FCC RADIO TEST REPORT

FCC ID	:	**PKRISGM3000A**
Equipment	:	**M3000A**
Brand Name	:	**Inseego**
Model Name	:	**M3000A**
Marketing Name	:	**M3000**
Applicant	:	**Inseego Corp.** **9710 Scranton Road Suite 200, San Diego, CA 92121**
Manufacturer	:	**Inseego Corp.** **9710 Scranton Road Suite 200, San Diego, CA 92121**
Standard	:	**FCC 47 CFR Part 2, 96**

The product was received on Jun. 08, 2022 and testing was performed from Apr. 11, 2022 to Jul. 01, 2022. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The test results in this partial report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FG1D2414N	01	Initial issue of report	Jul. 04, 2022

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power	Reporting only	-
3.3	§96.41	Peak-to-Average Ratio	Pass	
3.4	§96.41	Effective Isotropic Radiated Power	Pass	-
3.5	§2.1049 §96.41	Occupied Bandwidth	Reporting only	-
3.6	§2.1051 §96.41	Conducted Band Edge Measurement	Pass	-
3.7	§2.1051 §96.41	Conducted Spurious Emission	Pass	
3.8	§2.1055	Frequency Stability for Temperature & Voltage	Pass	-

Declaration of Conformity:
The test results (PASS/FAIL) with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results.
Comments and Explanations:
The product specifications of the EUT presented in the report are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: William Chen

Report Producer: Lucy Wu

1 General Description

1.1 Product Feature of Equipment Under Test

3G-WCDMA, 4G-LTE, 5G-FR1 & FR2, Wi-Fi 2.4GHz 802.11b/g/n/ax, Wi-Fi 5GHz 802.11a/n/ac/ax and GNSS.

Product Feature	
Test Antenna Type	WWAN: Fixed Internal Antenna
Test Antenna Gain	LTE Band 48: <Ant. 4>: 1.5 dBi <Ant. 6>: 3.8 dBi

1.2 Modification of EUT

No modifications are made to the EUT during all test items.

1.3 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory	
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	**Sporton Site No.**	
	TH03-HY	
Test Engineer	Ivy Yeh and Luffy Lin	
Temperature (℃)	20~24	
Relative Humidity (%)	50~58	

FCC Designation No.: TW1190

1.4 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ANSI C63.26-2015
- ANSI / TIA-603-E
- FCC 47 CFR Part 2, 96
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 940660 D01 Part 96 CBRS Eqpt v03
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. The TAF code is not including all the FCC KDB listed without accreditation.

2 Test Configuration of Equipment Under Test

2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

Test Items	Band	Bandwidth (MHz)				Modulation					RB #			Test Channel		
		10	20	30	40	PI/2 BPSK	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
Max. Output Power	n48	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
26dB and 99% Bandwidth	n48	v	v	v	v	v	v	v	v	v			v		v	
Conducted Band Edge	n48	v	v	v	v	v	v	v	v	v	v		v	v	v	v
Peak-to-Average Ratio	n48		v			v	v	v	v	v			v		v	
Conducted Spurious Emission	n48	v	v	v	v		v				v			v	v	v
E.I.R.P	n48	v	v	v	v	v	v	v	v	v	Max. Power					
Frequency Stability	n48		v			v	v				v				v	
Remark	1. The mark "v " means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. One representative bandwidth is selected to perform PAR and frequency stability.															

2.2 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Example :

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)

2.3 Frequency List of Low/Middle/High Channels

5G NR n48 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
40	Channel	638000	641666	645332
	Frequency	3570	3624.99	3679.98
30	Channel	637668	641666	645666
	Frequency	3565.02	3624.99	3684.99
20	Channel	637334	641666	646000
	Frequency	3560.01	3624.99	3690
10	Channel	637000	641666	646332
	Frequency	3555	3624.99	3694.98

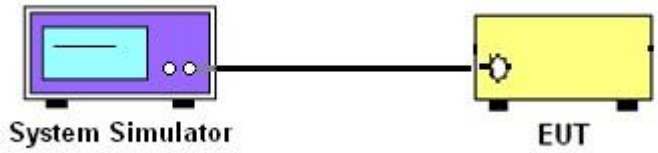
3 Conducted Test Items

3.1 Measuring Instruments

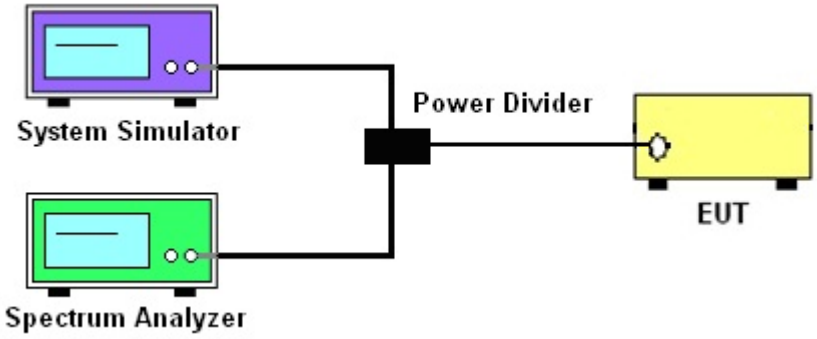
See list of measuring instruments of this test report.

3.1.1 Test Setup

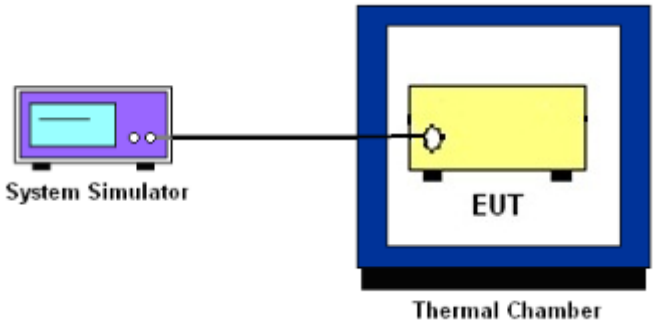
3.1.2 Conducted Output Power



3.1.3 Peak-to-Average Ratio, Occupied Bandwidth, Conducted Band Edge and Conducted Spurious Emission



3.1.4 Frequency Stability



3.1.5 Test Result of Conducted Test

Please refer to Appendix A.

3.2 Conducted Output Power

3.2.1 Description of the Conducted Output Power Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

3.2.2 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through the system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.

3.3 Peak-to-Average Ratio

3.3.1 Description of the PAR Measurement

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

3.3.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.2.6

1. The EUT was connected to spectrum and system simulator via a power divider.
2. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
3. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
4. Record the deviation as Peak to Average Ratio

3.4 EIRP

3.4.1 Description of the EIRP Measurement

The EIRP of mobile transmitters must not exceed 23 dBm /10 megahertz for LTE Band 48.

The testing follows ANSI C63.26-2015 Section 5.2.5.5

According to KDB 412172 D01 Power Approach,

EIRP = PT + GT – LC, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

Device	Maximum EIRP (dBm/10 MHz)	Maximum PSD (dBm/MHz)
End User Device	23	n/a

Remark:

1. Total channel power is complied with EIRP limit 23dBm/10MHz.
2. The MIMO mode is completely uncorrelated, so the directional gain is selected the maximum gain among all antennas.

3.4.2 Test Procedures

The testing follows procedure in Section 5.2 of ANSI C63.26-2015 and KDB 940660 D01 Part 96 CBRS Eqpt v03 Section 3.2(b)(2)

Determine the EIRP by adding the effective antenna gain to the measured average conducted power level.

3.5 Occupied Bandwidth

3.5.1 Description of Occupied Bandwidth Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

3.5.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.4.3 (26dB) and Section 5.4.4 (99OB)

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be between two and five times the anticipated OBW.
3. The nominal resolution bandwidth (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.
4. Set the detection mode to peak, and the trace mode to max hold.
5. Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace. (this is the reference value)
6. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
7. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “–X dB down amplitude” determined in step 6. If a marker is below this “-X dB down amplitude” value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.
8. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

3.6 Conducted Band Edge

3.6.1 Description of Conducted Band Edge Measurement

The conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed −13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B megahertz below the lower CBSD-assigned channel edge. At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed −25 dBm/MHz. Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB.

3.6.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured.
3. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
4. Beyond the 1 MHz band from the band edge, RBW=1MHz was used
5. Set spectrum analyzer with RMS detector.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. For MIMO mode, add additional MIMO factor 10log(NTX=2) = 3.01dB into the spectrum analyzer offset.

For Adjacent Channel Leakage Ratio (ACLR) measurement,

1. The Adjacent Channel Leakage Ratio (ACLR) is the ratio of the average power in the assigned aggregated channel bandwidth to the average power over the equivalent adjacent channel bandwidth.
2. The option ACLR of spectrum analyzer is used and measures the ACLR ratio by setting equivalent channel bandwidth.
3. The measured ACLR ratio shall be at least 30 dB.

3.7 Conducted Spurious Emission

3.7.1 Description of Conducted Spurious Emission Measurement

96.41 (e)(2)

The conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

3.7.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
6. Set spectrum analyzer with RMS detector.
7. Taking the record of maximum spurious emission.
8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
9. The limit line is −40dBm/MHz.
10. For MIMO mode, add additional MIMO factor 10log(NTX=2) = 3.01dB into the spectrum analyzer offset.

3.8 Frequency Stability

3.8.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency

3.8.2 Test Procedures for Temperature Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

1. The EUT was set up in the thermal chamber and connected with the system simulator.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.8.3 Test Procedures for Voltage Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

1. The EUT was placed in a temperature chamber at 25±5° C and connected with the system simulator.
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Programmable Power Supply	GW Instek	PSS-2005	EL890001	50Hz~60Hz	Oct. 06, 2021	Apr. 11, 2022~ Jul. 01, 2022	Oct. 05, 2022	Conducted (TH03-HY)
Signal Analyzer	Rohde & Schwarz	FSV3044	101049	10Hz~44GHz	Aug. 31, 2021	Apr. 11, 2022~ Jul. 01, 2022	Aug. 30, 2022	Conducted (TH03-HY)
Temperature Chamber	ESPEC	SH-641	92013720	-40℃ ~90℃	Sep. 09, 2021	Apr. 11, 2022~ Jul. 01, 2022	Sep. 08, 2022	Conducted (TH03-HY)
Hygrometer	TECPEL	DTM-303B	TP200886	NA	Mar. 21, 2022	Apr. 11, 2022~ Jul. 01, 2022	Mar. 20, 2023	Conducted (TH03-HY)
Base Station (Measure)	Anritsu	MT8821C	6261849015	LTE	Oct. 06, 2021	Apr. 11, 2022~ Jul. 01, 2022	Oct. 05, 2022	Conducted (TH03-HY)
Base Station (Measure)	Anritsu	MT8000A	6261940327	FR1	Oct. 29, 2021	Apr. 11, 2022~ Jul. 01, 2022	Oct. 28, 2022	Conducted (TH03-HY)

Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power and EIRP)

<SISO Mode>

NR n48 Maximum Average Power [dBm] (GT - LC = 1.5 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
10	1	1	PI/2 BPSK	15.54	21.35	21.30	22.96	0.1977
10	1	22		15.58	21.42	21.21		
10	12	6		15.60	21.46	21.31		
10	1	0		14.93	20.92	20.85		
10	1	23		15.03	20.85	20.66		
10	24	0		15.09	20.92	20.87		
10	1	1	QPSK	15.49	21.38	21.29		
10	1	22		15.54	21.34	21.23		
10	12	6		15.58	21.41	21.28		
10	1	0		14.51	20.43	20.32		
10	1	23		14.54	20.33	20.21		
10	24	0		14.55	20.40	20.30		
10	1	1	16-QAM	14.57	20.41	20.46	21.96	0.157
10	1	1	64-QAM	13.10	18.96	18.82		
10	1	1	256-QAM	10.64	16.78	16.54		
Limit	EIRP < 23dBm/10MHz			Result			Pass	

NR n48 Maximum Average Power [dBm] (GT - LC = 1.5 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
20	1	1	PI/2 BPSK	15.85	21.46	21.27	22.98	0.1986
20	1	49		15.95	21.40	21.31		
20	25	12		15.92	21.45	21.30		
20	1	0		15.36	21.06	20.87		
20	1	50		15.40	20.95	20.72		
20	50	0		15.45	21.05	20.73		
20	1	1	QPSK	15.86	21.48	21.32		
20	1	49		15.91	21.44	21.20		
20	25	12		15.93	21.43	21.27		
20	1	0		14.85	20.56	20.29		
20	1	50		14.94	20.45	20.14		
20	50	0		14.92	20.52	20.25		
20	1	1	16-QAM	14.68	20.73	20.38	22.23	0.1671
20	1	1	64-QAM	13.19	19.15	18.76		
20	1	1	256-QAM	11.13	16.73	16.47		
Limit	EIRP < 23dBm/10MHz			Result			Pass	

Total EIRP power is less than partial EIRP limit 23 dBm/10MHz.

