FCC RF Test Report

APPLICANT	: Motorola Mobility LLC
EQUIPMENT	: Mobile Cellular Phone
BRAND NAME	: Motorola
MODEL NAME	: XT2335-2
FCC ID	: IHDT56AJ7
STANDARD	: 47 CFR Part 2, 22, 27
CLASSIFICATION	: PCS Licensed Transmitter Held to Ear (PCE)
TEST DATE(S)	: Oct. 24, 2022 ~ Oct. 29, 2022

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown compliance with the applicable technical standards.

This report contains data that were produced under subcontract by Sporton International Inc. (Shenzhen)

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia

ACCREDITED Cert #5145.02

Sporton International Inc. (Kunshan)
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG292106-01C	Rev. 01	Initial issue of report	Nov. 18, 2022

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting Only	PASS	-
	§22.913(a)(5)	Effective Radiated Power (5G NR n5)	ERP < 7 Watt		
	§27.50(j)(3)	Equivalent Isotropic Radiated Power (5G NR n77, n78)	EIRP < 1Watt		
3.5	§27.50(j)(4)	Peak-to-Average Ratio	<13 dB	PASS	-
3.6	§2.1049	Occupied Bandwidth	Reporting Only	PASS	-
3.7	§2.1051 §22.917(a) §27.53(l)(2)	Conducted Band Edge Measurement (5G NR n5) (5G NR n77, n78)	< 43+10log10(P[Watts])	PASS	-
3.8	§2.1051 §22.917(a) §27.53(l)(2)	Conducted Spurious Emission (5G NR n5) (5G NR n77, n78)	< 43+10log10(P[Watts])	PASS	-
3.9	§2.1055 §22.355	Frequency Stability Temperature & Voltage	< 2.5 ppm for Part 22	PASS	-
	§27.54		Within Authorized Band		
4.4	§2.1053 §22.917(a) §27.53(l)(2)	Radiated Spurious Emission (5G NR n5) (5G NR n77, n78)	< 43+10log$_{10}$(P[Watts])	PASS	Under limit 26.66 dB at 10122.36 MHz

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Applicant

Motorola Mobility LLC
222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

1.2 Manufacturer

Motorola Mobility LLC
222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2335-2
FCC ID	IHDT56AJ7
IMEI Code	Conducted: 351401230012275/351401230012283 Radiation: 351401230013018/351401230013026
HW Version	DVT2
SW Version	TTP33.24
EUT Stage	Identical Prototype

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	5G NR n5 : 824 MHz ~ 849 MHz 5G NR n77: 3700 MHz ~ 3980 MHz 5G NR n78: 3700 MHz ~ 3800 MHz
Rx Frequency	5G NR n5 : 869 MHz ~ 894 MHz 5G NR n77: 3700 MHz ~ 3980 MHz 5G NR n78: 3700 MHz ~ 3800 MHz
Bandwidth	n5: 5MHz / 10MHz / 15MHz / 20MHz n77/n78: 20MHz /30MHz / 40MHz / 50MHz / 60MHz / 70MHz / 80MHz / 90MHz / 100MHz
SCS	15kHz for n5 30kHz for n77/78
Antenna Gain	**<Ant. 0>** n5: -6.1 dBi **<Ant. 1>** n5: -5.2 dBi **<Ant. 2>** n77: -5.5 dBi n78: -4.1 dBi **<Ant. 3>** n77: -4.7 dBi n78: -4.5 dBi **<Ant. 5>** n77: -2.3 dBi n78: -2.3 dBi **<Ant. 7>** n77: -4.1 dBi n78: -4.3 dBi
Type of Modulation	CP-OFDM: QPSK / 16QAM / 64QAM / 256QAM DFT-s-OFDM: PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM

Remark:

1. The maximum ERP/EIRP is calculated from max output power and max antenna gain, only the maximum ERP/EIRP are shown in the report, 5G NR n5 for Ant. 1 and n77/n78 for Ant. 5.
2. 5G NR support SA (n5/n78) mode and NSA(n5/n77/n78) mode. According to the maximum power between SA and NSA mode, SA covers NSA mode for n5， NSA covers SA mode for n78.
3. All the supported ENDC combinations are verified conducted power, only the ENDC combination with highest power are shown in the report.
4. 5G NR n77 overlaps the entire frequency range of 5G NR n78 and the maximum power of n77 > n78. Therefore, the test results provided in this report covers 5G NR n77 as well as 5G NR n78
5. The device supports HPUE mode for 5G NR n77/n78.
6. The device supports n78(1T4R) SRS resources on ant.2/3/5/7.
7. he EN-DC mode combination could be referred to the product spec.

1.5 Modification of EUT

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

1.6 Specification of Accessory

Specification of Accessory				
AC Adapter 1(US)	**Brand Name**	Motorola(AOHAI)	**Model Name**	MC-101
AC Adapter 1(EU)	**Brand Name**	Motorola(AOHAI)	**Model Name**	MC-102
AC Adapter 1(UK)	**Brand Name**	Motorola(AOHAI)	**Model Name**	MC-103
AC Adapter 1(AU)	**Brand Name**	Motorola(AOHAI)	**Model Name**	MC-105
AC Adapter 2(US)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-101
AC Adapter 2(EU)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-102
AC Adapter 2(UK)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-103
AC Adapter 2(AU)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-105
AC Adapter 3(US)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-101
AC Adapter 3(EU)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-102
AC Adapter 3(UK)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-103
AC Adapter 3(AU)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-105
AC Adapter 4(US)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-201L
AC Adapter 4(EU)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-202L
AC Adapter 4(AR)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-206L
AC Adapter 4(BR)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-207L
AC Adapter 4(CHILE)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-209L
AC Adapter 5(US)	**Brand Name**	Motorola(AOHAI)	**Model Name**	MC-201L
AC Adapter 5(EU)	**Brand Name**	Motorola(AOHAI)	**Model Name**	MC-202L
AC Adapter 5(AR)	**Brand Name**	Motorola(AOHAI)	**Model Name**	MC-206L
AC Adapter 6(BR)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-207
Battery 1	**Brand Name**	Motorola(ATL)	**Model Name**	NH50
Battery 2	**Brand Name**	Motorola(SUNWODA)	**Model Name**	NH50
Earphone 1	**Brand Name**	Motorola(New Leader)	**Model Name**	MH202
Earphone 2	**Brand Name**	Motorola(Lyand)	**Model Name**	MH202
USB Cable 1	**Brand Name**	Motorola(kawakami)	**Model Name**	S928D67706
USB Cable 2	**Brand Name**	Motorola(Beauford)	**Model Name**	S928D70140

1.7 Maximum ERP/EIRP Power and Emission Designator

5G NR n5 SA		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)	**Frequency Range (MHz)**	**Maximum ERP(W)**	**Emission Designator (99%OBW)**	**Maximum ERP(W)**	**Emission Designator (99%OBW)**
20	834.0 ~ 839.0	0.0426	19M3G7D	0.0330	19M3W7D

5G NR n77 (EN DC_41A-n77A)		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)	**Frequency Range (MHz)**	**Maximum EIRP(W)**	**Emission Designator (99%OBW)**	**Maximum EIRP(W)**	**Emission Designator (99%OBW)**
100	3750.00 ~ 3930.00	0.2877	98M7G7D	0.2218	98M1W7D

5G NR n78 SA (EN DC_41A-n78A)		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)
100	3750.00	0.2851	98M7G7D	0.2109	98M1W7D

Note:

1. 5G NR n77 overlaps the entire frequency range of 5G NR n78. Therefore, the test results provided in this report covers 5G NR n77 as well as 5G NR n78.
2. All modulations have been tested, only the worst test results of PSK & QAM are shown in the report.

1.8 Testing Location

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	TH01-KS	CN1257	314309

Sporton International Inc. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Test Firm	Sporton International Inc. (Shenzhen)		
Test Site Location	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City Guangdong Province China 518103 TEL: +86-755-33202398		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	03CH02-SZ	CN1256	421272

1.9 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH02-SZ	AUDIX	E3	6.2009-8-24a

1.10 Applicable Standards

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

- 47 CFR Part 2, 22, 27
- ANSI C63.26-2015
- FCC KDB 971168 D01 Power Meas License Digital Systems v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark:

All test items were verified and recorded according to the standards and without any deviation during the test.

2 Test Configuration of Equipment Under Test

2.1 Test Mode

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

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.

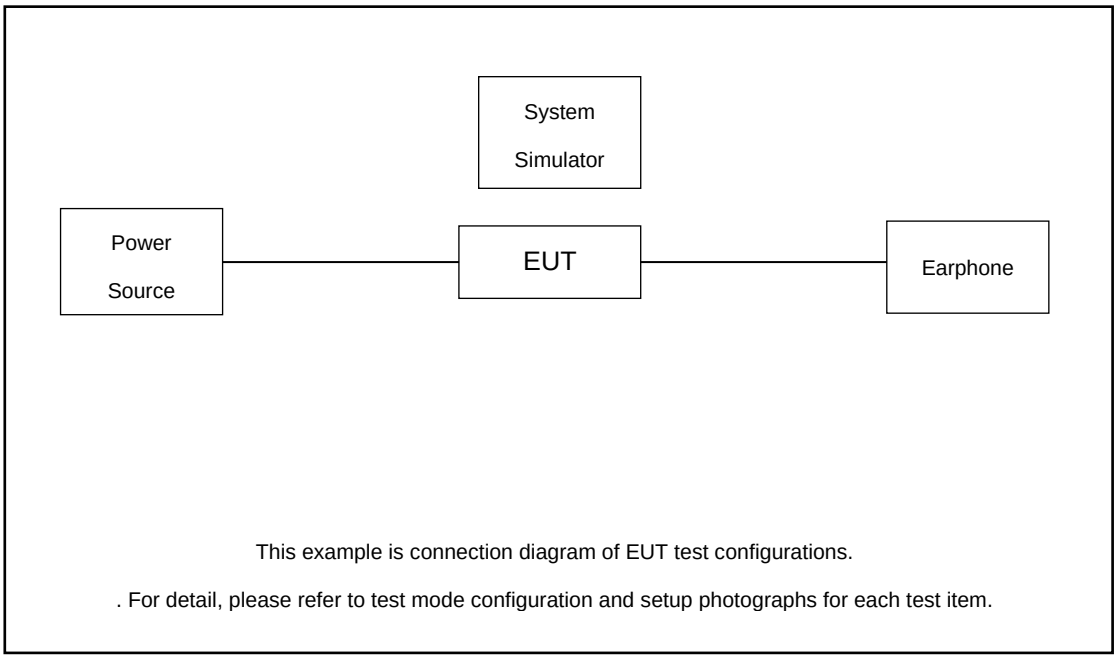
The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.

	X Plane	Y Plane	Z Plane
Orthogonal Planes of EUT			

Test Items	5G NR	Bandwidth (MHz)													Modulation					RB #		Test Channel		
		5	10	15	20	25	30	40	50	60	70	80	90	100	PI/2 BPSK	QPSK	16QAM	64QAM	256QAM	1	Full	L	M	H
Max. Output Power	n5	v	v	v	v	-	-	-	-	-	-	-	-	-	v	v	v	v	v	v	v	v	v	v
	n77	-	-	-	v	-	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	n78	-	-	-	v	-	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
Peak-to-Average Ratio	n5				v	-	-	-	-	-	-	-	-	-	v	v					v		v	
	n77	-	-	-	v	-									v	v					v		v	
26dB and 99% Bandwidth	n5	v	v	v	v	-	-	-	-	-	-	-	-	-	v	v	v	v	v		v		v	
	n77	-	-	-	v	-	v	v	v	v	v	v	v	v	v	v	v	v	v		v		v	
Conducted Band Edge	n5	v	v	v	v	-	-	-	-	-	-	-	-	-	v	v				v	v	v		v
	n77	-	-	-	v	-				v				v	v	v				v	v	v		v
Conducted Spurious Emission	n5	v	v	v	v	-	-	-	-	-	-	-	-	-	v	v				v		v	v	v
	n77	-	-	-	v	-				v				v	v	v				v		v	v	v
Frequency Stability	n5				v	-	-	-	-	-	-	-	-	-		v				v			v	
	n77	-	-	-	v	-										v				v			v	
E.R.P / E.I.R.P	n5	v	v	v	v	-	-	-	-	-	-	-	-	-	v	v	v	v	v	v	v	v	v	v
	n77	-	-	-	v	-	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	n78	-	-	-	v	-	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v

Radiated Spurious Emission	n5	Worst Case		v	
	n77	Worst Case		v	
	n78	Worst Case		v	
Note	1. The mark "**v** " means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported. 4. Frequency Stability：Normal Voltage = 3.87V ；Low Voltage =3.60V.；High Voltage =4.45V				

2.2 Connection Diagram of Test System



The EUT has been configuration operated in a manner tended to maximize its emission characteristics in a typical application.

2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	DC Power Supply	GW	GPS-3030D	N/A	N/A	Unshielded, 1.8 m
2.	LTE Base Station	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m
3.	NR Base Station	Anritsu	MT8000A	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss 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.

Offset = RF cable loss.

Following shows an offset computation example with cable loss 4.8 dB.

Example :

Offset(dB) = RF cable loss(dB).

= 4.8 (dB)

2.5 Frequency List of Low/Middle/High Channels

5G NR n5 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
20	Channel	166800	167300	167800
	Frequency	834	836.5	839
15	Channel	166300	167300	168300
	Frequency	831.5	836.5	841.5
10	Channel	165800	167300	168800
	Frequency	829	836.5	844
5	Channel	165300	167300	169300
	Frequency	826.5	836.5	846.5

5G n77 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
100	Channel	650000	656000	662000
	Frequency	3750	3840	3930
90	Channel	649668	656000	662332
	Frequency	3745.02	3840	3934.98
80	Channel	649334	656000	662666
	Frequency	3740.01	3840	3939.99
70	Channel	649000	656000	663000
	Frequency	3735	3840	3945
60	Channel	648668	656000	663332
	Frequency	3730.02	3840	3949.98
50	Channel	648334	656000	663666
	Frequency	3725.01	3840	3954.99
40	Channel	648000	656000	664000
	Frequency	3720	3840	3960
30	Channel	647668	656000	664332
	Frequency	3715.02	3840	3964.98
20	Channel	647334	656000	664666
	Frequency	3710.01	3840	3969.99

5G n78 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
100	Channel		650000	
	Frequency		3750	
90	Channel	649668	650000	650332
	Frequency	3745.02	3750	3754.98
80	Channel	649334	650000	650666
	Frequency	3740.01	3750	3759.99
70	Channel	649000	650000	651000
	Frequency	3735	3750	3765
60	Channel	648668	650000	651332
	Frequency	3730.02	3750	3769.98
50	Channel	648334	650000	651666
	Frequency	3725.01	3750	3774.99
40	Channel	648000	650000	652000
	Frequency	3720	3750	3780
30	Channel	647668	650000	652332
	Frequency	3715.02	3750	3784.98
20	Channel	647334	650000	652666
	Frequency	3710.01	3750	3789.99

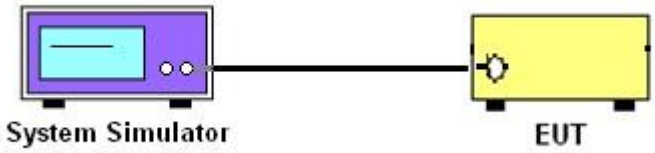
3 Conducted Test Items

3.1 Measuring Instruments

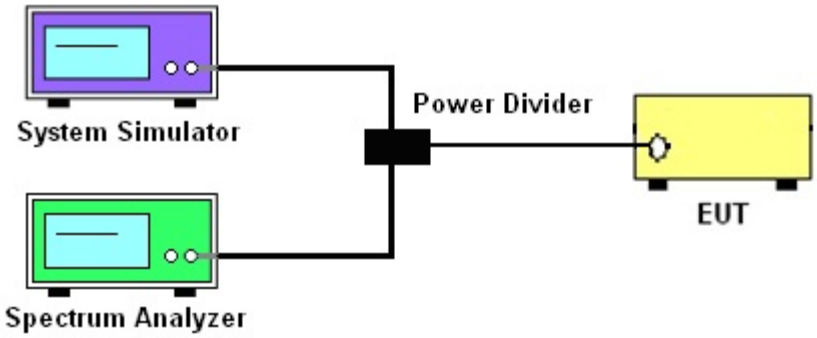
See list of measuring instruments of this test report.

3.2 Test Setup

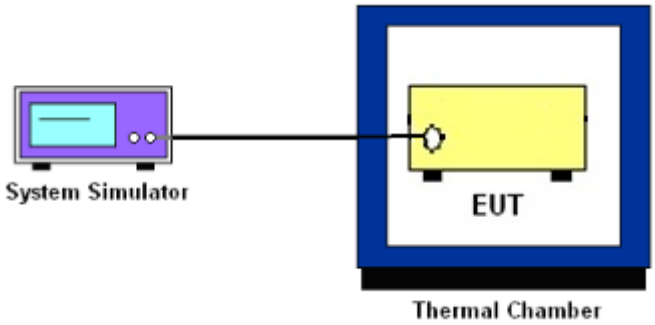
3.2.1 Conducted Output Power



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



3.2.3 Frequency Stability



3.3 Test Result of Conducted Test

Please refer to Appendix A.

3.4 Conducted Output Power and ERP/EIRP

3.4.1 Description of the Conducted Output Power Measurement and ERP/EIRP 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.

The ERP of mobile transmitters must not exceed 7 Watts for 5G NR n5.

The EIRP of mobile transmitters must not exceed 1 Watts for 5G NR n77, n78.

According to KDB 412172 D01 Power Approach,

EIRP = $P_T + G_T – L_C$, ERP = EIRP -2.15, 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

3.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2
2. The transmitter output port was connected to the system simulator.
3. Set EUT at maximum power through the system simulator.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure and record the power level from the system simulator.

3.5 Peak-to-Average Ratio

3.5.1 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.

3.5.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2.3.4 (CCDF).
2. The EUT was connected to spectrum and system simulator via a power divider.
3. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
4. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
5. Record the deviation as Peak to Average Ratio.

