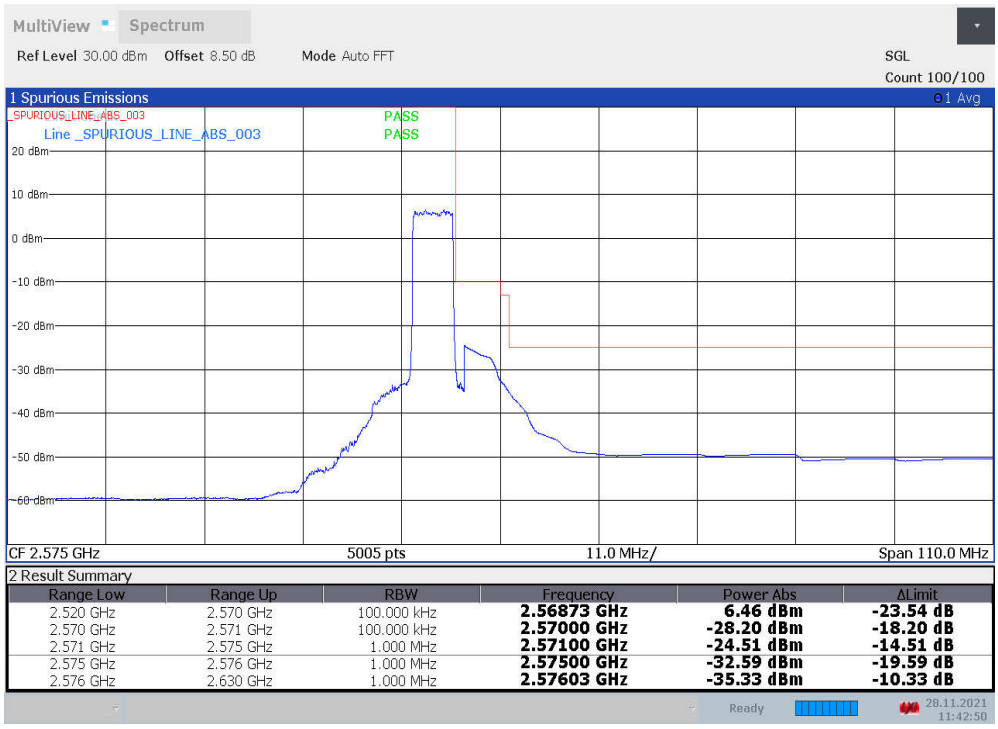
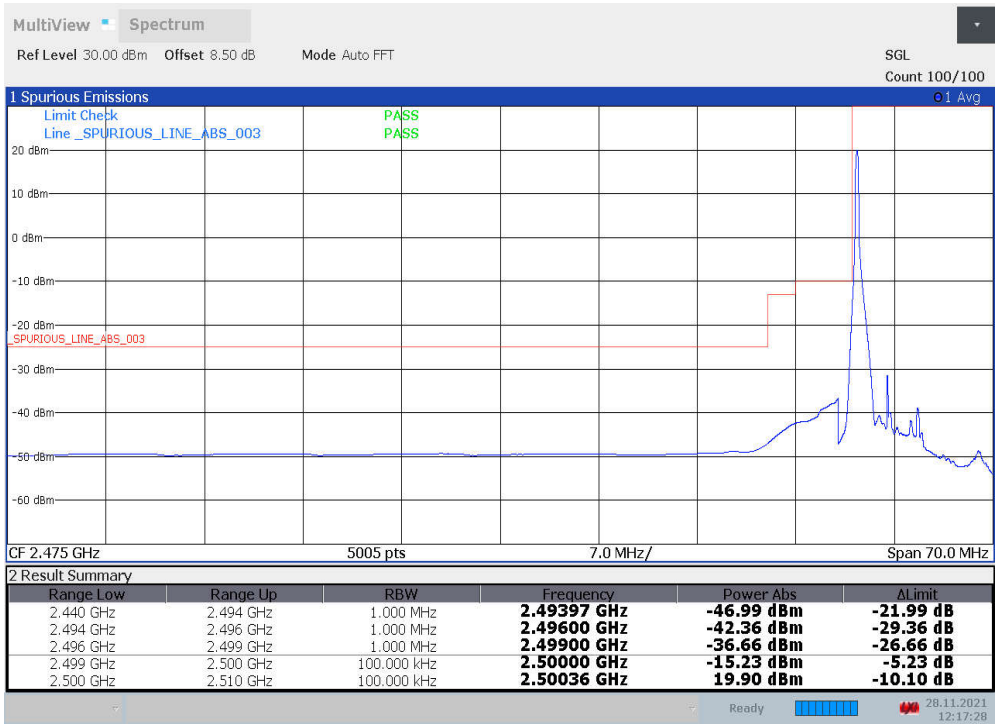
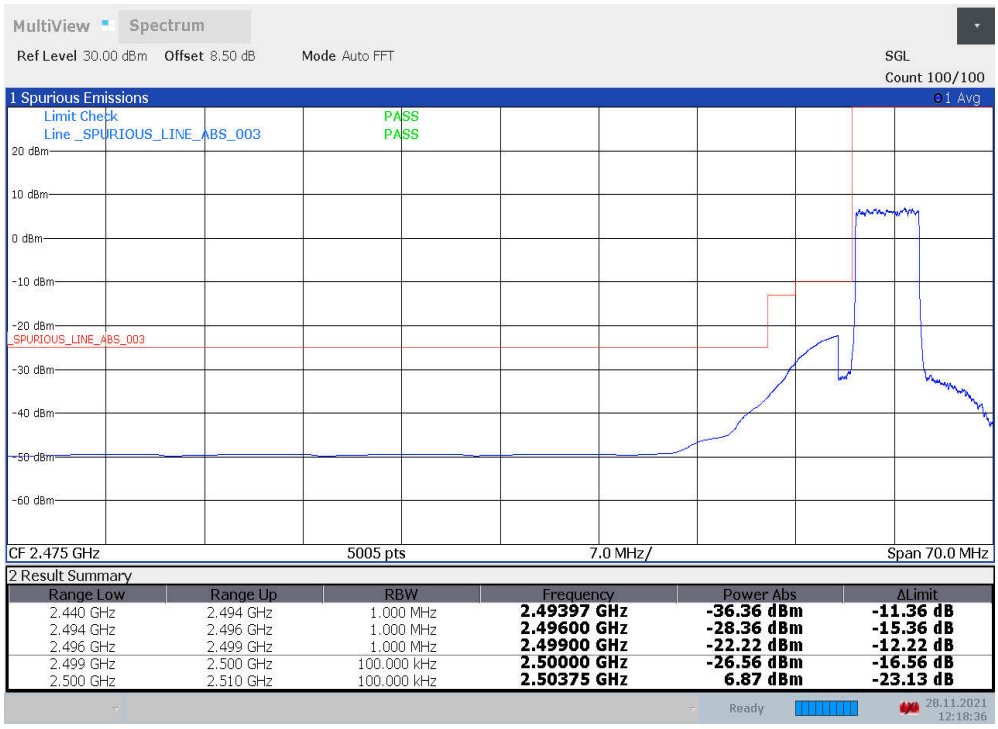


DC_66A_n7A

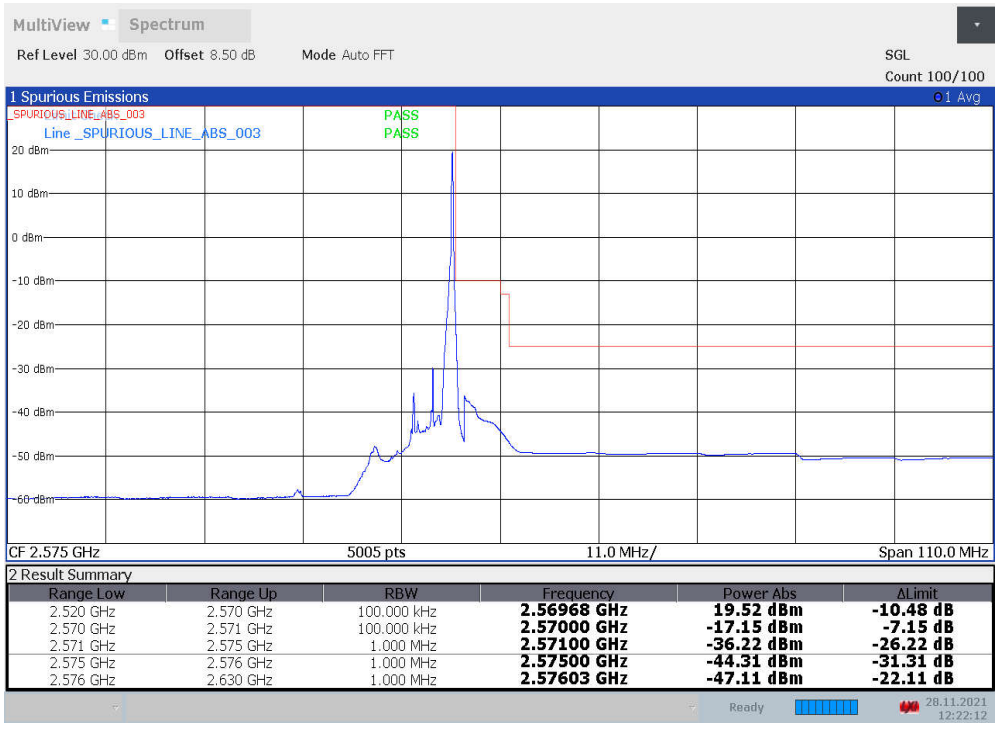
DC_66A_n7A (NR 5M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low



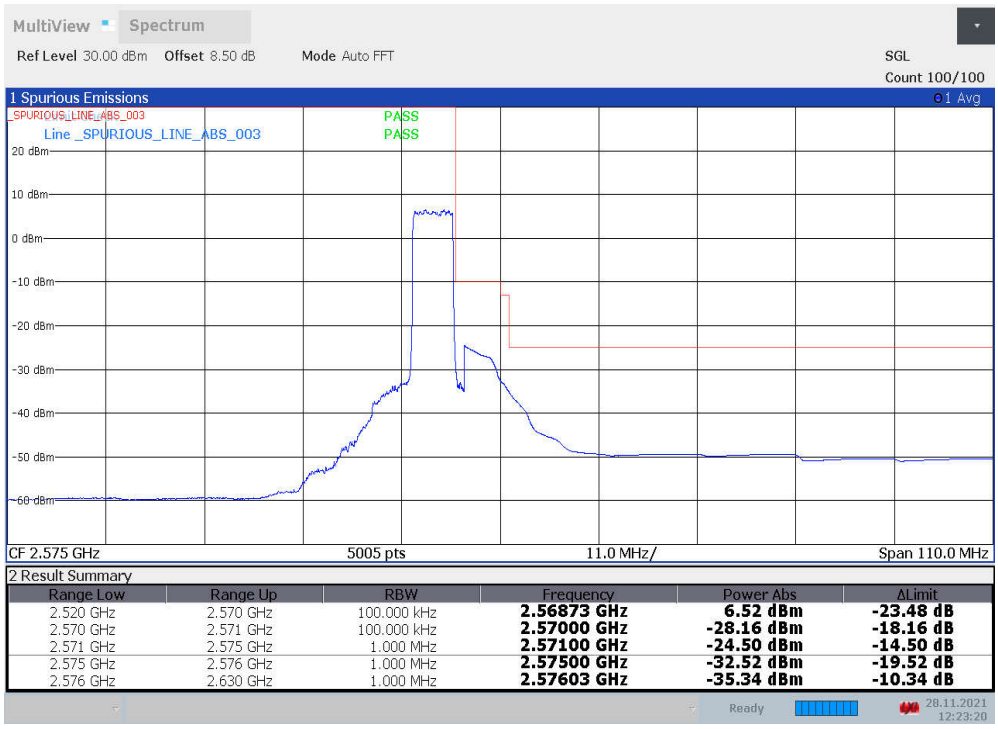
DC_66A_n7A (NR 5M)_DFT-s-OFDM_QPSK_Outer_Full_Low



DC_66A_n7A (NR 5M)_DFT-s-OFDM_QPSK_Edge_1RB_Right_High

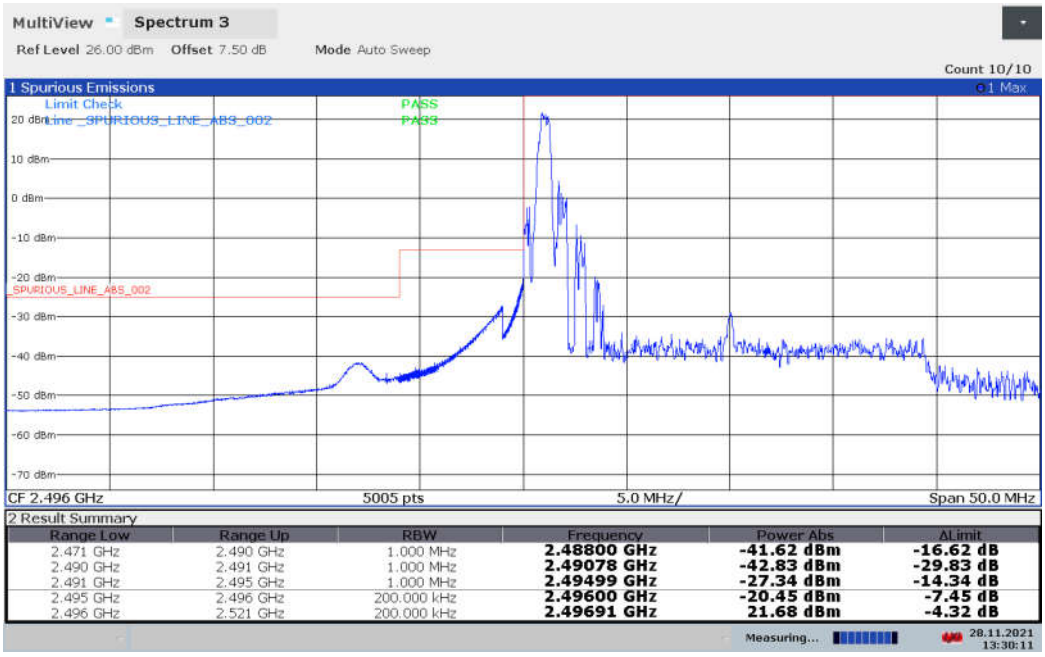


DC_66A_n7A (NR 5M)_DFT-s-OFDM_QPSK_Outer_Full_High

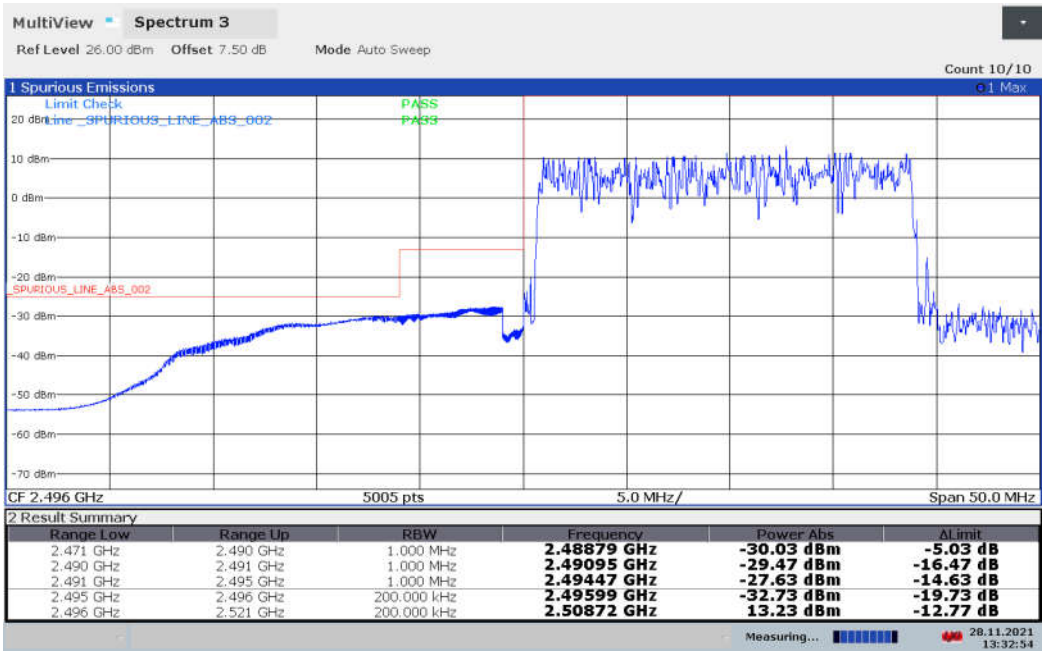


DC_26A_n41A

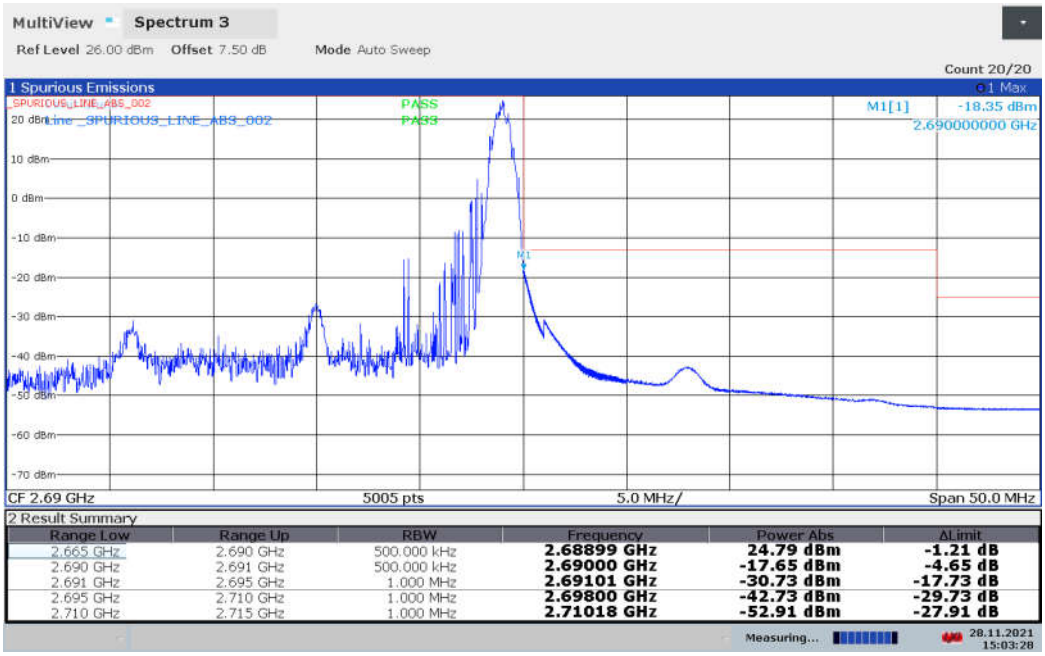
DC_26A_n41A (NR 20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low



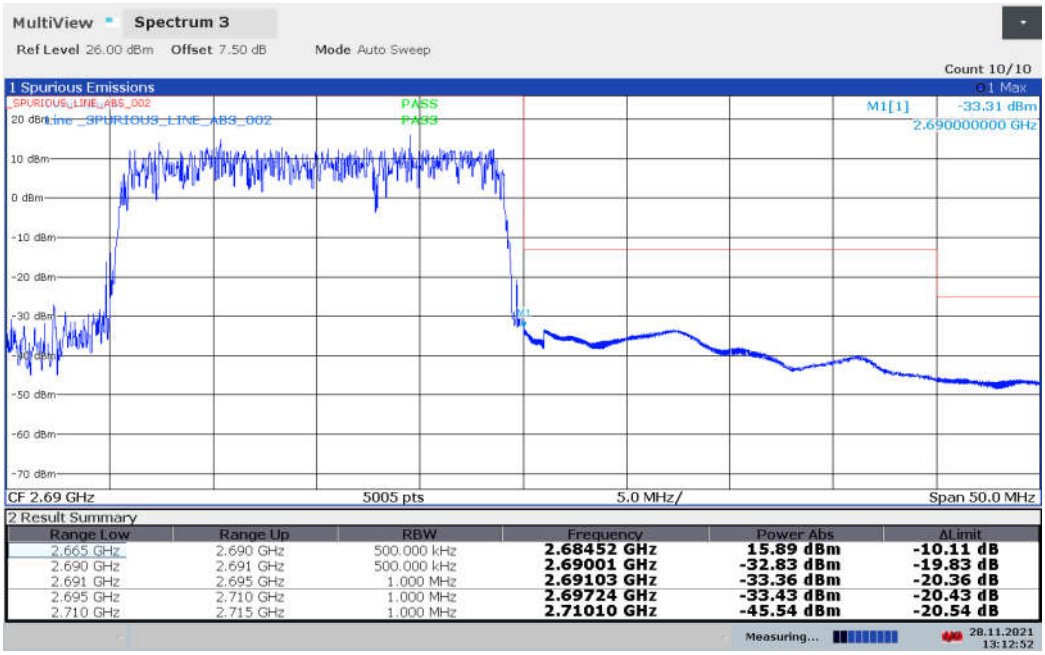
DC_26A_n41A (NR 20M)_DFT-s-OFDM_QPSK_Outer_Full_Low



DC_26A_n41A (NR 20M)_DFT-s-OFDM_QPSK_Edge_1RB_Right_High



DC_26A_n41A (NR 20M)_DFT-s-OFDM_QPSK_Outer_Full_High



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, 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 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

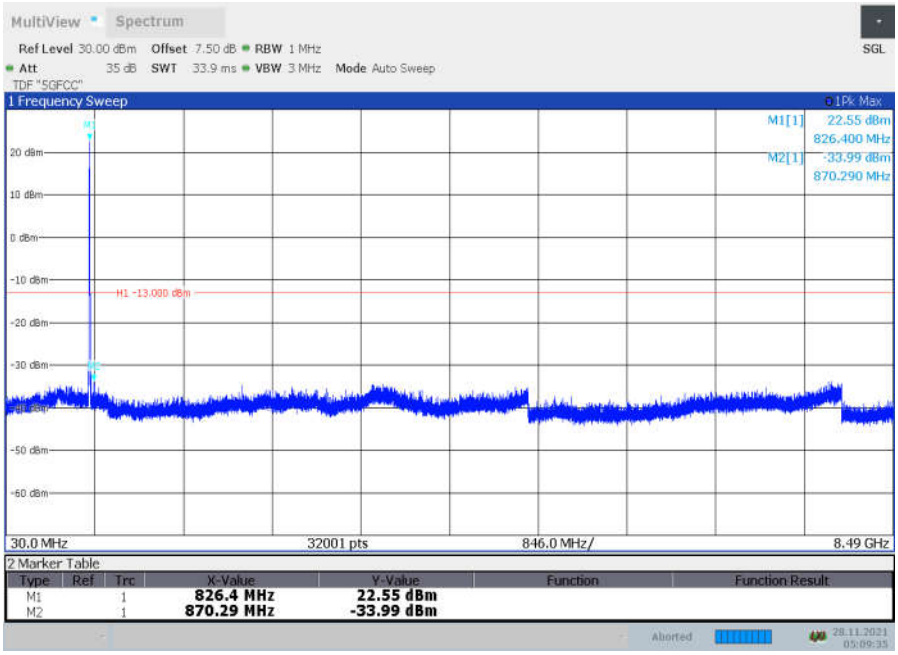
SA

n5 : 30MHz –8.49GHz

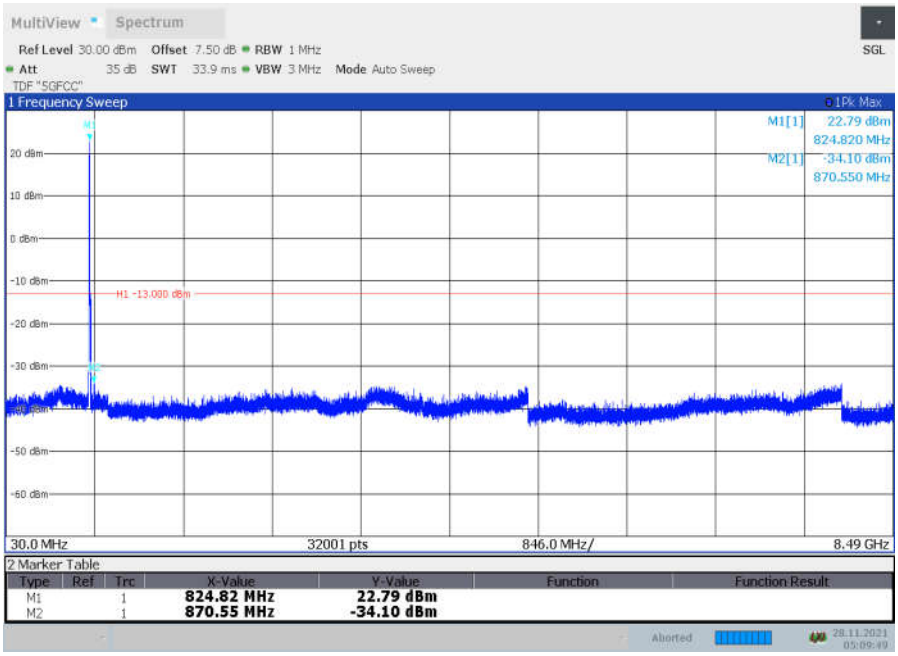
Spurious emission limit –13dBm.

