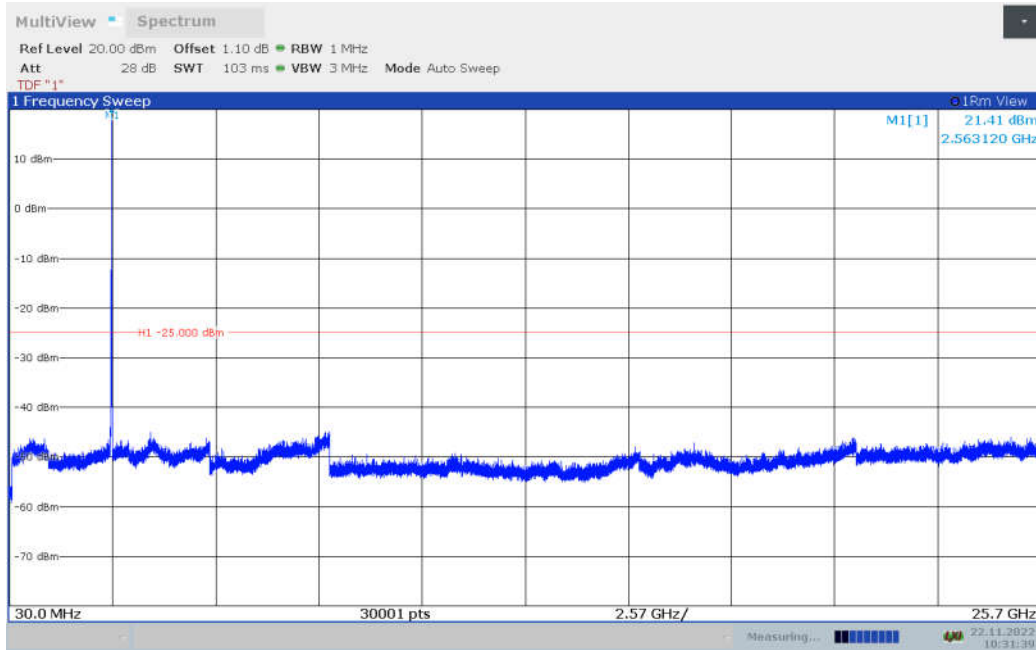
NOTE: peak above the limit line is the carrier frequency.

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

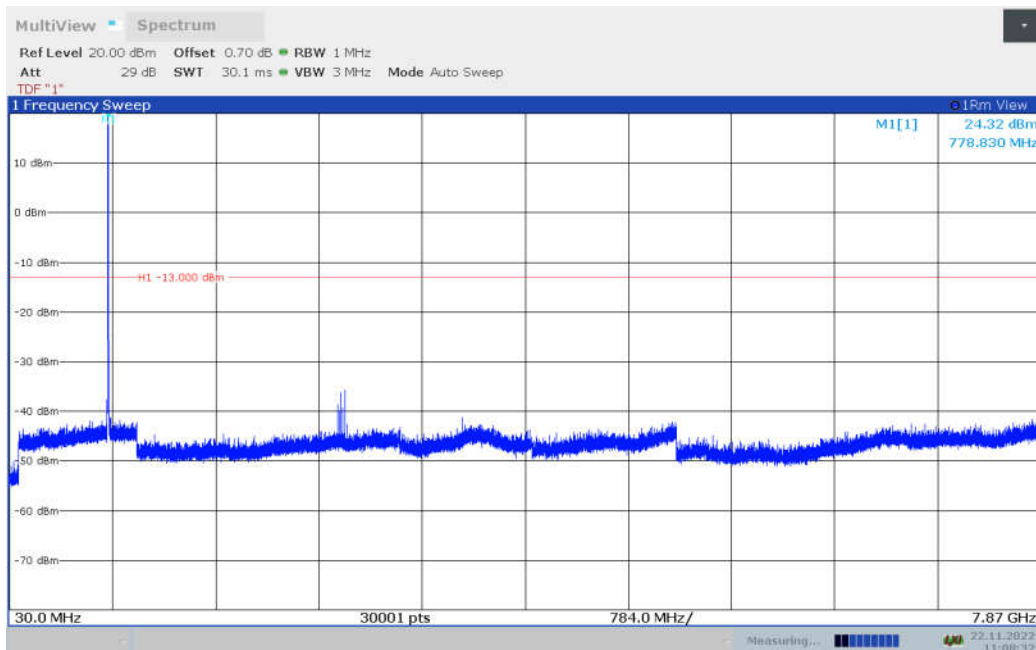Spurious emission limit –25dBm.

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

LTE band 13: 30MHz – 7.87GHz

Spurious emission limit –13dBm.

