



A.3.3 Measurement results

n2

Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	1850.256	1908.656		
50				-5.10	0.0027
40				-2.10	0.0011
30				-2.50	0.0013
10				-0.60	0.0003
0				0.60	0.0003
-10				-0.30	0.0002
-20				3.70	0.0020
-30				3.60	0.0019

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	1850.256	1908.656	3.30	0.0018
4.48				3.00	0.0016

DC_7A-n5A

Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	824.240	847.656		
50				-0.40	0.0005
40				-1.20	0.0014
30				-1.50	0.0018
10				-2.60	0.0031
0				-1.70	0.0020
-10				-0.60	0.0007
-20				-3.20	0.0038
-30				-1.00	0.0012

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	824.240	847.656	-0.60	0.0007
4.48				0.10	0.0001



n7

Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	2500.272	2568.656		
50				-1.10	0.0004
40				0.90	0.0004
30				-0.90	0.0004
10				2.20	0.0009
0				4.70	0.0019
-10				3.00	0.0012
-20				5.90	0.0023
-30				3.20	0.0013

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	2500.272	2568.656	5.20	0.0021
4.48				6.70	0.0026

n12

Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	699.160	715.104		
50				0.90	0.0013
40				-2.40	0.0034
30				0.10	0.0001
10				-0.30	0.0004
0				0.20	0.0003
-10				3.00	0.0042
-20				3.50	0.0049
-30				-0.50	0.0007

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	699.160	715.104	2.80	0.0040
4.48				1.30	0.0018



n25

Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	1850.256	1913.656		
50				-4.50	0.0024
40				0.60	0.0003
30				-3.20	0.0017
10				0.60	0.0003
0				0.80	0.0004
-10				1.20	0.0006
-20				6.50	0.0035
-30				0.00	0.0000

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	1850.256	1913.656	0.50	0.0003
4.48				0.50	0.0003

n38

Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	2570.592	2617.184		
50				-5.00	0.0019
40				-3.50	0.0013
30				-2.20	0.0008
10				-3.00	0.0012
0				-2.10	0.0008
-10				0.40	0.0002
-20				2.30	0.0009
-30				1.40	0.0005

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	2570.592	2617.184	2.40	0.0009
4.48				3.10	0.0012



n41

Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	2496.768	2688.096		
50				1.70	0.0007
40				2.10	0.0008
30				4.20	0.0016
10				4.60	0.0018
0				3.60	0.0014
-10				2.10	0.0008
-20				2.60	0.0010
-30				2.90	0.0011

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	2496.768	2688.096	2.10	0.0008
4.48				6.70	0.0026

DC_5A-n66A

Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	1710.256	1778.672		
50				2.90	0.0017
40				0.30	0.0002
30				-0.60	0.0003
10				0.20	0.0001
0				2.90	0.0017
-10				7.20	0.0041
-20				2.60	0.0015
-30				2.00	0.0011

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	1710.256	1778.672	0.60	0.0003
4.48				3.60	0.0021

Expanded measurement uncertainty is 10Hz, $k = 2$



A.4 OCCUPIED BANDWIDTH&26dB Emission Bandwidth

Reference

FCC: CFR Part 2.1049, 22.917, 27.53.

A.4.1 Occupied Bandwidth Results

Occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the US Cellular/PCS frequency bands. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the following pages.

- a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (i.e., two to five times the OBW).
- b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
- c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least 10log (OBW / RBW) below the reference level.
- d) Set the detection mode to peak, and the trace mode to max hold.
- e) Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

A.4.2 Emission Bandwidth Results

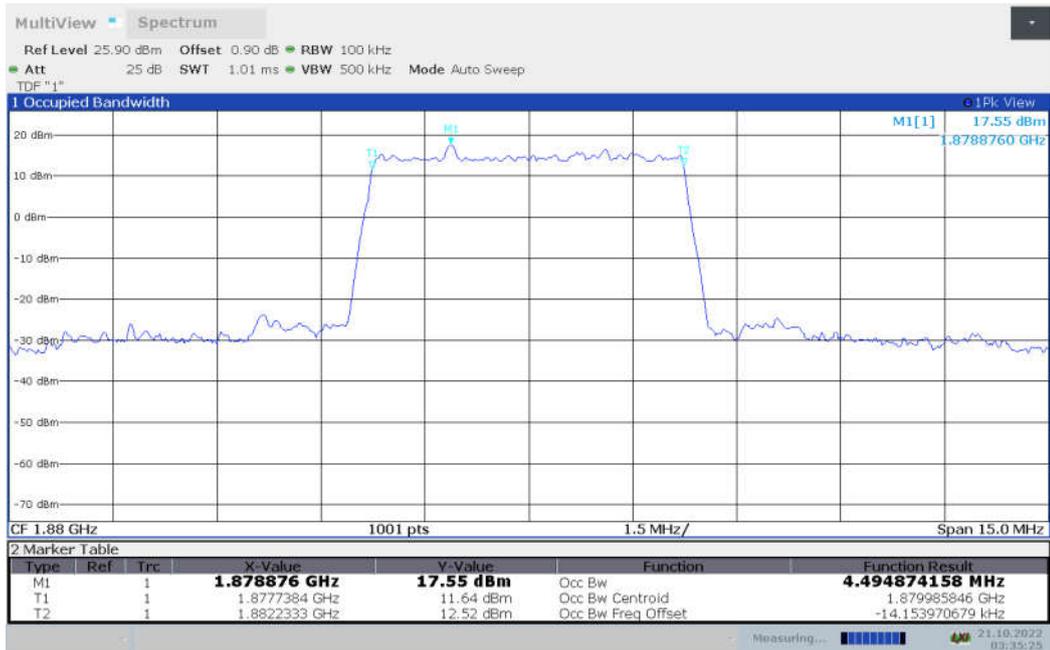
The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. Table below lists the measured -26dBc BW. Spectrum analyzer plots are included on the following pages.

n2

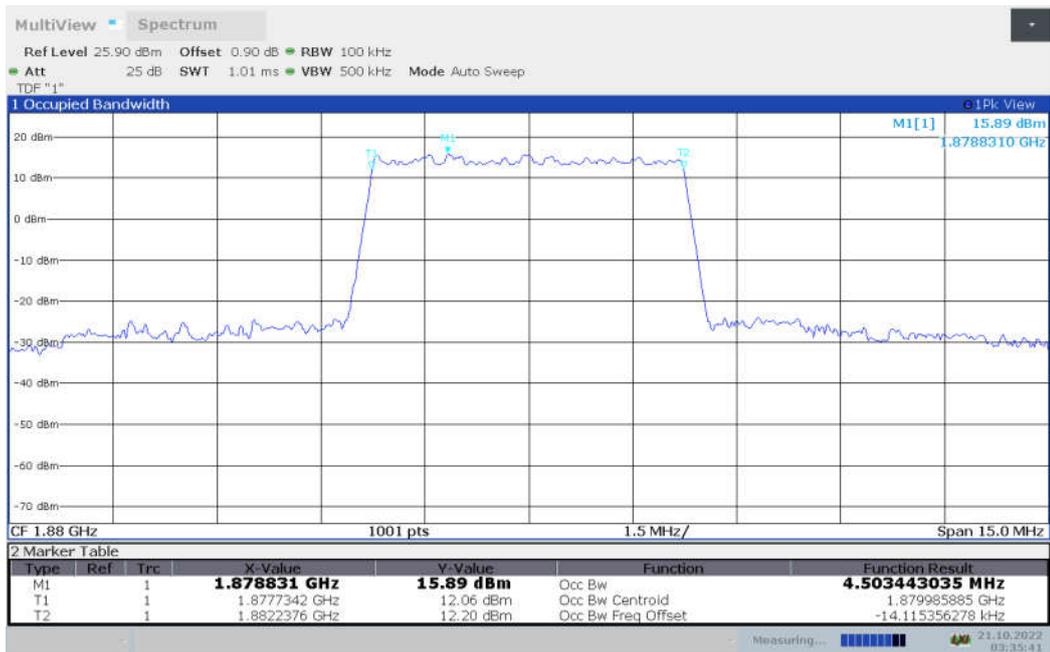
n2,5MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
1880	4.495	4.503

n2,5MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n2,5MHz Bandwidth,DFT-s-QPSK (99% BW)

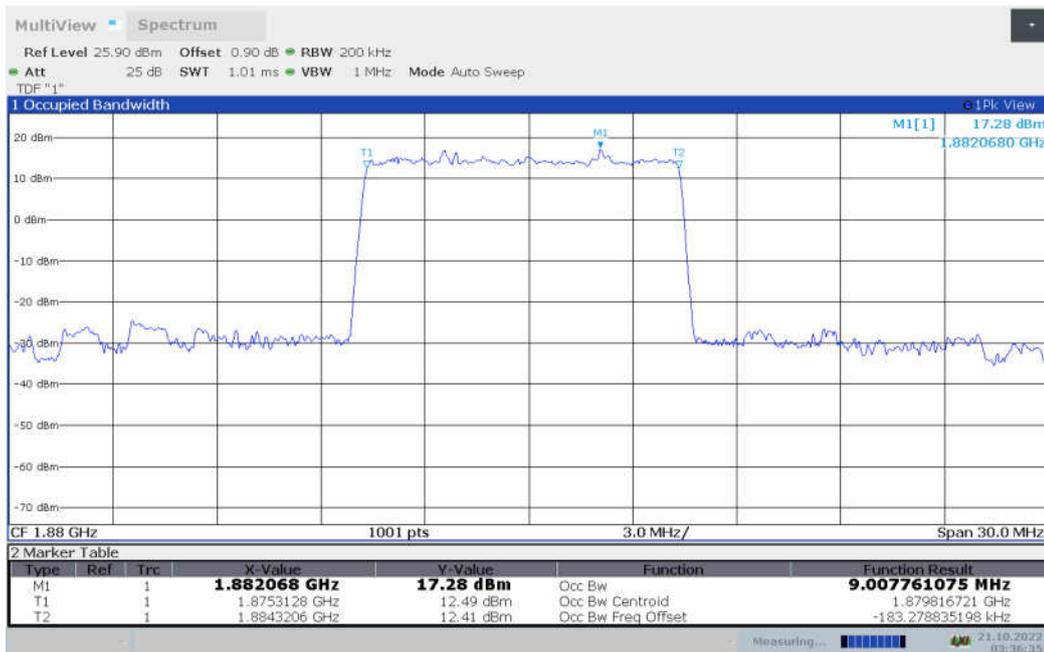




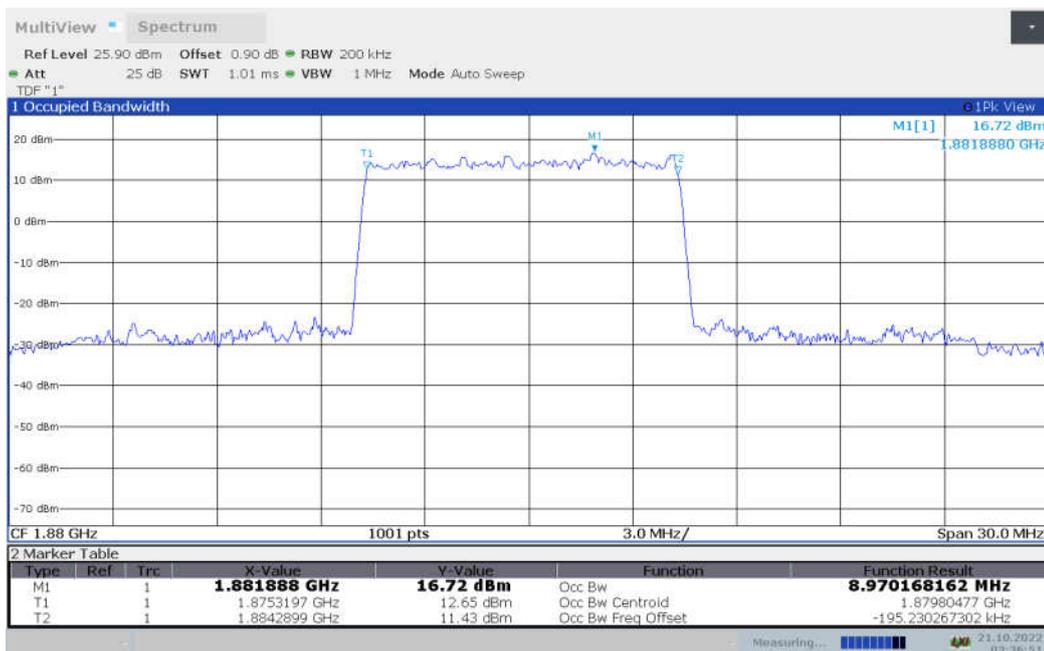
n2,10MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
1880	9.008	8.970

n2,10MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n2,10MHz Bandwidth,DFT-s-QPSK (99% BW)

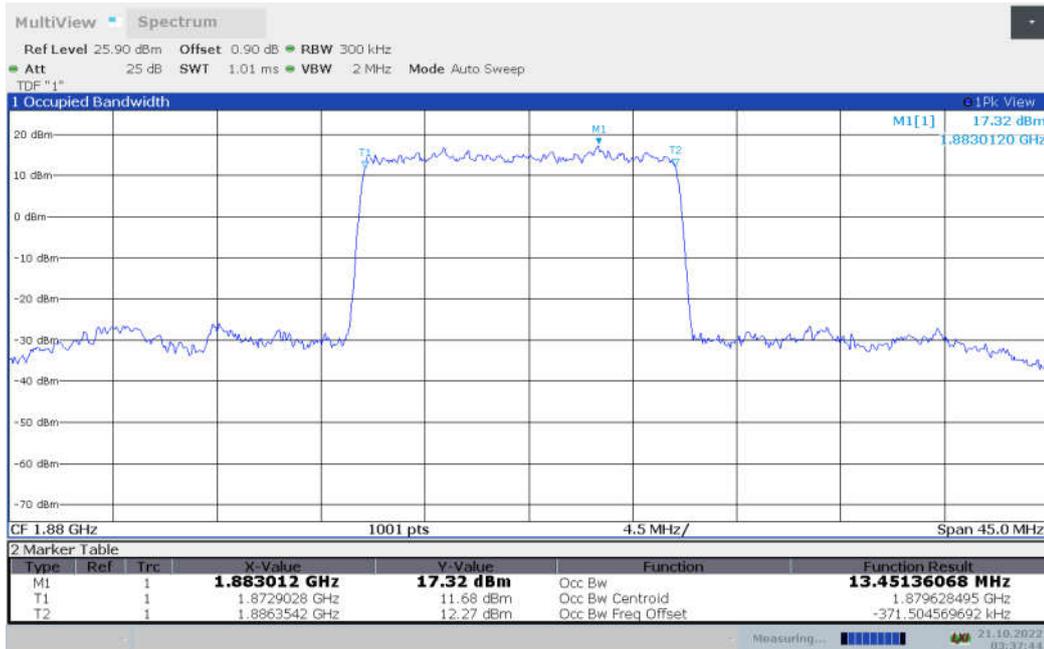




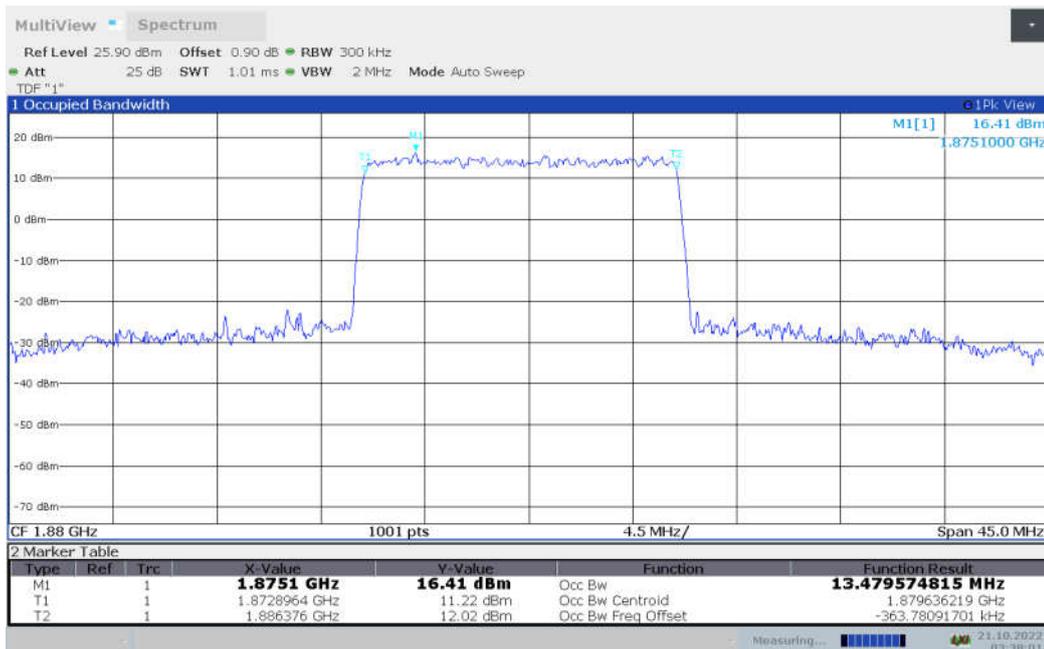
n2,15MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
1880	13.451	13.480

n2,15MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n2,15MHz Bandwidth,DFT-s-QPSK (99% BW)