NR n48 Maximum Average Power [dBm] (GT - LC = 1.5 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
30	1	1	PI/2 BPSK	15.75	21.47	21.48	22.98	0.1986
30	1	76		15.65	21.43	21.31		
30	36	18		15.81	21.47	21.47		
30	1	0		15.30	21.06	21.11		
30	1	77		15.22	20.88	20.82		
30	75	0		15.28	21.15	21.05		
30	1	1	QPSK	15.77	21.48	21.43		
30	1	76		15.66	21.36	21.23		
30	36	18		15.81	21.43	21.41		
30	1	0		14.75	20.54	20.70		
30	1	77		14.71	20.34	20.21		
30	75	0		14.76	20.61	20.56		
30	1	1	16-QAM	14.96	20.66	20.63	22.16	0.1644
30	1	1	64-QAM	13.34	18.96	19.05		
30	1	1	256-QAM	10.99	16.90	16.83		
Limit	EIRP < 23dBm/10MHz			Result			Pass	

NR n48 Maximum Average Power [dBm] (GT - LC = 1.5 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
40	1	1	PI/2 BPSK	15.92	21.49	21.32	22.99	0.1991
40	1	104		15.89	21.40	21.39		
40	50	25		15.96	21.42	21.43		
40	1	0		15.31	20.96	20.92		
40	1	105		15.23	20.85	20.86		
40	100	0		15.42	21.07	20.99		
40	1	1	QPSK	15.83	21.41	21.33		
40	1	104		15.94	21.40	21.36		
40	50	25		15.97	21.46	21.45		
40	1	0		14.88	20.52	20.39		
40	1	105		14.86	20.43	20.40		
40	100	0		14.93	20.58	20.46		
40	1	1	16-QAM	14.90	20.53	20.58	22.08	0.1614
40	1	1	64-QAM	13.29	18.96	18.81		
40	1	1	256-QAM	11.28	16.84	16.59		
Limit	EIRP < 23dBm/10MHz			Result			Pass	

Total EIRP power is less than partial EIRP limit 23 dBm/10MHz.

<MIMO Mode>

Part96 NR n48 Maximum AHerage Power [dBm], DG = 3.8 dBi														
BW	RB	RB	Mod	Antenna 4			Antenna 6			Combine			EIRP	EIRP
(MHz)	Size	Offset		Lowest	Middle	Highest	Lowest	Middle	Highest	Lowest	Middle	Highest	(dBm)	(W)
10	1	1	QPSK	8.99	14.12	13.85	9.00	13.67	13.53	12.01	16.91	16.70	20.71	0.1178
10	1	22		9.04	13.96	13.81	8.96	13.61	13.44	12.01	16.80	16.64		
10	12	6		8.93	14.05	13.91	9.12	13.70	13.59	12.04	16.89	16.76		
10	1	0		7.36	12.54	12.56	7.54	12.25	12.03	10.46	15.41	15.31		
10	1	23		7.40	12.47	12.46	7.52	12.12	11.92	10.47	15.31	15.21		
10	24	0		7.46	12.61	12.41	7.55	12.17	12.00	10.52	15.41	15.22		
10	1	1	16-QAM	8.46	13.66	13.63	8.49	0.24	13.33	11.49	13.85	16.49	20.29	0.1069
10	1	1	64-QAM	6.70	12.01	11.70	7.00	11.50	11.44	9.86	14.77	14.58		
10	1	1	256-QAM	3.88	8.99	8.86	3.96	8.73	8.85	6.93	11.87	11.87		
Limit	EIRP < 23dBm/10MHz			Result									Pass	

Part96 NR n48 Maximum AHerage Power [dBm], DG = 3.8 dBi														
BW	RB	RB	Mod	Antenna 4			Antenna 6			Combine			EIRP	EIRP
(MHz)	Size	Offset		Lowest	Middle	Highest	Lowest	Middle	Highest	Lowest	Middle	Highest	(dBm)	(W)
20	1	1	QPSK	9.26	14.07	13.91	9.24	13.81	13.54	12.26	16.95	16.74	20.77	0.1194
20	1	49		9.30	13.91	13.70	9.27	13.47	13.50	12.30	16.71	16.61		
20	25	12		9.40	14.11	13.87	9.51	13.81	13.42	12.47	16.97	16.66		
20	1	0		7.57	12.70	12.47	7.87	12.36	11.98	10.73	15.54	15.24		
20	1	50		7.74	12.46	12.31	7.80	12.08	12.00	10.78	15.28	15.17		
20	51	0		7.74	12.59	12.36	7.90	12.17	11.96	10.83	15.40	15.17		
20	1	1	16-QAM	8.51	13.76	13.47	9.05	13.23	13.22	11.80	16.51	16.36	20.31	0.1074
20	1	1	64-QAM	7.08	11.86	11.90	7.17	11.73	11.32	10.14	14.81	14.63		
20	1	1	256-QAM	4.10	9.18	8.92	4.51	8.78	8.54	7.32	11.99	11.74		
Limit	EIRP < 23dBm/10MHz			Result									Pass	

Total EIRP power is less than partial EIRP limit 23 dBm/10MHz.

Part96 NR n48 Maximum AHerage Power [dBm], DG = 3.8 dBi														
BW	RB	RB	Mod	Antenna 4			Antenna 6			Combine			EIRP	EIRP
(MHz)	Size	Offset		Lowest	Middle	Highest	Lowest	Middle	Highest	Lowest	Middle	Highest	(dBm)	(W)
30	1	1	QPSK	9.43	14.04	13.94	9.41	13.75	13.76	12.43	16.91	16.86	20.71	0.1178
30	1	76		9.41	13.86	13.60	9.33	13.47	13.53	12.38	16.68	16.58		
30	39	19		9.47	14.05	13.98	9.47	13.71	13.59	12.48	16.89	16.80		
30	1	0		7.73	12.69	12.56	8.06	12.27	12.26	10.91	15.50	15.42		
30	1	77		7.59	12.41	12.26	7.67	12.02	11.99	10.64	15.23	15.14		
30	78	0		7.84	12.53	12.47	7.92	12.25	12.08	10.89	15.40	15.29		
30	1	1	16-QAM	8.73	13.68	13.64	9.14	13.31	13.53	11.95	16.51	16.60	20.4	0.1096
30	1	1	64-QAM	7.33	11.96	11.96	7.26	11.72	11.53	10.31	14.85	14.76		
30	1	1	256-QAM	4.32	9.10	8.98	4.51	8.70	8.65	7.43	11.91	11.83		
Limit	EIRP < 23dBm/10MHz			Result									Pass	

Part96 NR n48 Maximum AHerage Power [dBm], DG = 3.8 dBi														
BW	RB	RB	Mod	Antenna 4			Antenna 6			Combine			EIRP	EIRP
(MHz)	Size	Offset		Lowest	Middle	Highest	Lowest	Middle	Highest	Lowest	Middle	Highest	(dBm)	(W)
40	1	1	QPSK	9.33	14.19	13.94	9.20	13.75	13.59	12.28	16.99	16.78	20.79	0.1199
40	1	104		9.23	13.84	13.90	8.93	13.48	13.58	12.09	16.67	16.75		
40	53	26		9.30	14.10	13.99	9.21	13.76	13.54	12.27	16.94	16.78		
40	1	0		7.72	12.64	12.55	7.84	12.41	12.02	10.79	15.54	15.30		
40	1	105		7.75	13.86	12.50	7.47	13.49	12.11	10.62	16.69	15.32		
40	106	0		7.75	12.66	12.47	7.74	12.32	12.07	10.76	15.50	15.28		
40	1	1	16-QAM	8.86	13.98	13.60	8.67	13.49	12.97	11.78	16.75	16.31	20.55	0.1135
40	1	1	64-QAM	7.02	11.89	11.78	7.11	11.78	11.42	10.08	14.85	14.61		
40	1	1	256-QAM	4.25	9.08	9.04	4.30	8.85	8.50	7.29	11.98	11.79		
Limit	EIRP < 23dBm/10MHz			Result									Pass	

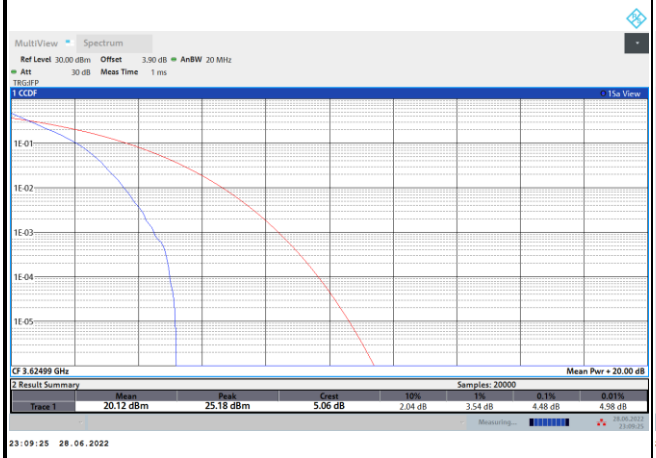
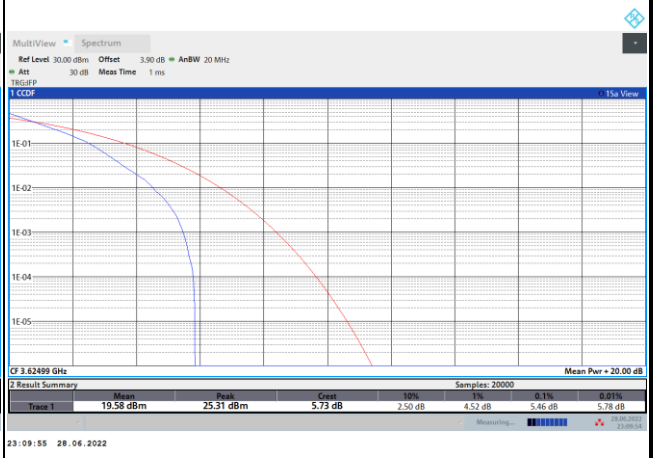
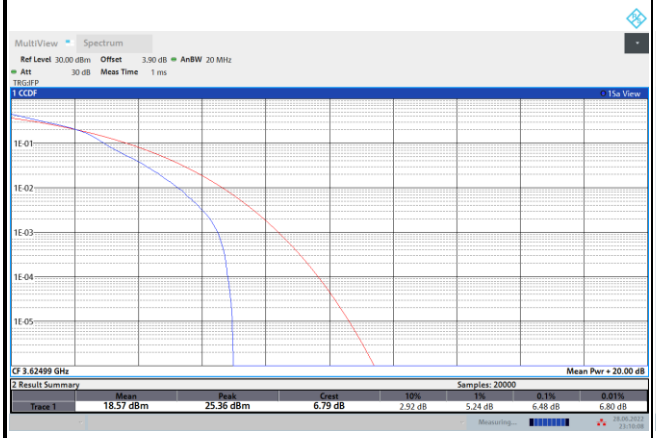
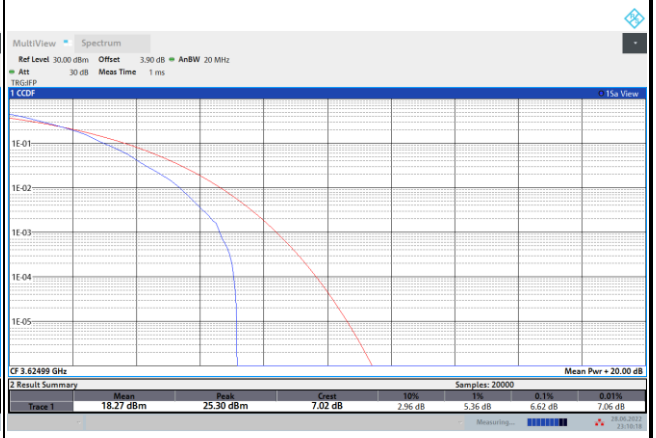
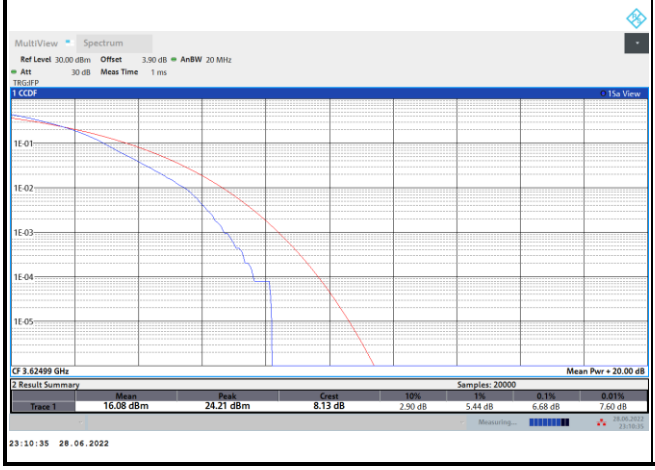
Total EIRP power is less than partial EIRP limit 23 dBm/10MHz.