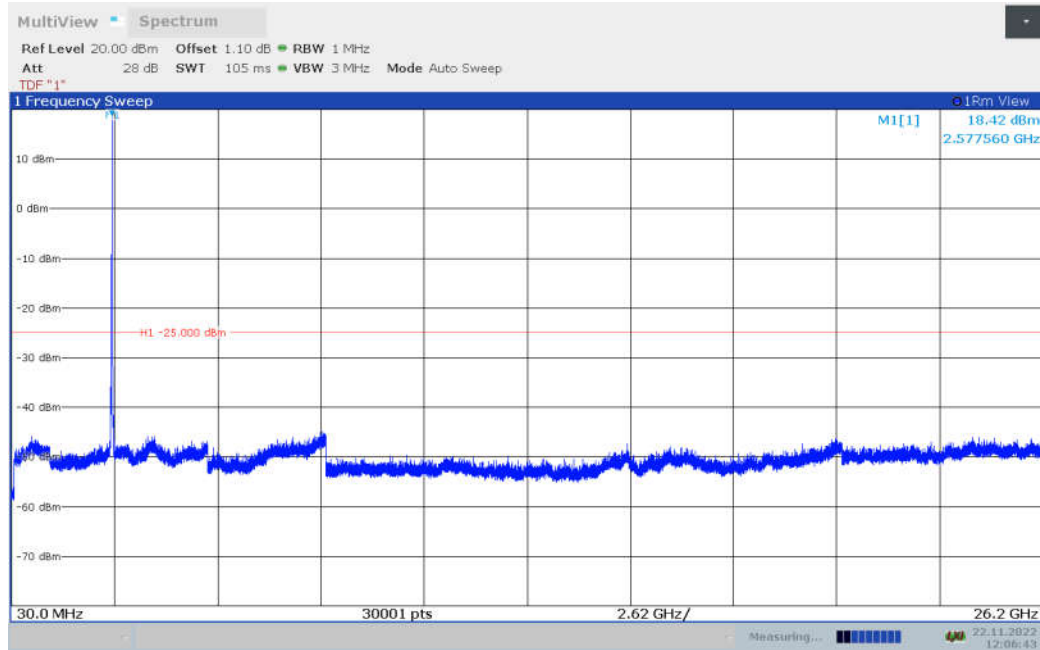**NOTE: peak above the limit line is the carrier frequency.**

LTE band 38: 30MHz – 26.2GHz
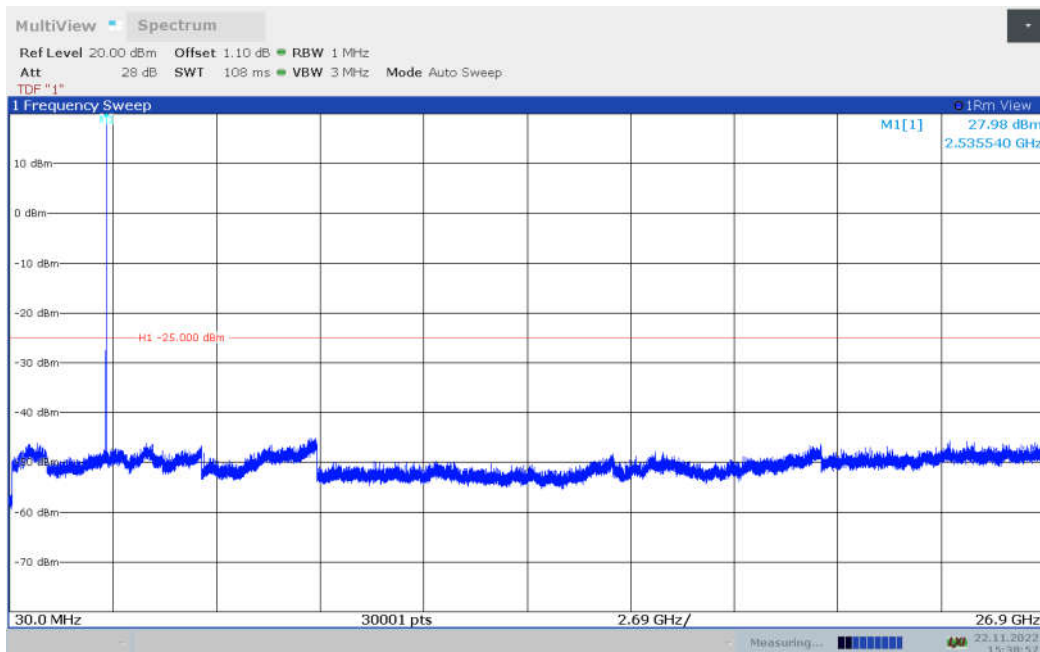
Spurious emission limit –25dBm.

