FCC RF Test Report

APPLICANT	**:**	**Motorola Mobility LLC**
EQUIPMENT	**:**	**Mobile Cellular Phone**
BRAND NAME	**:**	**Motorola**
MODEL NAME	**:**	**XT2313-3, XT2313-4, XT2313-6**
FCC ID	**:**	**IHDT56AJ8**
STANDARD	**:**	**47 CFR Part 2, 27**
CLASSIFICATION	**:**	**PCS Licensed Transmitter Held to Ear (PCE)**
TEST DATE(S)	**:**	**Nov. 30, 2022 ~ Dec. 23, 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)
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People's Republic of China

TABLE OF CONTENTS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG2N1810K	Rev. 01	Initial issue of report	Jan. 11, 2023

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting Only	PASS	-
	§27.50(b)(10) §27.50(c)(10)	Effective Radiated Power (5G NR n12, n71)	ERP < 3 Watt		
	§27.50(d)(4)	Equivalent Isotropic Radiated Power (5G NR n70)	EIRP < 1Watt		
	§27.50(h)(2)	Equivalent Isotropic Radiated Power (5G NR n7, n41)	EIRP < 2Watt		
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 §27.53(g) §27.53(h)	Conducted Band Edge Measurement (5G NR n12, n71) (5G NR n70)	< 43+10log10(P[Watts])	PASS	-
	§27.53(m)(4)	Conducted Band Edge Measurement (5G NR n7, n41)	§27.53(m)(4)		
3.8	§2.1051 §27.53(g) §27.53(h)	Conducted Spurious Emission (5G NR n12, n71) (5G NR n70)	< 43+10log10(P[Watts])	PASS	-
	§2.1051 §27.53(m)(4)	Conducted Spurious Emission (5G NR n7, n41)	< 55+10log$_{10}$(P[Watts])		
3.9	§27.54	Frequency Stability Temperature & Voltage	Within Authorized Band	PASS	-
4.4	§2.1053 §27.53(g) §27.53(h)	Radiated Spurious Emission (5G NR n12, n71) (5G NR n70)	< 43+10log$_{10}$(P[Watts])	PASS	Under limit 16.23 dB at 5184.000 MHz
	§2.1053 §27.53(m)(4)	Radiated Spurious Emission (5G NR n7, n41)	< 55+10log$_{10}$(P[Watts])		

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	XT2313-3, XT2313-4, XT2313-6
FCC ID	IHDT56AJ8
IMEI Code	Conducted : 353054820021830/353054820021756 Radiation : 353054820015733
HW Version	DVT2
SW Version	T1TPN33.13
EUT Stage	Identical Prototype

Note: The three model name XT2313-3, XT2313-4, XT2313-6 are the same product except model name different for market segment.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	5G NR n7 : 2500 MHz ~ 2570 MHz 5G NR n12 : 699 MHz ~ 716 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n70 : 1695 MHz ~ 1710 MHz 5G NR n71: 663 MHz ~ 698 MHz
Rx Frequency	5G NR n7 : 2620 MHz ~ 2690 MHz 5G NR n12: 729 MHz ~ 746 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n70 : 1995 MHz ~ 2020 MHz 5G NR n71: 617 MHz ~ 652 MHz
Bandwidth	n7 : 5MHz / 10MHz / 15MHz / 20MHz / 25MHz / 30MHz / 40MHz n12 : 5MHz / 10MHz / 15MHz n41 : 20MHz / 30MHz / 40MHz / 50MHz / 60MHz / 80MHz / 90MHz / 100MHz n70: 5MHz / 10MHz / 15MHz n71: 5MHz / 10MHz / 15MHz / 20MHz
SCS	n7, n12, n70, n71 for 15kHz

	n41 for 30kHz
Antenna Gain	**<Ant.0>** n12 : -1.23 dBi n70 : -1.81 dBi n71 : -2.36 dBi **<Ant. 1>** n7 : 0.03 dBi n41 : 0.03 dBi **<Ant. 2>** n41 : -3.1 dBi **<Ant. 4>** n7 : -0.58 dBi n12 : -2.5 dBi n41 : -1.6 dBi n70 : -1 dBi n71 : -5.8 dBi **<Ant. 7>** n41 : -3.23 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 output power and antenna gain, only the maximum ERP/EIRP are shown in the report, 5G NR n12/71 for Ant. 0 and n7/n41 for Ant. 1 and n70 for Ant. 4
2. All the supported ENDC combinations are verified conducted power, only the ENDC combination with highest power are shown in the report.
3. 5G NR n7/n12/n41/n71 support SA mode and NSA mode. According to the maximum power between SA and NSA mode, SA covers NSA mode.
4. 5G NR n7 supports two PAs (Main PA for Ant.1 and other PA for Ant.4)
5. 5G NR n70 supports SA mode only.
6. The device supports HPUE mode for 5G NR n41.
7. The 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				
Battery 1	**Brand Name**	Motorola (ATL)	**Model Name**	NH50
Battery 2	**Brand Name**	Motorola (Sunwoda)	**Model Name**	NH50
USB Cable 1	**Brand Name**	Motorola (Saibao)	**Model Name**	SLQ-A212A
USB Cable 2	**Brand Name**	Motorola (NAIYI)	**Model Name**	1.1.0196

1.7 Maximum ERP/EIRP Power and Emission Designator

5G NR n12		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)
5	701.5 ~ 713.5	0.1064	4M48G7D	0.0966	4M48W7D
10	704.0~ 711.0	0.1028	9M26G7D	0.0942	9M28W7D
15	706.5 ~ 708.5	0.1074	14M1G7D	0.0979	14M1W7D