FR1 n48

<SISO Mode>

Peak-to-Average Ratio

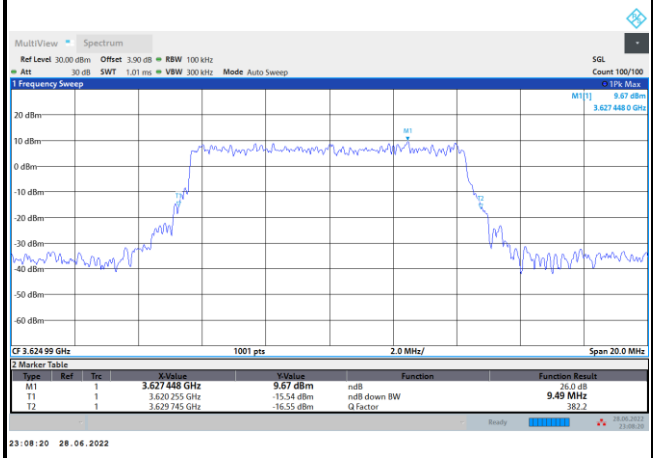
Mode	FR1 n48 / 20MHz / DFT-S OFDM				
Mod.	PI/2 BPSK	QPSK	16QAM	64QAM	Limit: 13dB
RB Size	Full RB	Full RB	Full RB	Full RB	Result
Middle CH	4.48	5.46	6.48	6.62	PASS
Mode	FR1 n48 / 20MHz / DFT-S OFDM				
Mod.	256QAM				Limit: 13dB
RB Size	Full RB				Result
Middle CH	6.68				PASS

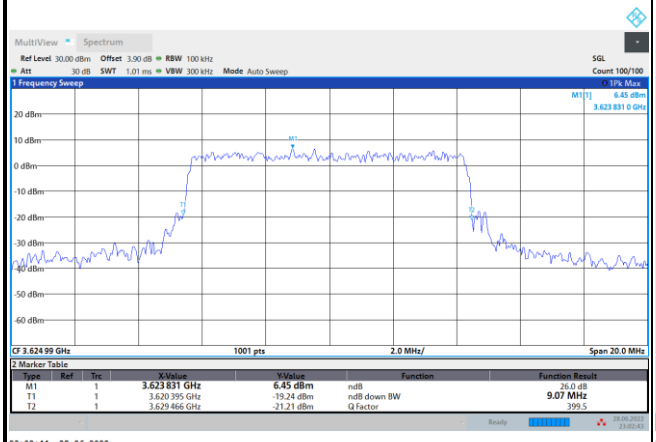
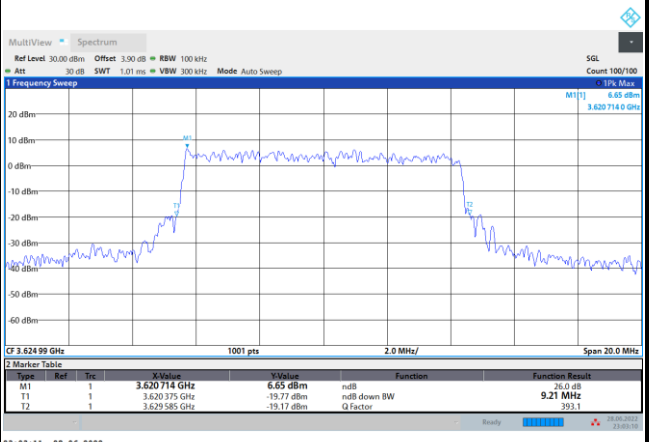
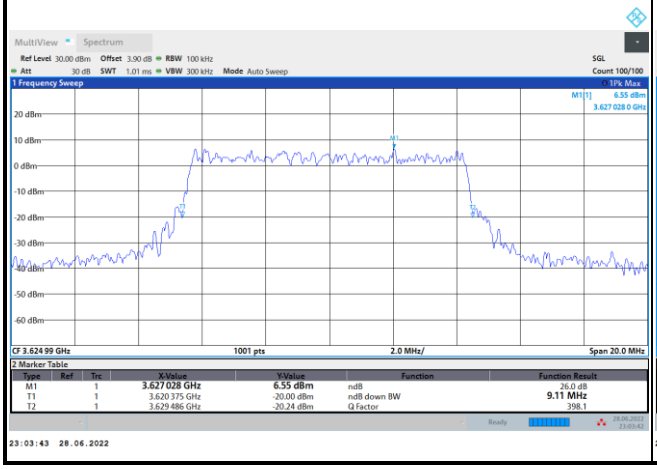
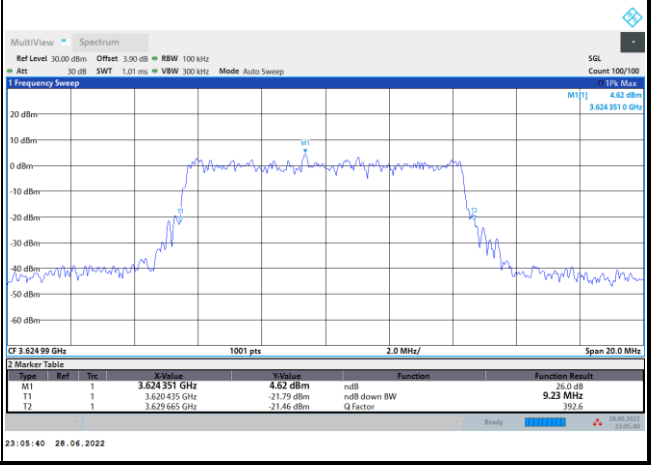
FR1 n48 / 20MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	QPSK
	
16QAM	64QAM
	
256QAM	
	

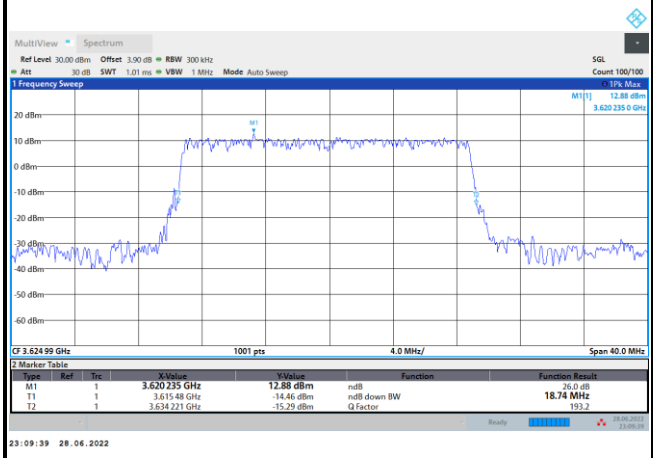
26dB Bandwidth

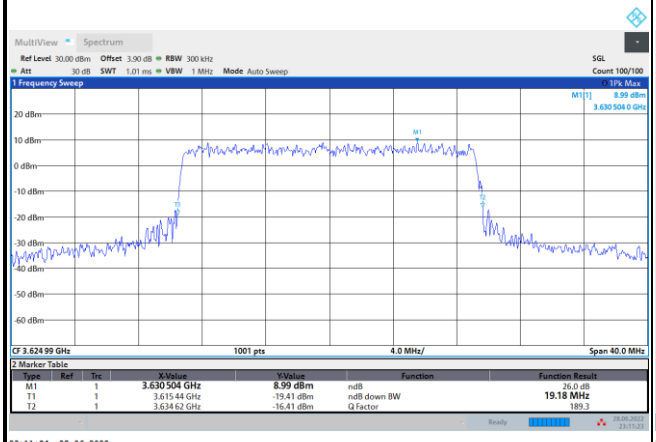
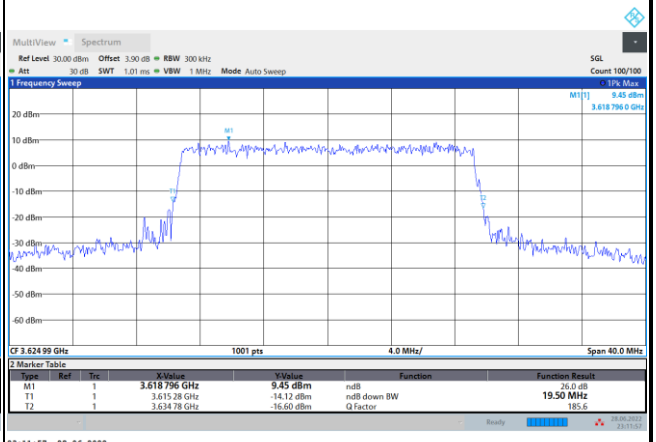
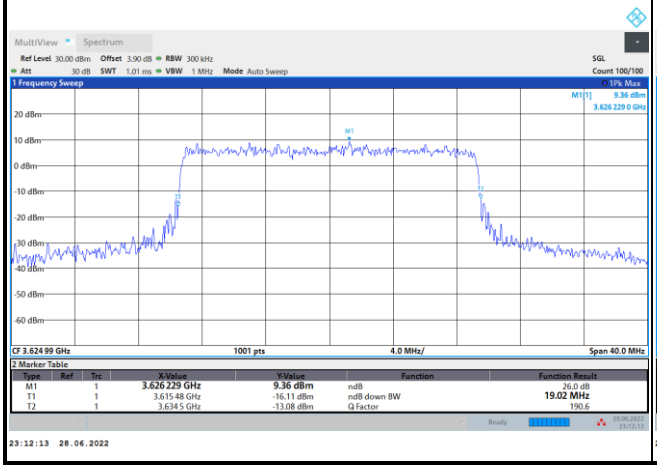
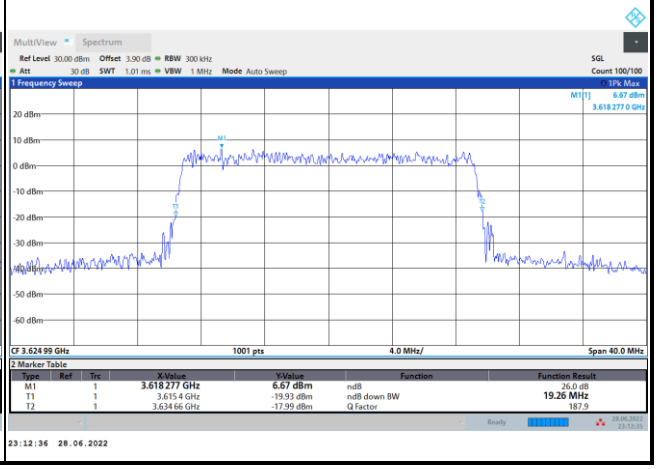
Mode	FR1 n48 : 26dB BW(MHz) / DFT-S OFDM							
BW	10MHz	15MHz	20MHz	30MHz	40MHz	50MHz	60MHz	70MHz
Mod.	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK
Middle CH	9.49	-	18.74	28.11	38.28	-	-	-
BW	80MHz	90MHz	100MHz					
Mod.	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK					
Middle CH	-	-	-					