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

LTE band 41: 30MHz – 26.55GHz

Spurious emission limit –25dBm.
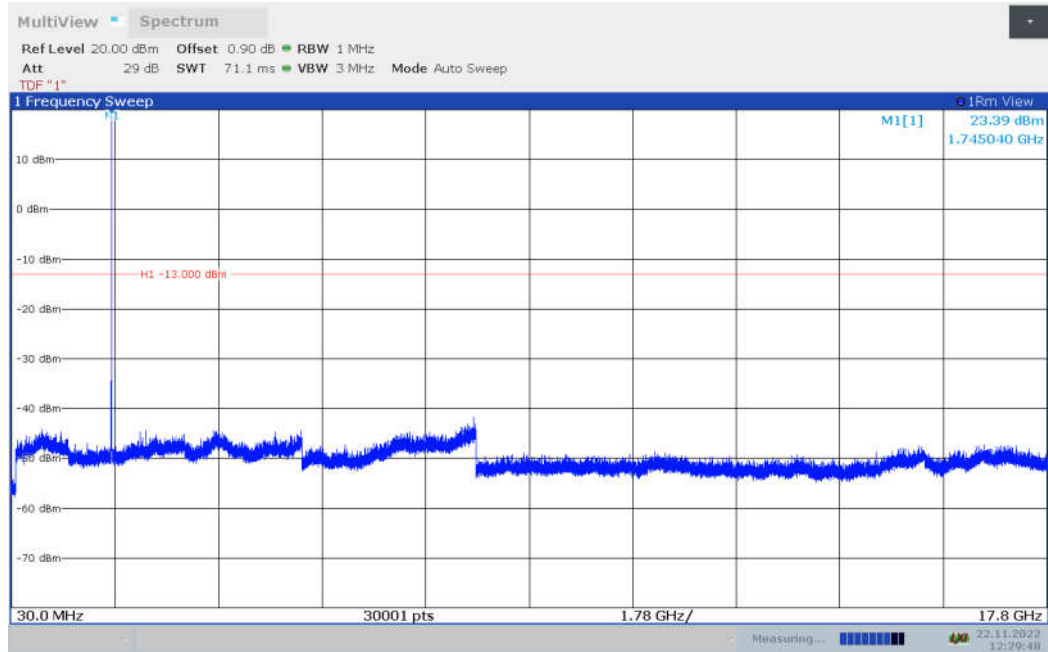
NOTE: peak above the limit line is the carrier frequency.

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 ≥ 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 2

Frequency(MHz)	Bandwidth(MHz)	PAPR(dB)	
		QPSK	16QAM
1880.0	20	5.28	6.12

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

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

	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	21.25 dBm	28.77 dBm	7.52 dB	2.90 dB	4.92 dB	6.12 dB	6.94 dB