5G NR n70		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)
5	1697.5 ~ 1707.5	0.1683	4M48G7D	0.0933	4M48W7D
10	1700.0 ~ 1705.0	0.1702	9M28G7D	0.0920	9M29W7D
15	1702.5	0.1718	14M1G7D	0.0946	14M1W7D

5G NR n71		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)
5	665.5 ~ 695.5	0.0793	4M47G7D	0.0753	4M47W7D
10	668.0 ~ 693.0	0.0807	9M25G7D	0.0748	9M26W7D
15	670.5 ~ 690.5	0.0785	14M0G7D	0.0724	14M1W7D
20	673.0 ~ 688.0	0.0811	18M8G7D	0.0733	18M8W7D

5G NR n7		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)
5	2502.5 ~ 2567.5	0.2133	4M48G7D	0.1738	4M49W7D
10	2505.0 ~ 2565.0	0.2113	9M29G7D	0.1718	9M30W7D
15	2507.5 ~ 2562.5	0.2014	14M1G7D	0.1660	14M1W7D
20	2510.0 ~ 2560.0	0.2104	18M9G7D	0.1667	19M0W7D
25	2512.5 ~ 2557.5	0.2123	23M7G7D	0.1663	23M8W7D
30	2515.0 ~ 2555.0	0.2128	28M6G7D	0.1730	28M6W7D
40	2520.0 ~ 2550.0	0.2168	38M6G7D	0.1746	38M6W7D

5G NR n7 EN DC_2A-n7A		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)
5	2502.5 ~ 2567.5	0.1862	4M47G7D	0.1500	4M48W7D
10	2505.0 ~ 2565.0	0.1871	9M29G7D	0.1496	9M30W7D
15	2507.5 ~ 2562.5	0.1871	14M1G7D	0.1611	14M1W7D
20	2510.0 ~ 2560.0	0.1845	18M9G7D	0.1570	19M0W7D
25	2512.5 ~ 2557.5	0.1871	23M7G7D	0.1500	23M7W7D
30	2515.0 ~ 2555.0	0.1841	28M6G7D	0.1496	28M6W7D
40	2520.0 ~ 2550.0	0.1875	38M5G7D	0.1483	38M5W7D

5G NR n41		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)
20	2506.02 ~ 2679.99	0.4064	18M2G7D	0.3673	18M3W7D
30	2511.00 ~ 2674.98	0.4276	27M9G7D	0.3963	27M9W7D
40	2516.01 ~ 2670.00	0.4064	37M8G7D	0.3690	37M9W7D
50	2521.02 ~ 2664.99	0.4009	47M5G7D	0.3656	47M6W7D
60	2526.00 ~ 2659.98	0.3864	58M0G7D	0.3589	57M9W7D
80	2536.02 ~ 2649.99	0.3715	77M5G7D	0.3475	77M6W7D
90	2541.00 ~ 2644.98	0.3673	87M6G7D	0.3459	87M6W7D
100	2546.01 ~ 2640.00	0.4345	97M5G7D	0.3715	97M6W7D

Note: 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.**
	03CH04-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	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	TH01-SZ	CN1256	421272

Test data subcontracted:Conducted test cases in section 3 of this report.

1.9 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH04-KS	AUDIX	E3	6.2009-8-24al

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, 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/Y/Z-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.

Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			

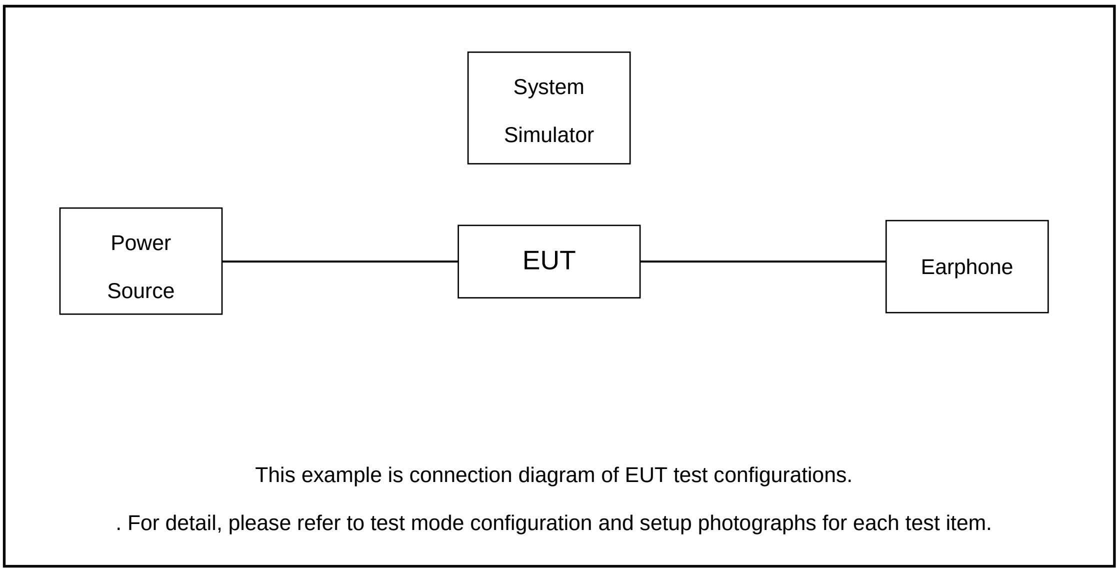
Test Items	5G NR	Bandwidth (MHz)													Modulation					RB #		Test Channel		
		5	10	15	20	25	30	40	50	60	70	80	90	100	PI/2 BPSK	QPSK	16QAM	64QAM	256QAM	1	Full	L	M	H
Test Items	n7	v	v	v	v	v	v	v	-	-	-	-	-	-	v	v	v	v	v	v	v	v	v	v
	n12	v	v	v	-	-	-	-	-	-	-	-	-	-	v	v	v	v	v	v	v	v	v	v
	n41	-	-	-	v	-	v	v	v	v	-	v	v	v	v	v	v	v	v	v	v	v	v	v
	n70	v	v	v	-	-	-	-	-	-	-	-	-	-	v	v	v	v	v	v	v	v	v	v
	n71	v	v	v	v	-	-	-	-	-	-	-	-	-	v	v	v	v	v	v	v	v	v	v
Peak-to-Average Ratio	n7				v				-	-	-	-	-	-	v	v				v	v	v	v	v
	n12		v		-	-	-	-	-	-	-	-	-	-	v	v				v	v	v	v	v
	n41	-	-	-	v	-					-				v	v				v	v	v	v	v
	n70		v		-	-	-	-	-	-	-	-	-	-	v	v				v	v	v	v	v
	n71				v	-	-	-	-	-	-	-	-	-	v	v				v	v	v	v	v
26dB and 99% Bandwidth	n7	v	v	v	v	v	v	v	-	-	-	-	-	-	v	v	v	v	v		v		v	
	n12	v	v	v	-	-	-	-	-	-	-	-	-	-	v	v	v	v	v		v		v	
	n41	-	-	-	v	-	v	v	v	v	-	v	v	v	v	v	v	v	v		v		v	
	n70	v	v	v	-	-	-	-	-	-	-	-	-	-	v	v	v	v	v		v		v	
	n71	v	v	v	v	-	-	-	-	-	-	-	-	-	v	v	v	v	v		v		v	
Conducted Band Edge	n7	v			v			v	-	-	-	-	-	-	v	v				v	v	v		v
	n12	v	v	v	-	-	-	-	-	-	-	-	-	-	v	v				v	v	v		v