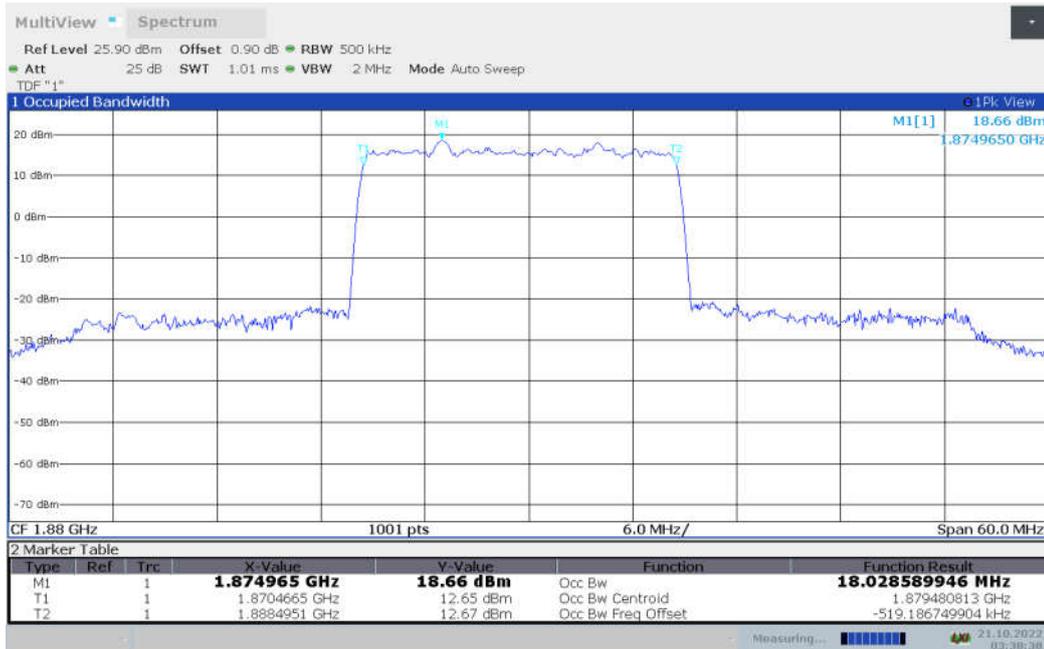




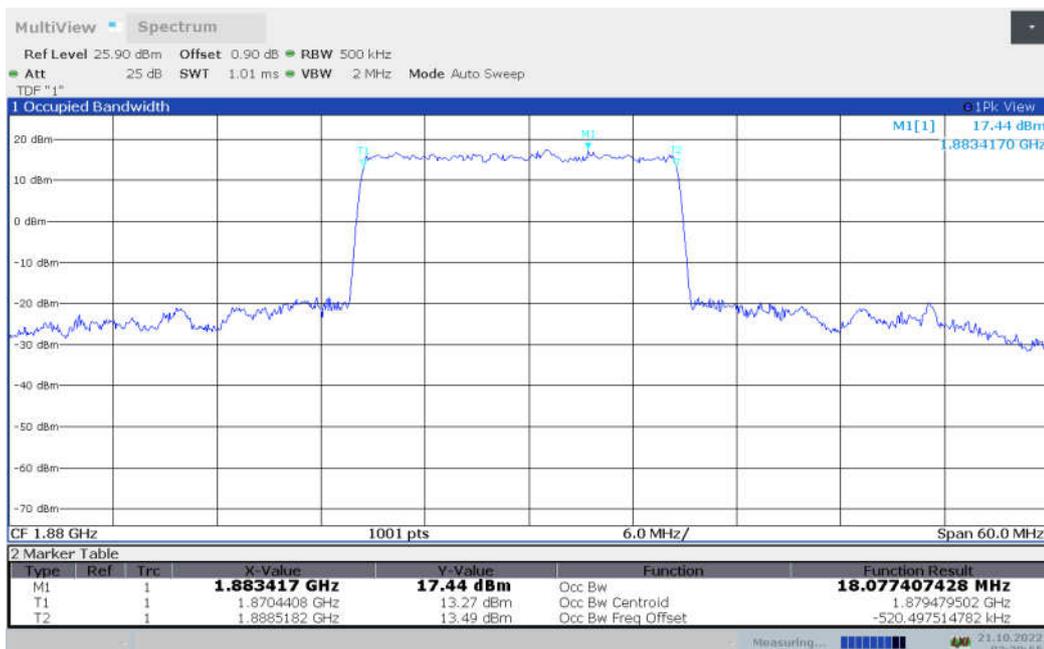
n2,20MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
1880	18.029	18.077

n2,20MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n2,20MHz Bandwidth,DFT-s-QPSK (99% BW)



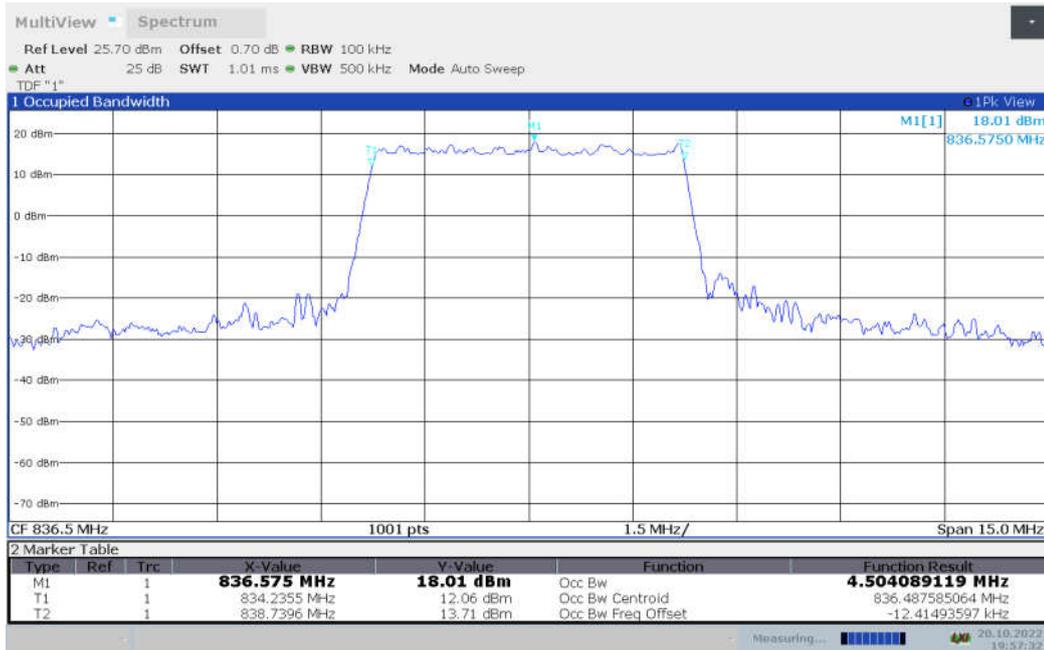


DC_7A-n5A

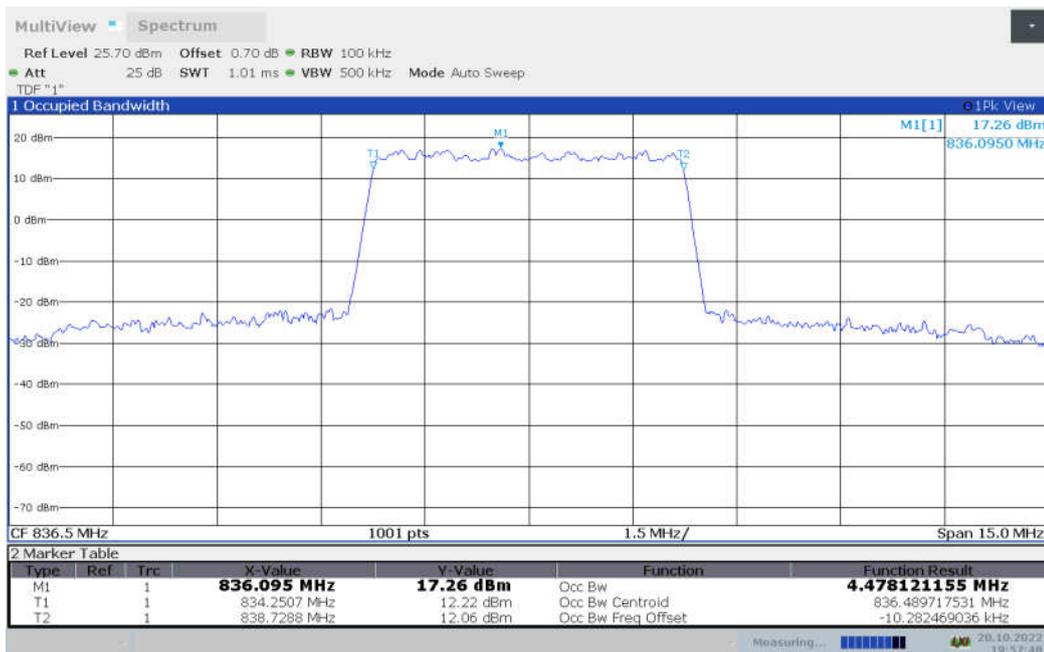
DC_7A-n5A,5MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
836.5	4.504	4.478

DC_7A-n5A,5MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



DC_7A-n5A,5MHz Bandwidth,DFT-s-QPSK (99% BW)

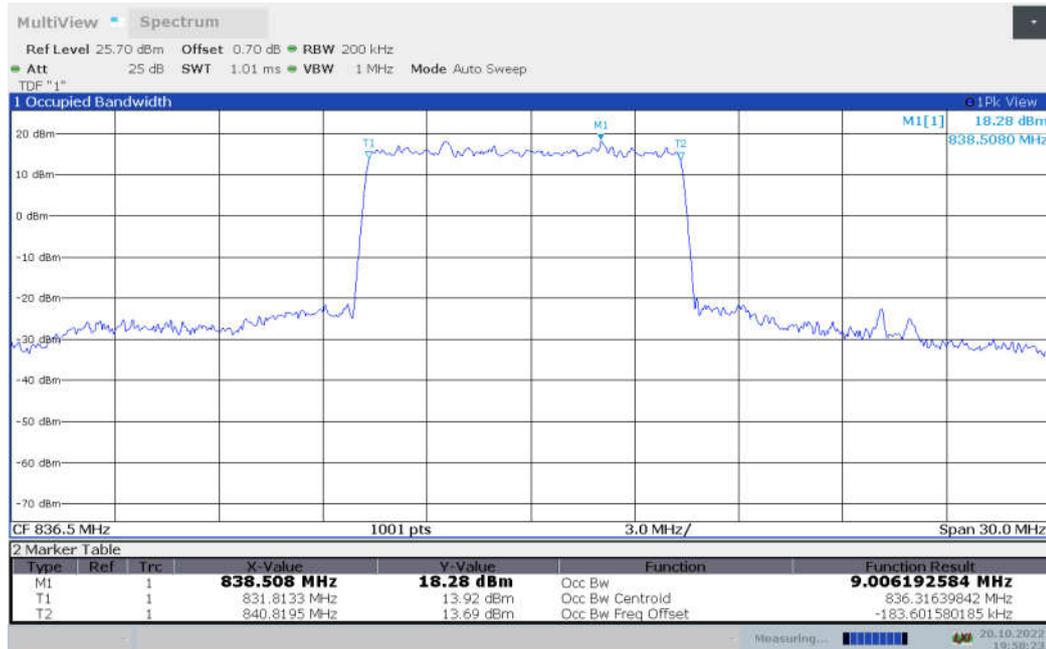




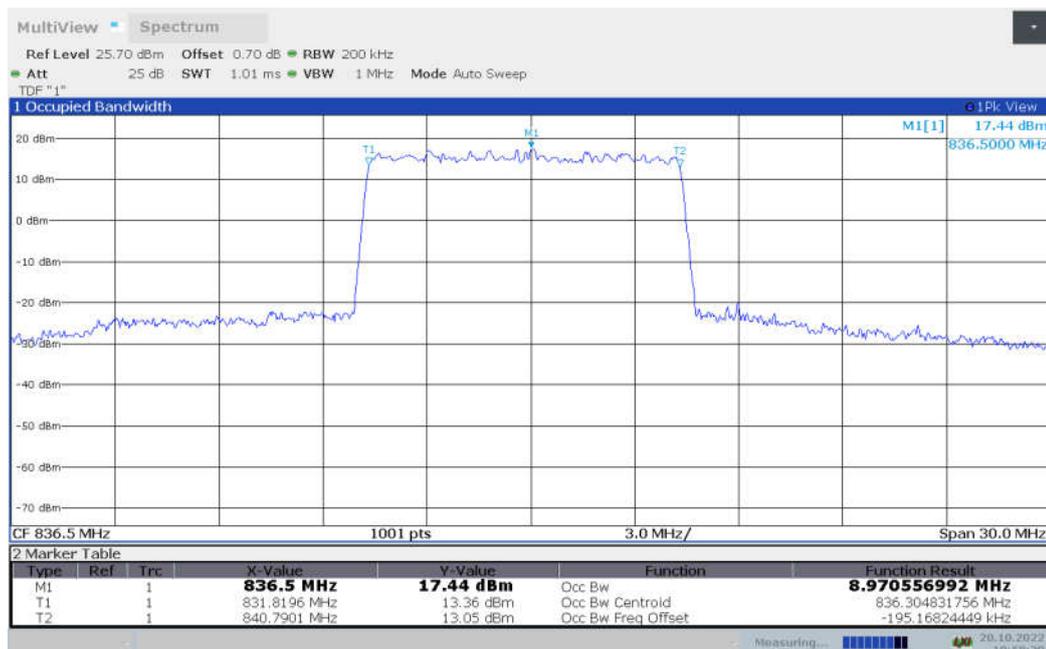
DC_7A-n5A,10MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
836.5	9.006	8.971

DC_7A-n5A,10MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



DC_7A-n5A,10MHz Bandwidth,DFT-s-QPSK (99% BW)

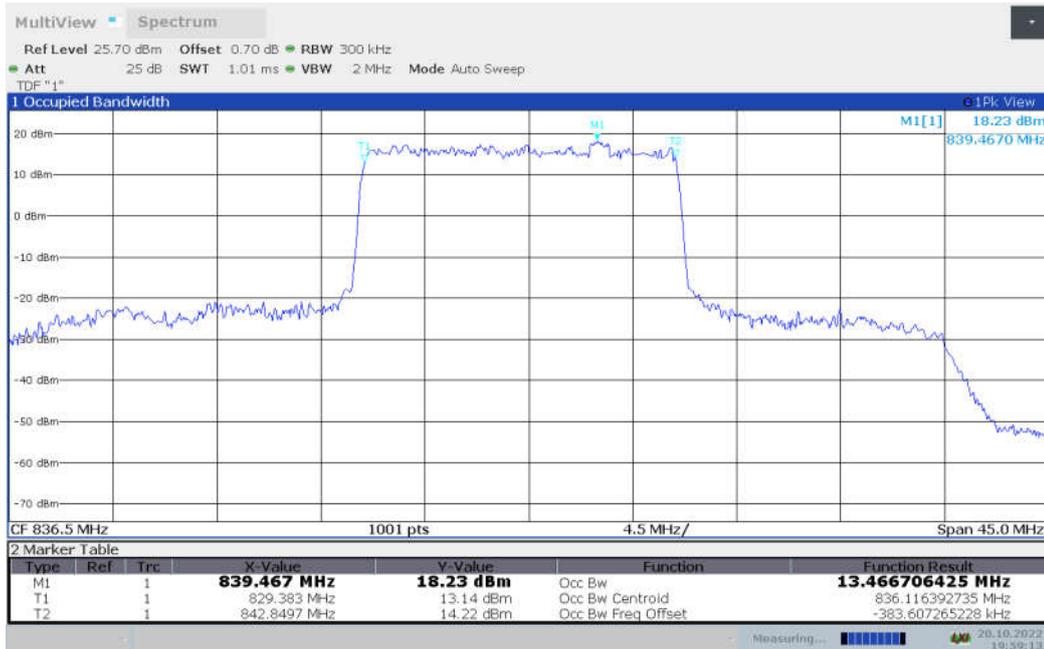




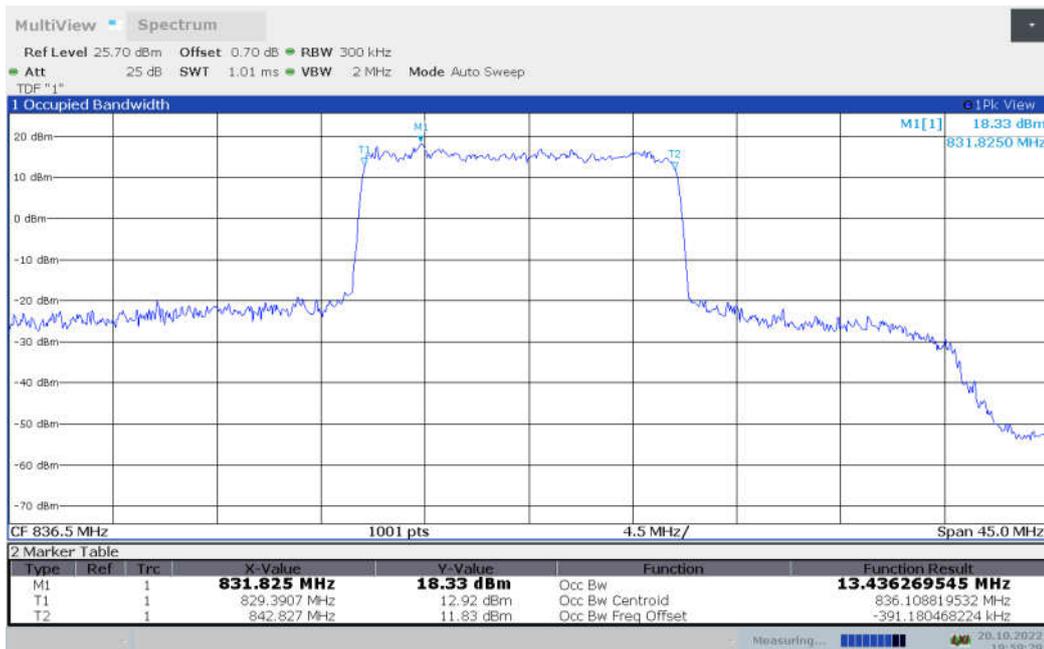
DC_7A-n5A,15MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
836.5	13.467	13.436