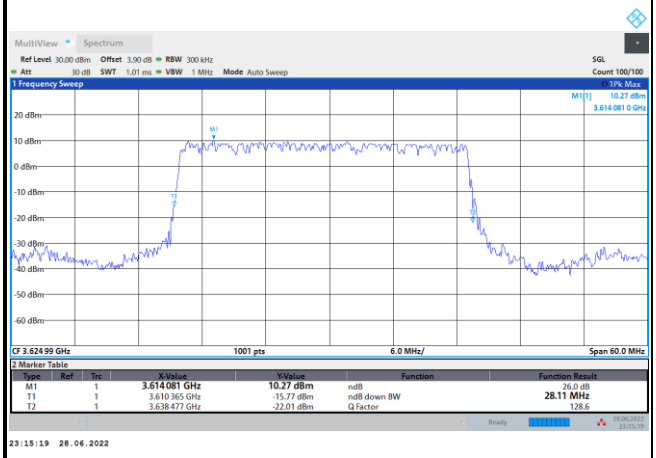
Mode	FR1 n48 : 26dB BW(MHz) / CP OFDM							
BW	10MHz		15MHz		20MHz		30MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Middle CH	9.07	9.21	-	-	19.18	19.50	29.19	28.95
Mod.	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM
Middle CH	9.11	9.23	-	-	19.02	19.26	28.95	29.01
BW	40MHz		50MHz		60MHz		70MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Middle CH	40.20	40.28	-	-	-	-	-	-
Mod.	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM
Middle CH	40.20	40.52	-	-	-	-	-	-
BW	80MHz		90MHz		100MHz			
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM		
Middle CH	-	-	-	-	-	-		
Mod.	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM		
Middle CH	-	-	-	-	-	-		

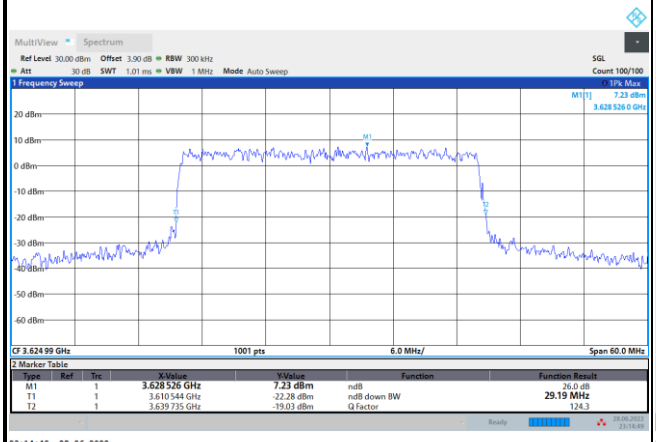
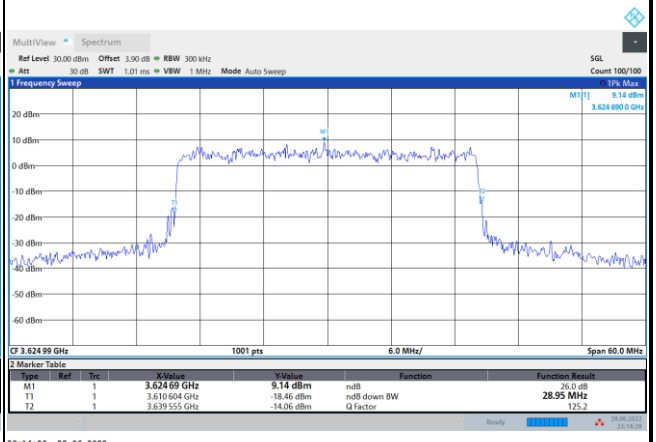
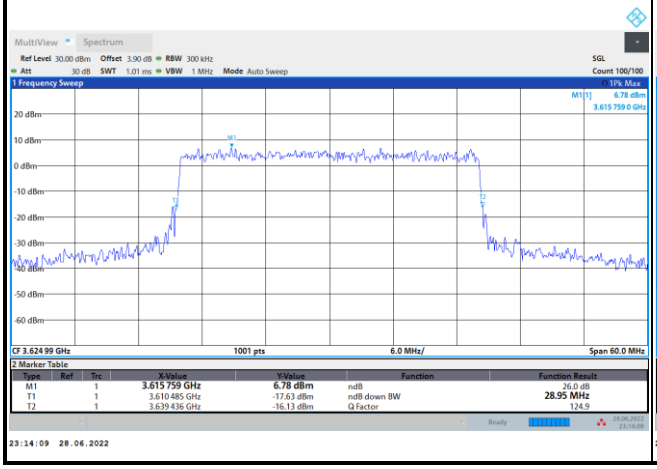
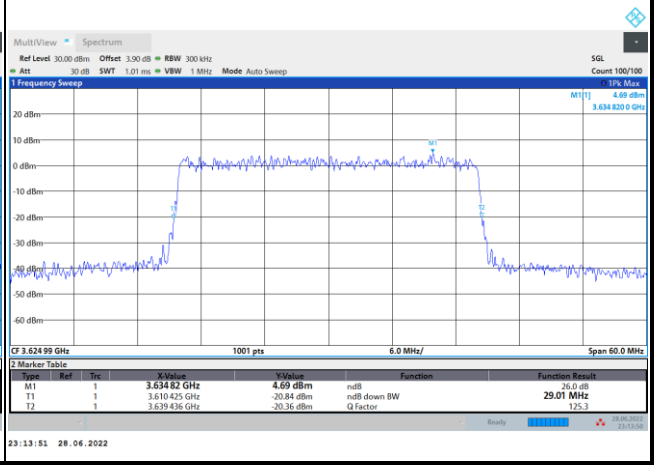
FR1 n48 / 10MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

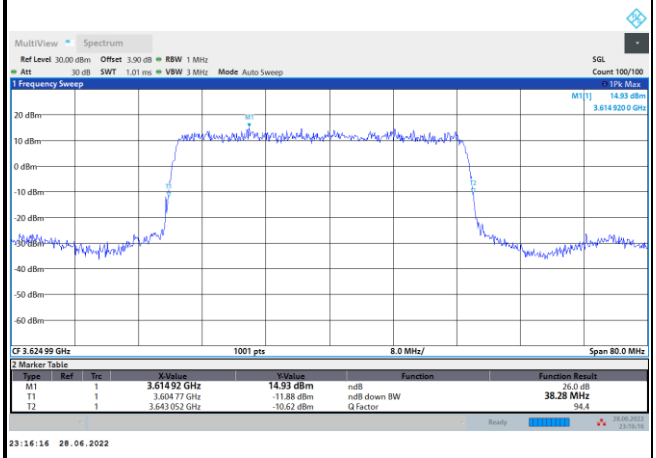
FR1 n48 / 10MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

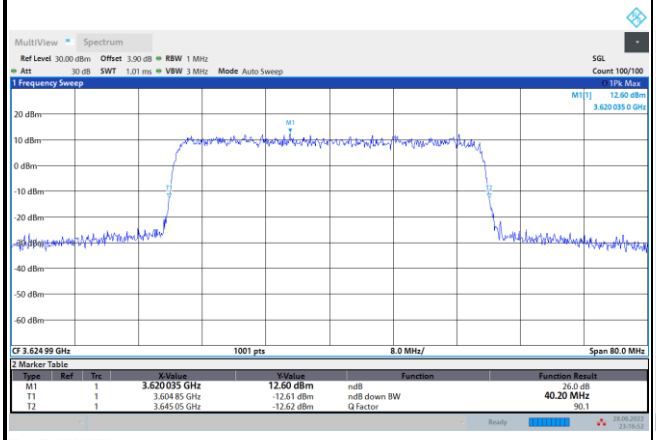
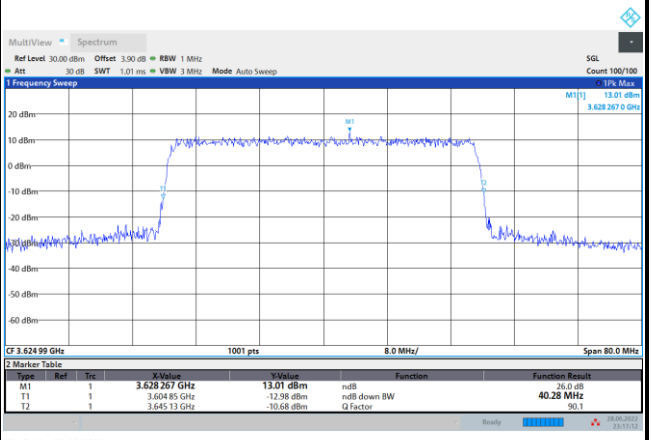
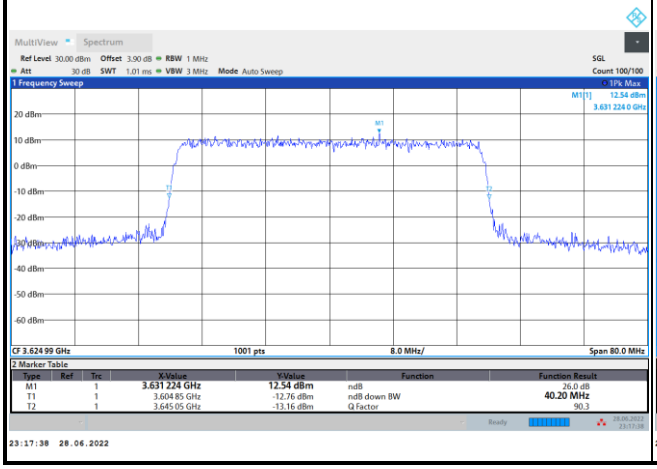
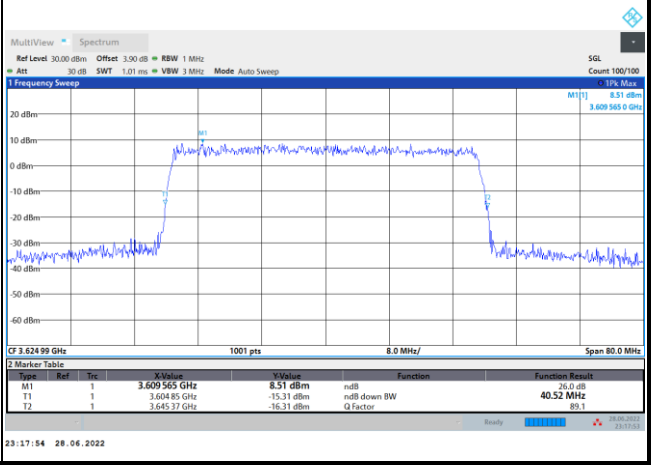
FR1 n48 / 20MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