1. The testing follows ANSI C63.26 Section 5.2.6 (PAPR).
2. The EUT was connected to spectrum and system simulator via a power divider.
3. Set EUT in maximum power output.
4. Set the RBW = 1MHz, VBW = 3MHz, Detector = Peak, Trace mode = max hold, Set span ≥ 2 × OBW in spectrum analyzer.
5. Set the RBW = 1MHz, VBW = 3MHz, Detector = power averaging, Trace mode = max hold, Set span ≥ 2 × OBW in spectrum analyzer.
6. Add [10 log (1/duty cycle)] to the measured maximum power level to compute the average power during continuous transmission.
7. **PAPR (dB) = P_{Pk} (dBm) − P_{Avg} (dBm)**

   where

   PAPR peak-to-average power ratio, in dB

   P_{Pk} measured peak power level, in dBm

   P_{Avg} measured average power level, in dBm
8. Record the deviation as Peak to Average Ratio.

3.6 Occupied Bandwidth

3.6.1 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.

3.6.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.4
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. 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.
4. 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.
5. Set the detection mode to peak, and the trace mode to max hold.
6. 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)
7. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
8. 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.
9. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

3.7 Conducted Band Edge

3.7.1 Description of Conducted Band Edge Measurement

22.917(a)

For operations in the 824 – 849 MHz band, the FCC limit is 43 + $10\log_{10}$(P[Watts]) dB below the transmitter power P(Watts) in a 100kHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

27.53(l)(2)

For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz. Compliance with this paragraph is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz.

3.7.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured.
4. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
5. Beyond the 1 MHz band from the band edge, RBW=1MHz was used or a narrower RBW was used (generally limited to no less than 1% of the OBW) and the measured power was integrated over the full required measurement bandwidth.
6. Set spectrum analyzer with RMS detector.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. Checked that all the results comply with the emission limit line.
   Example:
   The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB) = -13dBm.
9. When using the integration method, the starting frequency of the integration shall be centered at one-half of the RBW away from the band edge.

3.8 Conducted Spurious Emission

3.8.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10^{th} harmonic.

3.8.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. 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.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
7. Set spectrum analyzer with RMS detector.
8. Taking the record of maximum spurious emission.
9. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
10. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.

3.9 Frequency Stability

3.9.1 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.

3.9.2 Test Procedures for Temperature Variation

1. The testing follows ANSI C63.26 section 5.6.4
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. 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.
4. 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.

3.9.3 Test Procedures for Voltage Variation

1. The testing follows ANSI C63.26 section 5.6.5
2. The EUT was placed in a temperature chamber at 20±5°C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value for other than hand carried battery equipment.
4. For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.
5. The variation in frequency was measured for the worst case.

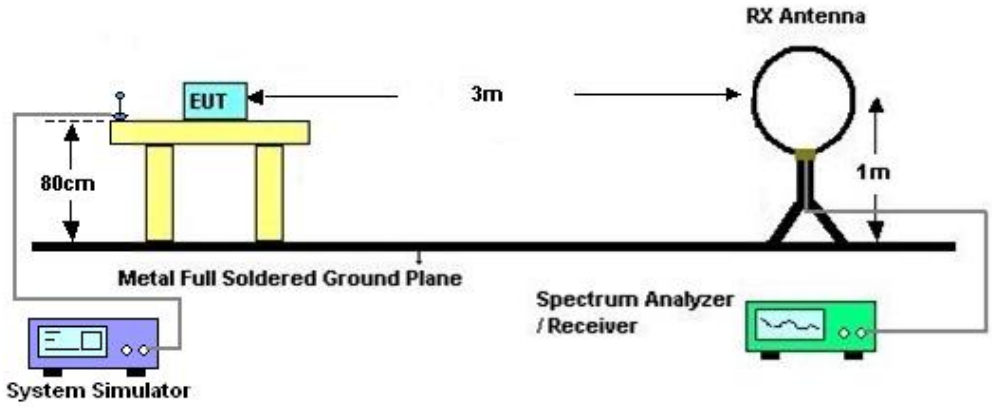
4 Radiated Test Items

4.1 Measuring Instruments

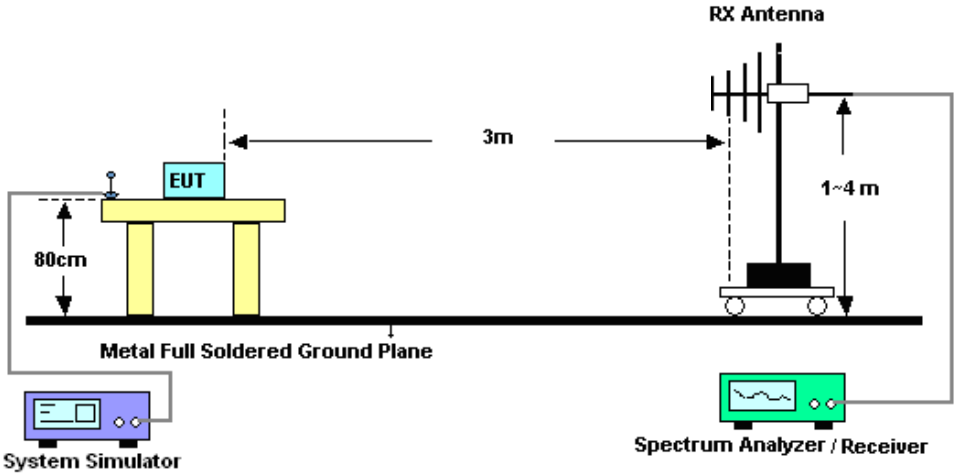
See list of measuring instruments of this test report.

4.2 Test Setup

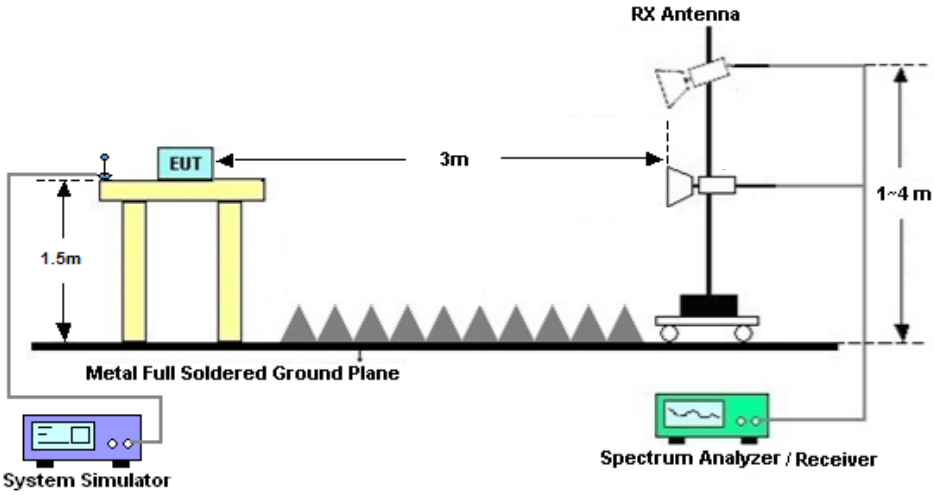
4.2.1 For radiated test below 30MHz



4.2.2 For radiated test from 30MHz to 1GHz



4.2.3 For radiated test above 1GHz



4.3 Test Result of Radiated Test

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

Please refer to Appendix B.

4.4 Radiated Spurious Emission

4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI C63.26. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

4.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
2. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
6. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
7. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
8. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
9. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
10. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
11. ERP (dBm) = EIRP - 2.15
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
    The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 12, 2022	Oct. 24, 2022~ Oct. 28, 2022	Oct. 11, 2023	Conducted (TH01-KS)
Power divider	STI	STI08-0055	-	0.5~40GHz	Aug. 25, 2022	Oct. 24, 2022~ Oct. 28, 2022	Aug. 24, 2023	Conducted (TH01-KS)
Temperature &humidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 15, 2022	Oct. 24, 2022~ Oct. 28, 2022	Jul. 14, 2023	Conducted (TH01-KS)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Jul. 07, 2022	Oct. 29, 2022	Jul. 06, 2023	Radiation (03CH02-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	Jul. 28, 2022	Oct. 29, 2022	Jul. 27, 2024	Radiation (03CH02-SZ)
Bilog Antenna	TeseQ	CBL6112D	35407	30MHz-2GHz	Oct. 21, 2022	Oct. 29, 2022	Oct. 20, 2023	Radiation (03CH02-SZ)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00119436	1GHz~18GHz	Jul. 07, 2022	Oct. 29, 2022	Jul. 06, 2023	Radiation (03CH02-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 07, 2022	Oct. 29, 2022	Jul. 06, 2023	Radiation (03CH02-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz-40GHz	Apr. 10, 2022	Oct. 29, 2022	Apr. 09, 2023	Radiation (03CH02-SZ)
LF Amplifier	Burgeon	BPA-530	102211	0.01~3000Mhz	Oct. 21, 2022	Oct. 29, 2022	Oct. 20, 2023	Radiation (03CH02-SZ)
HF Amplifier	KEYSIGHT	83017A	MY53270105	0.5GHz~26.5Ghz	Oct. 21, 2022	Oct. 29, 2022	Oct. 20, 2023	Radiation (03CH02-SZ)
AC Power Source	Chroma	61601	616010002470	N/A	NCR	Oct. 29, 2022	NCR	Radiation (03CH02-SZ)
Turn Table	Chaintek	T-200	N/A	0~360 degree	NCR	Oct. 29, 2022	NCR	Radiation (03CH02-SZ)
Antenna Mast	Chaintek	MBS-400	N/A	1 m~4 m	NCR	Oct. 29, 2022	NCR	Radiation (03CH02-SZ)

NCR: No Calibration Required

6 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Power	±0.46 dB
Conducted Emissions	±0.48 dB
Occupied Channel Bandwidth	±0.1 %

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.47dB

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.31dB

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.72dB

---------- THE END ----------

Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power and ERP/EIRP)

5G NR n5

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Gain	ERP	ERP	ERP
Channel				166800	167300	167800		L	M	H
Frequency (MHz)				834	836.5	839				
20	PI/2 BPSK	1	1	23.35	23.47	23.33	-5.2	0.0398	0.0409	0.0396
20	QPSK	1	1	23.48	23.64	23.41	-5.2	0.0410	0.0426	0.0404
20	QPSK	1	53	23.34	23.42	23.46	-5.2	0.0397	0.0405	0.0408
20	QPSK	1	104	23.26	23.30	23.25	-5.2	0.0390	0.0394	0.0389
20	QPSK	100	0	22.37	22.42	22.45	-5.2	0.0318	0.0321	0.0324
20	16QAM	1	1	22.44	22.53	22.51	-5.2	0.0323	0.0330	0.0328
20	64QAM	1	1	20.61	20.75	20.65	-5.2	0.0212	0.0219	0.0214
20	256QAM	1	1	18.77	18.96	18.82	-5.2	0.0139	0.0145	0.0140
Channel				166300	167300	168300	Gain	ERP	ERP	ERP
Frequency (MHz)				831.5	836.5	841.5				
15	QPSK	1	1	23.51	23.47	23.41	-5.2	0.0413	0.0409	0.0404
15	16QAM	1	1	22.56	22.50	22.39	-5.2	0.0332	0.0327	0.0319
Channel				165800	167300	168800	Gain	ERP	ERP	ERP
Frequency (MHz)				829	836.5	844				
10	QPSK	1	1	23.54	23.48	23.44	-5.2	0.0416	0.0410	0.0406
10	16QAM	1	1	22.61	22.52	22.34	-5.2	0.0336	0.0329	0.0316
Channel				165300	167300	169300	Gain	ERP	ERP	ERP
Frequency (MHz)				826.5	836.5	846.5				
5	QPSK	1	1	23.59	23.54	23.43	-5.2	0.0421	0.0416	0.0406
5	16QAM	1	1	22.68	22.55	22.46	-5.2	0.0341	0.0331	0.0324

5G NR n77 (EN DC_41A-n77A)

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Gain	EIRP	EIRP	EIRP
Channel				650000	656000	662000		L	M	H
Frequency (MHz)				3750	3840	3930				
100	PI/2 BPSK	1	1	26.69	26.58	26.40	-2.3	0.2748	0.2679	0.2570
100	QPSK	1	1	26.89	26.88	26.36	-2.3	0.2877	0.2871	0.2547
100	QPSK	1	137	26.63	26.51	26.55	-2.3	0.2710	0.2636	0.2661
100	QPSK	1	271	26.67	26.58	26.73	-2.3	0.2735	0.2679	0.2773
100	QPSK	270	0	25.63	25.42	25.53	-2.3	0.2153	0.2051	0.2104
100	16QAM	1	1	25.75	25.74	25.58	-2.3	0.2213	0.2208	0.2128
100	64QAM	1	1	24.11	24.06	25.76	-2.3	0.1517	0.1500	0.2218
100	256QAM	1	1	22.06	22.11	21.84	-2.3	0.0946	0.0957	0.0899
Channel				649668	656000	662332	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3745.02	3840	3934.98				
90	PI/2 BPSK	1	1	26.62	26.58	26.39	-2.3	0.2704	0.2679	0.2564
Channel				649334	656000	662666	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3740.01	3840	3939.99				
80	PI/2 BPSK	1	1	26.73	26.57	26.32	-2.3	0.2773	0.2673	0.2523
Channel				649000	656000	663000	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3735	3840	3945				
70	PI/2 BPSK	1	1	26.84	26.64	26.58	-2.3	0.2844	0.2716	0.2679
Channel				648668	656000	663332	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3730.02	3840	3949.98				
60	PI/2 BPSK	1	1	26.82	26.76	26.54	-2.3	0.2831	0.2793	0.2655
Channel				648334	656000	663666	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3725.01	3840	3954.99				
50	PI/2 BPSK	1	1	26.85	26.82	26.49	-2.3	0.2851	0.2831	0.2624
Channel				648000	656000	664000	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3720	3840	3960				
40	PI/2 BPSK	1	1	26.81	26.84	26.67	-2.3	0.2825	0.2844	0.2735
Channel				647668	656000	664332	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3715.02	3840	3964.98				
30	PI/2 BPSK	1	1	26.83	26.74	26.61	-2.3	0.2838	0.2780	0.2698
Channel				647334	656000	664666	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3710.01	3840	3969.99				
20	PI/2 BPSK	1	1	26.85	26.86	26.74	-2.3	0.2851	0.2858	0.2780

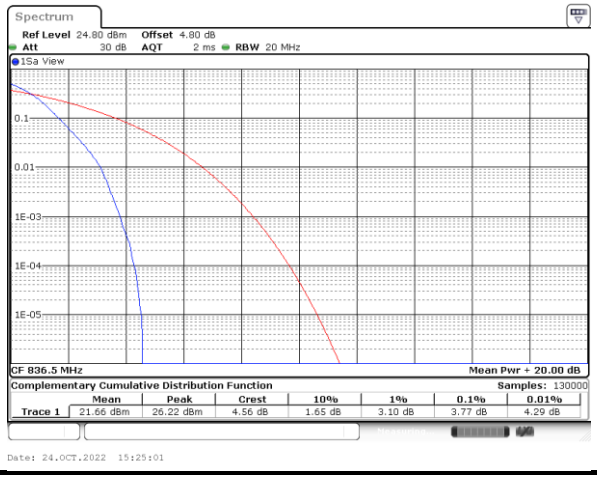
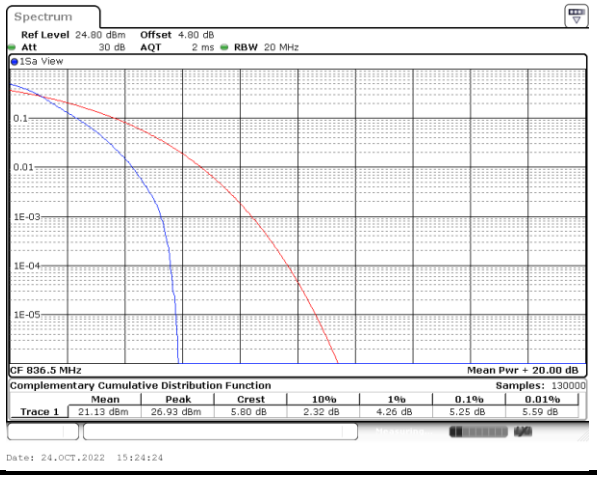
5G NR n78 (EN DC_41A-n78A)

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Gain	EIRP	EIRP	EIRP
Channel				650000	650000	650000		L	M	H
Frequency (MHz)				3750	3750	3750				
100	PI/2 BPSK	1	1		26.39		-2.3		0.2564	
100	QPSK	1	1		26.85		-2.3		0.2851	
100	QPSK	1	137		26.19		-2.3		0.2449	
100	QPSK	1	271		26.25		-2.3		0.2483	
100	QPSK	270	0		25.21		-2.3		0.1954	
100	16QAM	1	1		25.54		-2.3		0.2109	
100	64QAM	1	1		23.83		-2.3		0.1422	
100	256QAM	1	1		21.81		-2.3		0.0893	
Channel				649668	650000	650334	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3745.02	3750	3755.01				
90	PI/2 BPSK	1	1	26.52	26.44	26.35	-2.3	0.2642	0.2594	0.2541
Channel				649334	650000	650668	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3740.01	3750	3760.02				
80	PI/2 BPSK	1	1	26.69	26.42	26.30	-2.3	0.2748	0.2582	0.2512
Channel				649000	650000	651000	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3735	3750	3765				
70	PI/2 BPSK	1	1	26.77	26.59	26.55	-2.3	0.2799	0.2685	0.2661
Channel				648668	650000	651334	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3730.02	3750	3770.01				
60	PI/2 BPSK	1	1	26.73	26.68	26.43	-2.3	0.2773	0.2742	0.2588
Channel				648334	650000	651668	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3725.01	3750	3775.02				
50	PI/2 BPSK	1	1	26.63	26.75	26.44	-2.3	0.2710	0.2786	0.2594
Channel				648000	650000	652000	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3720	3750	3780				
40	PI/2 BPSK	1	1	26.83	26.74	26.62	-2.3	0.2838	0.2780	0.2704
Channel				647668	650000	652334	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3715.02	3750	3785.01				
30	PI/2 BPSK	1	1	26.84	26.72	26.54	-2.3	0.2844	0.2767	0.2655
Channel				647334	650000	652668	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3710.01	3750	3790.02				
20	PI/2 BPSK	1	1	26.81	26.75	26.66	-2.3	0.2825	0.2786	0.2729