LTE band 4

Frequency(MHz)	Bandwidth(MHz)	PAPR(dB)	
		QPSK	16QAM
1732.5	20	5.64	6.34

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

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

LTE band 5

Frequency(MHz)	Bandwidth(MHz)	PAPR(dB)	
		QPSK	16QAM
826.5	10	6.02	6.76

LTE band 5, 10MHz Bandwidth, QPSK (PAPR)
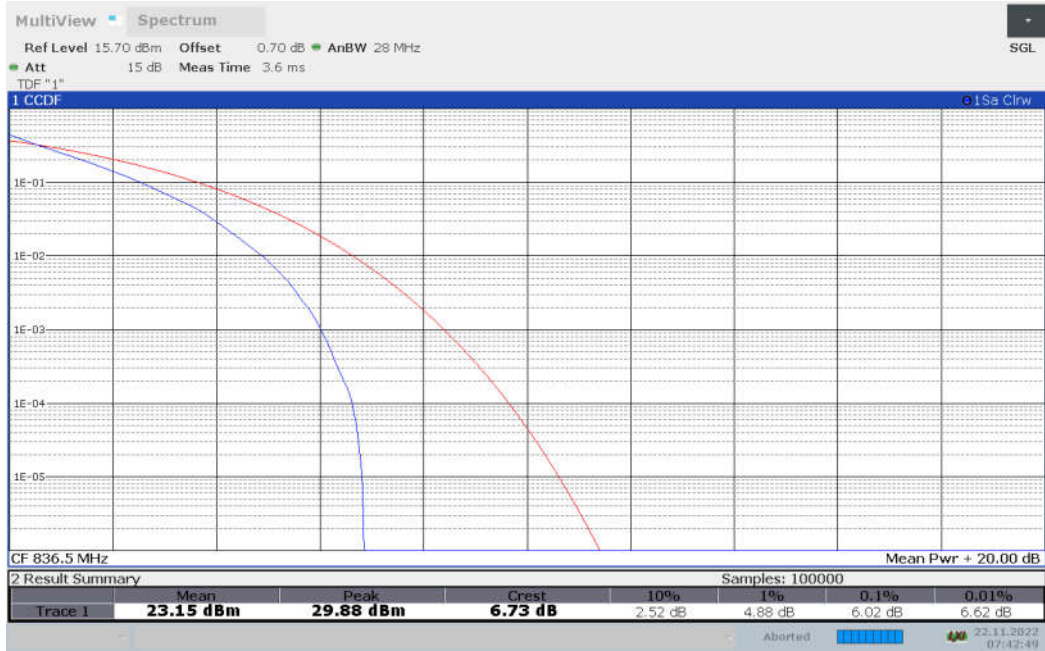
LTE band 5, 10MHz Bandwidth, 16QAM (PAPR)
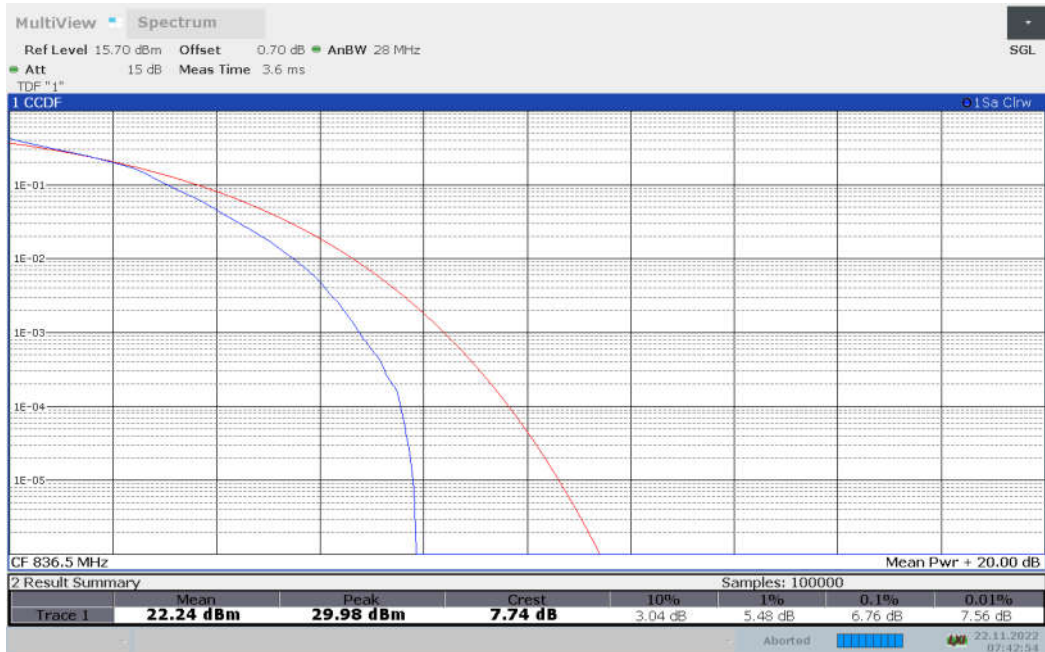
LTE band 7