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
	n41	-	-	-	v	-			v		-			v	v	v				v	v	v		v
	n70	v	v	v	-	-	-	-	-	-	-	-	-	-	v	v				v	v	v		v
	n71	v	v		v	-	-	-	-	-	-	-	-	-	v	v				v	v	v		v
Conducted Spurious Emission	n7	v			v			v	-	-	-	-	-	-	v	v				v		v	v	v
	n12	v	v	v	-	-	-	-	-	-	-	-	-	-	v	v				v		v	v	v
	n41	-	-	-	v	-			v		-			v	v	v				v		v	v	v
	n70	v	v	v	-	-	-	-	-	-	-	-	-	-	v	v				v		v	v	v
	n71	v	v		v	-	-	-	-	-	-	-	-	-	v	v				v		v	v	v
Frequency Stability	n7				v				-	-	-	-	-	-		v					v		v	
	n12		v		-	-	-	-	-	-	-	-	-	-		v					v		v	
	n41	-	-	-	v	-					-					v					v		v	
	n70		v		-	-	-	-	-	-	-	-	-	-		v					v		v	
	n71				v	-	-	-	-	-	-	-	-	-		v					v		v	
E.R.P / E.I.R.P	n7	v	v	v	v	v	v	v	-	-	-	-	-	-	v	v	v	v	v	v	v	v	v	v
	n12	v	v	v	-	-	-	-	-	-	-	-	-	-	v	v	v	v	v	v	v	v	v	v
	n41	-	-	-	v	-	v	v	v	v	-	v	v	v	v	v	v	v	v	v	v	v	v	v
	n70	v	v	v	-	-	-	-	-	-	-	-	-	-	v	v	v	v	v	v	v	v	v	v
	n71	v	v	v	v	-	-	-	-	-	-	-	-	-	v	v	v	v	v	v	v	v	v	v
Radiated Spurious Emission	n7	Worst Case																				v	v	v
	n12	Worst Case																				v	v	v
	n41	Worst Case																				v	v	v
	n70	Worst Case																				v	v	v
	n71	Worst Case																				v	v	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 =4.51V

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
4.	Earphone	Lenovo	P121	N/A	N/A	Unshielded,1.2m
5.	AC Adapter	Moto	MC-101	N/A	N/A	N/A

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 8.4dB.

Example :

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

= 8.4 (dB)

2.5 Frequency List of Low/Middle/High Channels

5G NR n7 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
40	Channel	504000	507000	510000
	Frequency	2520	2535	2550
30	Channel	503000	507000	511000
	Frequency	2515	2535	2555
25	Channel	502500	507000	511500
	Frequency	2512.5	2535	2557.5
20	Channel	502000	507000	512000
	Frequency	2510	2535	2560
15	Channel	501500	507000	512500
	Frequency	2507.5	2535	2562.5
10	Channel	501000	507000	513000
	Frequency	2505	2535	2565
5	Channel	500500	507000	513500
	Frequency	2502.5	2535	2567.5

5G NR n12 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
15	Channel	141300	141500	141700
	Frequency	706.5	707.5	708.5
10	Channel	140800	141500	142200
	Frequency	704	707.5	711
5	Channel	140300	141500	142700
	Frequency	701.5	707.5	713.5