FR1 n5

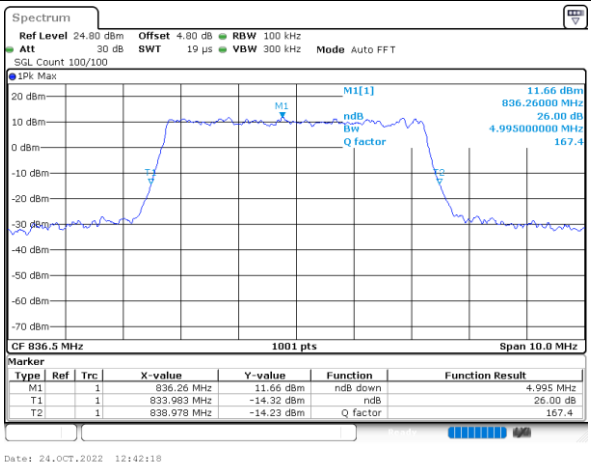
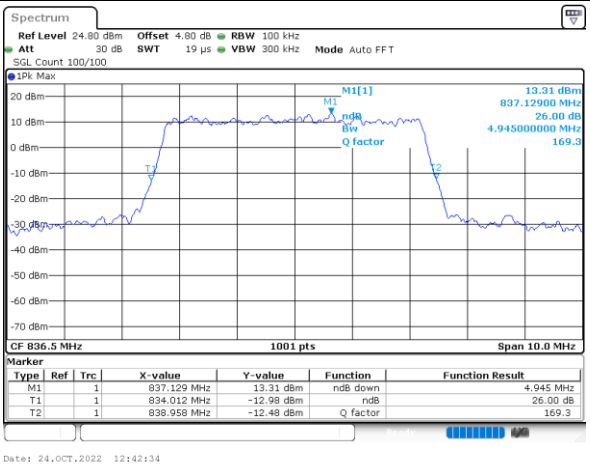
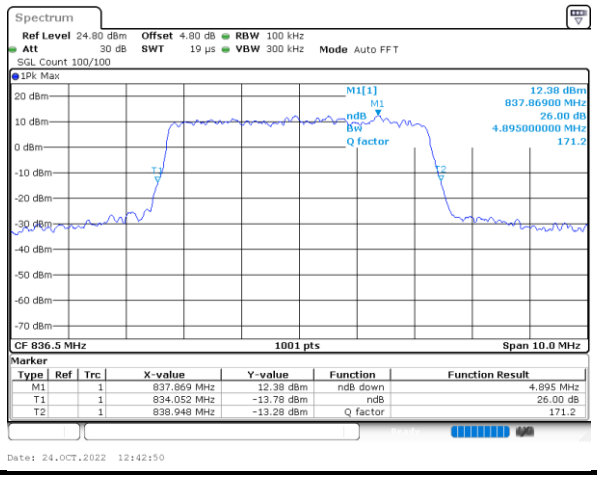
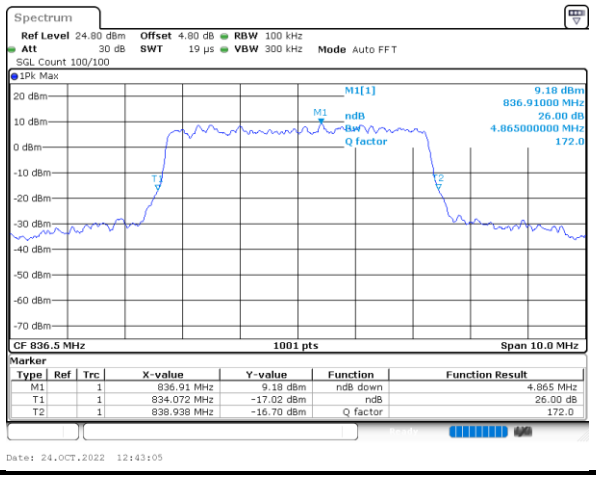
Peak-to-Average Ratio

Mode	FR1 n5 / 20MHz / DFT-S OFDM				
Mod.	PI/2 BPSK	QPSK			Limit: 13dB
RB Size	Full RB	Full RB			Result
Middle CH	3.77	5.25			PASS

FR1 n5 / 20MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	QPSK
	

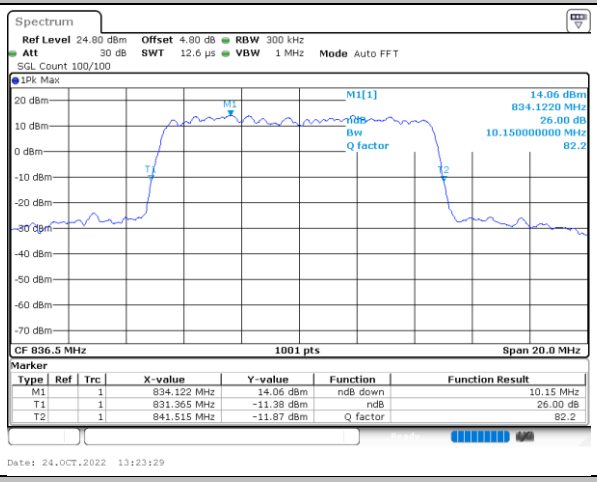
26dB Bandwidth

Mode	FR1 n5 : 26dBW (MHz) / CP OFDM			
BW	5M			
Mod.	QPSK	16QAM	64QAM	256QAM
Middle CH	5.0	4.95	4.90	4.87
BW	10M			
Mod.	QPSK	16QAM	64QAM	256QAM
Middle CH	10.15	10.05	10.21	10.07
BW	15M			
Mod.	QPSK	16QAM	64QAM	256QAM
Middle CH	14.93	14.87	14.96	14.87
BW	20M			
Mod.	QPSK	16QAM	64QAM	256QAM
Middle CH	21.26	21.22	21.38	21.22

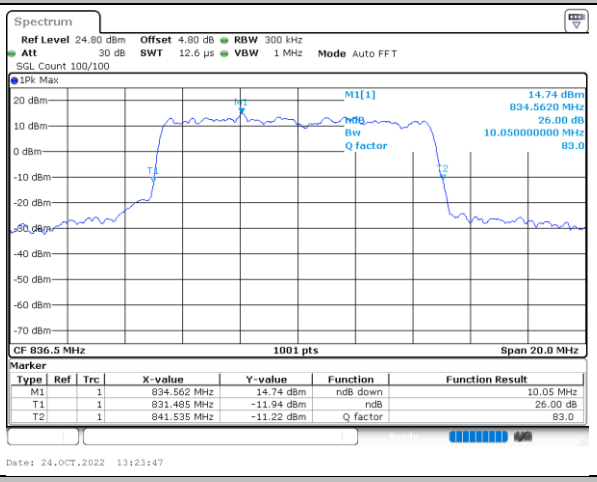
FR1 n5 / 5MHz / CP / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

FR1 n5 / 10MHz / CP / Middle Channel / Full RB

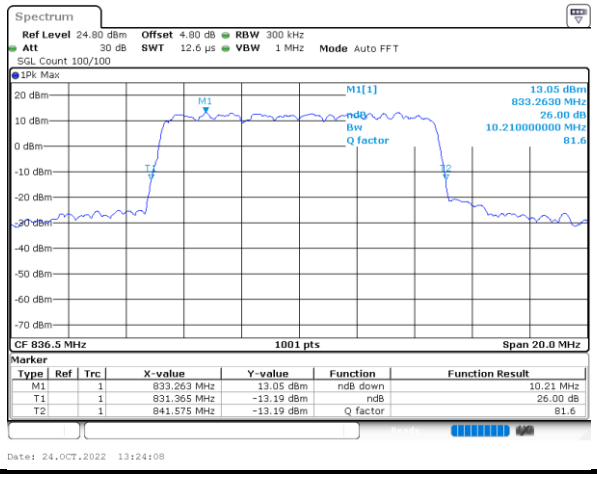
QPSK



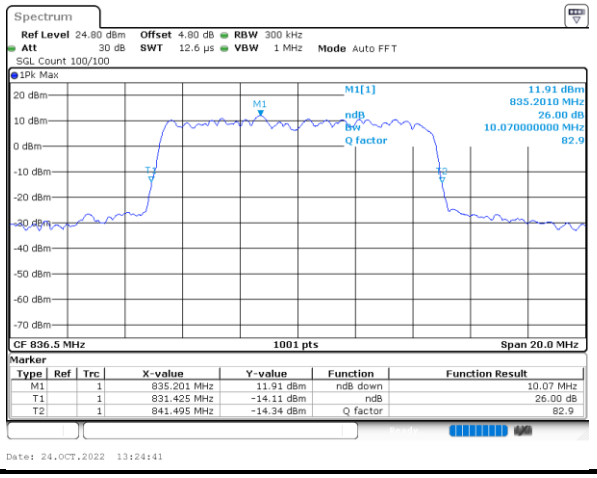
16QAM



64QAM

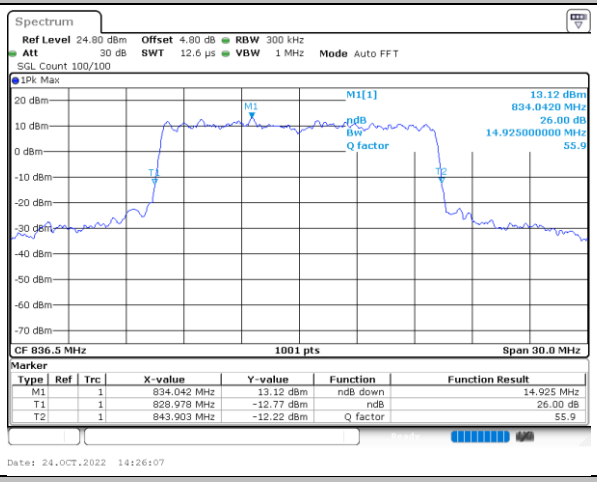


256QAM

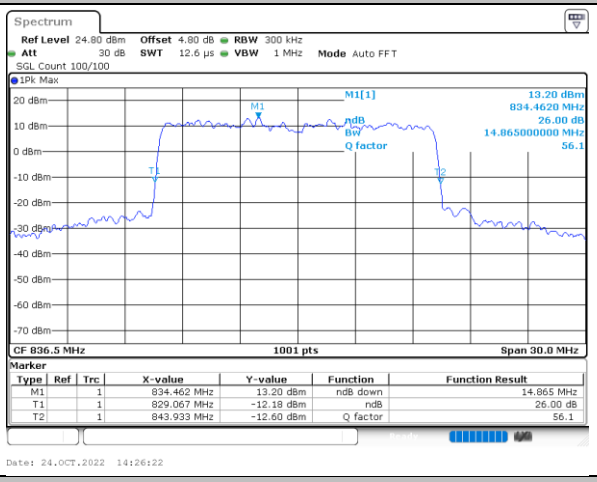


FR1 n2 / 15MHz / CP / Middle Channel / Full RB

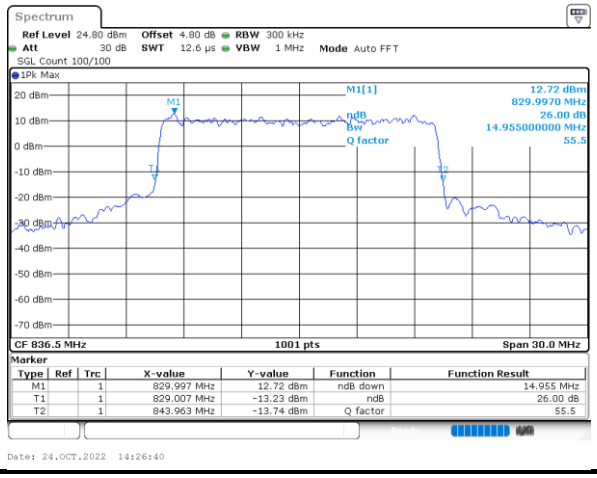
QPSK



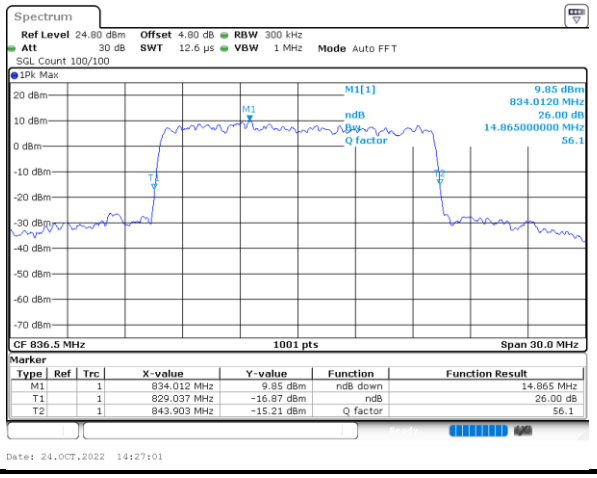
16QAM



64QAM

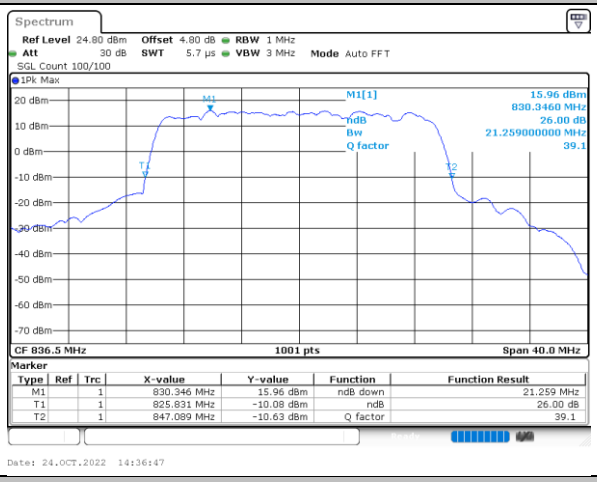


256QAM

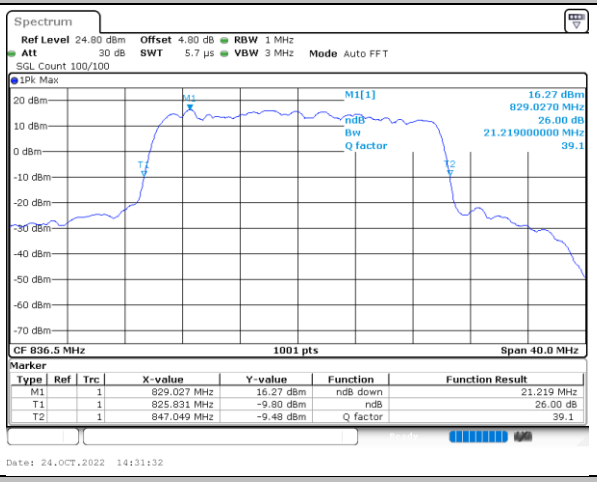


FR1 n2 / 20MHz / CP / Middle Channel / Full RB

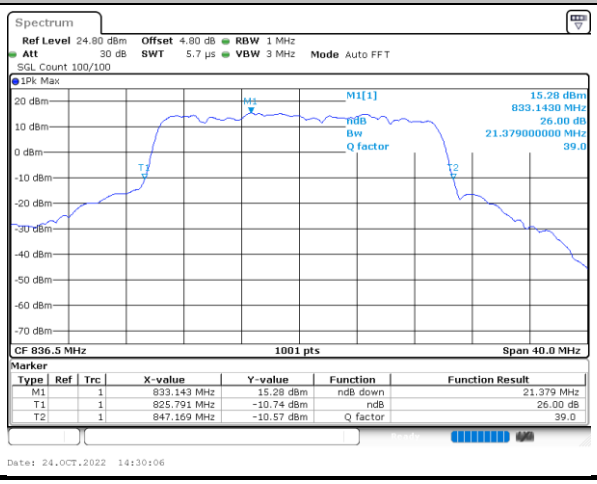
QPSK



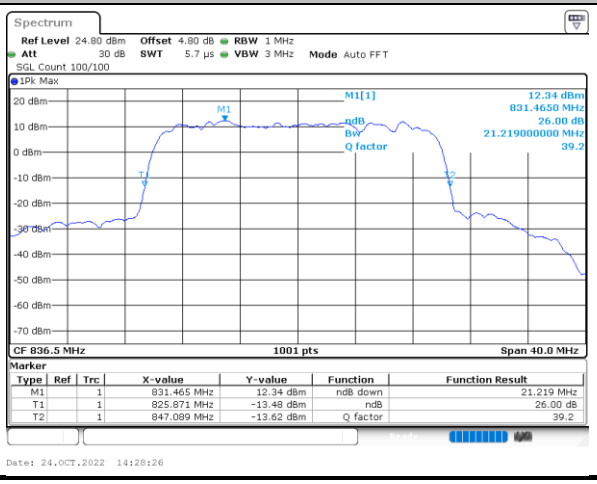
16QAM



64QAM



256QAM

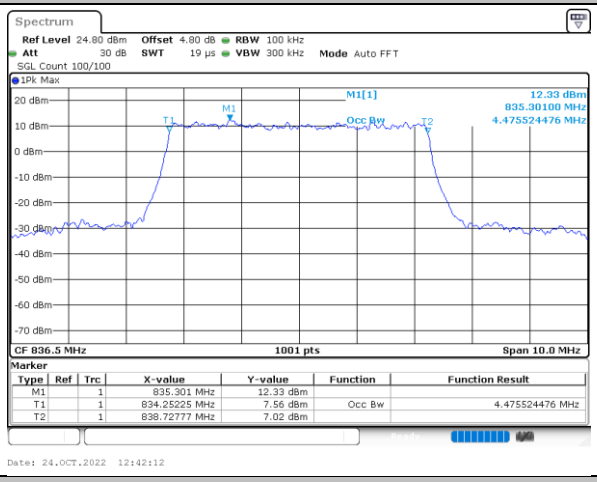


Occupied Bandwidth

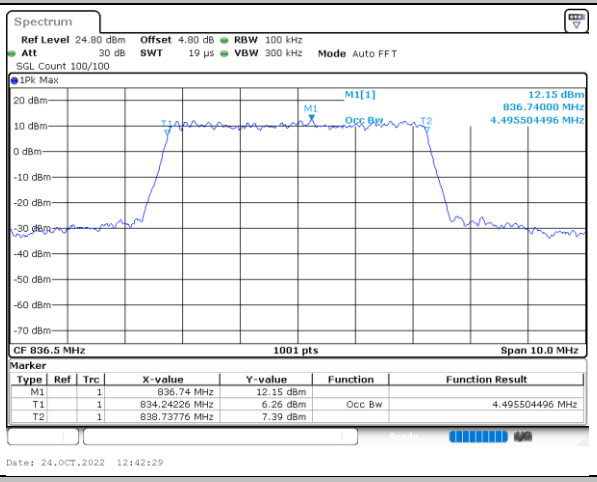
Mode	FR1 n2 : 99%OBW (MHz) / CP OFDM			
BW	5M			
Mod.	QPSK	16QAM	64QAM	256QAM
Middle CH	4.48	4.50	4.48	4.52
BW	10M			
Mod.	QPSK	16QAM	64QAM	256QAM
Middle CH	9.35	9.35	9.33	9.39
BW	15M			
Mod.	QPSK	16QAM	64QAM	256QAM
Middle CH	14.09	14.15	14.12	14.09
BW	20M			
Mod.	QPSK	16QAM	64QAM	256QAM
Middle CH	19.26	19.18	19.30	19.14