DC_7A-n5A,15MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



DC_7A-n5A,15MHz Bandwidth,DFT-s-QPSK (99% BW)

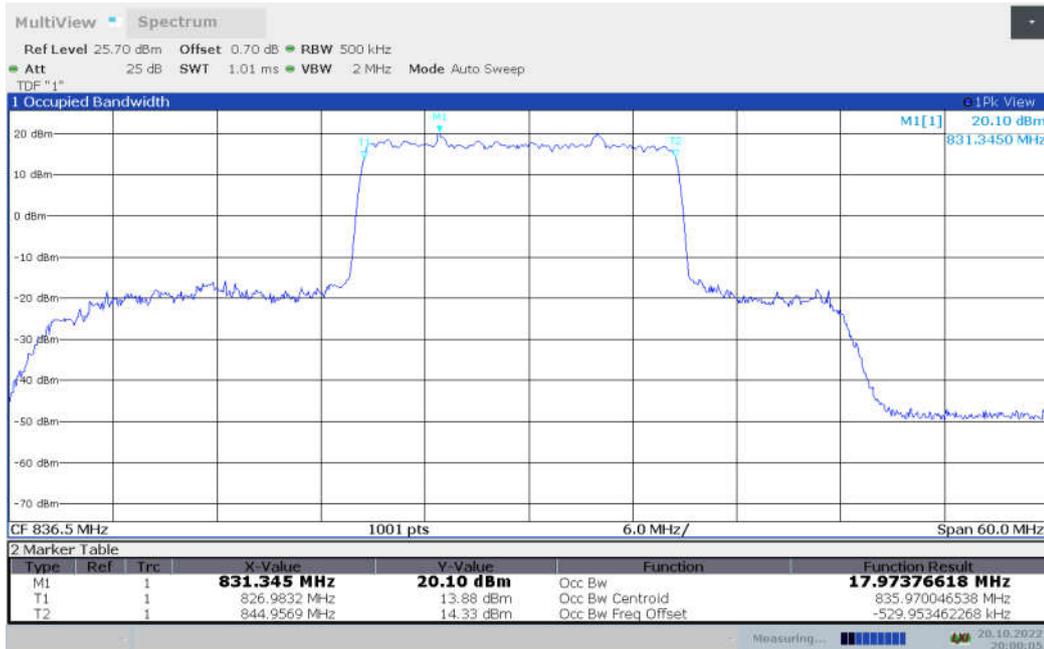




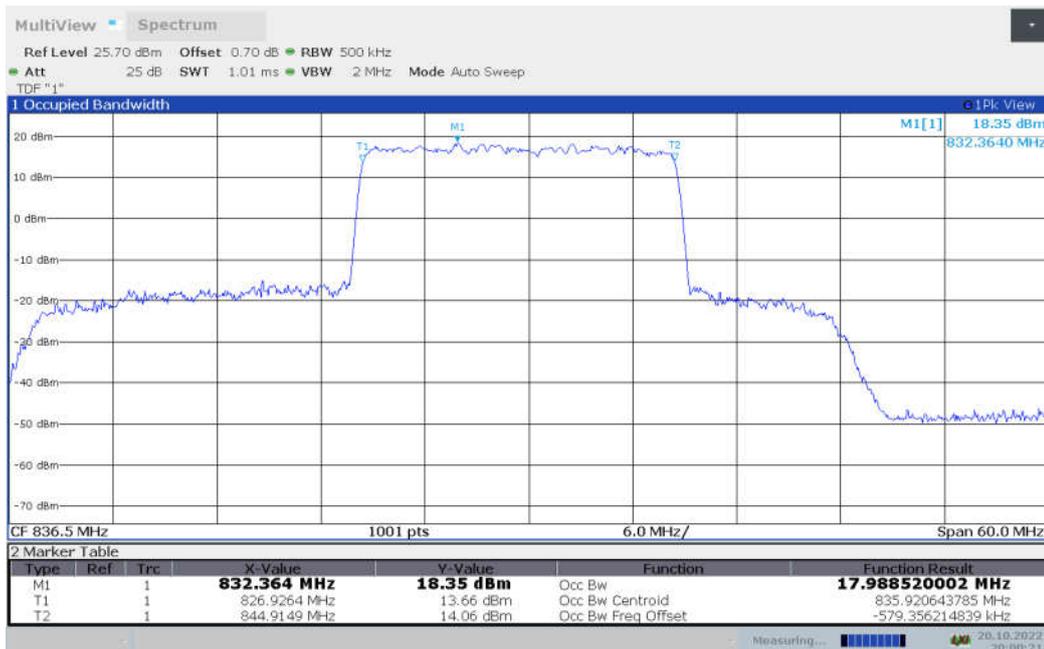
DC_7A-n5A,20MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
836.5	17.974	17.989

DC_7A-n5A,20MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



DC_7A-n5A,20MHz Bandwidth,DFT-s-QPSK (99% BW)



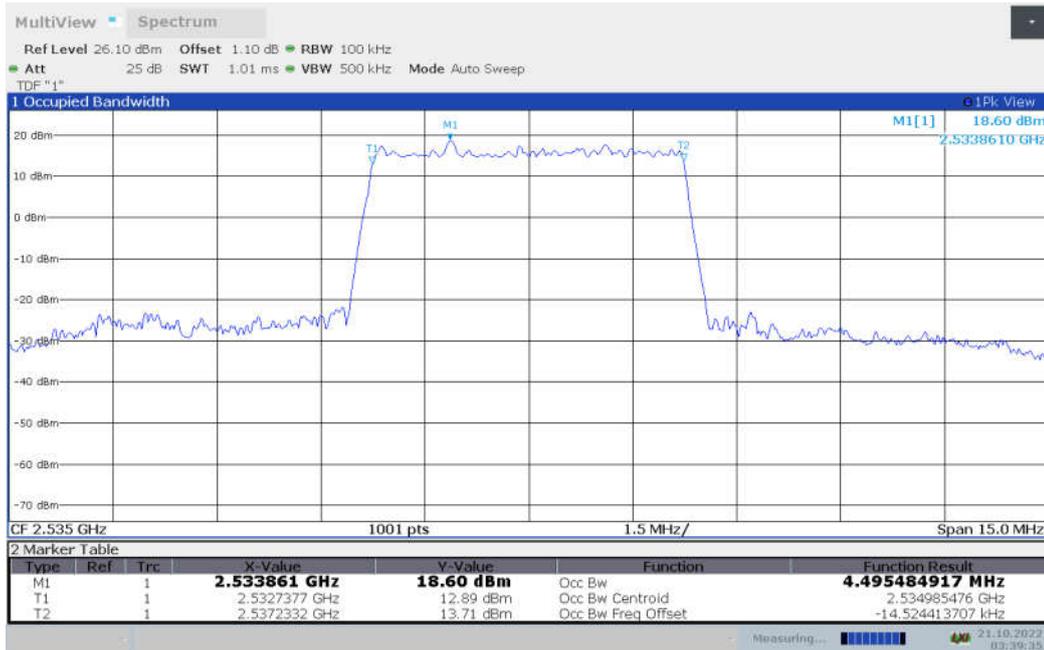


n7

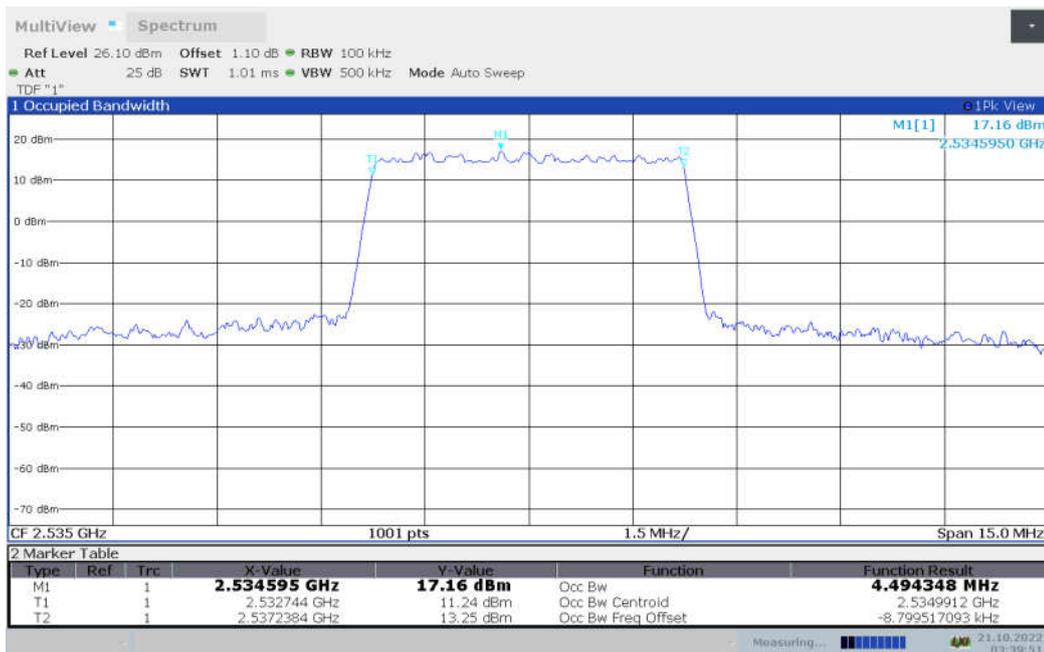
n7,5MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
2535	4.495	4.494

n7,5MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n7,5MHz Bandwidth,DFT-s-QPSK (99% BW)

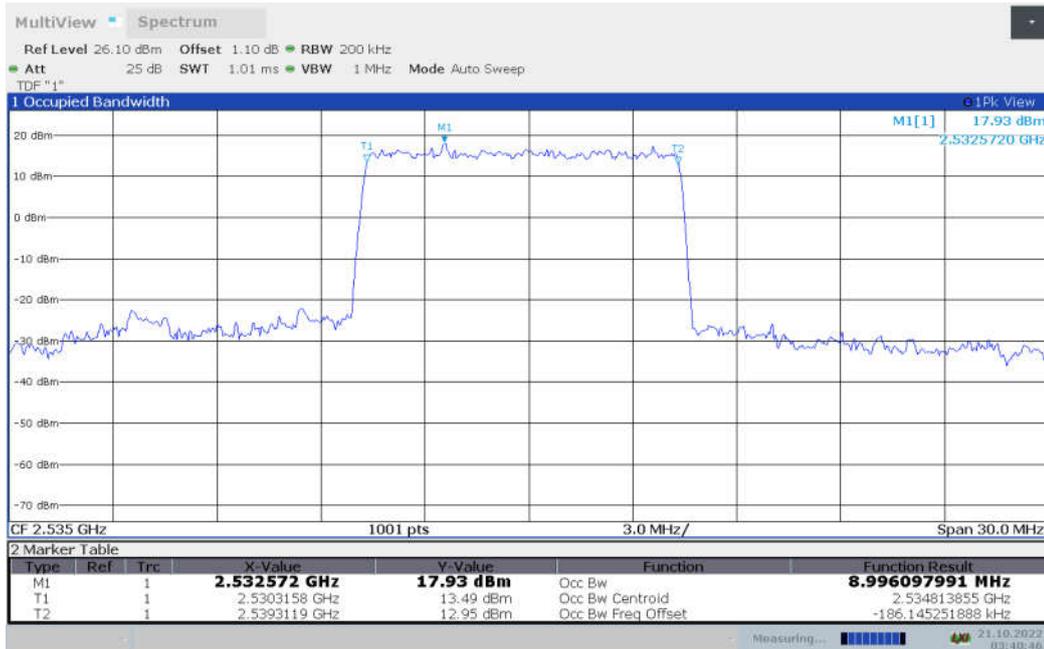




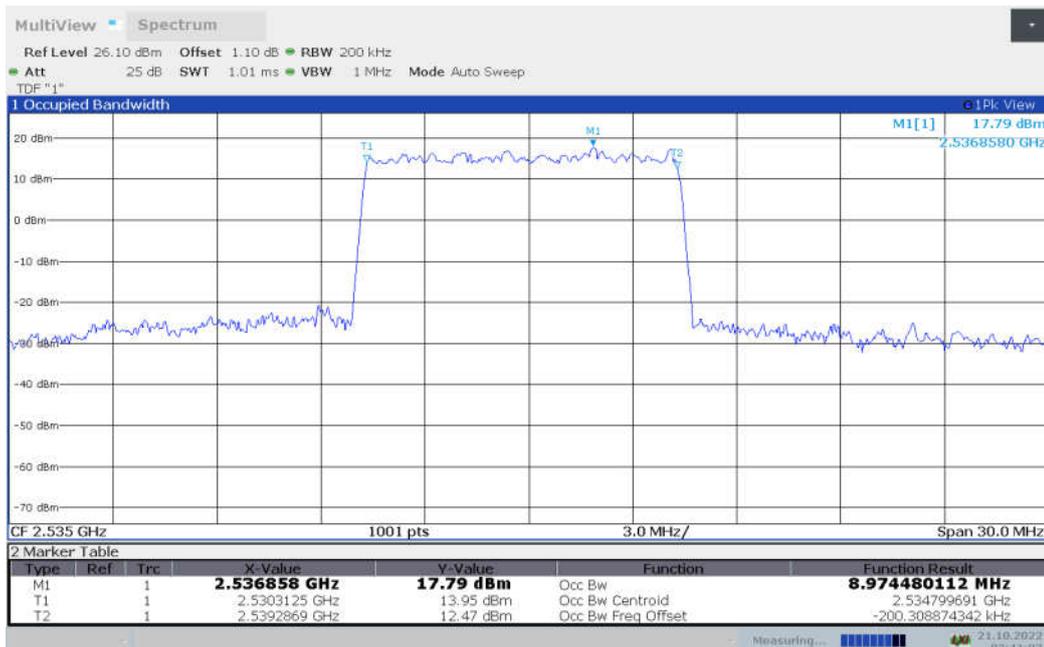
n7,10MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
2535	8.996	8.974

n7,10MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n7,10MHz Bandwidth,DFT-s-QPSK (99% BW)