5G NR n41 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
100	Channel	509202	518598	528000
	Frequency	2546.01	2592.99	2640
90	Channel	508200	518598	528996
	Frequency	2541	2592.99	2644.98
80	Channel	507204	518598	529998
	Frequency	2536.02	2592.99	2649.99
60	Channel	505200	518598	531996
	Frequency	2526	2592.99	2659.98
50	Channel	504204	518598	532998
	Frequency	2521.02	2592.99	2664.99
40	Channel	503202	518598	534000
	Frequency	2516.01	2592.99	2670
30	Channel	502200	518598	534996
	Frequency	2511	2592.99	2674.98
20	Channel	501204	518598	535998
	Frequency	2506.02	2592.99	2679.99

5G NR n70 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
15	Channel		340500	
	Frequency		1702.5	
10	Channel	340000	340500	341000
	Frequency	1700	1702.5	1705
5	Channel	399500	340500	341500
	Frequency	1697.5	1702.5	1707.5

5G NR n71 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
20	Channel	134600	136100	137600
	Frequency	673	680.5	688
15	Channel	134100	136100	138100
	Frequency	670.5	680.5	690.5
10	Channel	133600	136100	138600
	Frequency	668	680.5	693
5	Channel	133100	136100	139100
	Frequency	665.5	680.5	695.5

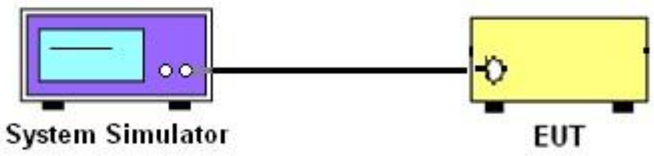
3 Conducted Test Items

3.1 Measuring Instruments

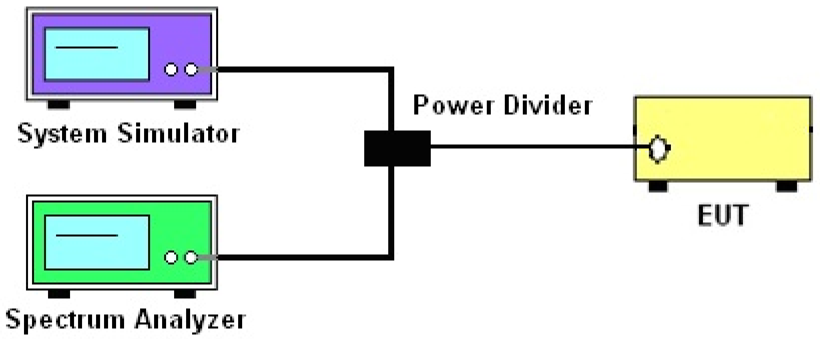
See list of measuring instruments of this test report.

3.2 Test Setup

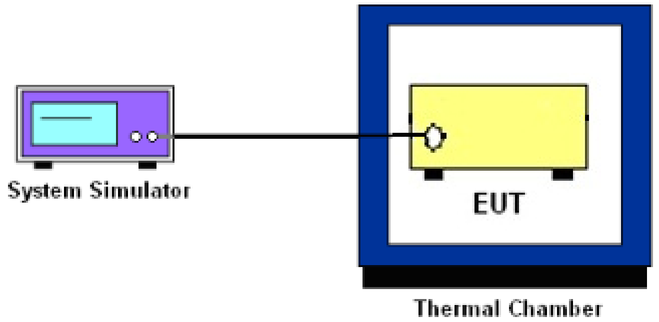
3.2.1 Conducted Output Power



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 3 Watts for 5G NR n12, n71.

The EIRP of mobile transmitters must not exceed 2 Watts for 5G NR n7, n41.

The EIRP of mobile transmitters must not exceed 1 Watts for 5G NR n70.

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.

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

27.53 (h)

For operations in the 1695 - 1710 MHz band, the FCC limit is 43 + $10\log_{10}$(P[Watts]) dB below the transmitter power P(Watts) in a 1 MHz 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 (g)

For operations in the 600MHz band and 698 -746 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 100 kHz bandwidth. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

27.53(m)(4)

For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

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
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. For 5G NR n7/n41, the other 40 dB, and 55 dB have additionally applied same calculation above.
10. 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.

For 5G NR n7/n41:

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 55 + 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.
11. For 5G NR n7/n41
    The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [55+ 10log(P)] (dB)
    = [30+ 10log(P)] (dBm) - [55+ 10log(P)] (dB)
    = -25dBm.

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.

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.

