12.2.6 Occupied bandwidth

Description:

Measurement of the occupied bandwidth of the transmitted signal.

Measurement:

Similar to conducted emissions, 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 LTE band 41 frequency band. The table below lists the measured 99% power and -26dBc occupied bandwidths. Spectrum analyzer plots are included on the following pages.

Measurement parameters	
Detector:	Peak
Sweep time:	See plots
Video bandwidth:	See plots
Resolution bandwidth:	See plots
Span:	2 x nominal bandwidth
Trace mode:	Max Hold
Used equipment:	See chapter 8.4 setup A
Measurement uncertainty:	See chapter 9
Measurement procedure	FCC: § 2.1049

Limits:

FCC
§ 2.1049
Reporting only

Results:

Occupied Bandwidth – QPSK			
Bandwidth	**Channel**	**99% OBW (kHz)**	**-26 dBc BW (kHz)**
5.0	low	4.5	5.3
	mid	4.5	5.2
	high	4.5	5.5
10.0	low	9.1	11.8
	mid	9.1	12.8
	high	9.1	13.0
15.0	low	13.5	16.6
	mid	13.5	16.8
	high	13.5	17.3
20.0	low	18.0	22.1
	mid	18.1	24.2
	high	18.1	24.0

Occupied Bandwidth – 16-QAM			
Bandwidth	**Channel**	**99% OBW (kHz)**	**-26 dBc BW (kHz)**
5.0	low	4.5	5.2
	mid	4.5	5.4
	high	4.5	5.3
10.0	low	9.1	11.9
	mid	9.1	12.1
	high	9.1	13.8
15.0	low	13.5	16.9
	mid	13.5	16.2
	high	13.5	17.1
20.0	low	18.0	23.0
	mid	18.1	23.3
	high	18.1	25.1

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Occupied Bandwidth – 64-QAM			
Bandwidth	**Channel**	**99% OBW (kHz)**	**-26 dBc BW (kHz)**
5.0	low	4.5	5.6
	mid	4.5	5.8
	high	4.5	5.6
10.0	low	9.1	12.1
	mid	9.1	13.0
	high	9.1	12.2
15.0	low	13.5	14.1
	mid	13.5	16.5
	high	13.5	16.3
20.0	low	18.0	23.0
	mid	18.0	22.6
	high	18.1	22.8

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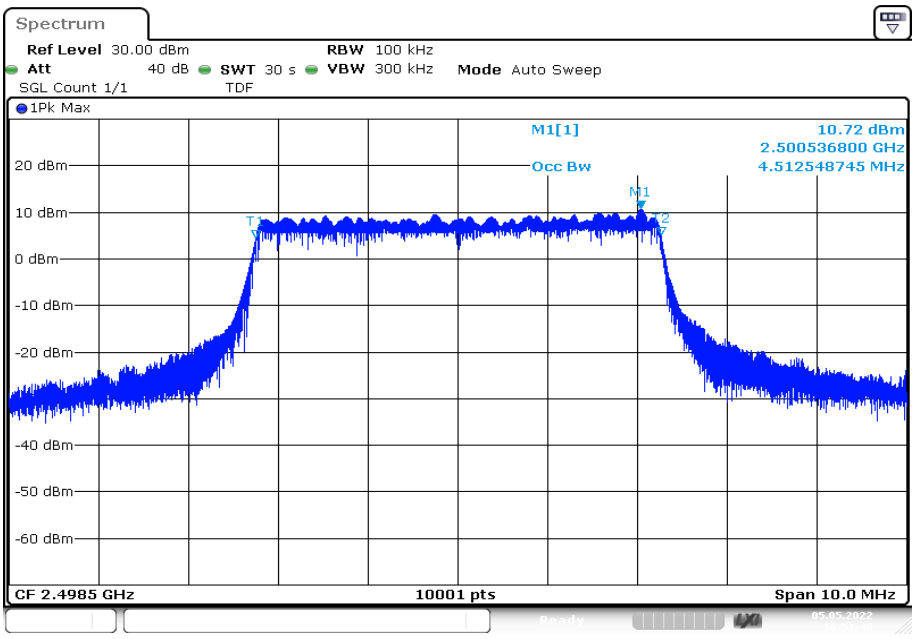
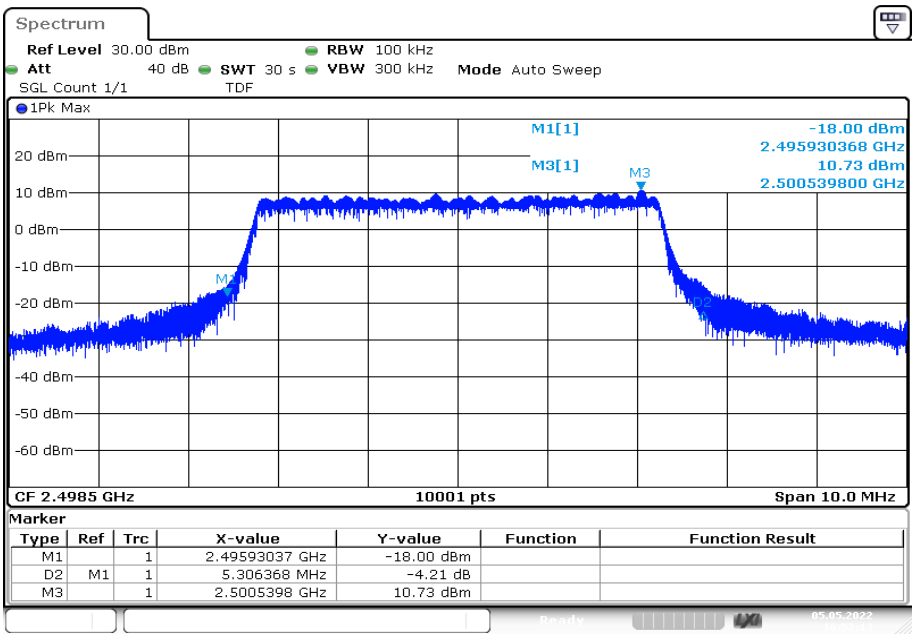
Plots:

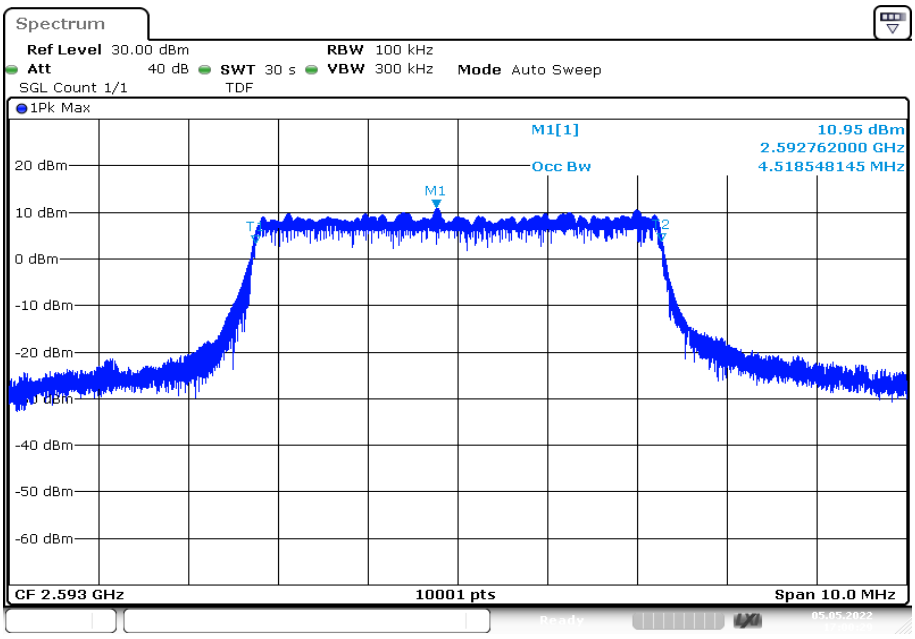
Plot 1: 5 MHz – QPSK - lowest channel (99% - OBW)



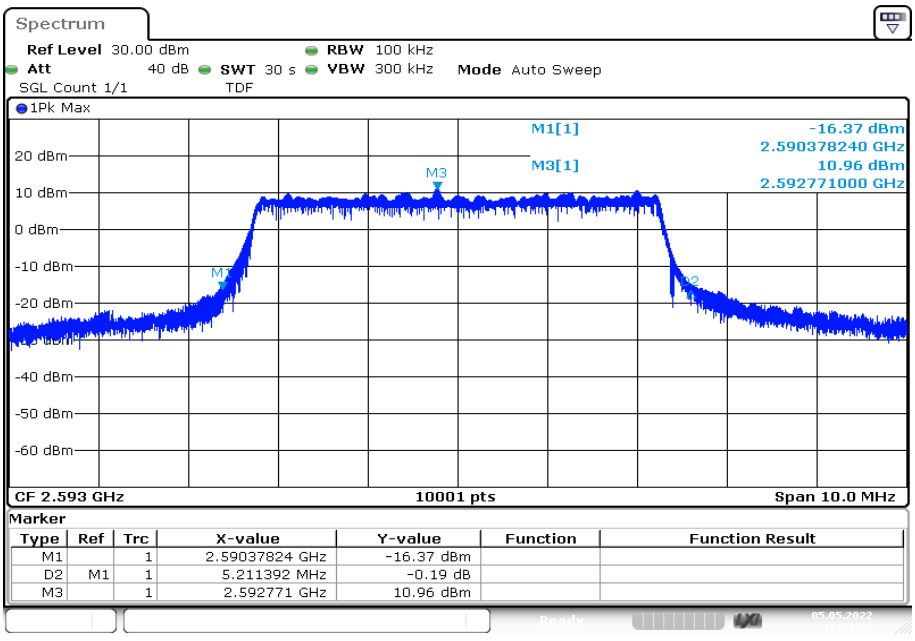
Plot 2: 5 MHz – QPSK - lowest channel (-26 dBc BW)



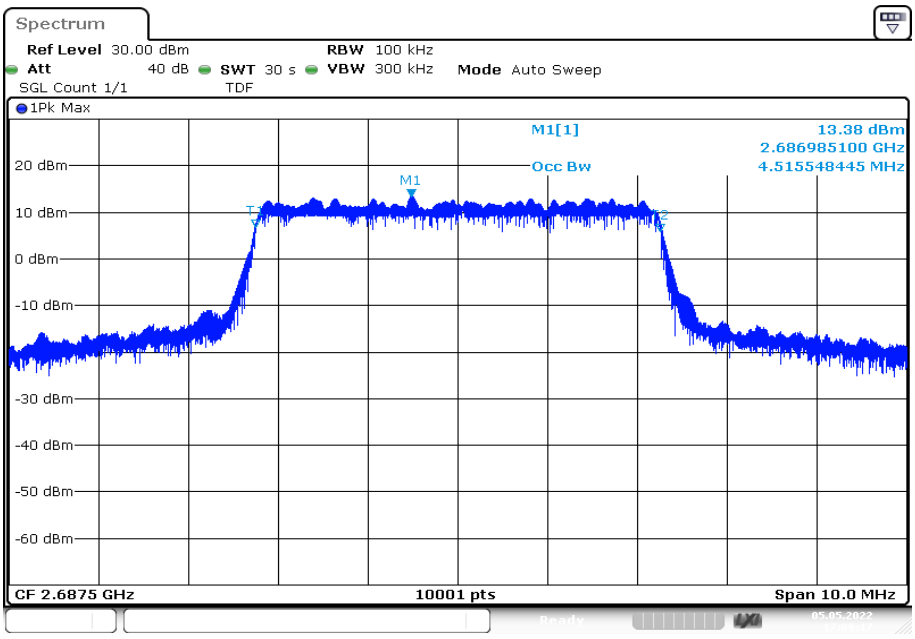
Plot 3: 5 MHz – QPSK - middle channel (99% - OBW)



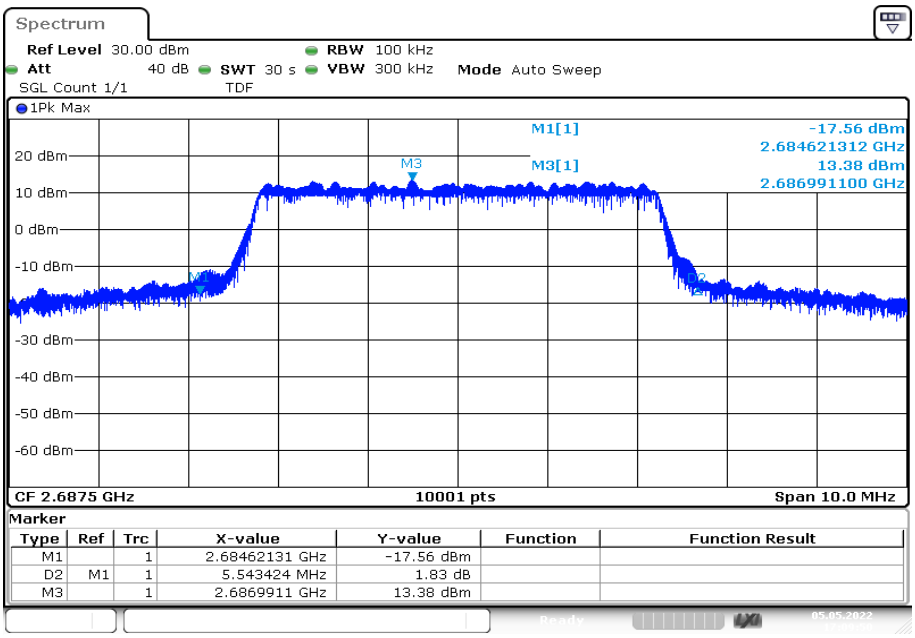
Plot 4: 5 MHz – QPSK - middle channel (-26 dBc BW)



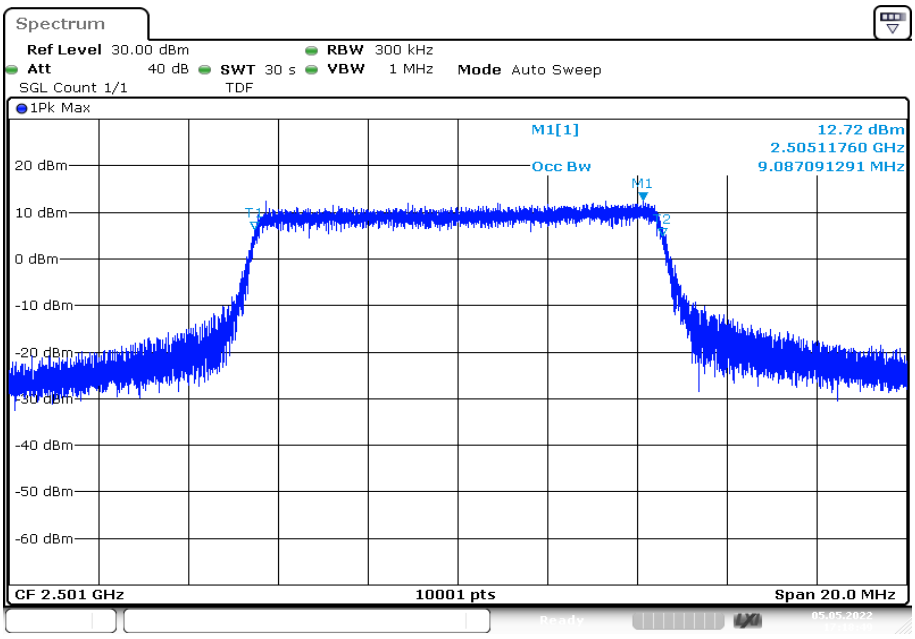
Plot 5: 5 MHz – QPSK - highest channel (99% - OBW)



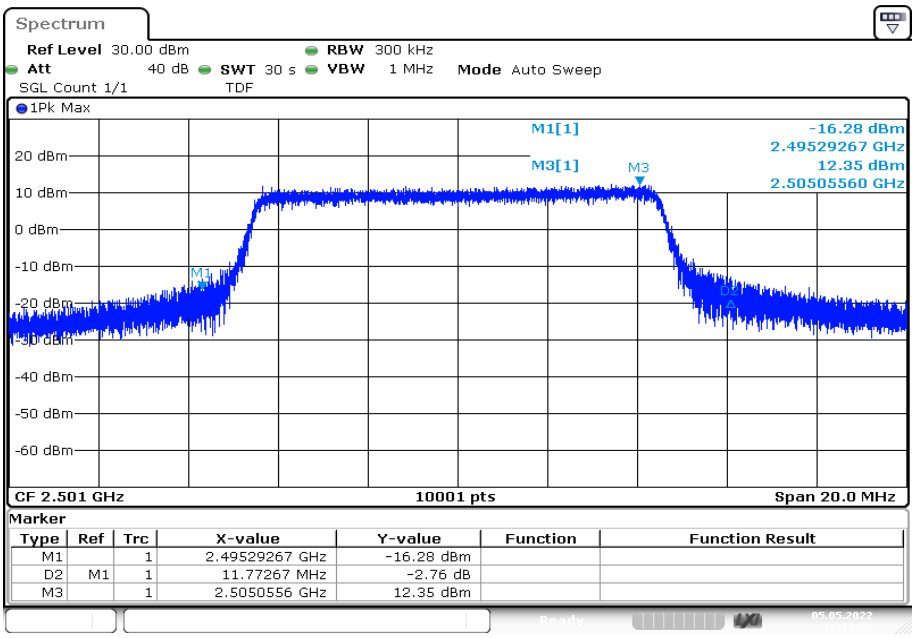
Plot 6: 5 MHz – QPSK - highest channel (-26 dBc BW)



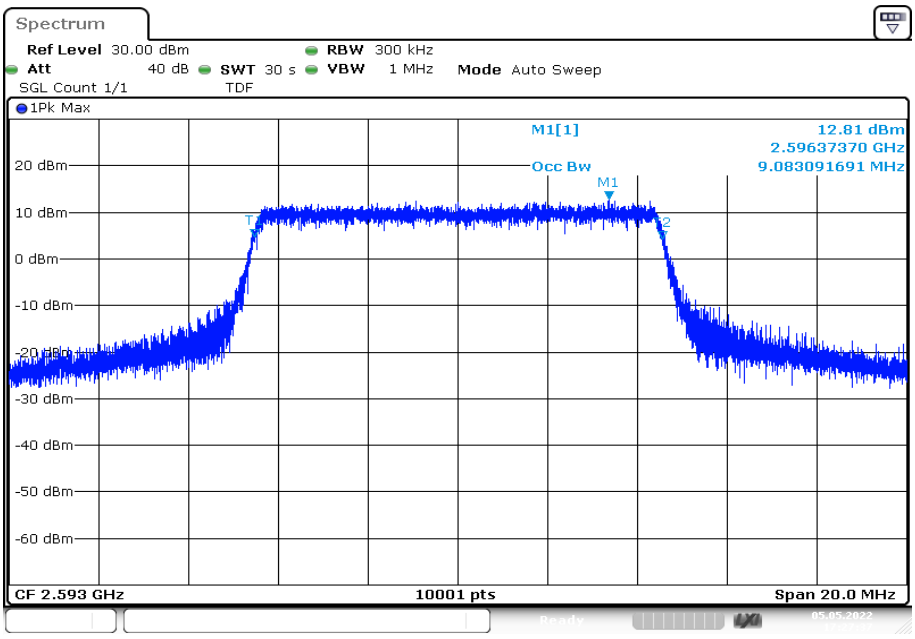
Plot 7: 10 MHz – QPSK - lowest channel (99% - OBW)



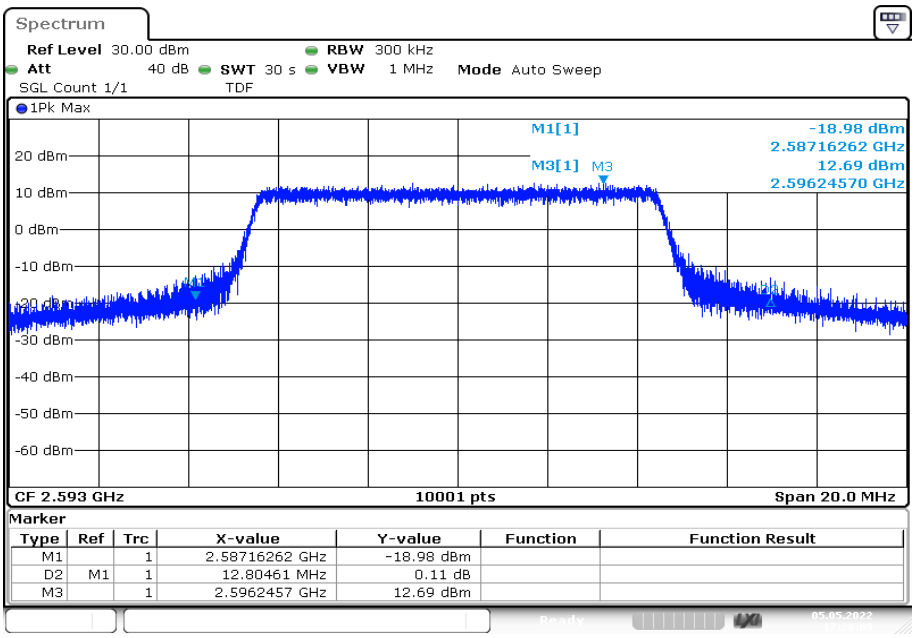
Plot 8: 10 MHz – QPSK - lowest channel (-26 dBc BW)



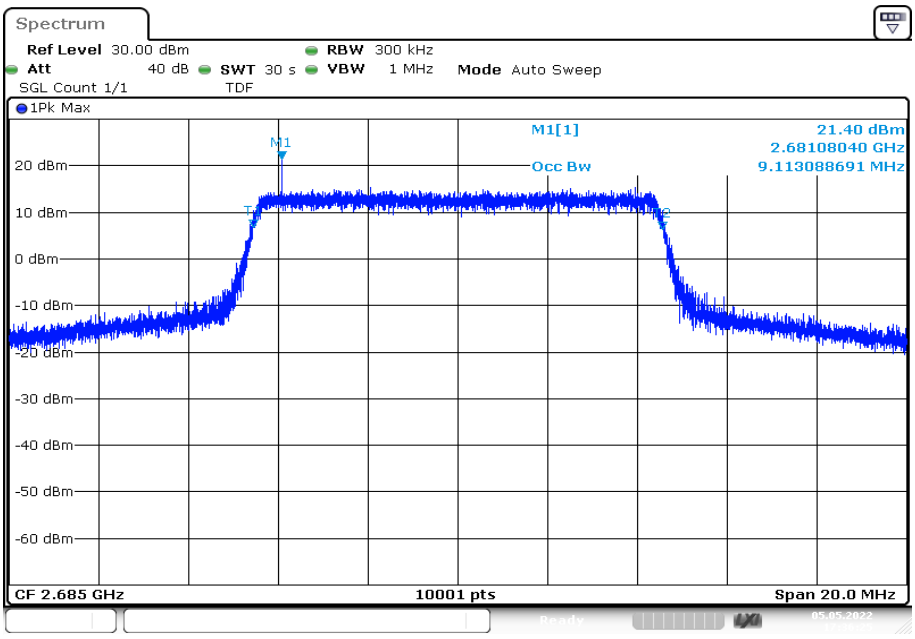
Plot 9: 10 MHz – QPSK - middle channel (99% - OBW)



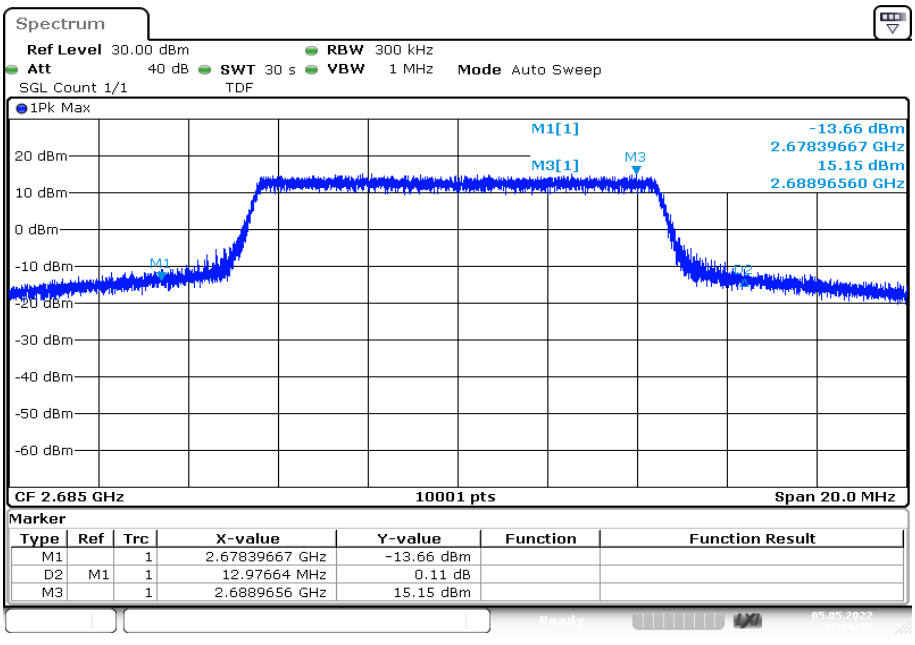
Plot 10: 10 MHz – QPSK - middle channel (-26 dBc BW)



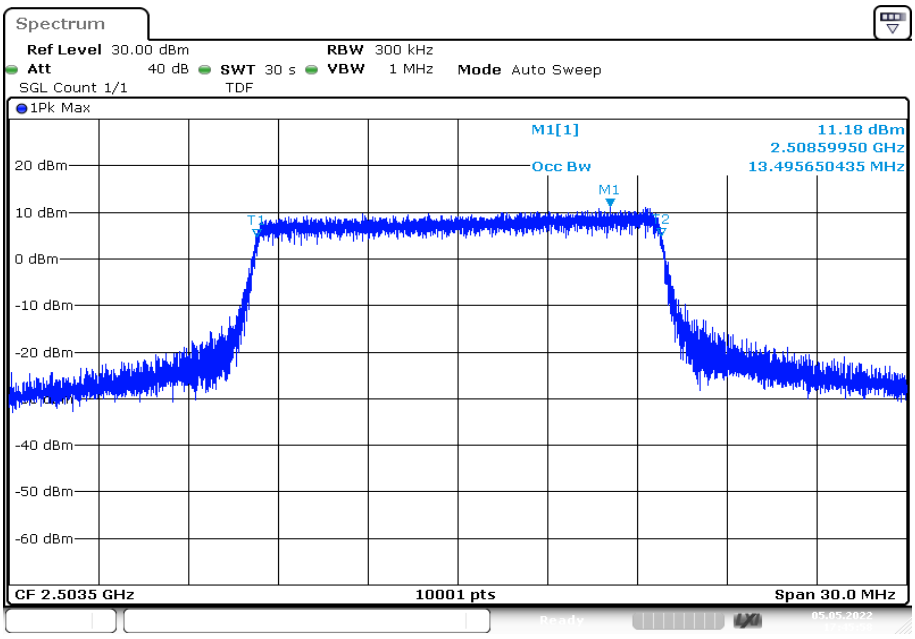
Plot 11: 10 MHz – QPSK - highest channel (99% - OBW)