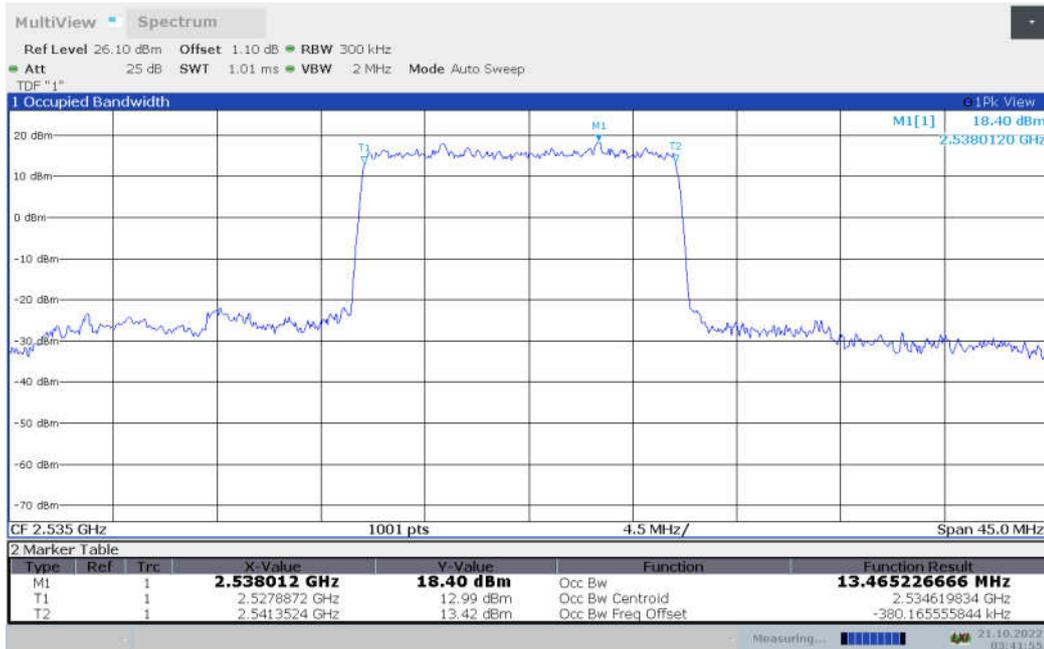




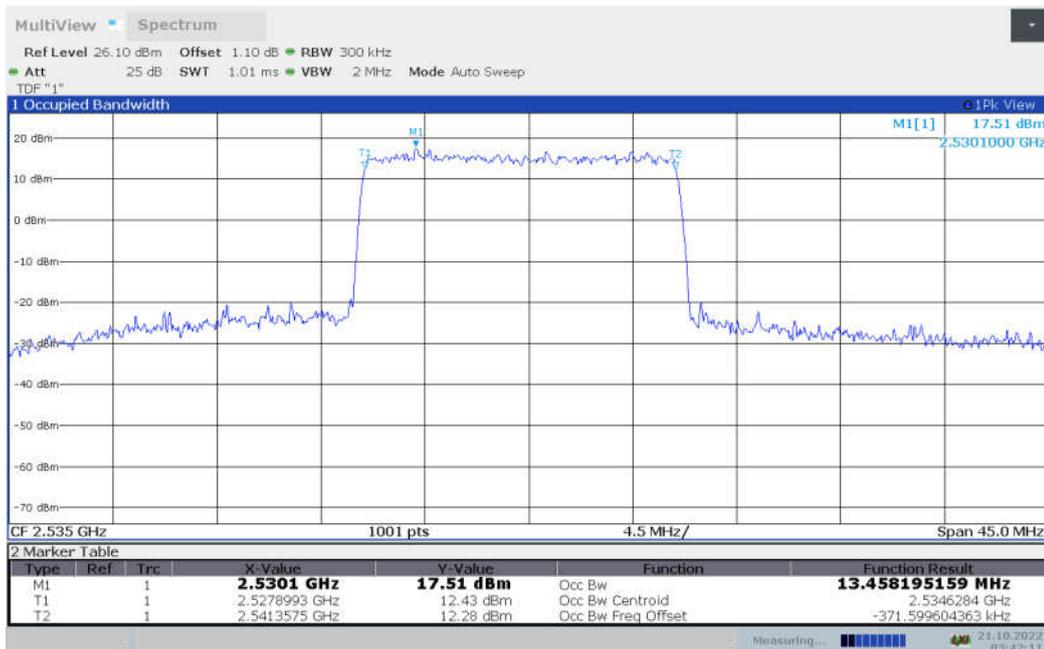
n7,15MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
2535	13.465	13.458

n7,15MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n7,15MHz Bandwidth,DFT-s-QPSK (99% BW)

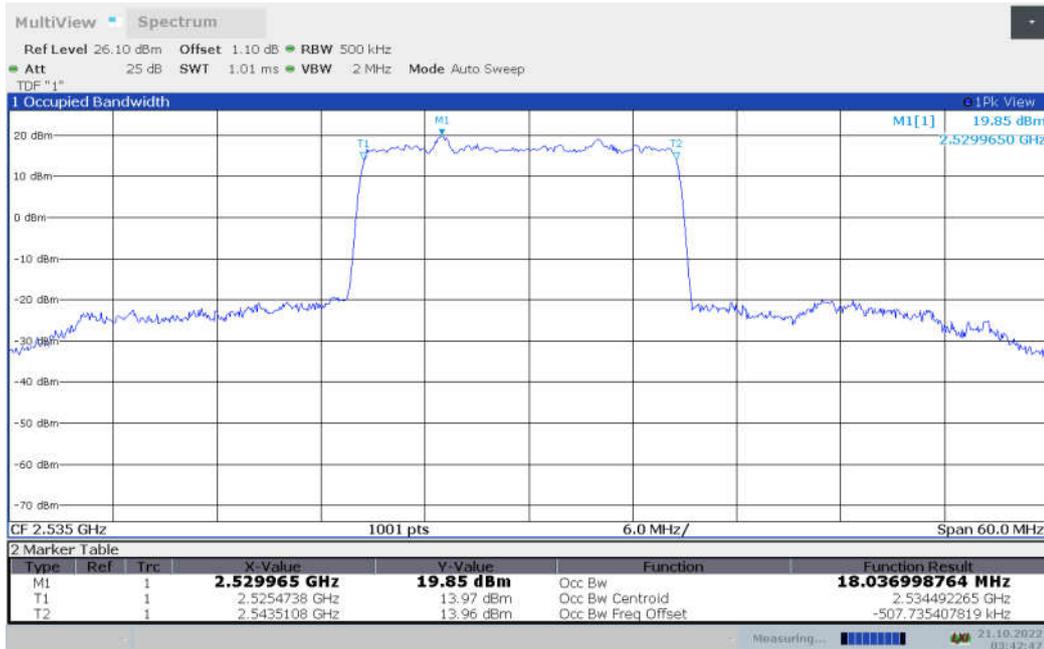




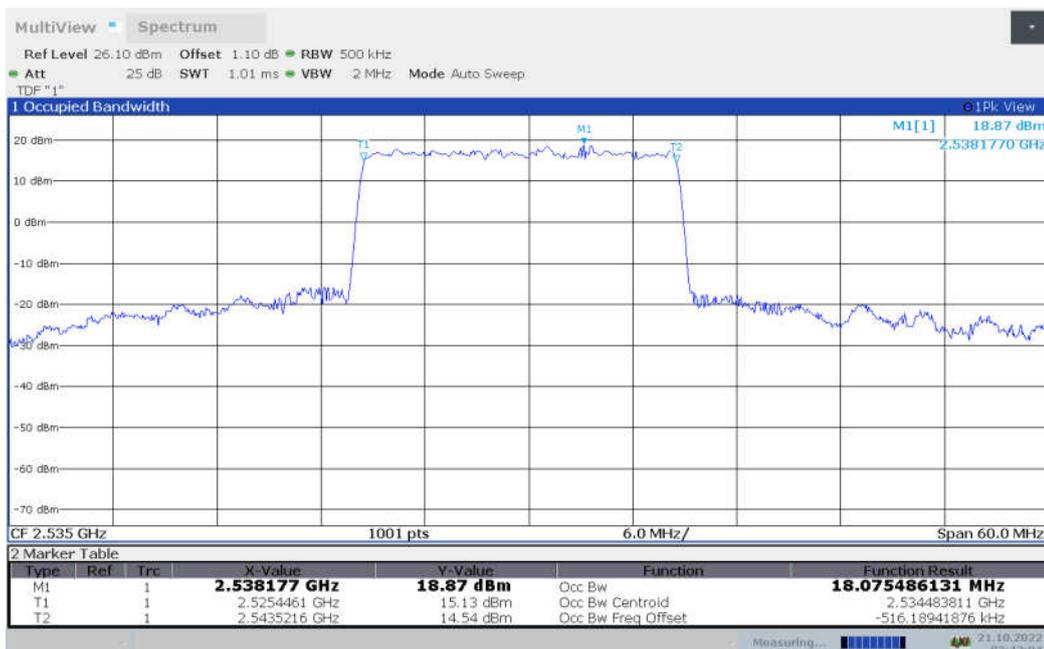
n7,20MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
2535	18.037	18.075

n7,20MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n7,20MHz Bandwidth,DFT-s-QPSK (99% BW)



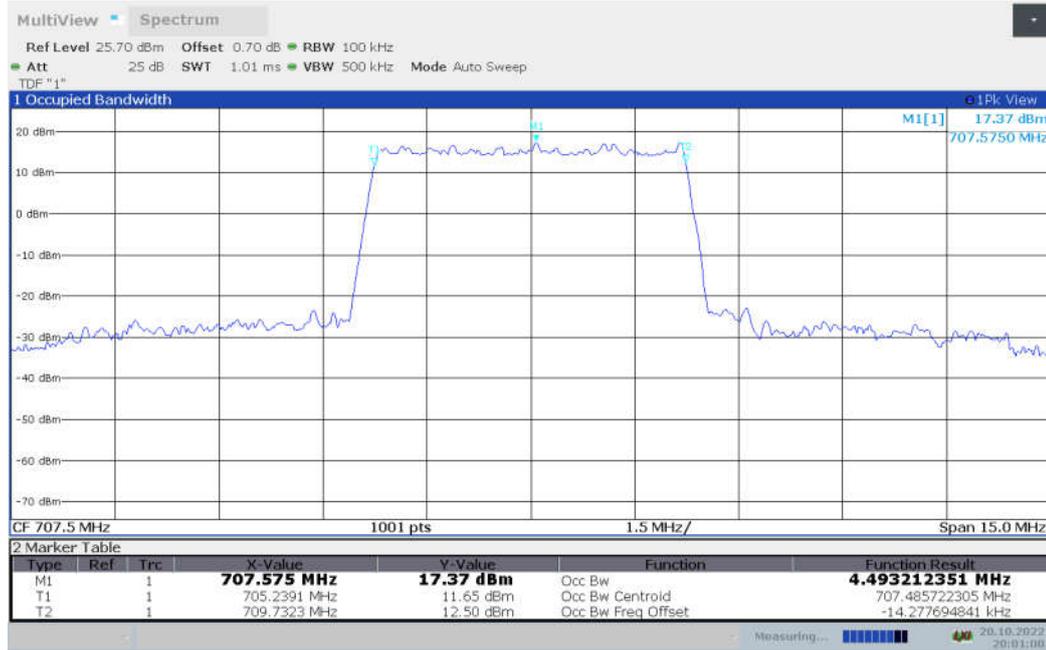


n12

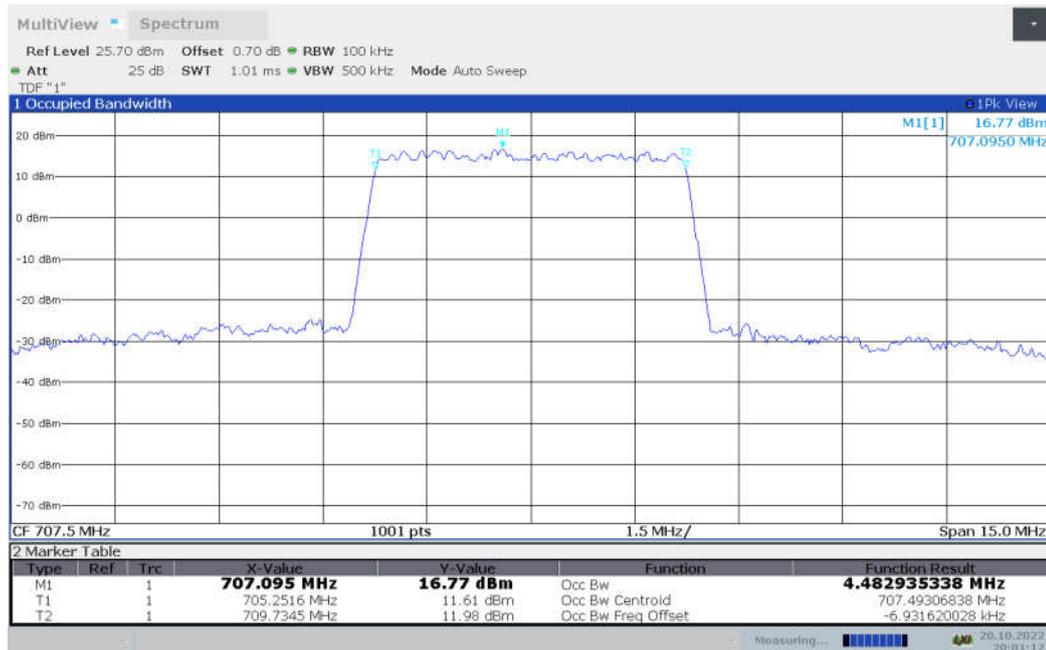
n12,5MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
707.5	4.493	4.483

n12,5MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n12,5MHz Bandwidth,DFT-s-QPSK (99% BW)

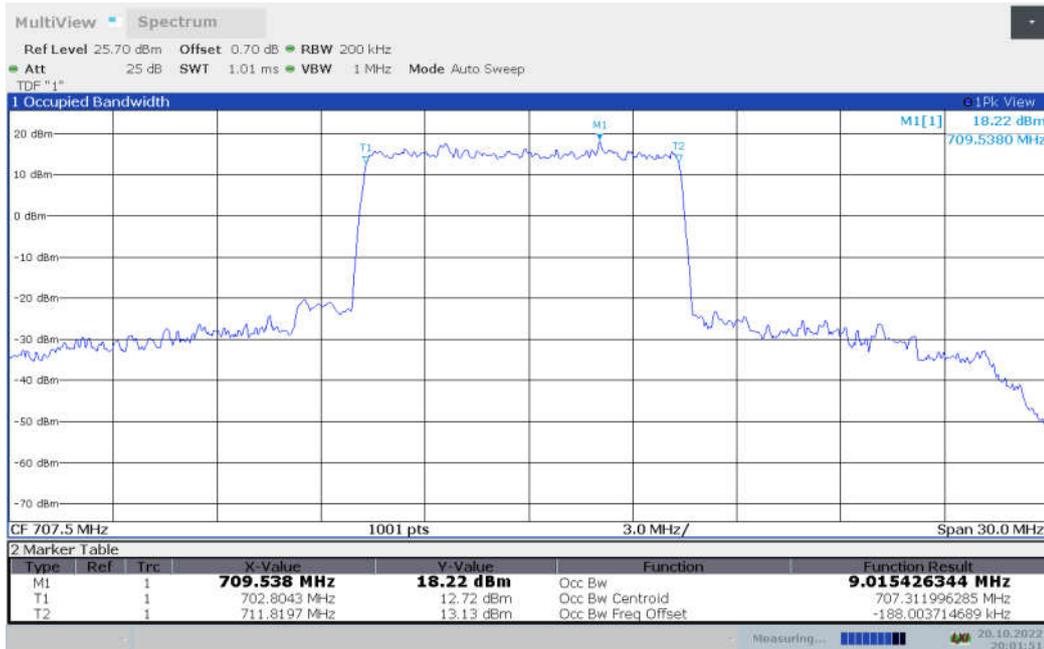




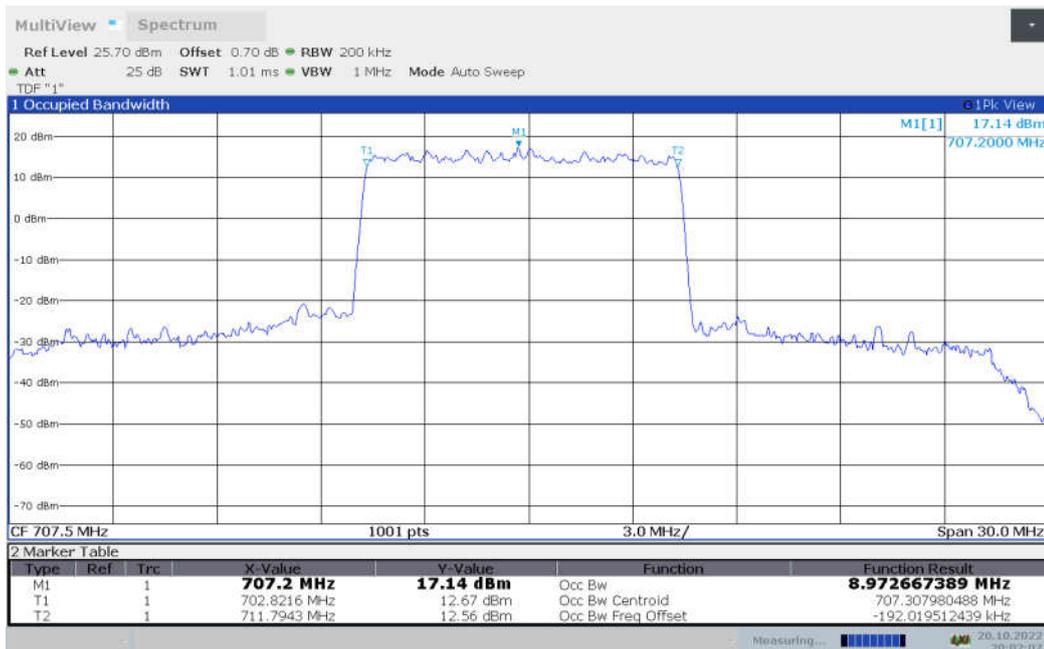
n12,10MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
707.5	9.015	8.973

n12,10MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n12,10MHz Bandwidth,DFT-s-QPSK (99% BW)