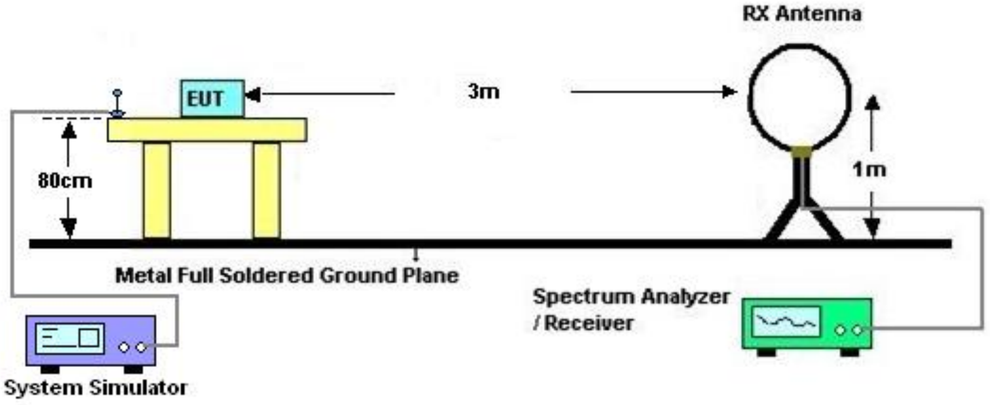
4 Radiated Test Items

4.1 Measuring Instruments

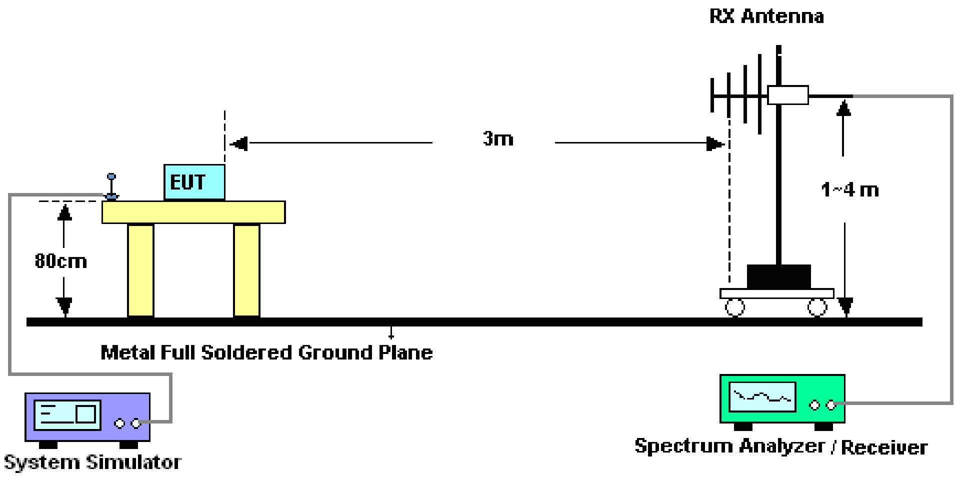
See list of measuring instruments of this test report.

4.2 Test Setup

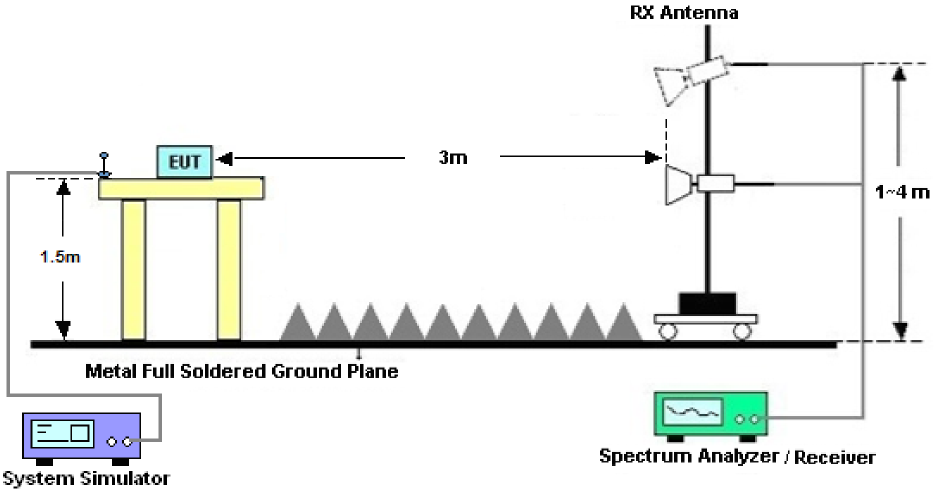
4.2.1 For radiated test below 30MHz



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.

For 5G NR n7/n41

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 55 + 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.
13. For 5G NR n7/n41:
    The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver&SA	Agilent	N9038A	MY52260185	20Hz~26.5GHz	Dec. 27, 2021	Nov. 30, 2022~ Dec. 19, 2022	Dec. 26, 2022	Conducted (TH01-SZ)
Power Divider	TOJOIN	PS-2SM-04 265	60.06.020.007 7	0.4GHz~26.5GHz	Dec. 25, 2021	Nov. 30, 2022~ Dec. 19, 2022	Dec. 24, 2022	Conducted (TH01-SZ)
Thermal Chamber	Ten Billion Hongzhangroup	LP-150U	H2014081803	-40~+150°C	Jul. 07, 2022	Nov. 30, 2022~ Dec. 19, 2022	Jul. 06, 2023	Conducted (TH01-SZ)
EXA Spectrum Analyzer	Keysight	N9010B	MY57471079	10Hz-44G,MAX 30dB	Oct. 12, 2022	Dec. 23, 2022	Oct. 11, 2023	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 29, 2022	Dec. 23, 2022	Oct. 28, 2023	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	May 24, 2022	Dec. 23, 2022	May 23, 2023	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1284	1GHz~18GHz	Jan. 05, 2022	Dec. 23, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2022	Dec. 23, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Jan. 05, 2022	Dec. 23, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40G GA	060728	18~40GHz	Jan. 05, 2022	Dec. 23, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
high gain Amplifier	EM	EM01G18G A	060840	1Ghz-18Ghz	Oct. 12, 2022	Dec. 23, 2022	Oct. 11, 2023	Radiation (03CH04-KS)
Amplifier	Agilent	8449B	3008A02370	1Ghz-18Ghz	Oct. 12, 2022	Dec. 23, 2022	Oct. 11, 2023	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Dec. 23, 2022	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Dec. 23, 2022	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Dec. 23, 2022	NCR	Radiation (03CH04-KS)

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	±1.34 dB
Conducted Emissions	±1.34 dB
Occupied Channel Bandwidth	±0.12 %

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.3 dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.8 dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.8 dB

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

Appendix A. Test Results of Conducted Test

Test Engineer :	Jung Guo	**Temperature :**	24~26℃
		Relative Humidity :	50~53%

FR1 N7(ANT1)