FR1 n48 / 20MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

FR1 n48 / 30MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

FR1 n48 / 30MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

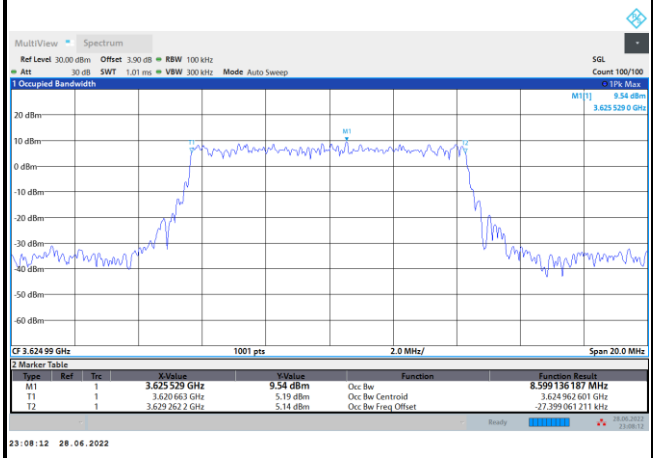
FR1 n48 / 40MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

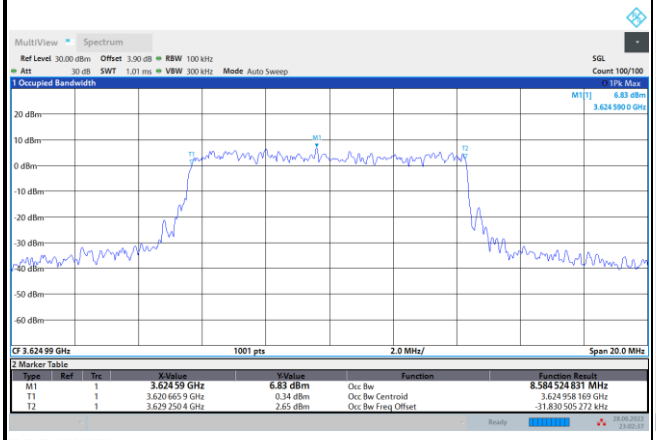
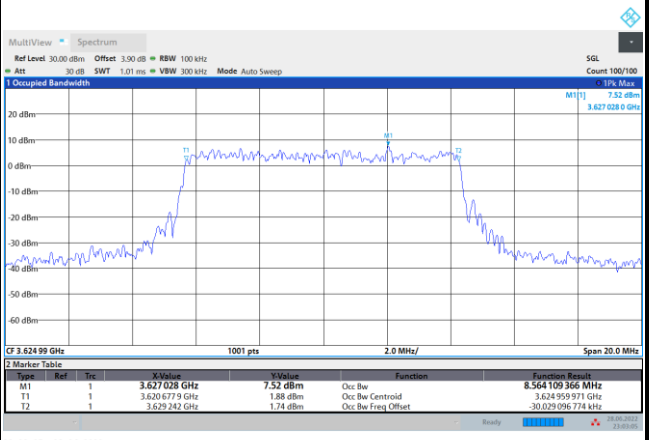
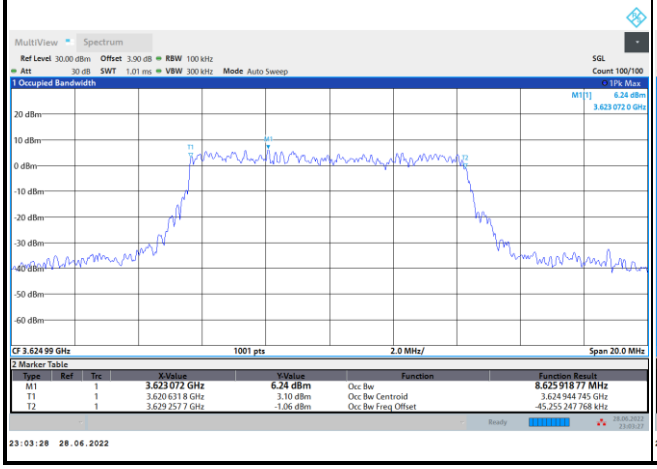
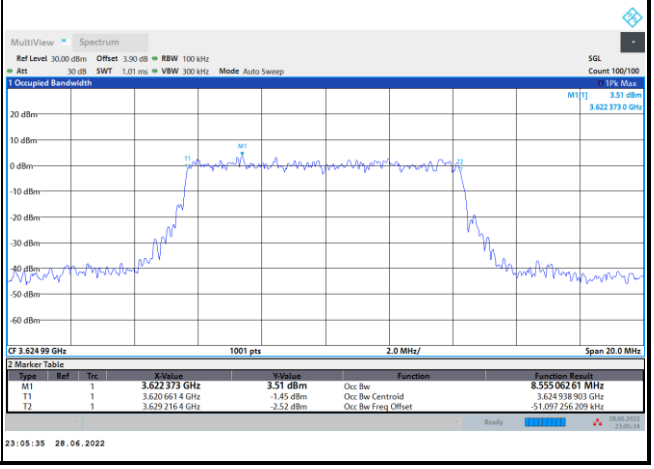
FR1 n48 / 40MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

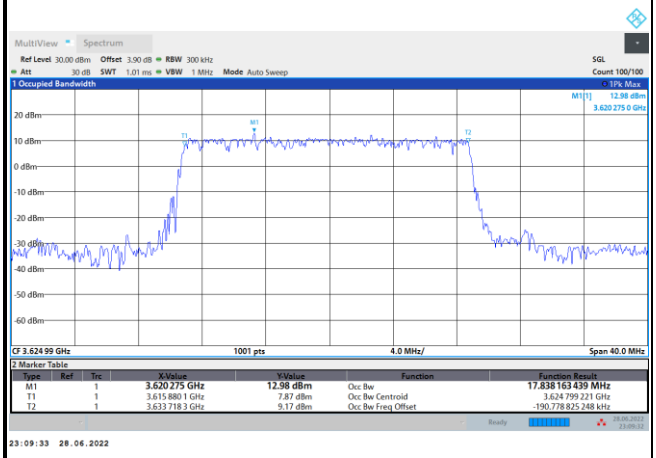
Occupied Bandwidth

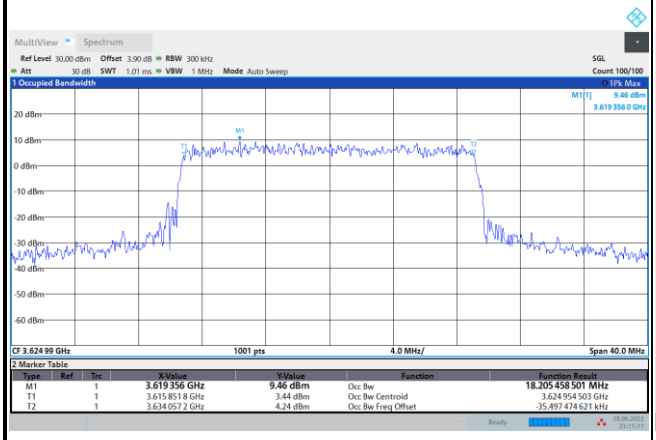
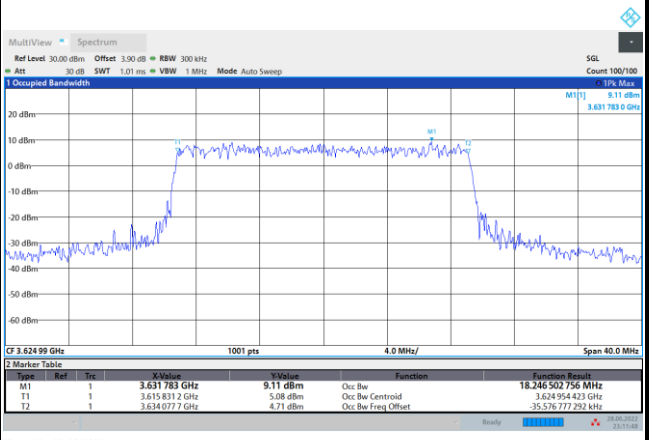
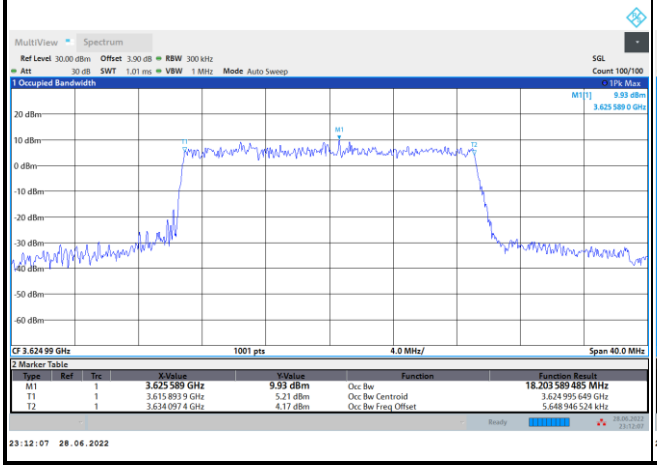
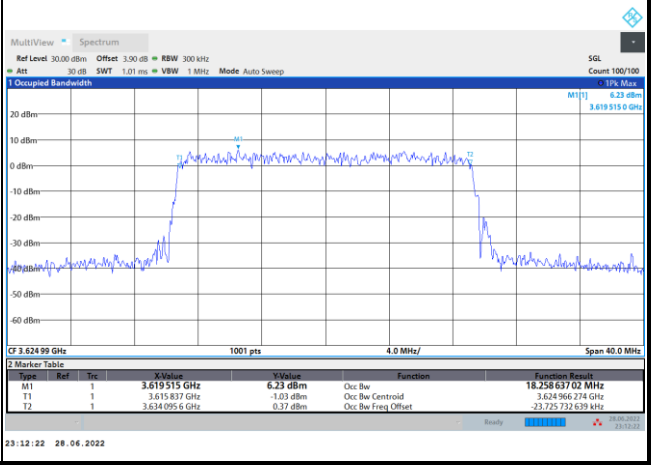
Mode	FR1 n48 : OB BW(MHz) / DFT-S OFDM							
BW	10MHz	15MHz	20MHz	30MHz	40MHz	50MHz	60MHz	70MHz
Mod.	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK
Middle CH	8.59	-	17.83	26.80	35.97	-	-	-
BW	80MHz	90MHz	100MHz					
Mod.	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK					
Middle CH	-	-	-					

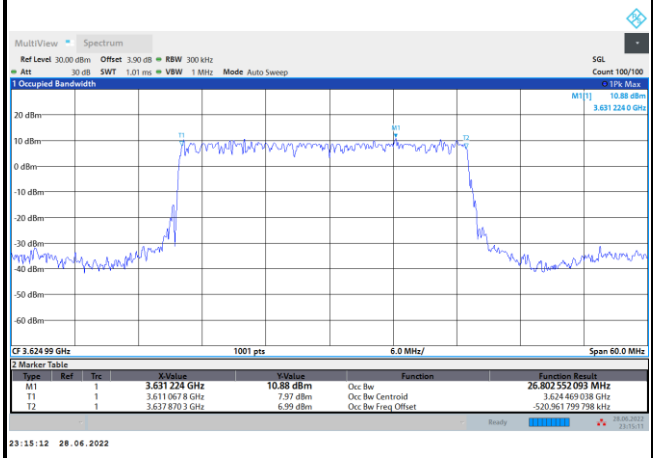
Mode	FR1 n48 : OB BW(MHz) / CP OFDM							
BW	10MHz		15MHz		20MHz		30MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Middle CH	8.58	8.56	-	-	18.20	18.24	27.77	27.83
Mod.	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM
Middle CH	8.62	8.55	-	-	18.20	18.25	27.80	27.74
BW	40MHz		50MHz		60MHz		70MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Middle CH	37.99	38.04	-	-	-	-	-	-
Mod.	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM
Middle CH	37.99	38.02	-	-	-	-	-	-
BW	80MHz		90MHz		100MHz			
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM		
Middle CH	-	-	-	-	-	-		
Mod.	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM		
Middle CH	-	-	-	-	-	-		