Frequency(MHz)	Bandwidth(MHz)	PAPR(dB)	
		QPSK	16QAM
2535.0	20	5.48	6.26

LTE band 7, 20MHz Bandwidth, QPSK (PAPR)
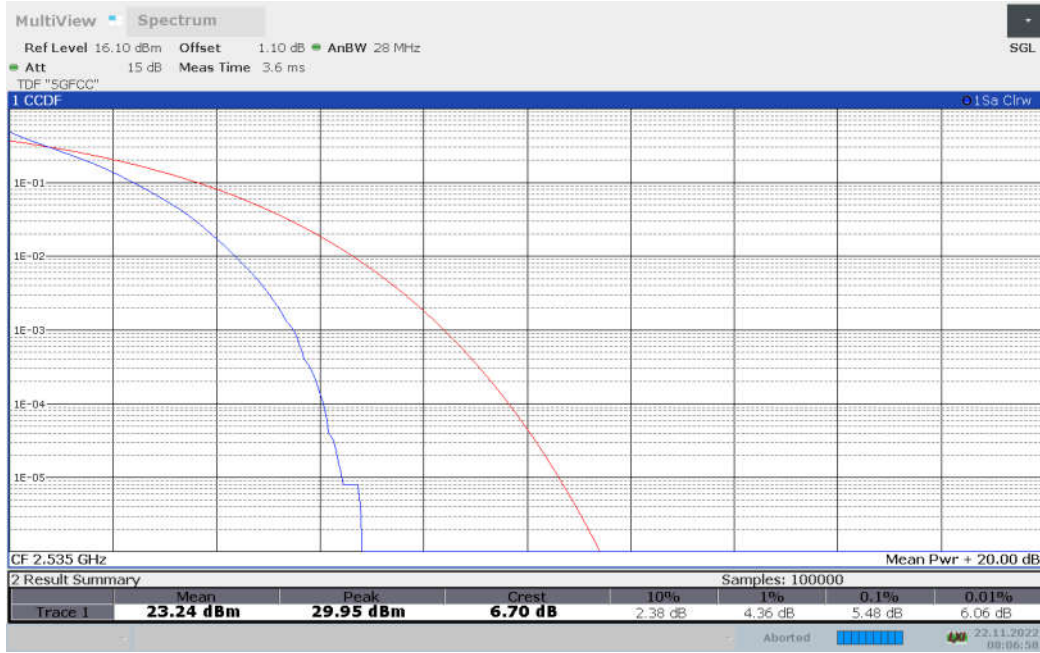
LTE band 7, 20MHz Bandwidth, 16QAM (PAPR)
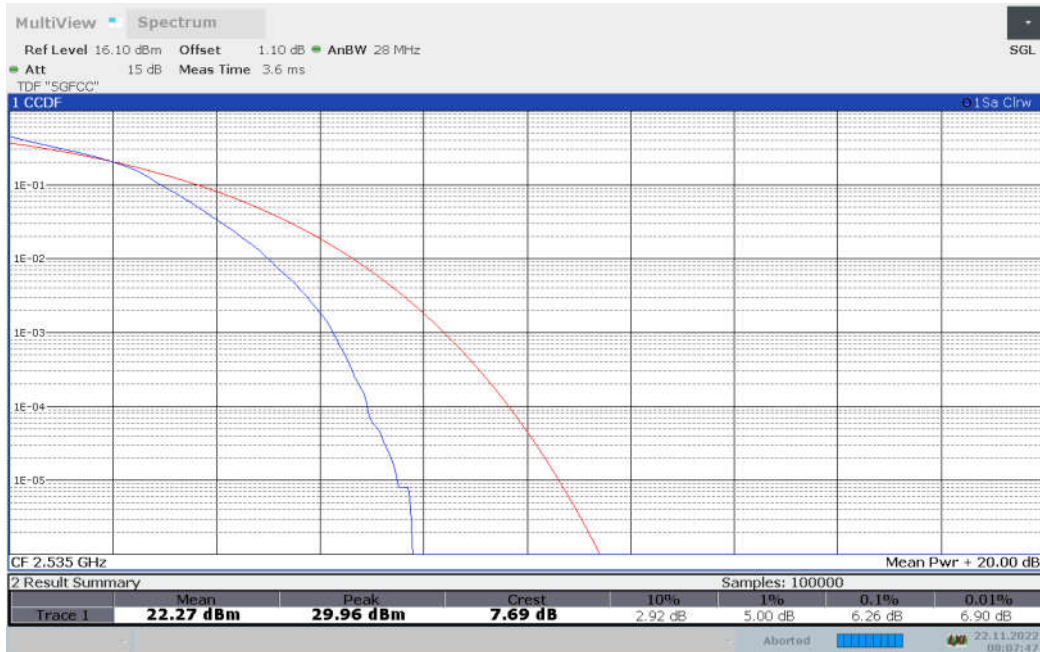
LTE band 13