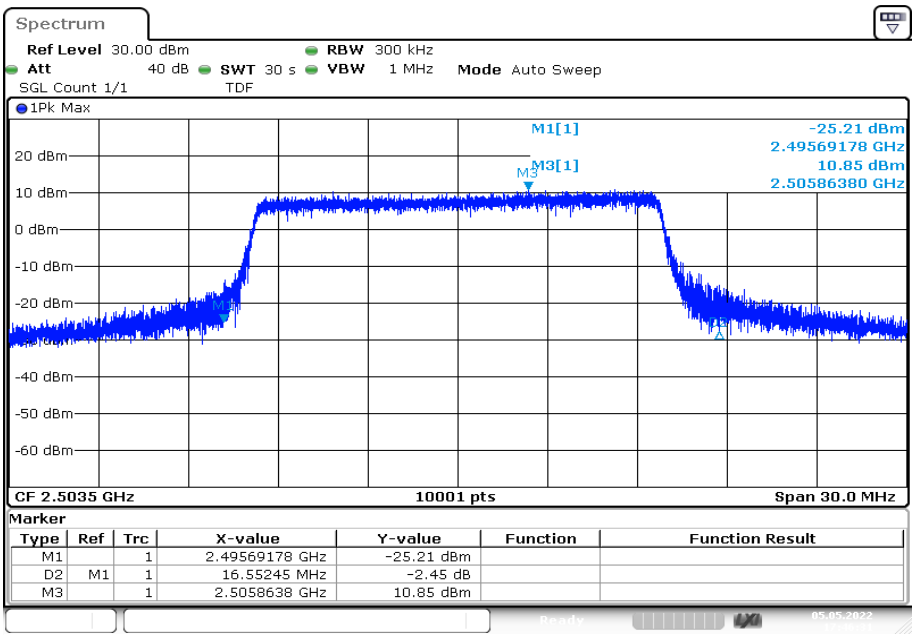
Plot 12: 10 MHz – QPSK - highest channel (-26 dBc BW)



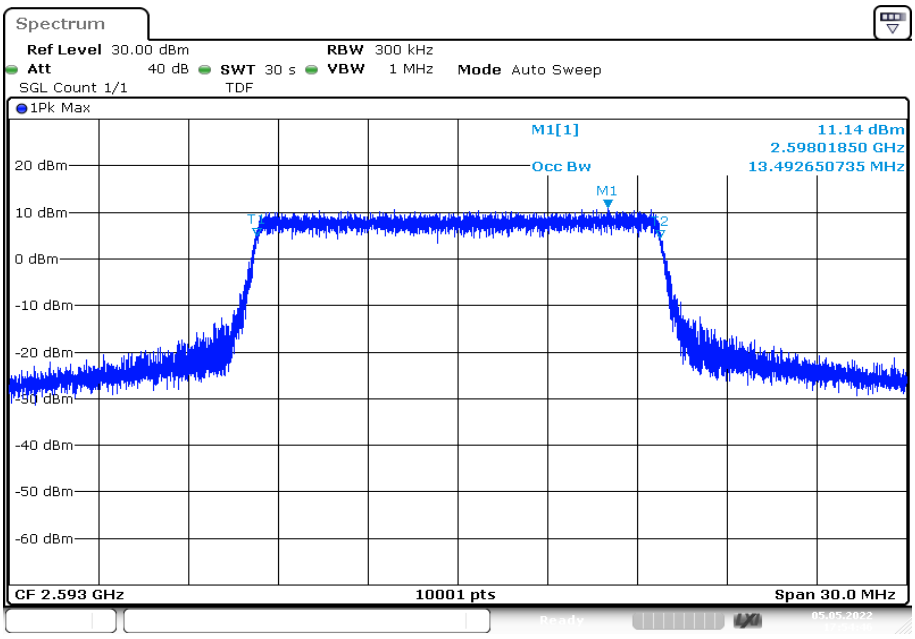
Plot 13: 15 MHz – QPSK - lowest channel (99% - OBW)



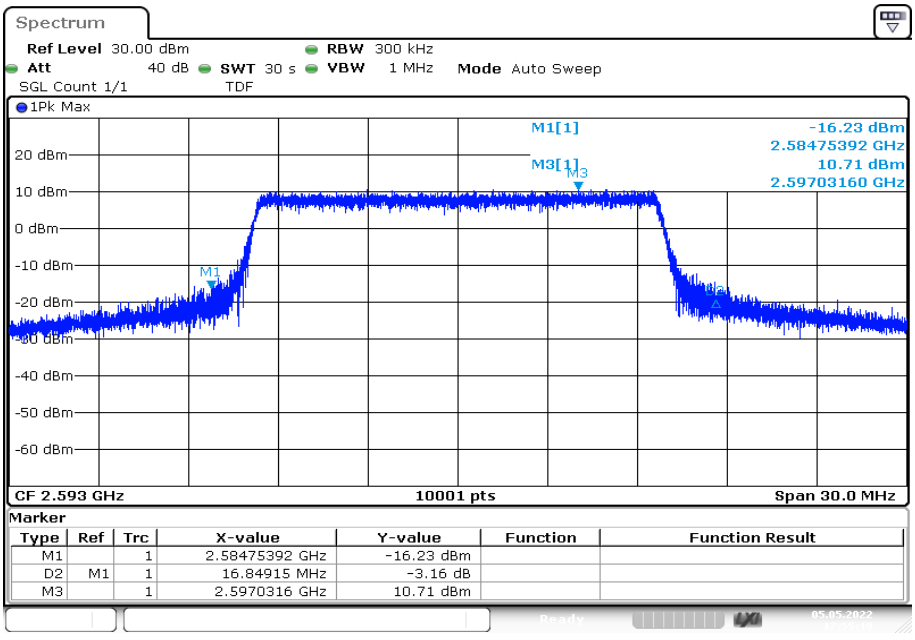
Plot 14: 15 MHz – QPSK - lowest channel (-26 dBc BW)



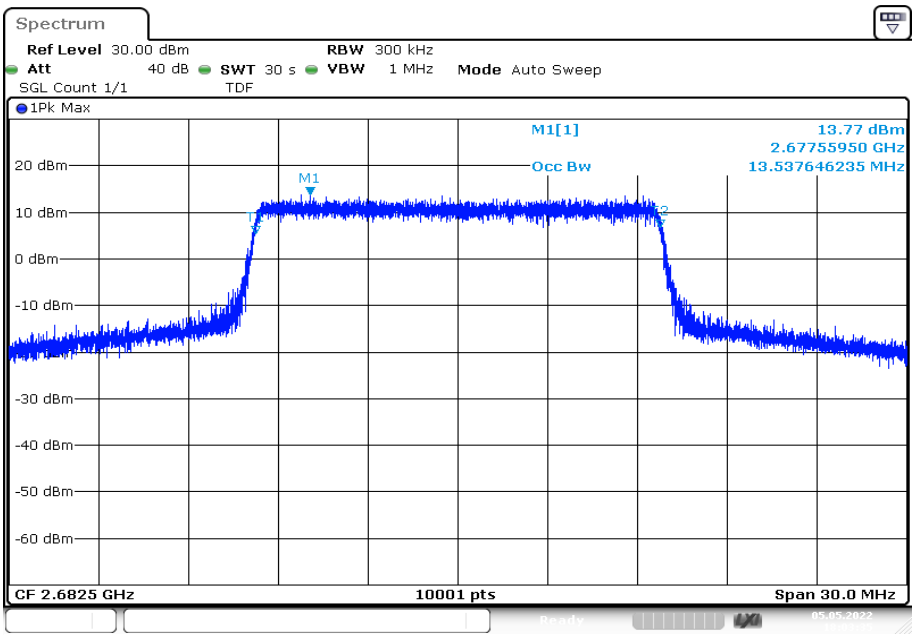
Plot 15: 15 MHz – QPSK - middle channel (99% - OBW)



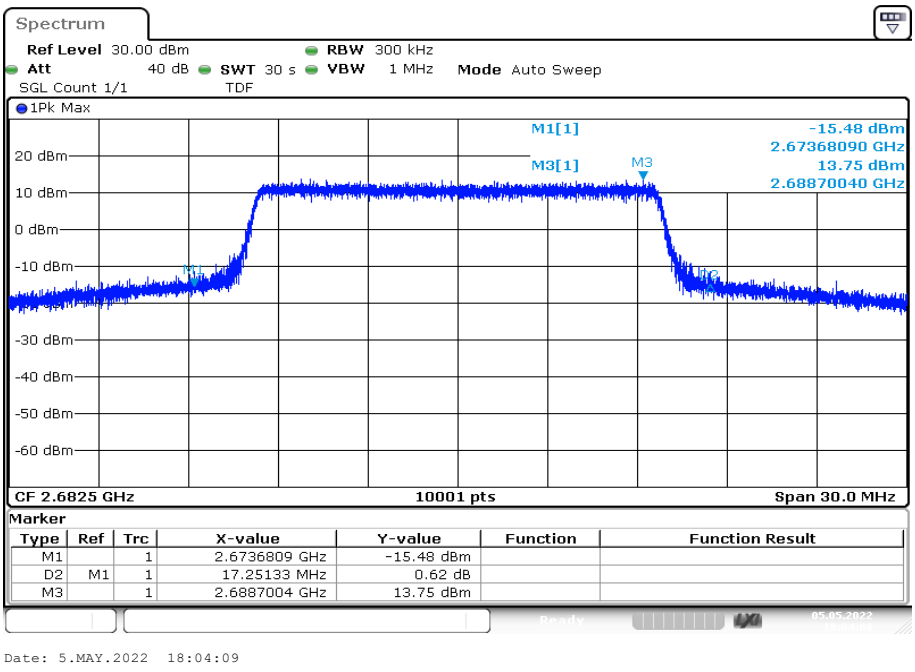
Plot 16: 15 MHz – QPSK - middle channel (-26 dBc BW)



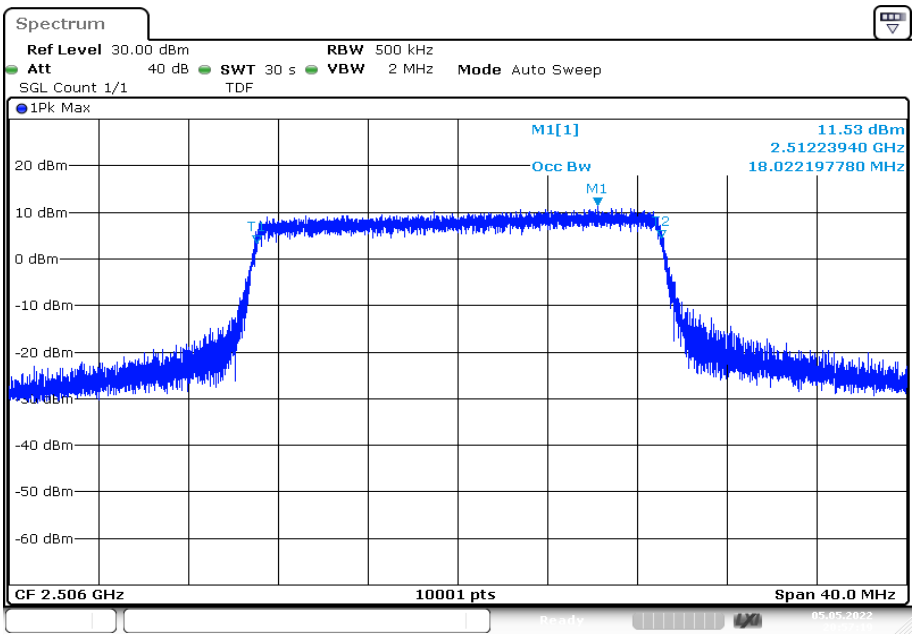
Plot 17: 15 MHz – QPSK - highest channel (99% - OBW)



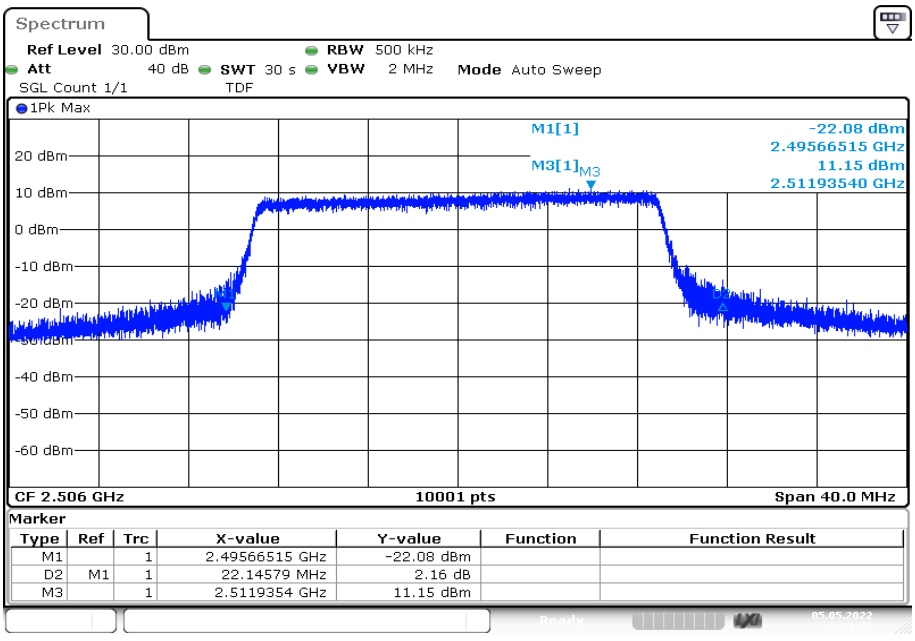
Plot 18: 15 MHz – QPSK - highest channel (-26 dBc BW)



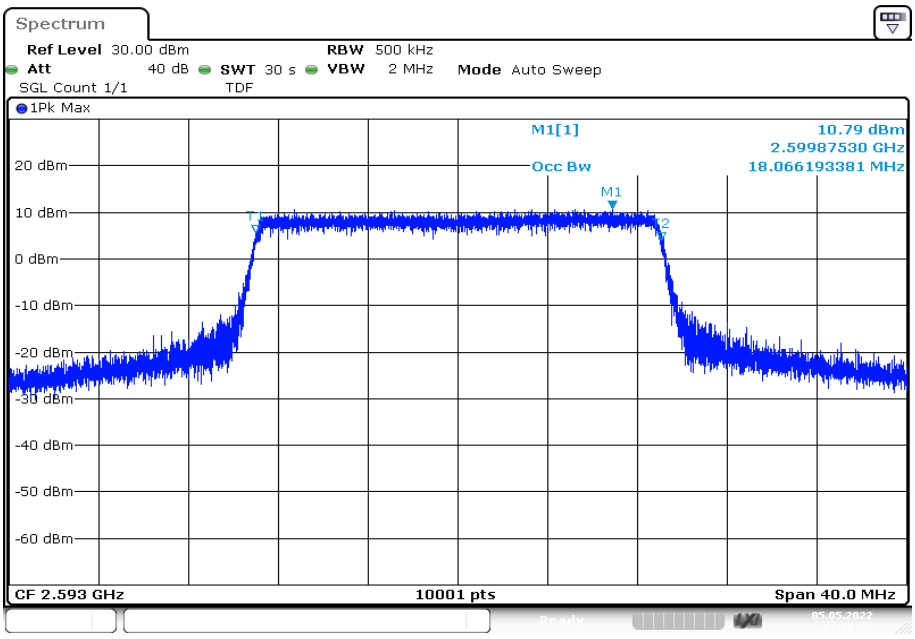
Plot 19: 20 MHz – QPSK - lowest channel (99% - OBW)



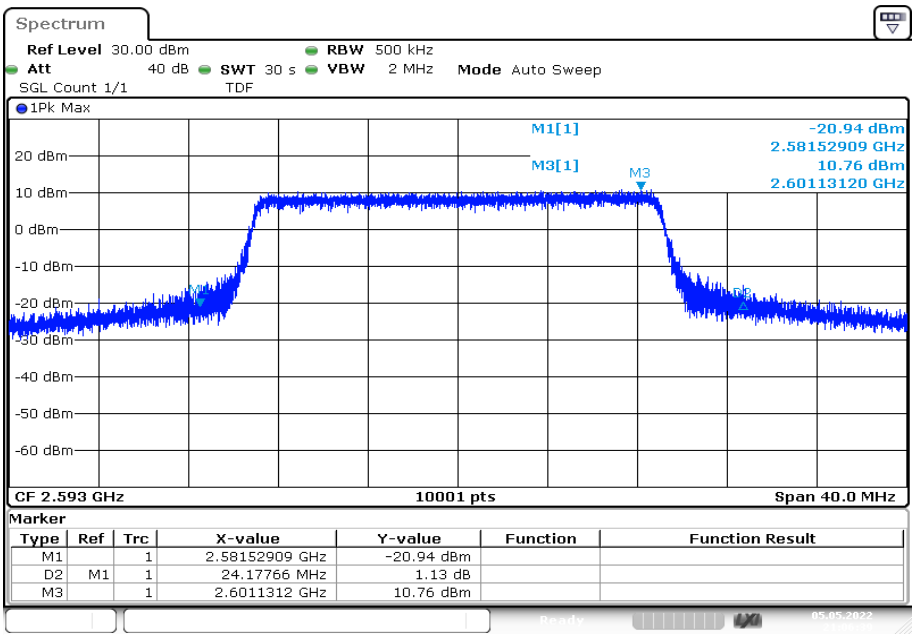
Plot 20: 20 MHz – QPSK - lowest channel (-26 dBc BW)



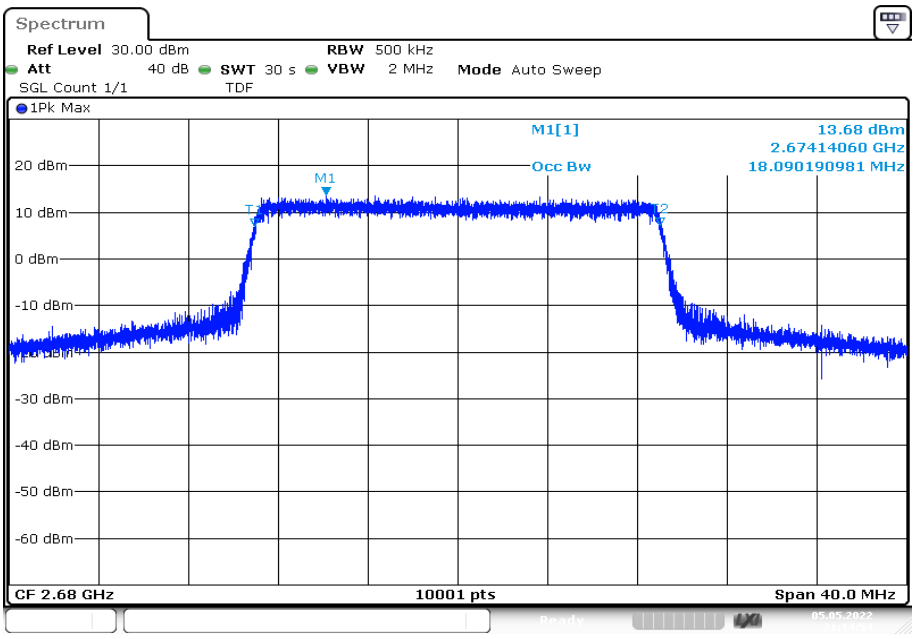
Plot 21: 20 MHz – QPSK - middle channel (99% - OBW)



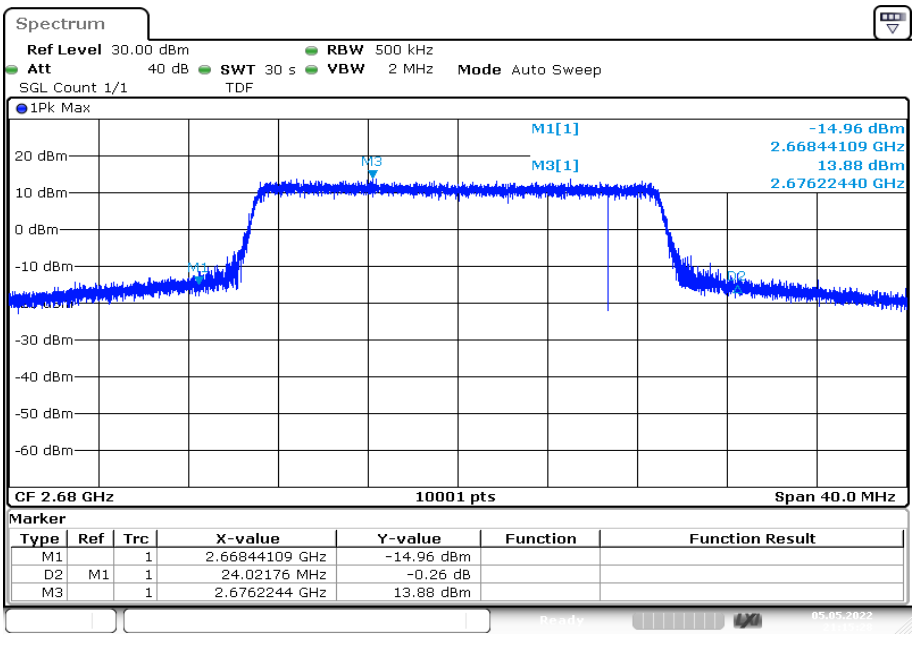
Plot 22: 20 MHz – QPSK - middle channel (-26 dBc BW)



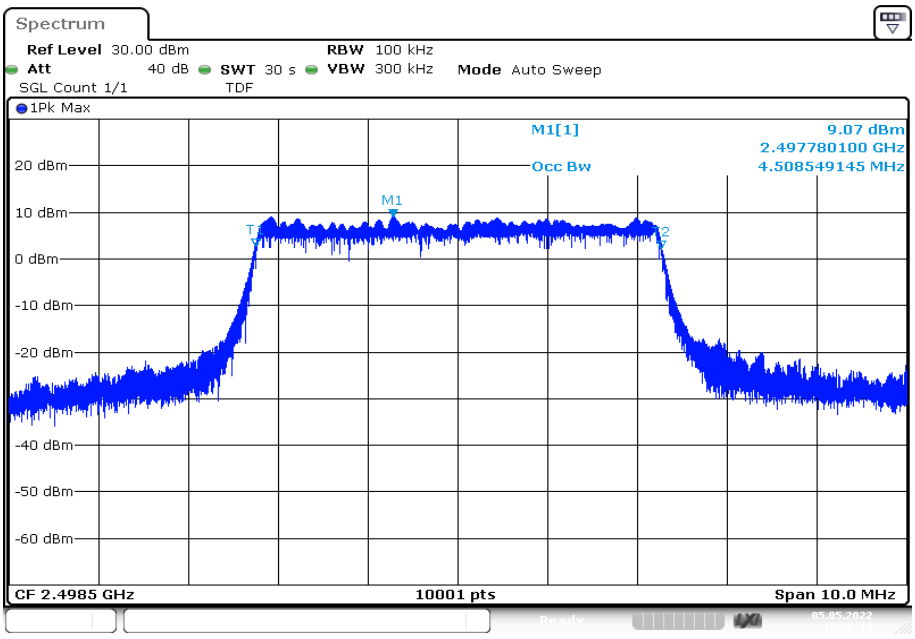
Plot 23: 20 MHz – QPSK - highest channel (99% - OBW)



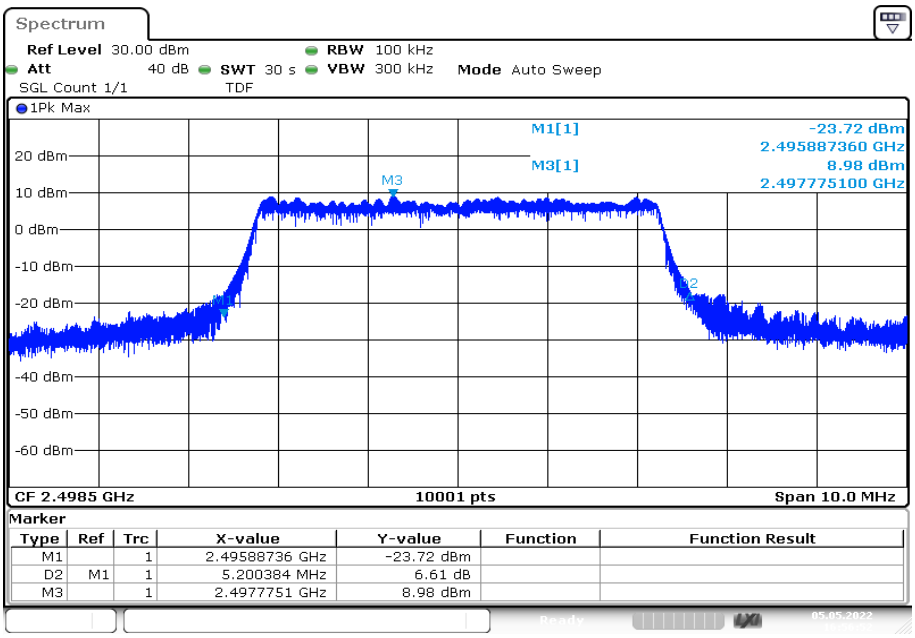
Plot 24: 20 MHz – QPSK - highest channel (-26 dBc BW)



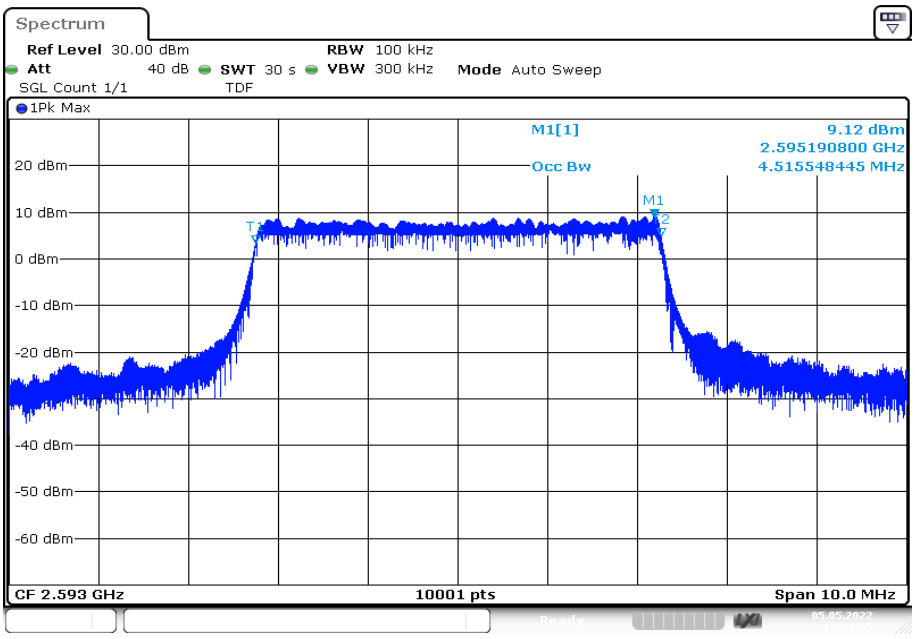
Plot 25: 5 MHz – 16-QAM - lowest channel (99% - OBW)