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

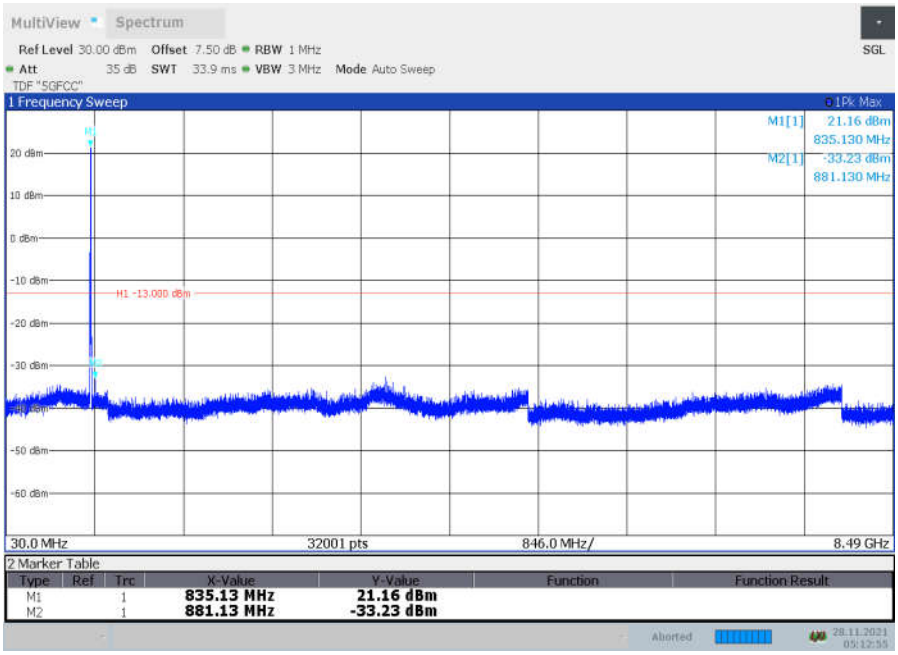
n5(5M)_DFT-s-OFDM_BPSK_Low_CH



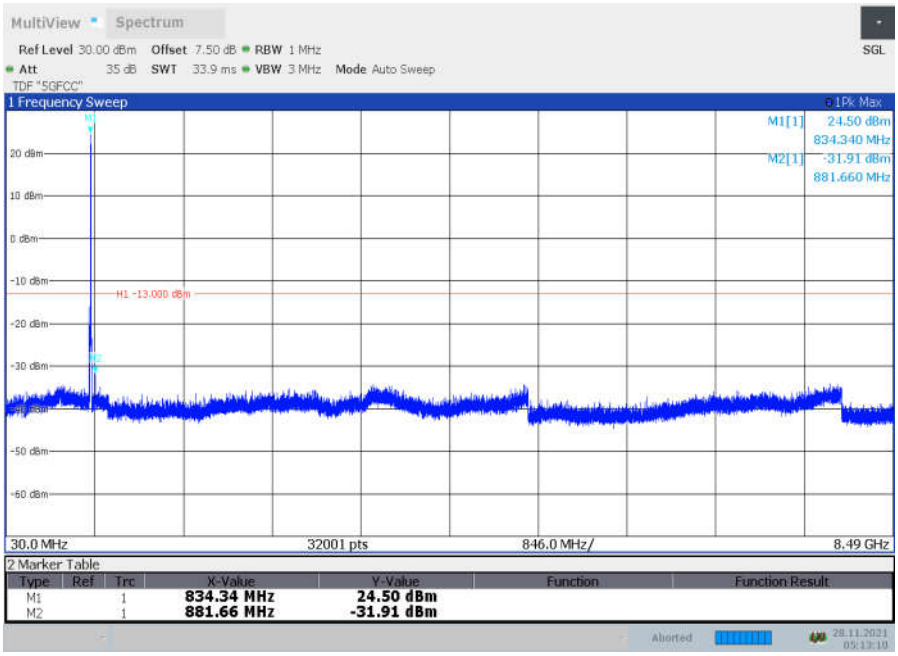
n5(5M)_DFT-s-OFDM_QPSK _Low_CH



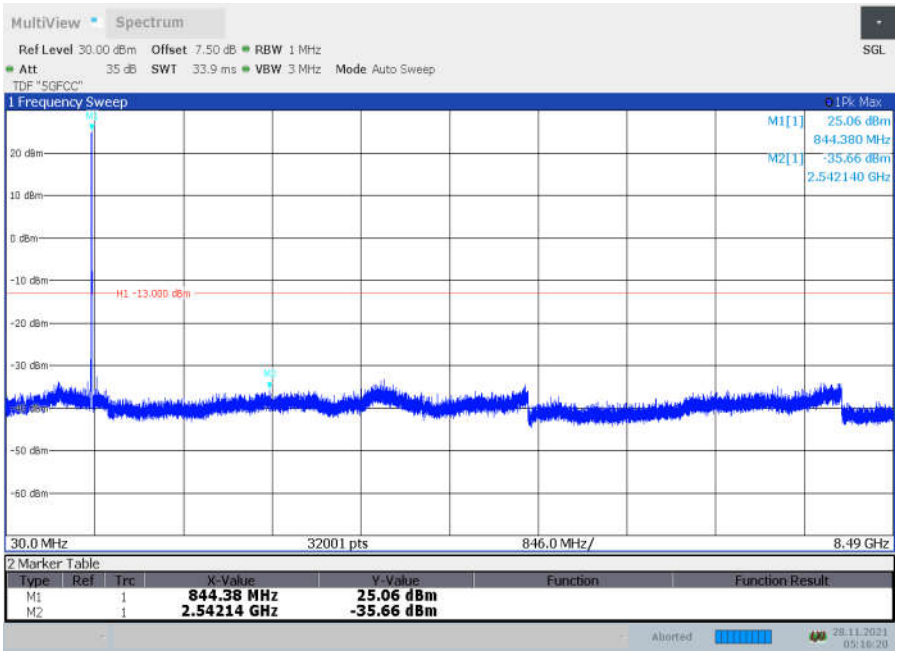
n5(5M)_DFT-s-OFDM_BPSK_Mid_CH



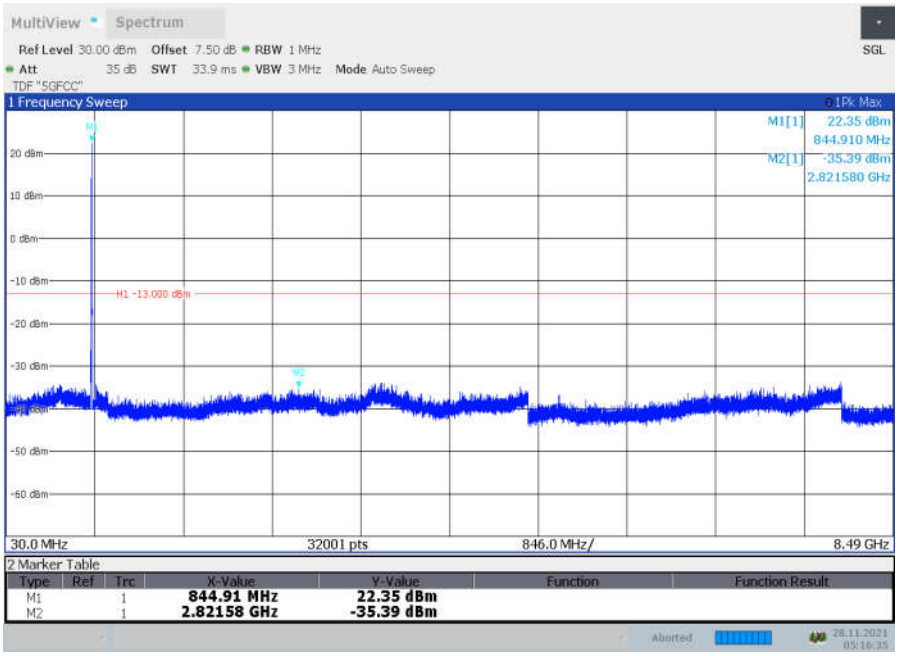
n5(5M)_DFT-s-OFDM_QPSK_Mid_CH



n5(5M)_DFT-s-OFDM_BPSK _High_CH



n5(5M)_DFT-s-OFDM_QPSK _High_CH

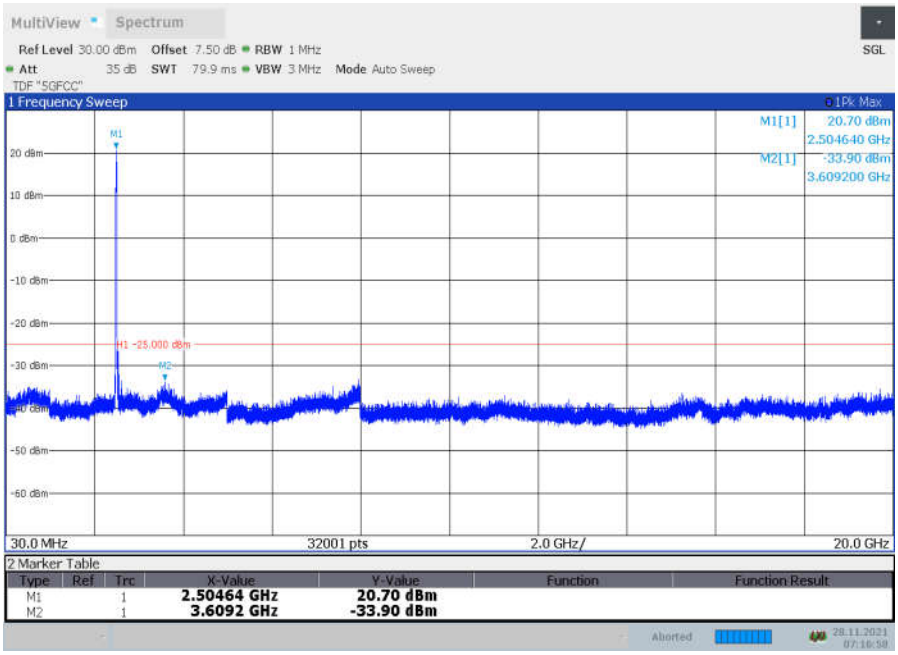


n7 : 30MHz –25.7GHz

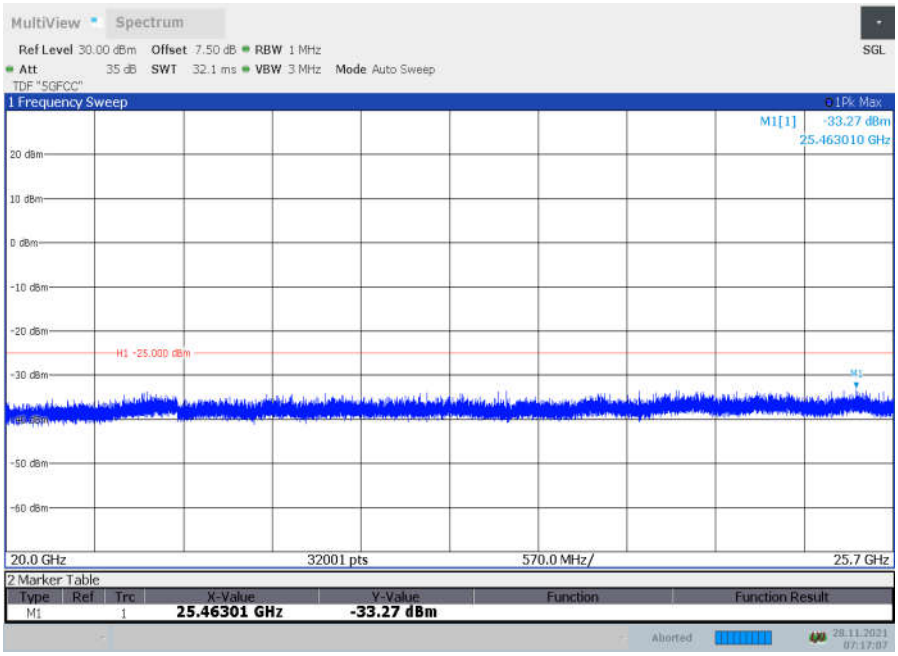
Spurious emission limit –25dBm.

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

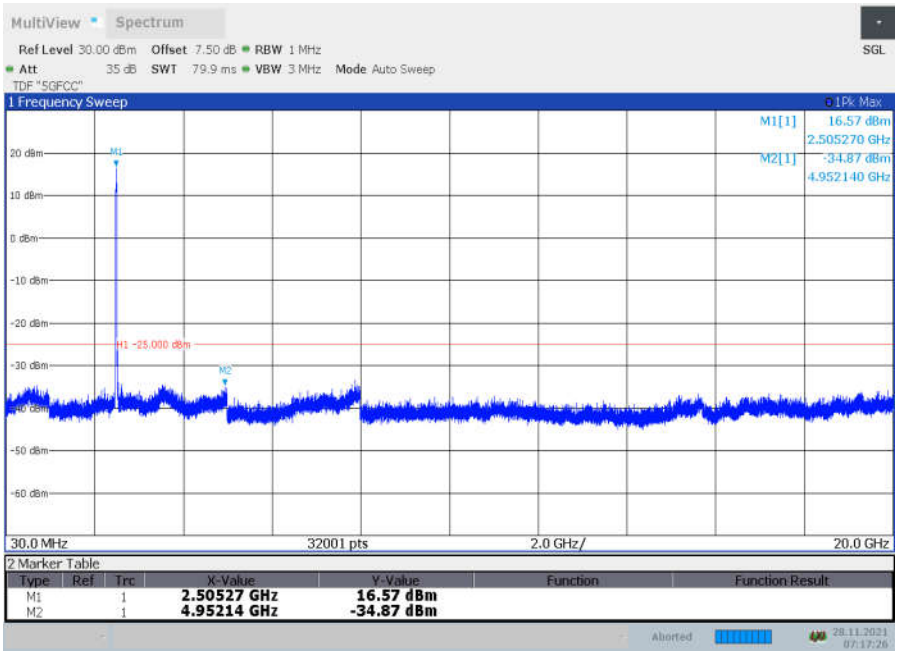
n7(20M)_DFT-s-OFDM_BPSK _Low_CH(30MHz-20GHz)



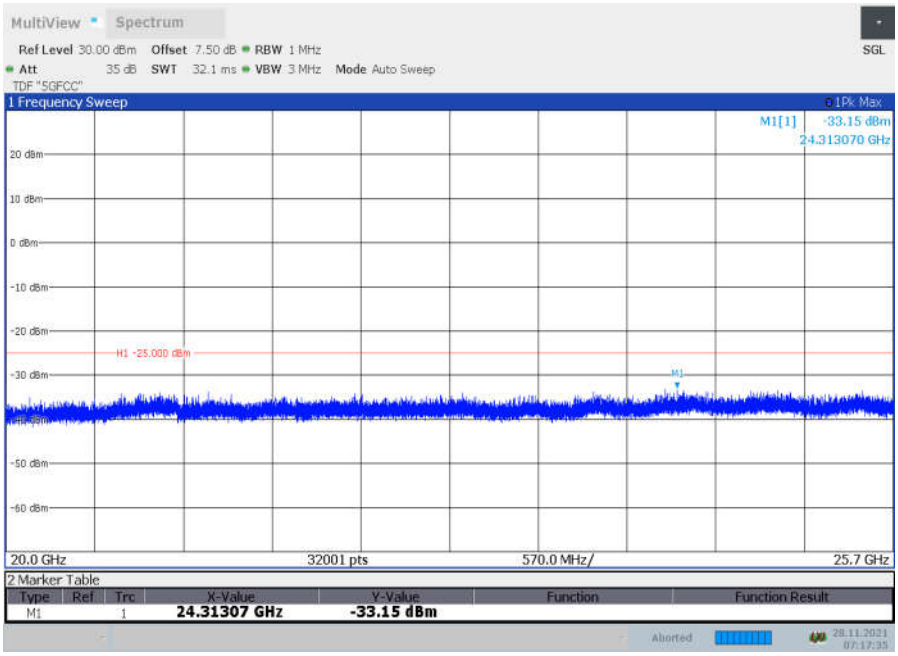
n7(20M)_DFT-s-OFDM_BPSK _Low_CH(20GHz -25.7GHz)



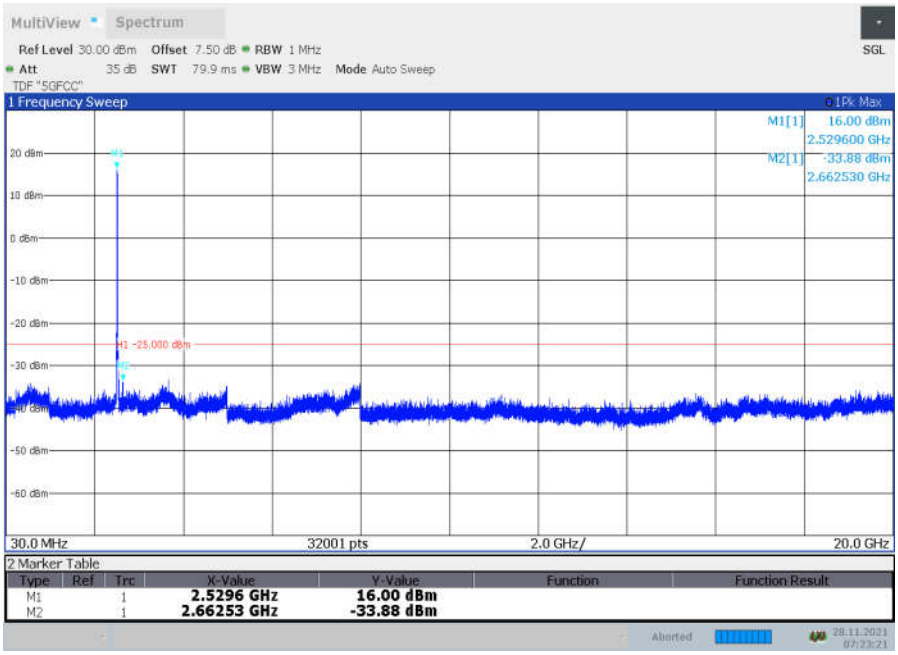
n7(20M)_DFT-s-OFDM_QPSK_ _Low_CH(30MHz-20GHz)