Frequency(MHz)	Bandwidth(MHz)	PAPR(dB)	
		QPSK	16QAM
782.0	10	5.52	6.36

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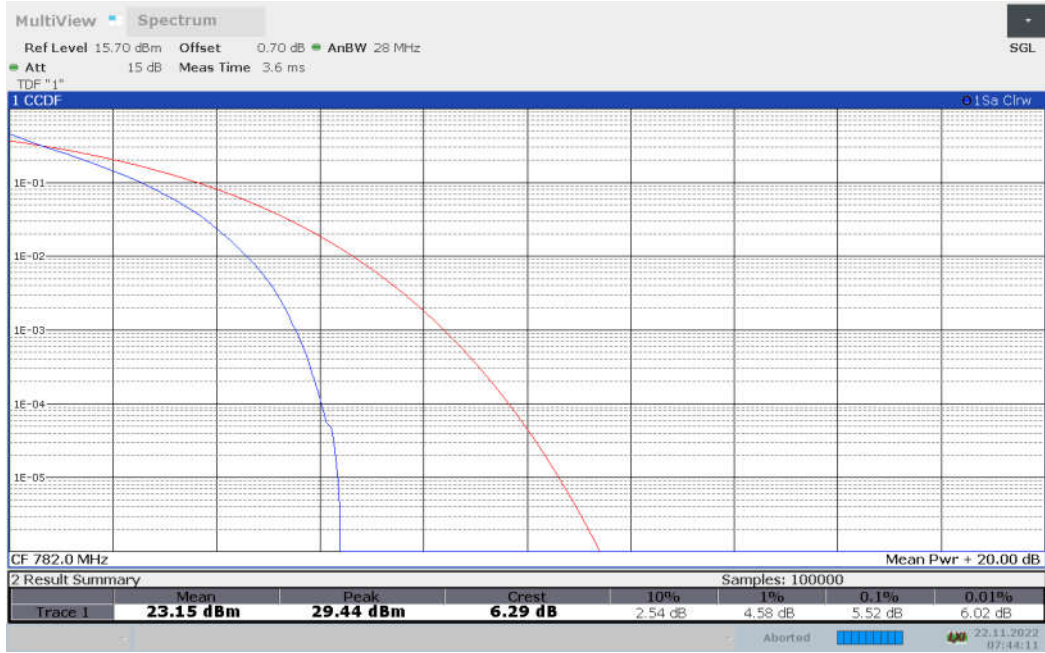
LTE band 13, 10MHz Bandwidth, 16QAM (PAPR)

LTE band 38

Frequency(MHz)	Bandwidth(MHz)	PAPR(dB)	
		QPSK	16QAM
2595.0	20	7.78	8.48

LTE band 38, 20MHz Bandwidth, QPSK (PAPR)
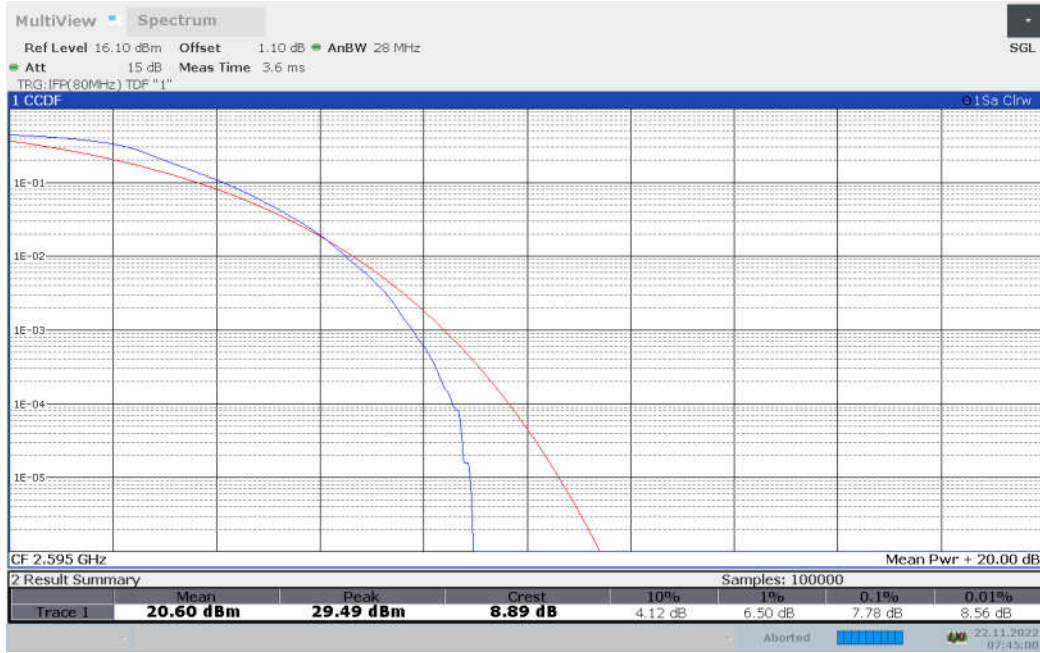
LTE band 38, 20MHz Bandwidth, 16QAM (PAPR)
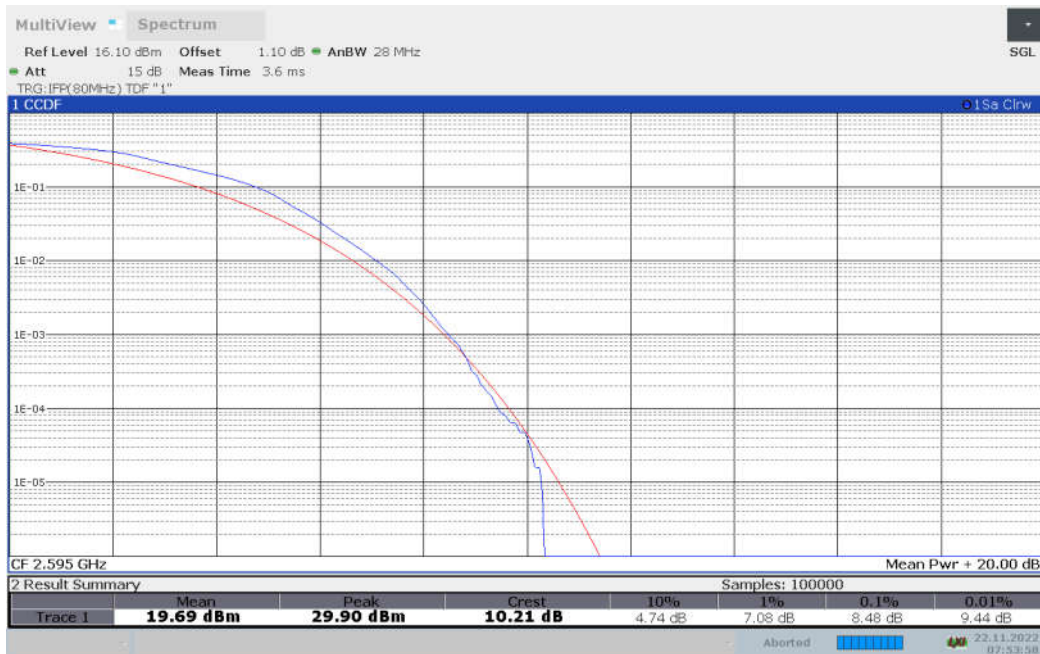
LTE band 41