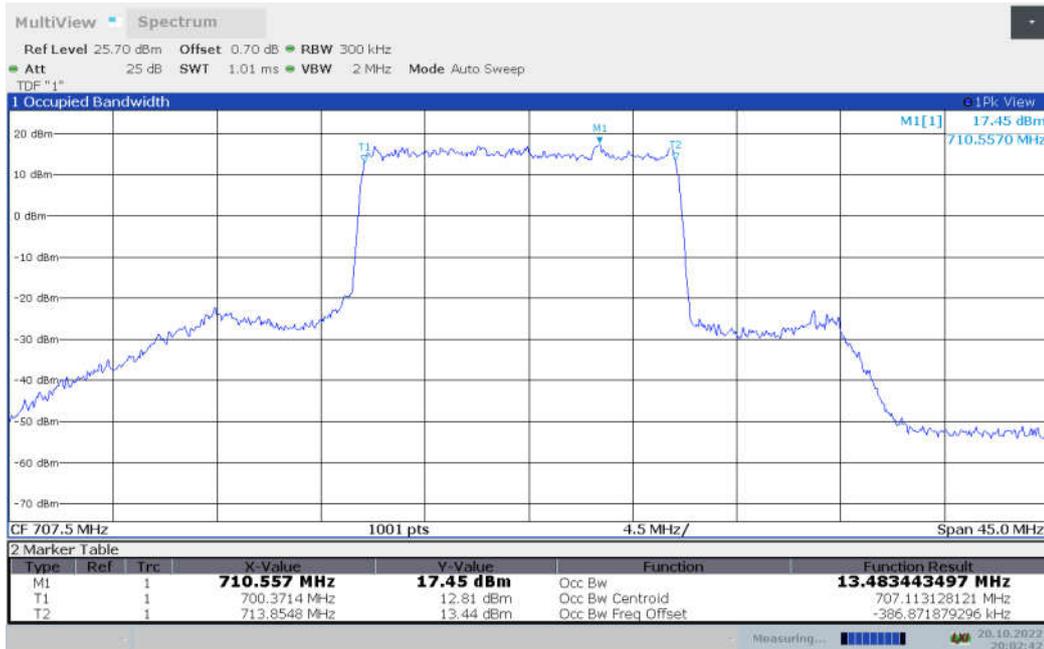




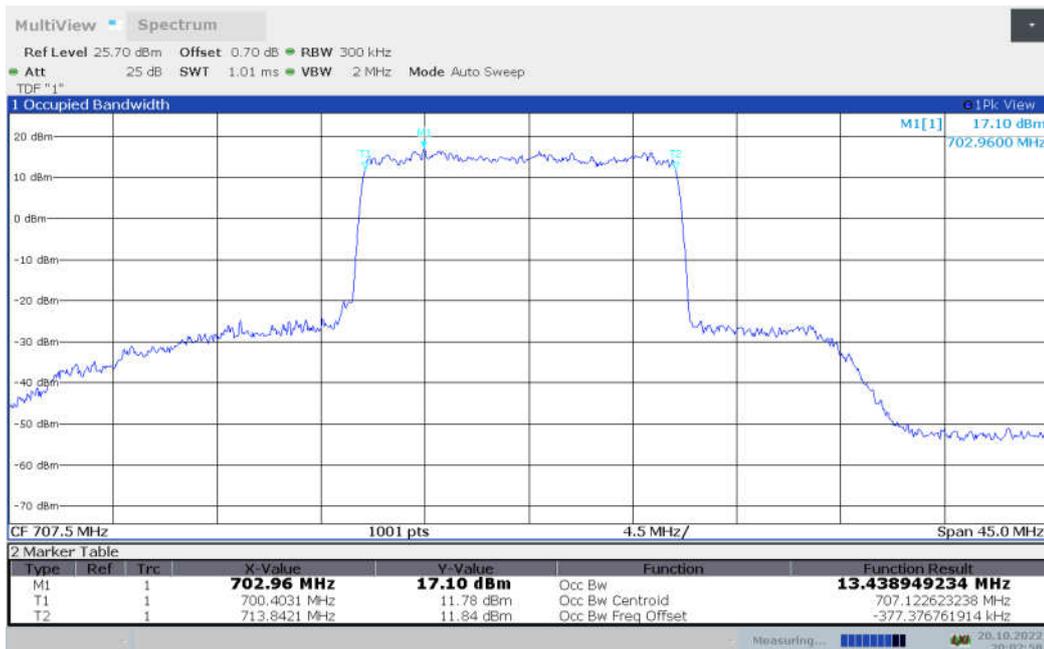
n12,15MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
707.5	13.483	13.439

n12,15MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n12,15MHz Bandwidth,DFT-s-QPSK (99% BW)



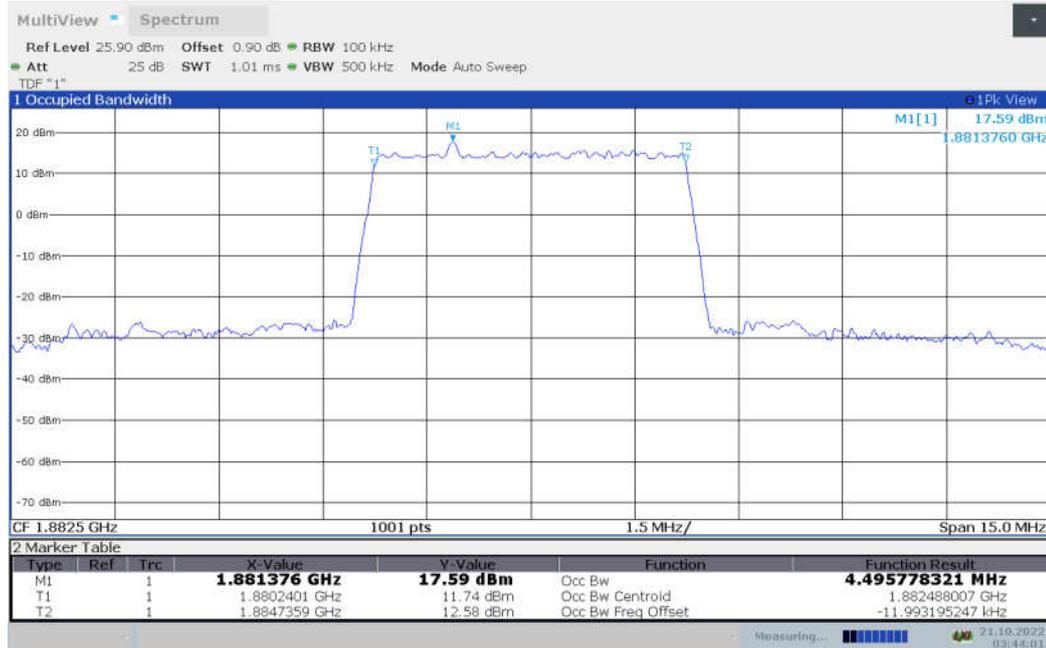


n25

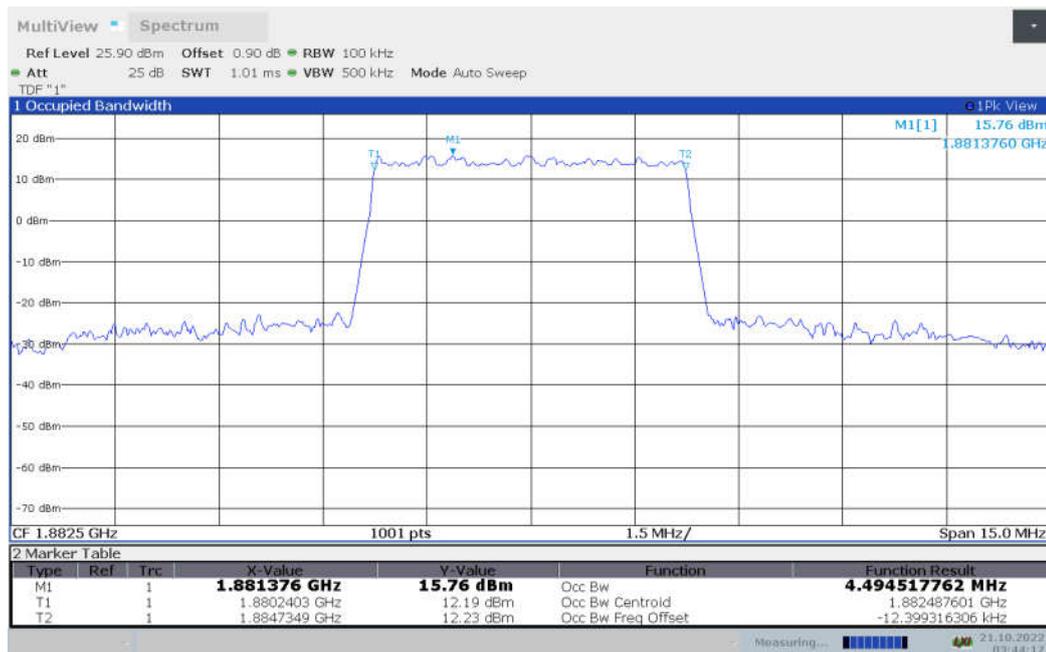
n25,5MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
1882.5	4.496	4.495

n25,5MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n25,5MHz Bandwidth,DFT-s-QPSK (99% BW)

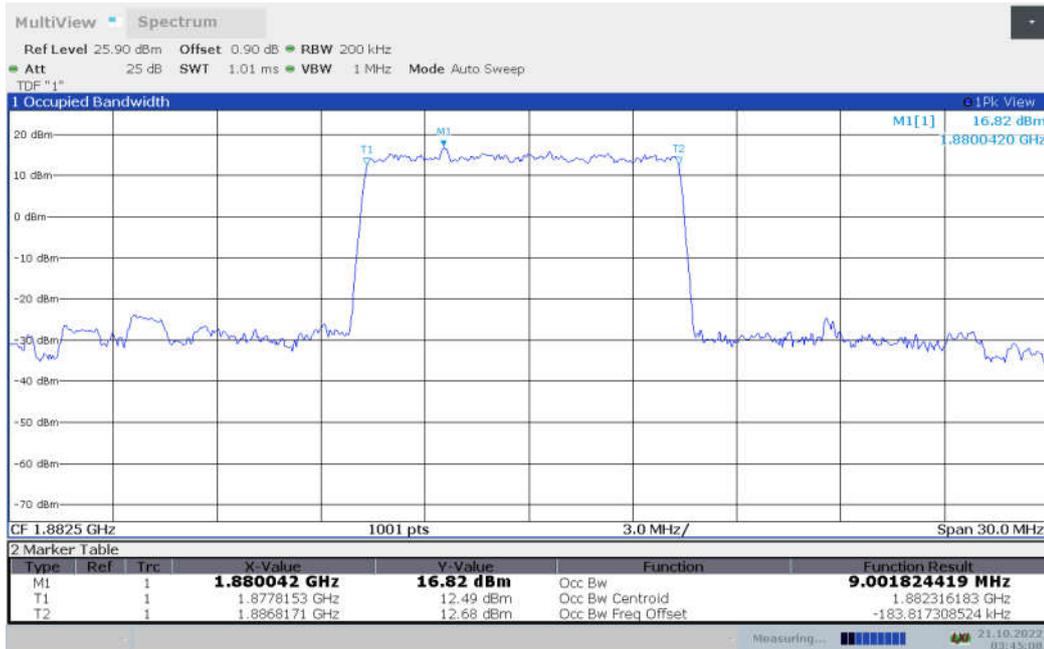




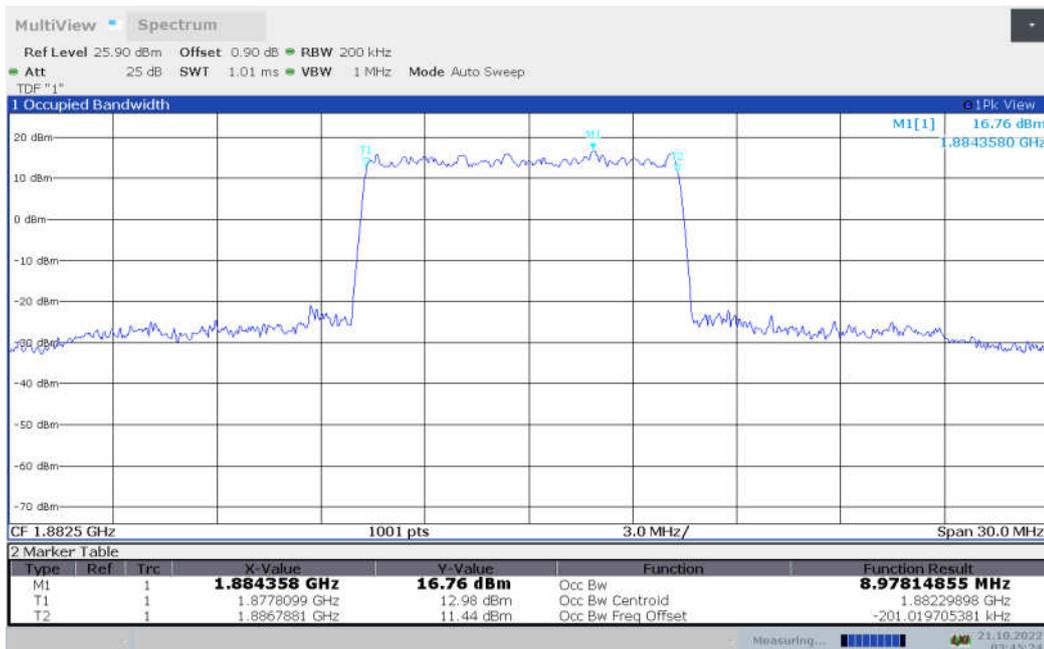
n25,10MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
1882.5	9.002	8.978

n25,10MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n25,10MHz Bandwidth,DFT-s-QPSK (99% BW)

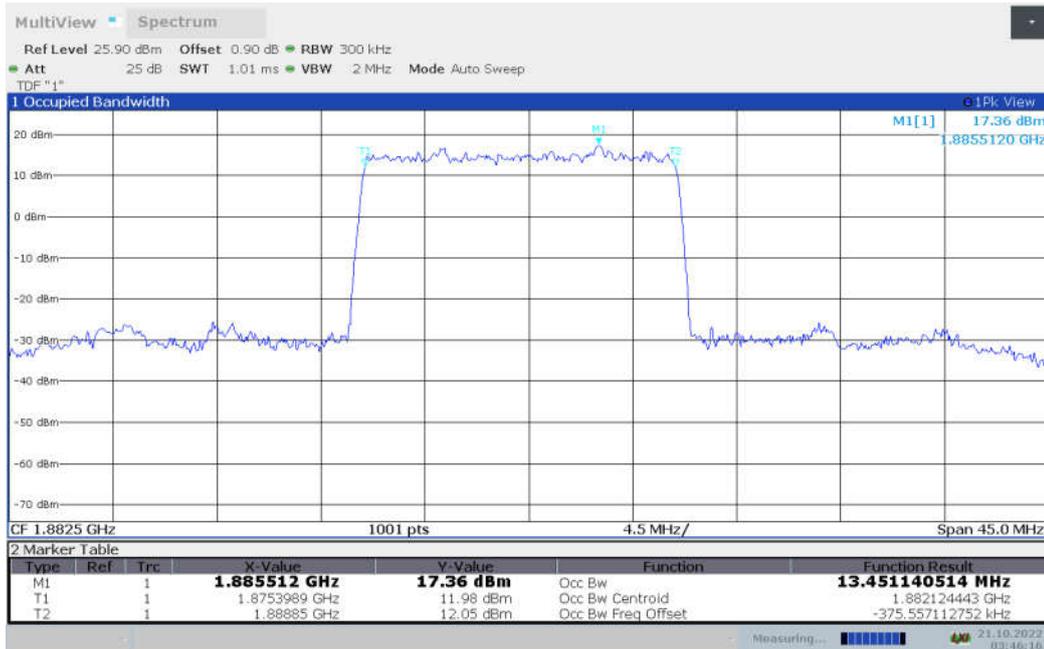




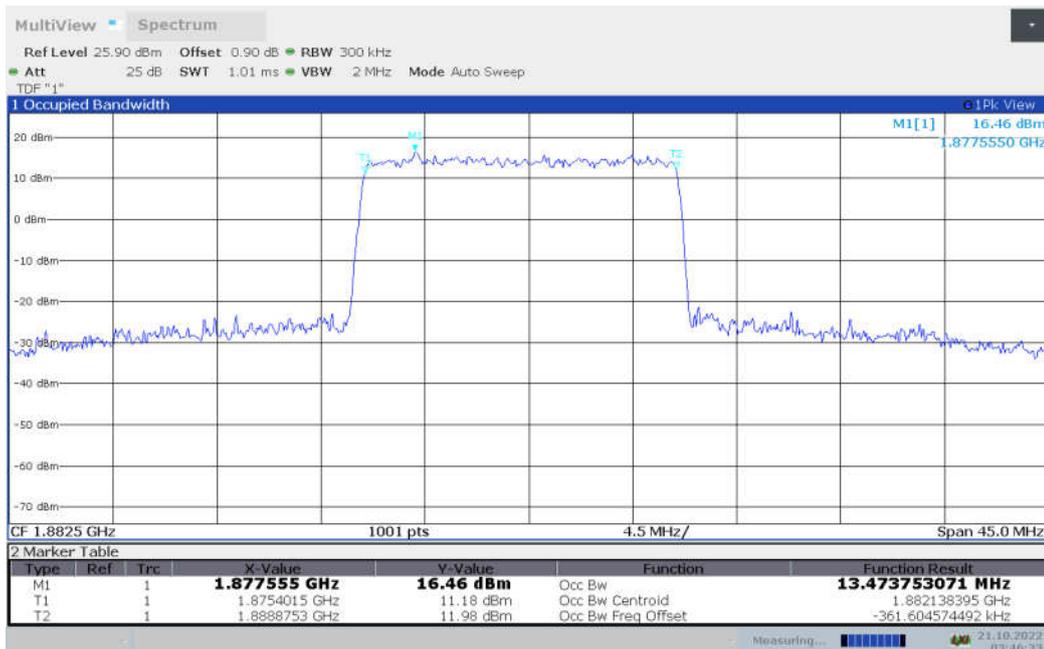
n25,15MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
1882.5	13.451	13.474

n25,15MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n25,15MHz Bandwidth,DFT-s-QPSK (99% BW)