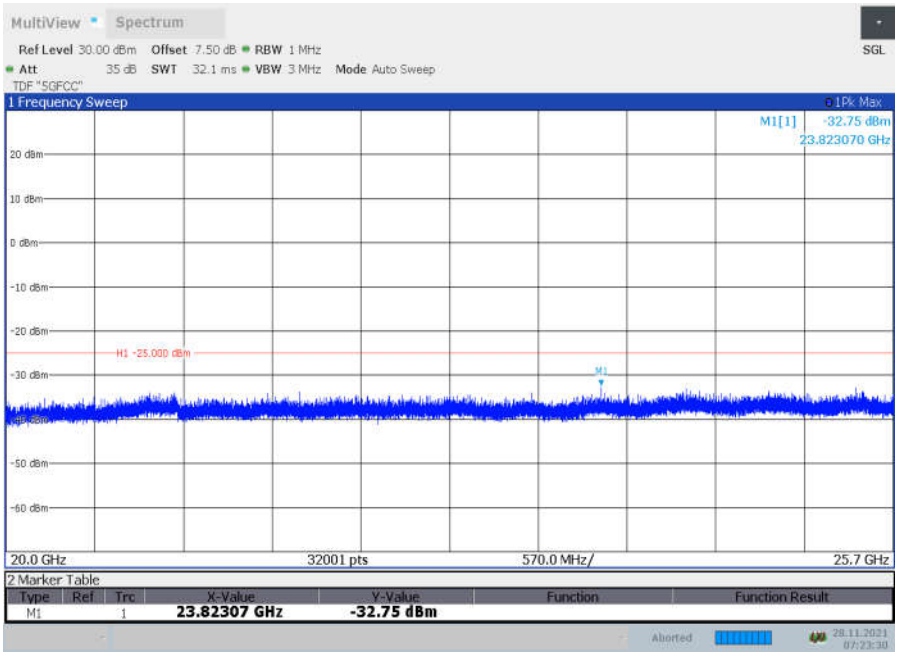
n7(20M)_DFT-s-OFDM_QPSK_ _Low_CH(20GHz -25.7GHz)



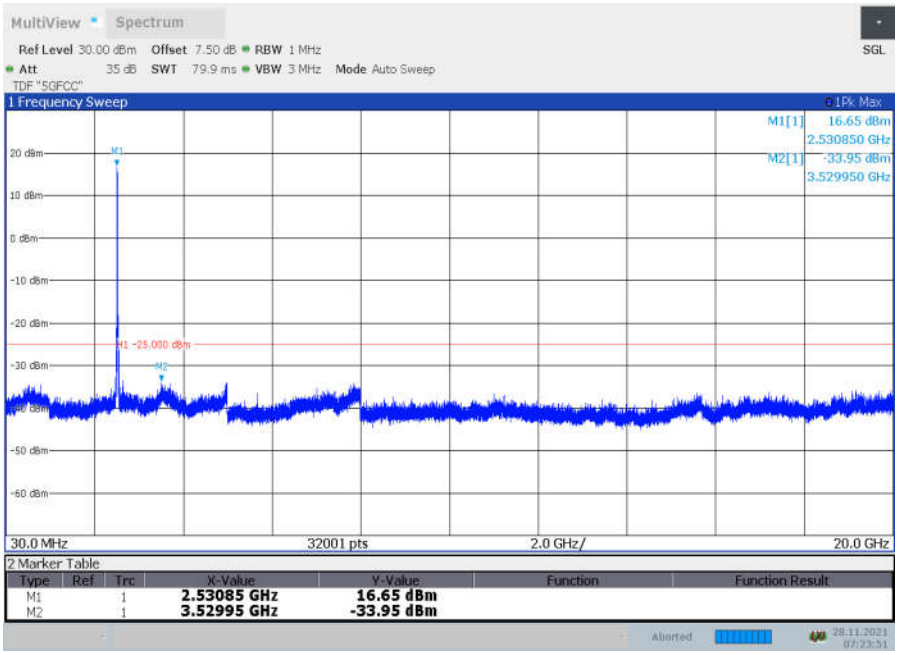
n7(20M)_DFT-s-OFDM_BPSK _Mid_CH(30MHz-20GHz)



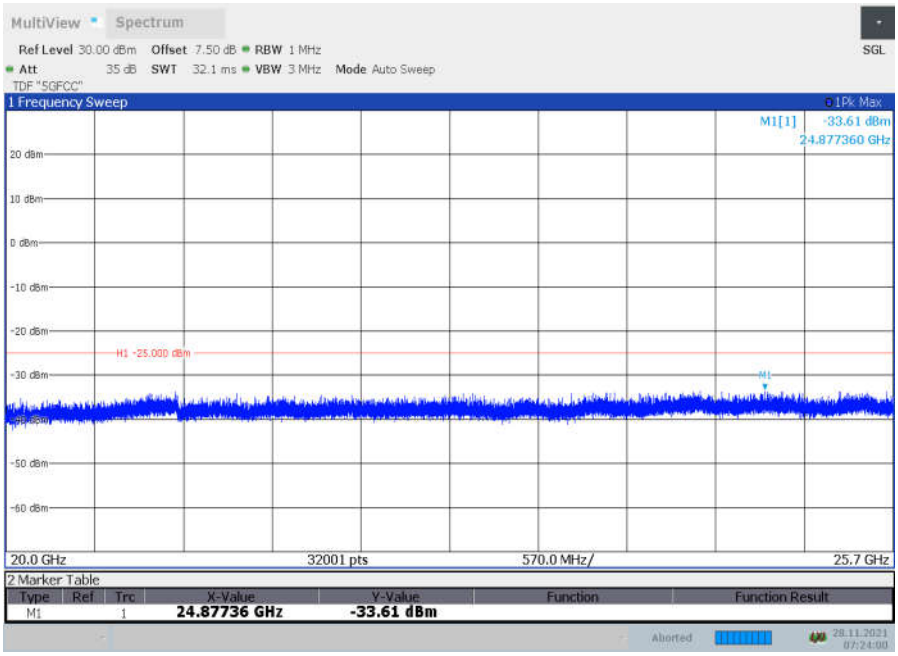
n7(20M)_DFT-s-OFDM_BPSK _ Mid _CH(20GHz -25.7GHz)



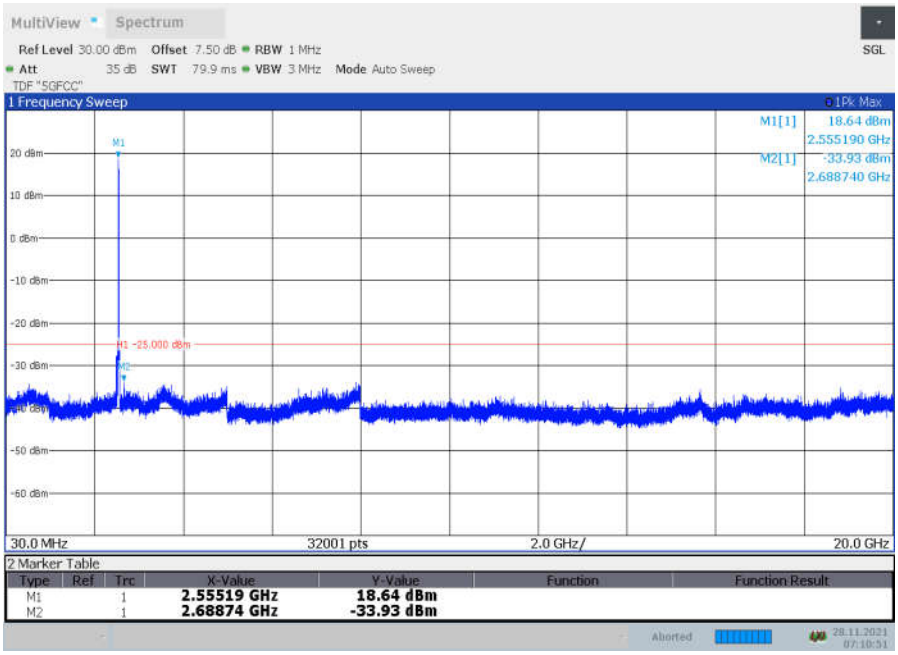
n7(20M)_DFT-s-OFDM_QPSK_ Mid _CH(30MHz-20GHz)



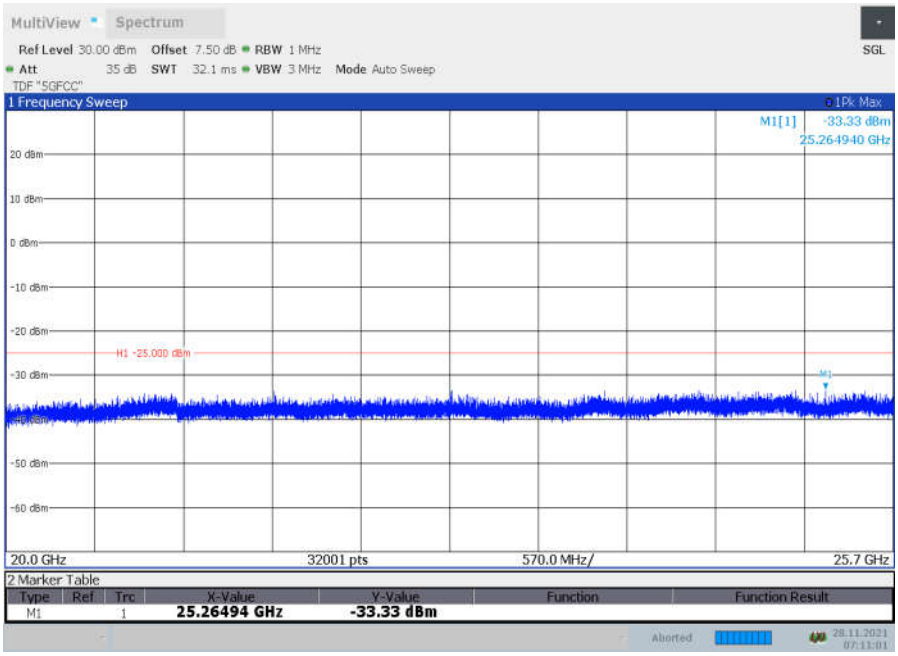
n7(20M)_DFT-s-OFDM_QPSK_ Mid _CH(20GHz -25.7GHz)



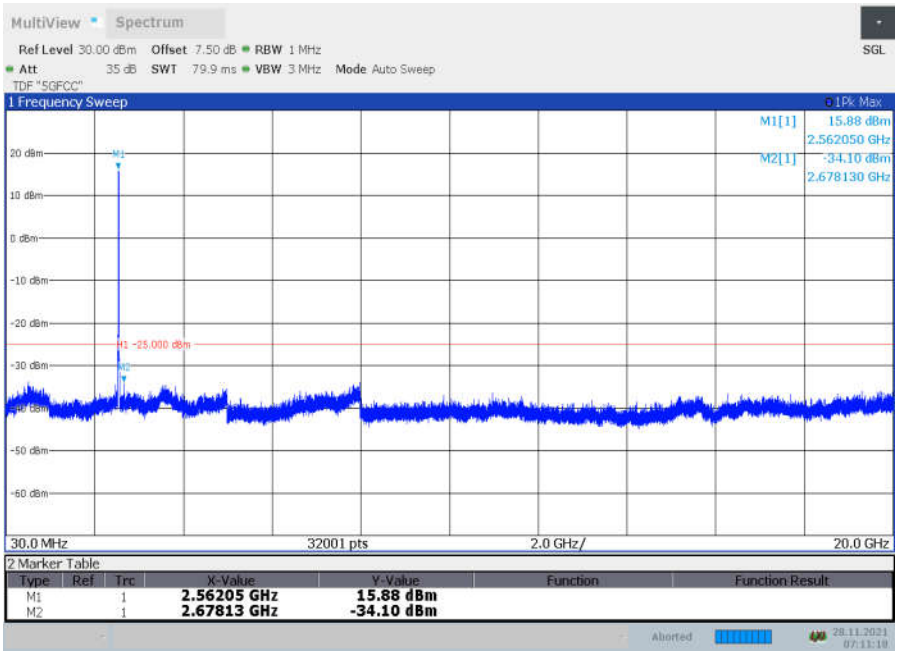
n7(20M)_DFT-s-OFDM_BPSK _High_CH(30MHz-20GHz)



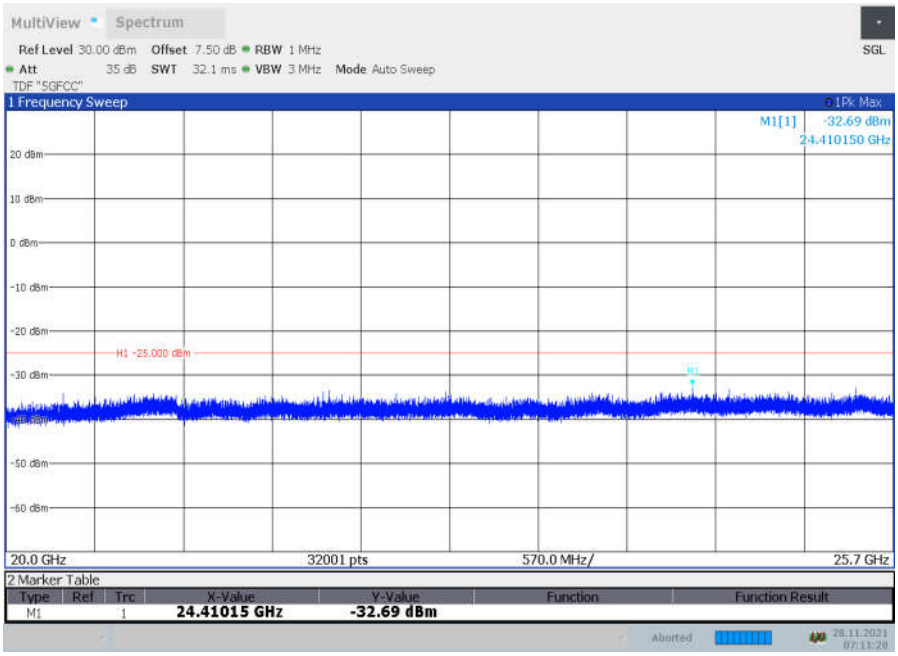
n7(20M)_DFT-s-OFDM_BPSK _ High _CH(20GHz -25.7GHz)



n7(20M)_DFT-s-OFDM_QPSK_ High _CH(30MHz-20GHz)



n7(20M)_DFT-s-OFDM_QPSK_ High _CH(20GHz -25.7GHz)

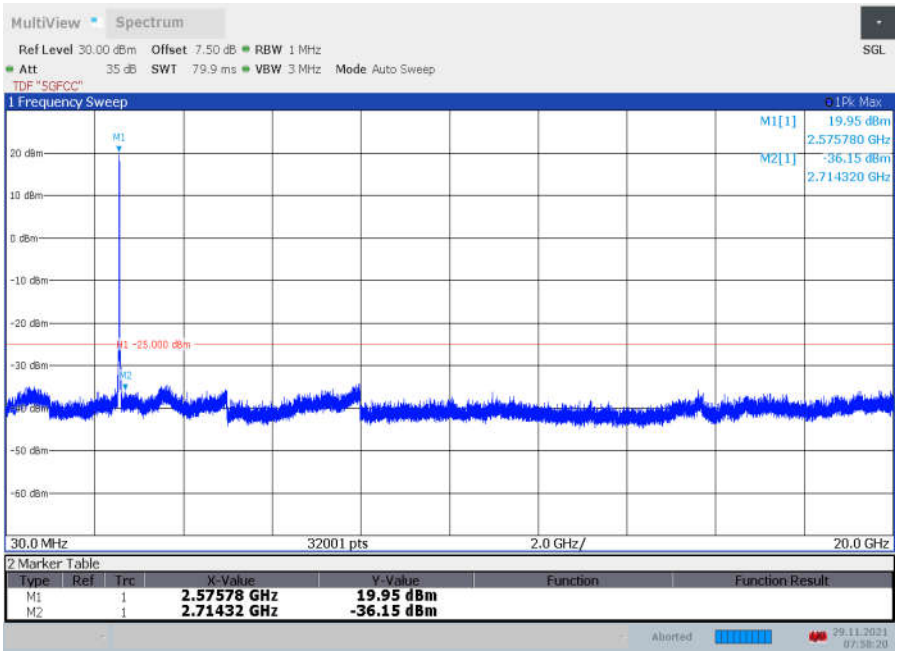


n38 : 30MHz –26.2GHz

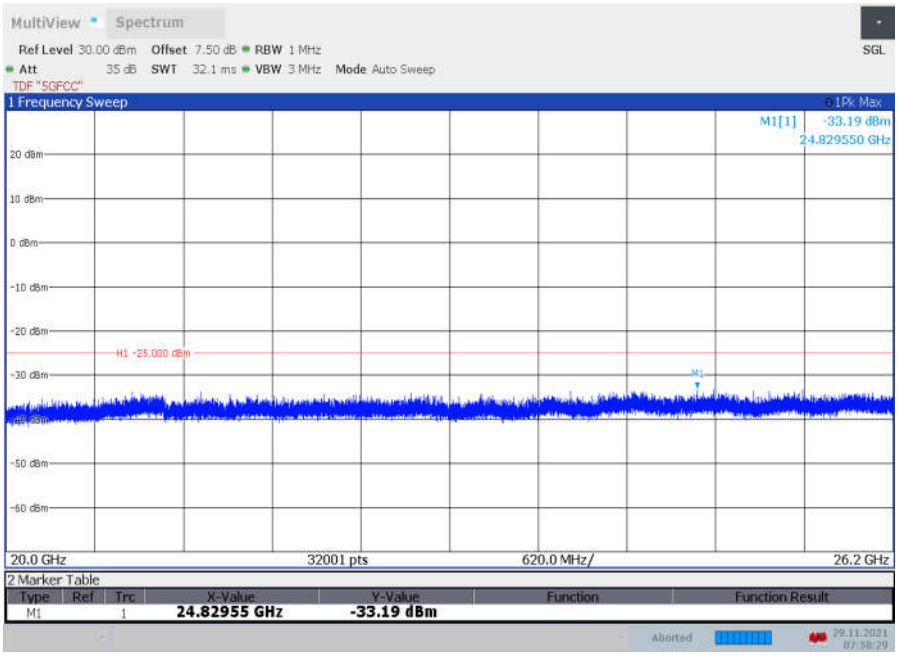
Spurious emission limit –25dBm.

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

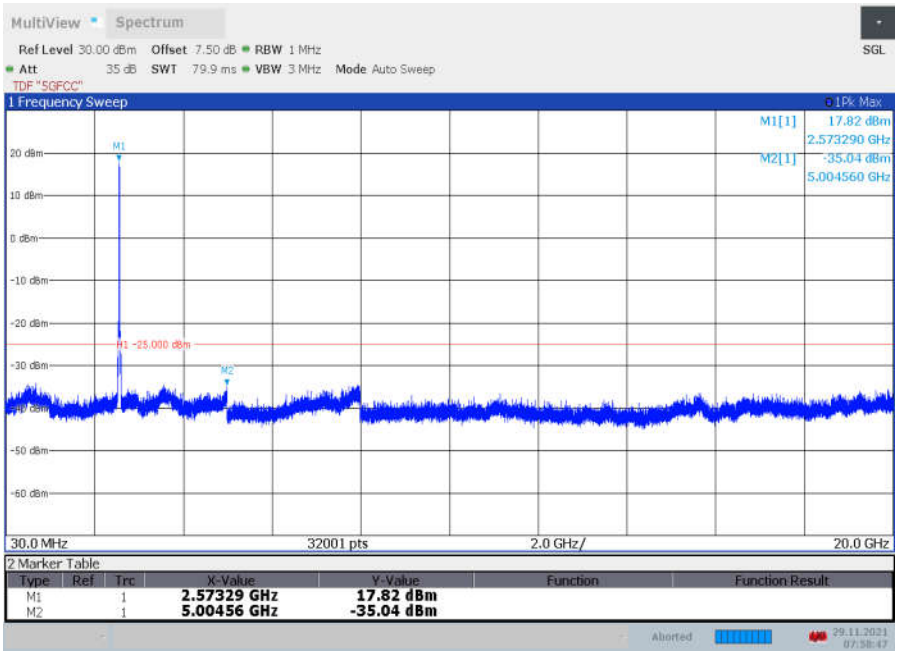
n38(20M)_DFT-s-OFDM_BPSK _Low_CH(30MHz-20GHz)



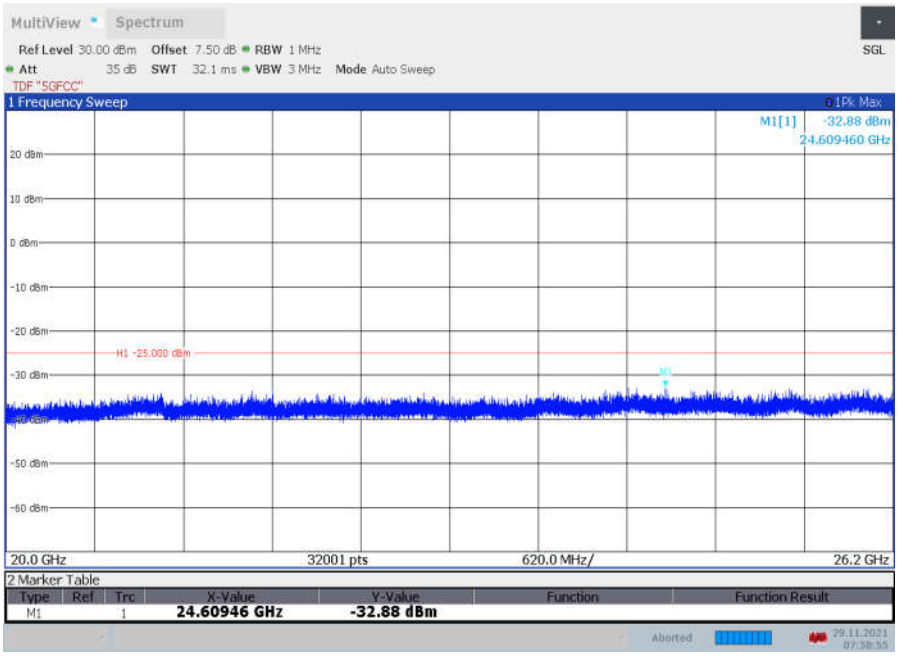
n38 (20M)_DFT-s-OFDM_BPSK _Low_CH(20GHz -26.2GHz)