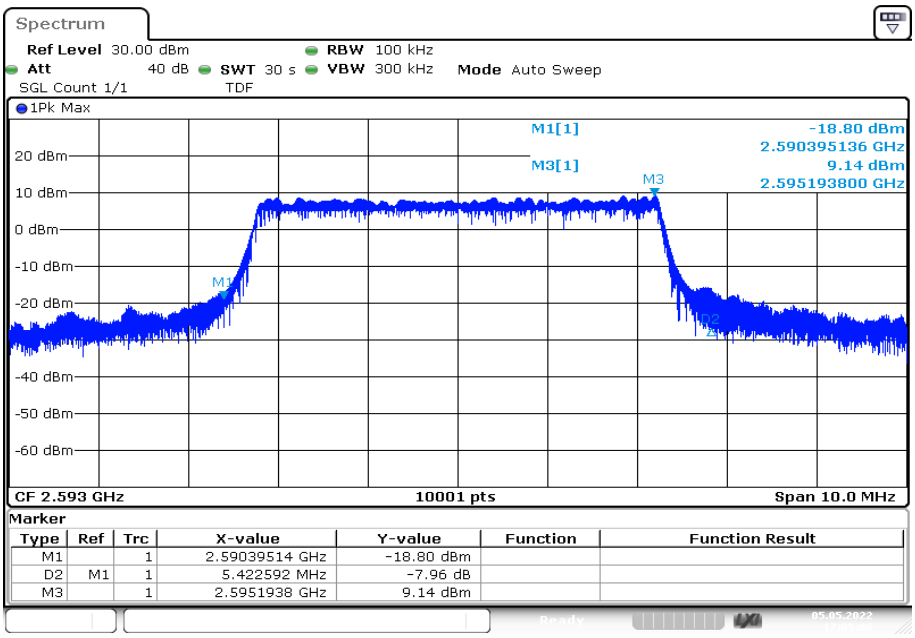
Plot 26: 5 MHz – 16-QAM - lowest channel (-26 dBc BW)



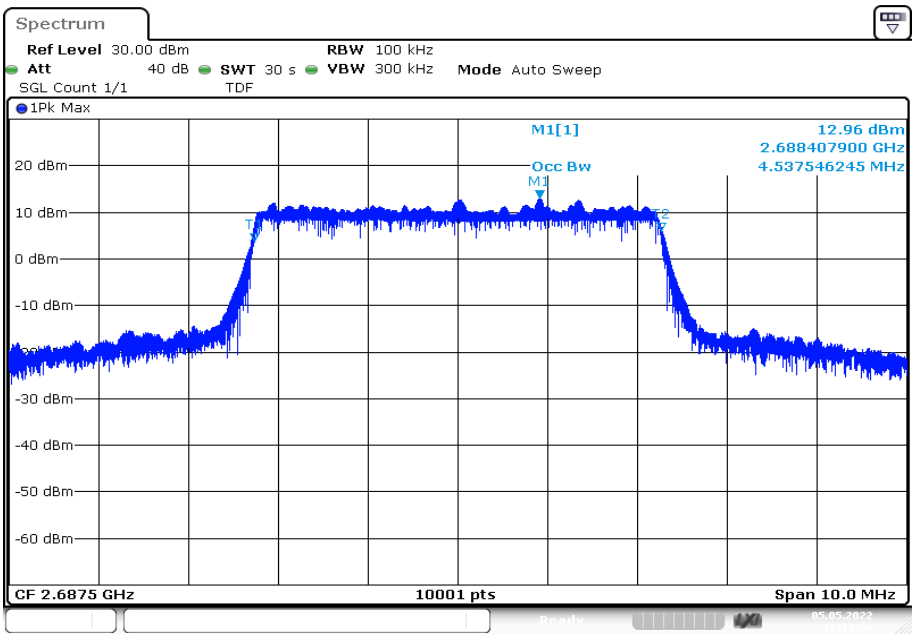
Plot 27: 5 MHz – 16-QAM - middle channel (99% - OBW)



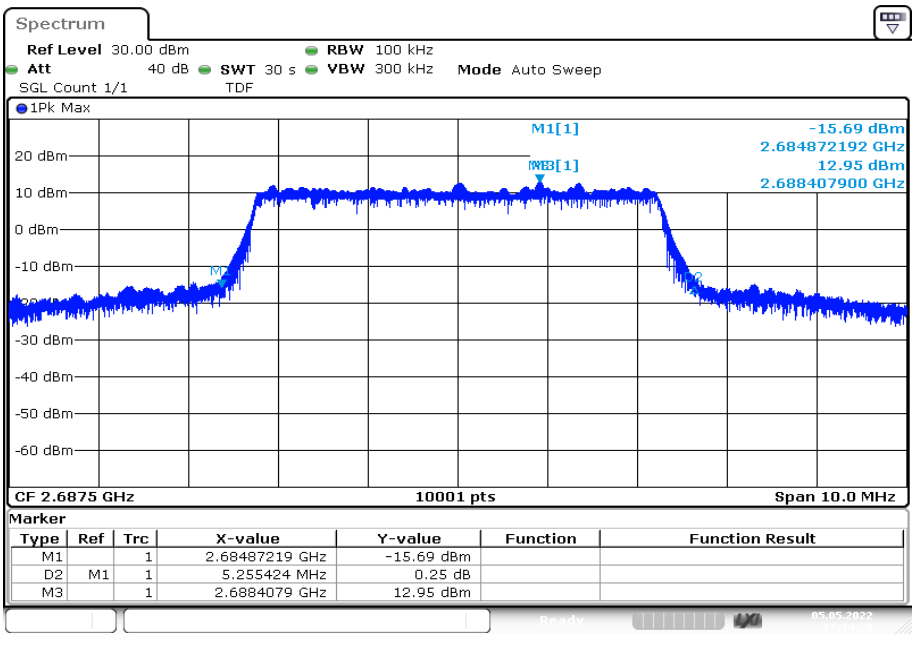
Plot 28: 5 MHz – 16-QAM - middle channel (-26 dBc BW)



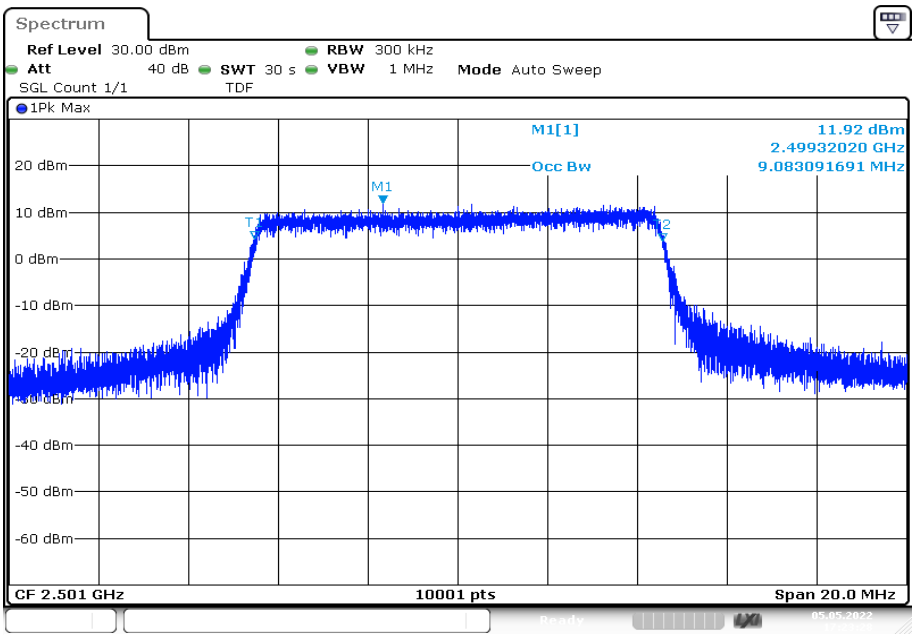
Plot 29: 5 MHz – 16-QAM - highest channel (99% - OBW)



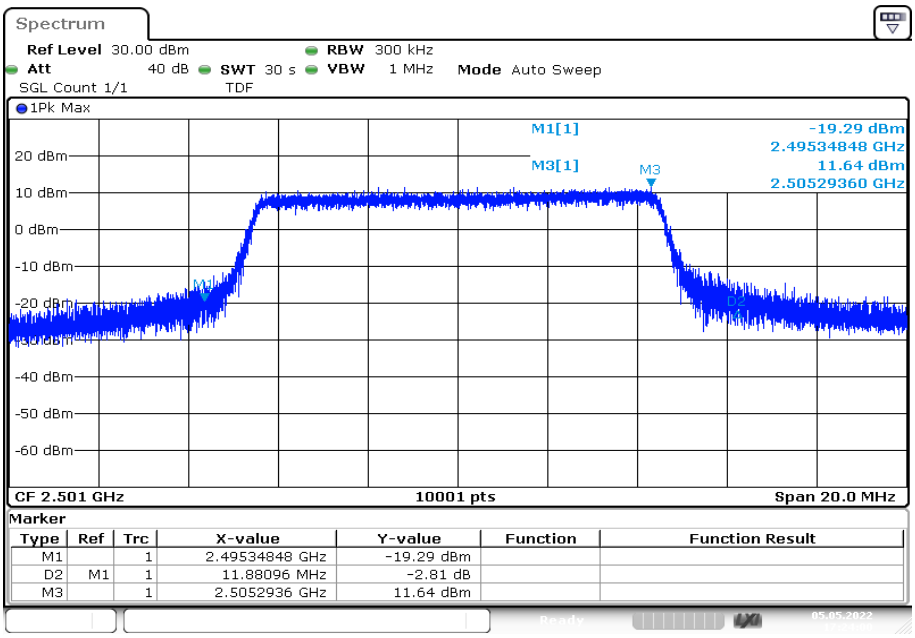
Plot 30: 5 MHz – 16-QAM - highest channel (-26 dBc BW)



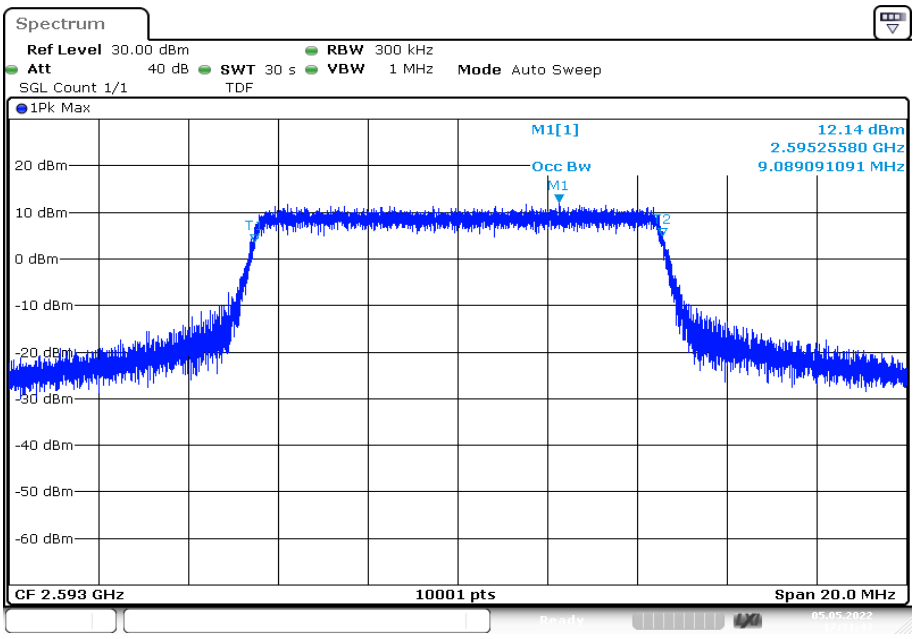
Plot 31: 10 MHz – 16-QAM - lowest channel (99% - OBW)



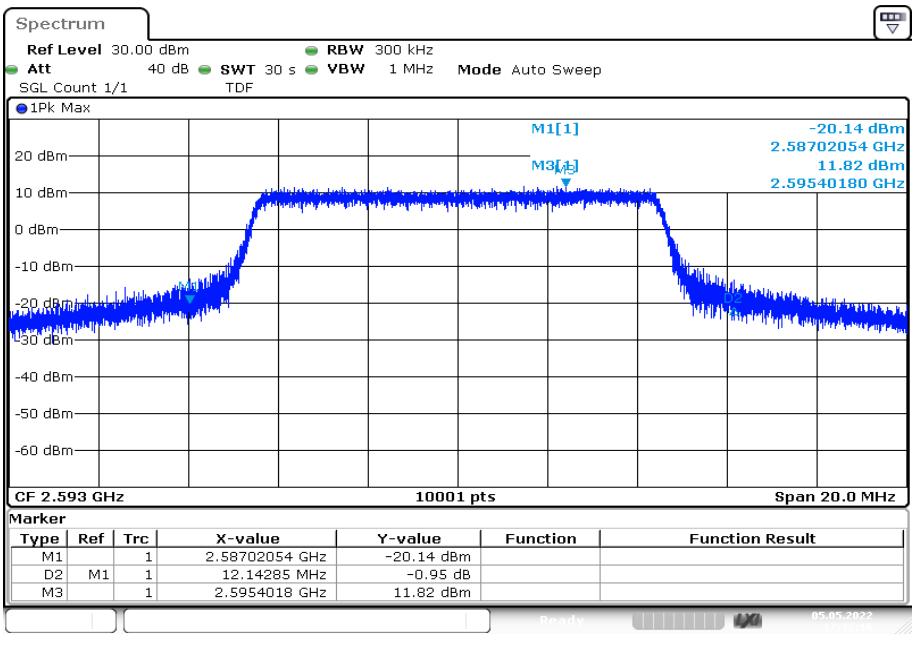
Plot 32: 10 MHz – 16-QAM - lowest channel (-26 dBc BW)



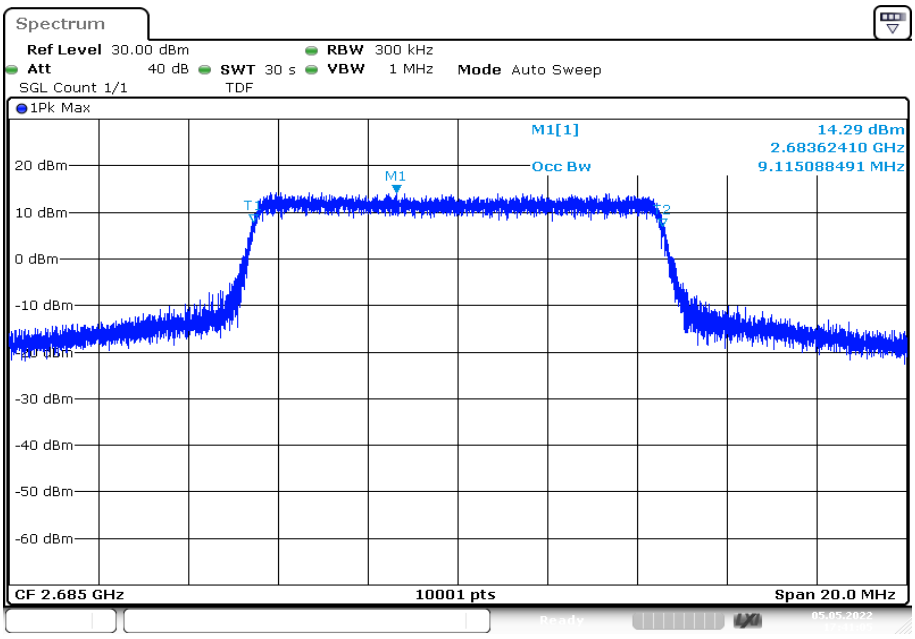
Plot 33: 10 MHz – 16-QAM - middle channel (99% - OBW)



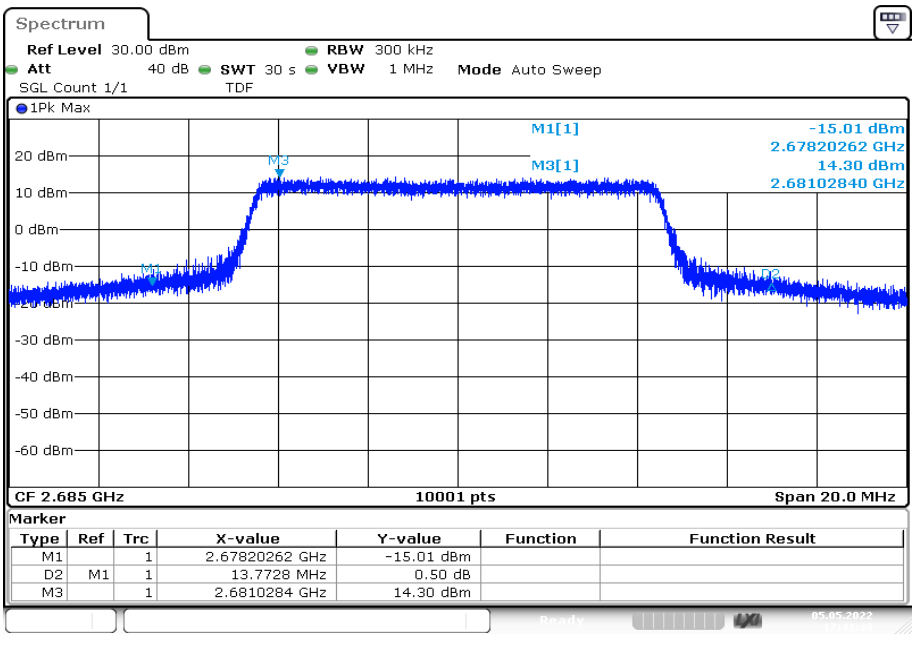
Plot 34: 10 MHz – 16-QAM - middle channel (-26 dBc BW)



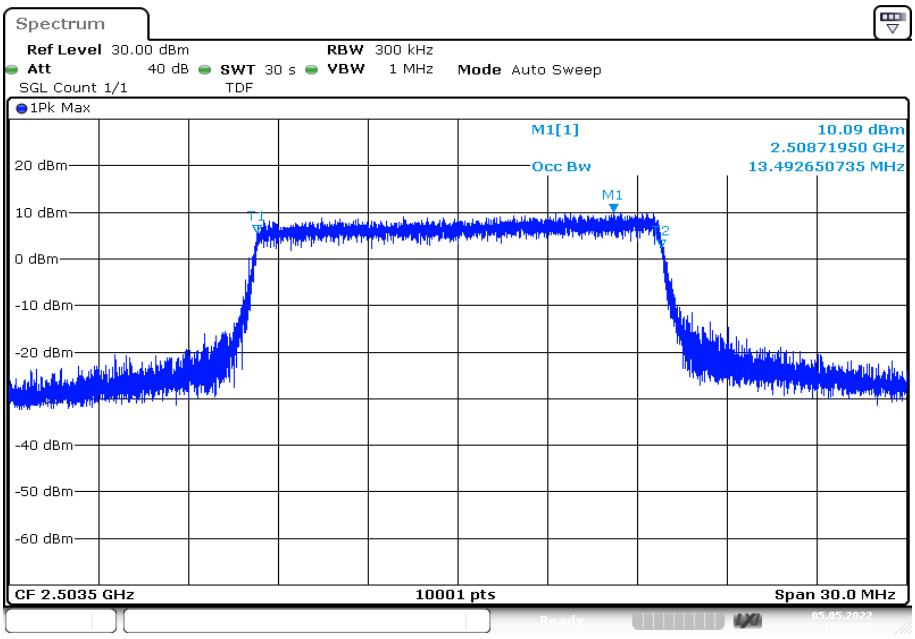
Plot 35: 10 MHz – 16-QAM - highest channel (99% - OBW)



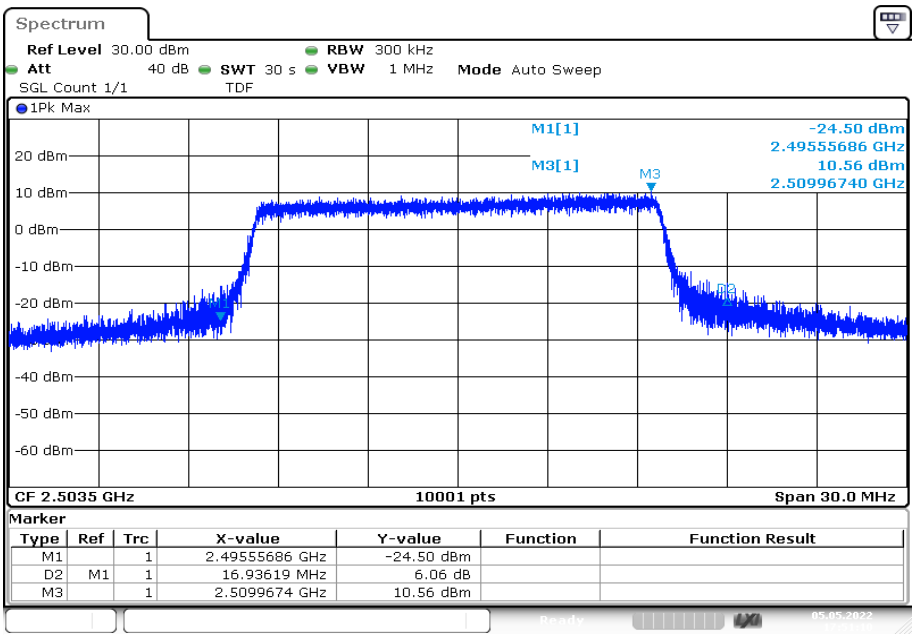
Plot 36: 10 MHz – 16-QAM - highest channel (-26 dBc BW)



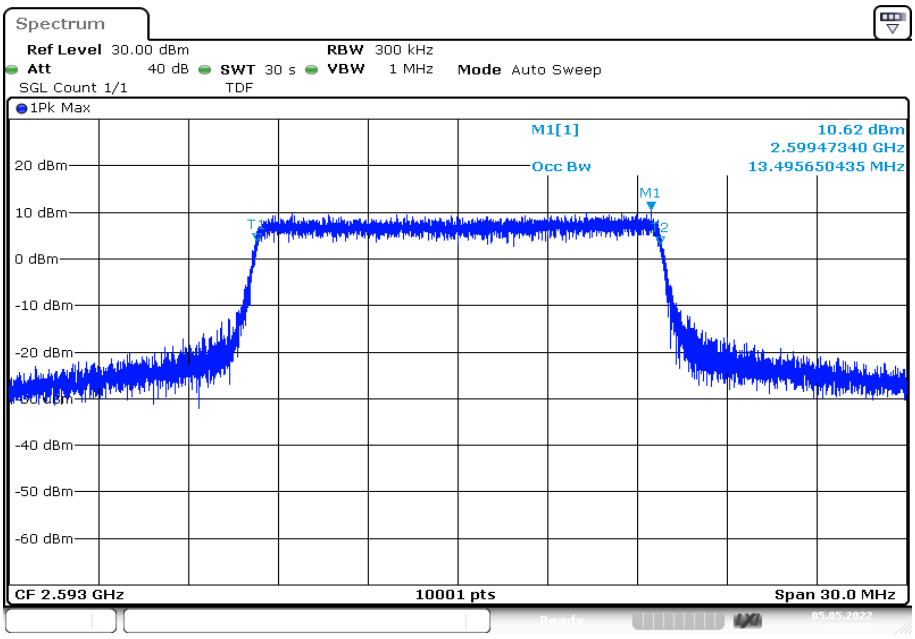
Plot 37: 15 MHz – 16-QAM - lowest channel (99% - OBW)



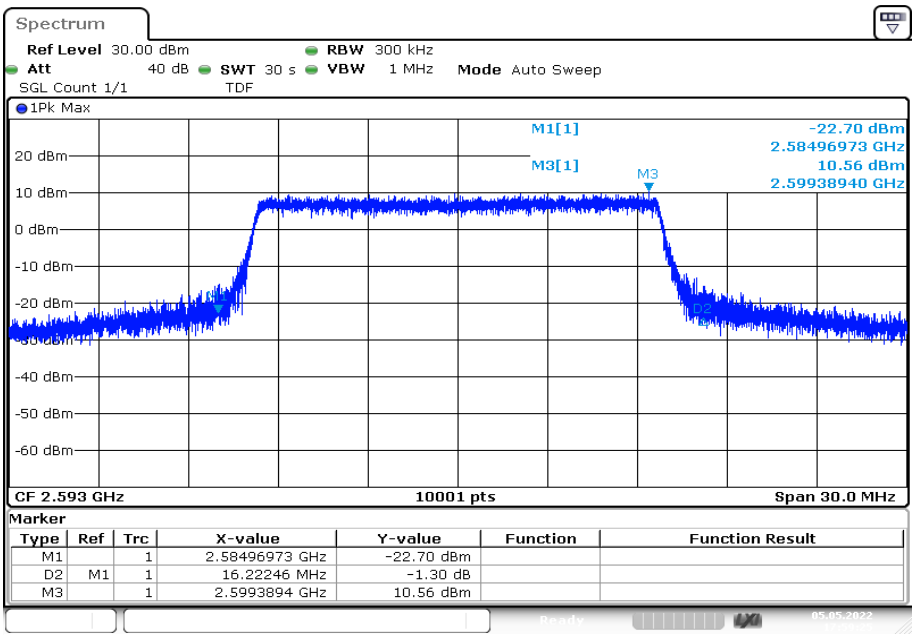
Plot 38: 15 MHz – 16-QAM - lowest channel (-26 dBc BW)



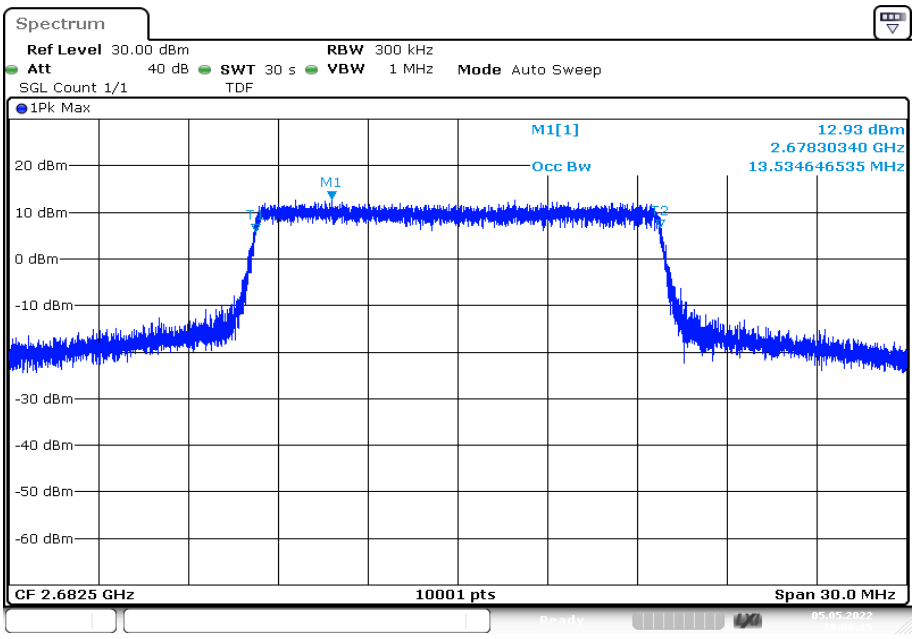
Plot 39: 15 MHz – 16-QAM - middle channel (99% - OBW)