Transmitter Conducted Output Power And EIRP, (G_T - L_C)=0.03dB

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Conducted Power(dBm)	EIRP (dBm)	EIRP (W)
7	15	5	500500	2502.5	DFT-s-OFDM QPSK	1@1	23.13	23.16	0.2070
7	15	5	500500	2502.5	DFT-s-OFDM 16 QAM	1@1	22.25	22.28	0.1690
7	15	5	507000	2535	DFT-s-OFDM QPSK	1@1	23.15	23.18	0.2080
7	15	5	507000	2535	DFT-s-OFDM 16 QAM	1@1	22.09	22.12	0.1629
7	15	5	513500	2567.5	DFT-s-OFDM QPSK	1@1	23.26	23.29	0.2133
7	15	5	513500	2567.5	DFT-s-OFDM 16 QAM	1@1	22.37	22.4	0.1738
7	15	10	501000	2505	DFT-s-OFDM QPSK	1@1	23.19	23.22	0.2099
7	15	10	501000	2505	DFT-s-OFDM 16 QAM	1@1	22.18	22.21	0.1663
7	15	10	507000	2535	DFT-s-OFDM QPSK	1@1	23.01	23.04	0.2014
7	15	10	507000	2535	DFT-s-OFDM 16 QAM	1@1	22.07	22.1	0.1622
7	15	10	513000	2565	DFT-s-OFDM QPSK	1@1	23.22	23.25	0.2113
7	15	10	513000	2565	DFT-s-OFDM 16 QAM	1@1	22.32	22.35	0.1718
7	15	15	501500	2507.5	DFT-s-OFDM QPSK	1@1	23.01	23.04	0.2014
7	15	15	501500	2507.5	DFT-s-OFDM 16 QAM	1@1	22.17	22.2	0.1660
7	15	15	507000	2535	DFT-s-OFDM QPSK	1@1	22.94	22.97	0.1982
7	15	15	507000	2535	DFT-s-OFDM 16 QAM	1@1	22.02	22.05	0.1603
7	15	15	512500	2562.5	DFT-s-OFDM QPSK	1@1	23.01	23.04	0.2014
7	15	15	512500	2562.5	DFT-s-OFDM 16 QAM	1@1	22.16	22.19	0.1656
7	15	20	502000	2510	DFT-s-OFDM QPSK	1@1	23.2	23.23	0.2104
7	15	20	502000	2510	DFT-s-OFDM 16 QAM	1@1	22.19	22.22	0.1667
7	15	20	507000	2535	DFT-s-OFDM QPSK	1@1	23.03	23.06	0.2023

7	15	20	507000	2535	DFT-s-OFDM 16 QAM	1@1	22.04	22.07	0.1611
7	15	20	512000	2560	DFT-s-OFDM QPSK	1@1	23	23.03	0.2009
7	15	20	512000	2560	DFT-s-OFDM 16 QAM	1@1	22.14	22.17	0.1648
7	15	25	502500	2512.5	DFT-s-OFDM QPSK	1@1	23.13	23.16	0.2070
7	15	25	502500	2512.5	DFT-s-OFDM 16 QAM	1@1	22.18	22.21	0.1663
7	15	25	507000	2535	DFT-s-OFDM QPSK	1@1	23.1	23.13	0.2056
7	15	25	507000	2535	DFT-s-OFDM 16 QAM	1@1	22.17	22.2	0.1660
7	15	25	511500	2557.5	DFT-s-OFDM QPSK	1@1	23.24	23.27	0.2123
7	15	25	511500	2557.5	DFT-s-OFDM 16 QAM	1@1	22.18	22.21	0.1663
7	15	30	503000	2515	DFT-s-OFDM QPSK	1@1	23.24	23.27	0.2123
7	15	30	503000	2515	DFT-s-OFDM 16 QAM	1@1	22.18	22.21	0.1663
7	15	30	507000	2535	DFT-s-OFDM QPSK	1@1	23.14	23.17	0.2075
7	15	30	507000	2535	DFT-s-OFDM 16 QAM	1@1	22.15	22.18	0.1652
7	15	30	511000	2555	DFT-s-OFDM QPSK	1@1	23.25	23.28	0.2128
7	15	30	511000	2555	DFT-s-OFDM 16 QAM	1@1	22.35	22.38	0.1730
7	15	40	504000	2520	DFT-s-OFDM PI/2 BPSK	108@54	22.99	23.02	0.2004
7	15	40	504000	2520	DFT-s-OFDM PI/2 BPSK	1@1	23.12	23.15	0.2065
7	15	40	504000	2520	DFT-s-OFDM PI/2 BPSK	1@214	23.03	23.06	0.2023
7	15	40	504000	2520	DFT-s-OFDM QPSK	108@54	23.03	23.06	0.2023
7	15	40	504000	2520	DFT-s-OFDM QPSK	1@1	23.24	23.27	0.2123
7	15	40	504000	2520	DFT-s-OFDM QPSK	1@214	23.06	23.09	0.2037
7	15	40	504000	2520	DFT-s-OFDM 16 QAM	108@54	22.1	22.13	0.1633
7	15	40	504000	2520	DFT-s-OFDM 16 QAM	1@1	22.28	22.31	0.1702
7	15	40	504000	2520	DFT-s-OFDM 16 QAM	1@214	22.29	22.32	0.1706
7	15	40	504000	2520	DFT-s-OFDM 64 QAM	108@54	20.58	20.61	0.1151
7	15	40	504000	2520	DFT-s-OFDM 64 QAM	1@1	20.72	20.75	0.1189
7	15	40	504000	2520	DFT-s-OFDM 64 QAM	1@214	20.7	20.73	0.1183