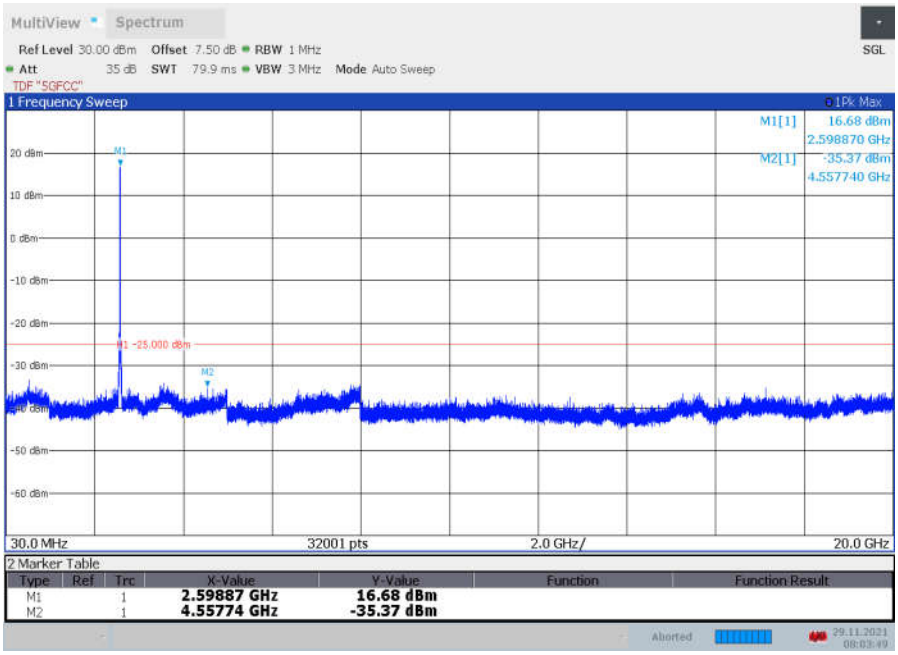
n38 (20M)_DFT-s-OFDM_QPSK_ _Low_CH(30MHz-20GHz)



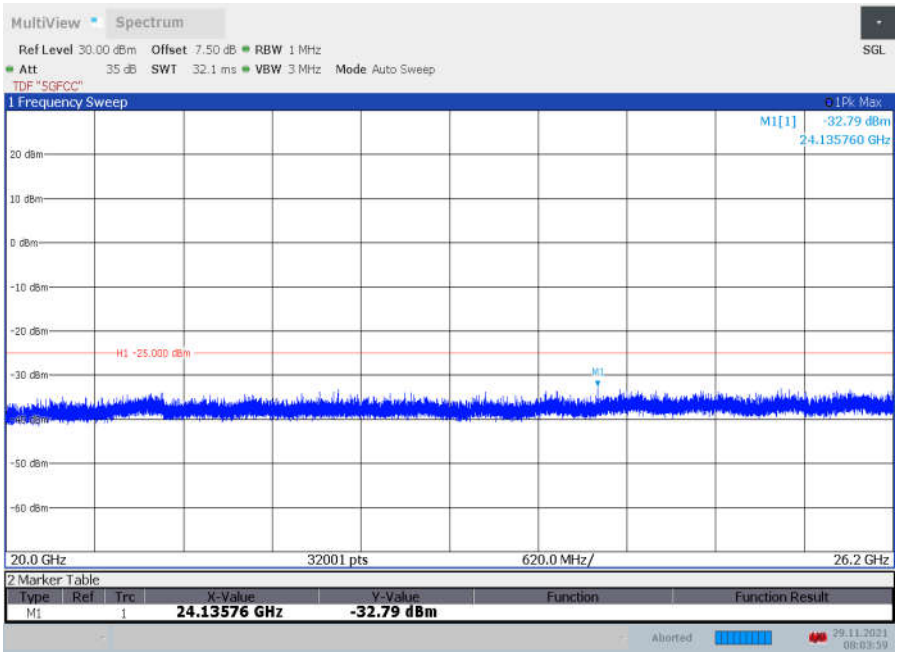
n38 (20M)_DFT-s-OFDM_QPSK_ _Low_CH(20GHz -26.2GHz)



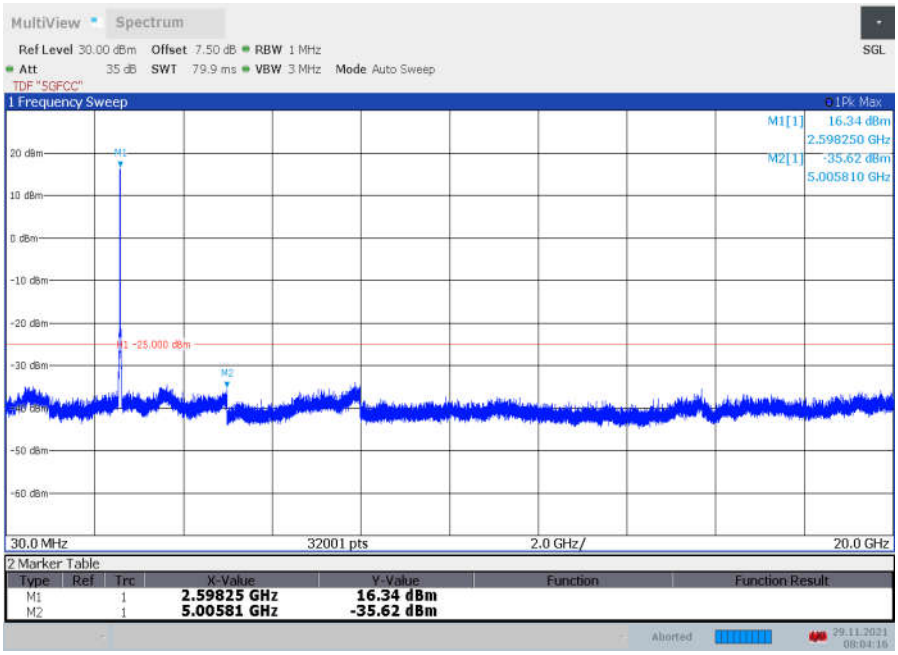
n38 (20M)_DFT-s-OFDM_BPSK _Mid_CH(30MHz-20GHz)



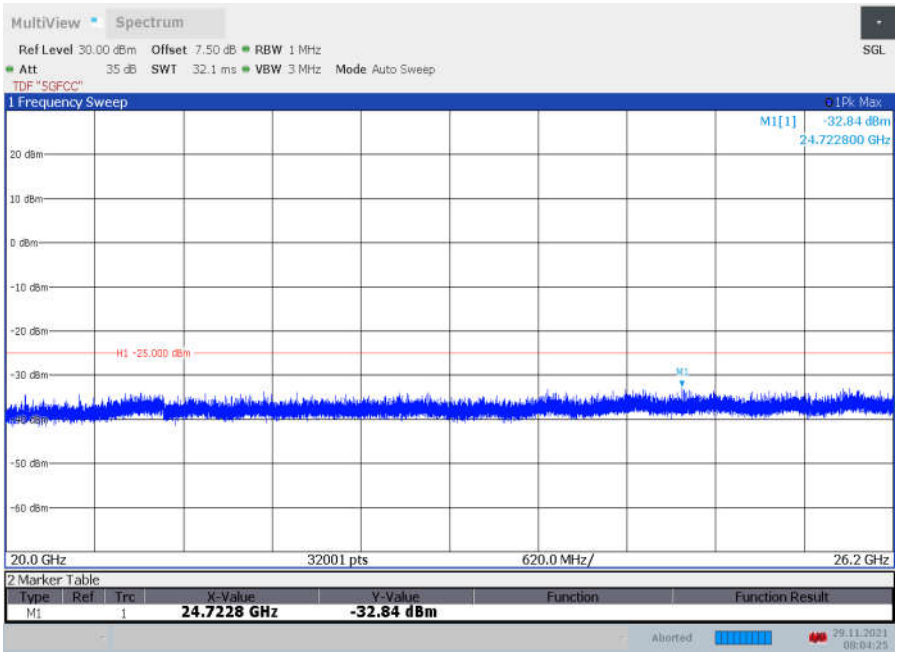
n38 (20M)_DFT-s-OFDM_BPSK _ Mid _CH(20GHz -26.2GHz)



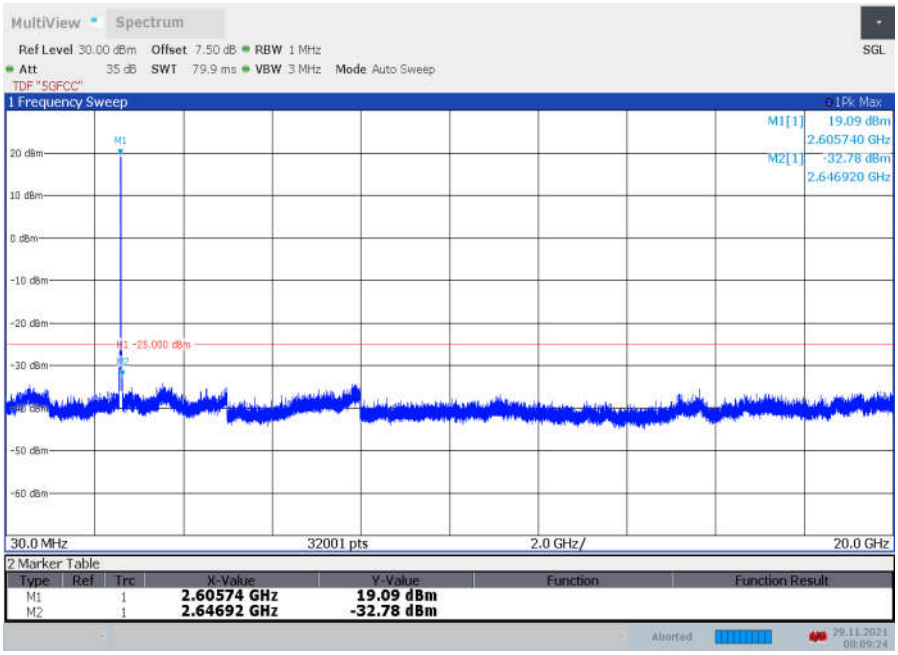
n38 (20M)_DFT-s-OFDM_QPSK_ Mid _CH(30MHz-20GHz)



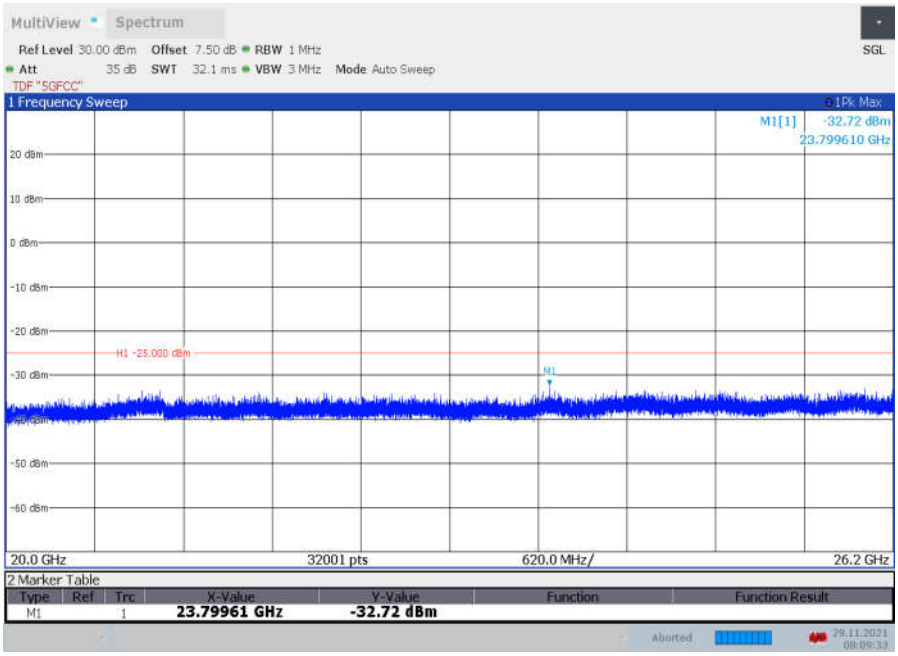
n38 (20M)_DFT-s-OFDM_QPSK_ Mid _CH(20GHz -26.2GHz)



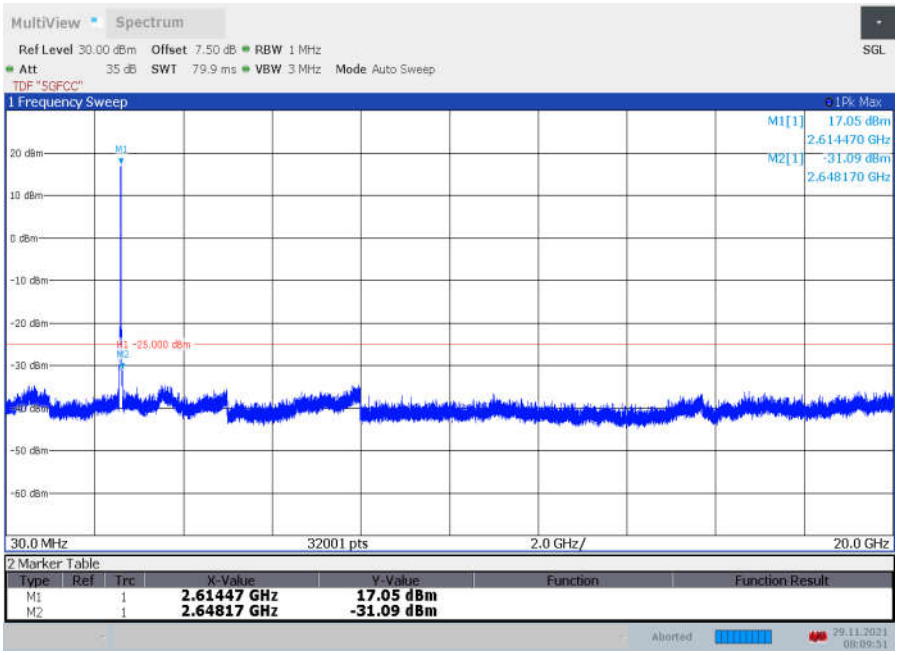
n38 (20M)_DFT-s-OFDM_BPSK _High_CH(30MHz-20GHz)



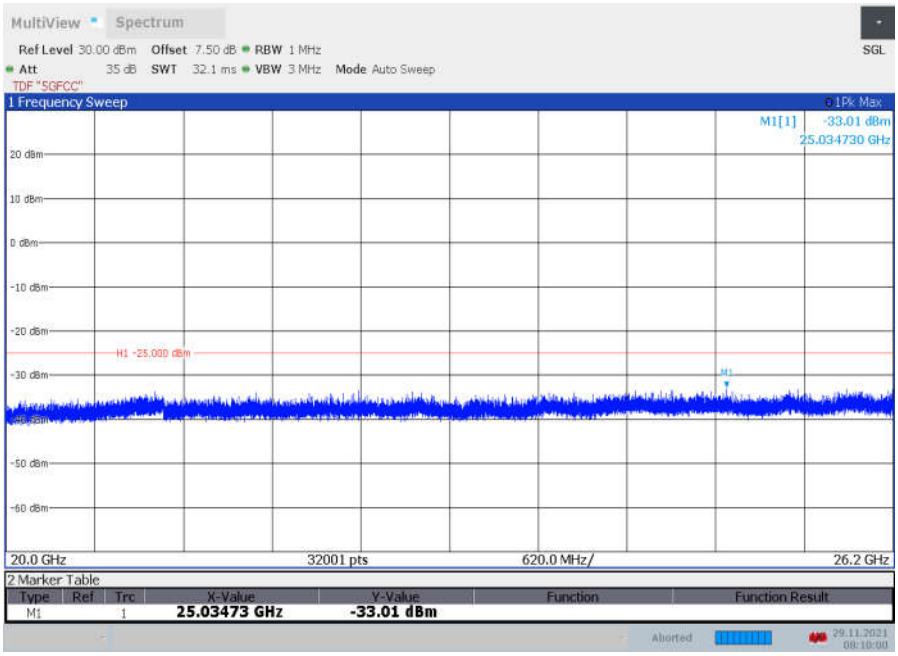
n38 (20M)_DFT-s-OFDM_BPSK _ High _CH(20GHz -26.2GHz)



n38 (20M)_DFT-s-OFDM_QPSK_ High _CH(30MHz-20GHz)



n38 (20M)_DFT-s-OFDM_QPSK_ High _CH(20GHz -26.2GHz)

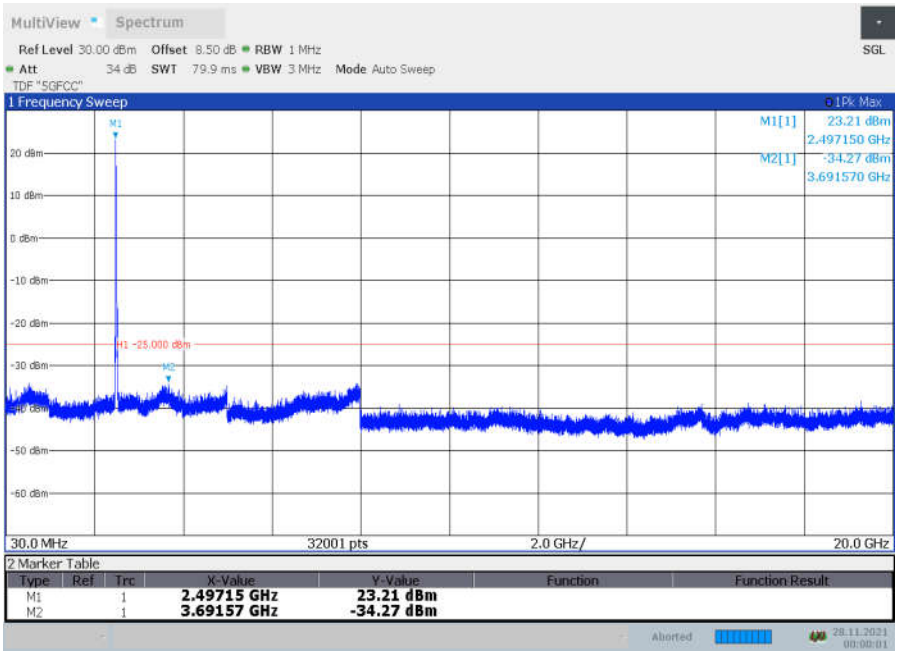


n41 : 30MHz –26.9GHz

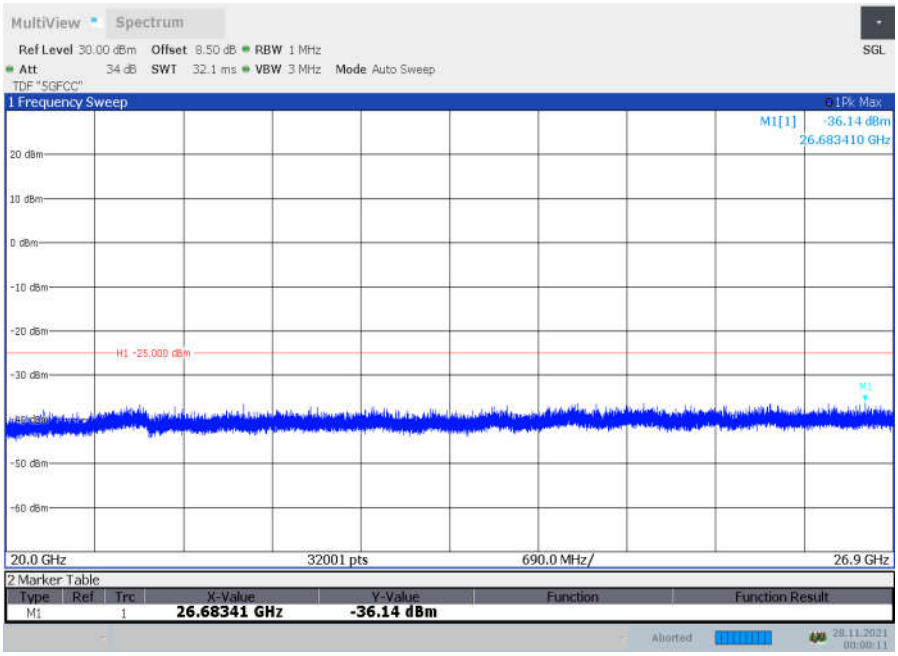
Spurious emission limit –25dBm.