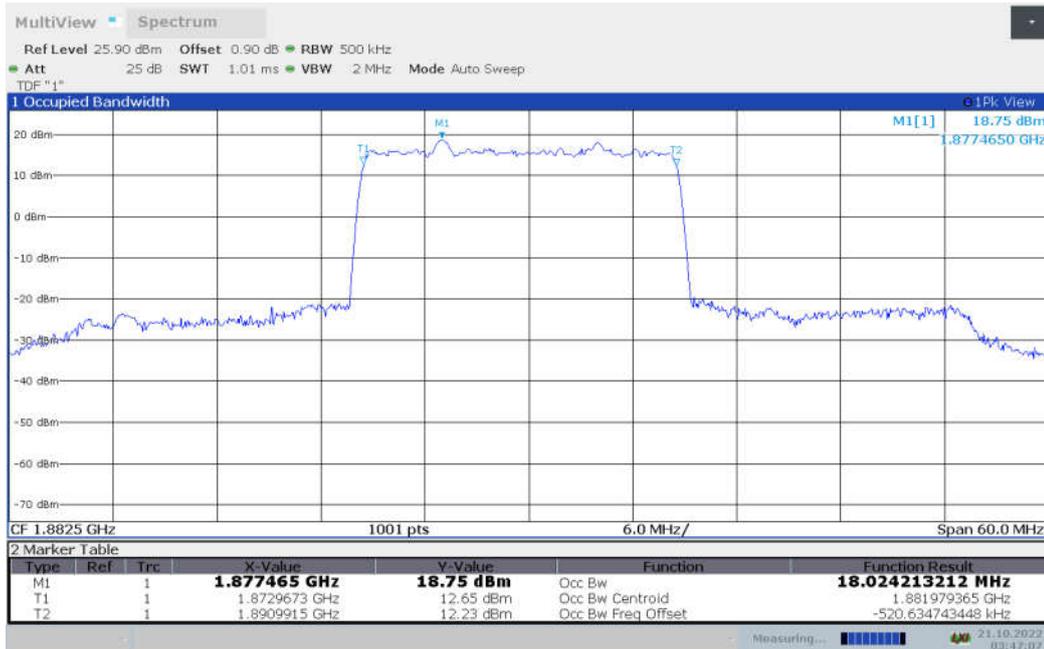




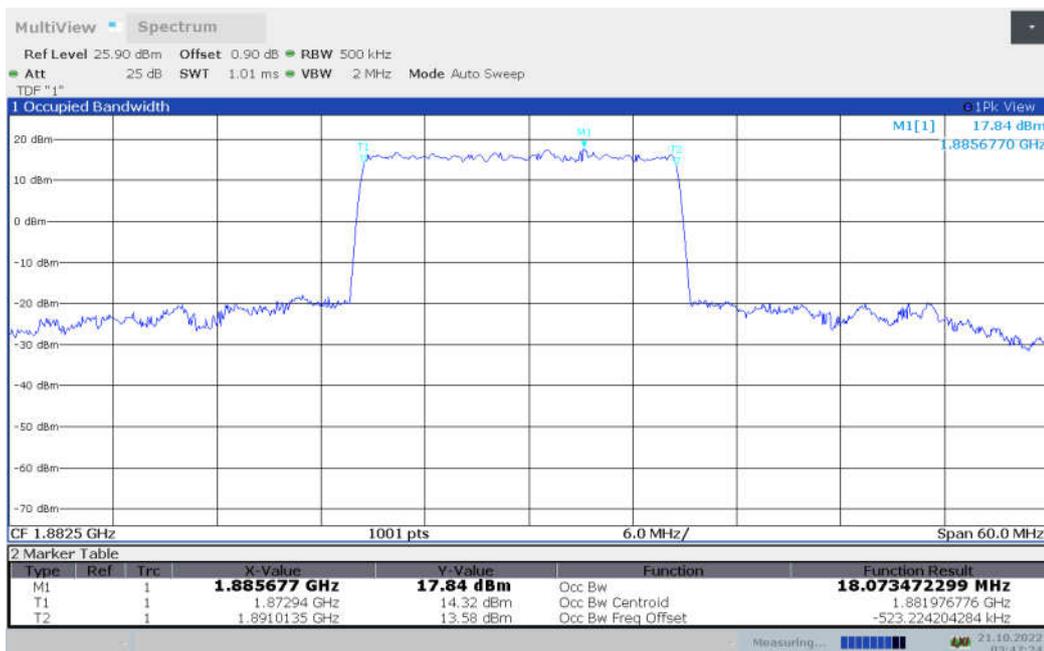
n25,20MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
1882.5	18.024	18.073

n25,20MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n25,20MHz Bandwidth,DFT-s-QPSK (99% BW)



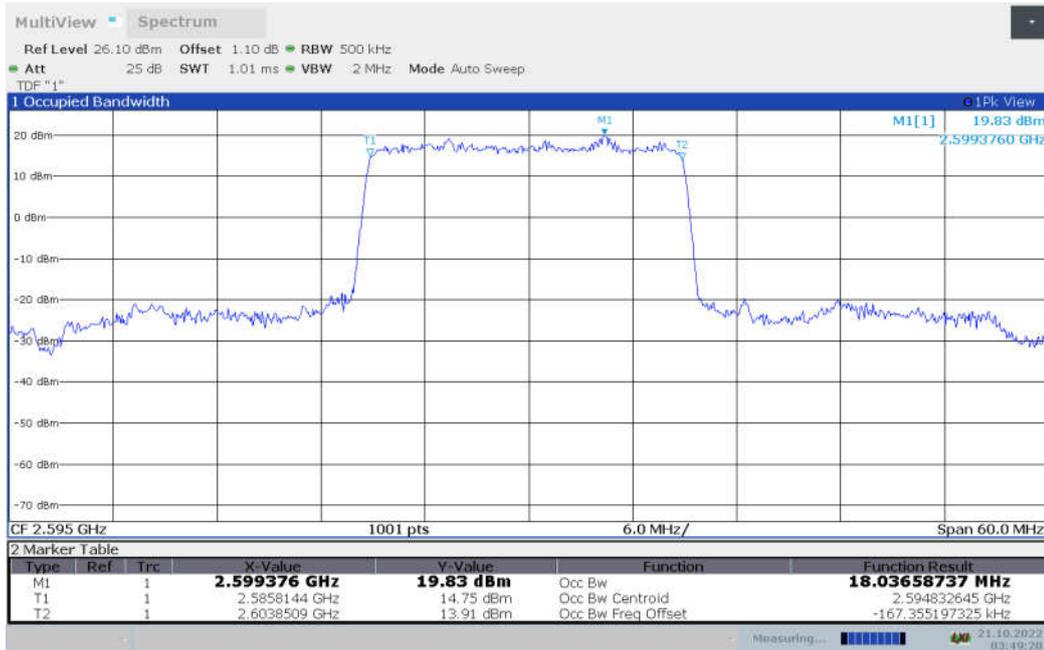


n38

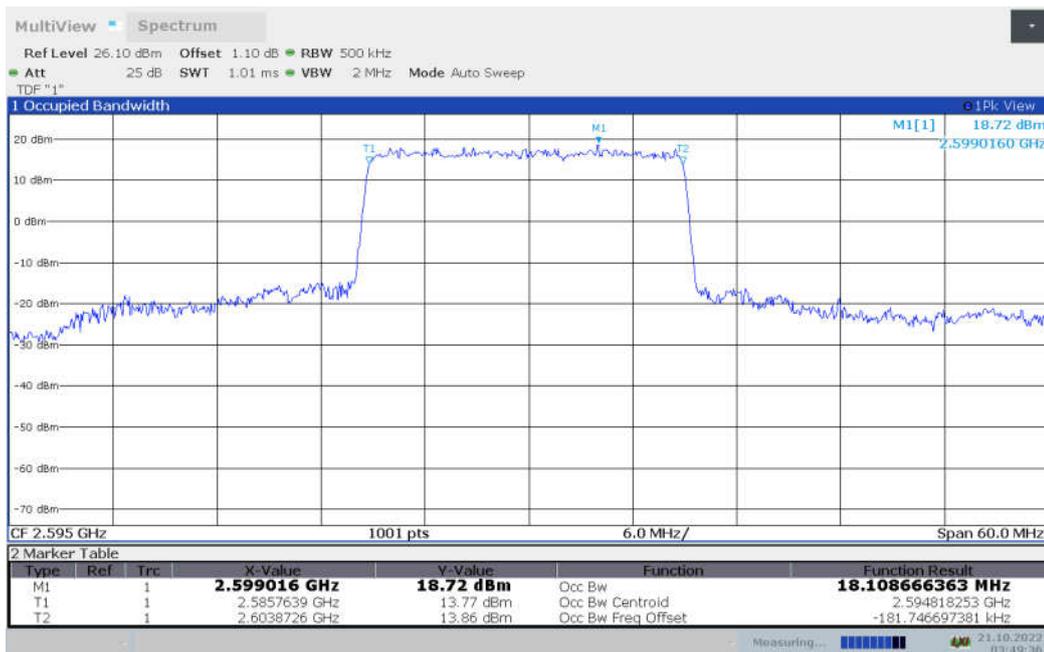
n38,20MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
2595	18.037	18.109

n38,20MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n38,20MHz Bandwidth,DFT-s-QPSK (99% BW)

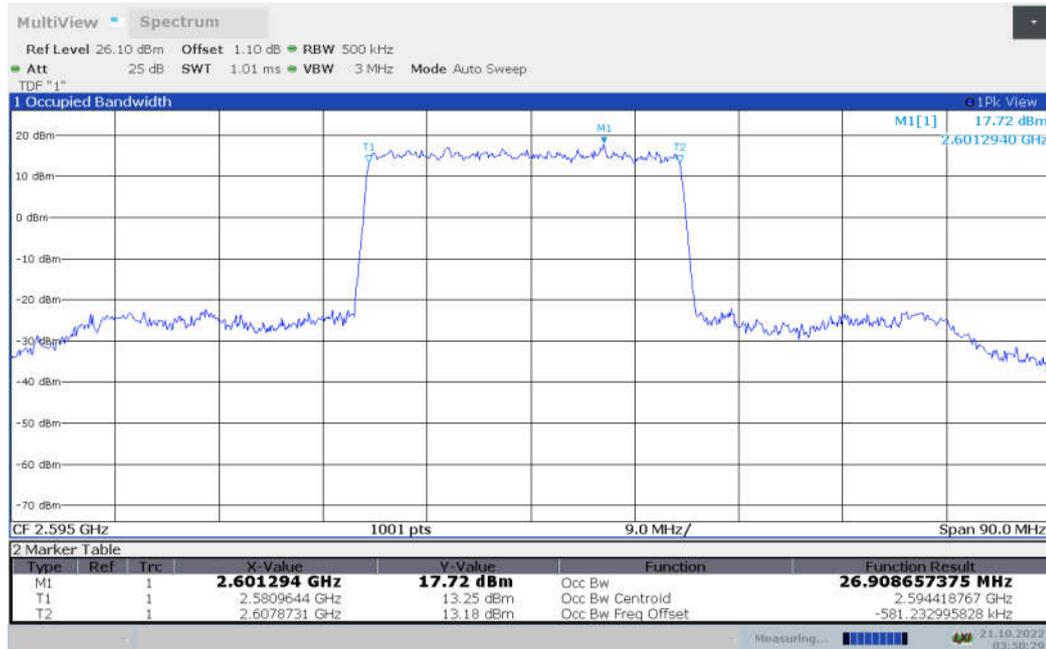




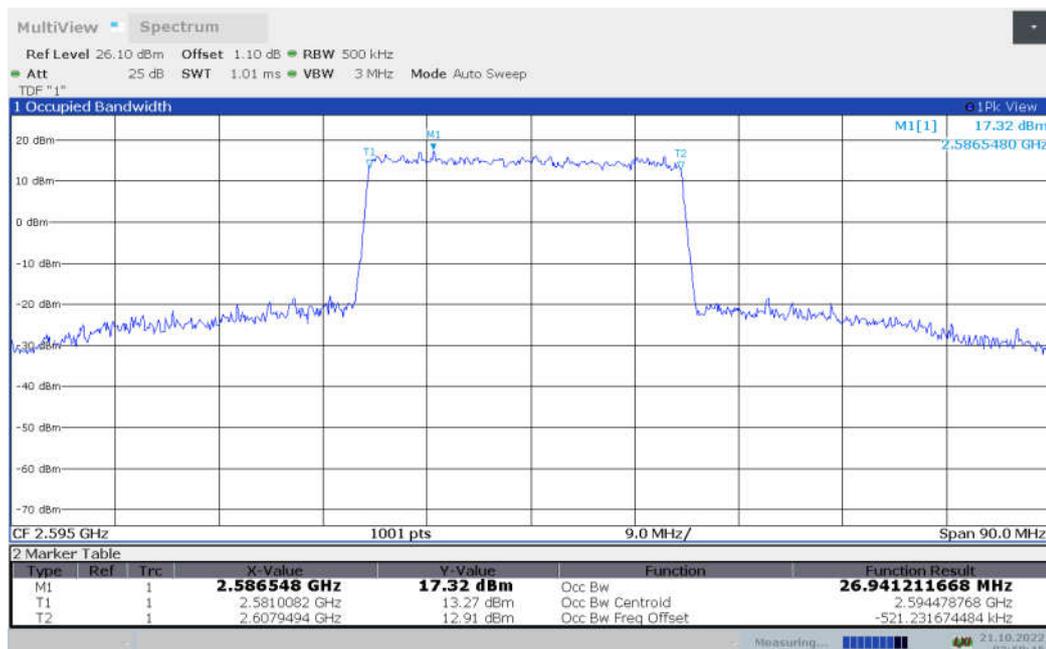
n38,30MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
2595	26.909	26.941

n38,30MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n38,30MHz Bandwidth,DFT-s-QPSK (99% BW)