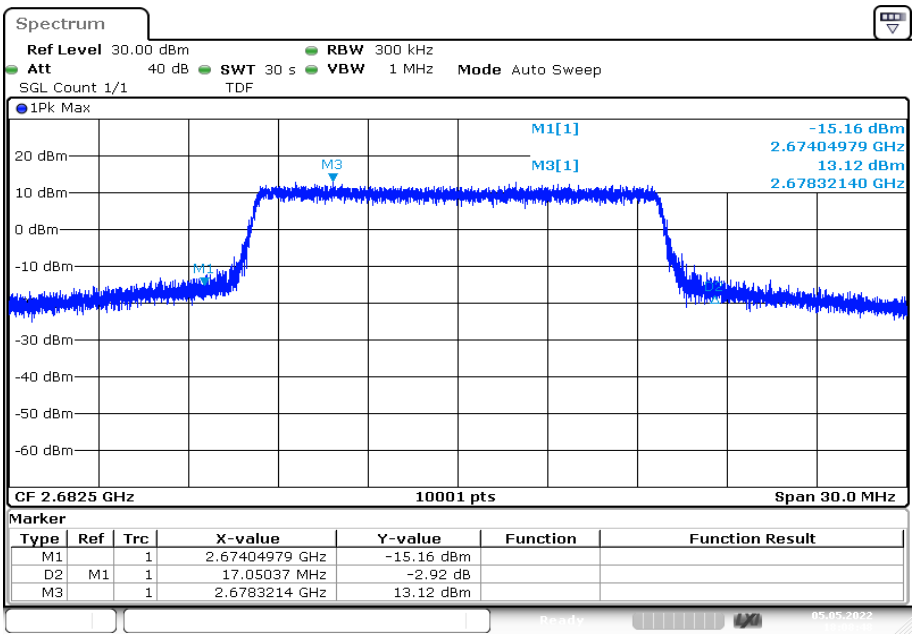
Plot 40: 15 MHz – 16-QAM - middle channel (-26 dBc BW)



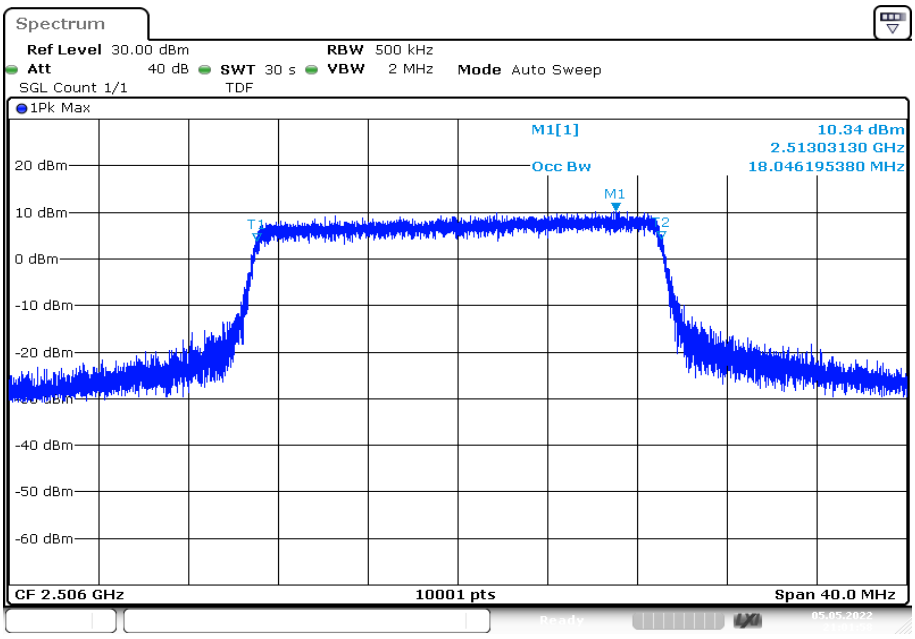
Plot 41: 15 MHz – 16-QAM - highest channel (99% - OBW)



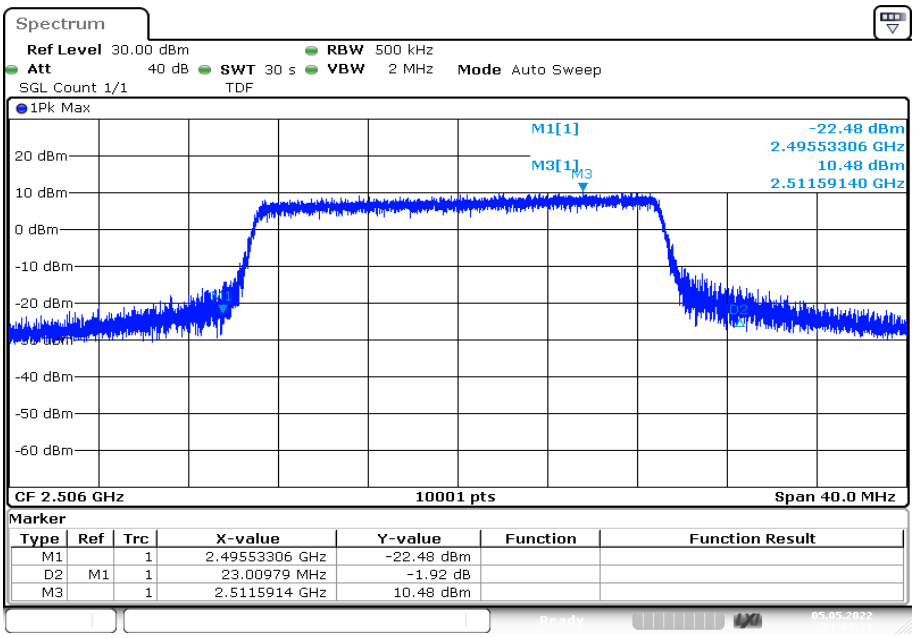
Plot 42: 15 MHz – 16-QAM - highest channel (-26 dBc BW)



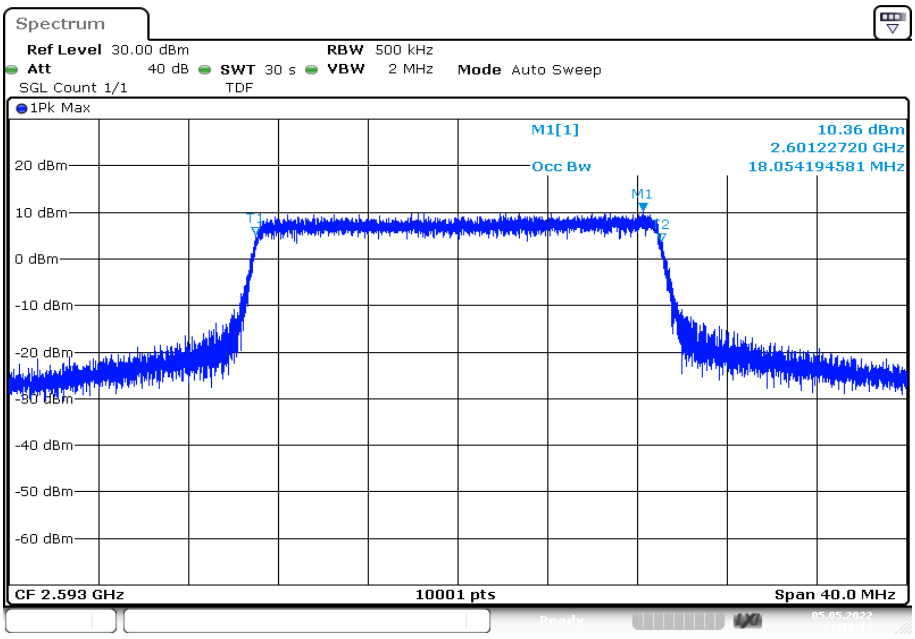
Plot 43: 20 MHz – 16-QAM - lowest channel (99% - OBW)



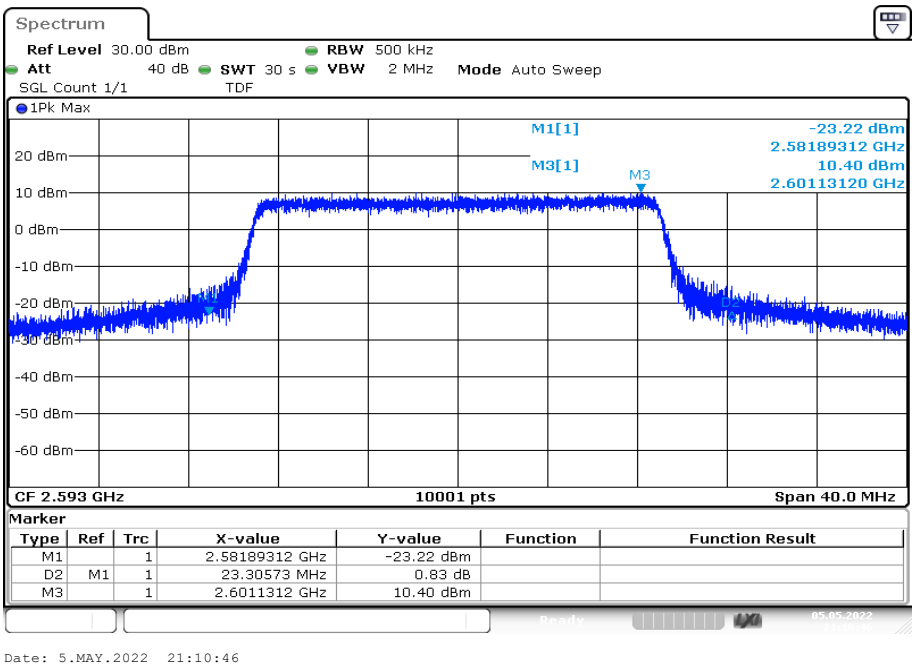
Plot 44: 20 MHz – 16-QAM - lowest channel (-26 dBc BW)



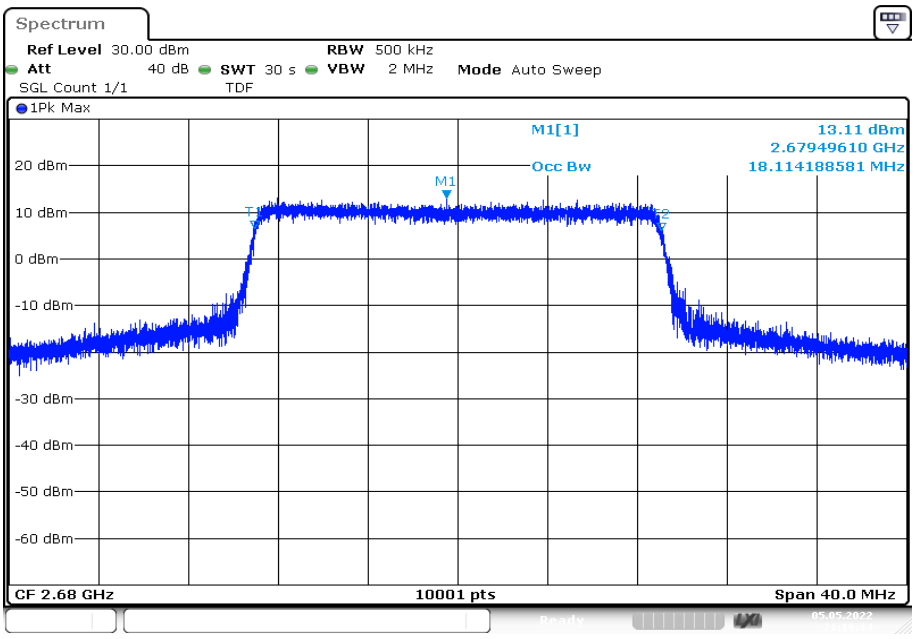
Plot 45: 20 MHz – 16-QAM - middle channel (99% - OBW)



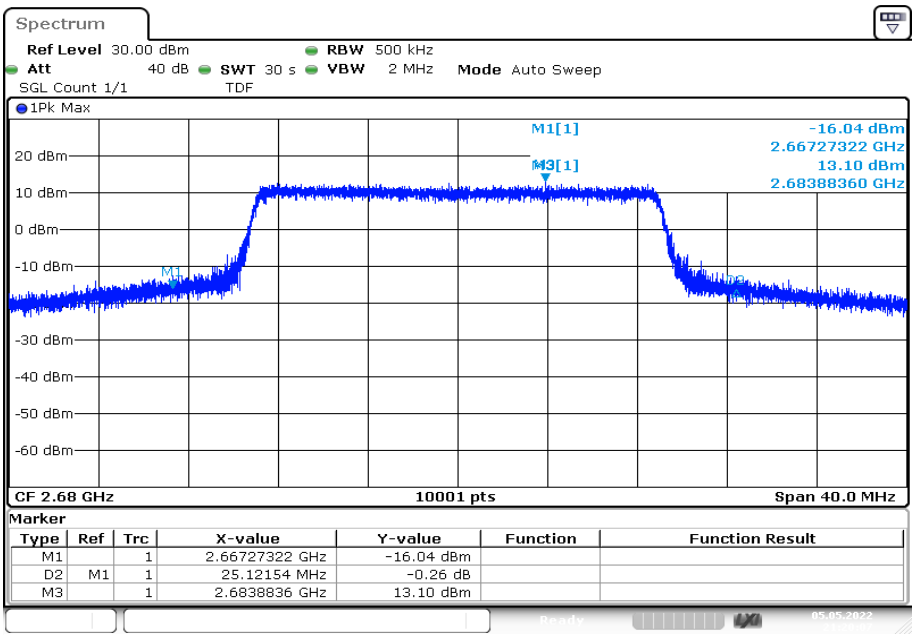
Plot 46: 20 MHz – 16-QAM - middle channel (-26 dBc BW)



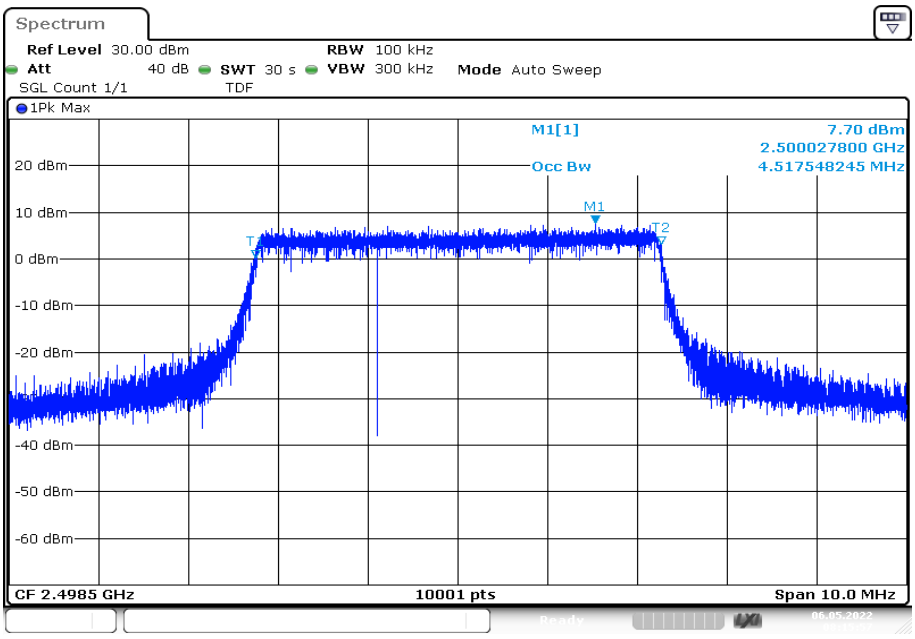
Plot 47: 20 MHz – 16-QAM - highest channel (99% - OBW)



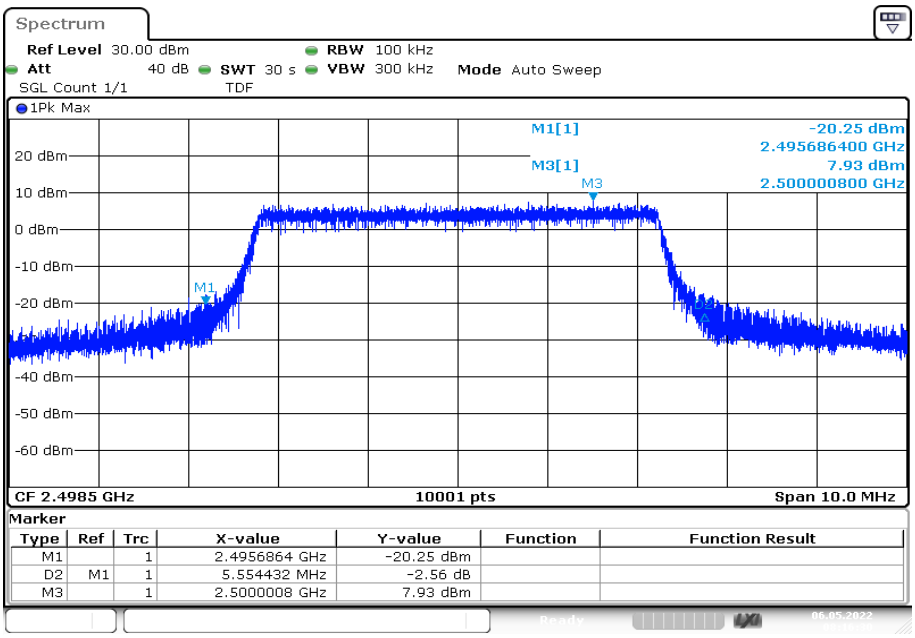
Plot 48: 20 MHz – 16-QAM - highest channel (-26 dBc BW)



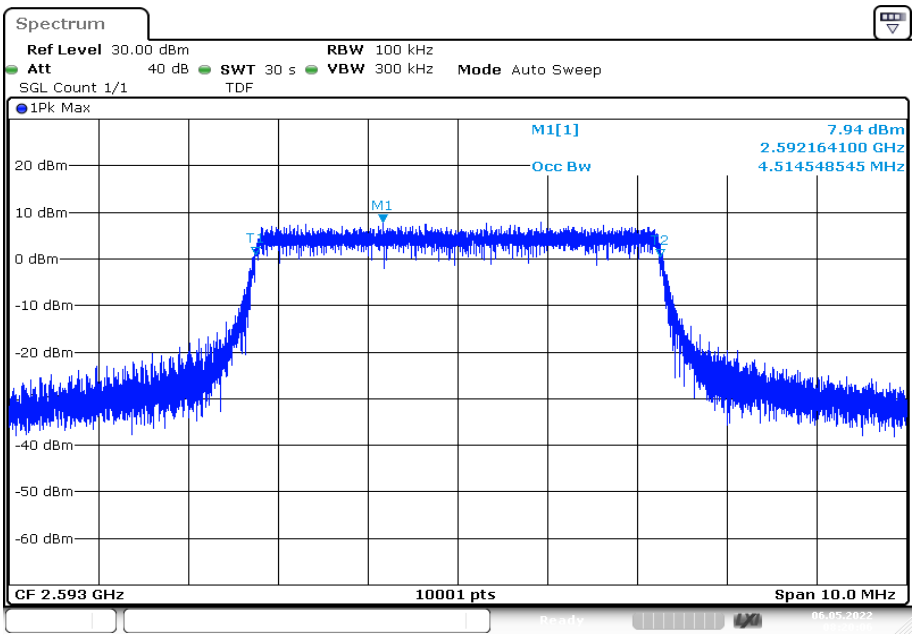
Plot 49: 5 MHz – 64-QAM - lowest channel (99% - OBW)



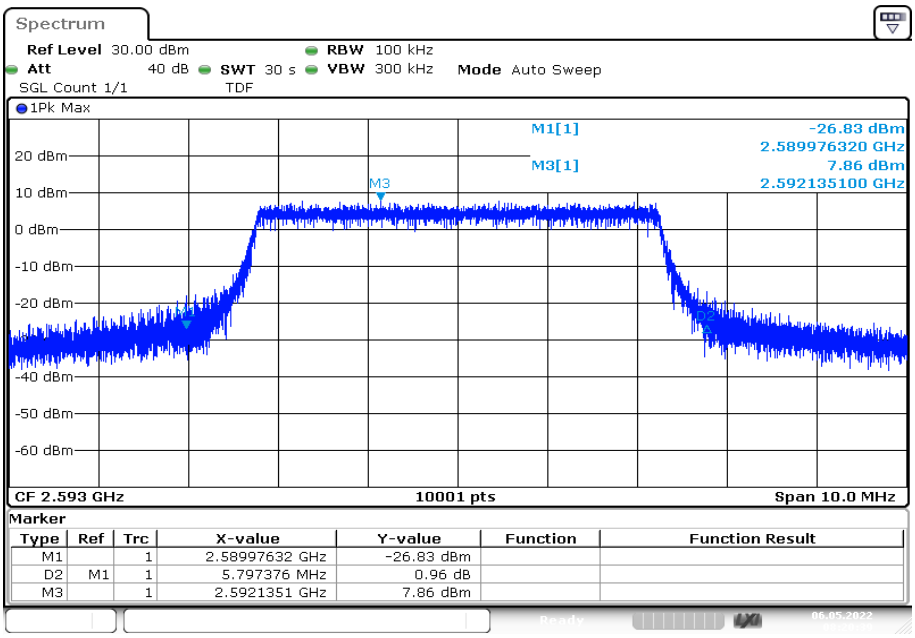
Plot 50: 5 MHz – 64-QAM - lowest channel (-26 dBc BW)



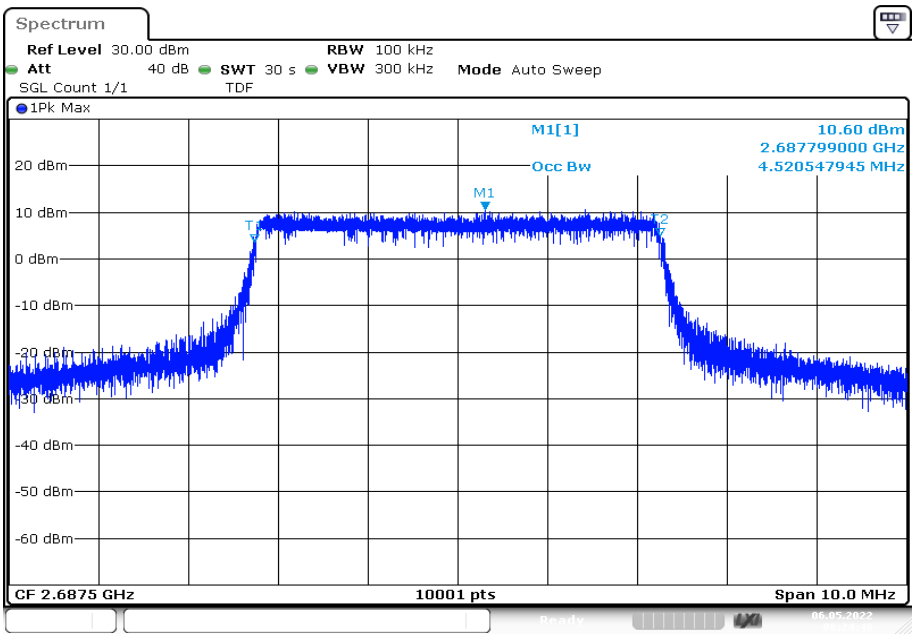
Plot 51: 5 MHz – 64-QAM - middle channel (99% - OBW)



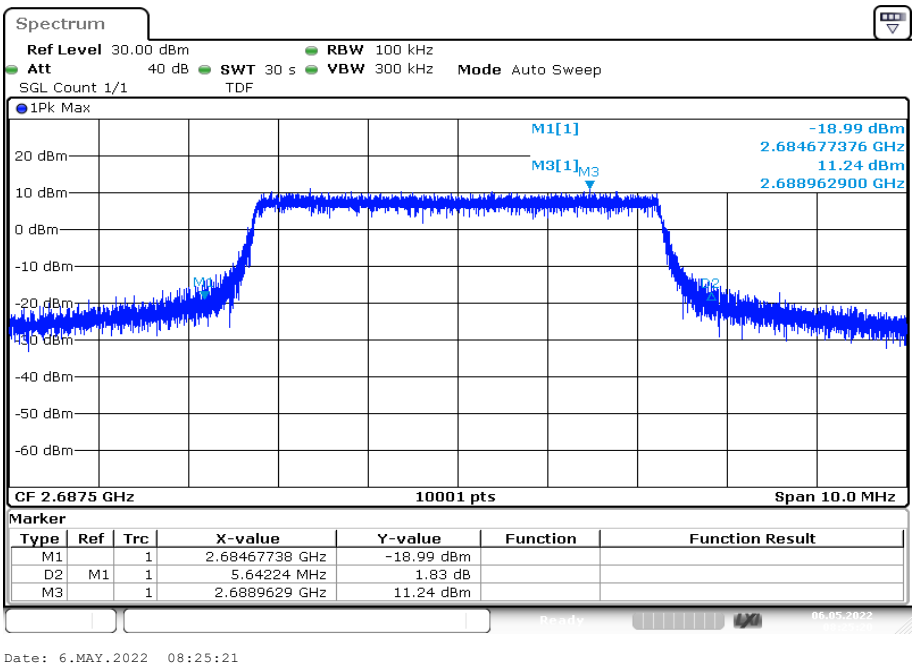
Plot 52: 5 MHz – 64-QAM - middle channel (-26 dBc BW)