FR1 n2 / 5MHz / CP / Middle Channel / Full RB

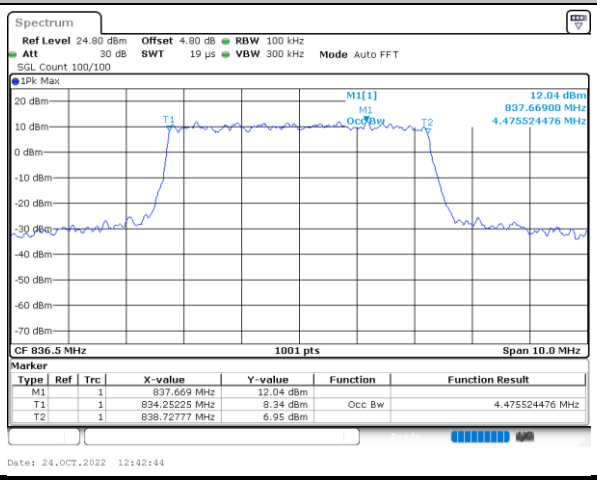
QPSK



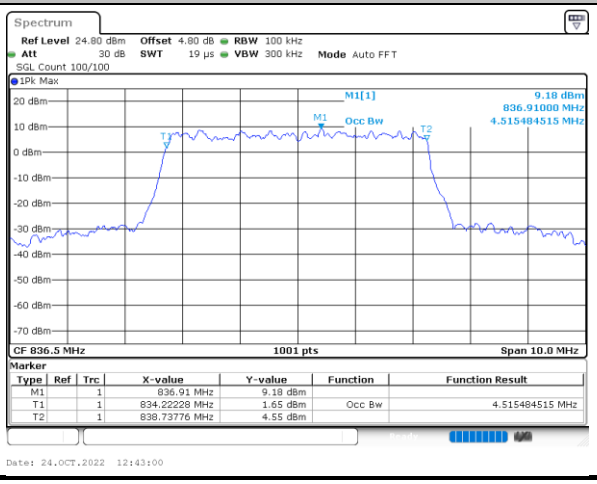
16QAM

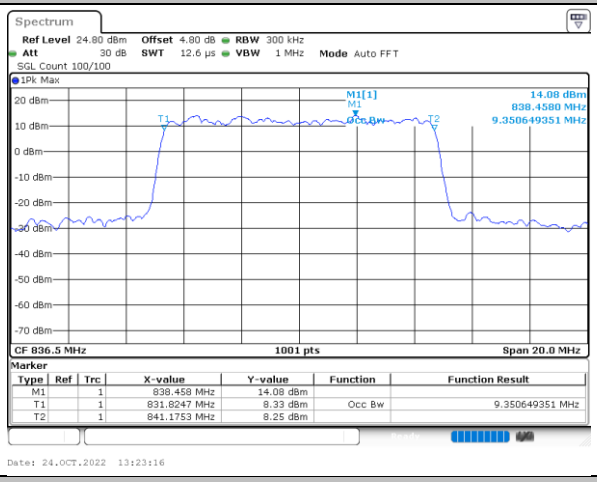
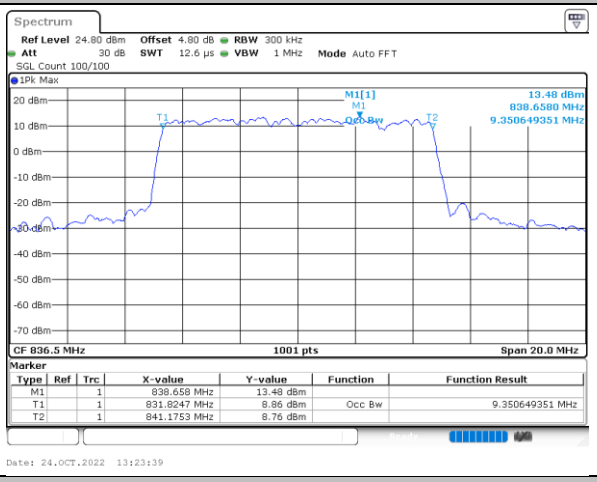
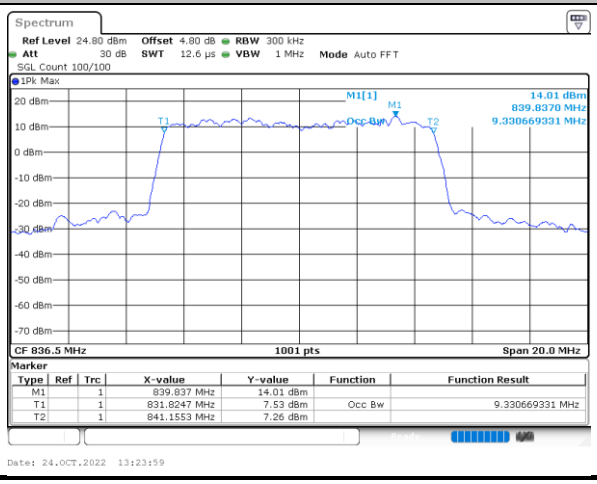
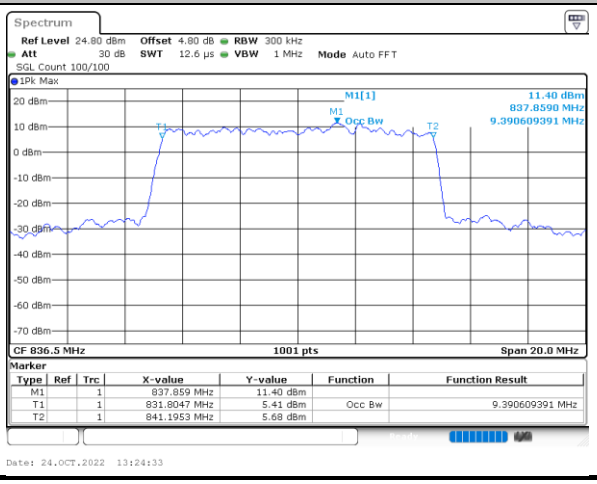


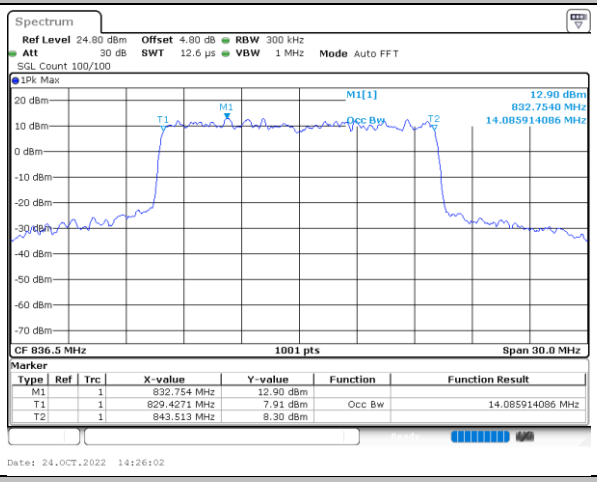
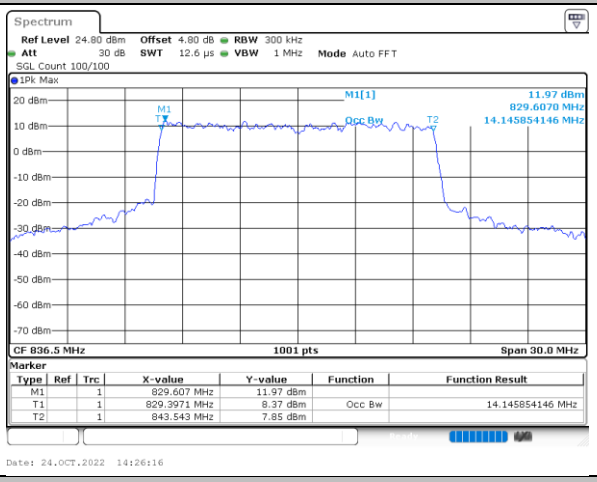
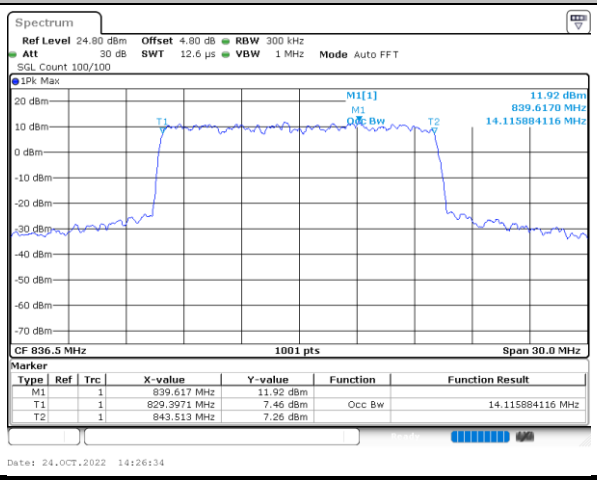
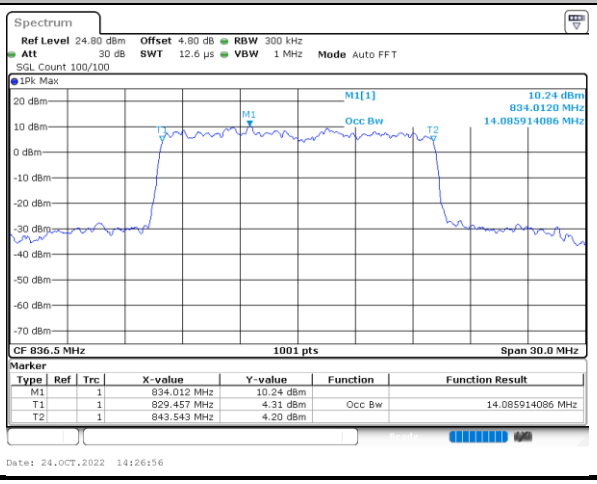
64QAM

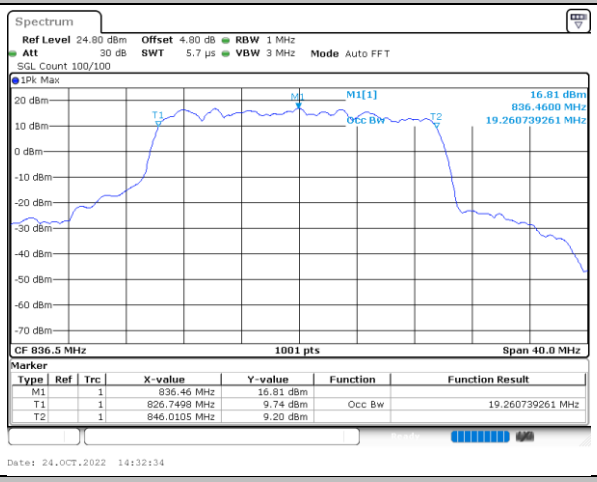
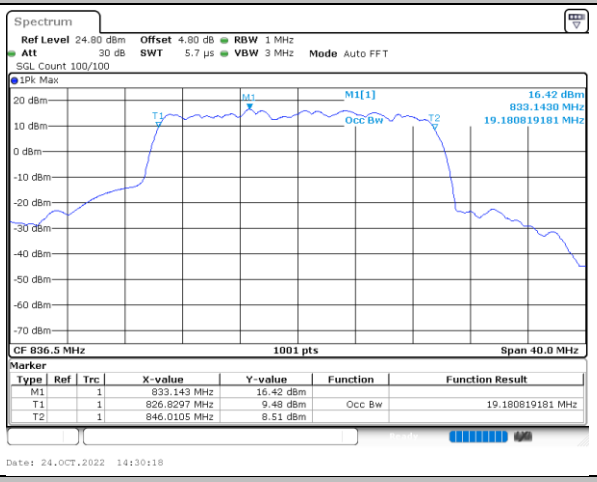
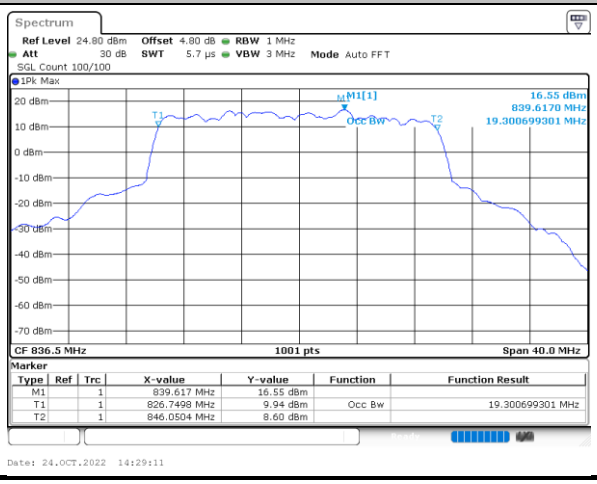
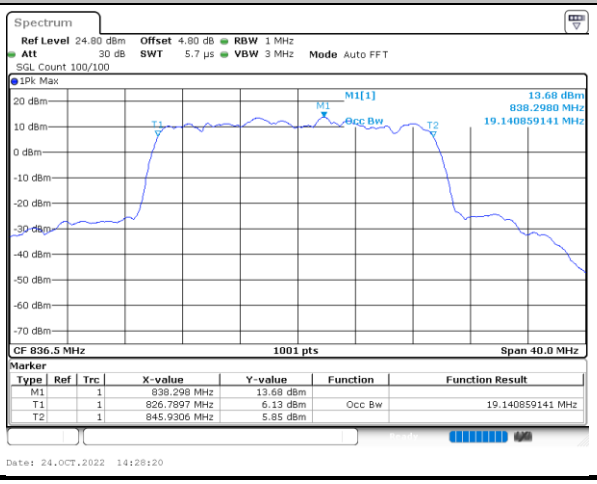


256QAM



FR1 n2 / 10MHz / CP / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

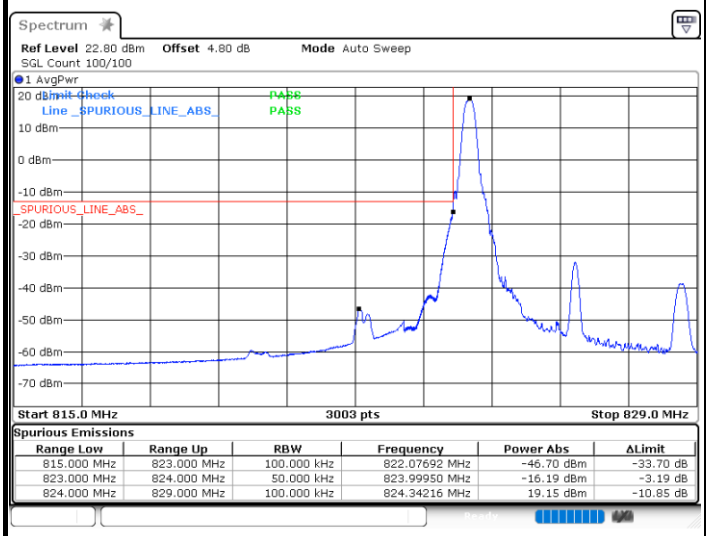
FR1 n2 / 15MHz / CP / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