7	15	40	504000	2520	DFT-s-OFDM 256 QAM	108@54	18.34	18.37	0.0687
7	15	40	504000	2520	DFT-s-OFDM 256 QAM	1@1	18.34	18.37	0.0687
7	15	40	504000	2520	DFT-s-OFDM 256 QAM	1@214	18.22	18.25	0.0668
7	15	40	504000	2520	CP-OFDM QPSK	108@54	21.53	21.56	0.1432
7	15	40	504000	2520	CP-OFDM QPSK	1@1	21.66	21.69	0.1476
7	15	40	504000	2520	CP-OFDM QPSK	1@214	21.7	21.73	0.1489
7	15	40	507000	2535	DFT-s-OFDM PI/2 BPSK	108@54	23.07	23.1	0.2042
7	15	40	507000	2535	DFT-s-OFDM PI/2 BPSK	1@1	22.96	22.99	0.1991
7	15	40	507000	2535	DFT-s-OFDM PI/2 BPSK	1@214	23.11	23.14	0.2061
7	15	40	507000	2535	DFT-s-OFDM QPSK	108@54	23.1	23.13	0.2056
7	15	40	507000	2535	DFT-s-OFDM QPSK	1@1	23.2	23.23	0.2104
7	15	40	507000	2535	DFT-s-OFDM QPSK	1@214	23.32	23.35	0.2163
7	15	40	507000	2535	DFT-s-OFDM 16 QAM	108@54	22.15	22.18	0.1652
7	15	40	507000	2535	DFT-s-OFDM 16 QAM	1@1	22.18	22.21	0.1663
7	15	40	507000	2535	DFT-s-OFDM 16 QAM	1@214	22.38	22.41	0.1742
7	15	40	507000	2535	DFT-s-OFDM 64 QAM	108@54	20.62	20.65	0.1161
7	15	40	507000	2535	DFT-s-OFDM 64 QAM	1@1	20.7	20.73	0.1183
7	15	40	507000	2535	DFT-s-OFDM 64 QAM	1@214	20.88	20.91	0.1233
7	15	40	507000	2535	DFT-s-OFDM 256 QAM	108@54	18.25	18.28	0.0673
7	15	40	507000	2535	DFT-s-OFDM 256 QAM	1@1	18.12	18.15	0.0653
7	15	40	507000	2535	DFT-s-OFDM 256 QAM	1@214	18.19	18.22	0.0664
7	15	40	507000	2535	CP-OFDM QPSK	108@54	21.47	21.5	0.1413
7	15	40	507000	2535	CP-OFDM QPSK	1@1	21.67	21.7	0.1479
7	15	40	507000	2535	CP-OFDM QPSK	1@214	21.67	21.7	0.1479
7	15	40	510000	2550	DFT-s-OFDM PI/2 BPSK	108@54	23.17	23.2	0.2089
7	15	40	510000	2550	DFT-s-OFDM PI/2 BPSK	1@1	23.01	23.04	0.2014
7	15	40	510000	2550	DFT-s-OFDM PI/2 BPSK	1@214	23.06	23.09	0.2037

7	15	40	510000	2550	DFT-s-OFDM QPSK	108@54	23.15	23.18	0.2080
7	15	40	510000	2550	DFT-s-OFDM QPSK	1@1	23.15	23.18	0.2080
7	15	40	510000	2550	DFT-s-OFDM QPSK	1@214	23.33	23.36	0.2168
7	15	40	510000	2550	DFT-s-OFDM 16 QAM	108@54	22.27	22.3	0.1698
7	15	40	510000	2550	DFT-s-OFDM 16 QAM	1@1	22.2	22.23	0.1671
7	15	40	510000	2550	DFT-s-OFDM 16 QAM	1@214	22.39	22.42	0.1746
7	15	40	510000	2550	DFT-s-OFDM 64 QAM	108@54	20.73	20.76	0.1191
7	15	40	510000	2550	DFT-s-OFDM 64 QAM	1@1	20.7	20.73	0.1183
7	15	40	510000	2550	DFT-s-OFDM 64 QAM	1@214	20.84	20.87	0.1222
7	15	40	510000	2550	DFT-s-OFDM 256 QAM	108@54	18.4	18.43	0.0697
7	15	40	510000	2550	DFT-s-OFDM 256 QAM	1@1	18.21	18.24	0.0667
7	15	40	510000	2550	DFT-s-OFDM 256 QAM	1@214	18.15	18.18	0.0658
7	15	40	510000	2550	CP-OFDM QPSK	108@54	21.62	21.65	0.1462
7	15	40	510000	2550	CP-OFDM QPSK	1@1	21.54	21.57	0.1435
7	15	40	510000	2550	CP-OFDM QPSK	1@214	21.3	21.33	0.1358

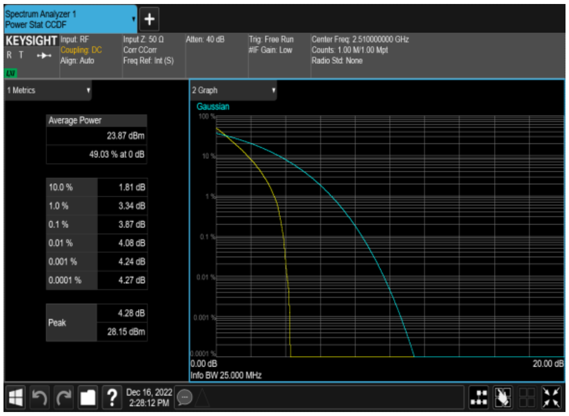
Frequency Stability

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Deviation (ppm)	Verdict	Environment
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0000	**PASS**	NV
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0016	**PASS**	LV
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0027	**PASS**	HV
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0013	**PASS**	-30℃
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0030	**PASS**	-20℃
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0010	**PASS**	-10℃
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0008	**PASS**	0℃
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0001	**PASS**	10℃
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0000	**PASS**	20℃
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0022	**PASS**	30℃
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0012	**PASS**	40℃
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0013	**PASS**	50℃