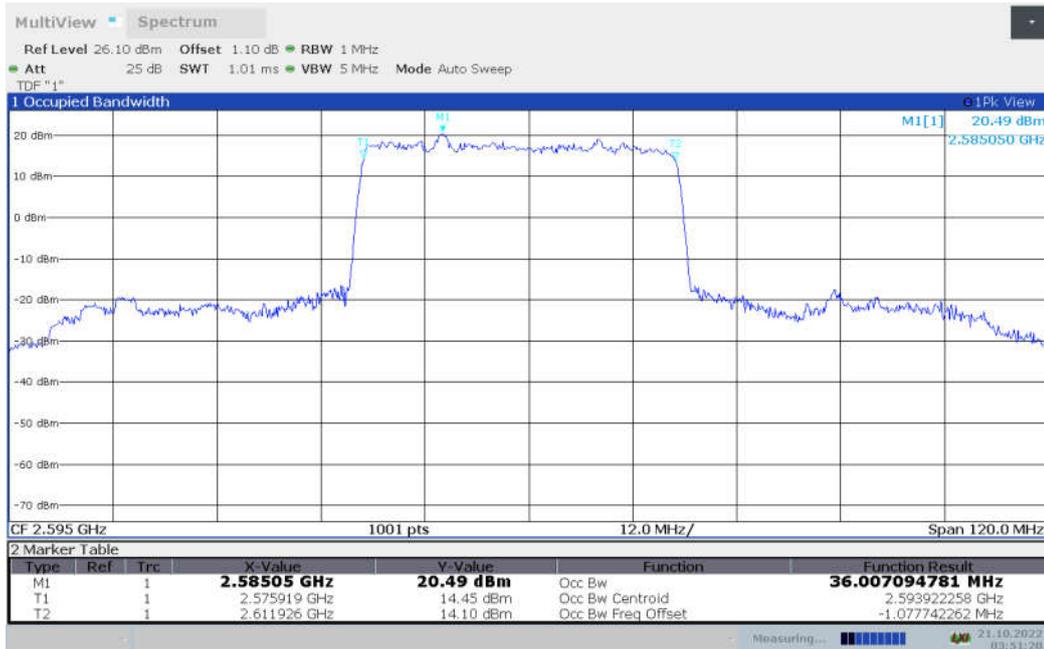




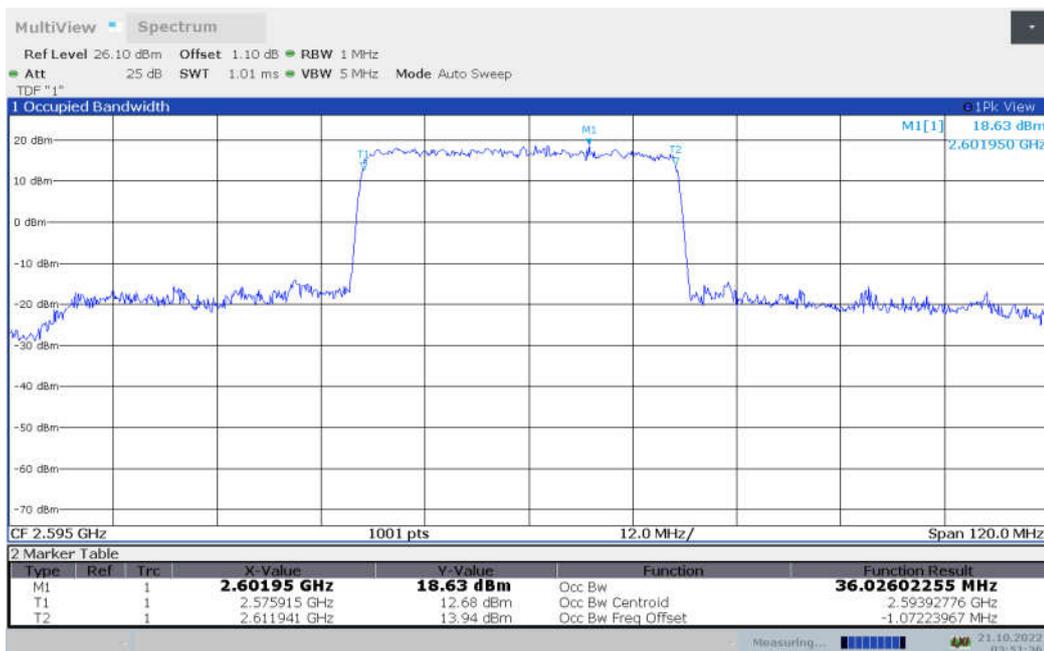
n38,40MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
2595	36.007	36.026

n38,40MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n38,40MHz Bandwidth,DFT-s-QPSK (99% BW)



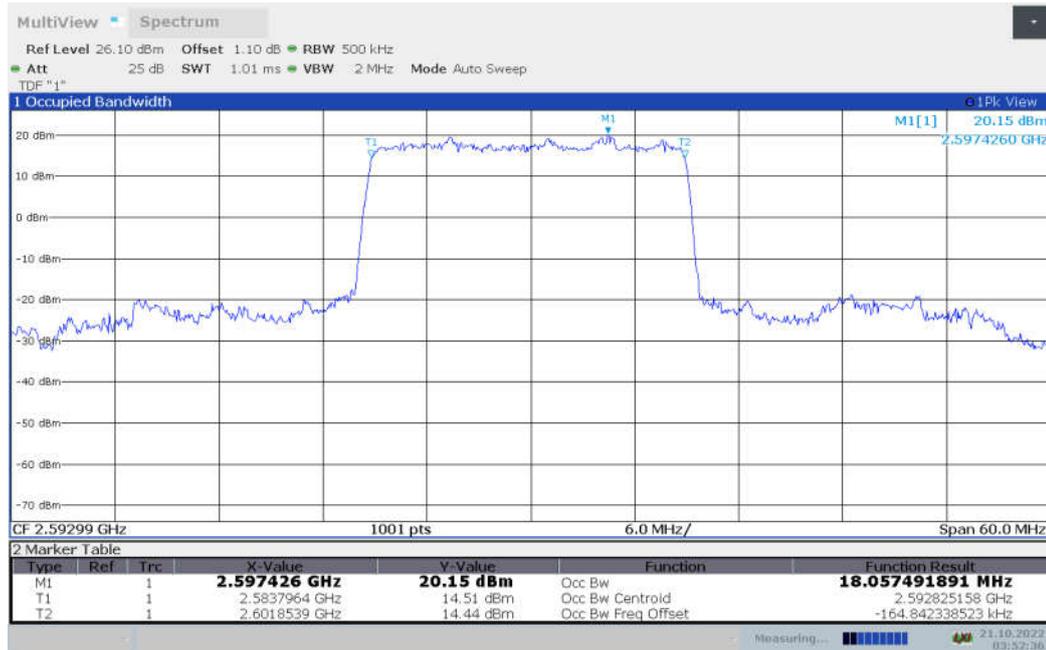


n41

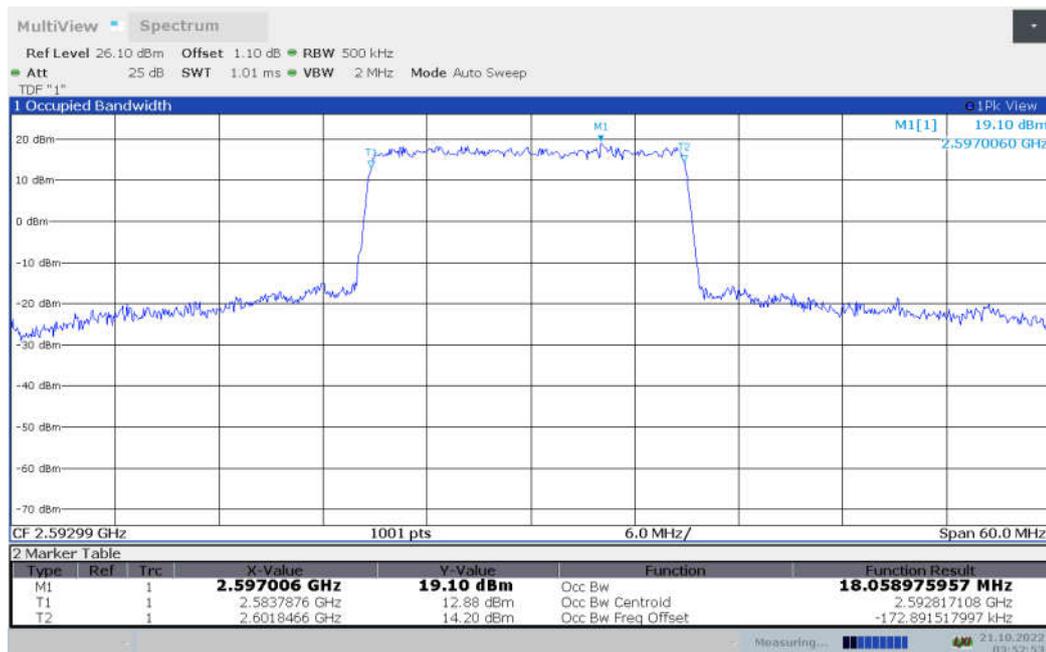
n41,20MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
2592.99	18.057	18.059

n41,20MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n41,20MHz Bandwidth,DFT-s-QPSK (99% BW)

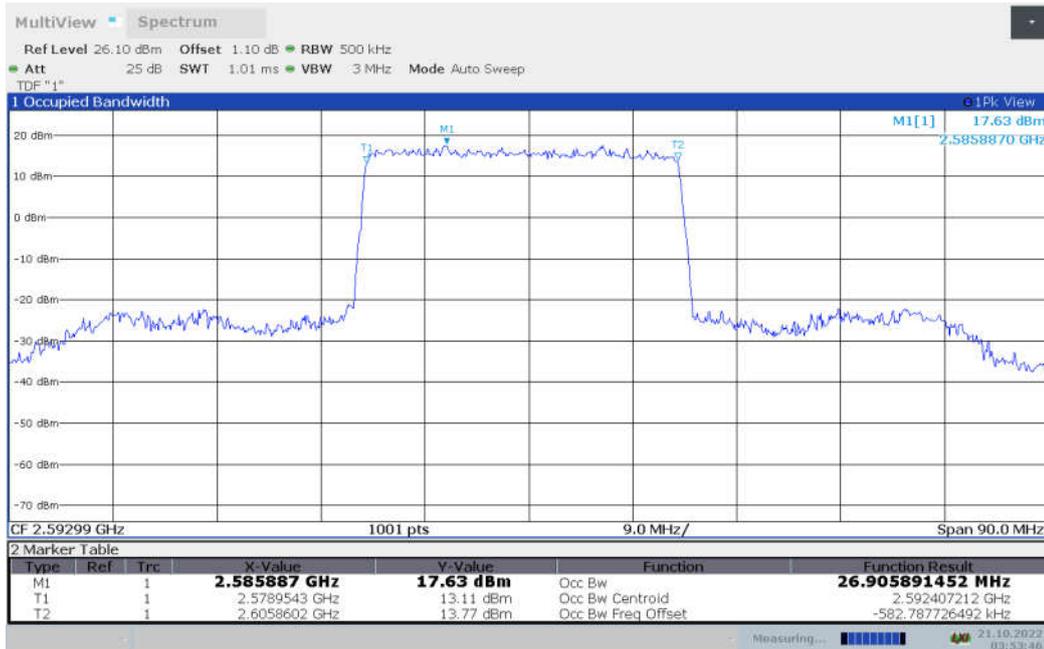




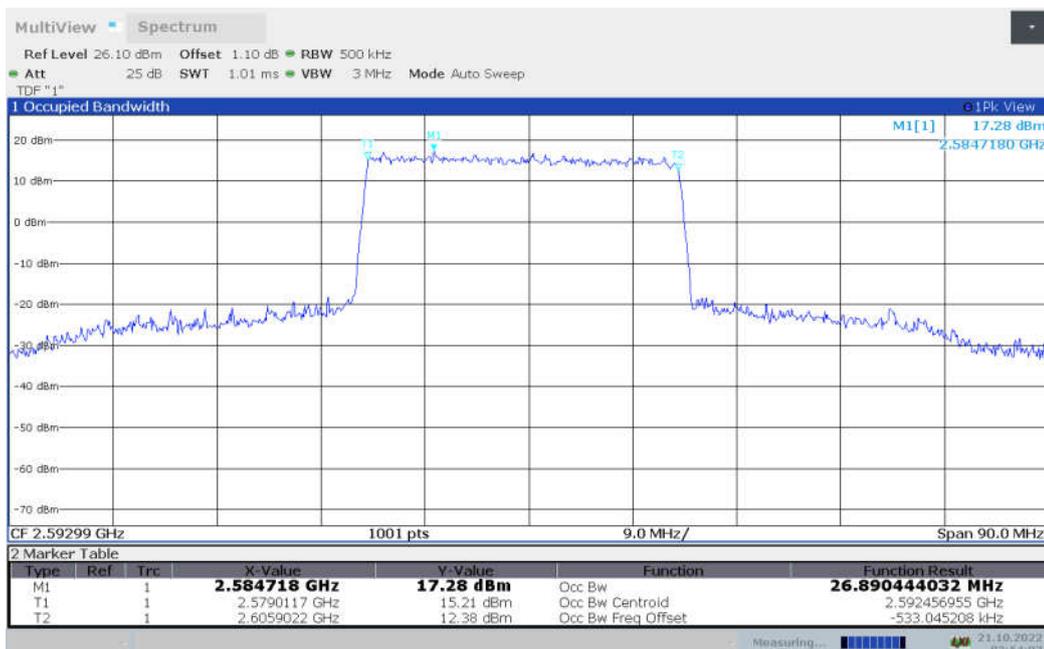
n41,30MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
2592.99	26.906	26.890

n41,30MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n41,30MHz Bandwidth,DFT-s-QPSK (99% BW)

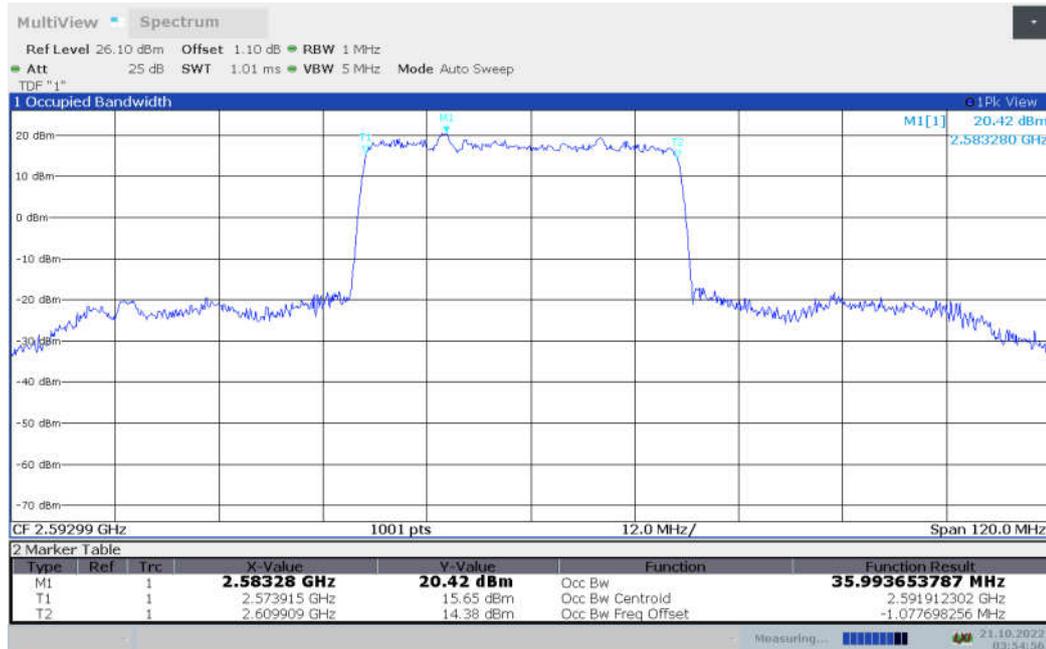




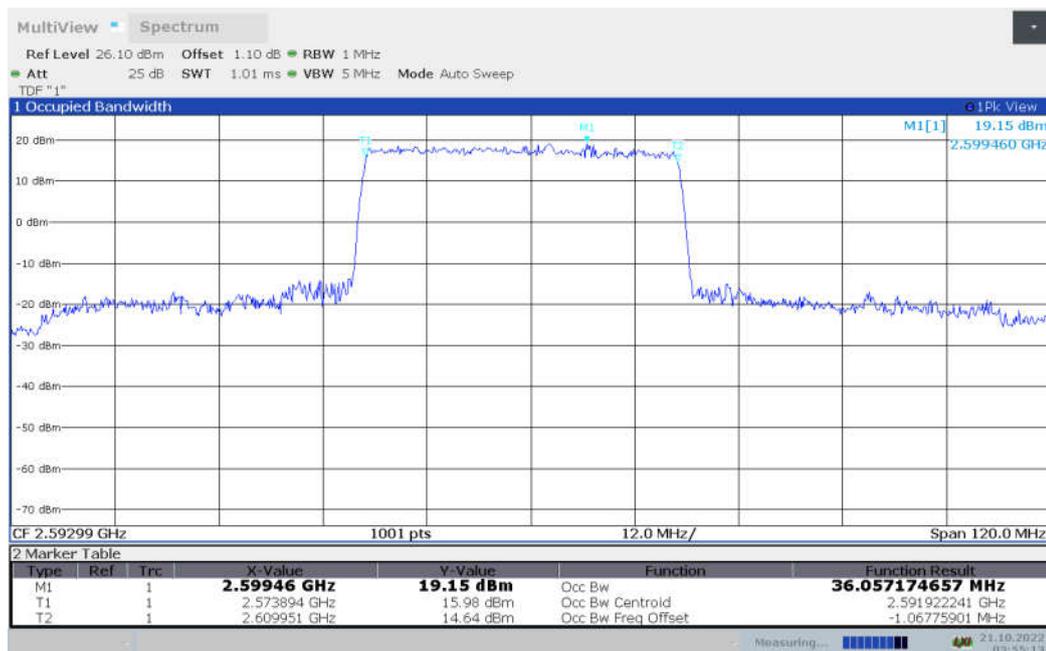
n41,40MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
2592.99	35.994	36.057

n41,40MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n41,40MHz Bandwidth,DFT-s-QPSK (99% BW)