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

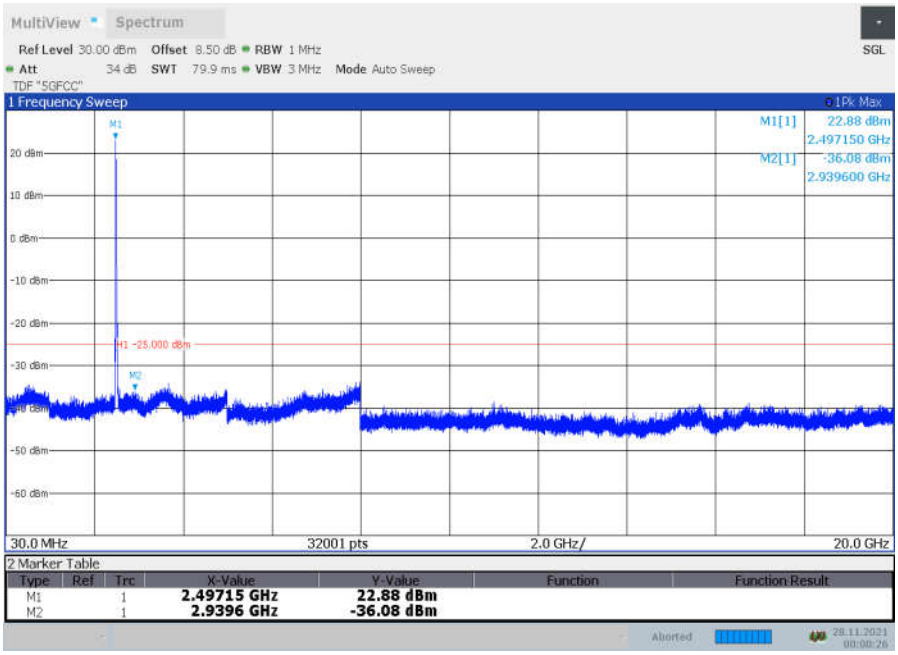
n41(20M)_DFT-s-OFDM_BPSK _Low_CH(30MHz-20GHz)



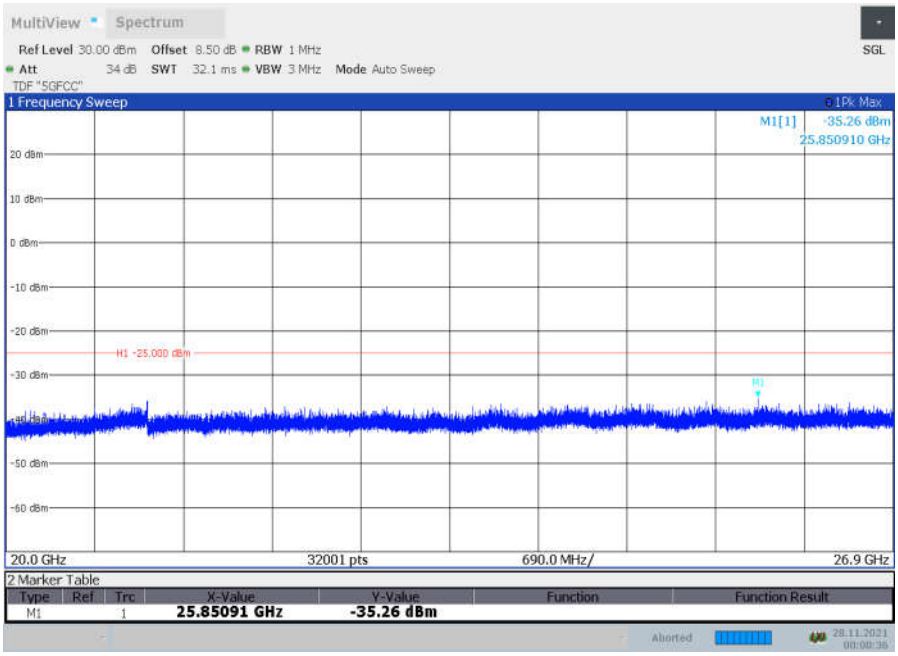
n41 (20M)_DFT-s-OFDM_BPSK _Low_CH(20GHz -26.9GHz)



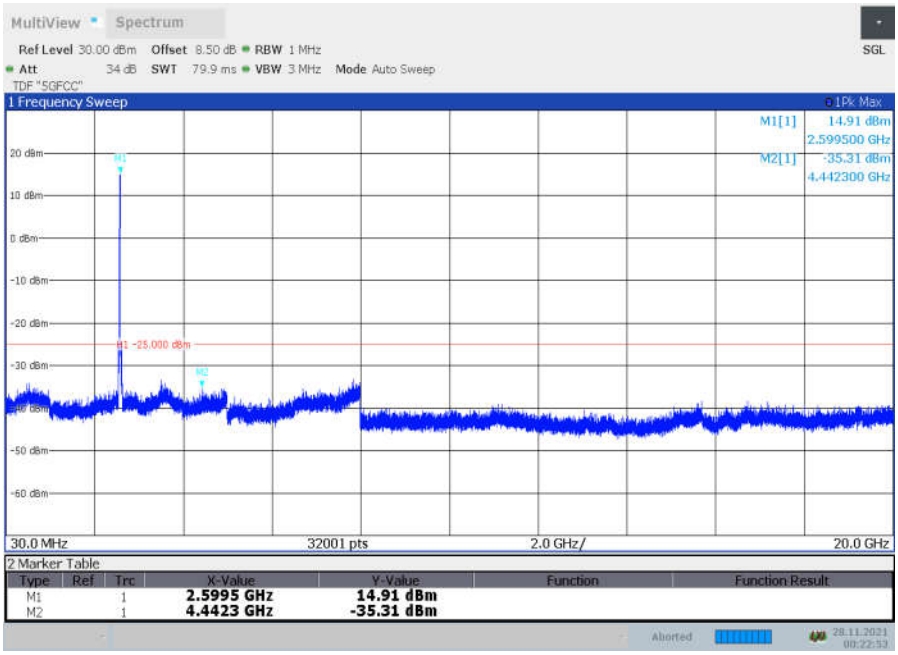
n41 (20M)_DFT-s-OFDM_QPSK_ _Low_CH(30MHz-20GHz)



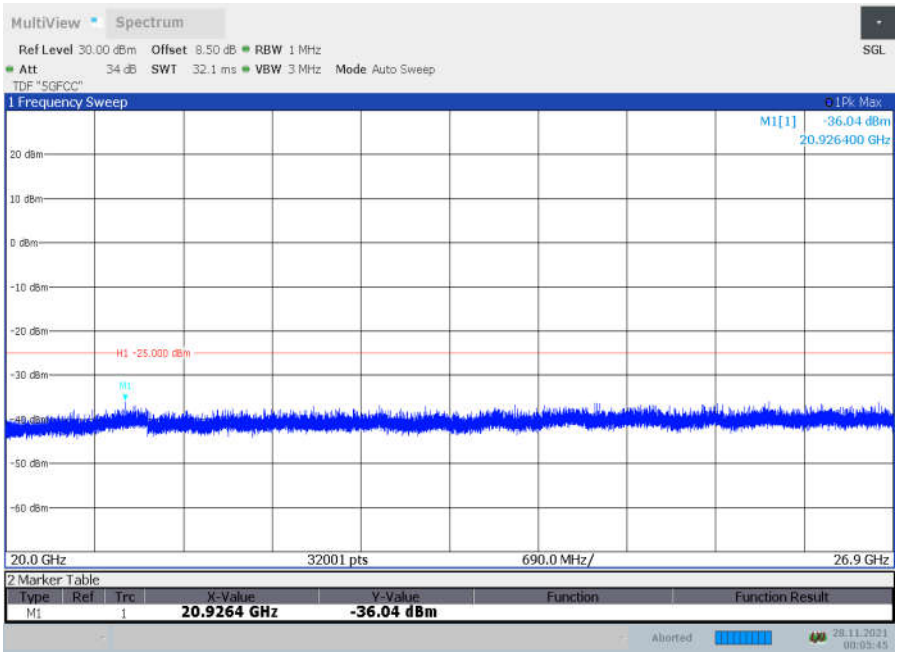
n41 (20M)_DFT-s-OFDM_QPSK_ _Low_CH(20GHz -26.9GHz)



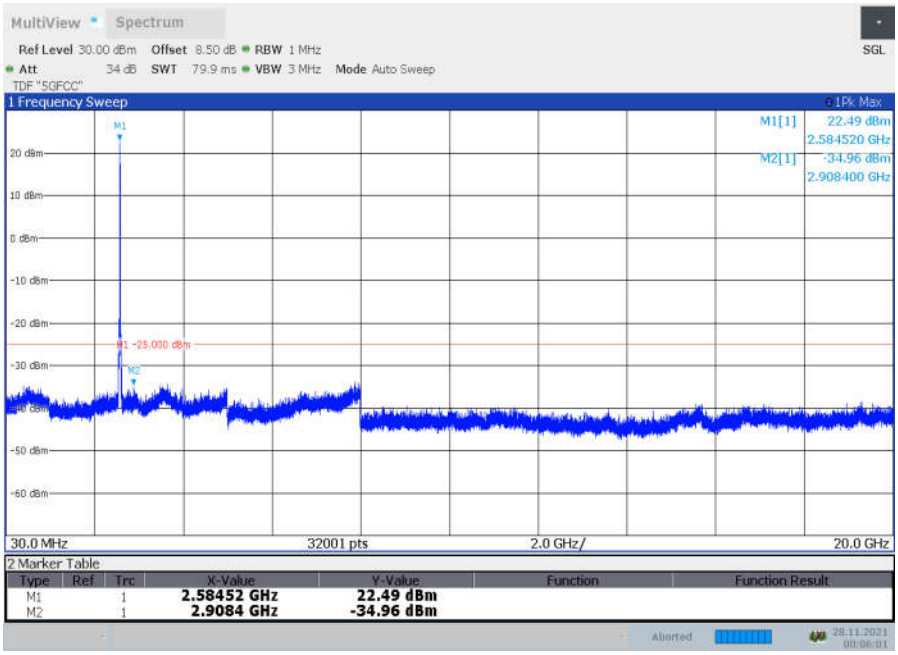
n41 (20M)_DFT-s-OFDM_BPSK _Mid_CH(30MHz-20GHz)



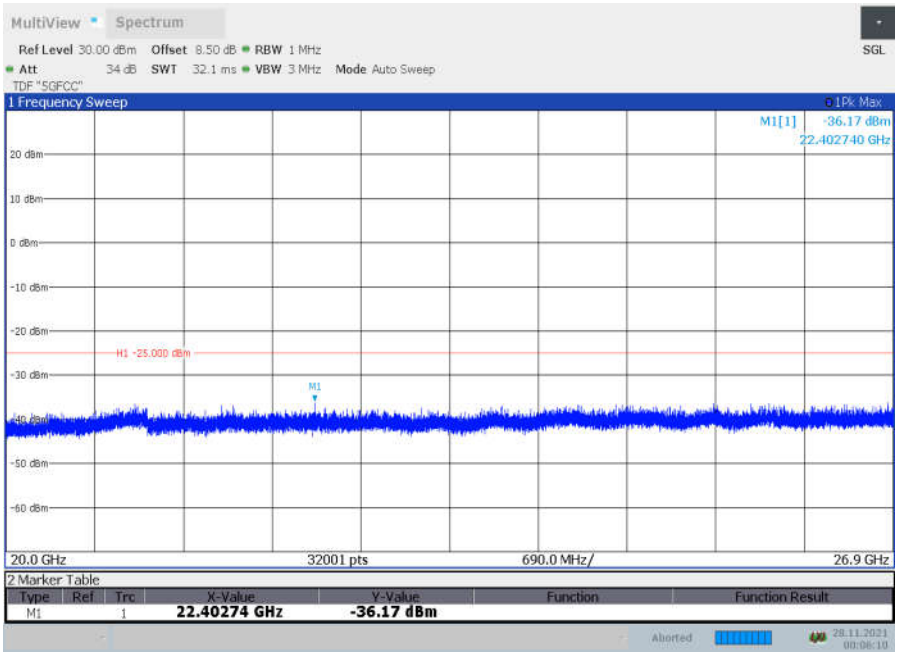
n41 (20M)_DFT-s-OFDM_BPSK _ Mid _CH(20GHz -26.9GHz)



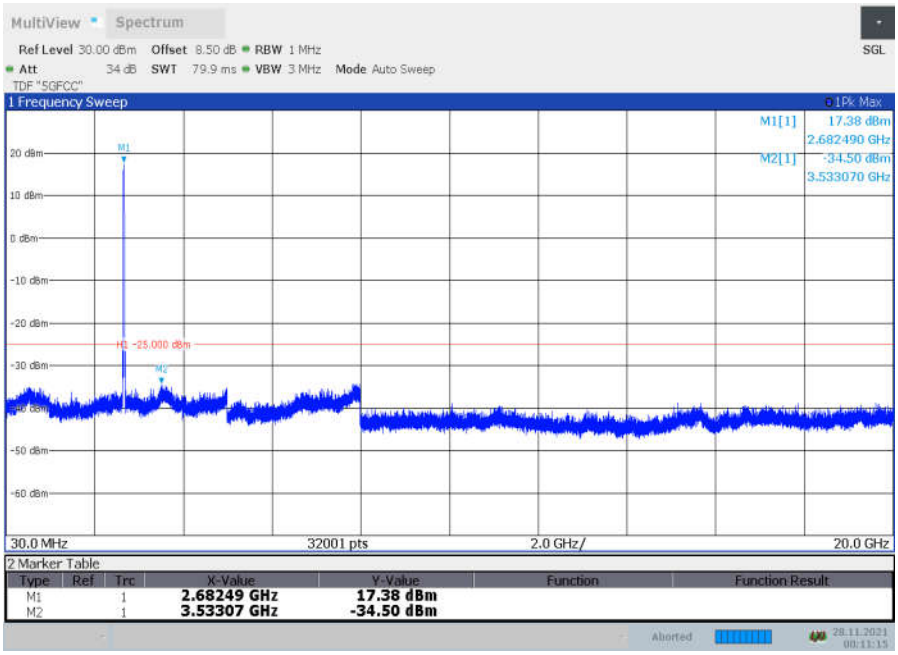
n41 (20M)_DFT-s-OFDM_QPSK_ Mid _CH(30MHz-20GHz)



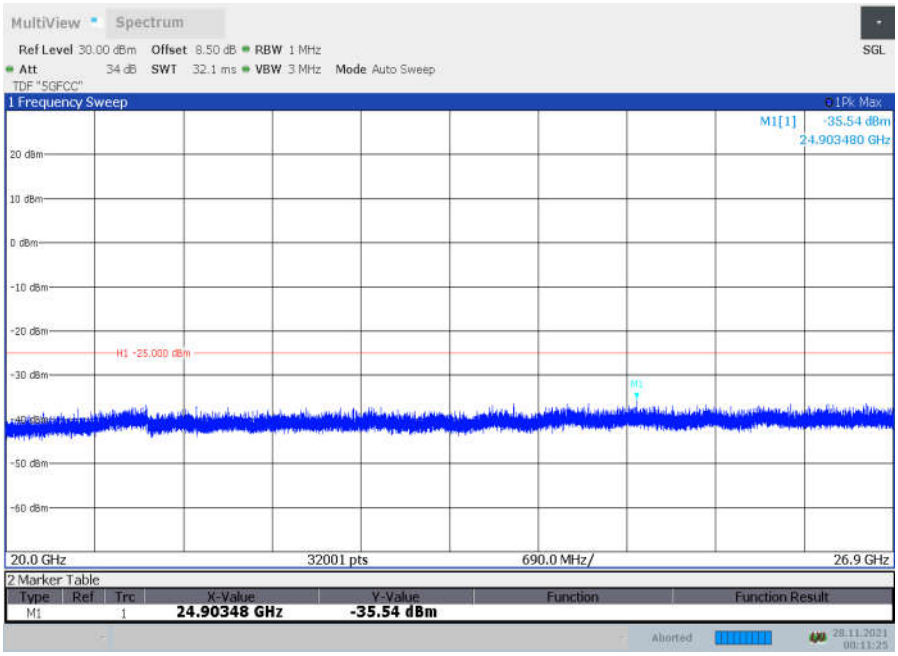
n41(20M)_DFT-s-OFDM_QPSK_ Mid _CH(20GHz -26.9GHz)



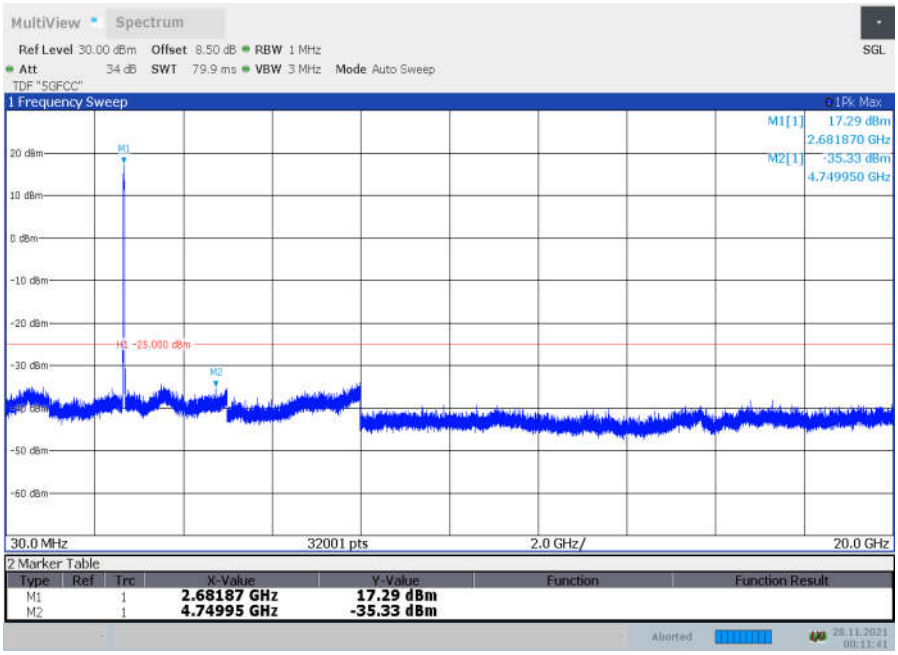
n41 (20M)_DFT-s-OFDM_BPSK _High_CH(30MHz-20GHz)



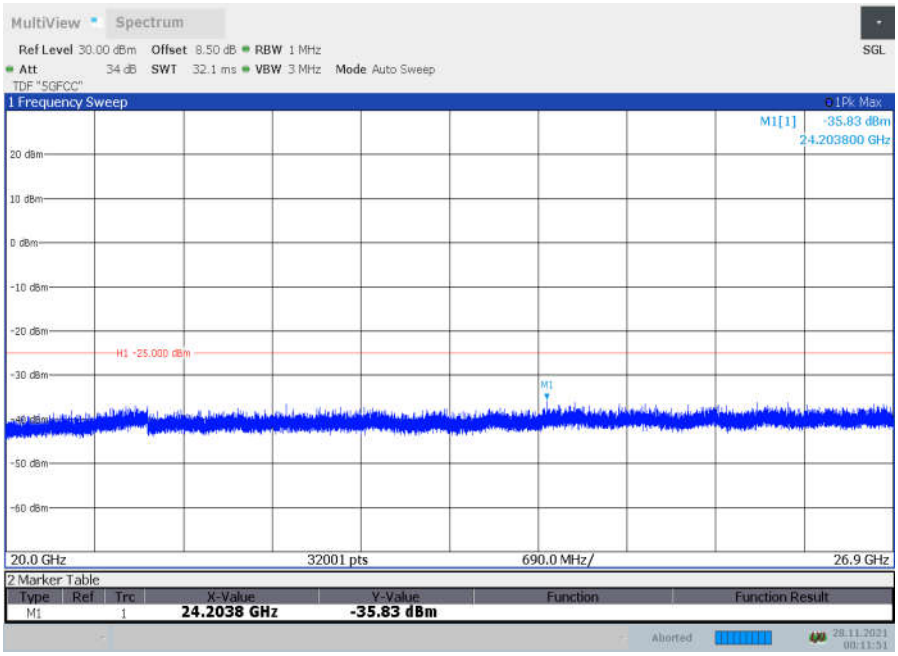
n41 (20M)_DFT-s-OFDM_BPSK _ High _CH(20GHz -26.9GHz)



n41 (20M)_DFT-s-OFDM_QPSK_ High _CH(30MHz-20GHz)



n41 (20M)_DFT-s-OFDM_QPSK_ High _CH(20GHz -26.9GHz)

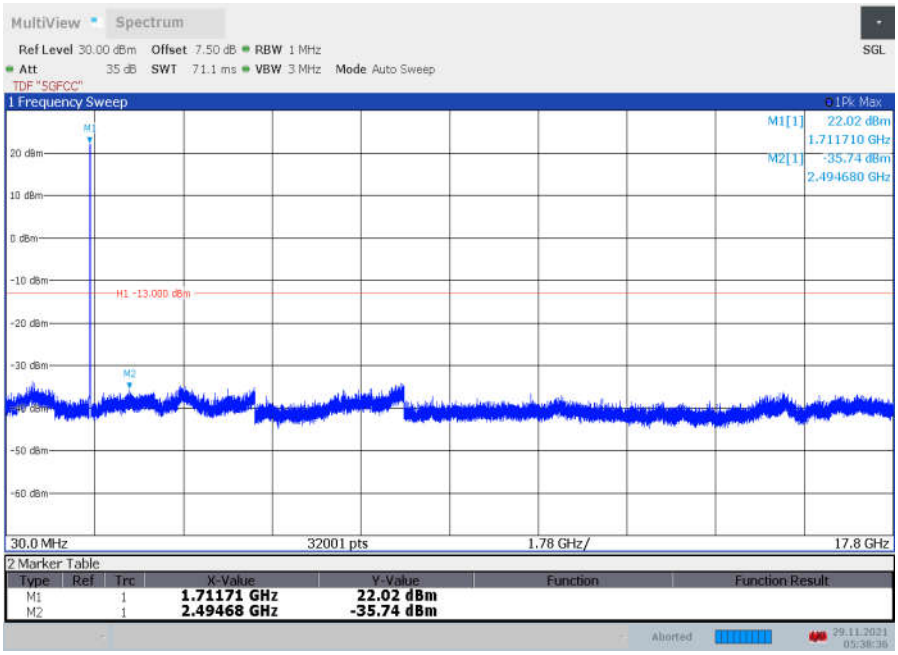


n66 : 30MHz –25.7GHz

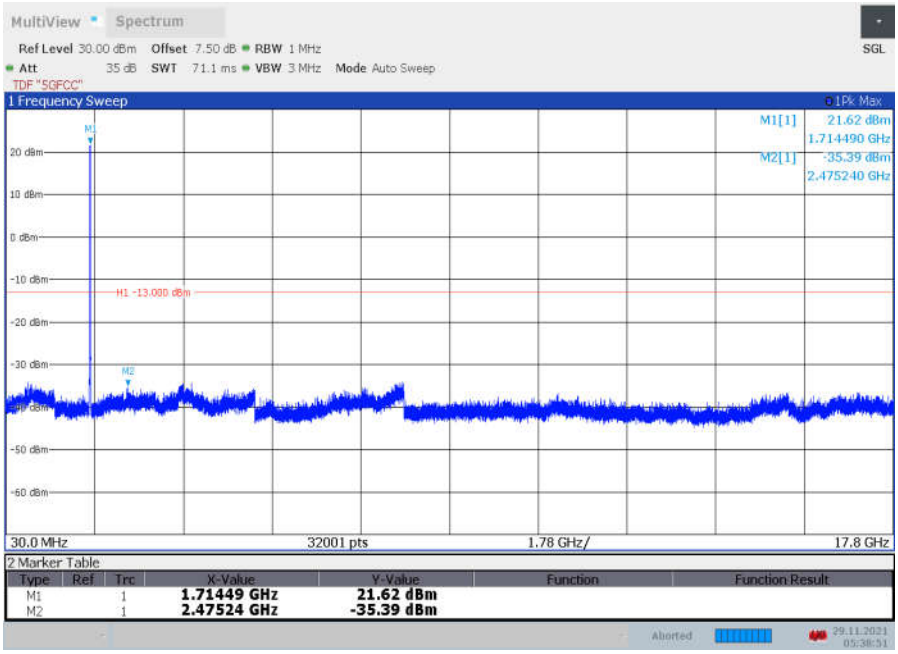
Spurious emission limit –13dBm.