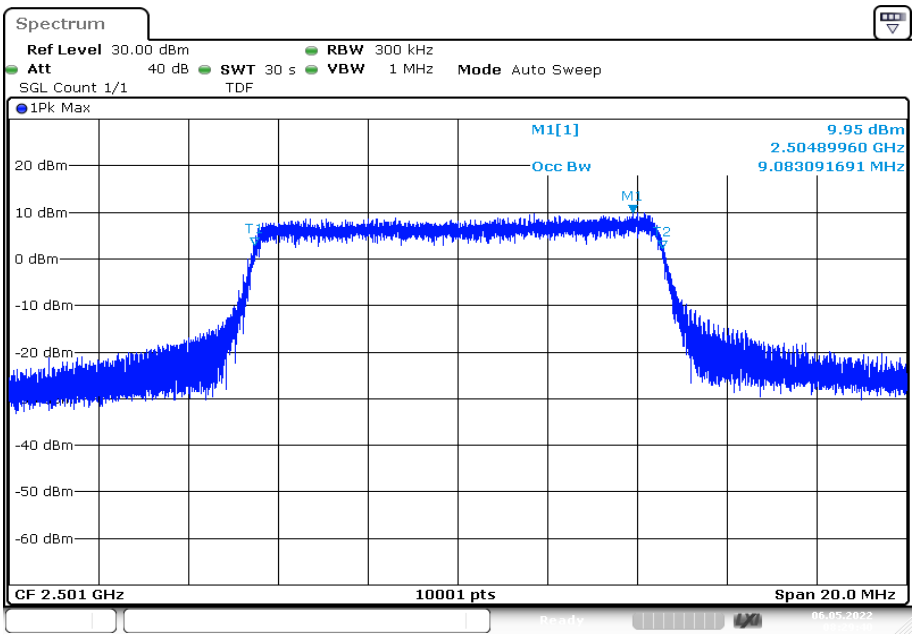
Plot 53: 5 MHz – 64-QAM - highest channel (99% - OBW)



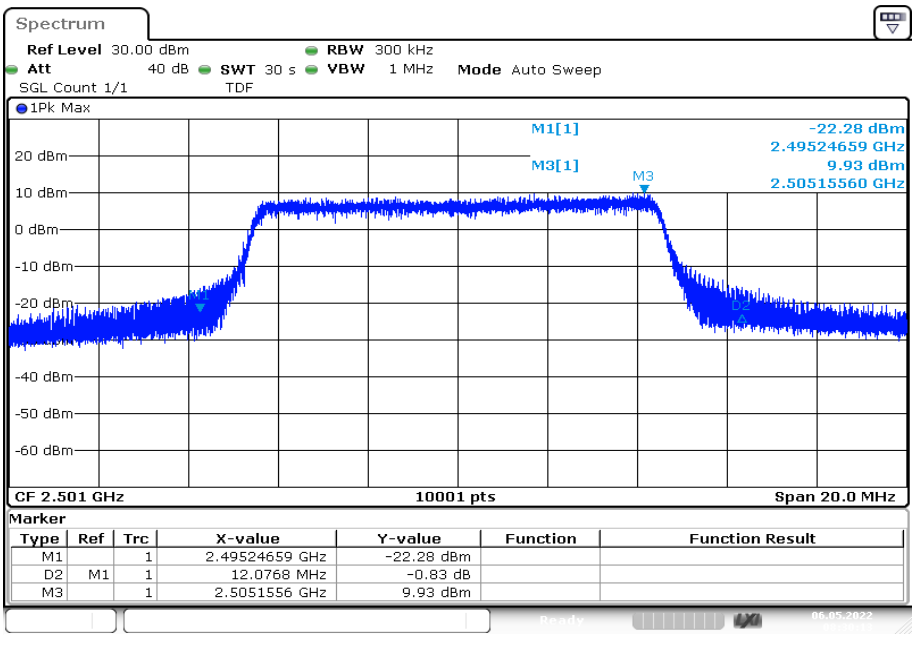
Plot 54: 5 MHz – 64-QAM - highest channel (-26 dBc BW)



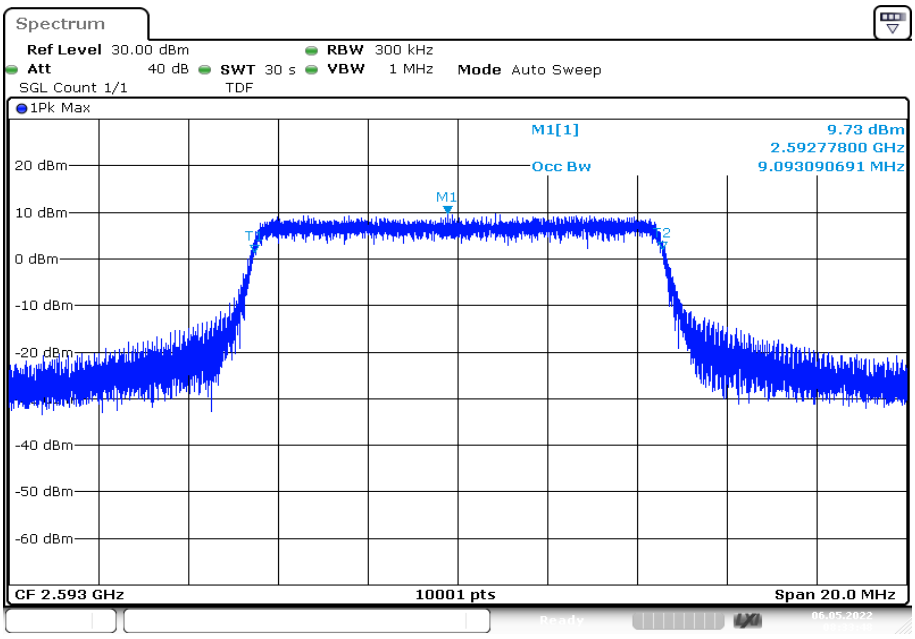
Plot 55: 10 MHz – 64-QAM - lowest channel (99% - OBW)



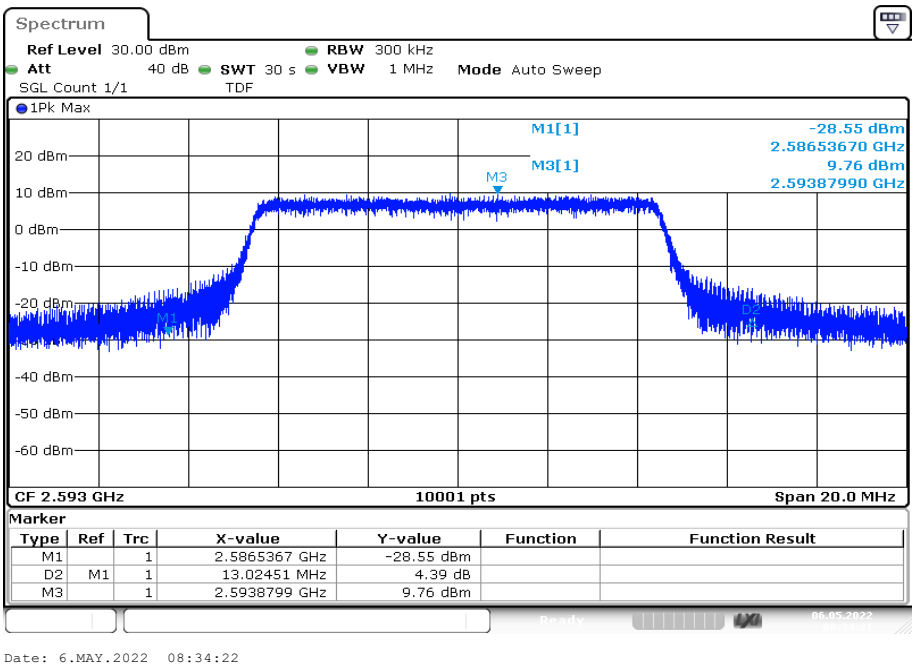
Plot 56: 10 MHz – 64-QAM - lowest channel (-26 dBc BW)



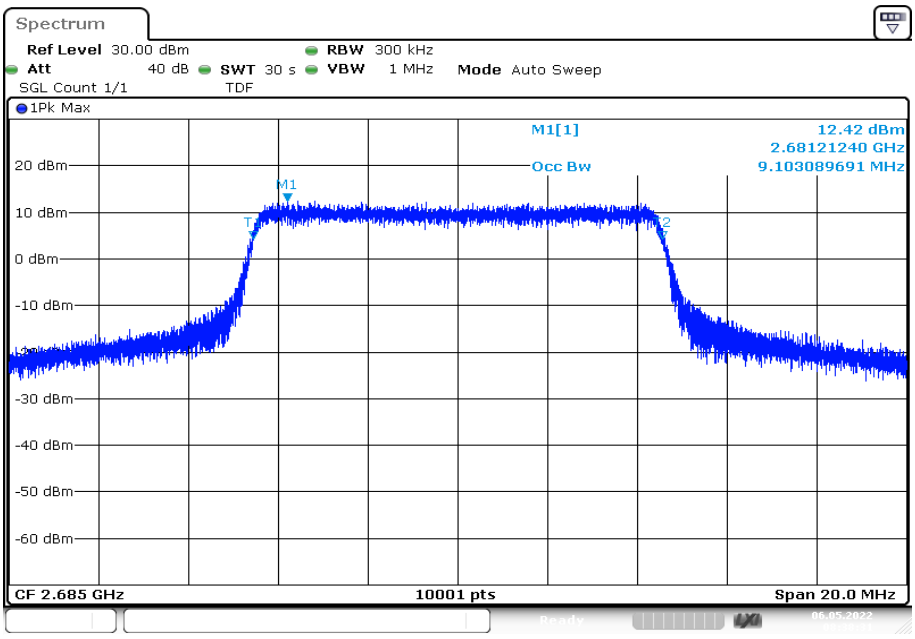
Plot 57: 10 MHz – 64-QAM - middle channel (99% - OBW)



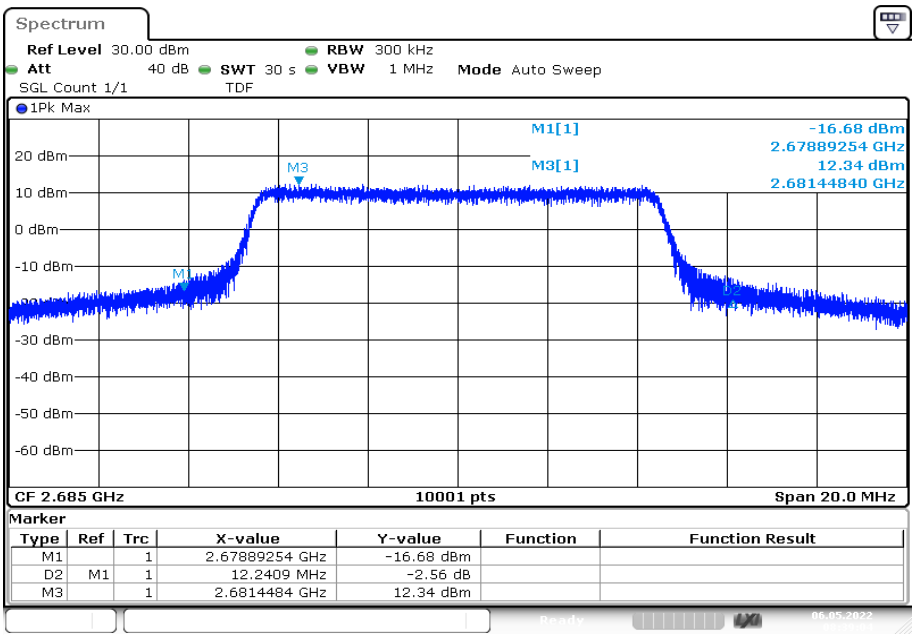
Plot 58: 10 MHz – 64-QAM - middle channel (-26 dBc BW)



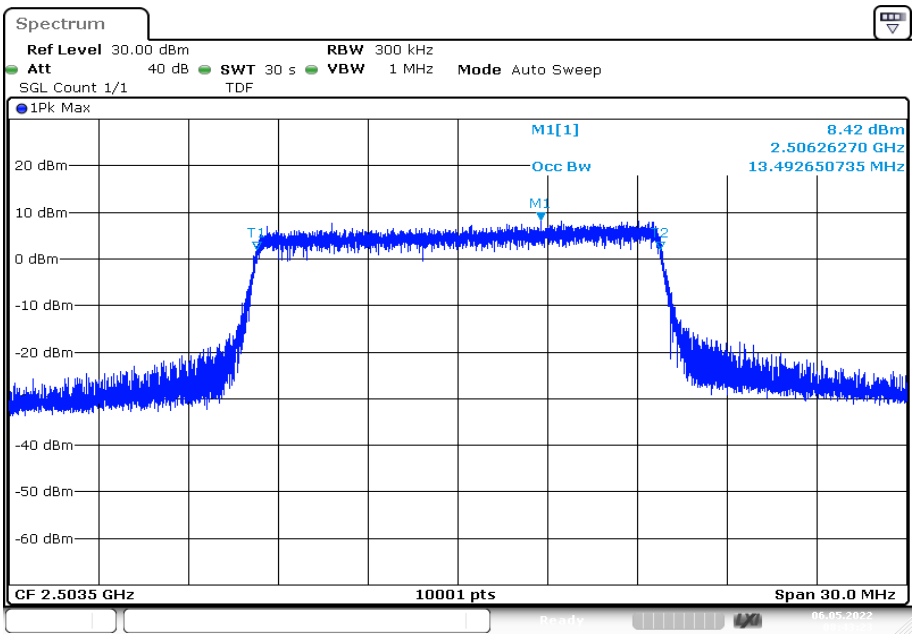
Plot 59: 10 MHz – 64-QAM - highest channel (99% - OBW)



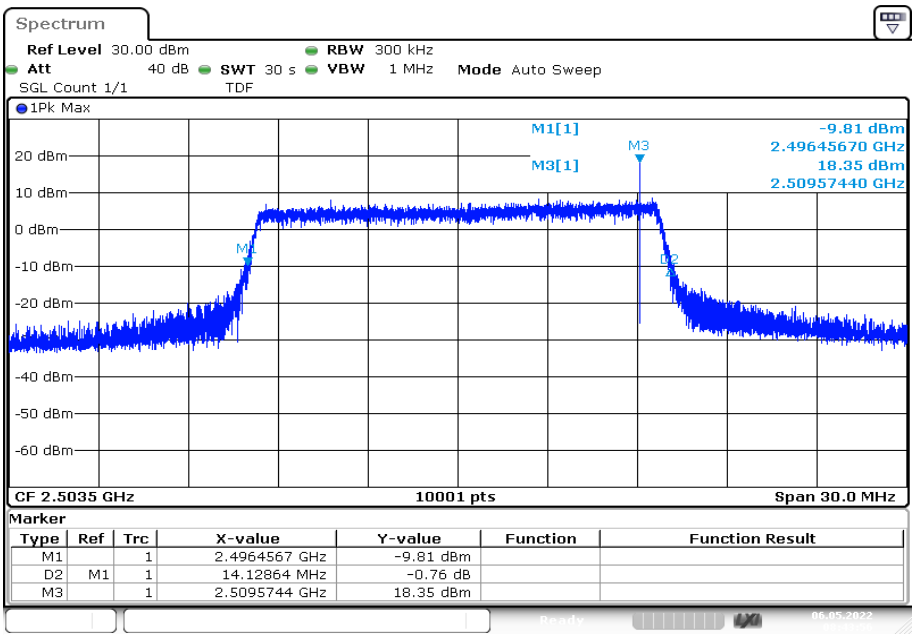
Plot 60: 10 MHz – 64-QAM - highest channel (-26 dBc BW)



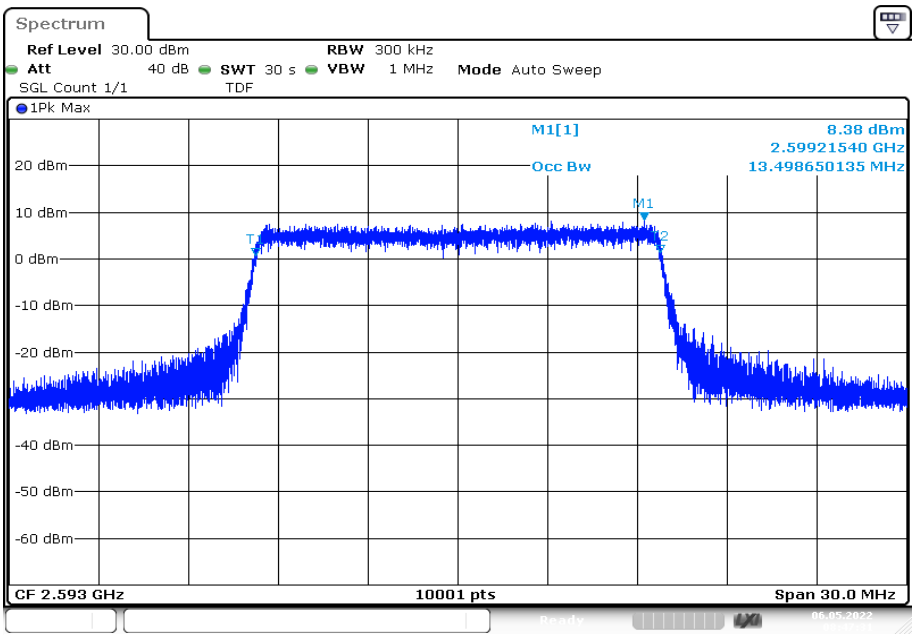
Plot 61: 15 MHz – 16-QAM - lowest channel (99% - OBW)



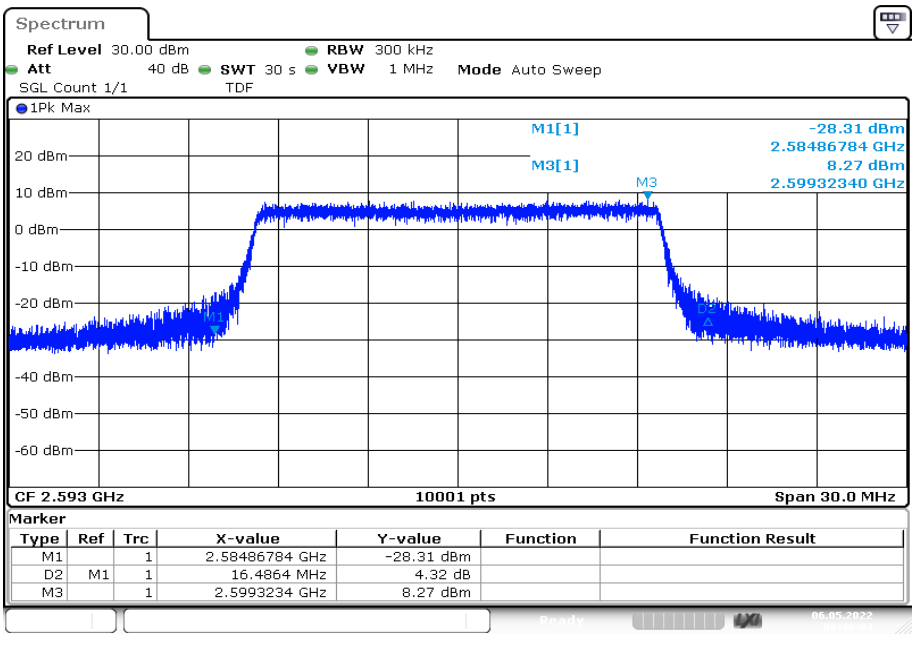
Plot 62: 15 MHz – 16-QAM - lowest channel (-26 dBc BW)



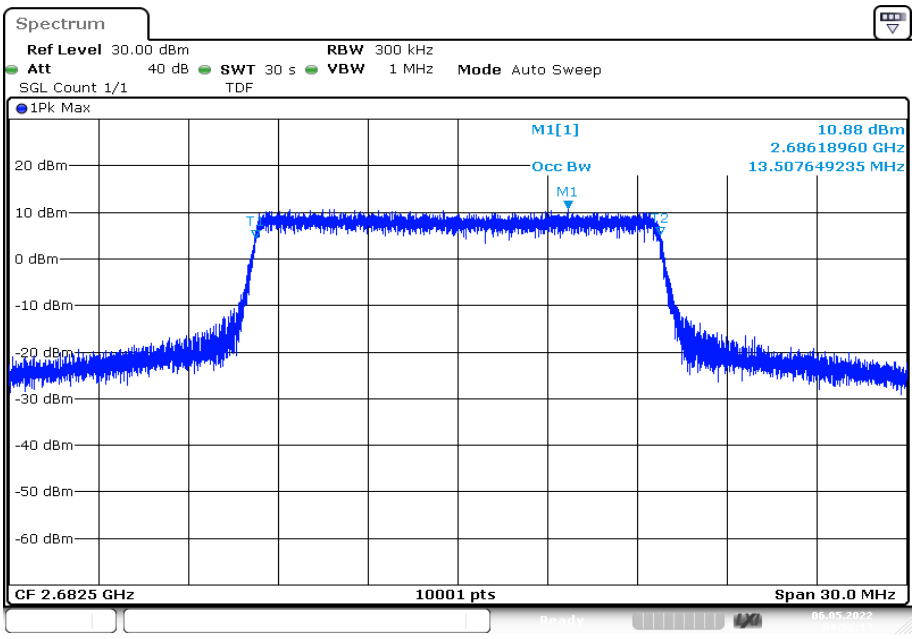
Plot 63: 15 MHz – 64-QAM - middle channel (99% - OBW)



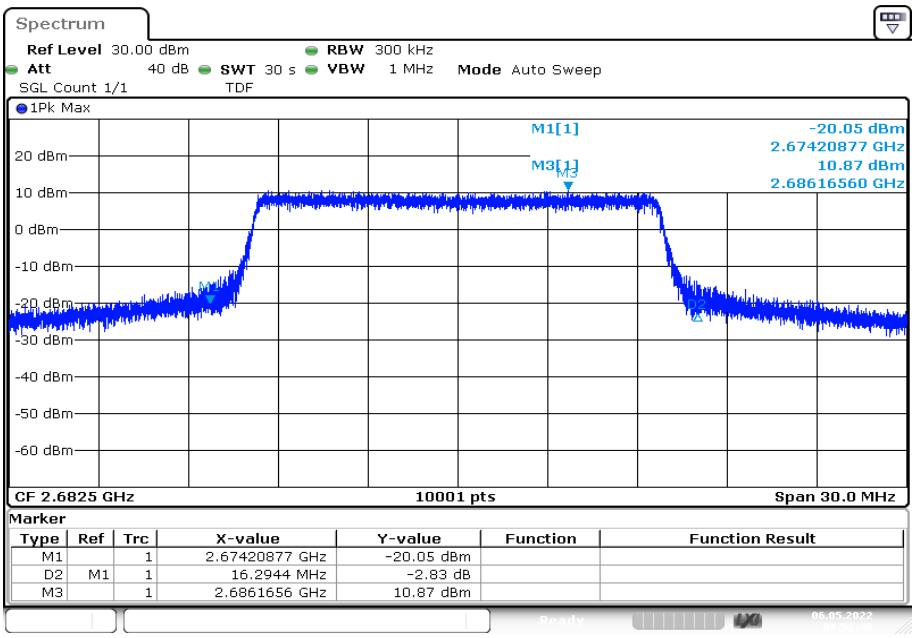
Plot 64: 15 MHz – 64-QAM - middle channel (-26 dBc BW)



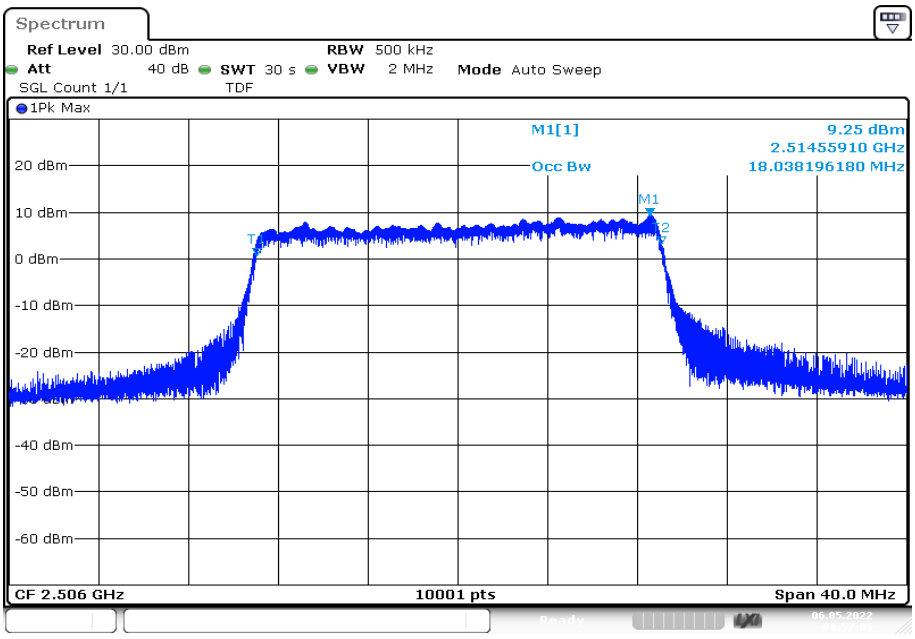
Plot 65: 15 MHz – 64-QAM - highest channel (99% - OBW)



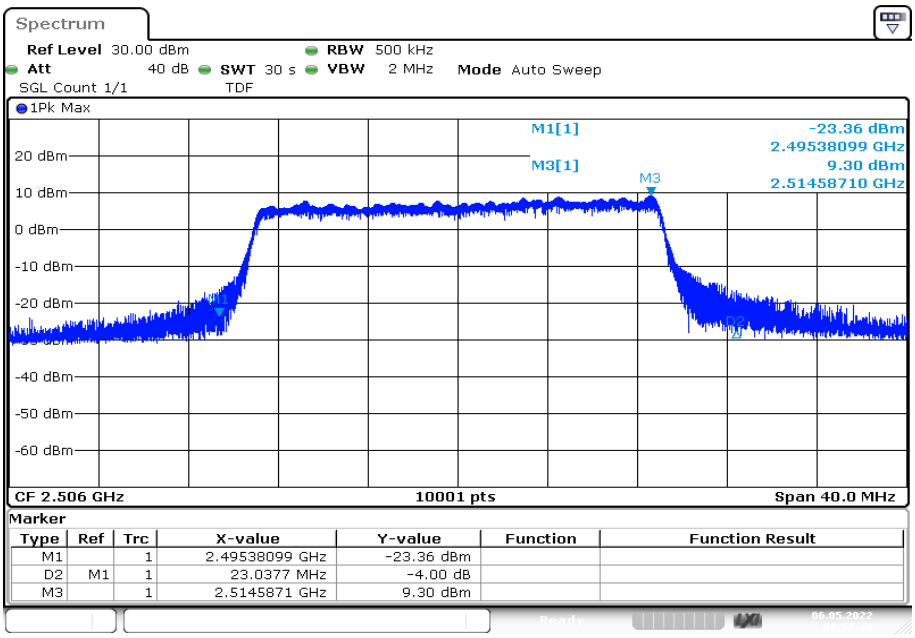
Plot 66: 15 MHz – 64-QAM - highest channel (-26 dBc BW)