FR1 n2 / 20MHz / CP / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

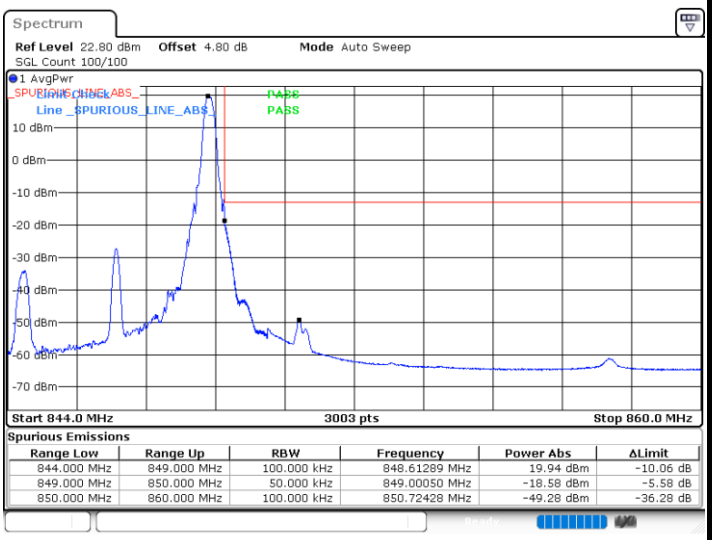
Conducted Band Edge

FR1 n2 / 5MHz / DFT-S OFDM / PI/2 BPSK

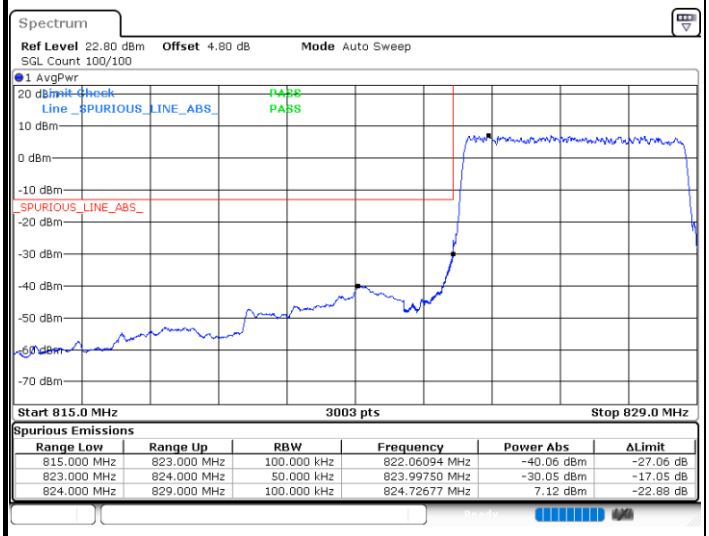
Lowest Band Edge / 1RB0



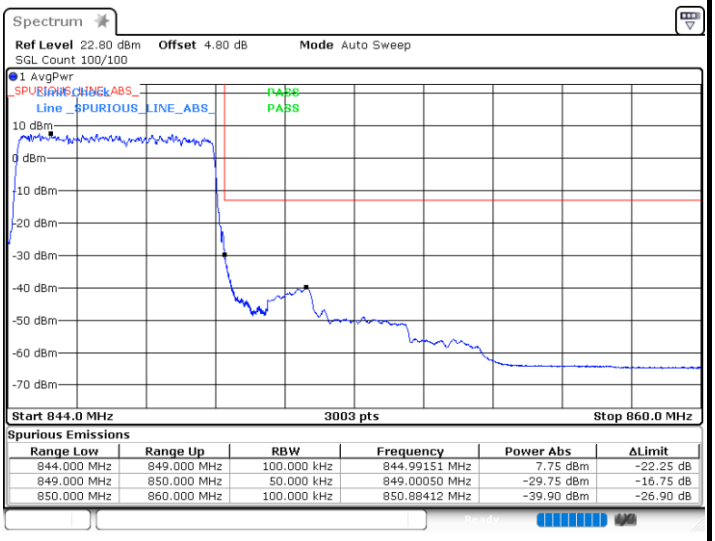
Highest Band Edge / 1RBmax



Lowest Band Edge / Full RB

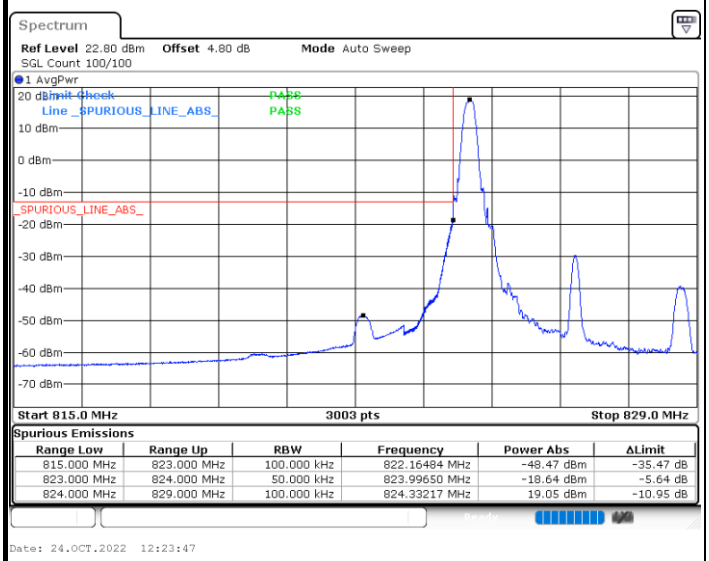


Highest Band Edge / Full RB



FR1 n2 / 5MHz / DFT-S OFDM / QPSK

Lowest Band Edge / 1RB0

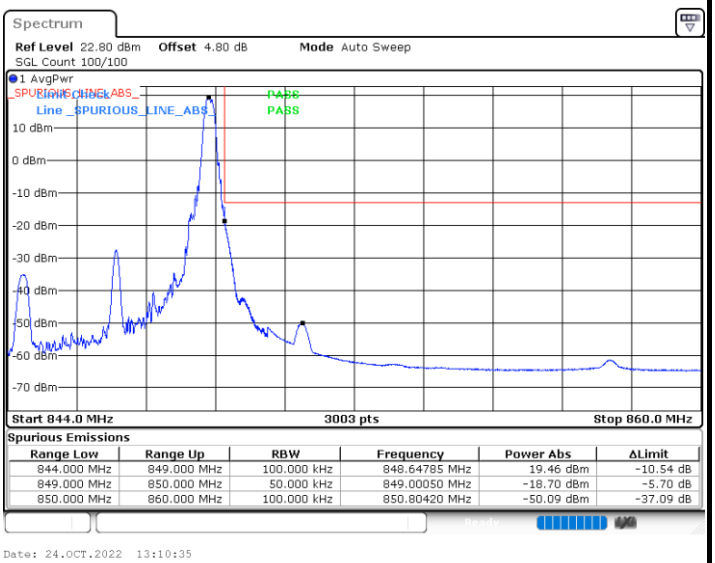


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.16484 MHz	-48.47 dBm	-35.47 dB
823.000 MHz	824.000 MHz	50.000 kHz	823.99650 MHz	-18.64 dBm	-5.64 dB
824.000 MHz	829.000 MHz	100.000 kHz	824.33217 MHz	19.05 dBm	-10.95 dB

Date: 24.OCT.2022 12:23:47

Highest Band Edge / 1RBmax

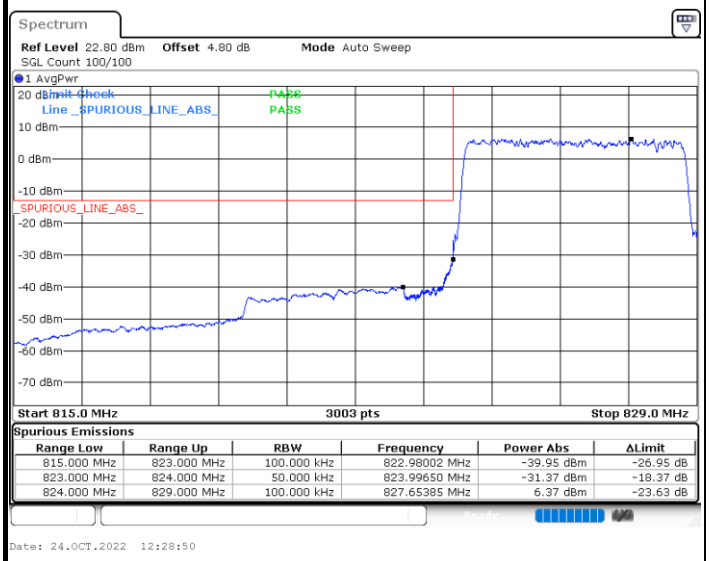


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
844.000 MHz	849.000 MHz	100.000 kHz	848.64785 MHz	19.46 dBm	-10.54 dB
849.000 MHz	850.000 MHz	50.000 kHz	849.00050 MHz	-18.70 dBm	-5.70 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.80420 MHz	-50.09 dBm	-37.09 dB

Date: 24.OCT.2022 13:10:35

Lowest Band Edge / Full RB

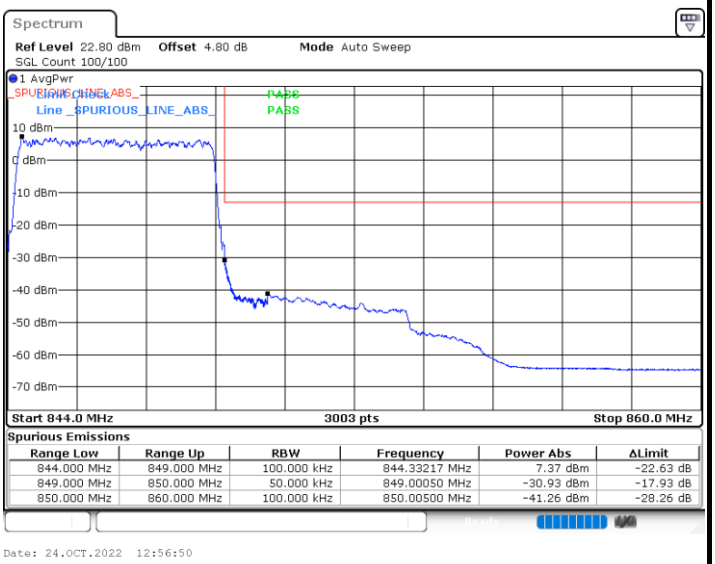


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.98002 MHz	-39.95 dBm	-26.95 dB
823.000 MHz	824.000 MHz	50.000 kHz	823.99650 MHz	-31.37 dBm	-18.37 dB
824.000 MHz	829.000 MHz	100.000 kHz	827.65385 MHz	6.37 dBm	-23.63 dB

Date: 24.OCT.2022 12:28:50

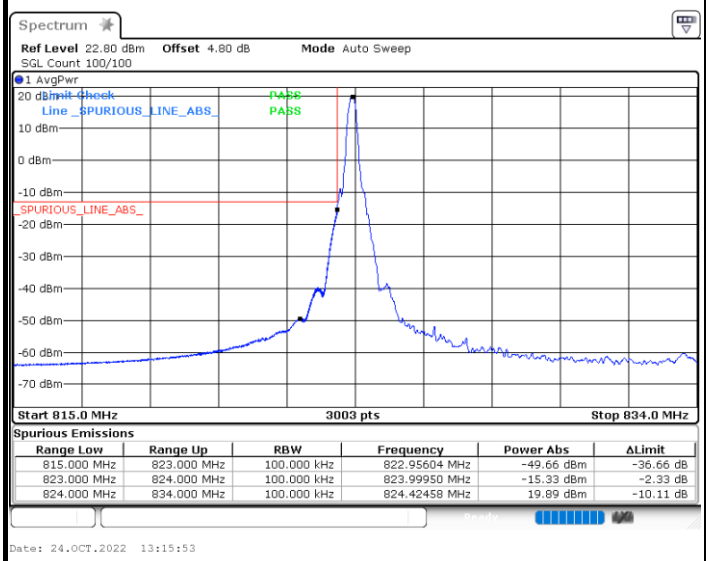
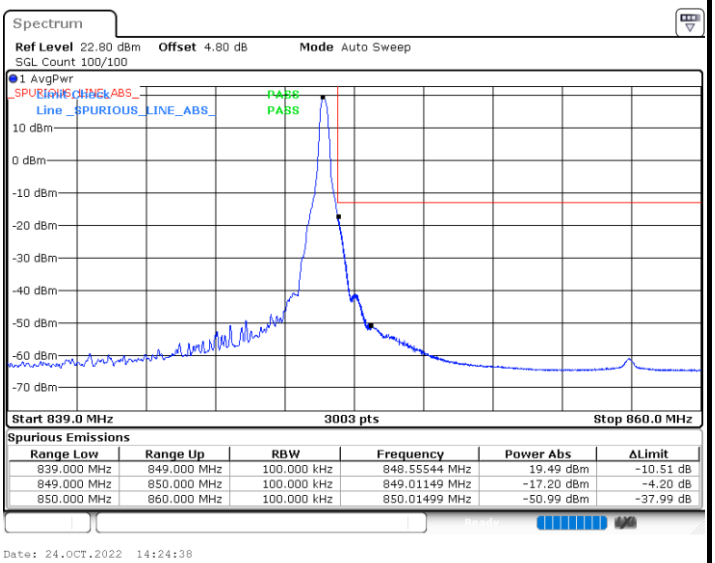
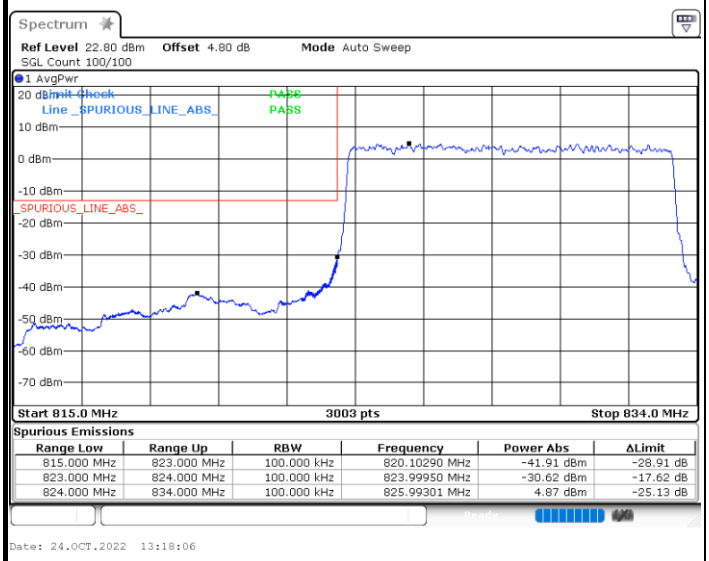
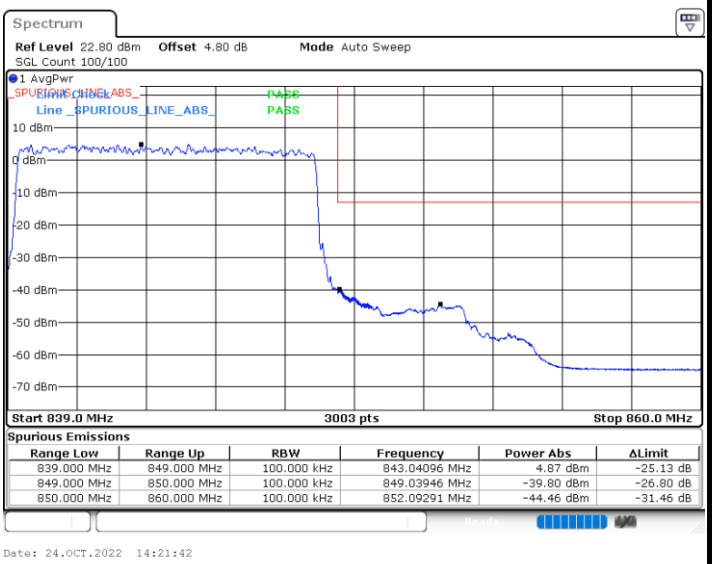
Highest Band Edge / Full RB

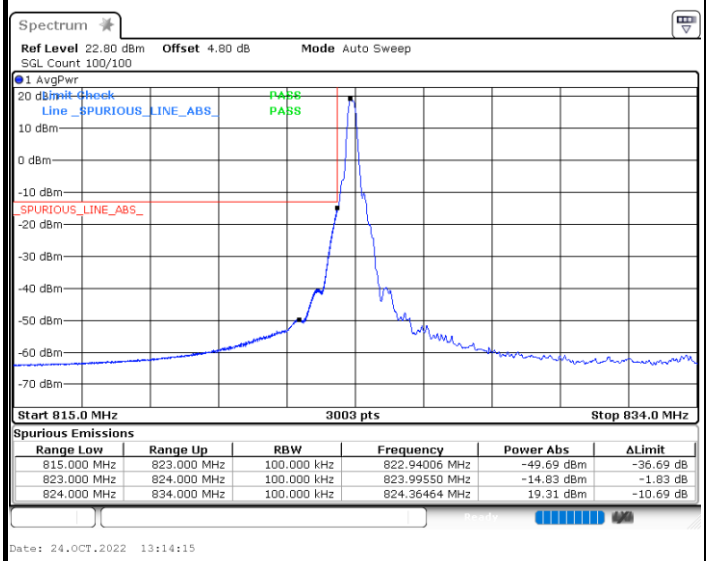
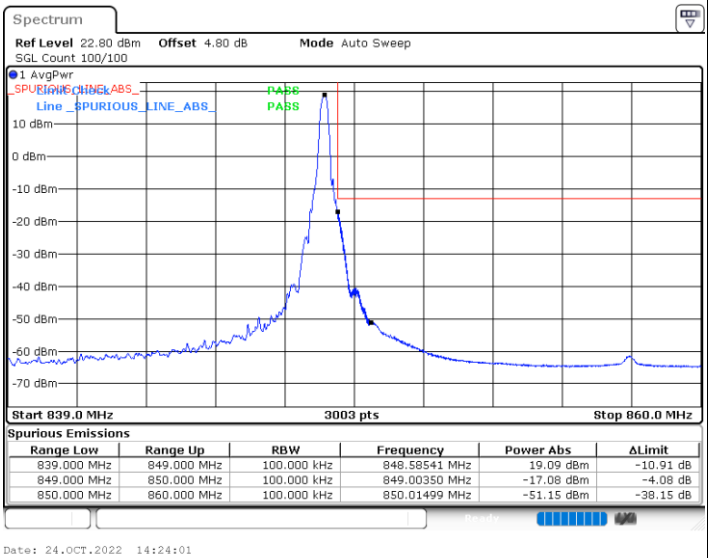
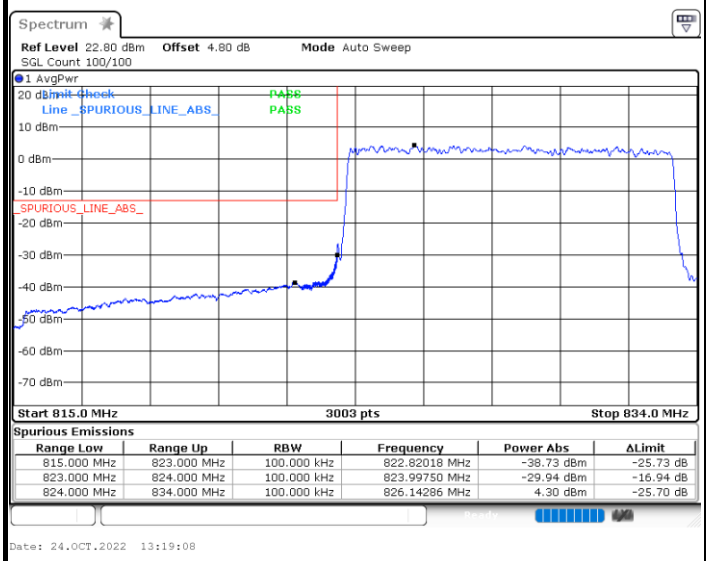
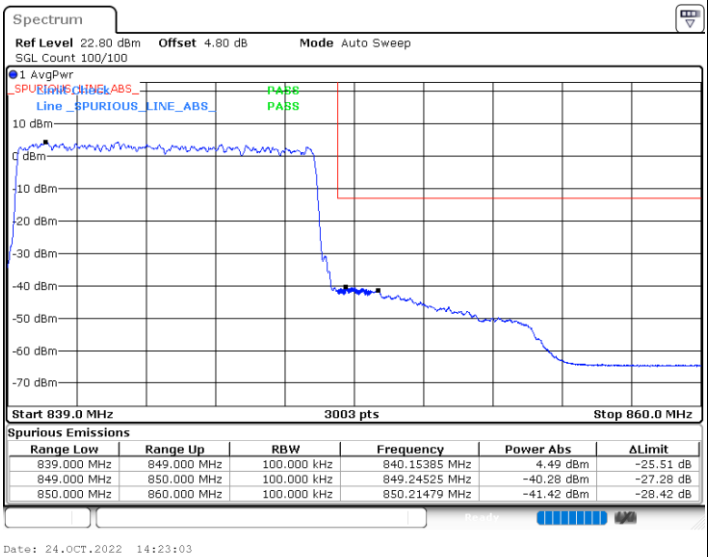