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

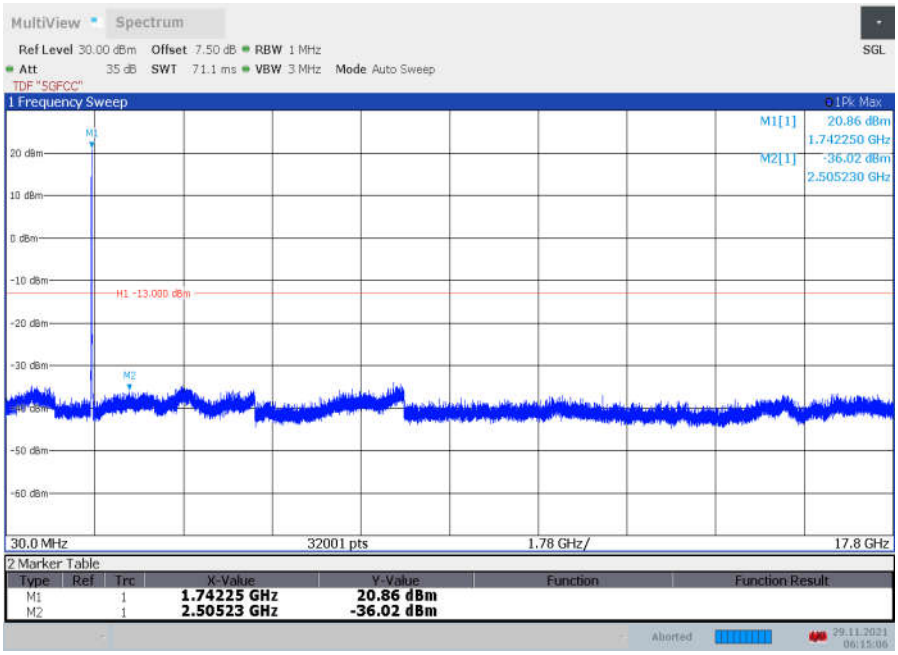
n66(10M)_DFT-s-OFDM_BPSK _Low_CH(30MHz-17.8GHz)



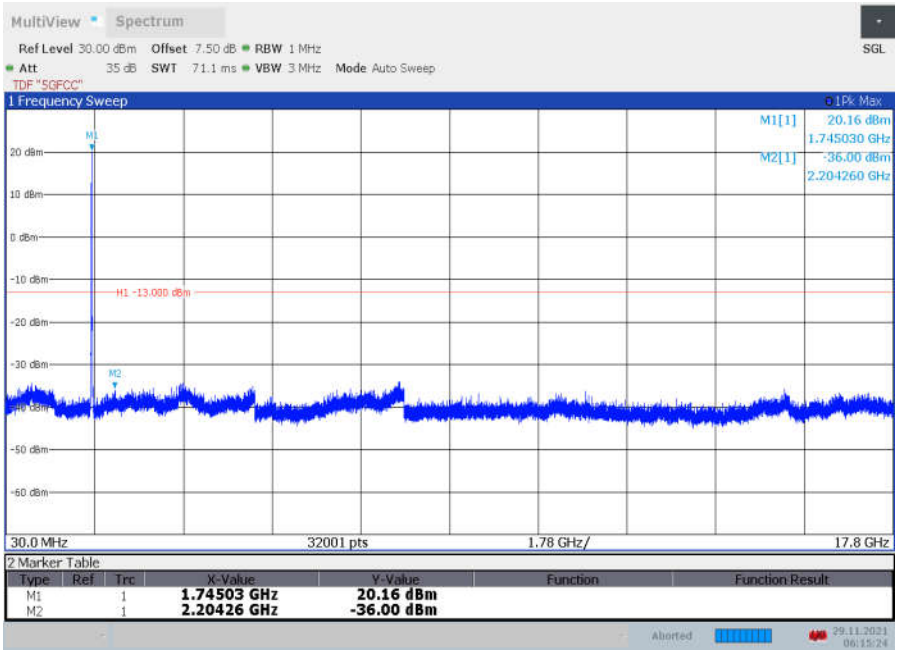
n66 (10M)_DFT-s-OFDM_QPSK_ _Low_CH(30MHz-17.8GHz)



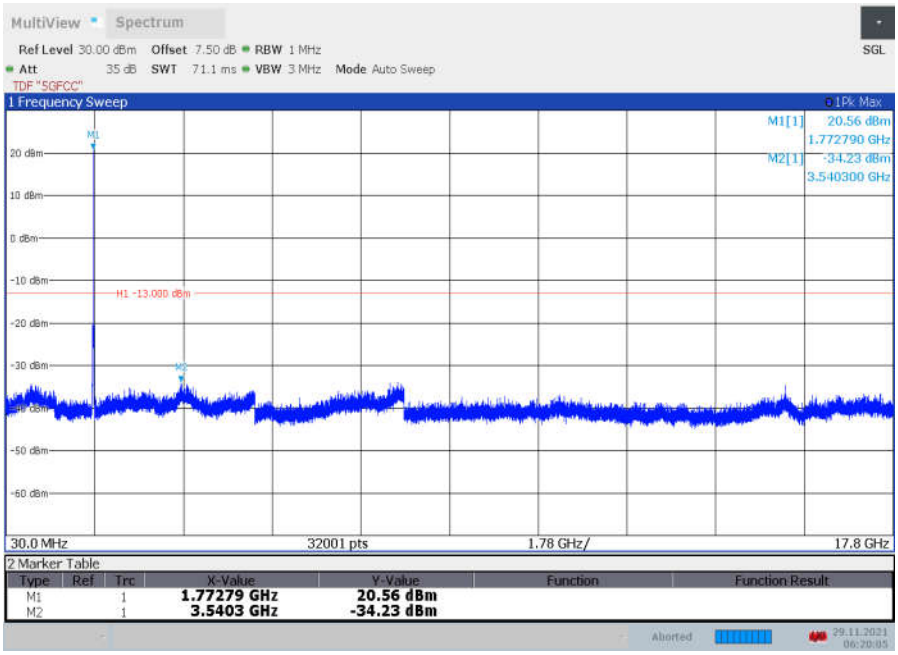
n66 (10M)_DFT-s-OFDM_BPSK _Mid_CH(30MHz-17.8GHz)



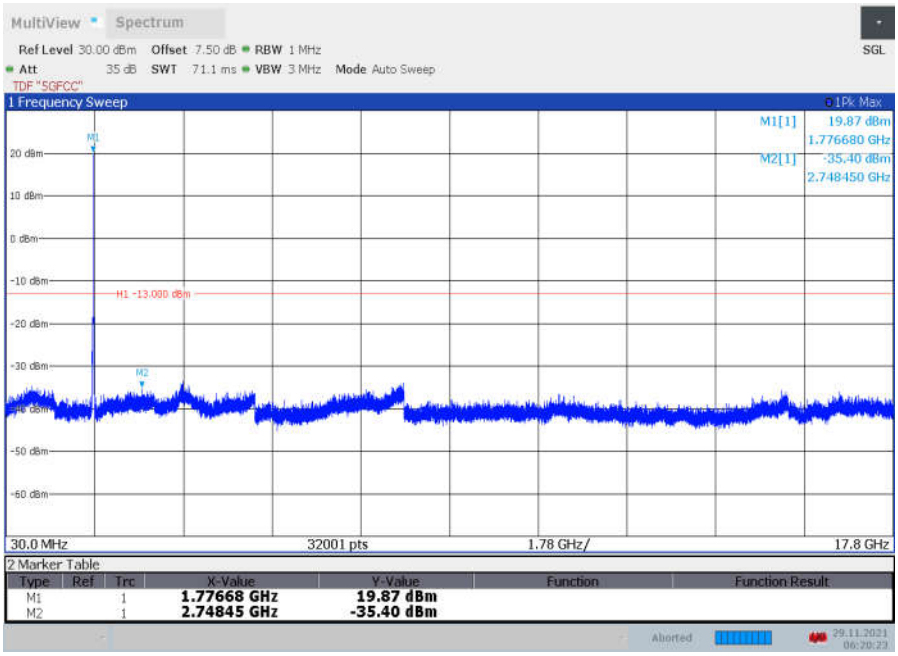
n66 (10M)_DFT-s-OFDM_QPSK_ Mid _CH(30MHz-17.8GHz)



n66 (10M)_DFT-s-OFDM_BPSK _High_CH(30MHz-17.8GHz)



n66 (10M)_DFT-s-OFDM_QPSK_ High _CH(30MHz-17.8GHz)



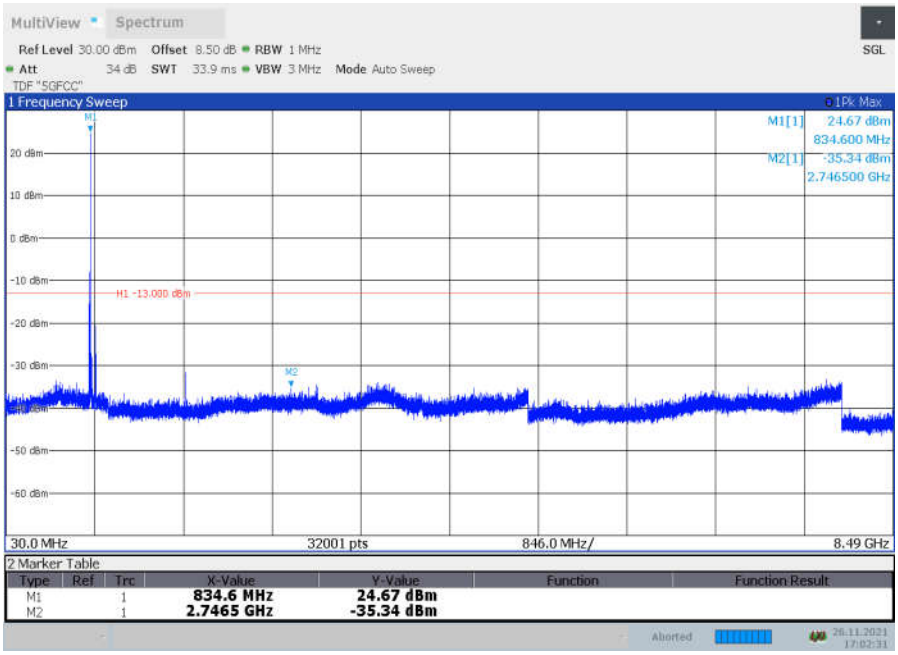
NSA

LTE Bands are set under the 10MHz bandwidth, middle channel, 50RB and QPSK modulation.

DC_66A_n5A : 30MHz –8.49GHz

Spurious emission limit –13dBm.

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

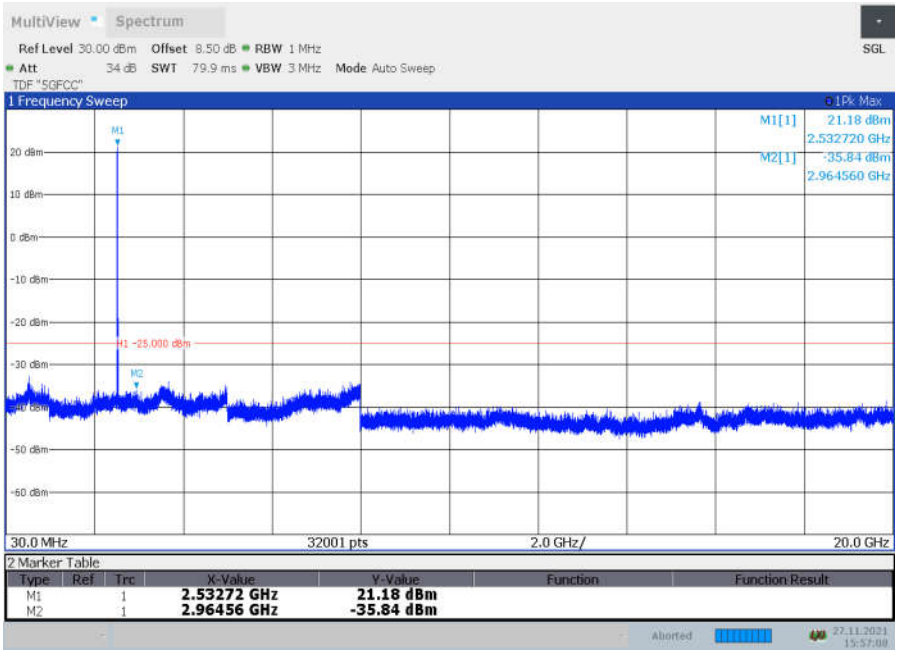


DC_5A_n7A : 30MHz –25.7GHz

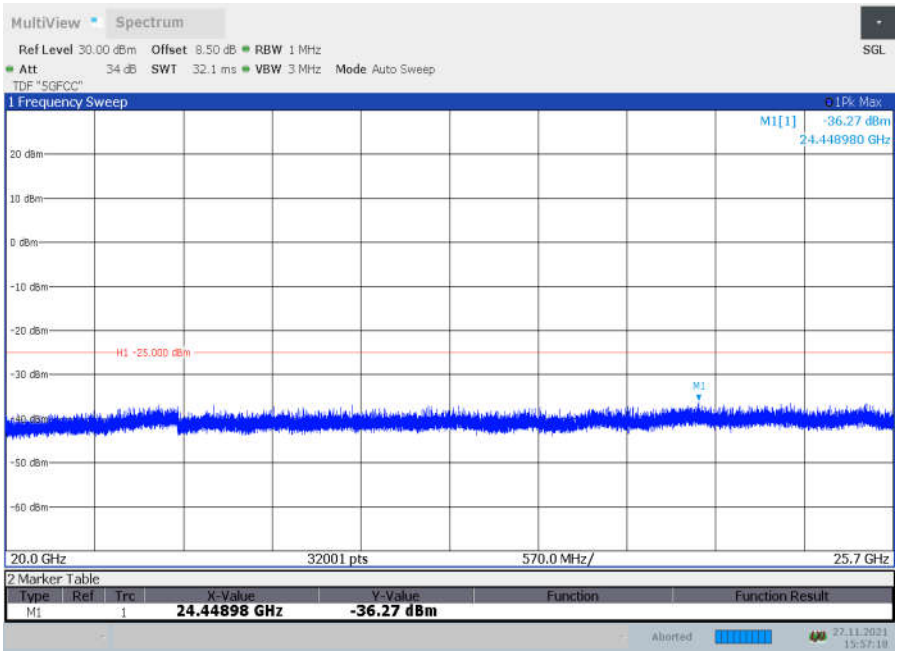
Spurious emission limit –25dBm.

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

30MHz –20GHz



20GHz –25.7GHz

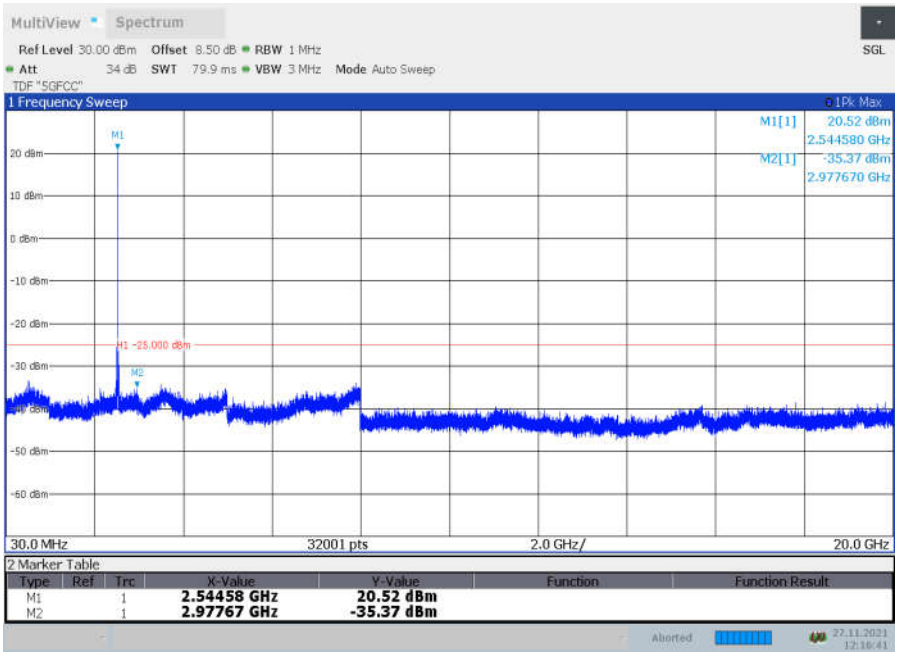


DC_66A_n7A : 30MHz –25.7GHz

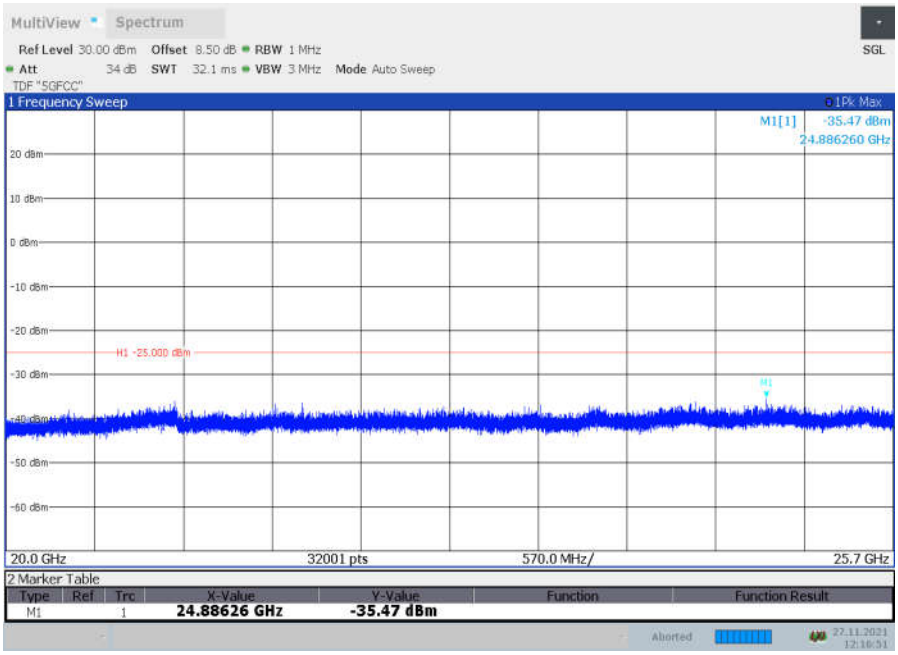
Spurious emission limit –25dBm.

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

30MHz –20GHz



20GHz –25.7GHz

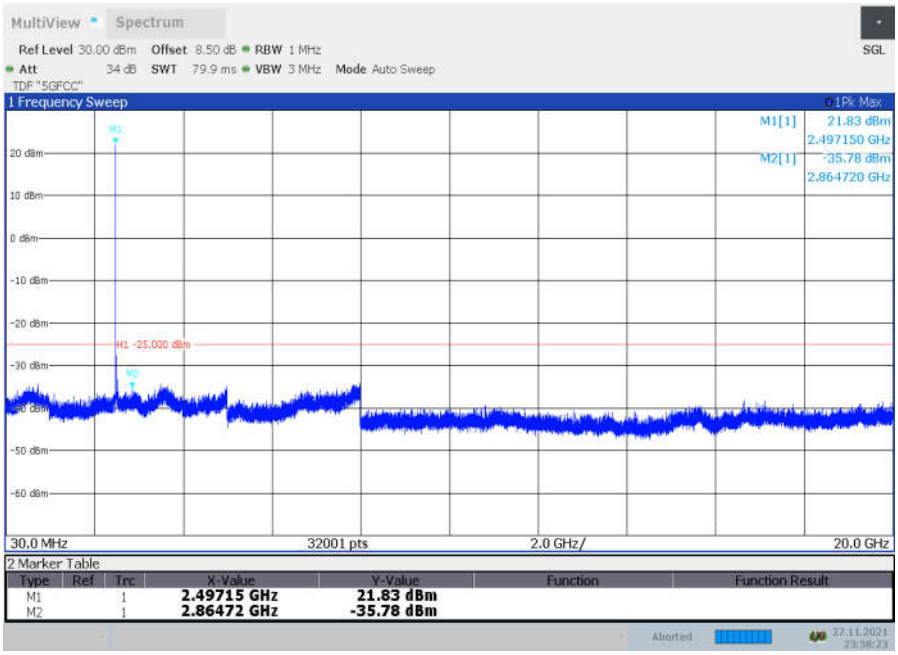


DC_26A_n41A : 30MHz –26.9GHz

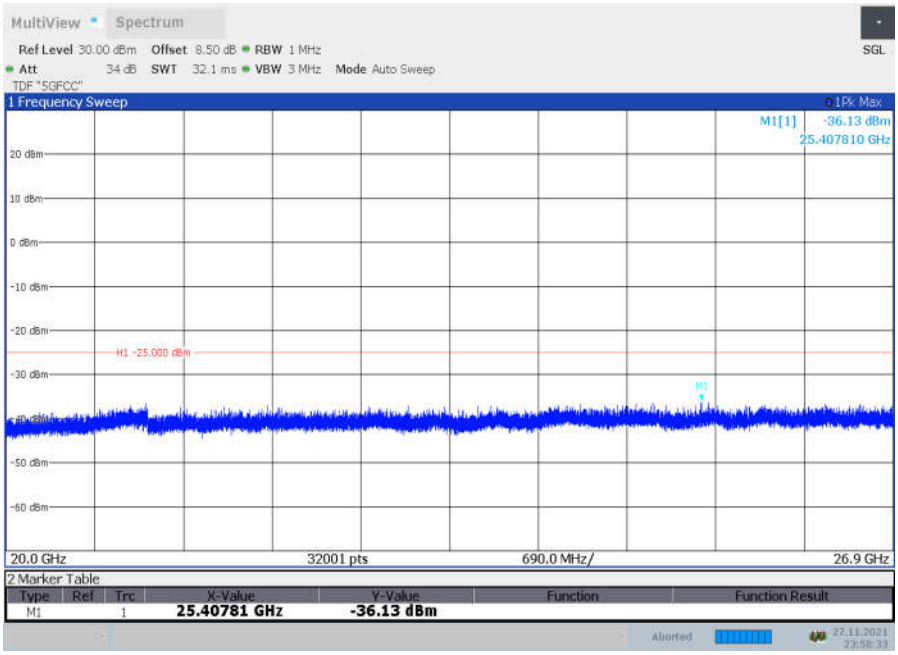
Spurious emission limit –25dBm.