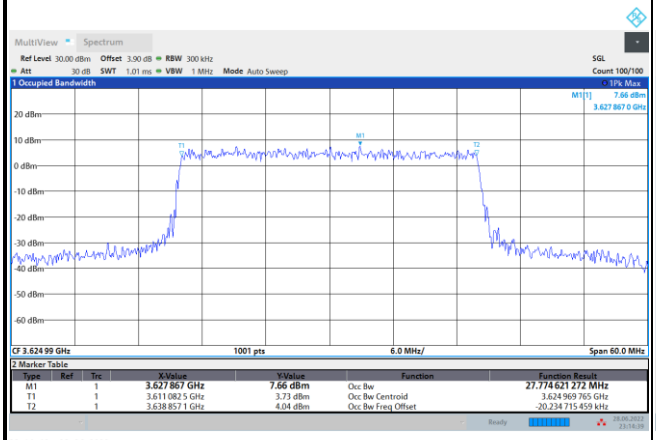
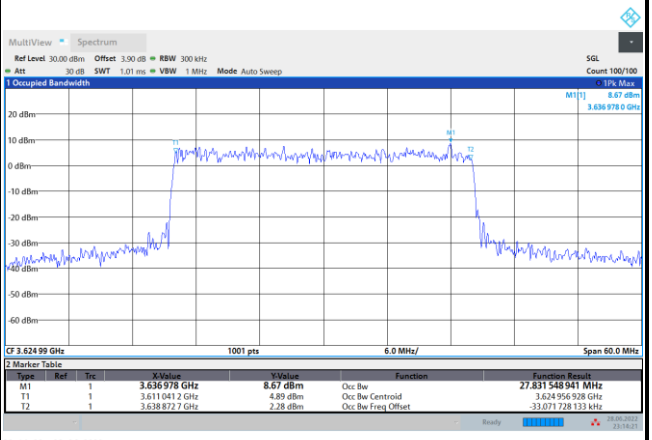
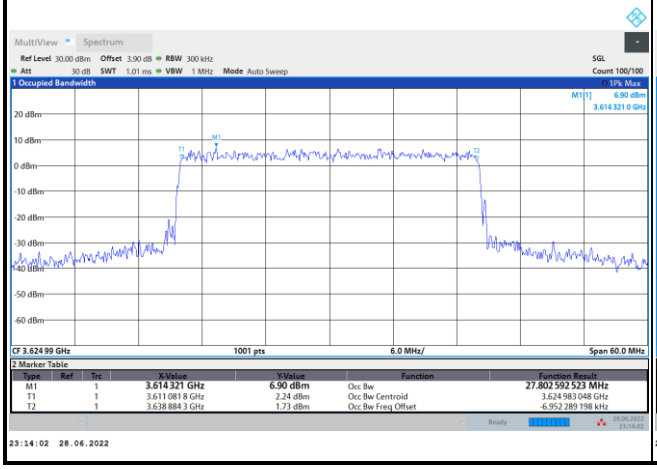
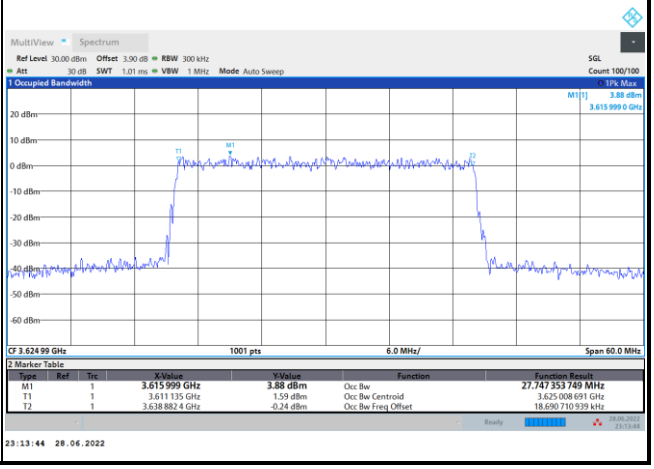
FR1 n48 / 10MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

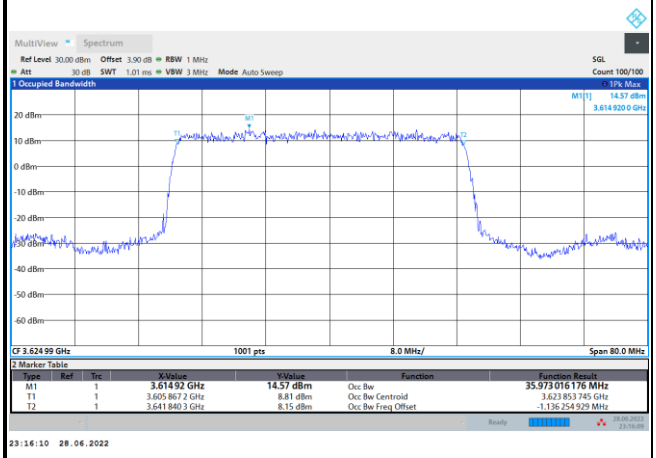
FR1 n48 / 10MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

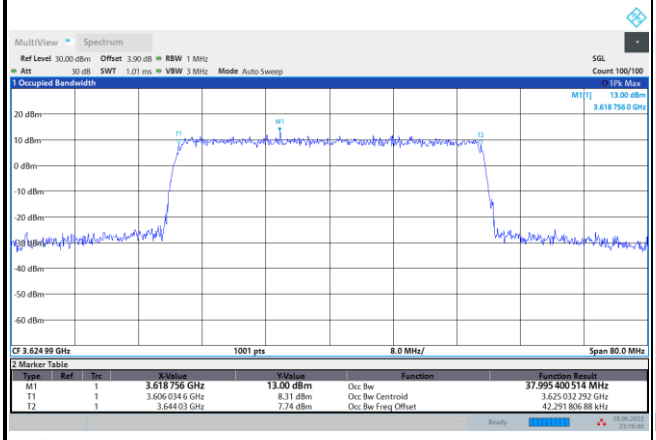
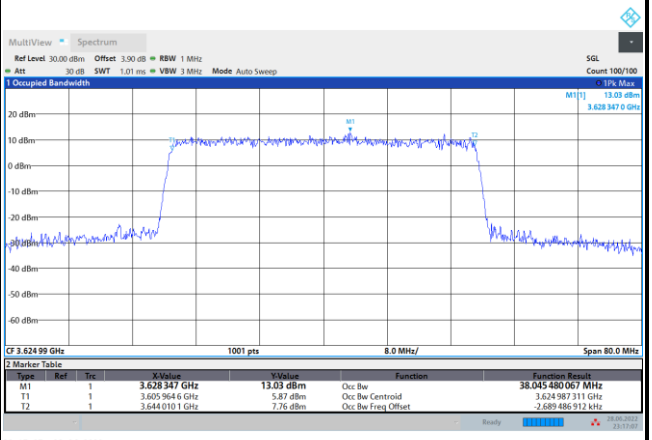
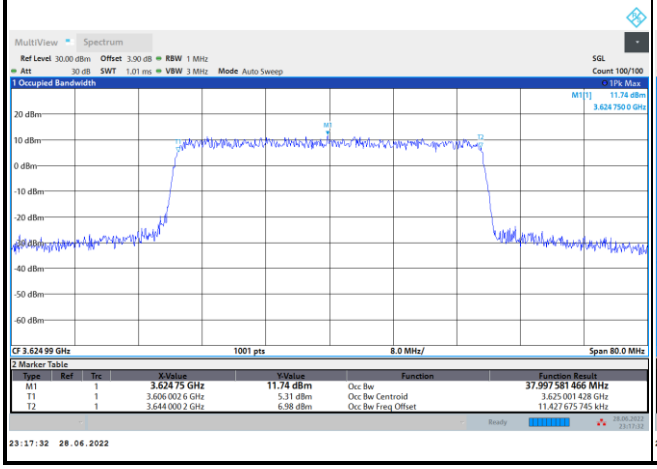
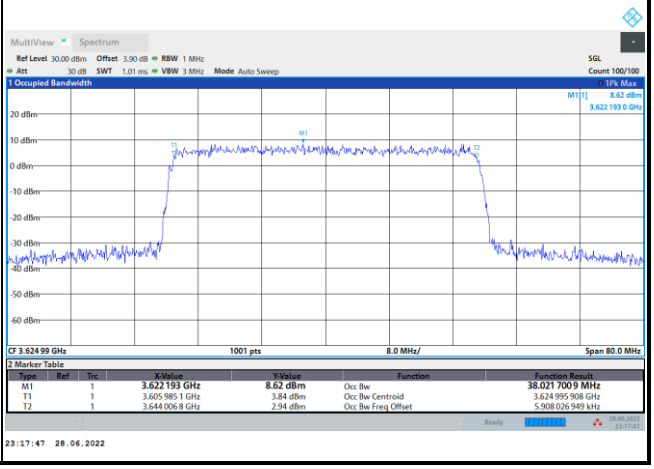
FR1 n48 / 20MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

FR1 n48 / 20MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

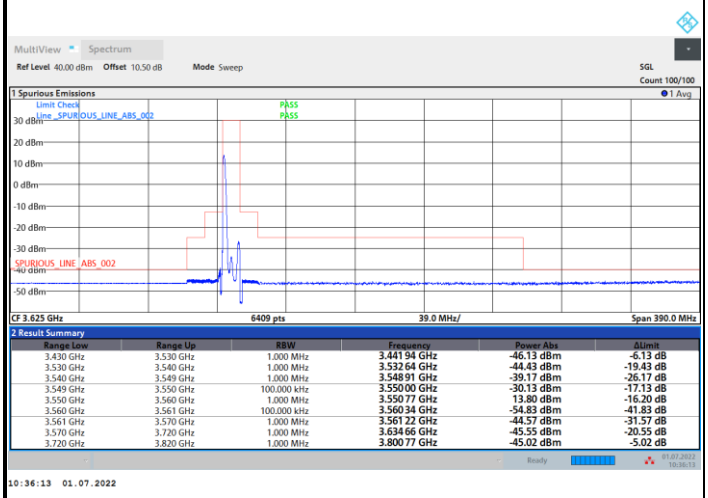
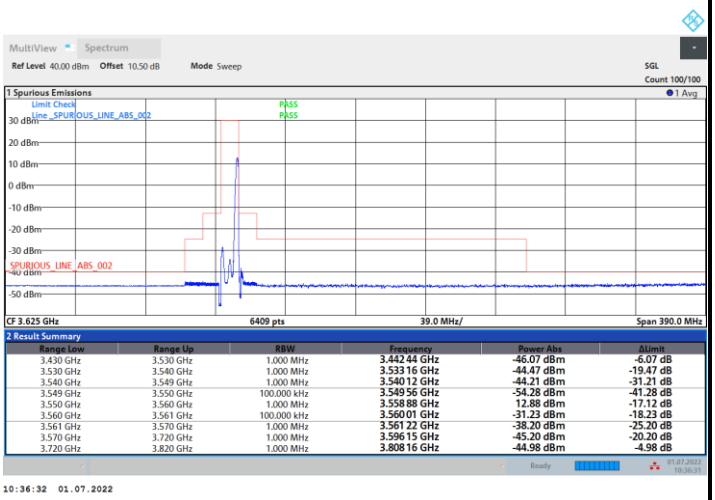
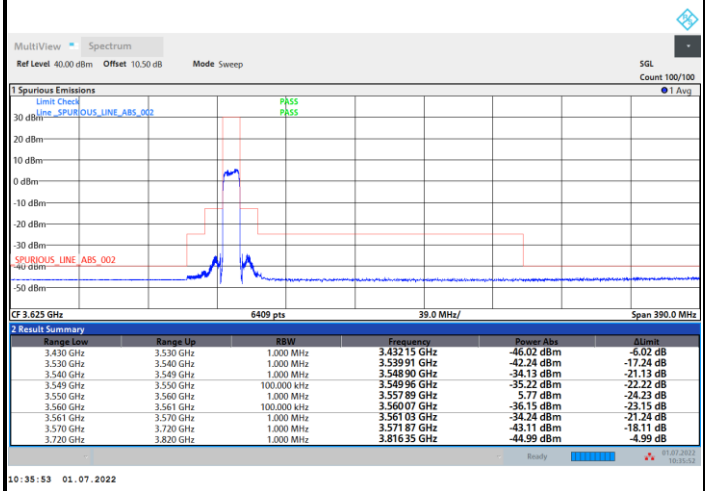
FR1 n48 / 30MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