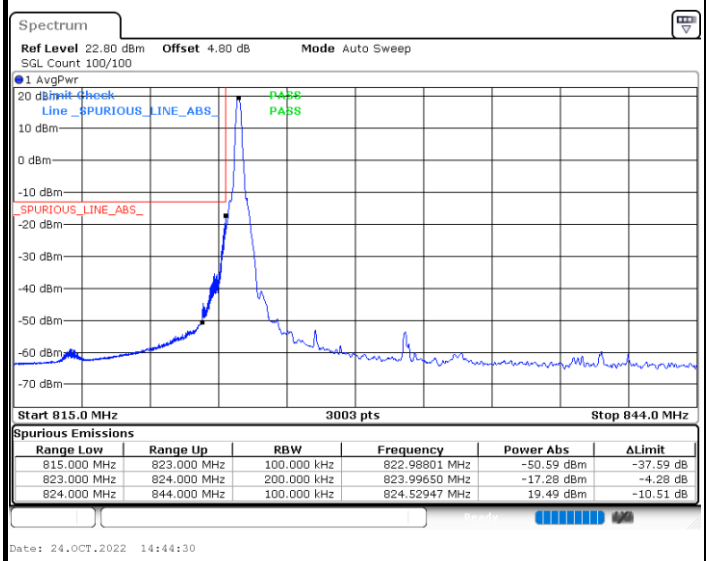
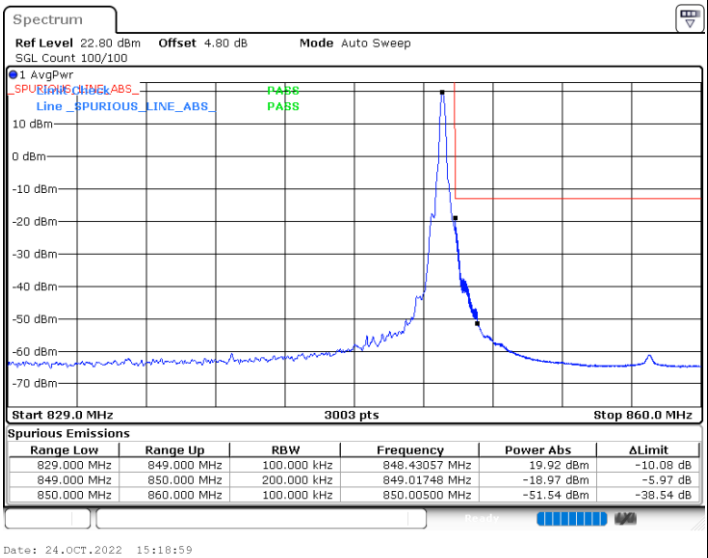
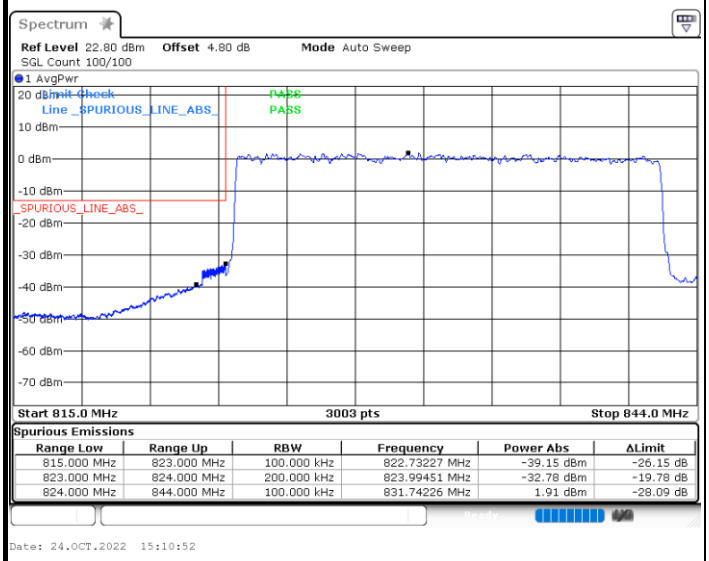
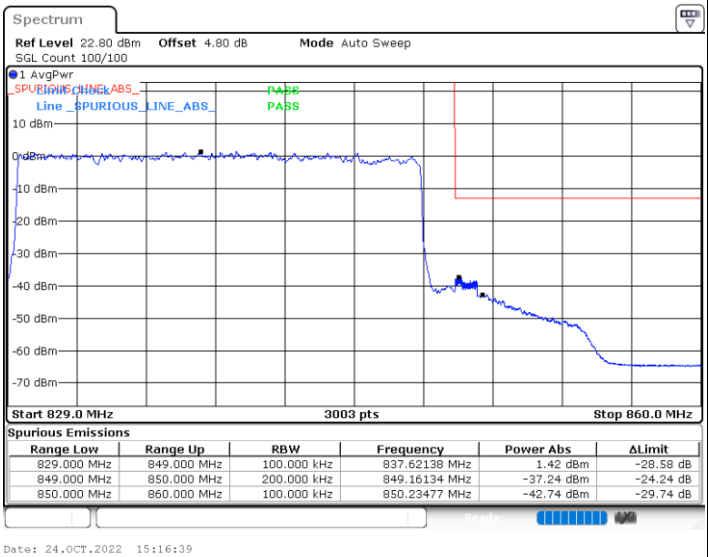
Spurious Emissions

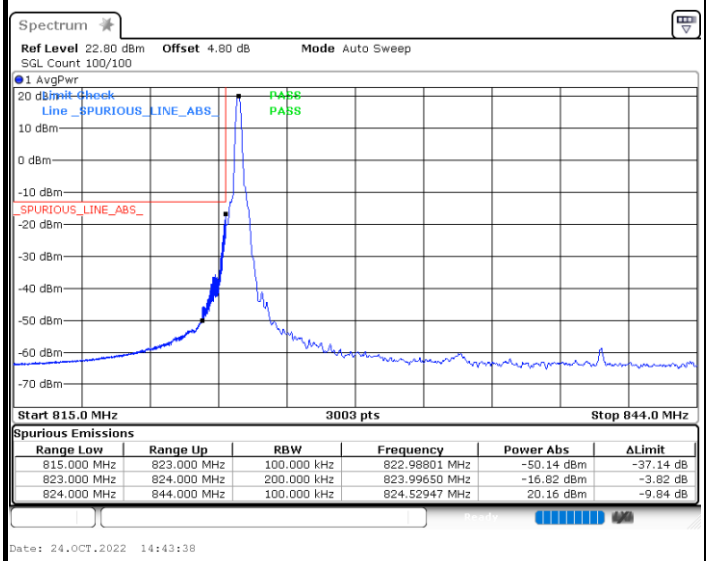
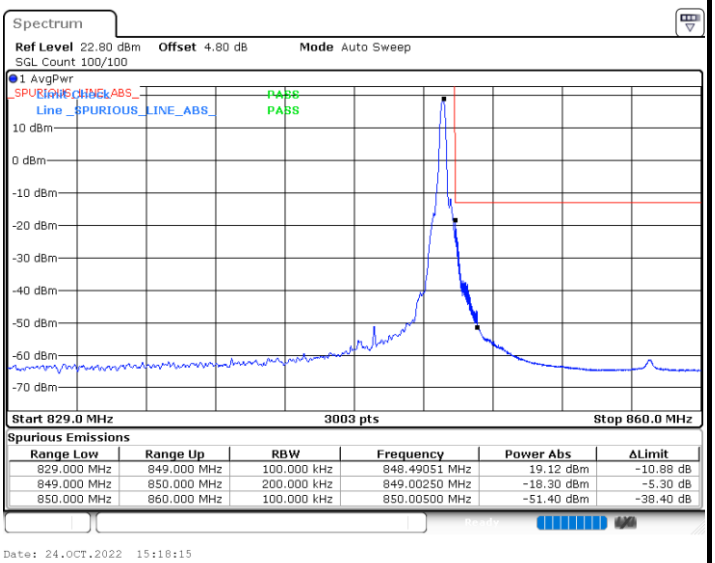
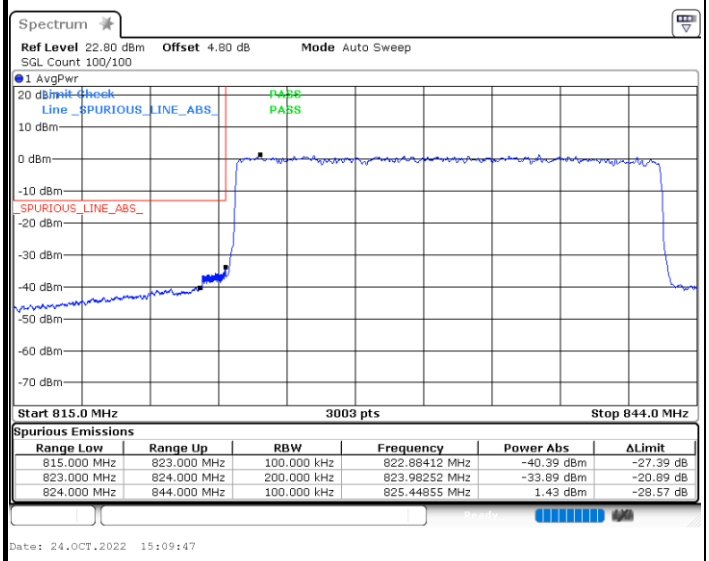
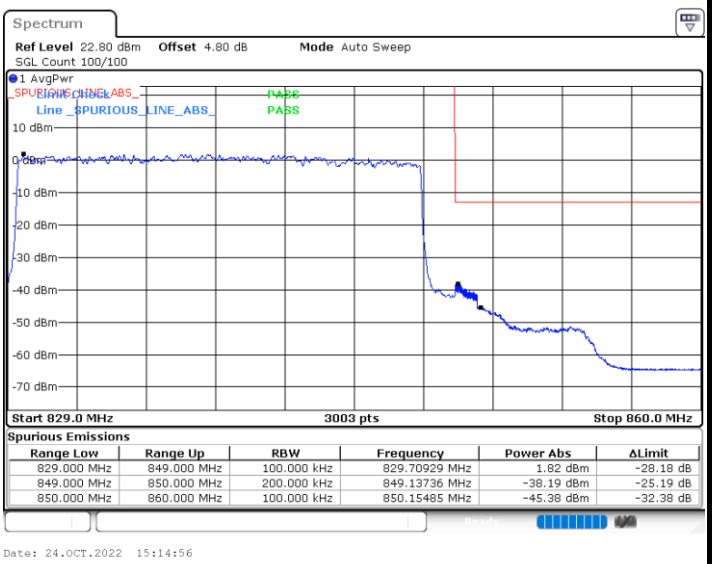
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
844.000 MHz	849.000 MHz	100.000 kHz	844.33217 MHz	7.37 dBm	-22.63 dB
849.000 MHz	850.000 MHz	50.000 kHz	849.00050 MHz	-30.93 dBm	-17.93 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.00500 MHz	-41.26 dBm	-28.26 dB

Date: 24.OCT.2022 12:56:50

FR1 n2 / 10MHz / DFT-s-OFDM / PI/2 BPSK	
Lowest Band Edge / 1RB0	**Highest Band Edge / 1RBmax**
	
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	

FR1 n2 / 10MHz / DFT-s-OFDM / QPSK	
Lowest Band Edge / 1RB0	**Highest Band Edge / 1RBmax**
	
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	

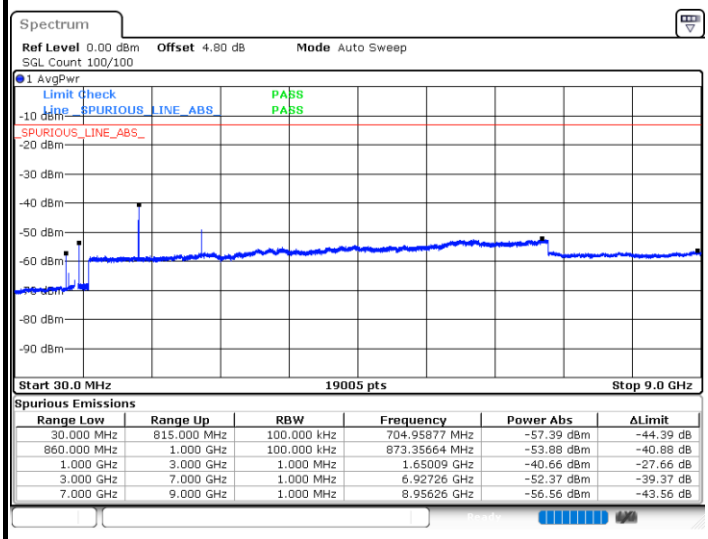
FR1 n2 / 20MHz / DFT-s-OFDM / PI/2 BPSK	
Lowest Band Edge / 1RB0	**Highest Band Edge / 1RBmax**
	
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	

FR1 n2 / 20MHz / DFT-s-OFDM / QPSK	
Lowest Band Edge / 1RB0	**Highest Band Edge / 1RBmax**
	
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	

Conducted Spurious Emission

FR1 n2 / 5MHz / DFT-S OFDM / BPSK

Lowest Channel / 1RB1

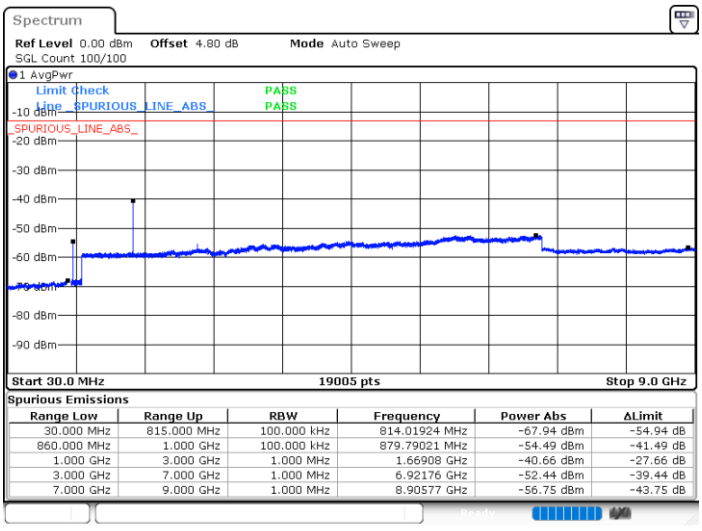


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	704.95877 MHz	-57.39 dBm	-44.39 dB
860.000 MHz	1.000 GHz	100.000 kHz	873.35664 MHz	-53.88 dBm	-40.88 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.65009 GHz	-40.66 dBm	-27.66 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.92726 GHz	-52.37 dBm	-39.37 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.95626 GHz	-56.56 dBm	-43.56 dB

Date: 24.OCT.2022 12:39:51

Middle Channel / 1RB1

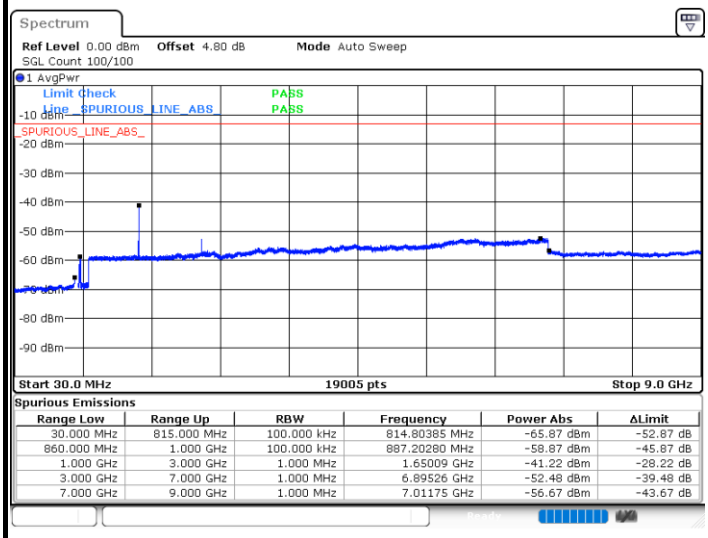


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	814.01924 MHz	-67.94 dBm	-54.94 dB
860.000 MHz	1.000 GHz	100.000 kHz	879.79021 MHz	-54.49 dBm	-41.49 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.66908 GHz	-40.66 dBm	-27.66 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.92176 GHz	-52.44 dBm	-39.44 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.90577 GHz	-56.75 dBm	-43.75 dB

Date: 24.OCT.2022 12:41:18

Highest Channel / 1RB1



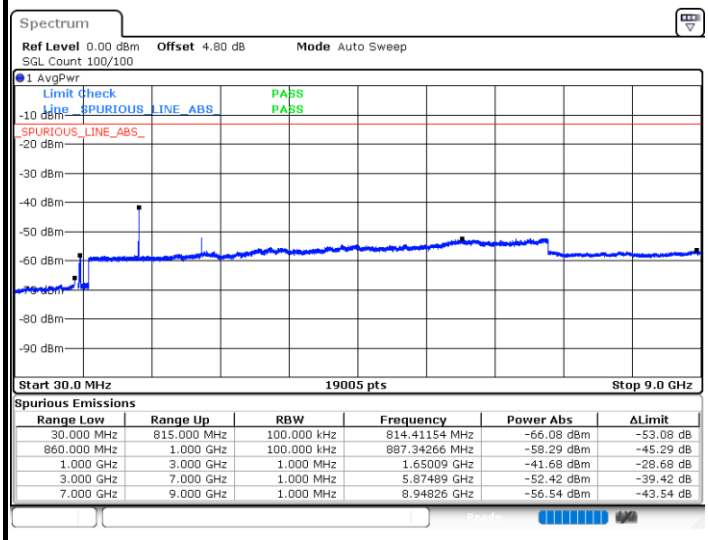
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	814.80385 MHz	-65.87 dBm	-52.87 dB
860.000 MHz	1.000 GHz	100.000 kHz	887.20280 MHz	-58.87 dBm	-45.87 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.65009 GHz	-41.22 dBm	-28.22 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.89526 GHz	-52.48 dBm	-39.48 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.01175 GHz	-56.67 dBm	-43.67 dB