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

30MHz –20GHz



20GHz –26.9GHz



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

A.7 PEAK-TO-AVERAGE POWER RATIO

Reference

FCC: CFR Part 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.7.1 Measurement limit

not exceed 13 dB

A.7.2 Measurement results

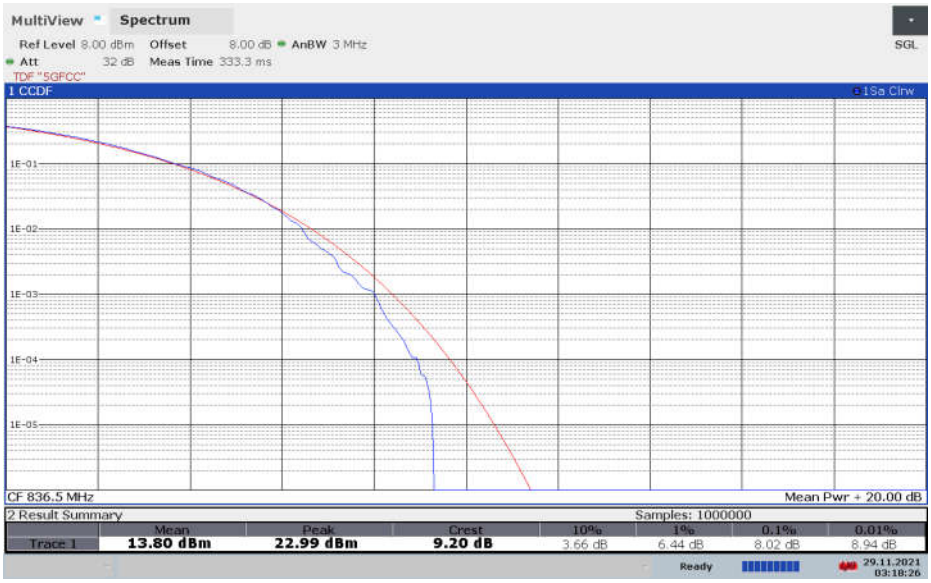
Only worst case result is given below

SA

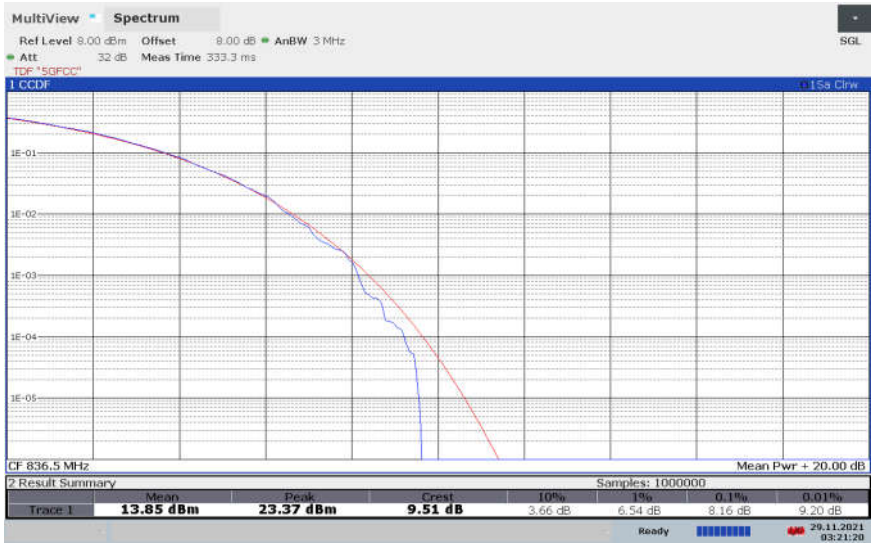
n5

Frequency(MHz)	BW(MHz)	OFDM	PAPR(dB)			
			pi/2 BPSK	QPSK	16QAM	64QAM
836.5	20	DFT	6.40	7.34	7.72	8.04
		CP	N/A	8.02	8.16	8.50

n5, CP-QPSK (PAPR)



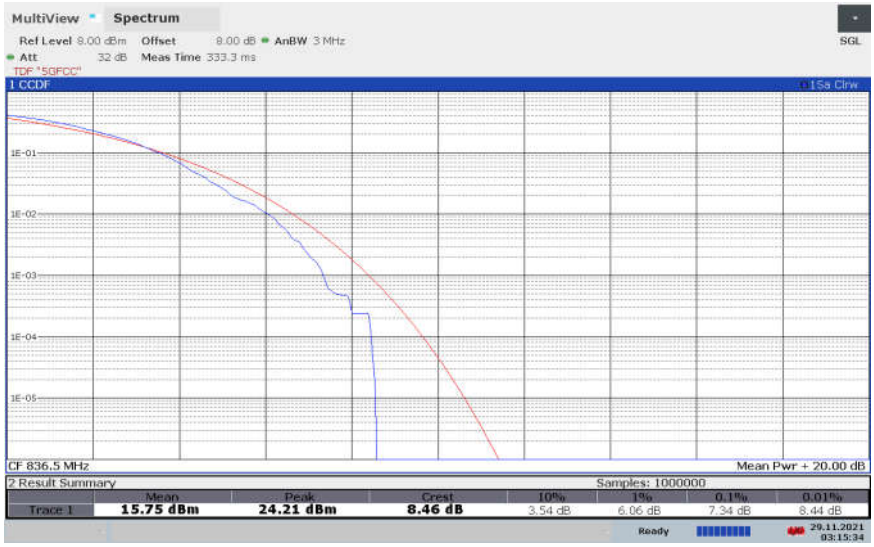
n5, CP-16QAM (PAPR)



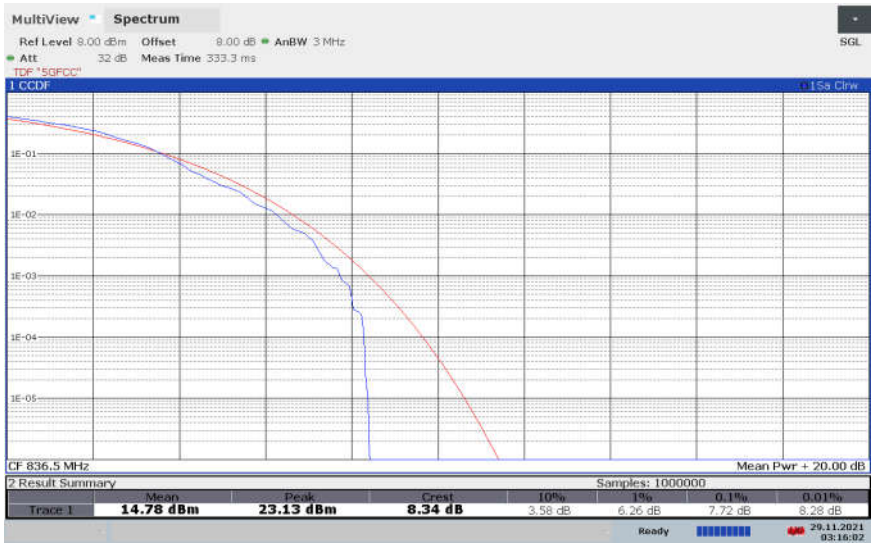
n5, CP-64QAM (PAPR)

n5, DFT-s-pi/2 BPSK (PAPR)

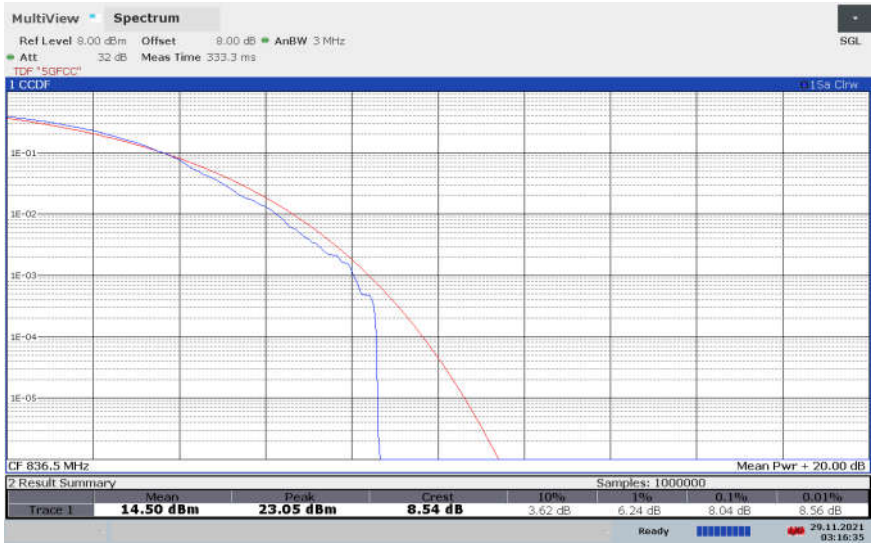
n5, DFT-s-QPSK (PAPR)



n5, DFT-s-16QAM (PAPR)



n5, DFT-s-64QAM (**PAPR)**

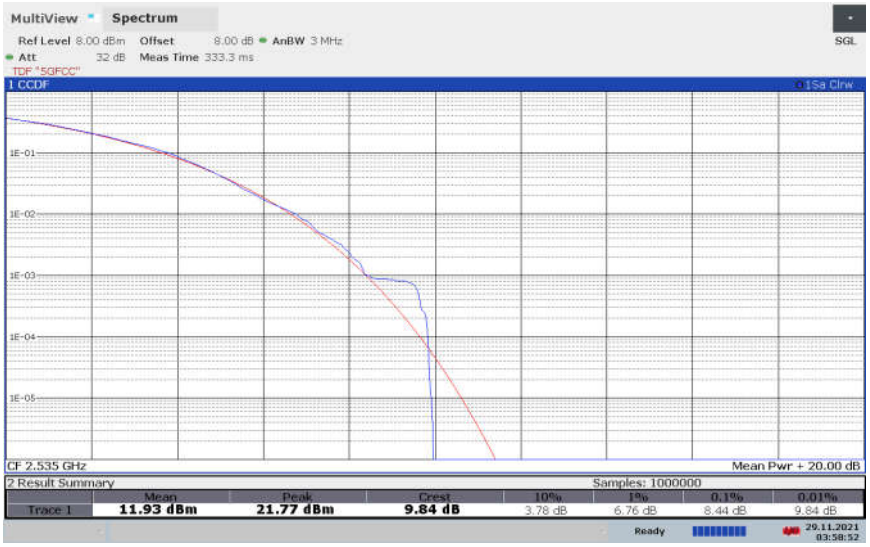


n7

Frequency(MHz)	BW(MHz)	OFDM	PAPR(dB)			
			pi/2 BPSK	QPSK	16QAM	64QAM
2535	20	DFT	6.16	7.40	7.50	7.98
		CP	N/A	8.28	8.44	8.58

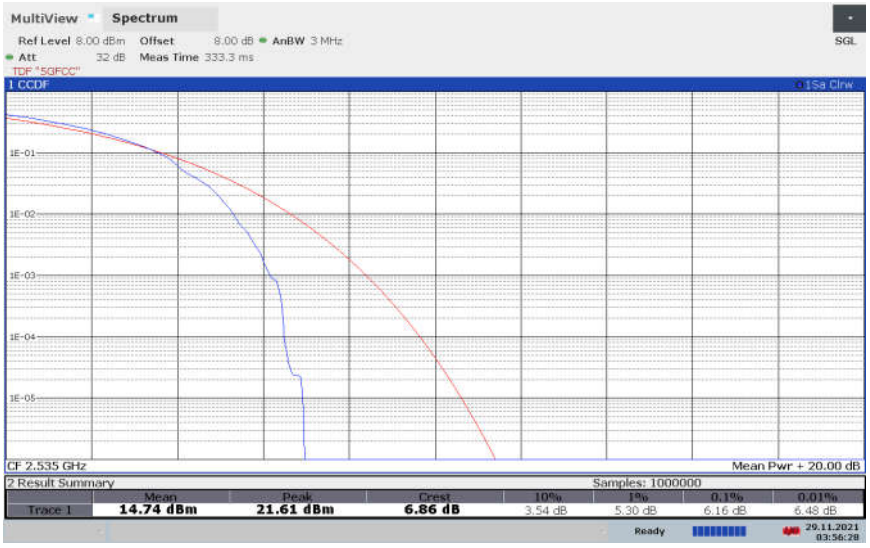
n7, CP-QPSK (PAPR)

n7, CP-16QAM (PAPR)

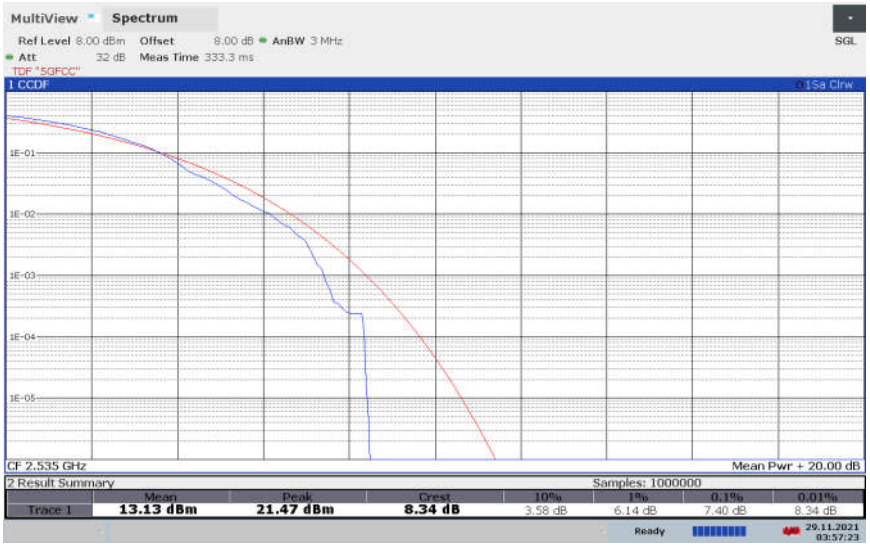


n7, CP-64QAM (PAPR)

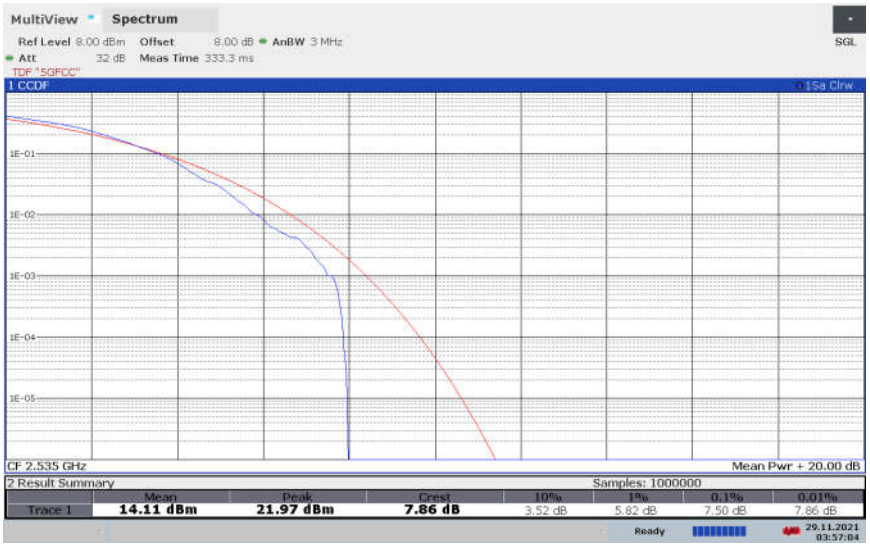
n7, DFT-s-pi/2 BPSK (PAPR)



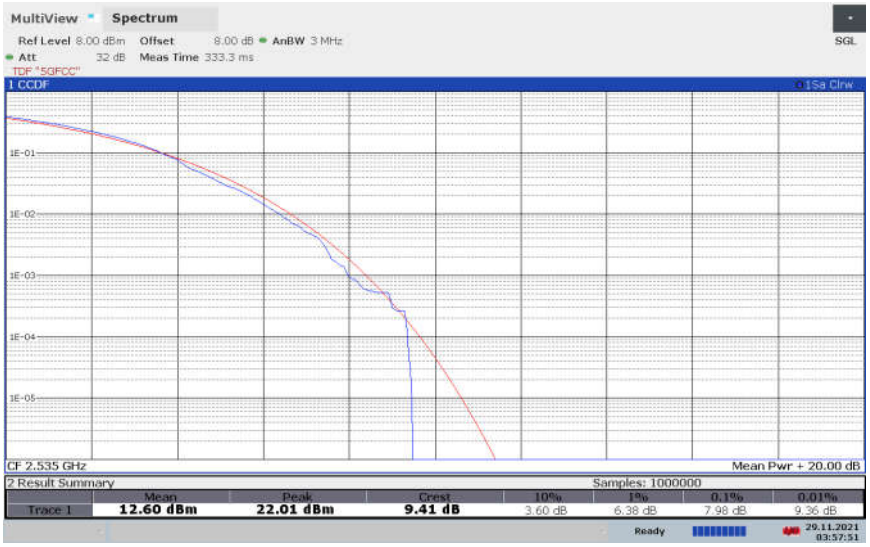
n7, DFT-s-QPSK (PAPR)



n7, DFT-s-16QAM (PAPR)



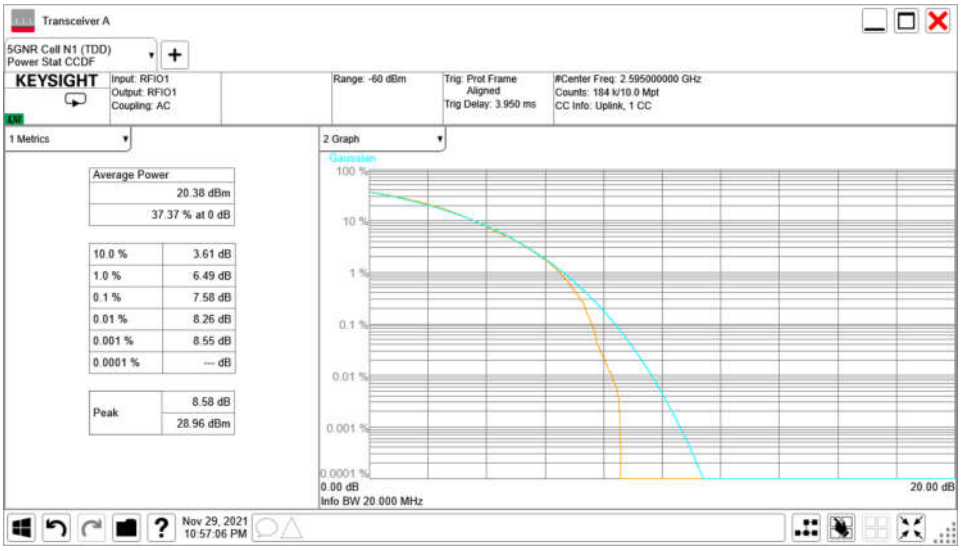
n7, DFT-s-64QAM (**PAPR)**



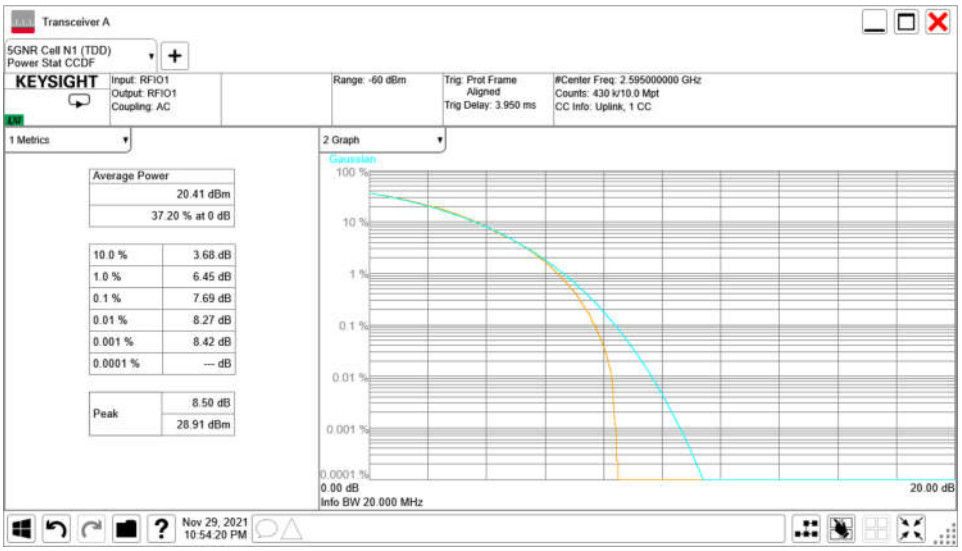
n38

Frequency(MHz)	BW(MHz)	OFDM	PAPR(dB)			
			pi/2 BPSK	QPSK	16QAM	64QAM
2595	20	DFT	4.43	5.40	6.11	6.42
		CP	N/A	7.58	7.69	7.87

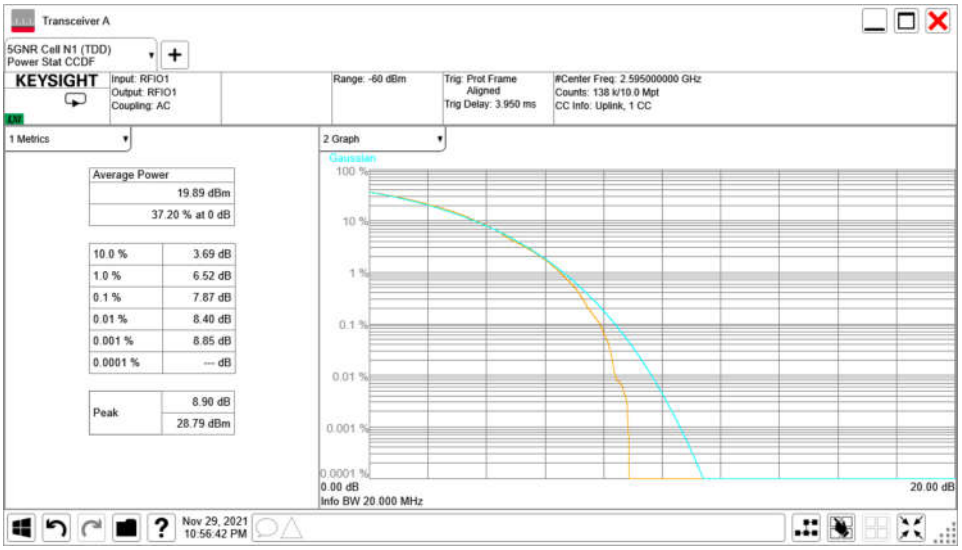
n38, CP-QPSK (PAPR)