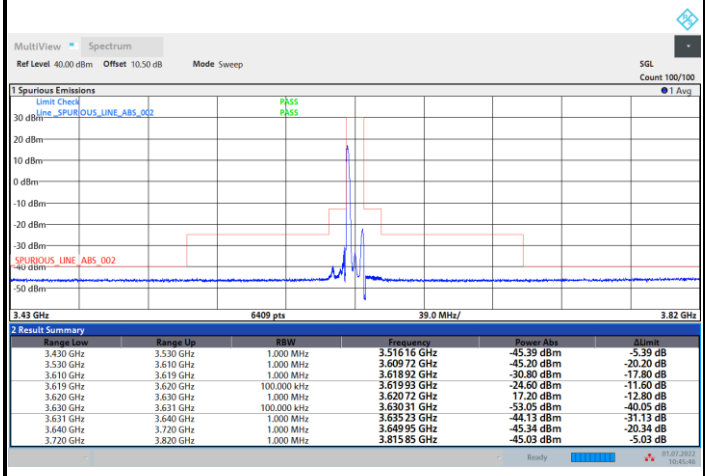
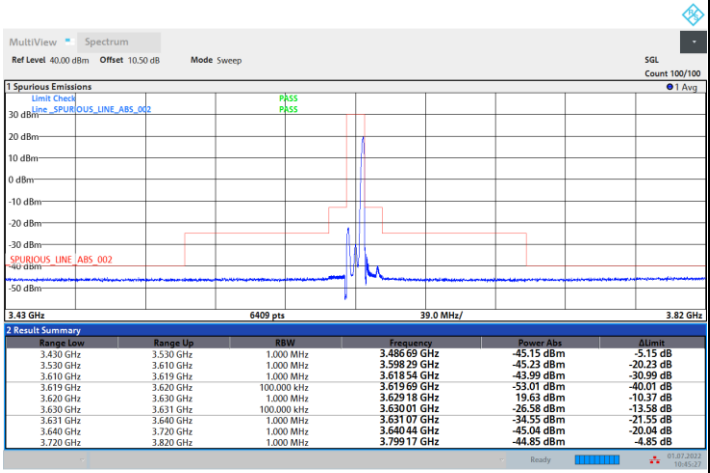
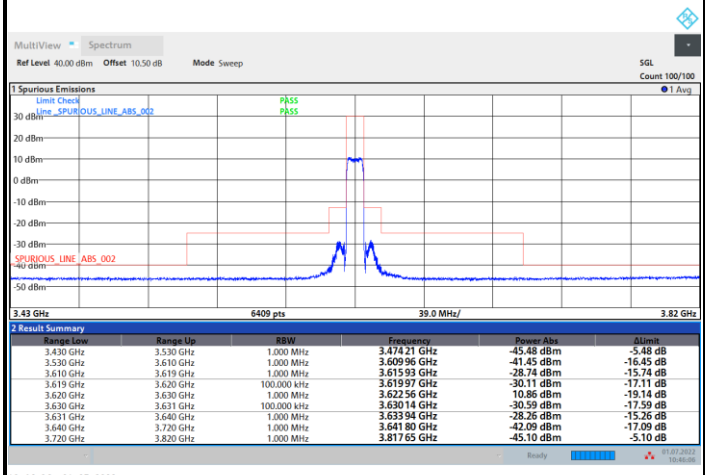
FR1 n48 / 30MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

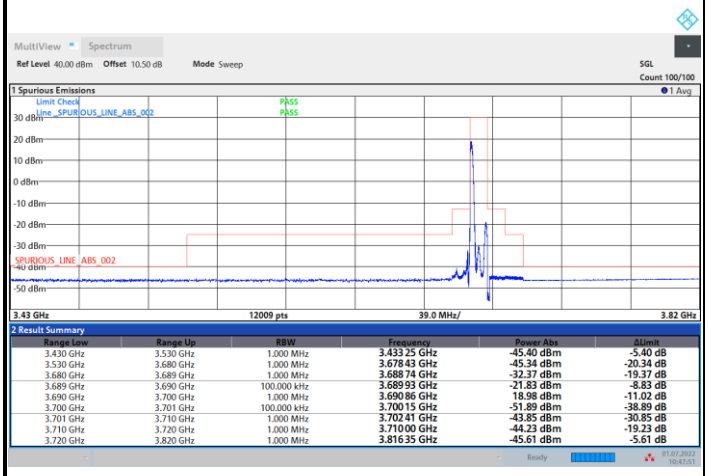
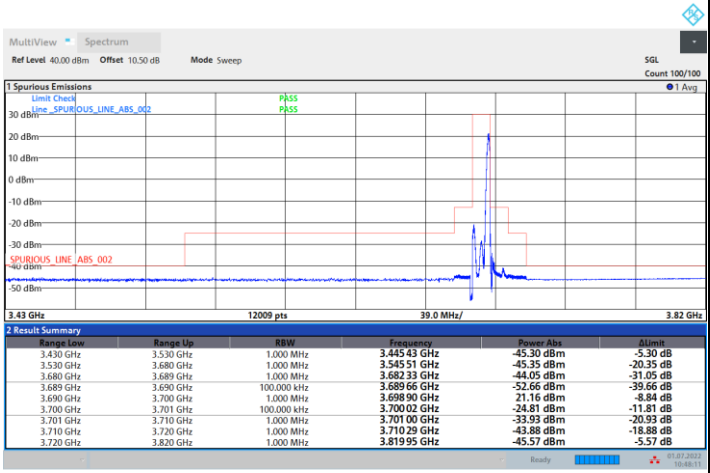
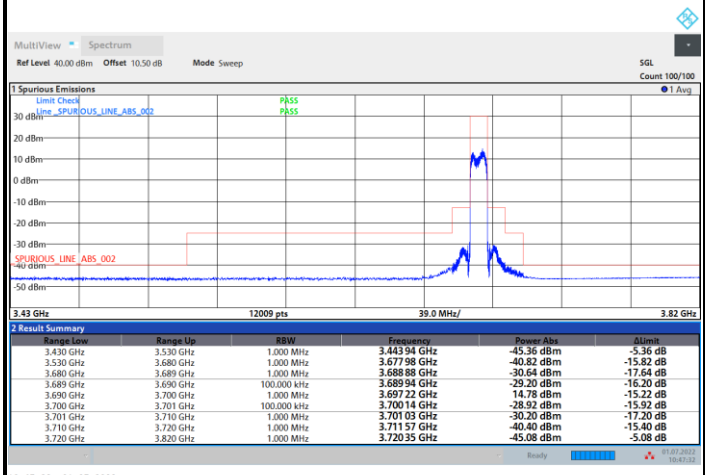
FR1 n48 / 40MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

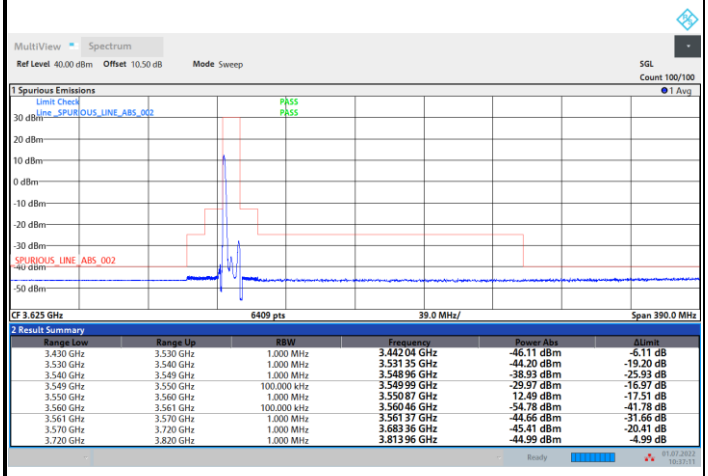
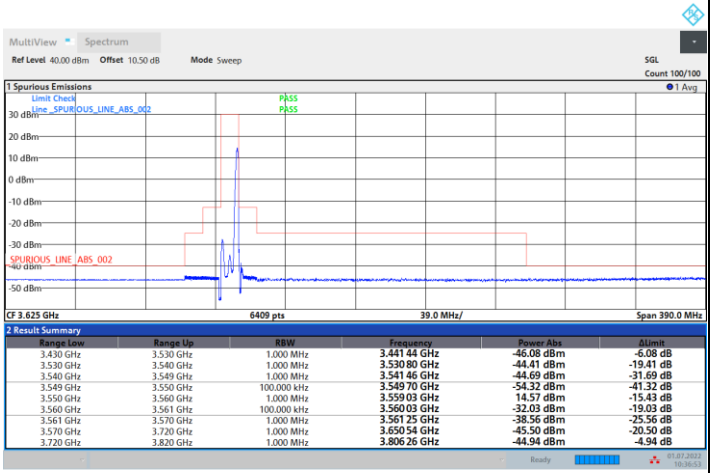
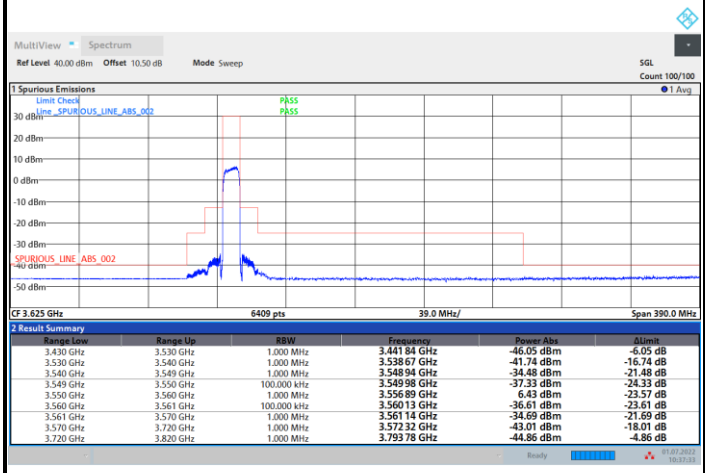
FR1 n48 / 40MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