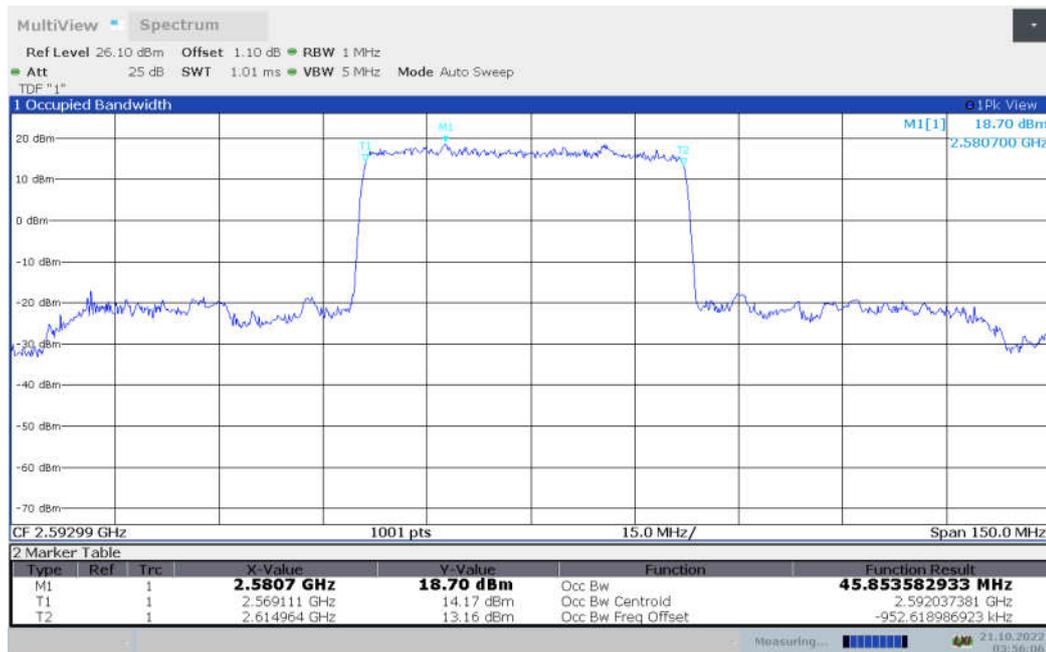




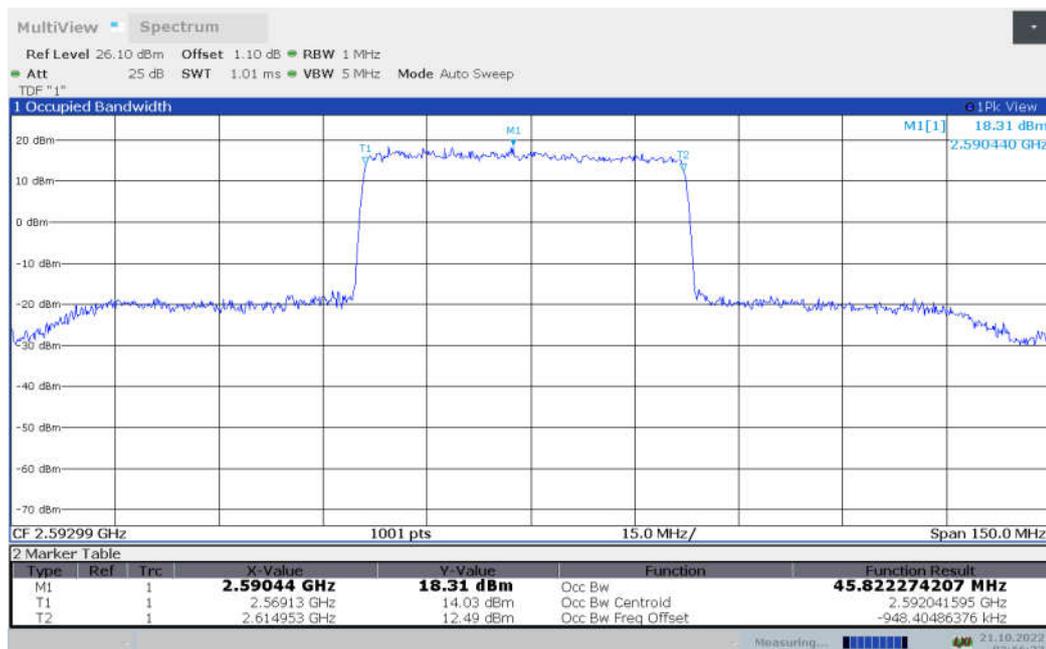
n41,50MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
2592.99	45.854	45.822

n41,50MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n41,50MHz Bandwidth,DFT-s-QPSK (99% BW)

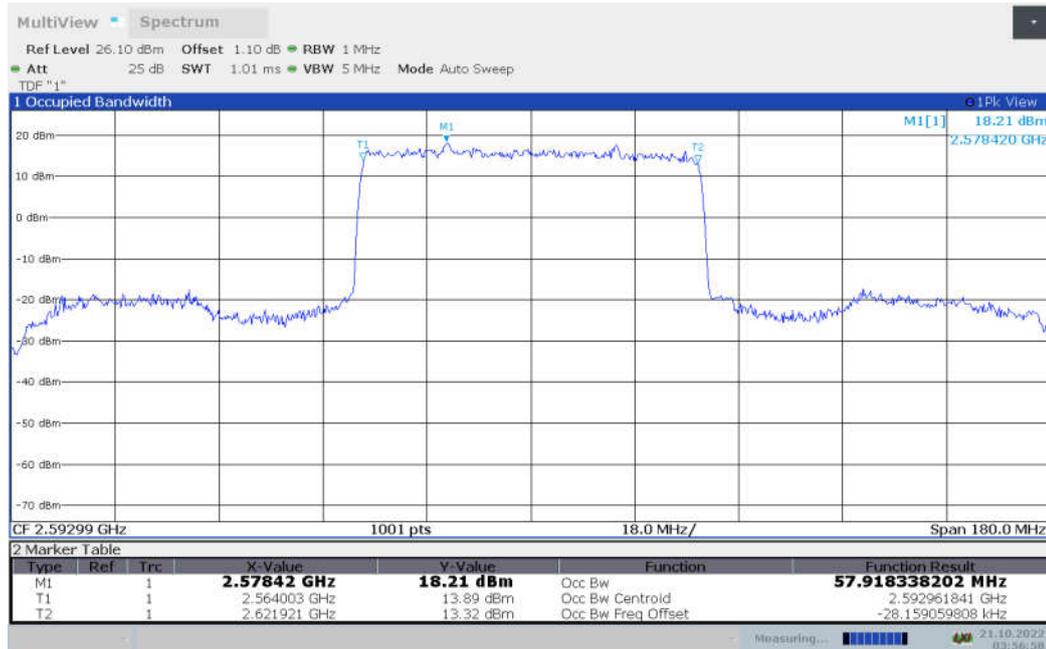




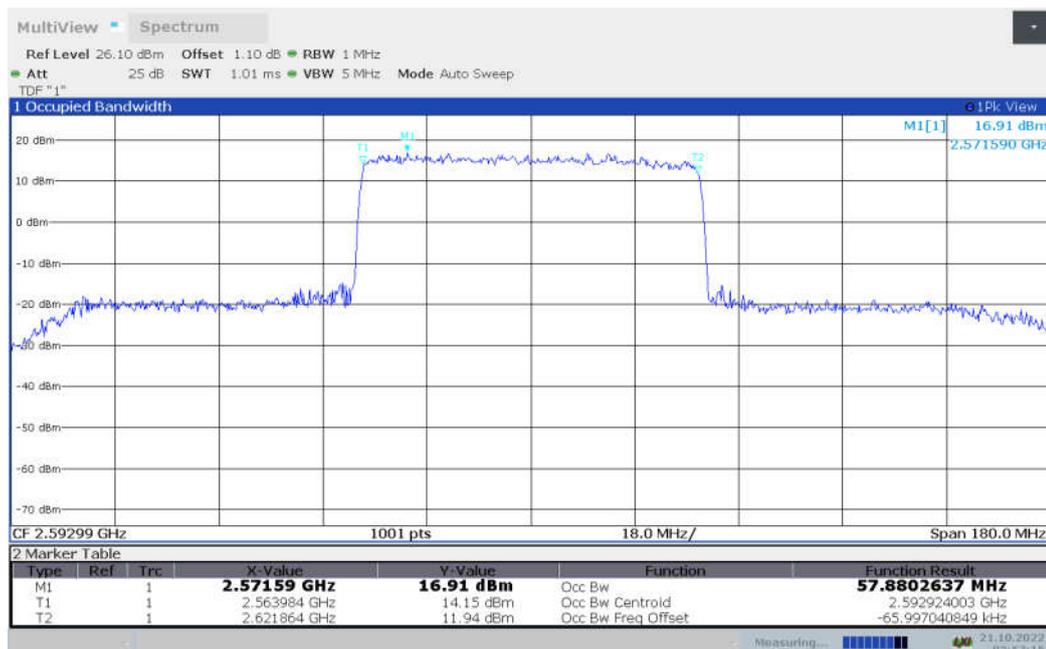
n41,60MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
2592.99	57.918	57.880

n41,60MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n41,60MHz Bandwidth,DFT-s-QPSK (99% BW)

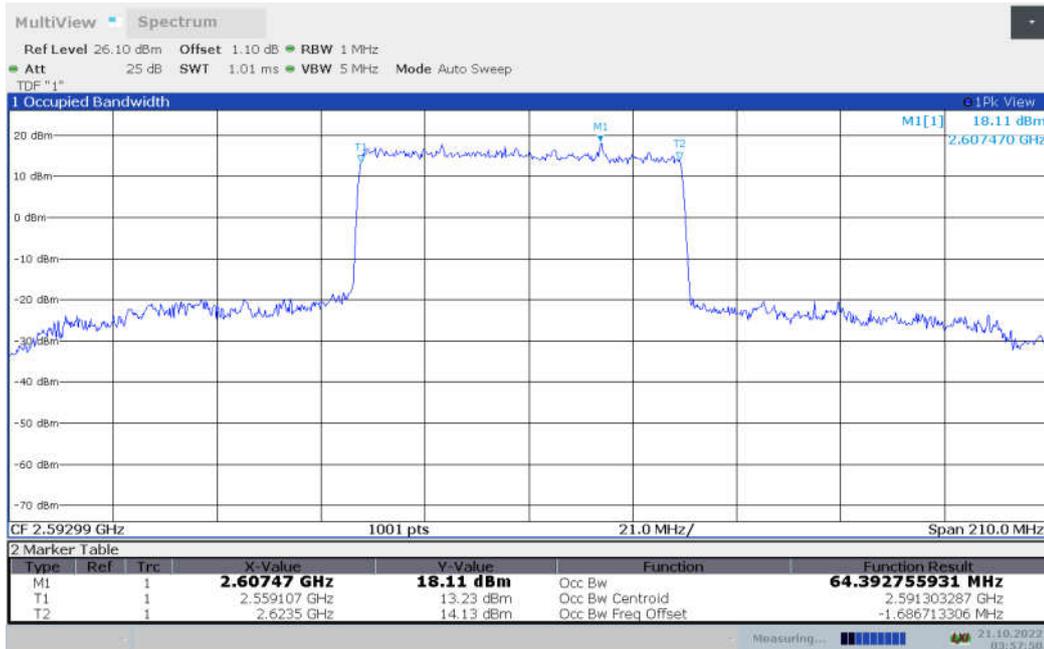




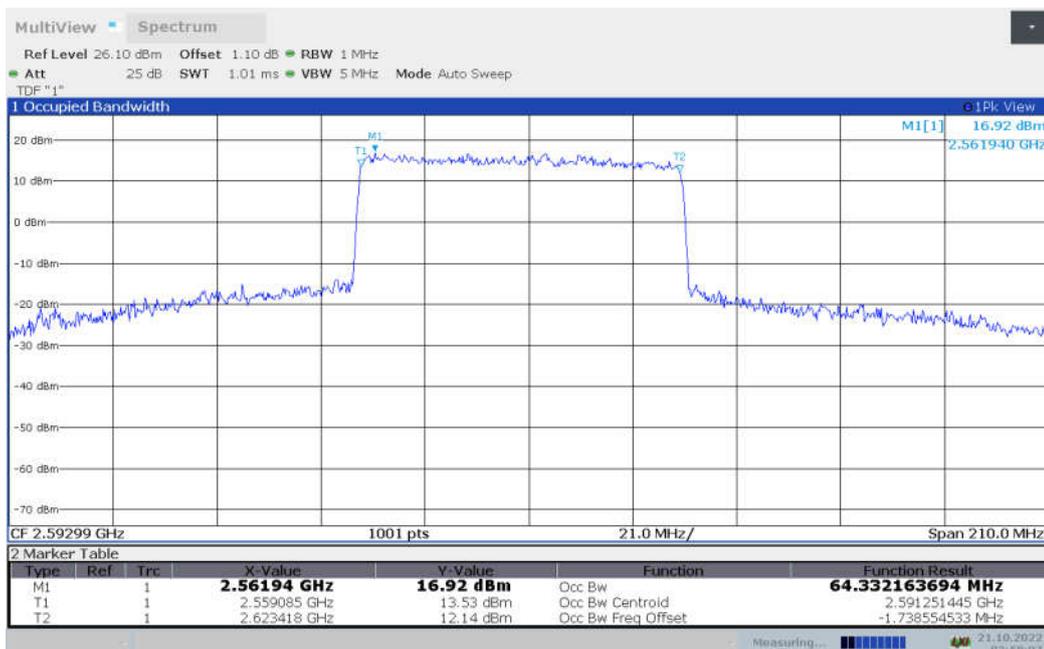
n41,70MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
2592.99	64.393	64.332

n41,70MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n41,70MHz Bandwidth,DFT-s-QPSK (99% BW)

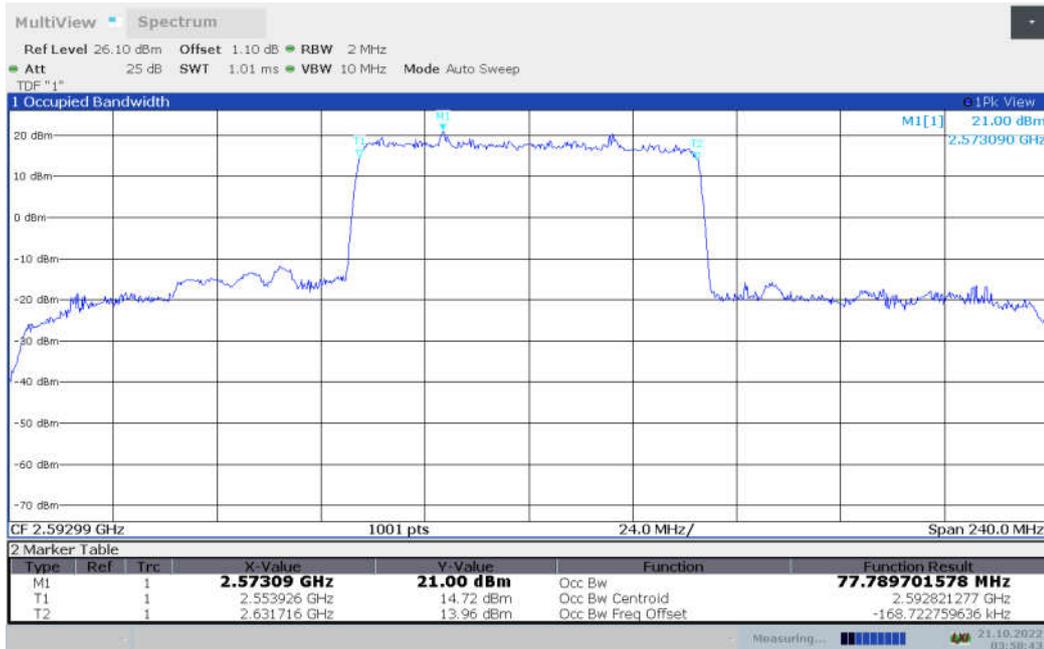




n41,80MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	
	DFT-s-pi/2 BPSK	DFT-s-QPSK
2592.99	77.790	77.861

n41,80MHz Bandwidth,DFT-s-pi/2 BPSK (99% BW)



n41,80MHz Bandwidth,DFT-s-QPSK (99% BW)