Frequency(MHz)	Bandwidth(MHz)	PAPR(dB)	
		QPSK	16QAM
2335.0	20	12.76	8.58

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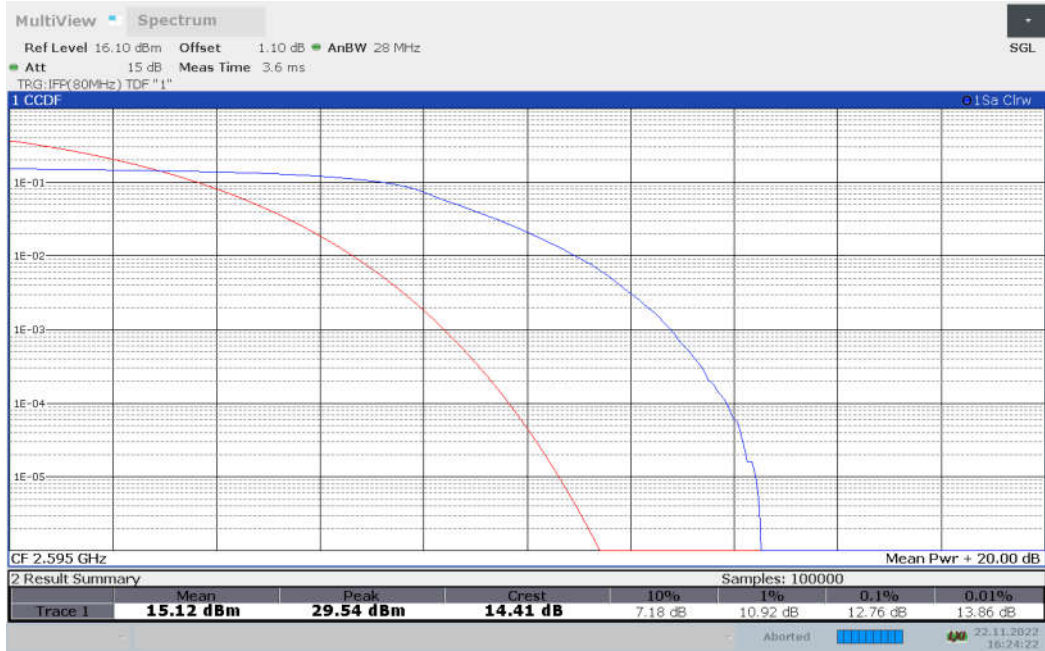
LTE band 41, 20MHz Bandwidth, 16QAM (PAPR)