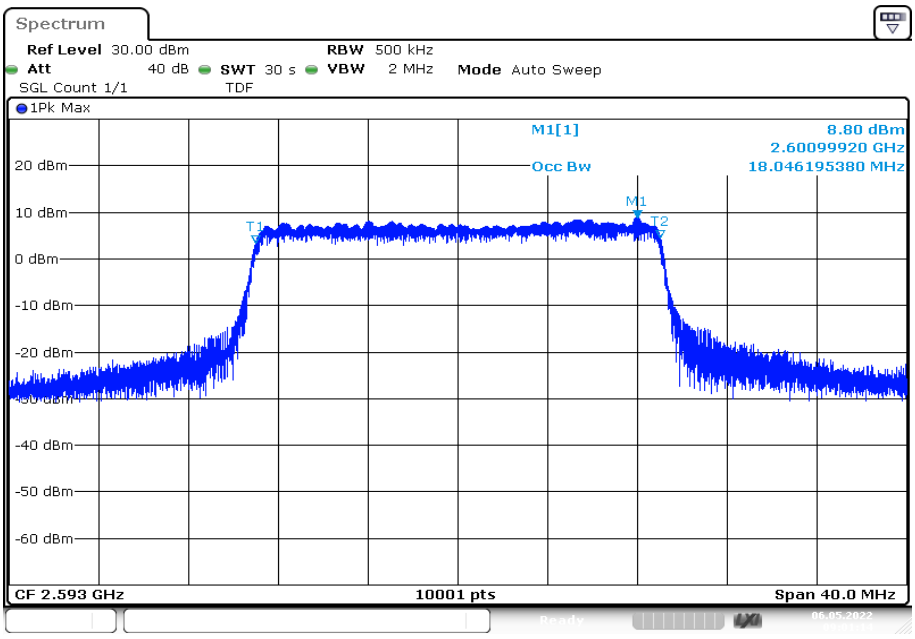
Plot 67: 20 MHz – 64-QAM - lowest channel (99% - OBW)



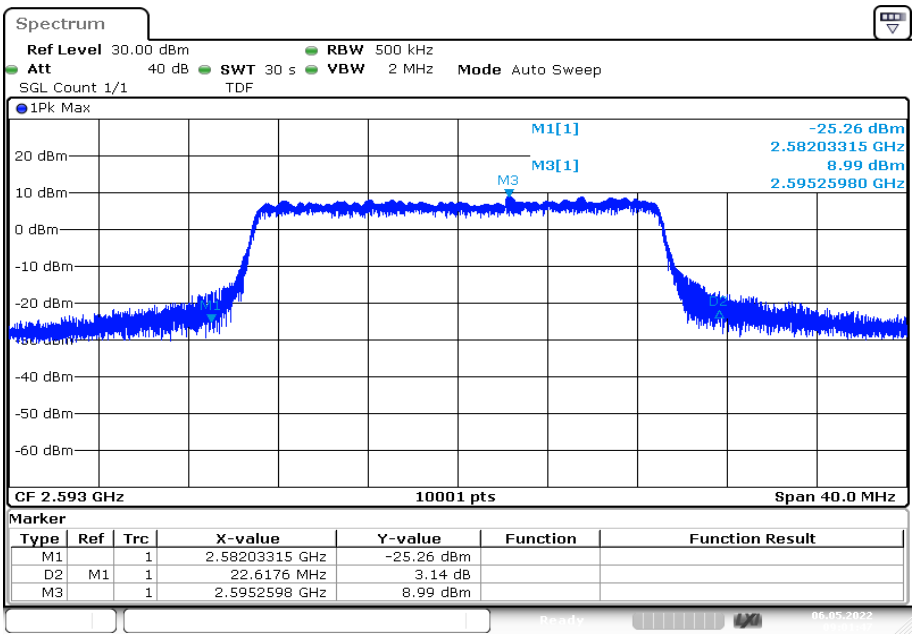
Plot 68: 20 MHz – 64-QAM - lowest channel (-26 dBc BW)



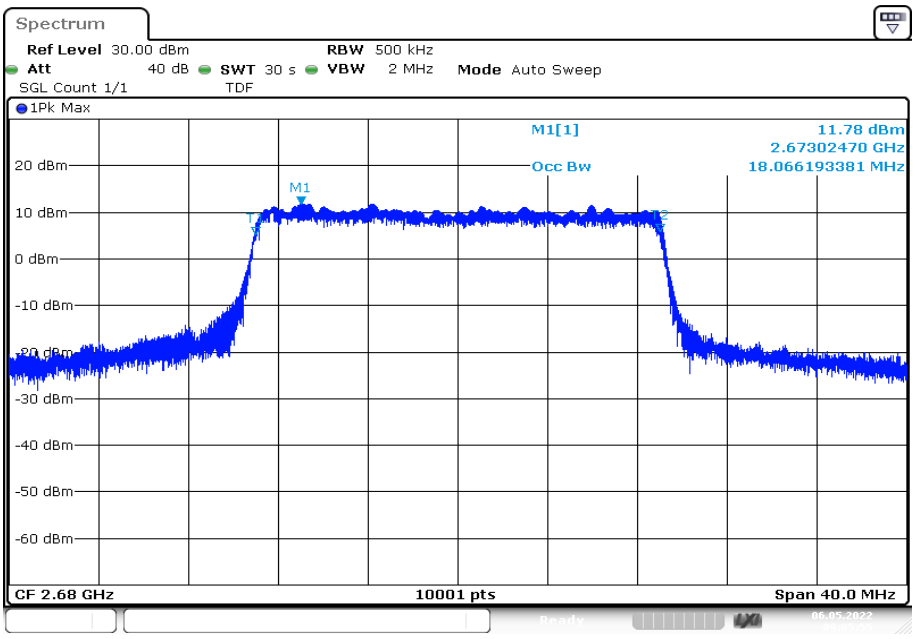
Plot 69: 20 MHz – 64-QAM - middle channel (99% - OBW)



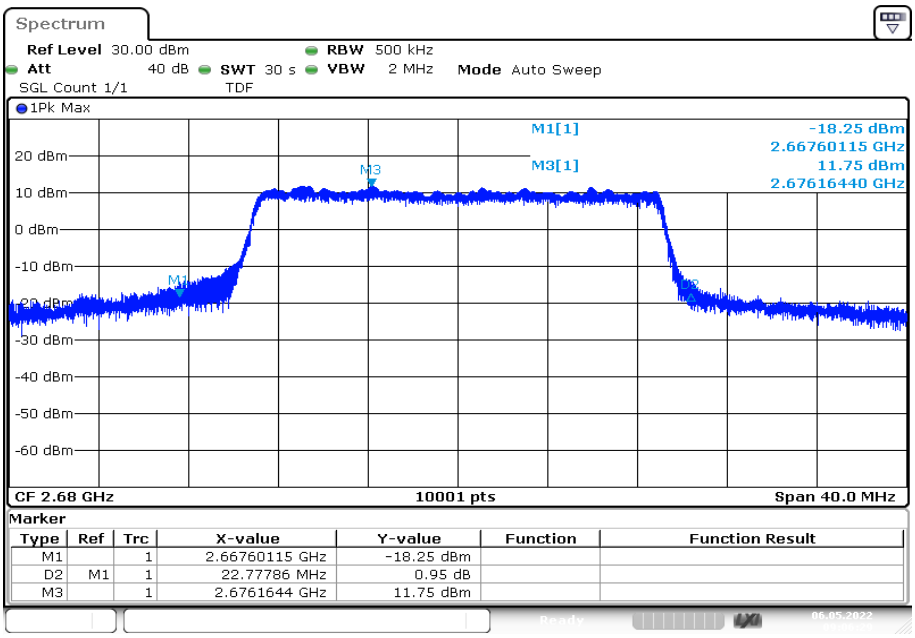
Plot 70: 20 MHz – 64-QAM - middle channel (-26 dBc BW)



Plot 71: 20 MHz – 64-QAM - highest channel (99% - OBW)



Plot 72: 20 MHz – 64-QAM - highest channel (-26 dBc BW)



13 Summary of measurement results

☒	No deviations from the technical specifications were ascertained
☐	There were deviations from the technical specifications ascertained
☐	This test report is only a partial test report. The content and verdict of the performed test cases are listed below.

TC identifier	Description	verdict	date	Remark
RF-Testing	FCC: CFR Part 2 & Part 27	See table!	2022-06-01	-/-

13.1 Part 27: 5G NR band 41

Test Case	temperature conditions	power source voltages	C	NC	NA	NP	Remark
RF Output Power	Nominal	Nominal	☒	☐	☐	☐	-/-
Frequency Stability	Extreme	Extreme	☒	☐	☐	☐	-/-
Spurious Emissions Radiated	Nominal	Nominal	☒	☐	☐	☐	-/-
Spurious Emissions Conducted	Nominal	Nominal	☒	☐	☐	☐	-/-
Block Edge Compliance	Nominal	Nominal	☒	☐	☐	☐	-/-
Occupied Bandwidth	Nominal	Nominal	☒	☐	☐	☐	-/-

Notes:

C	Compliant	**NC**	Not compliant	**NA**	Not applicable	**NP**	Not performed

14 RF measurements

14.1 Description of test setup

For the spurious measurements we use the substitution method according TIA/EIA 603.

14.2 Results 5G NR band 41

The EUT was set to transmit the maximum power.

14.2.1 RF output power

Description:

This paragraph contains average power, peak output power and EIRP measurements for the mobile station. In all cases, the peak output power is within the required mask (this mask is specified in the JTC standards, TIA PN3389 Vol. 1 Chap 7, and is no FCC requirement).

Measurement:

The mobile was set up for the maximum output power with pseudo random data modulation.

To determine the Peak-To-Average Power Ratio (PAPR) the measurement was performed with the Power Complementary Cumulative Distribution Function (CCDF).

Measurement parameters	
Power meter and MT8000A	
Used equipment:	See chapter 8.2 setup A & 8.4 setup A
Measurement uncertainty:	See chapter 9
Measurement procedure:	FCC: § 2.1046

Limits:

FCC
§27.50(h)(2)
Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.
Power: 33 dBm EIRP PAPR: Reporting only

Results:

Output Power (conducted) ANT1 + ANT2 sum									ANT2
Band-width (MHz)	Channel / Frequency (MHz)	Resource block allocation			Average Output Power (dBm)	Average Output Power (dBm)	Average Output Power (dBm)	Average Output Power (dBm)	Average Output Power (dBm)
		RB configuration	RB Allocation	RB Offset	QPSK	16-QAM	64-QAM	256-QAM	PI/2BPSK
20	501204 / 2506.02	1 RB low	1	0	25.1	25.2	25.0	22.1	22.2
		1 RB low+1	1	1	27.2	26.7	25.0	22.5	25.7
		1 RB high-1	1	49	27.3	26.8	25.1	22.3	25.7
		1 RB high	1	50	25.5	25.3	25.1	22.2	25.7
		50% RB mid	25	12	27.3	26.6	25.2	22.2	25.8
		100% RB	51	0	25.6	25.7	25.2	22.3	25.3
	518598 / 2592.99	1 RB low	1	0	25.6	25.7	25.5	22.3	22.4
		1 RB low+1	1	1	27.5	27.1	25.7	22.7	26.0
		1 RB high-1	1	49	27.6	27.1	25.7	22.8	25.9
		1 RB high	1	50	25.6	25.8	25.6	22.6	26.0
		50% RB mid	25	12	27.6	27.0	25.6	22.7	26.1
		100% RB	51	0	26.1	26.0	25.6	22.6	25.6
	535998 / 2679.99	1 RB low	1	0	25.4	25.2	25.1	22.2	22.0
		1 RB low+1	1	1	27.3	26.6	25.1	22.2	25.5
		1 RB high-1	1	49	27.3	26.6	24.9	22.1	25.5
		1 RB high	1	50	25.3	25.1	25.0	22.3	25.4
		50% RB mid	25	12	27.1	26.5	25.1	22.0	25.5
		100% RB	51	0	25.5	25.6	25.1	22.1	25.0
30	502200 / 2511.00	1 RB low	1	0	25.3	25.4	25.3	22.3	22.3
		1 RB low+1	1	1	27.4	26.9	25.1	22.4	25.7
		1 RB high-1	1	76	27.8	27.2	25.5	22.6	26.1
		1 RB high	1	77	25.8	25.7	25.4	22.5	26.1
		50% RB mid	39	19	27.3	26.8	25.4	22.3	25.8
		100% RB	78	0	25.9	25.8	25.5	22.4	25.4
	518598 / 2592.99	1 RB low	1	0	25.5	25.5	25.4	22.3	22.3
		1 RB low+1	1	1	27.5	26.9	25.3	22.7	25.9
		1 RB high-1	1	76	27.7	27.0	25.4	22.5	26.0
		1 RB high	1	77	25.7	25.7	25.5	22.5	25.9
		50% RB mid	39	19	27.6	27.1	25.6	22.6	25.9
		100% RB	78	0	26.1	26.1	25.6	22.7	25.5

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Output Power (conducted) ANT1 + ANT2 sum									ANT2
Band-width (MHz)	Channel / Frequency (MHz)	Resource block allocation			Average Output Power (dBm)	Average Output Power (dBm)	Average Output Power (dBm)	Average Output Power (dBm)	Average Output Power (dBm)
		RB configuration	RB Allocation	RB Offset	QPSK	16-QAM	64-QAM	256-QAM	PI/2BPSK
	534996 / 2674.98	1 RB low	1	0	25.6	25.8	25.5	22.6	22.4
		1 RB low+1	1	1	27.7	27.1	25.5	22.5	25.9
		1 RB high-1	1	76	27.4	26.9	25.2	22.4	25.7
		1 RB high	1	77	25.4	25.6	25.2	22.5	25.7
		50% RB mid	39	19	27.3	26.7	25.3	22.3	25.8
		100% RB	78	0	25.8	25.8	25.4	22.4	25.2
40	503202 / 2516.01	1 RB low	1	0	25.4	25.3	25.1	22.3	22.2
		1 RB low+1	1	1	27.4	26.9	25.2	22.2	25.8
		1 RB high-1	1	104	27.6	27.4	25.4	22.5	25.6
		1 RB high	1	105	25.6	25.6	25.5	22.5	25.6
		50% RB mid	53	26	27.3	26.8	25.3	22.3	25.7
		100% RB	106	0	25.9	25.8	25.4	22.4	25.2
	518598 / 2592.99	1 RB low	1	0	25.5	25.4	25.2	22.4	22.3
		1 RB low+1	1	1	27.5	27.0	25.3	22.5	25.7
		1 RB high-1	1	104	27.7	27.2	25.5	22.8	25.9
		1 RB high	1	105	25.6	25.5	25.4	22.5	25.9
		50% RB mid	53	26	27.7	27.1	25.6	22.6	26.0
		100% RB	106	0	26.0	26.1	25.6	22.6	25.5
	534000 / 2670.00	1 RB low	1	0	25.9	25.7	25.6	22.7	22.7
		1 RB low+1	1	1	27.9	27.3	25.5	22.8	26.2
		1 RB high-1	1	104	27.4	26.9	25.1	22.4	25.6
		1 RB high	1	105	25.3	25.3	25.1	22.2	25.6
		50% RB mid	53	26	27.3	26.7	25.3	22.3	26.0
		100% RB	106	0	25.9	25.9	25.4	22.4	25.4
50	504204 / 2521.02	1 RB low	1	0	25.3	25.2	25.0	22.2	22.1
		1 RB low+1	1	1	27.3	26.8	25.1	22.2	25.7
		1 RB high-1	1	131	27.6	27.2	25.3	22.7	25.9
		1 RB high	1	132	25.7	25.5	25.3	22.7	25.8
		50% RB mid	66	33	27.4	26.9	25.4	22.5	25.9
		100% RB	133	0	25.9	26.0	25.4	22.5	25.5
	518598 / 2592.99	1 RB low	1	0	25.2	25.2	25.0	22.2	22.2
		1 RB low+1	1	1	27.3	26.9	25.1	22.4	25.6

Output Power (conducted) ANT1 + ANT2 sum									ANT2
Band-width (MHz)	Channel / Frequency (MHz)	Resource block allocation			Average Output Power (dBm)	Average Output Power (dBm)	Average Output Power (dBm)	Average Output Power (dBm)	Average Output Power (dBm)
		RB configuration	RB Allocation	RB Offset	QPSK	16-QAM	64-QAM	256-QAM	PI/2BPSK
		1 RB high-1	1	131	27.4	27.0	25.2	22.4	25.7
		1 RB high	1	132	25.4	25.3	25.1	22.2	25.7
		50% RB mid	66	33	27.5	27.0	25.5	22.6	26.0
		100% RB	133	0	26.0	25.9	25.4	22.5	25.4
	532998 / 2664.99	1 RB low	1	0	25.6	25.7	25.5	22.5	22.5
		1 RB low+1	1	1	27.6	27.1	25.5	22.6	26.0
		1 RB high-1	1	131	27.4	26.9	25.1	22.2	25.5
		1 RB high	1	132	25.3	25.3	25.1	22.2	25.5
		50% RB mid	66	33	27.4	26.8	25.5	22.4	25.8
		100% RB	133	0	25.9	26.0	25.5	22.5	25.4
60	505200 / 2526.00	1 RB low	1	0	25.2	25.3	25.1	22.2	22.3
		1 RB low+1	1	1	27.3	26.8	25.1	22.4	25.7
		1 RB high-1	1	160	27.2	26.6	25.0	22.1	25.4
		1 RB high	1	161	25.2	25.2	24.9	22.0	22.0
		50% RB mid	81	40	27.4	26.9	25.4	22.5	25.9
		100% RB	162	0	25.9	25.8	25.5	22.4	25.2
	518598 / 2592.99	1 RB low	1	0	25.4	25.1	25.0	22.0	22.2
		1 RB low+1	1	1	27.1	26.8	25.0	22.3	25.6
		1 RB high-1	1	160	27.4	27.0	25.2	22.5	25.6
		1 RB high	1	161	25.4	25.3	25.2	22.3	22.1
		50% RB mid	81	40	27.4	27.0	25.5	22.6	26.0
		100% RB	162	0	25.9	25.9	25.4	22.4	25.4
	531996 / 2659.98	1 RB low	1	0	25.4	25.2	25.1	22.2	22.2
		1 RB low+1	1	1	27.4	26.9	25.1	22.2	25.6
		1 RB high-1	1	160	27.2	26.7	25.0	22.1	25.4
		1 RB high	1	161	25.2	25.2	25.0	22.2	21.9
		50% RB mid	81	40	27.4	26.9	25.4	22.4	26.0
		100% RB	162	0	25.9	25.8	25.3	22.4	25.3
80	507204 / 2536.02	1 RB low	1	0	25.2	25.1	24.9	21.9	22.0
		1 RB low+1	1	1	27.1	26.6	25.0	21.9	25.4
		1 RB high-1	1	215	27.1	26.7	24.9	21.9	25.2
		1 RB high	1	216	25.1	25.1	24.8	21.9	25.2

Output Power (conducted) ANT1 + ANT2 sum									ANT2
Band-width (MHz)	Channel / Frequency (MHz)	Resource block allocation			Average Output Power (dBm)	Average Output Power (dBm)	Average Output Power (dBm)	Average Output Power (dBm)	Average Output Power (dBm)
		RB configuration	RB Allocation	RB Offset	QPSK	16-QAM	64-QAM	256-QAM	PI/2BPSK
		50% RB mid	108	54	27.2	26.7	25.2	22.2	25.7
		100% RB	217	0	25.6	25.6	25.1	22.1	24.9
	518598 / 2592.99	1 RB low	1	0	25.1	25.1	24.9	22.3	22.1
		1 RB low+1	1	1	27.2	26.5	24.9	22.2	25.5
		1 RB high-1	1	215	27.2	26.6	25.1	22.1	25.6
		1 RB high	1	216	25.2	25.2	25.0	22.4	25.6
		50% RB mid	108	54	27.3	26.8	25.3	22.4	25.8
		100% RB	217	0	25.7	25.7	25.2	22.3	25.1
	529998 / 2649.99	1 RB low	1	0	25.4	25.1	25.0	22.2	21.9
		1 RB low+1	1	1	27.2	26.8	24.9	22.1	25.3
		1 RB high-1	1	215	27.0	26.7	24.8	22.2	25.2
		1 RB high	1	216	25.1	25.0	25.1	21.9	25.2
		50% RB mid	108	54	27.4	26.8	25.3	22.3	25.8
		100% RB	217	0	25.7	25.7	25.3	22.2	25.0
90	508200 / 2541.00	1 RB low	1	0	25.0	25.1	25.0	22.2	21.9
		1 RB low+1	1	1	27.1	26.6	24.9	22.2	25.6
		1 RB high-1	1	243	27.5	27.0	25.2	22.5	25.5
		1 RB high	1	244	25.4	25.4	25.2	22.5	25.5
		50% RB mid	122	61	27.3	26.8	25.3	22.4	25.7
		100% RB	245	0	25.7	25.7	25.2	22.2	25.2
	518598 / 2592.99	1 RB low	1	0	25.2	25.1	25.0	22.3	22.2
		1 RB low+1	1	1	27.4	26.7	25.1	22.3	25.7
		1 RB high-1	1	243	27.5	26.9	25.5	22.5	25.8
		1 RB high	1	244	25.5	25.3	25.2	22.5	25.7
		50% RB mid	122	61	27.3	26.8	25.3	22.4	25.5
		100% RB	245	0	25.7	25.7	25.3	22.3	25.1
	528996 / 2644.98	1 RB low	1	0	25.3	25.3	25.1	22.2	22.2
		1 RB low+1	1	1	27.3	26.7	25.1	22.2	25.6
		1 RB high-1	1	243	27.3	26.6	24.9	22.0	25.4
		1 RB high	1	244	25.0	25.1	24.8	22.0	25.4
		50% RB mid	122	61	27.4	26.8	25.5	22.4	25.5
		100% RB	245	0	25.8	25.8	25.3	22.3	25.1

Output Power (conducted) ANT1 + ANT2 sum									ANT2
Band-width (MHz)	Channel / Frequency (MHz)	Resource block allocation			Average Output Power (dBm)	Average Output Power (dBm)	Average Output Power (dBm)	Average Output Power (dBm)	Average Output Power (dBm)
		RB configuration	RB Allocation	RB Offset	QPSK	16-QAM	64-QAM	256-QAM	PI/2BPSK
100	509202 / 2546.01	1 RB low	1	0	25.1	25.3	24.9	22.2	22.1
		1 RB low+1	1	1	27.1	26.8	25.0	22.2	25.6
		1 RB high-1	1	271	27.5	27.0	25.3	22.5	25.5
		1 RB high	1	272	25.4	25.5	25.3	22.4	25.4
		50% RB mid	136	68	27.1	26.7	25.3	22.3	25.6
		100% RB	273	0	25.7	25.6	25.2	22.3	25.1
	518598 / 2592.99	1 RB low	1	0	25.4	25.3	25.1	22.4	22.5
		1 RB low+1	1	1	27.5	27.0	25.2	22.4	25.9
		1 RB high-1	1	271	27.5	27.2	25.3	22.5	25.9
		1 RB high	1	272	25.5	25.5	25.3	22.6	25.8
		50% RB mid	136	68	27.3	26.8	25.3	22.3	25.7
		100% RB	273	0	25.7	25.7	25.3	22.3	25.1
	528000 / 2640.00	1 RB low	1	0	25.4	25.4	25.2	22.3	22.2
		1 RB low+1	1	1	27.5	27.1	25.2	22.4	25.7
		1 RB high-1	1	271	27.3	26.8	24.9	22.3	25.8
		1 RB high	1	272	25.1	25.0	24.8	22.1	25.4
		50% RB mid	136	68	27.3	26.8	25.4	22.3	25.7
		100% RB	273	0	25.8	25.7	25.2	22.5	25.1

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PAPR conducted (ANT1) – 100% RB					
Bandwidth (MHz)	Channel / Frequency (MHz)	Average Output Power (dBm) QPSK	Average Output Power (dBm) 16-QAM	Average Output Power (dBm) 64-QAM	Average Output Power (dBm) 256-QAM
20	518598 / 2592.99	6.7	6.7	7.1	6.00
30	518598 / 2592.99	6.03	6.34	5.03	5.41
40	518598 / 2592.99	5.20	7.01	6.53	6.65
50	518598 / 2592.99	6.07	5.09	6.06	7.36
60	518598 / 2592.99	7.41	7.20	6.01	6.47
80	518598 / 2592.99	6.60	7.21	6.00	7.07
90	518598 / 2592.99	7.01	5.00	7.00	5.71
100	518598 / 2592.99	5.09	7.10	5.83	6.88

PAPR conducted (ANT2) – 100% RB					
Bandwidth (MHz)	Channel / Frequency (MHz)	Average Output Power (dBm) QPSK	Average Output Power (dBm) 16-QAM	Average Output Power (dBm) 64-QAM	Average Output Power (dBm) 256-QAM
20	518598 / 2592.99	7.50	7.50	7.90	7.21
30	518598 / 2592.99	6.17	7.35	6.51	6.16
40	518598 / 2592.99	6.73	6.17	7.62	5.95
50	518598 / 2592.99	7.05	6.29	6.48	7.62
60	518598 / 2592.99	7.79	5.02	5.34	6.00
80	518598 / 2592.99	6.04	5.40	6.61	7.37
90	518598 / 2592.99	6.85	7.02	5.27	5.12
100	518598 / 2592.99	5.86	6.00	7.16	6.01

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The radiated output power is measured in the mode with the highest conducted output power.

Output Power (EIRP)						
-/-		MIMO				SISO
Bandwidth (MHz)	Channel / Frequency (MHz)	Average Output Power (dBm) QPSK	Average Output Power (dBm) 16-QAM	Average Output Power (dBm) 64-QAM	Average Output Power (dBm) 256-QAM	Average Output Power (dBm) PI/2BPSK
20	501204 / 2506.02	31.4	30.9	29.3	26.5	30.5
	518598 / 2592.99	30.4	29.8	28.7	25.6	29.0
	535998 / 2679.99	28.7	28.0	26.6	23.7	27.6
30	502200 / 2511.00	32.0	31.4	29.6	26.8	30.8
	518598 / 2592.99	30.5	29.9	28.3	25.4	28.9
	534996 / 2674.98	29.1	28.5	26.9	24.3	28.0
40	503202 / 2516.01	31.8	31.4	29.5	26.7	30.5
	518598 / 2592.99	30.4	30.0	28.3	25.5	28.9
	534000 / 2670.00	29.1	28.6	27.0	24.2	28.3
50	504204 / 2521.02	31.7	31.2	29.6	26.9	30.6
	518598 / 2592.99	30.2	29.8	28.2	25.4	28.9
	532998 / 2664.99	29.0	28.4	27.0	24.1	28.1
60	505200 / 2526.00	31.5	31.1	29.5	26.7	30.6
	518598 / 2592.99	30.2	29.8	28.2	25.4	28.9
	531996 / 2659.98	28.8	28.3	26.8	23.9	28.1
80	507204 / 2536.02	31.4	31.1	29.3	26.4	30.4
	518598 / 2592.99	30.1	29.6	28.1	25.1	28.7
	529998 / 2649.99	28.7	28.3	26.8	24.0	27.9
90	508200 / 2541.00	31.6	31.2	29.6	26.7	30.4
	518598 / 2592.99	30.2	29.5	28.0	25.3	28.7
	528996 / 2644.98	28.8	28.2	26.8	23.8	27.7
100	509202 / 2546.01	31.6	31.2	29.5	26.7	30.3
	518598 / 2592.99	30.3	30.0	28.1	25.4	28.8
	528000 / 2640.00	28.8	28.5	26.8	23.9	27.9

14.2.2 Frequency stability

Description:

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the mobile station in a “call mode”. This is accomplished with the use of a MT8000A DIGITAL RADIOCOMMUNICATION TESTER.
1. Measure the carrier frequency at room temperature.
2. Subject the mobile station to overnight soak at -30 C.
3. With the mobile station, powered with V_{nom}, connected to the MT8000A and in a simulated call on channel 18900 (center channel), measure the carrier frequency. These measurements should be made within two minutes of powering up the mobile station, to prevent significant self warming.
4. Repeat the above measurements at 10°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
5. Re-measure carrier frequency at room temperature with V_{nom}. Vary supply voltage from V_{min} to V_{max}, in 0.1 Volt steps re-measuring carrier frequency at each voltage. Pause at V_{nom} for 1.5 hours unpowered, to allow any self heating to stabilize, before continuing.
6. At all temperature levels hold the temperature to +/- 0.5°C during the measurement procedure.