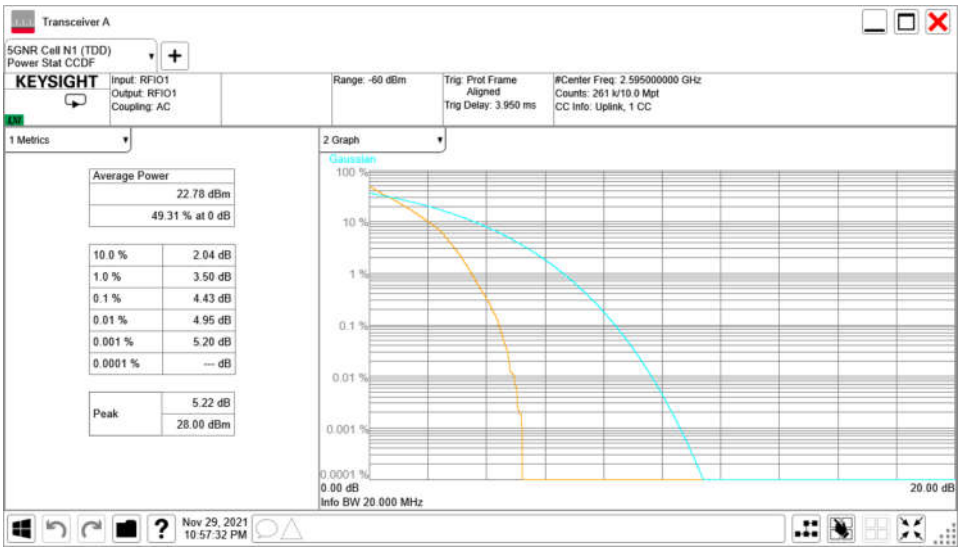
n38, CP-16QAM (PAPR)



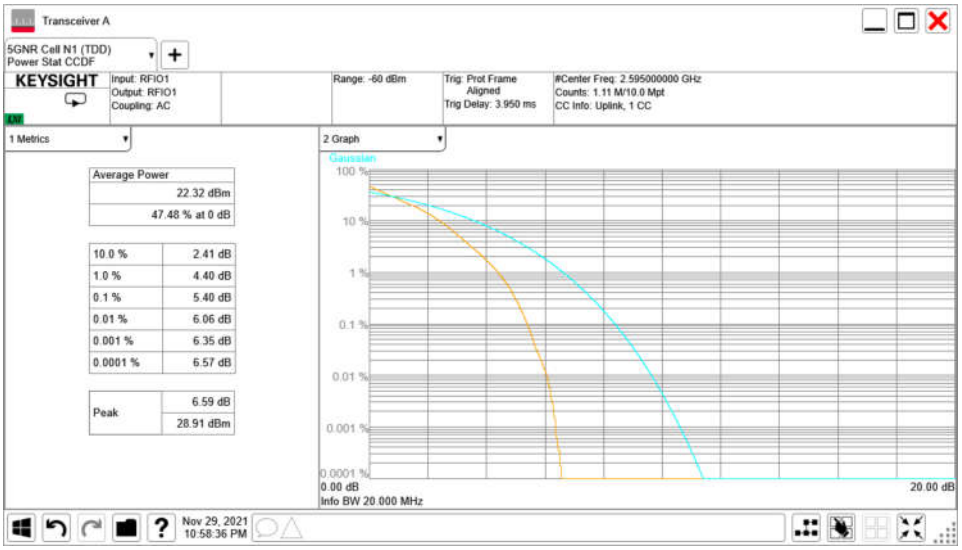
n38, CP-64QAM (PAPR)



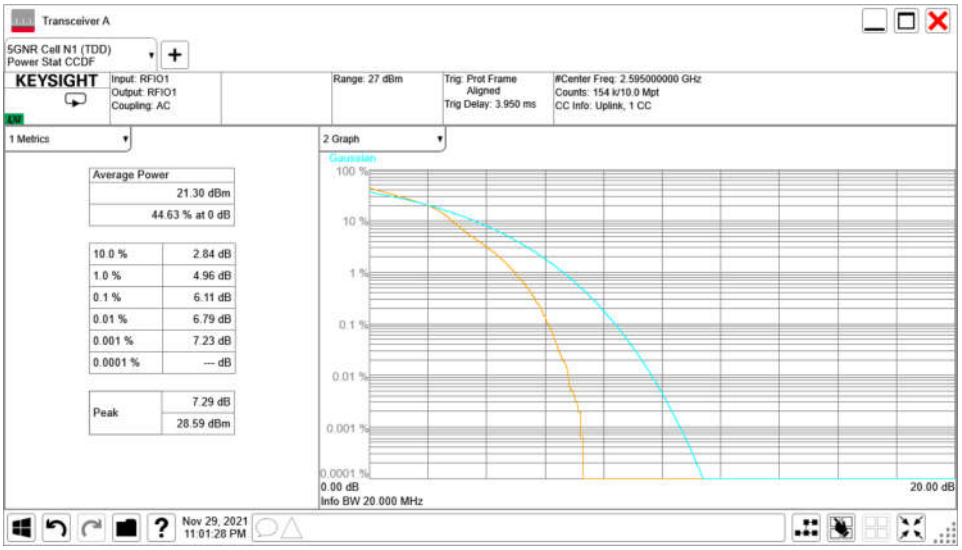
n38, DFT-s-pi/2 BPSK (PAPR)



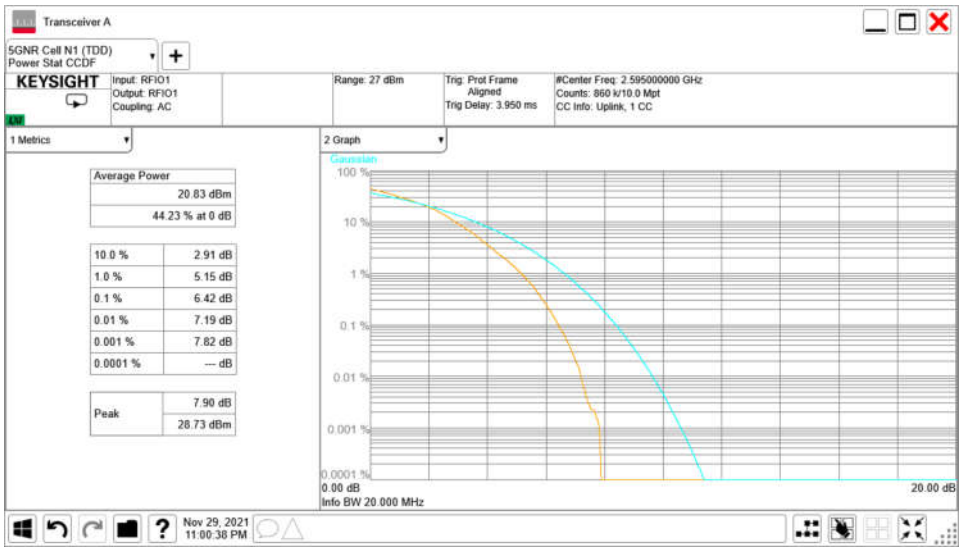
n38, DFT-s-QPSK (PAPR)



n38, DFT-s-16QAM (PAPR)



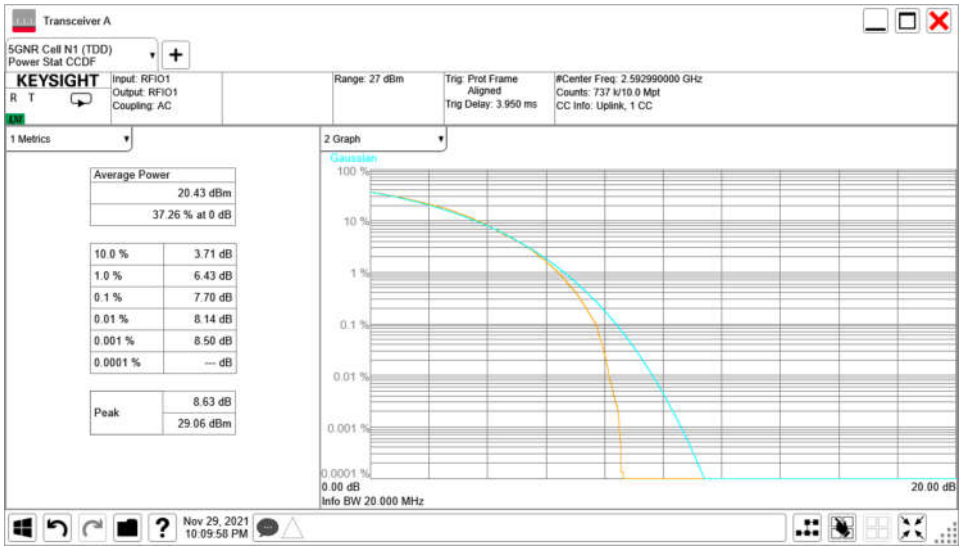
n38, DFT-s-64QAM (PAPR)



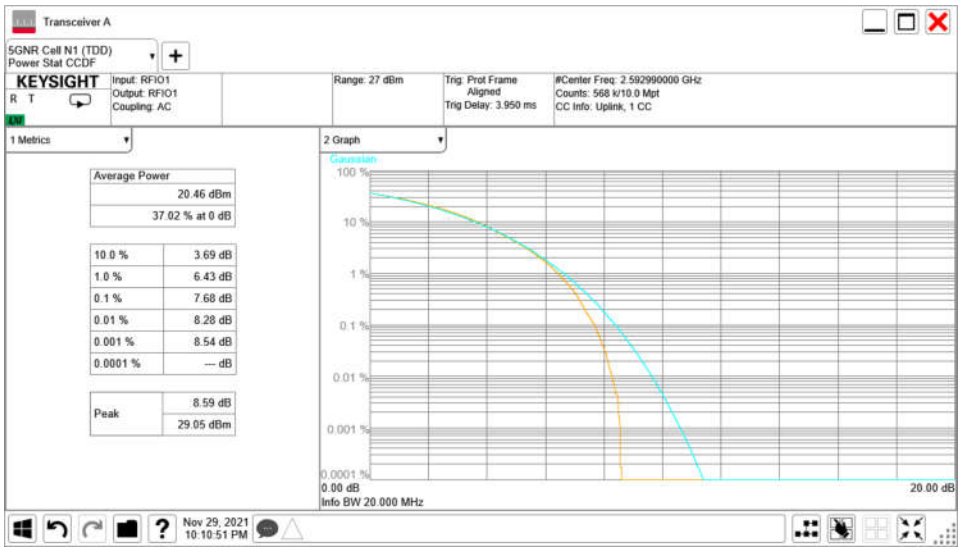
n41

Frequency(MHz)	BW(MHz)	OFDM	PAPR(dB)			
			pi/2 BPSK	QPSK	16QAM	64QAM
2592.99	20	DFT	4.40	5.13	6.08	6.41
		CP	N/A	7.70	7.68	7.75

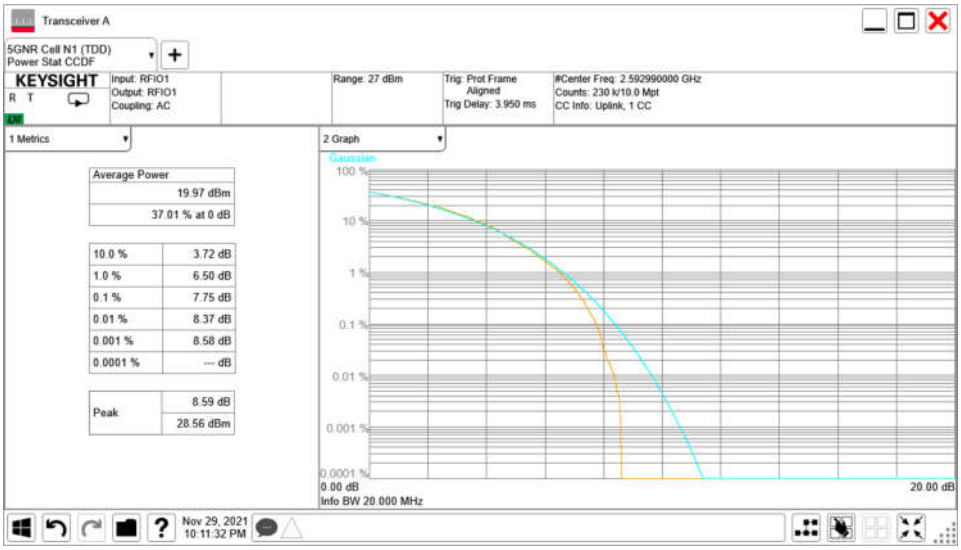
n41, CP-QPSK (PAPR)



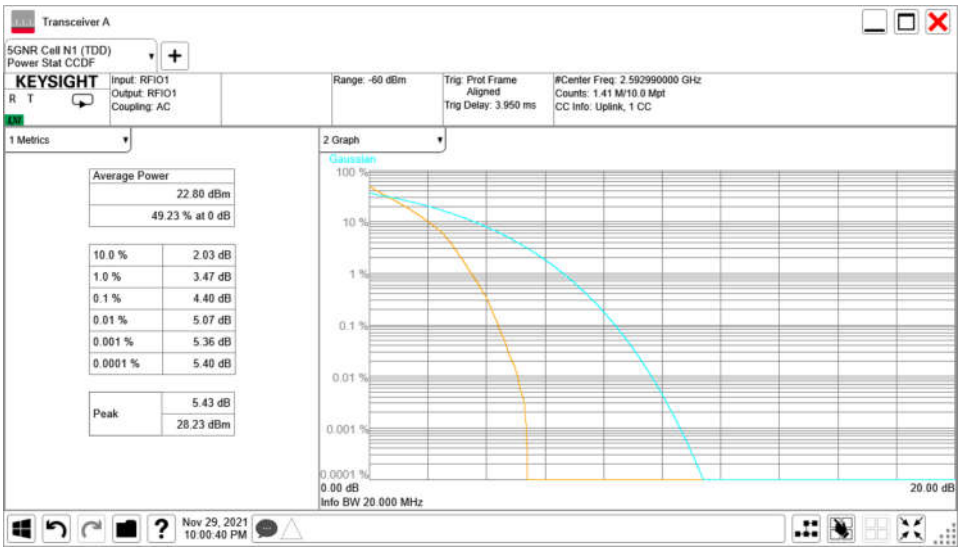
n41, CP-16QAM (PAPR)



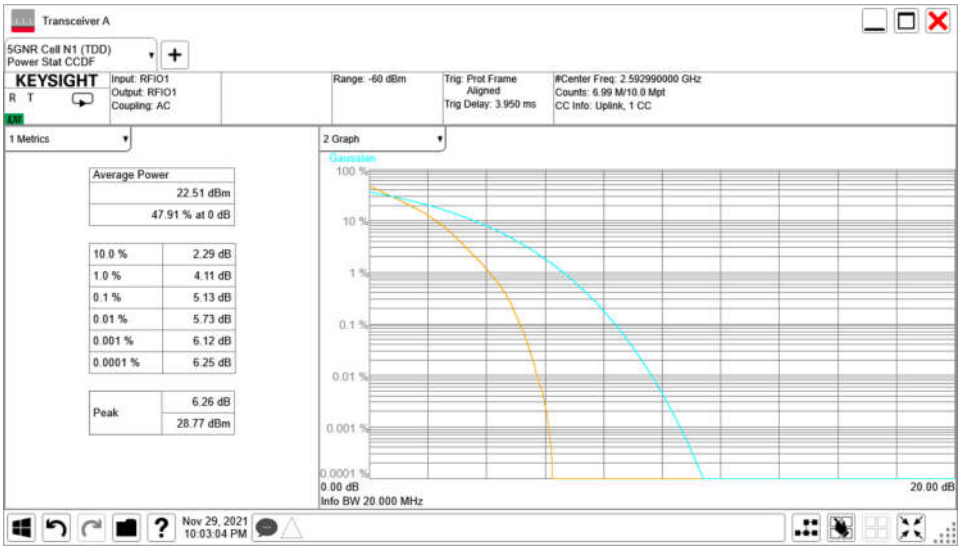
n41, CP-64QAM (PAPR)



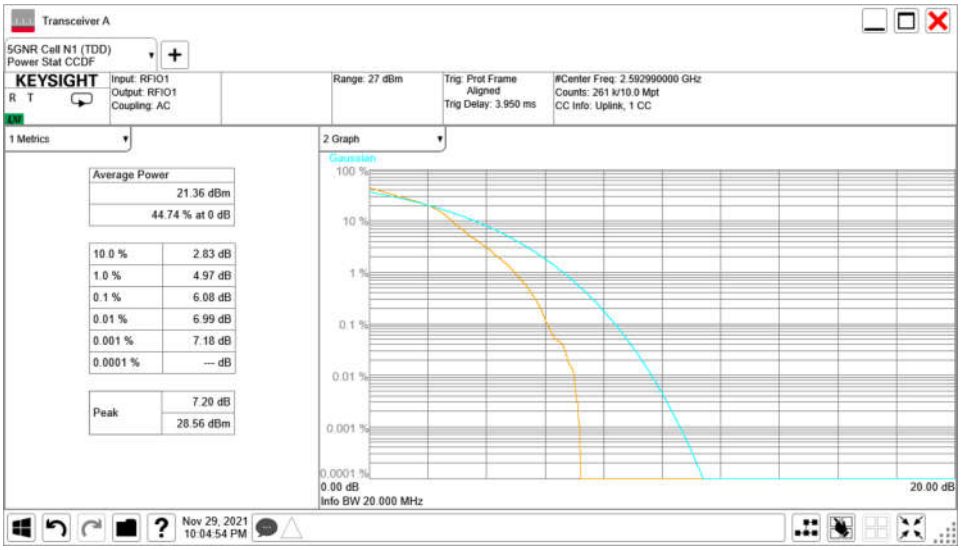
n41, DFT-s-pi/2 BPSK (PAPR)



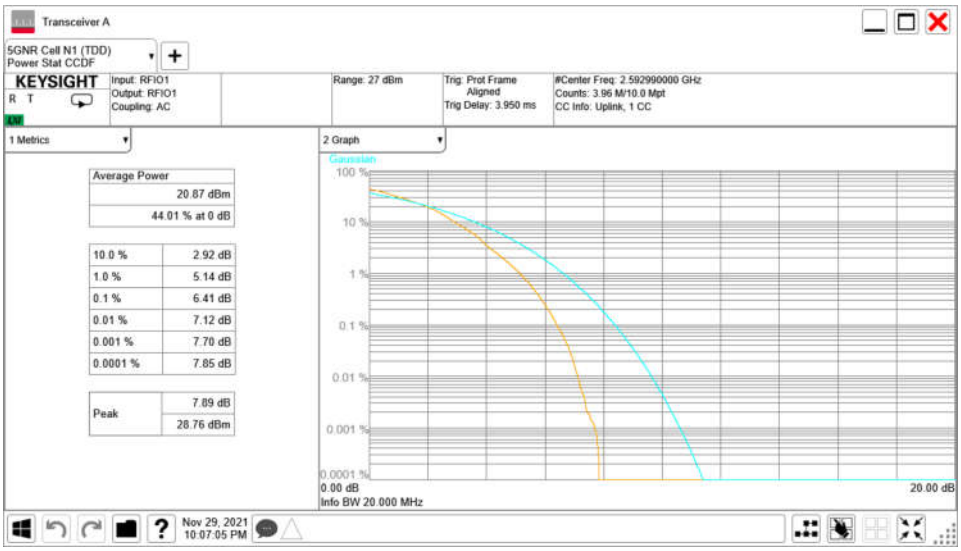
n41, DFT-s-QPSK (PAPR)



n41, DFT-s-16QAM (PAPR)



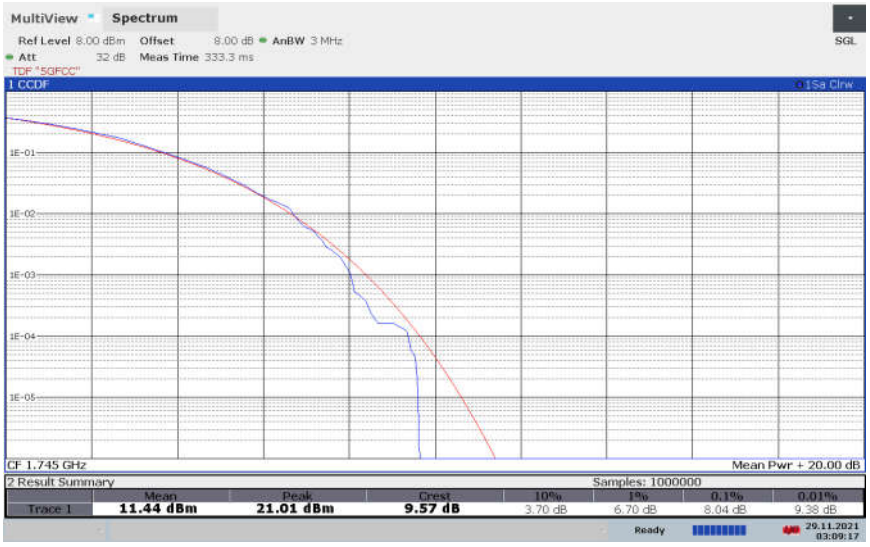
n41, DFT-s-64QAM (PAPR)



n66

Frequency(MHz)	BW(MHz)	OFDM	PAPR(dB)			
			pi/2 BPSK	QPSK	16QAM	64QAM
1745	20	DFT	6.20	7.40	7.44	8.08
		CP	N/A	8.04	8.14	8.54

n66, CP-QPSK (PAPR)



n66, CP-16QAM (PAPR)