LTE band 66

Frequency(MHz)	Bandwidth(MHz)	PAPR(dB)	
		QPSK	16QAM
1745.0	20	5.62	6.42

LTE band 66, 20MHz Bandwidth, QPSK (PAPR)
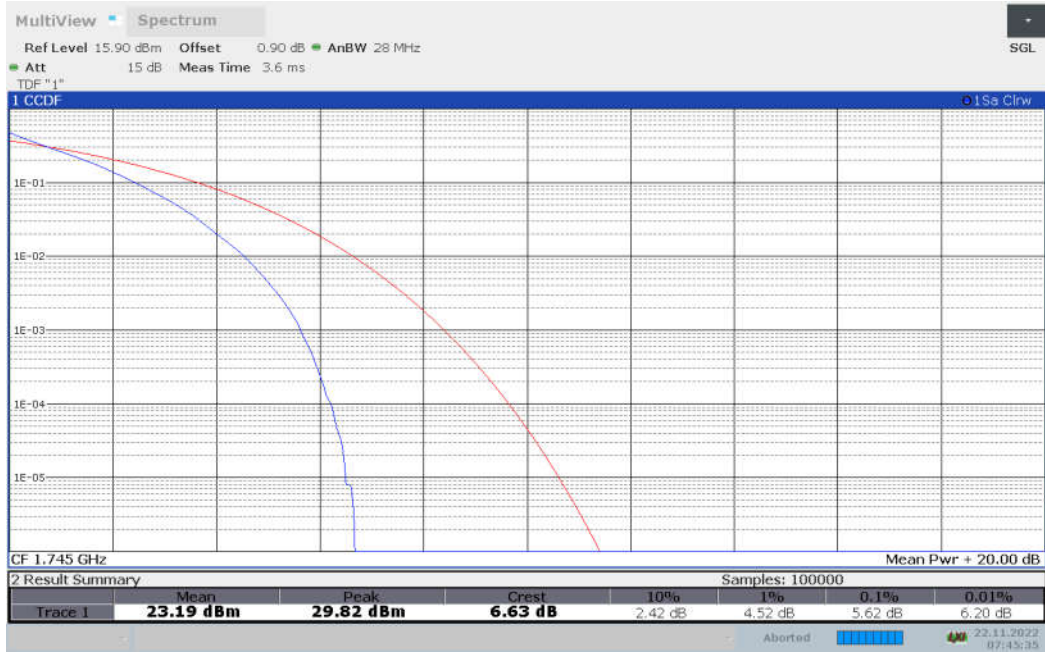
LTE band 66, 20MHz Bandwidth, 16QAM (PAPR)
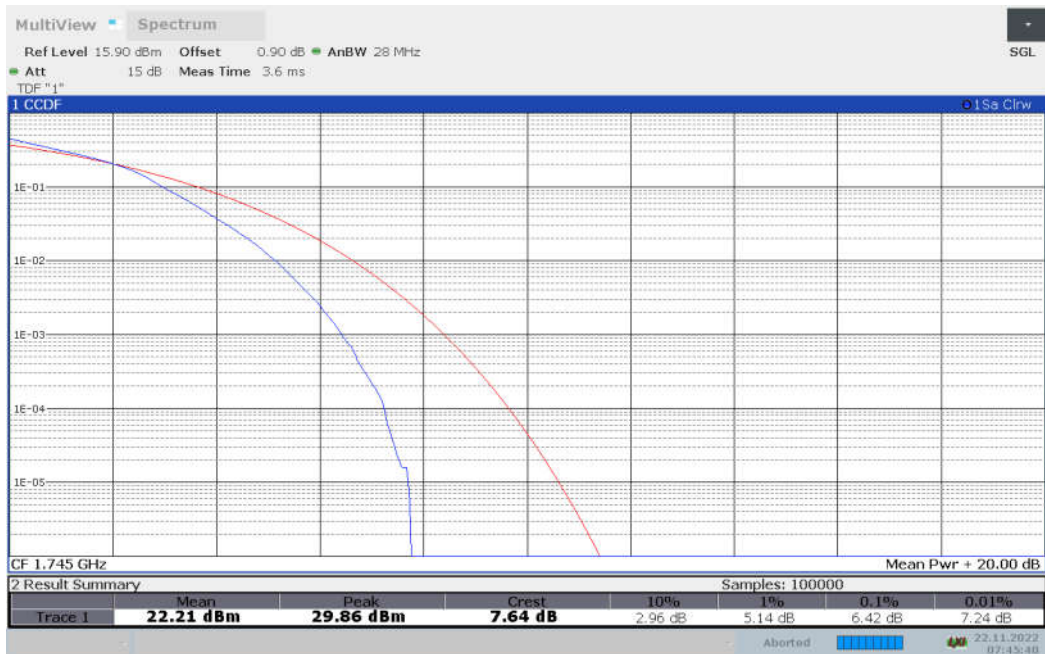
Note: Expanded measurement uncertainty is $U = 0.48$, $k = 2$

END OF REPORT