Date: 24.OCT.2022 14:53:22

FR1 n2 / 5MHz / DFT-S OFDM / QPSK

Lowest Channel / 1RB1

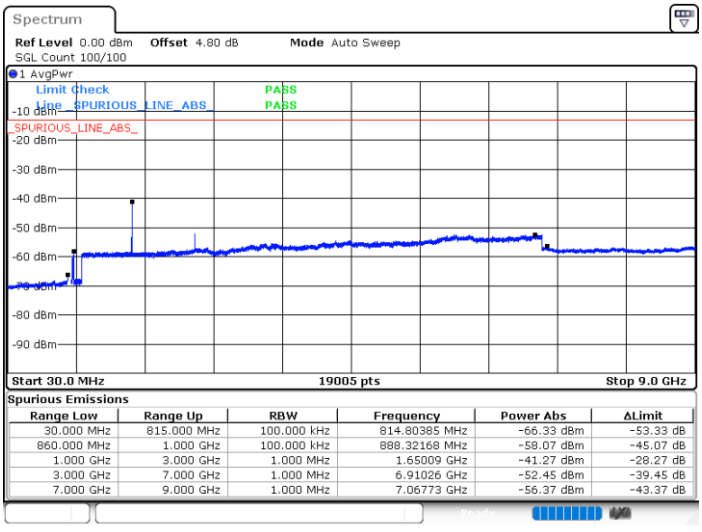


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	814.41154 MHz	-66.08 dBm	-53.08 dB
860.000 MHz	1.000 GHz	100.000 kHz	887.34266 MHz	-58.29 dBm	-45.29 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.65009 GHz	-41.68 dBm	-28.68 dB
3.000 GHz	7.000 GHz	1.000 MHz	5.87489 GHz	-52.42 dBm	-39.42 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.94826 GHz	-56.54 dBm	-43.54 dB

Date: 24.OCT.2022 14:50:16

Middle Channel / 1RB1

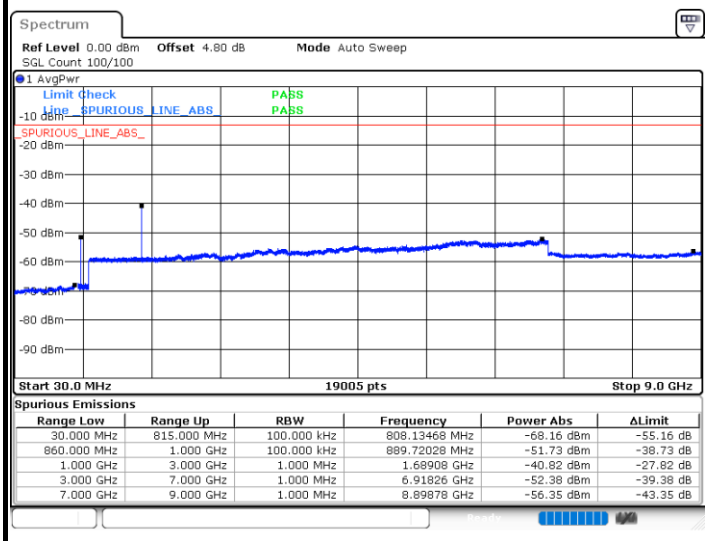


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	814.80385 MHz	-66.33 dBm	-53.33 dB
860.000 MHz	1.000 GHz	100.000 kHz	888.32168 MHz	-58.07 dBm	-45.07 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.65009 GHz	-41.27 dBm	-28.27 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.91026 GHz	-52.45 dBm	-39.45 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.06773 GHz	-56.37 dBm	-43.37 dB

Date: 24.OCT.2022 14:50:46

Highest Channel / 1RB1



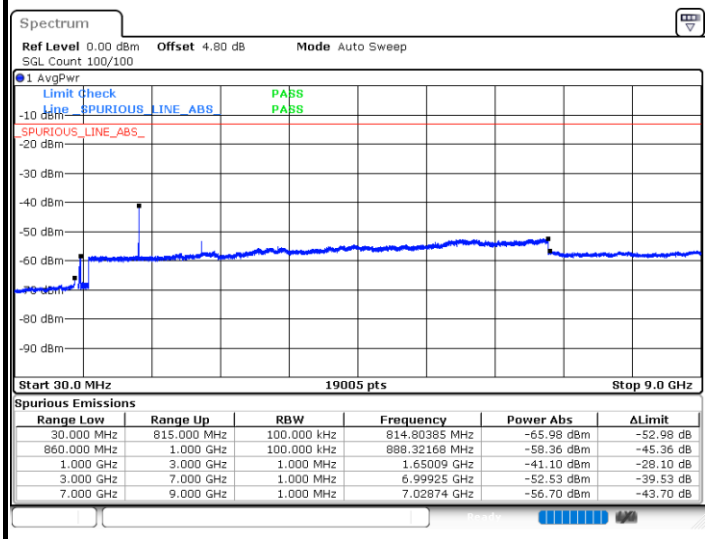
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	808.13468 MHz	-68.16 dBm	-55.16 dB
860.000 MHz	1.000 GHz	100.000 kHz	889.72028 MHz	-51.73 dBm	-38.73 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.68908 GHz	-40.82 dBm	-27.82 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.91826 GHz	-52.38 dBm	-39.38 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.89878 GHz	-56.35 dBm	-43.35 dB

Date: 24.OCT.2022 12:54:43

FR1 n2 / 10MHz / DFT-S OFDM / BPSK

Lowest Channel / 1RB1

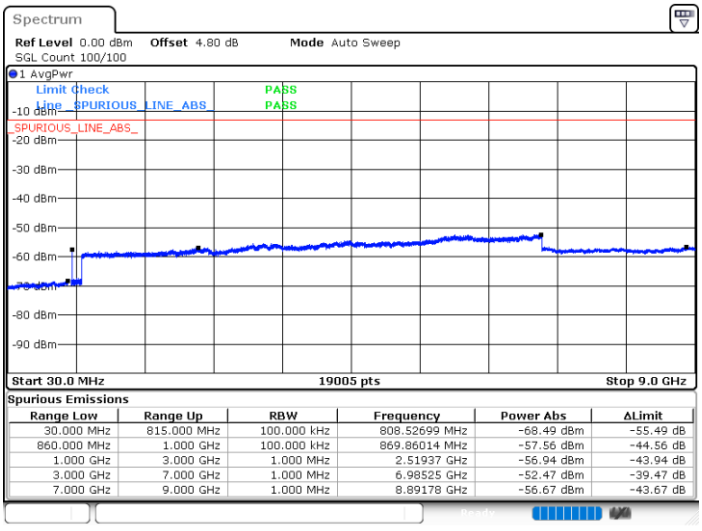


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	814.80385 MHz	-65.98 dBm	-52.98 dB
860.000 MHz	1.000 GHz	100.000 kHz	888.32168 MHz	-58.36 dBm	-45.36 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.65009 GHz	-41.10 dBm	-28.10 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99925 GHz	-52.53 dBm	-39.53 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.02874 GHz	-56.70 dBm	-43.70 dB

Date: 24.OCT.2022 14:56:28

Middle Channel / 1RB1

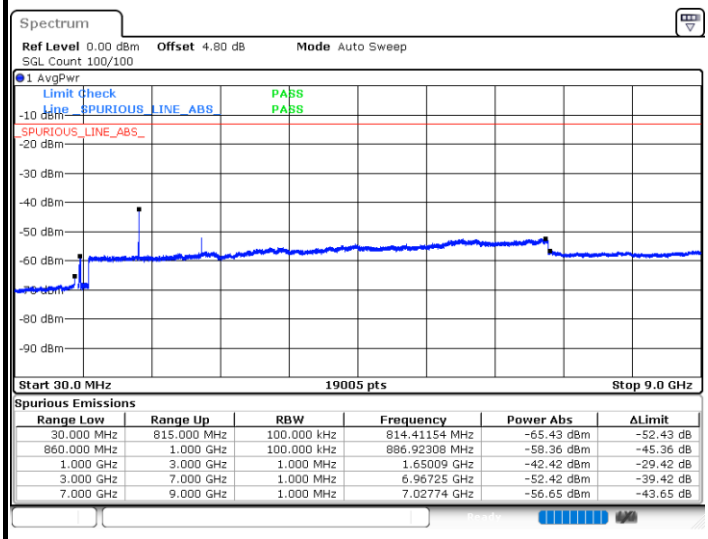


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	808.52699 MHz	-68.49 dBm	-55.49 dB
860.000 MHz	1.000 GHz	100.000 kHz	869.86014 MHz	-57.56 dBm	-44.56 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.51937 GHz	-56.94 dBm	-43.94 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.98525 GHz	-52.47 dBm	-39.47 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.89178 GHz	-56.67 dBm	-43.67 dB

Date: 24.OCT.2022 15:05:27

Highest Channel / 1RB1



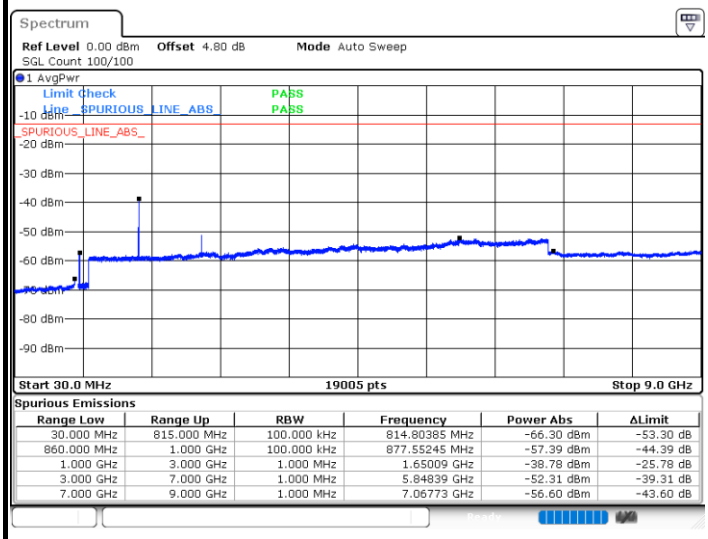
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	814.41154 MHz	-65.43 dBm	-52.43 dB
860.000 MHz	1.000 GHz	100.000 kHz	886.92308 MHz	-58.36 dBm	-45.36 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.65009 GHz	-42.42 dBm	-29.42 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.96725 GHz	-52.42 dBm	-39.42 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.02774 GHz	-56.65 dBm	-43.65 dB

Date: 24.OCT.2022 15:07:23

FR1 n2 / 10MHz / DFT-S OFDM / QPSK

Lowest Channel / 1RB1

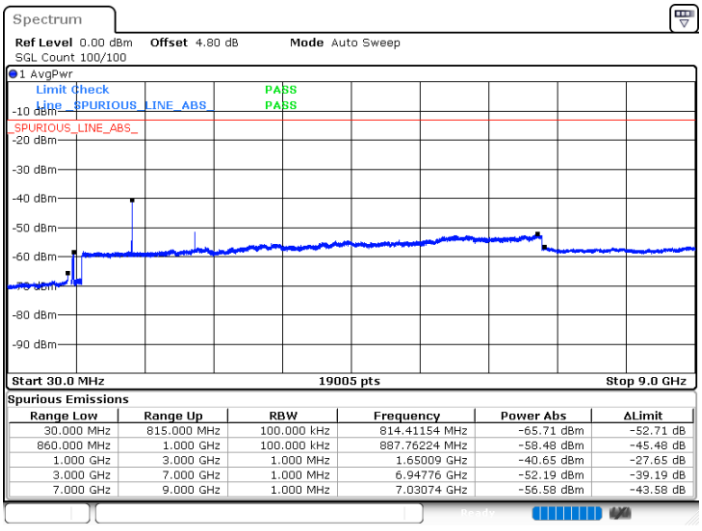


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	814.80385 MHz	-66.30 dBm	-53.30 dB
860.000 MHz	1.000 GHz	100.000 kHz	877.55245 MHz	-57.39 dBm	-44.39 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.65009 GHz	-38.78 dBm	-25.78 dB
3.000 GHz	7.000 GHz	1.000 MHz	5.84839 GHz	-52.31 dBm	-39.31 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.06773 GHz	-56.60 dBm	-43.60 dB

Date: 24.OCT.2022 13:21:18

Middle Channel / 1RB1

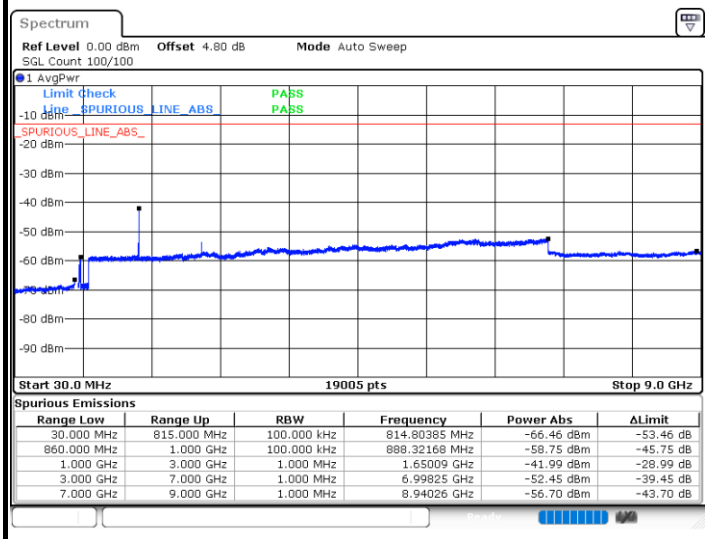


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	814.41154 MHz	-65.71 dBm	-52.71 dB
860.000 MHz	1.000 GHz	100.000 kHz	887.76224 MHz	-58.48 dBm	-45.48 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.65009 GHz	-40.65 dBm	-27.65 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.94776 GHz	-52.19 dBm	-39.19 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.03074 GHz	-56.58 dBm	-43.58 dB

Date: 24.OCT.2022 15:01:07

Highest Channel / 1RB1



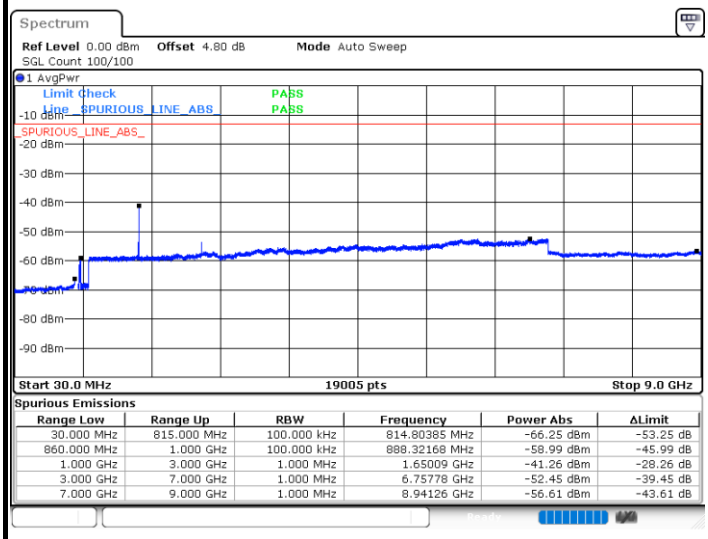
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	814.80385 MHz	-66.46 dBm	-53.46 dB
860.000 MHz	1.000 GHz	100.000 kHz	888.32168 MHz	-58.75 dBm	-45.75 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.65009 GHz	-41.99 dBm	-28.99 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99825 GHz	-52.45 dBm	-39.45 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.94026 GHz	-56.70 dBm	-43.70 dB

Date: 24.OCT.2022 15:04:23

FR1 n2 / 20MHz / DFT-S OFDM / BPSK

Lowest Channel / 1RB1

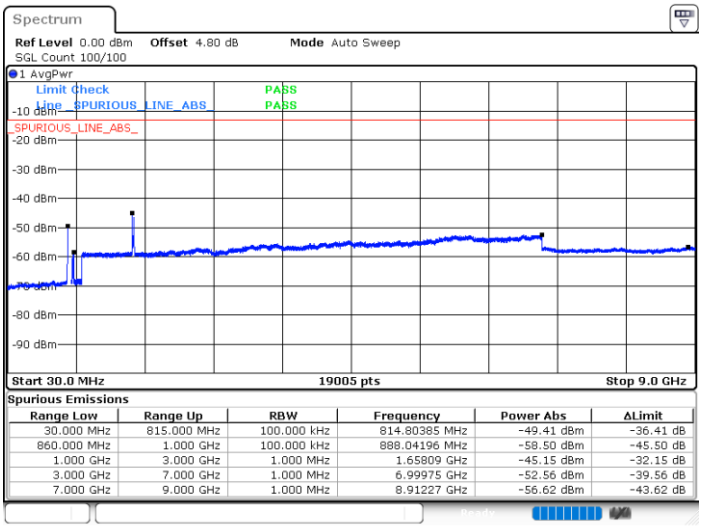


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	814.80385 MHz	-66.25 dBm	-53.25 dB
860.000 MHz	1.000 GHz	100.000 kHz	888.32168 MHz	-58.99 dBm	-45.99 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.65009 GHz	-41.26 dBm	-28.26 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.75778 GHz	-52.45 dBm	-39.45 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.94126 GHz	-56.61 dBm	-43.61 dB