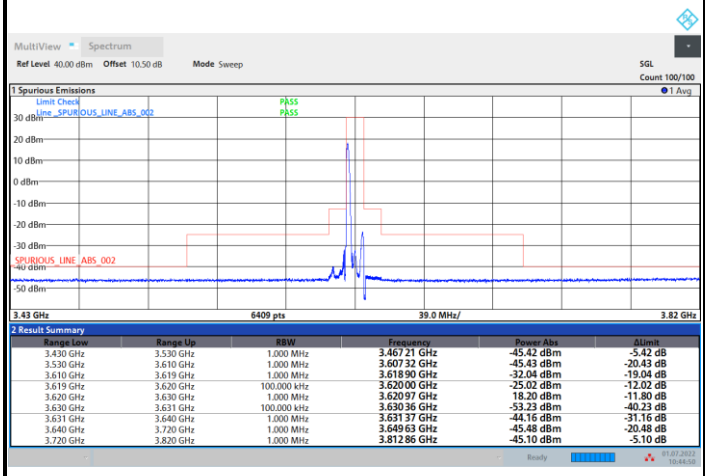
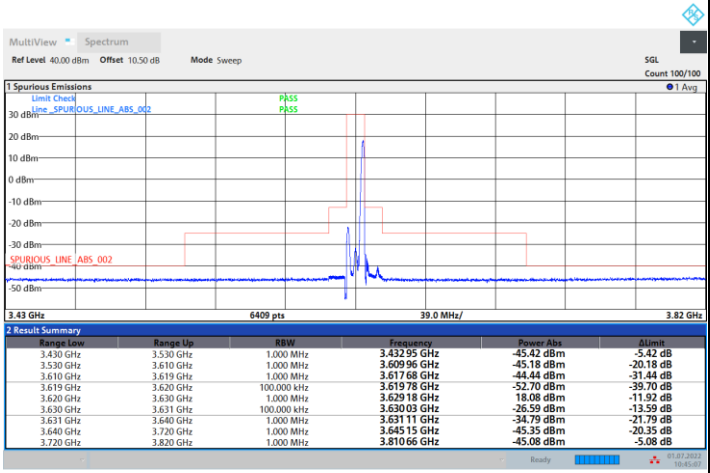
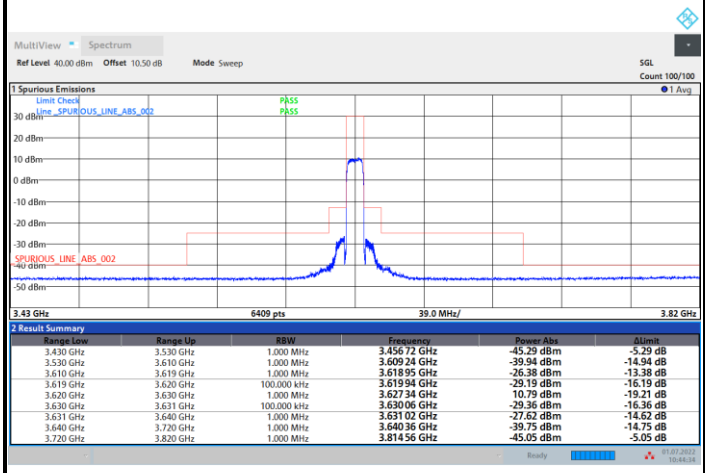
Unwanted Emission (MASK)

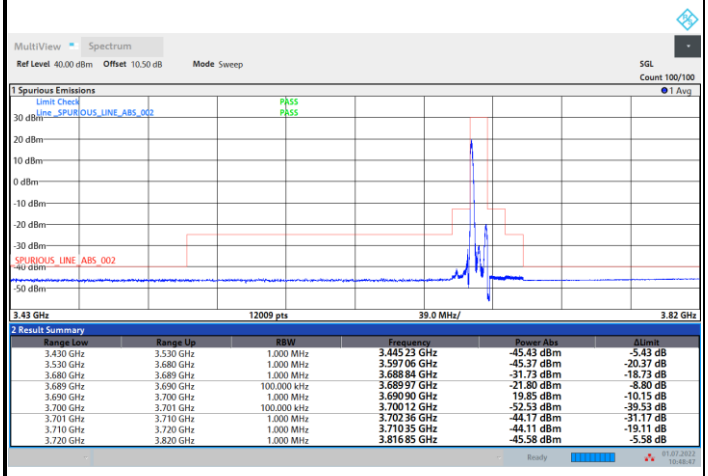
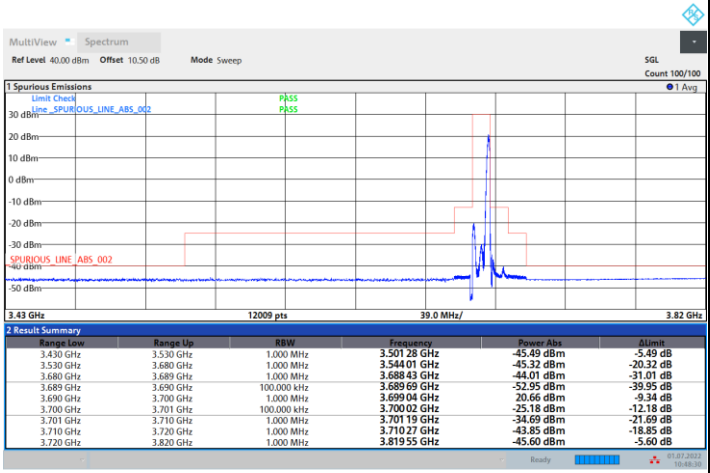
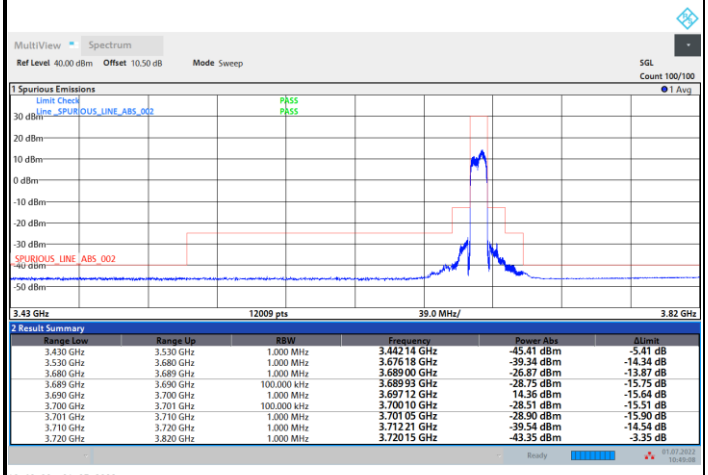
FR1 n48 / 10MHz / DFT-S OFDM / PI/2 BPSK	
Lowest Channel	
1RB0	1RBmax
	
Full RB	
	

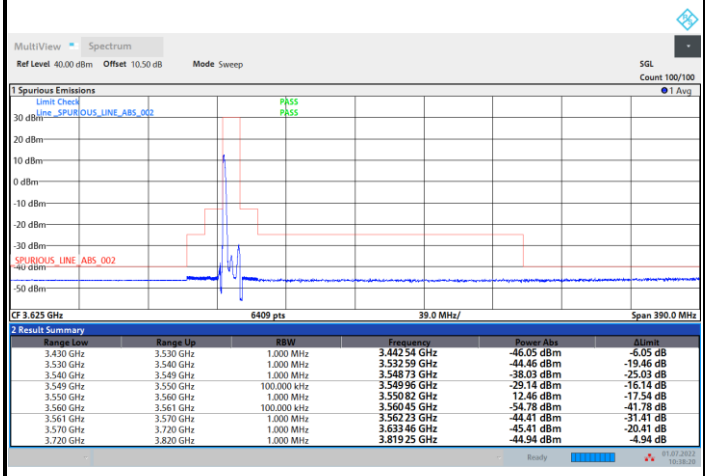
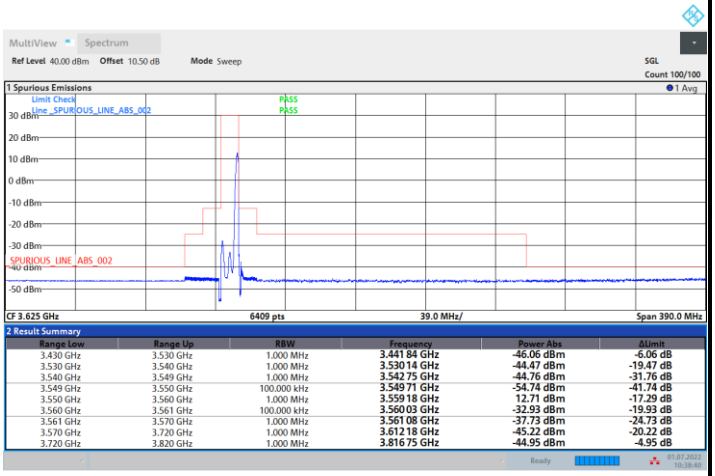
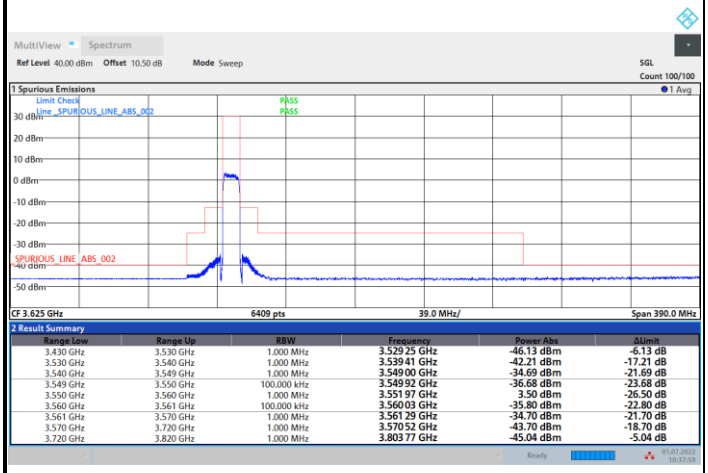
FR1 n48 / 10MHz / DFT-S OFDM / PI/2 BPSK	
Middle Channel	
1RB0	**1RBmax**
	
Full RB	
	

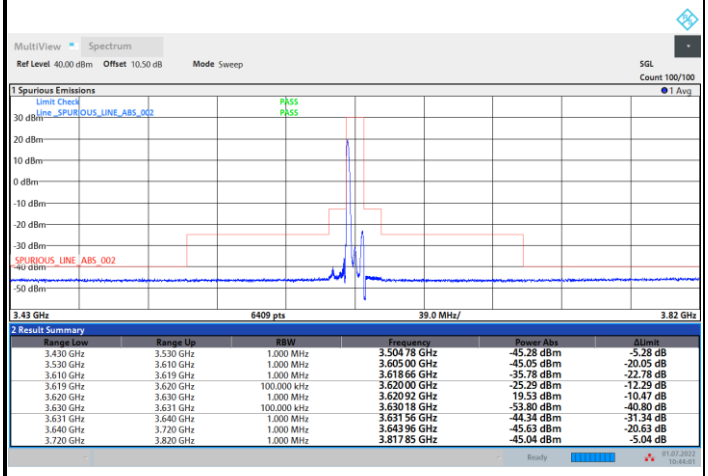
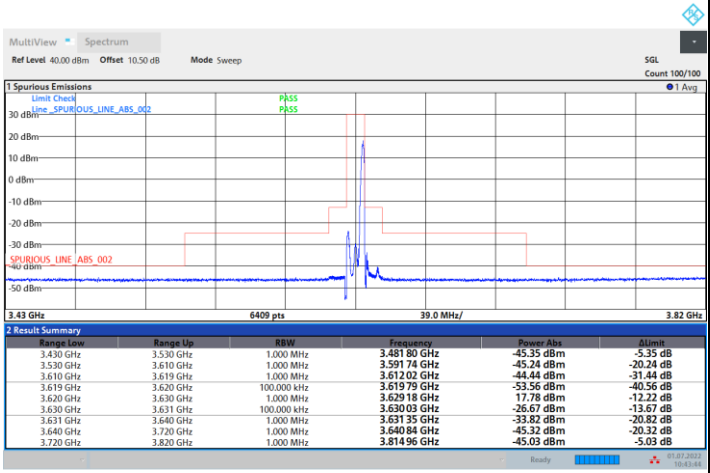
FR1 n48 / 10MHz / DFT-S OFDM / PI/2 BPSK	
Highest Channel	
1RB0	1RBmax
	
Full RB	
	

FR1 n48 / 10MHz / DFT-S OFDM / QPSK	
Lowest Channel	
1RB0	**1RBmax**
	
Full RB	
	

FR1 n48 / 10MHz / DFT-S OFDM / QPSK	
Middle Channel	
1RB0	**1RBmax**
	
Full RB	
	

FR1 n48 / 10MHz / DFT-S OFDM / QPSK	
Highest Channel	
1RB0	**1RBmax**
	
Full RB	
	

FR1 n48 / 10MHz / DFT-S OFDM / 16QAM	
Lowest Channel	
1RB0	**1RBmax**
	
Full RB	
	

FR1 n48 / 10MHz / DFT-S OFDM / 16QAM	
Middle Channel	
1RB0	**1RBmax**
	
Full RB