Measurement:

Measurement parameters	
Detector:	Measured with MT8000A
Sweep time:	
Video bandwidth:	
Resolution bandwidth:	
Span:	
Trace mode:	
Used equipment:	See chapter 8.4 setup A
Measurement uncertainty:	See chapter 9
Measurement procedure:	FCC: § 2.1055

Limits:

FCC
§27.54
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Results:

AFC FREQ ERROR versus VOLTAGE

Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)
102	19	0.0101
120	21	0.0112
138	17	0.0090

AFC FREQ ERROR versus TEMPERATURE

Temperature (°C)	Frequency Error (Hz)	Frequency Error (ppm)
-30	12	0.0064
-20	19	0.0101
-10	13	0.0069
± 0	21	0.0112
10	16	0.0085
20	13	0.0069
30	15	0.0080
40	-15	-0.0080
50	10	0.0053

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14.2.3 Spurious emissions radiated

Description:

The following steps outline the procedure used to measure the radiated emissions from the mobile station. The site is constructed in accordance with ANSI C63.4:2014 requirements and is recognized by the FCC to be in compliance for a 3 and a 10 meter site. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment. The resolution bandwidth is set as outlined in Part 27.53. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, middle and highest channels of the 5G NR band 41.

Measurement:

Measurement parameters	
Detector:	Peak
Sweep time:	2 sec.
Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Span:	100 MHz Steps
Trace mode:	Max Hold
Used equipment:	See chapter 8.1 setup A & 8.2 setup A+B & setup 8.3 A
Measurement uncertainty:	See chapter 9
Measurement procedure	FCC: § 2.1053

Limits:

FCC
§ 27.53 (m) (4)
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.
-25 dBm

Results:

QPSK:

Spurious Emission Level					
Lowest channel		**Middle channel**		**Highest channel**	
Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]
-/-		-/-		-/-	

16-QAM:

Spurious Emission Level					
Lowest channel		**Middle channel**		**Highest channel**	
Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]
-/-		-/-		-/-	

64-QAM:

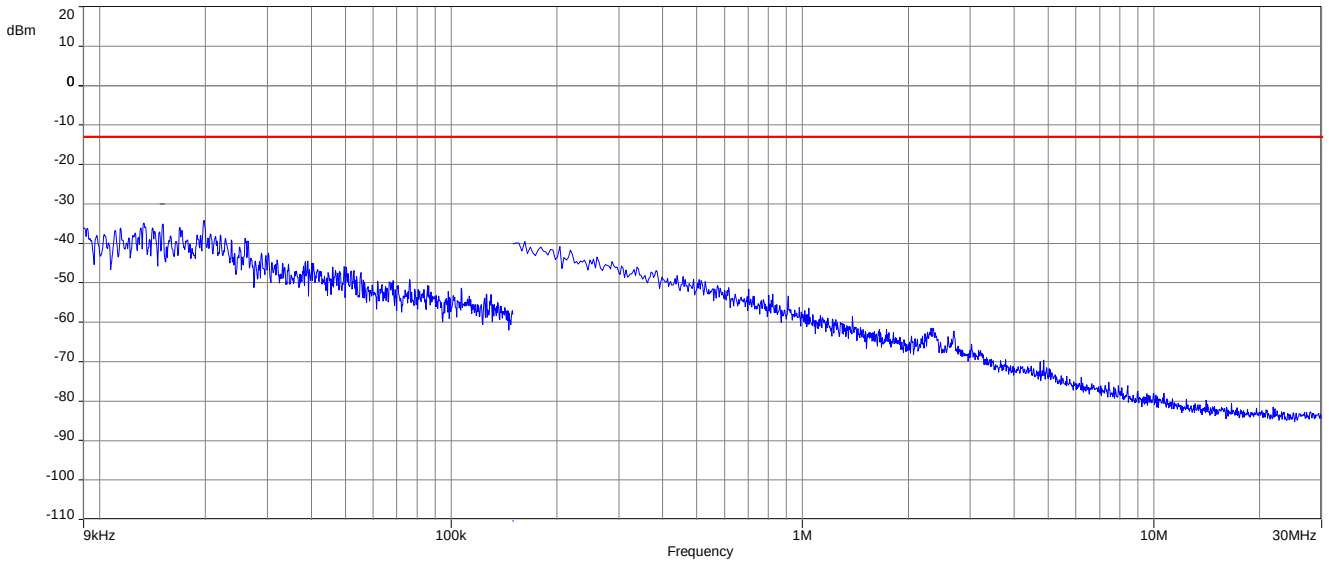
Spurious Emission Level					
Lowest channel		**Middle channel**		**Highest channel**	
Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]
-/-		-/-		-/-	

256-QAM:

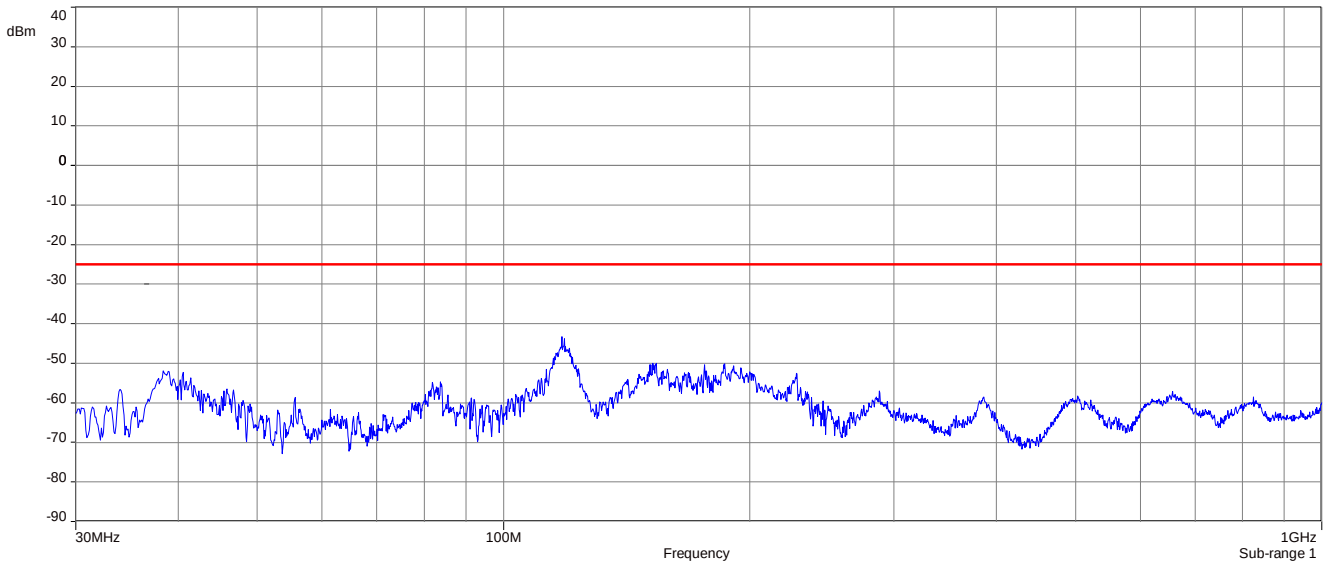
Spurious Emission Level					
Lowest channel		**Middle channel**		**Highest channel**	
Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]
-/-		-/-		-/-	

Plots:

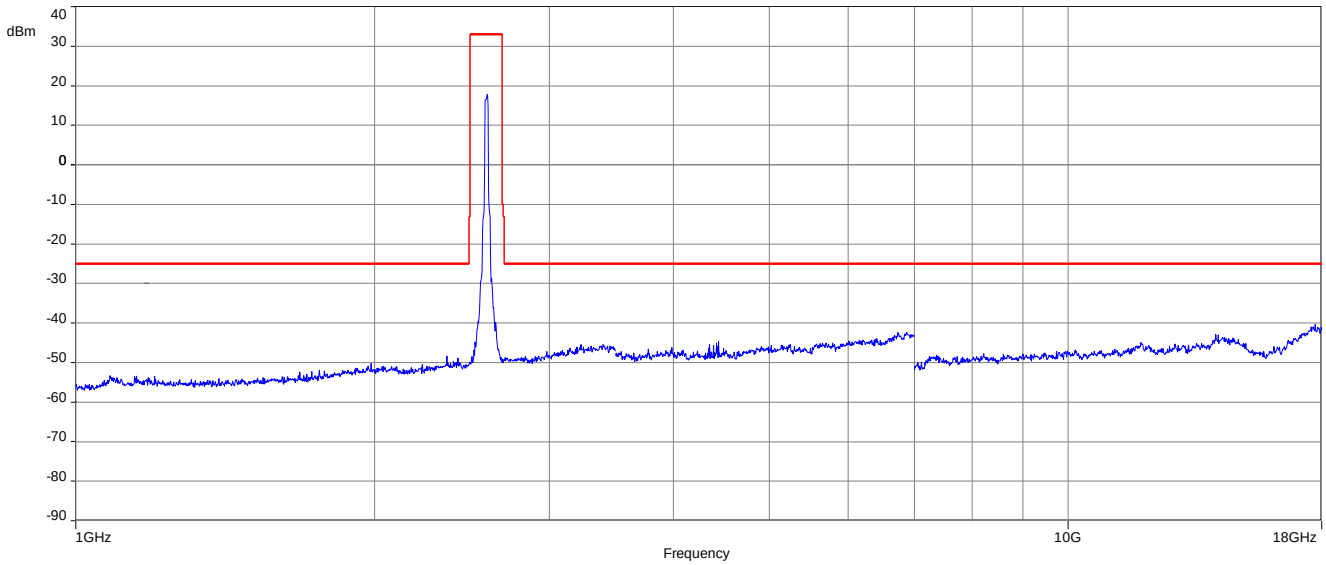
Plot 1: QPSK - Middle channel (9 kHz - 30 MHz)



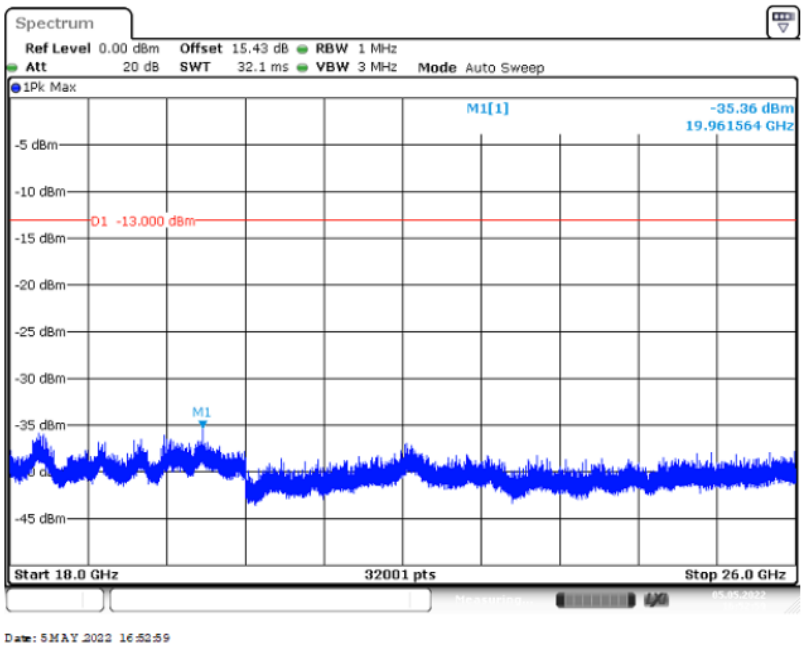
Plot 2: QPSK - Middle channel (30 MHz – 1 GHz)



Plot 3: QPSK - Middle channel (1 GHz – 18 GHz)

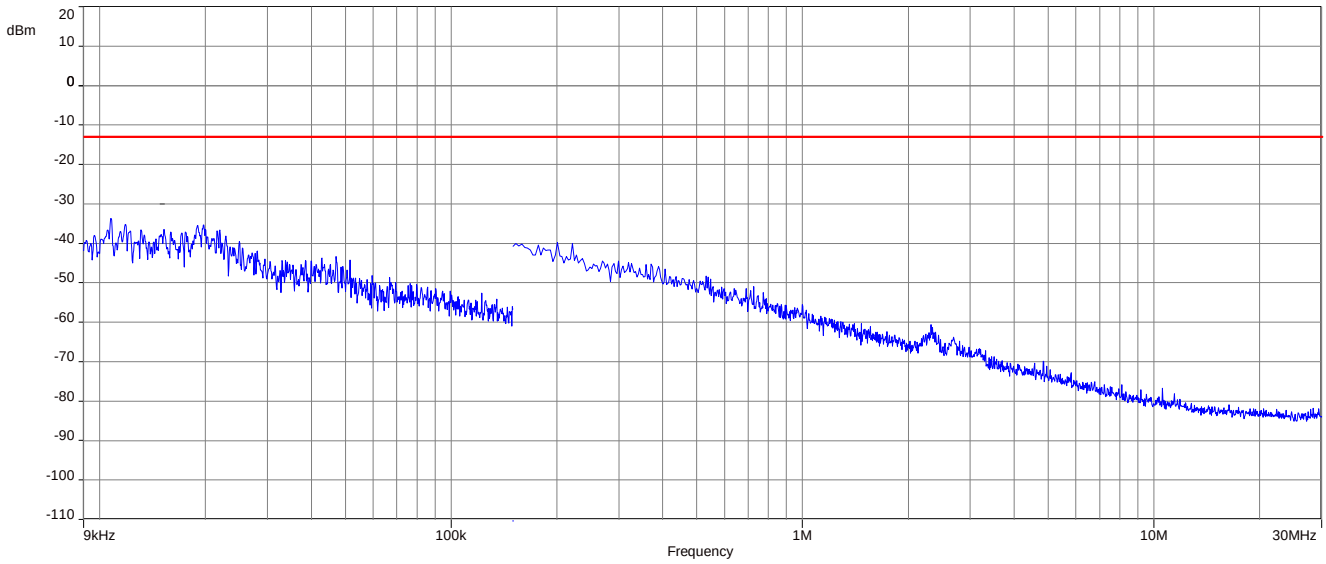


Plot 4: QPSK - Middle channel (18 GHz – 26 GHz)

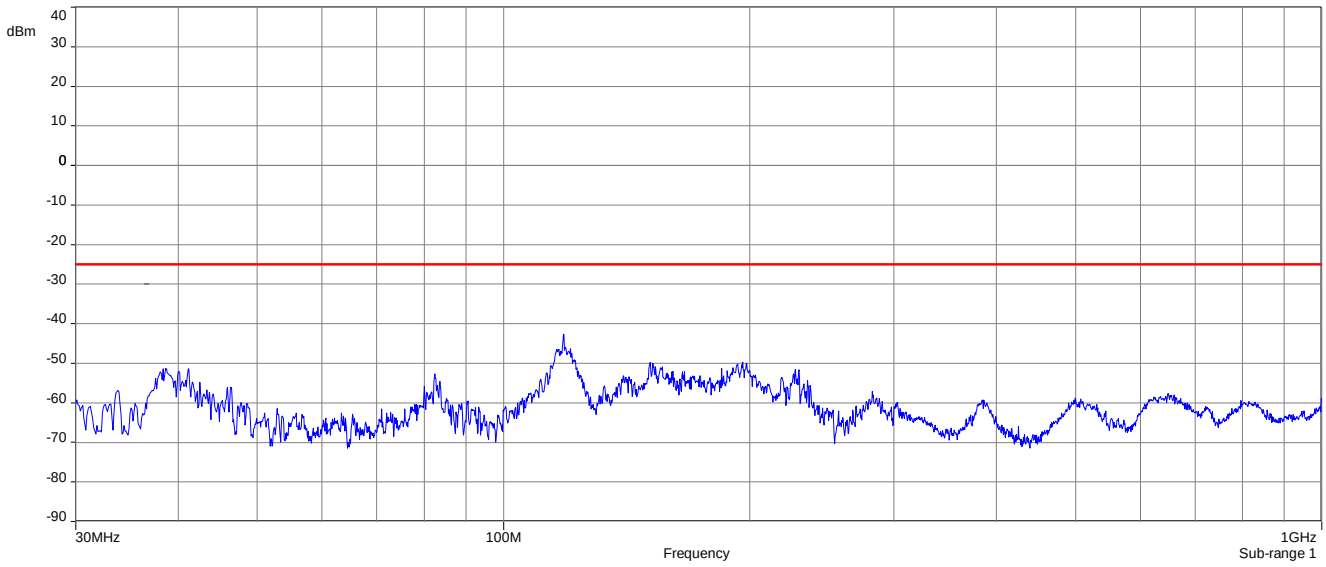


This plot is valid for LTE band 41 and 5G NR band 41.

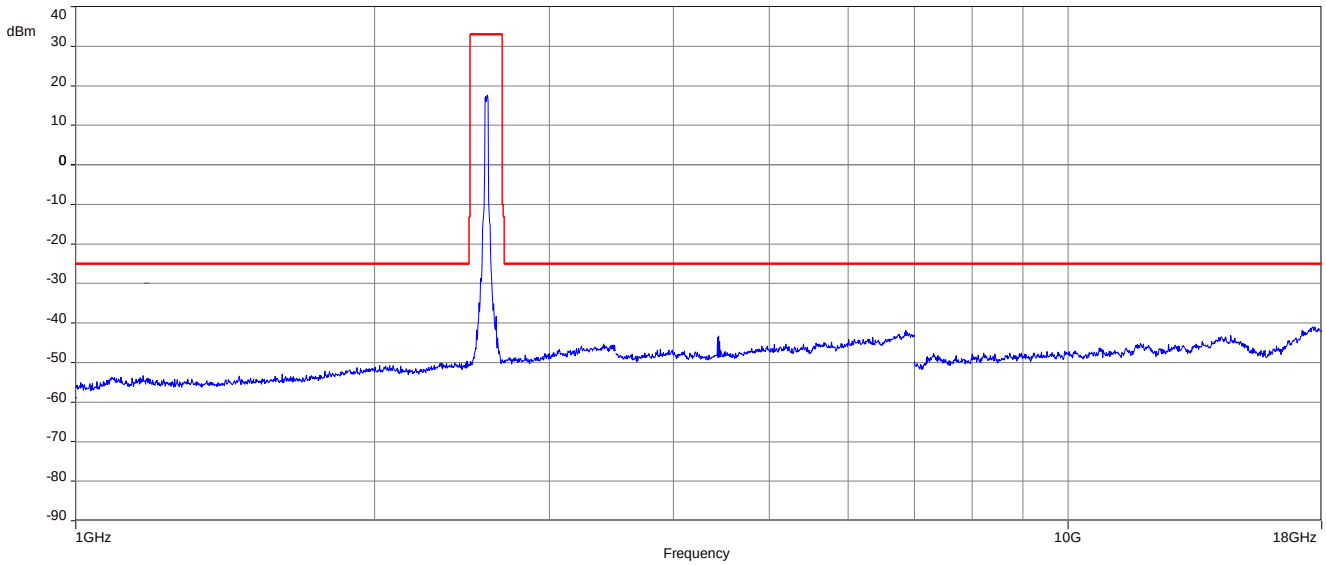
Plot 5: 16-QAM - Middle channel (9 kHz - 30 MHz)



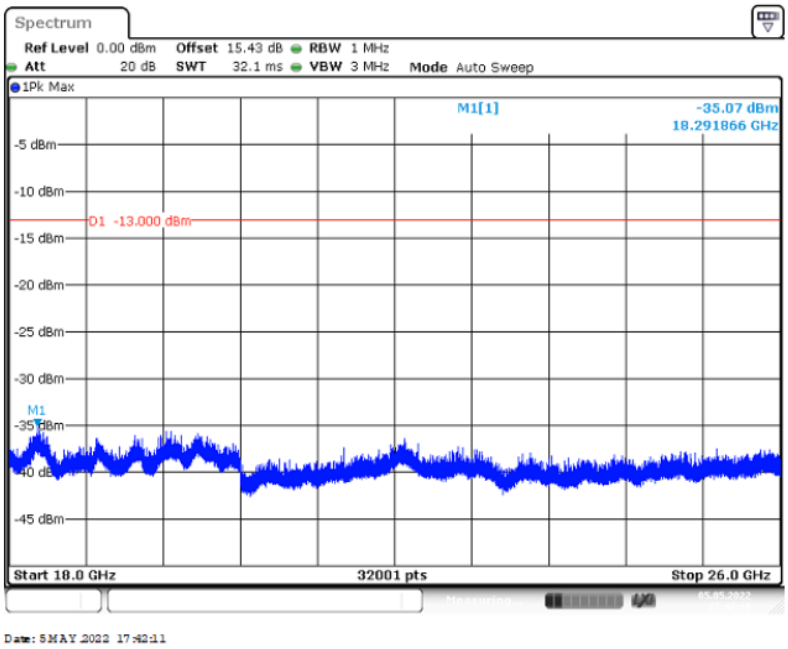
Plot 6: 16-QAM - Middle channel (30 MHz – 1 GHz)



Plot 7: 16-QAM - Middle channel (1 GHz – 18 GHz)

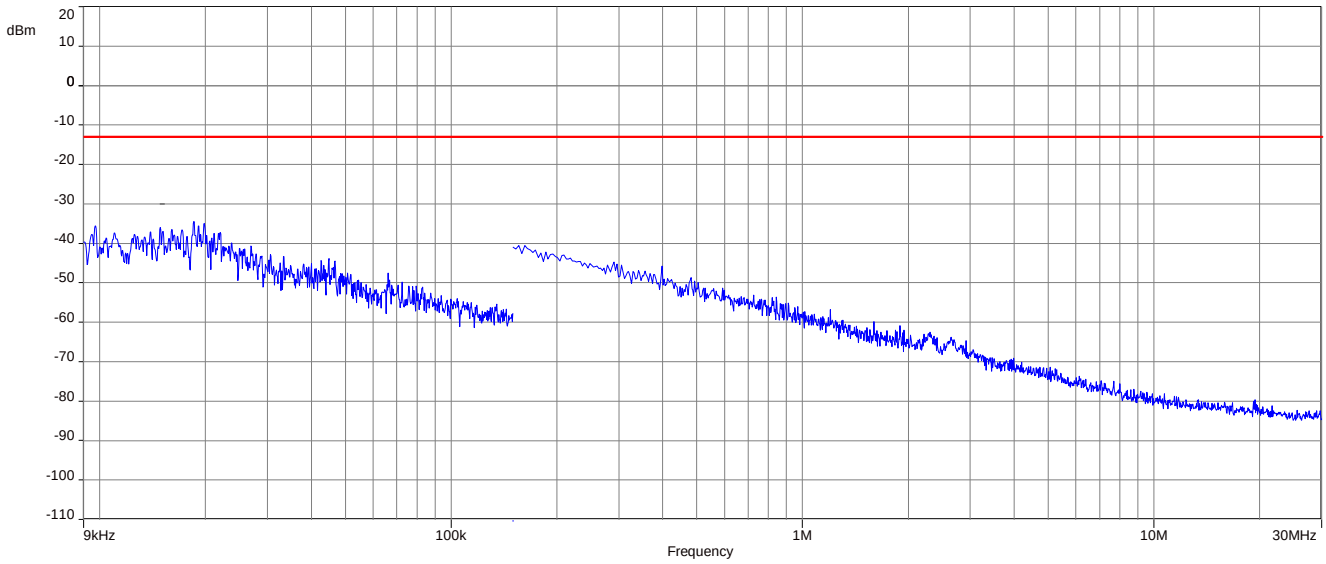


Plot 8: 16-QAM - Middle channel (18 GHz – 26 GHz)

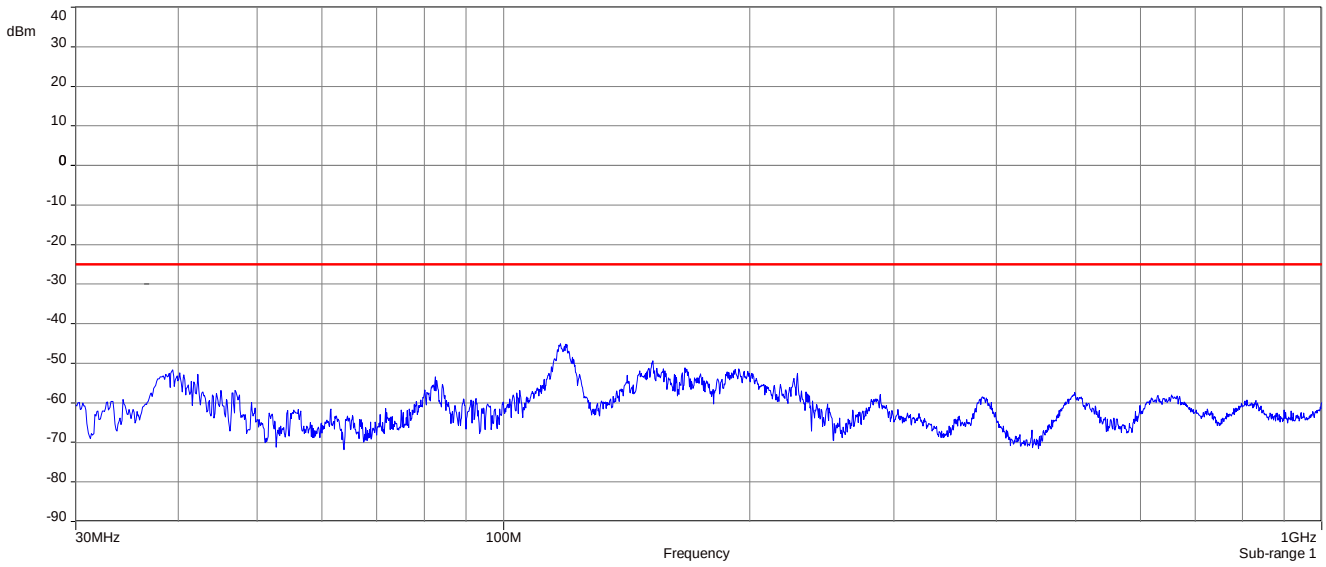


This plot is valid for LTE band 41 and 5G NR band 41.