Date: 24.OCT.2022 14:46:29

Middle Channel / 1RB1

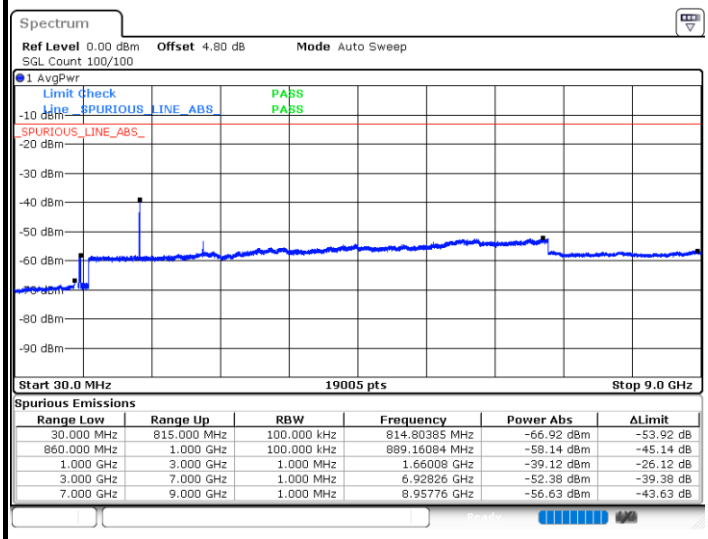


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	814.80385 MHz	-49.41 dBm	-36.41 dB
860.000 MHz	1.000 GHz	100.000 kHz	888.04196 MHz	-58.50 dBm	-45.50 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.65809 GHz	-45.15 dBm	-32.15 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99975 GHz	-52.56 dBm	-39.56 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.91227 GHz	-56.62 dBm	-43.62 dB

Date: 24.OCT.2022 15:12:13

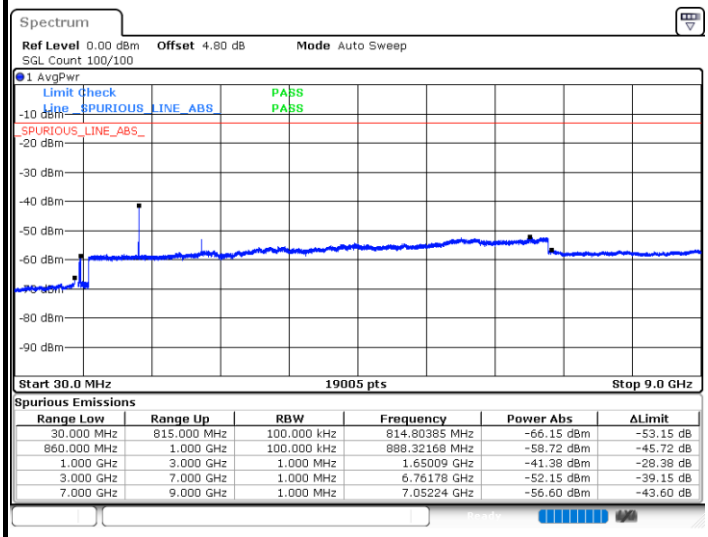
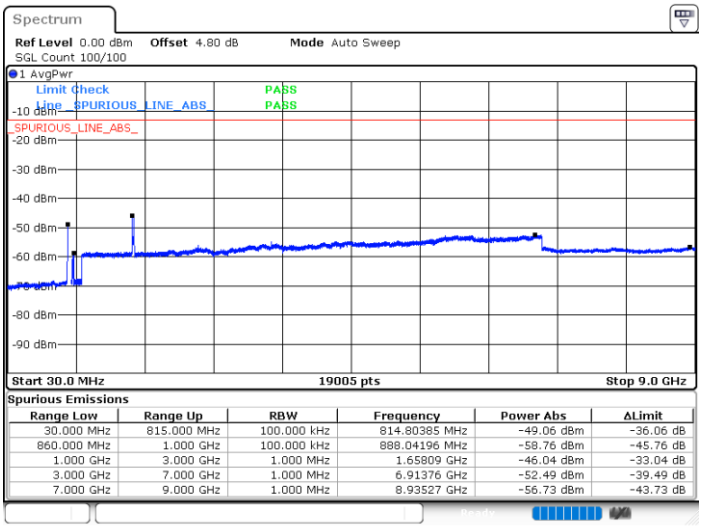
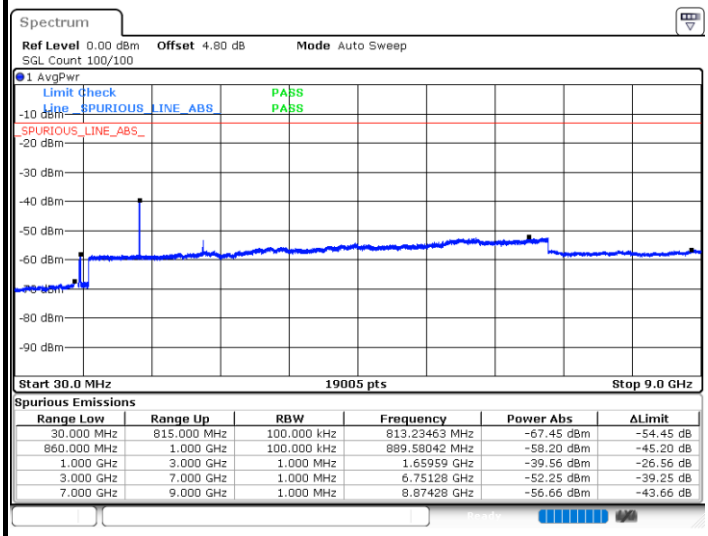
Highest Channel / 1RB1



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	814.80385 MHz	-66.92 dBm	-53.92 dB
860.000 MHz	1.000 GHz	100.000 kHz	889.16084 MHz	-58.14 dBm	-45.14 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.66008 GHz	-39.12 dBm	-26.12 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.92826 GHz	-52.38 dBm	-39.38 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.95776 GHz	-56.63 dBm	-43.63 dB

Date: 24.OCT.2022 15:22:07

FR1 n2 / 20MHz / DFT-S OFDM / QPSK	
Lowest Channel / 1RB1	**Middle Channel / 1RB1**
	
Highest Channel / 1RB1	
	

Frequency Stability

Test Conditions		FR1 n2 (QPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 20MHz	Note 2.
		Deviation (ppm)	Result
50	Normal Voltage	0.0025	PASS
40	Normal Voltage	0.0032	
30	Normal Voltage	0.0013	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0012	
0	Normal Voltage	0.0003	
-10	Normal Voltage	0.0032	
-20	Normal Voltage	0.0011	
-30	Normal Voltage	0.0032	
20	Maximum Voltage	0.0025	
20	Normal Voltage	0.0016	
20	Battery End Point	0.0005	

Note:

1. Normal Voltage =3.87 V. ; Battery End Point (BEP) =3.6 V. ; Maximum Voltage =4.45 V.

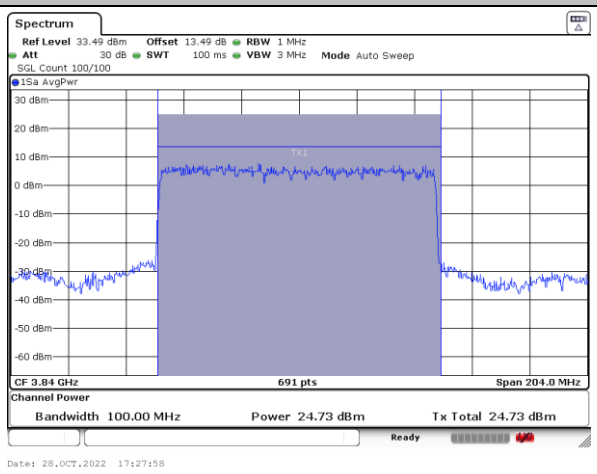
2. Note: The frequency fundamental emissions stay within the authorized frequency block.

FR1 n77

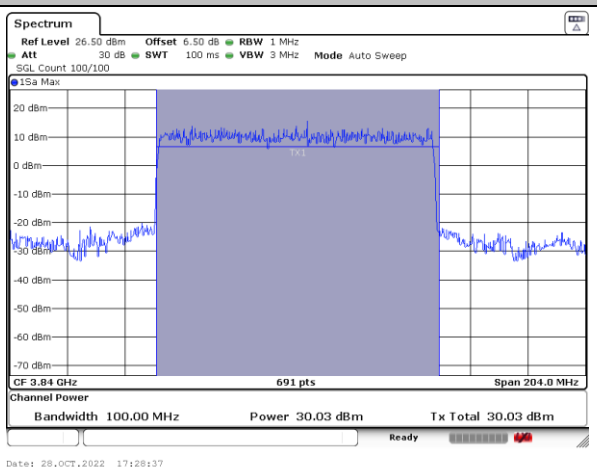
Peak-to-Average Ratio

Mode	FR1 n77 / 20MHz / DFT-S OFDM				
Mod.	20M				Limit: 13dB
RB Size	BPSK	QPSK			Result
Middle CH	5.3	5.42			PASS

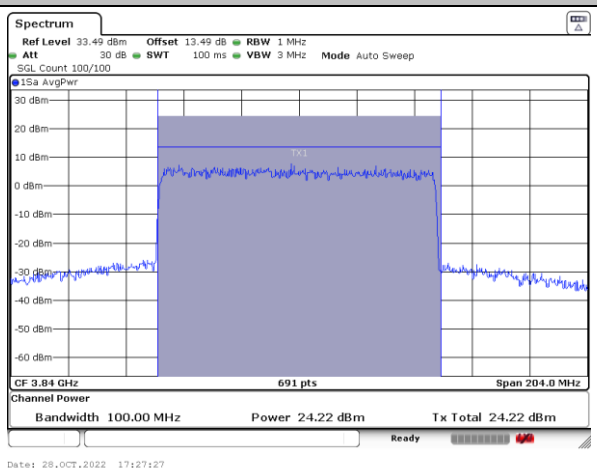
BPSK-A



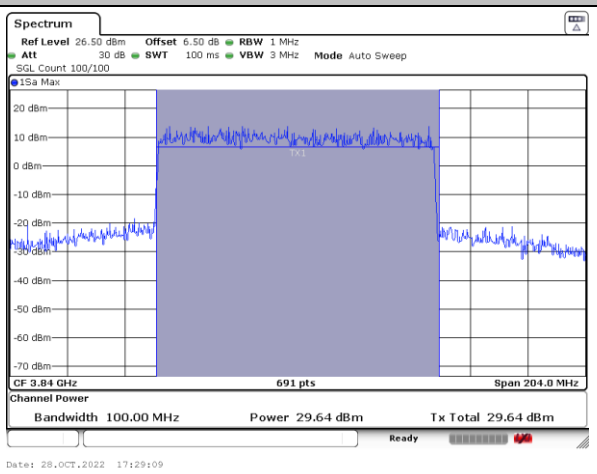
BPSK-P



QPSK-A



QPSK-P

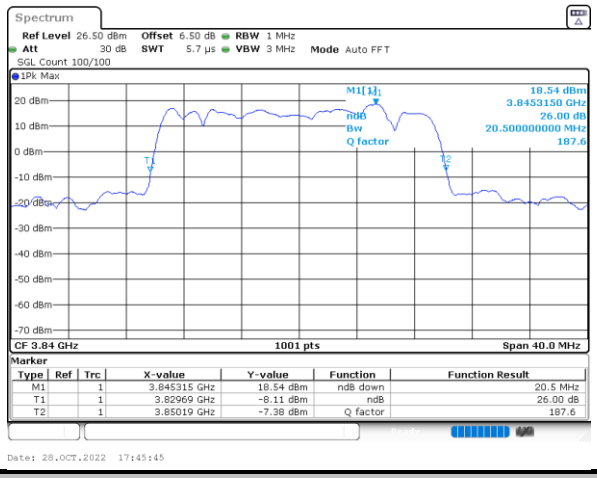


26dB Bandwidth

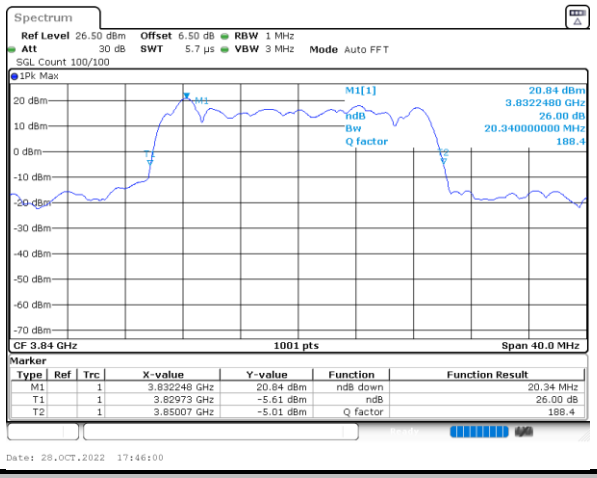
Mode	FR1 n77 : 26dB BW(20 MHz) / CP OFDM				
BW	CP				
Mod.		QPSK	16QAM	64QAM	256QAM
Middle CH		20.5	20.34	20.58	20.38
Mode	FR1 n77 : 26dB BW(30 MHz) / CP OFDM				
BW	CP				
Mod.		QPSK	16QAM	64QAM	256QAM
Middle CH		28.85	28.73	28.69	29.09
Mode	FR1 n77 : 26dB BW(40 MHz) / CP OFDM				
BW	CP				
Mod.		QPSK	16QAM	64QAM	256QAM
Middle CH		40.36	40.2	40.12	40.04
Mode	FR1 n77 : 26dB BW(50 MHz) / CP OFDM				
BW	CP				
Mod.		QPSK	16QAM	64QAM	256QAM
Middle CH		49.75	49.75	49.75	49.75
Mode	FR1 n77 : 26dB BW(60 MHz) / CP OFDM				
BW	CP				
Mod.		QPSK	16QAM	64QAM	256QAM
Middle CH		60.78	60.54	60.42	60.42
Mode	FR1 n77 : 26dB BW(70 MHz) / CP OFDM				
BW	CP				
Mod.		QPSK	16QAM	64QAM	256QAM
Middle CH		70.17	70.17	71.17	70.01
Mode	FR1 n77 : 26dB BW(80 MHz) / CP OFDM				
BW	CP				
Mod.		QPSK	16QAM	64QAM	256QAM
Middle CH		82.32	82.16	82.8	82.16
Mode	FR1 n77 : 26dB BW(90 MHz) / CP OFDM				
BW	CP				
Mod.		QPSK	16QAM	64QAM	256QAM
Middle CH		92.25	92.43	92.61	92.43
Mode	FR1 n77 : 26dB BW(100 MHz) / CP OFDM				
BW	CP				
Mod.		QPSK	16QAM	64QAM	256QAM
Middle CH		102.5	102.7	102.1	102.7

20MHz CP

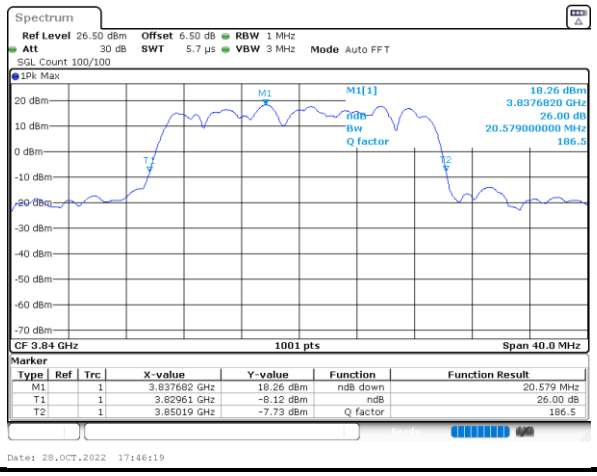
QPSK



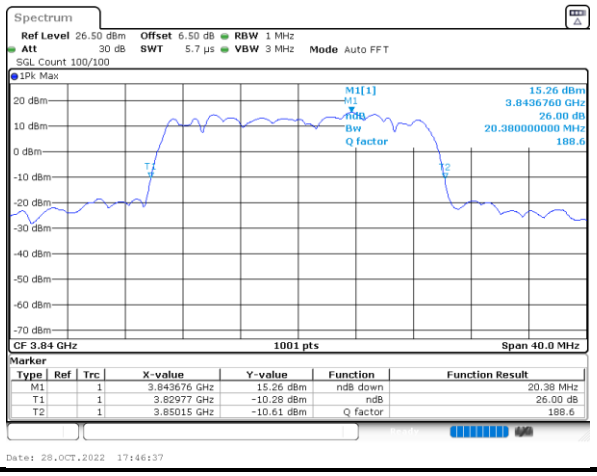
16QAM

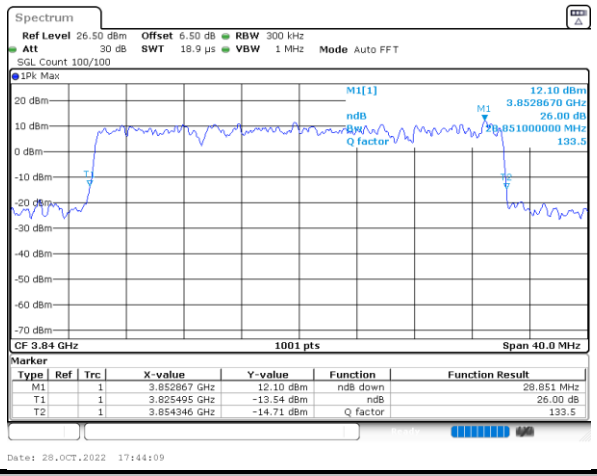
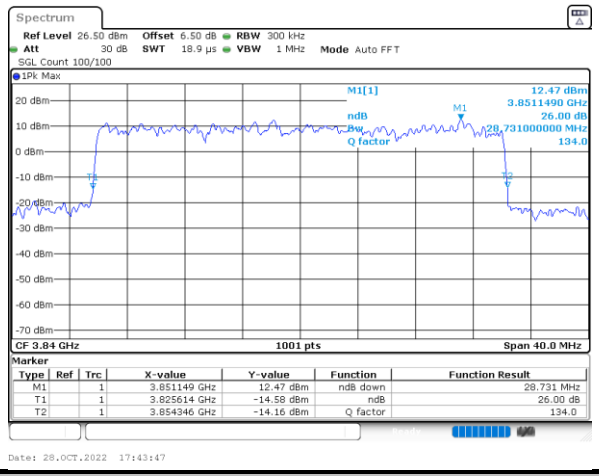


64QAM



256QAM



30MHz CP	
QPSK	16QAM
	
64QAM	256QAM