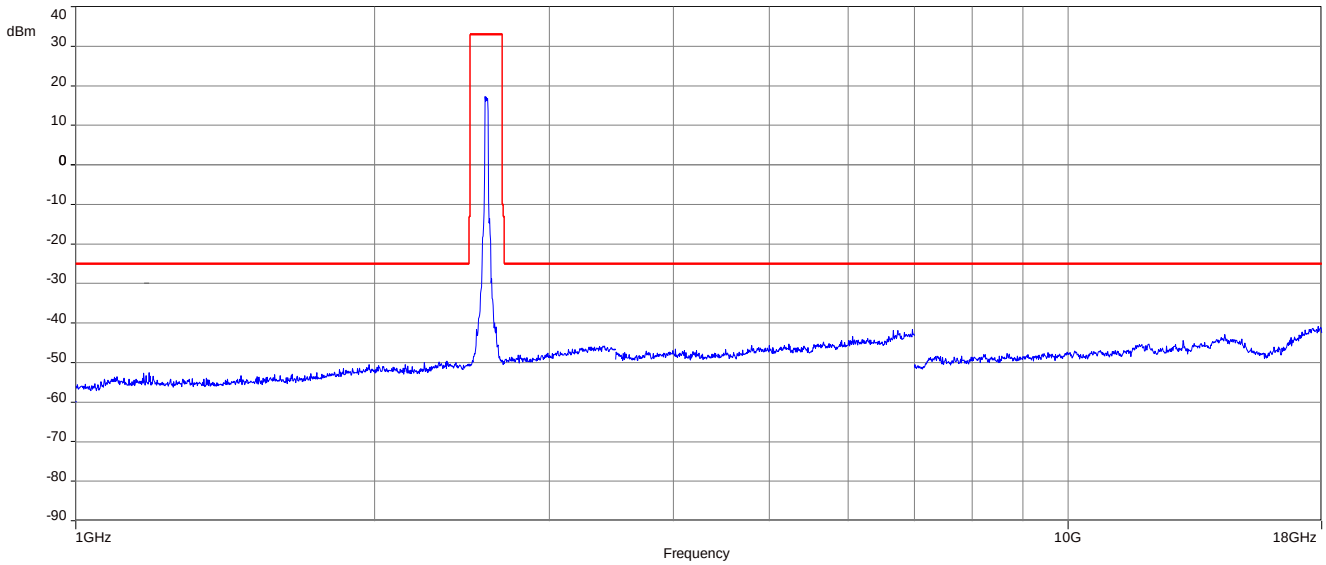
Plot 9: 64-QAM - Middle channel (9 kHz - 30 MHz)



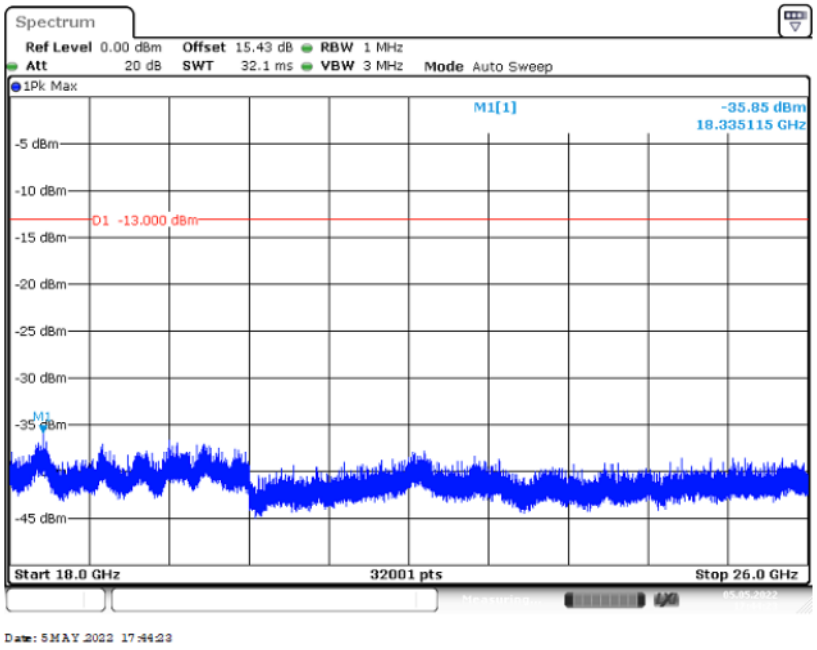
Plot 10: 64-QAM - Middle channel (30 MHz – 1 GHz)



Plot 11: 64-QAM - Middle channel (1 GHz – 18 GHz)

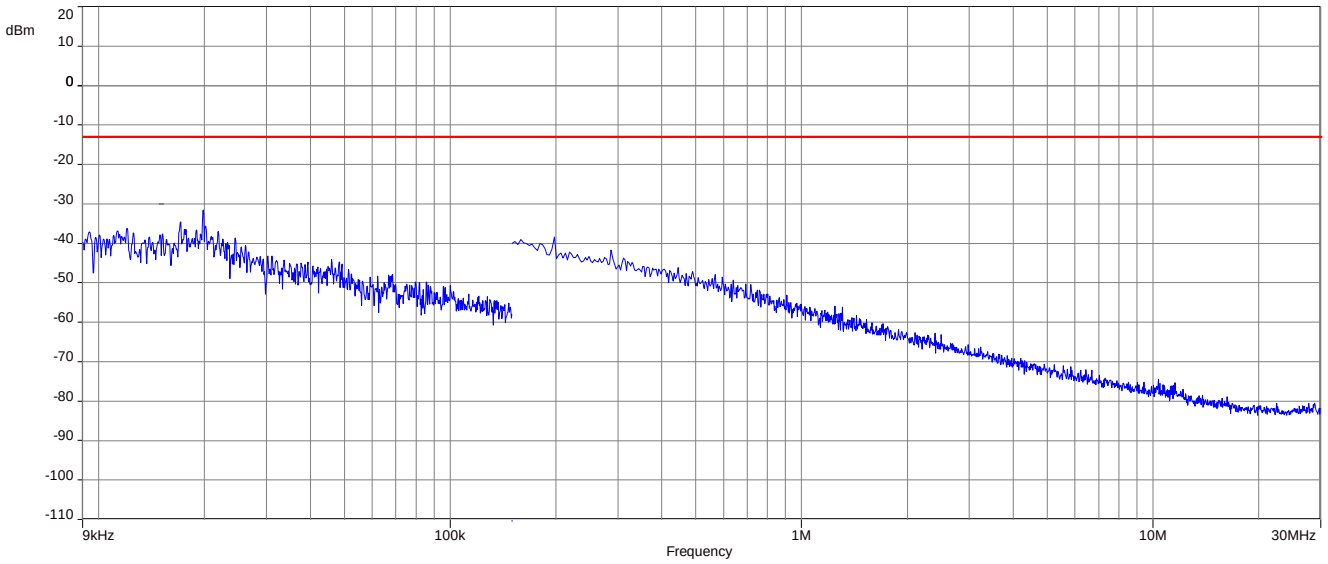


Plot 12: 64-QAM - Middle channel (18 GHz – 26 GHz)

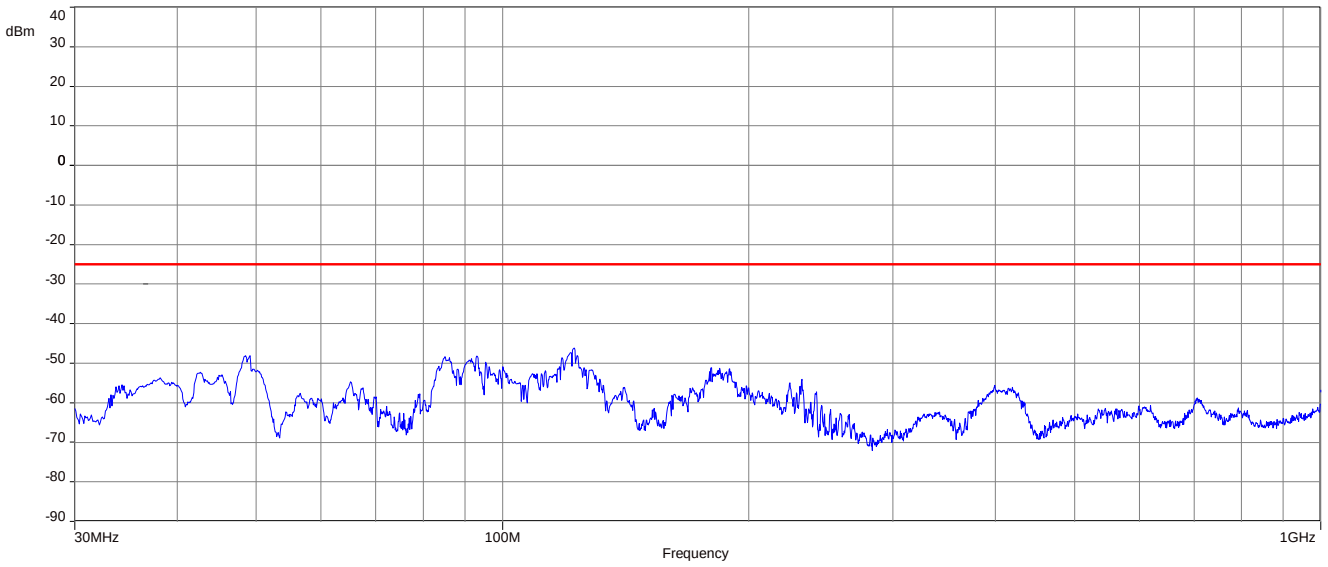


This plot is valid for LTE band 41 and 5G NR band 41.

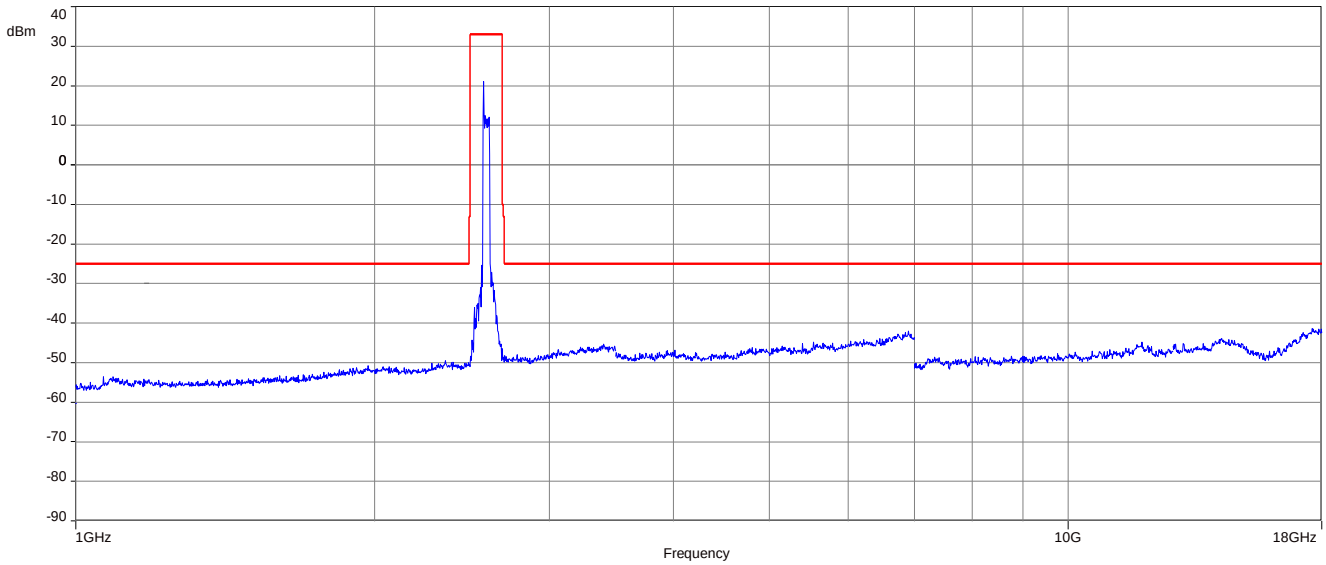
Plot 13: 256-QAM - Middle channel (9 kHz - 30 MHz)



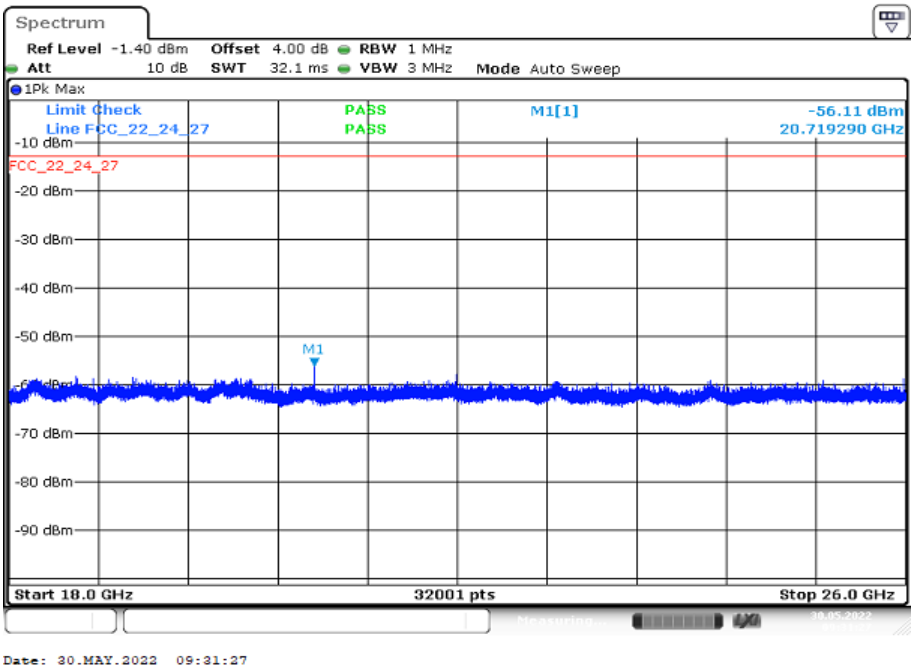
Plot 14: 256-QAM - Middle channel (30 MHz – 1 GHz)



Plot 15: 256-QAM - Middle channel (1 GHz – 18 GHz)



Plot 16: 256-QAM - Middle channel (18 GHz – 26 GHz)



14.2.4 Spurious emissions conducted

Description:

The following steps outline the procedure used to measure the conducted emissions from the mobile station.
1. Determine frequency range for measurements: From § 2.1057 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.
2. Determine mobile station transmits frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.

Measurement:

Measurement parameters	
Detector:	Peak
Sweep time:	Auto
Video bandwidth:	3 MHz
Resolution bandwidth:	1 MHz
Log file:	1-3977_22-02-08_Annex_MR_A2
Span:	30 MHz – 26 GHz
Trace mode:	Max Hold
Used equipment:	See chapter 8.4 setup A
Measurement uncertainty:	see chapter 9
Measurement procedure	FCC: § 2.1051

Limits:

FCC
§ 27.53 (m) (4)
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.
-25 dBm

Results: **ANT1**

QPSK:

Spurious Emission Level					
Lowest channel		**Middle channel**		**Highest channel**	
Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]
-/-		-/-		-/-	

NOTE: The limit of -25 dBm is fulfilled.

16-QAM:

Spurious Emission Level					
Lowest channel		**Middle channel**		**Highest channel**	
Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]
-/-		-/-		-/-	

NOTE: The limit of -25 dBm is fulfilled.

64-QAM:

Spurious Emission Level					
Lowest channel		**Middle channel**		**Highest channel**	
Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]
-/-		-/-		-/-	

NOTE: The limit of -25 dBm is fulfilled.

256-QAM:

Spurious Emission Level					
Lowest channel		**Middle channel**		**Highest channel**	
Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]
-/-		-/-		-/-	

NOTE: The limit of -25 dBm is fulfilled.

Results: **ANT2**

QPSK:

Spurious Emission Level					
Lowest channel		**Middle channel**		**Highest channel**	
Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]
-/-		-/-		-/-	

NOTE: The limit of -25 dBm is fulfilled.

14.2.5 Block edge compliance

Description:

The spectrum at the band edges must comply with the spurious emissions limits.

Measurement:

Measurement parameters	
Detector:	RMS
Sweep time:	See plots
Video bandwidth:	See plots
Resolution bandwidth:	See plots
Log file:	1-3977_22-02-08_Annex_MR_A2
Span:	1 MHz steps
Trace mode:	Max Hold
Used equipment:	See chapter 8.4 setup A
Measurement uncertainty:	See chapter 9
Measurement procedure	FCC: § 2.1051

Limits:

FCC
§ 27.53 (m) (4)
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.
-13 dBm

Results: PASS (See log files)

14.2.6 Occupied bandwidth

Description:

Measurement of the occupied bandwidth of the transmitted signal.

Measurement:

Similar to conducted emissions, 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 5G NR band 41 frequency band. The table below lists the measured 99% power and -26dBc occupied bandwidths. Spectrum analyzer plots are included on the following pages.

Measurement parameters	
Detector:	Peak
Sweep time:	See plots
Video bandwidth:	See plots
Resolution bandwidth:	See plots
Log file:	1-3977_22-02-08_Annex_MR_A1
Span:	2 x nominal bandwidth
Trace mode:	Max Hold
Used equipment:	See chapter 8.4 setup A
Measurement uncertainty:	See chapter 9
Measurement procedure	FCC: § 2.1049

Limits:

FCC
§ 2.1049
Reporting only

Results: ANT1

Occupied Bandwidth – QPSK			
Bandwidth	**Channel**	**99% OBW (MHz)**	**-26 dBc BW (MHz)**
20 MHz	mid	18.1	26.8
30 MHz	mid	26.8	34.0
40 MHz	mid	36.0	40.8
50 MHz	mid	45.8	49.4
60 MHz	mid	57.8	65.4
80 MHz	mid	77.5	82.8
90 MHz	mid	87.2	106.4
100 MHz	mid	96.7	113.3

Occupied Bandwidth – 16-QAM			
Bandwidth	**Channel**	**99% OBW (MHz)**	**-26 dBc BW (MHz)**
20 MHz	mid	18.0	21.9
30 MHz	mid	27.0	32.4
40 MHz	mid	35.9	42.8
50 MHz	mid	46.0	57.6
60 MHz	mid	57.8	62.9
80 MHz	mid	77.7	101.8
90 MHz	mid	87.2	100.0
100 MHz	mid	96.7	104.3

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Occupied Bandwidth – 64-QAM			
Bandwidth	**Channel**	**99% OBW (MHz)**	**-26 dBc BW (MHz)**
20 MHz	mid	18.1	22.0
30 MHz	mid	26.9	29.0
40 MHz	mid	36.0	52.7
50 MHz	mid	45.8	51.0
60 MHz	mid	58.1	62.6
80 MHz	mid	77.3	84.0
90 MHz	mid	87.7	117.2
100 MHz	mid	96.7	113.3

Occupied Bandwidth – 256-QAM			
Bandwidth	**Channel**	**99% OBW (MHz)**	**-26 dBc BW (MHz)**
20 MHz	mid	18.1	23.3
30 MHz	mid	26.9	29.7
40 MHz	mid	35.9	40.8
50 MHz	mid	45.8	54.0
60 MHz	mid	58.0	62.3
80 MHz	mid	77.5	89.2
90 MHz	mid	87.2	111.4
100 MHz	mid	99.4	107.3

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Results: ANT2

Occupied Bandwidth – PI/2 BPSK			
Bandwidth	**Channel**	**-26 dBc BW (MHz)**	**99% OBW (MHz)**
20 MHz	low	19.8	18.3
	mid	19.8	18.3
	high	19.7	18.3
30 MHz	low	28.7	27.3
	mid	28.7	27.3
	high	28.6	27.2
40 MHz	low	38.6	36.6
	mid	38.6	36.6
	high	38.6	36.7
50 MHz	low	48.8	46.6
	mid	48.6	46.6
	high	48.4	46.6
60 MHz	low	60.8	58.7
	mid	60.6	58.7
	high	60.8	58.7
80 MHz	low	82.6	78.7
	mid	82.6	78.7
	high	82.4	78.9
90 MHz	low	92.3	88.6
	mid	92.3	88.6
	high	92.3	88.8
100 MHz	low	103.0	98.4
	mid	103.0	98.4
	high	101.8	98.4

Occupied Bandwidth – QPSK			
Bandwidth	**Channel**	**-26 dBc BW (MHz)**	**99% OBW (MHz)**
20 MHz	low	20.5	18.4
	mid	20.3	18.4
	high	20.2	18.3
30 MHz	low	28.6	27.3
	mid	28.7	27.3
	high	28.6	27.2
40 MHz	low	38.6	36.6
	mid	38.7	36.6
	high	38.4	36.6
50 MHz	low	48.6	46.6
	mid	48.5	46.6
	high	48.5	46.7
60 MHz	low	60.8	58.6
	mid	60.9	58.7
	high	61.1	58.7
80 MHz	low	82.6	78.9
	mid	82.6	79.1
	high	82.4	79.1
90 MHz	low	92.0	88.3
	mid	92.0	88.3
	high	92.3	88.8
100 MHz	low	102.0	98.2
	mid	102.0	98.4
	high	102.0	97.9

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Occupied Bandwidth – 16-QAM			
Bandwidth	**Channel**	**-26 dBc BW (MHz)**	**99% OBW (MHz)**
20 MHz	low	20.5	18.4
	mid	20.5	18.4
	high	20.3	18.4
30 MHz	low	28.5	27.2
	mid	28.5	27.3
	high	28.7	27.3
40 MHz	low	38.5	36.6
	mid	38.8	36.7
	high	38.6	36.8
50 MHz	low	48.5	46.6
	mid	48.6	46.6
	high	48.5	46.6
60 MHz	low	60.9	58.7
	mid	60.9	58.7
	high	60.9	58.7
80 MHz	low	82.4	78.9
	mid	82.4	78.9
	high	82.4	78.9
90 MHz	low	92.3	88.8
	mid	92.0	88.8
	high	92.3	88.8
100 MHz	low	102.0	98.2
	mid	102.0	98.4
	high	102.0	98.2

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Occupied Bandwidth – 64-QAM			
Bandwidth	**Channel**	**-26 dBc BW (MHz)**	**99% OBW (MHz)**
20 MHz	low	20.4	18.3
	mid	20.4	18.4
	high	20.2	18.4
30 MHz	low	28.4	27.3
	mid	28.5	27.2
	high	28.5	27.3
40 MHz	low	38.5	36.7
	mid	38.5	36.7
	high	38.6	36.8
50 MHz	low	48.3	46.7
	mid	48.6	46.6
	high	48.4	46.7
60 MHz	low	60.8	58.7
	mid	60.8	58.7
	high	60.8	58.7
80 MHz	low	82.6	79.1
	mid	82.4	79.1
	high	82.4	79.1
90 MHz	low	92.3	88.6
	mid	92.3	88.6
	high	92.3	88.6
100 MHz	low	102.0	98.4
	mid	102.0	98.2
	high	102.0	98.4

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Occupied Bandwidth – 256-QAM			
Bandwidth	**Channel**	**-26 dBc BW (MHz)**	**99% OBW (MHz)**
20 MHz	low	19.3	18.3
	mid	19.4	18.4
	high	19.4	18.4
30 MHz	low	28.2	27.3
	mid	28.5	27.3
	high	28.1	27.2
40 MHz	low	38.1	36.6
	mid	38.5	36.7
	high	37.9	36.6
50 MHz	low	48.1	46.6
	mid	48.4	46.7
	high	48.1	46.6
60 MHz	low	60.3	58.6
	mid	60.8	58.7
	high	31.1	22.1
80 MHz	low	81.8	79.1
	mid	82.2	79.1
	high	81.8	78.9
90 MHz	low	91.8	88.8
	mid	91.8	88.8
	high	91.1	88.6
100 MHz	low	101.5	98.7
	mid	101.8	98.4
	high	101.3	98.7

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15 Glossary

EUT	Equipment under test
DUT	Device under test
UUT	Unit under test
GUE	GNSS User Equipment
ETSI	European Telecommunications Standards Institute
EN	European Standard
FCC	Federal Communications Commission
FCC ID	Company Identifier at FCC
IC	Industry Canada
PMN	Product marketing name
HMN	Host marketing name
HVIN	Hardware version identification number
FVIN	Firmware version identification number
EMC	Electromagnetic Compatibility
HW	Hardware
SW	Software
Inv. No.	Inventory number
S/N or SN	Serial number
C	Compliant
NC	Not compliant
NA	Not applicable
NP	Not performed
PP	Positive peak
QP	Quasi peak
AVG	Average
OC	Operating channel
OCW	Operating channel bandwidth
OBW	Occupied bandwidth
OOB	Out of band
DFS	Dynamic frequency selection
CAC	Channel availability check
OP	Occupancy period
NOP	Non occupancy period
DC	Duty cycle
PER	Packet error rate
CW	Clean wave
MC	Modulated carrier
WLAN	Wireless local area network
RLAN	Radio local area network
DSSS	Dynamic sequence spread spectrum
OFDM	Orthogonal frequency division multiplexing
FHSS	Frequency hopping spread spectrum
GNSS	Global Navigation Satellite System
C/N_0	Carrier to noise-density ratio, expressed in dB-Hz

16 Document history

Version	Applied changes	Date of release
-/-	Initial release	2022-06-01

17 Accreditation Certificate – D-PL-12076-01-05

first page

DAkkS Deutsche Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH

Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV
Signatory to the Multilateral Agreements of EA, ILAC and IAF for Mutual Recognition

Accreditation

The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory

CTC advanced GmbH
Untertürkheimer Straße 6-10, 66117 Saarbrücken

is competent under the terms of DIN EN ISO/IEC 17025:2018 to carry out tests in the following fields:

Telecommunication (FCC Requirements)

The accreditation certificate shall only apply in connection with the notice of accreditation of 09.06.2020 with the accreditation number D-PL-12076-01. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 05 pages.

Registration number of the certificate: **D-PL-12076-01-05**

Frankfurt am Main, 09.06.2020

by order Dipl.-Ing. (FH) Ralf Egner
Head of Division

The certificate together with its annex reflects the status at the time of the date of issue. The current status of the scope of accreditation can be found in the database of accredited bodies of Deutsche Akkreditierungsstelle GmbH.
https://www.dakks.de/en/content/accredited-bodies-dakks

See notes overleaf.

last page

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The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAkkS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf.

No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkkS.

The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31 July 2009 (Federal Law Gazette I p. 2625) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Union L 218 of 9 July 2008, p. 30). DAkkS is a signatory to the Multilateral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC). The signatories to these agreements recognise each other's accreditations.

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https://www.dakks.de/files/data/as/pdf/D-PL-12076-01-05e.pdf

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################################ END OF TEST REPORT ################################