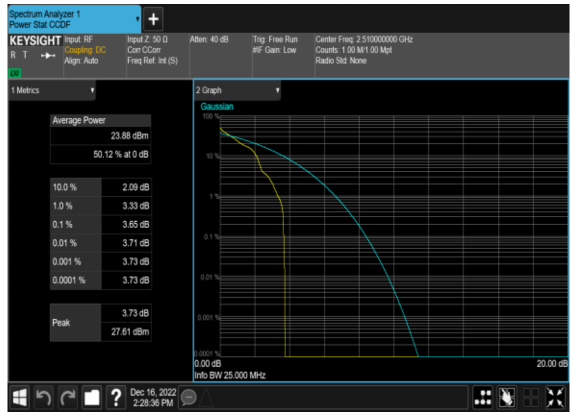
Peak to Average Ratio

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Result (dB)	Limit (dB)	Verdict
7	15	20	502000	2510.0	DFT-s-OFDM PI/2 BPSK	100@0	3.87	13	**PASS**
7	15	20	502000	2510.0	DFT-s-OFDM PI/2 BPSK	1@0	3.65	13	**PASS**
7	15	20	502000	2510.0	DFT-s-OFDM QPSK	100@0	5.25	13	**PASS**
7	15	20	502000	2510.0	DFT-s-OFDM QPSK	1@0	5.09	13	**PASS**
7	15	20	507000	2535.0	DFT-s-OFDM PI/2 BPSK	100@0	4.16	13	**PASS**
7	15	20	507000	2535.0	DFT-s-OFDM PI/2 BPSK	1@0	3.54	13	**PASS**
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	5.36	13	**PASS**
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	1@0	5.21	13	**PASS**
7	15	20	512000	2560.0	DFT-s-OFDM PI/2 BPSK	100@0	3.91	13	**PASS**
7	15	20	512000	2560.0	DFT-s-OFDM PI/2 BPSK	1@0	3.63	13	**PASS**
7	15	20	512000	2560.0	DFT-s-OFDM QPSK	100@0	5.03	13	**PASS**
7	15	20	512000	2560.0	DFT-s-OFDM QPSK	1@0	5.11	13	**PASS**

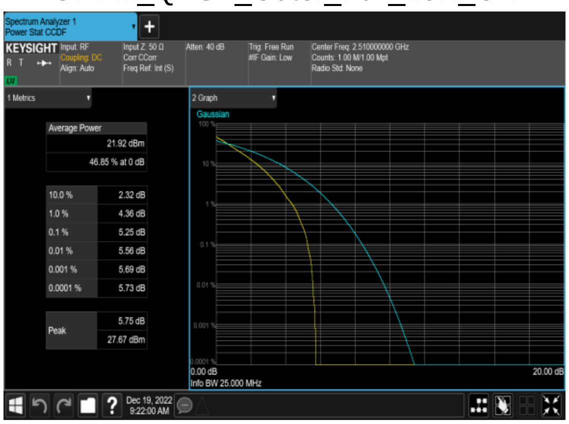
N7(20M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_Low_CH



N7(20M)_DFT-s-OFDM_PI_2-BPSK_Edge_1RB_Left_Low_CH

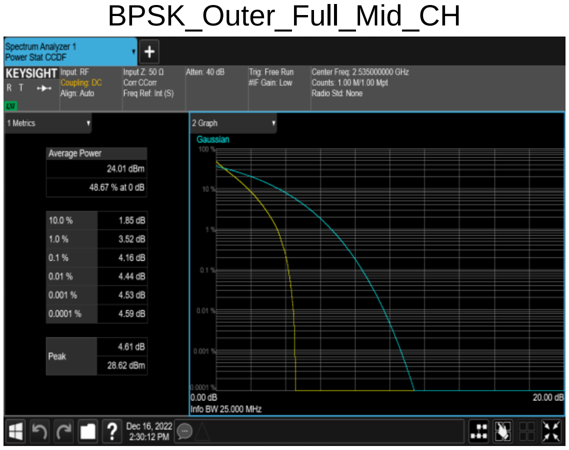


N7(20M)_DFT-s-OFDM_QPSK_Outer_Full_Low_CH

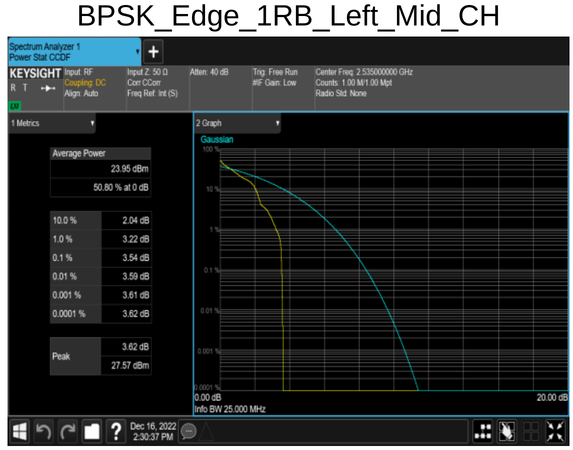


N7(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low_CH

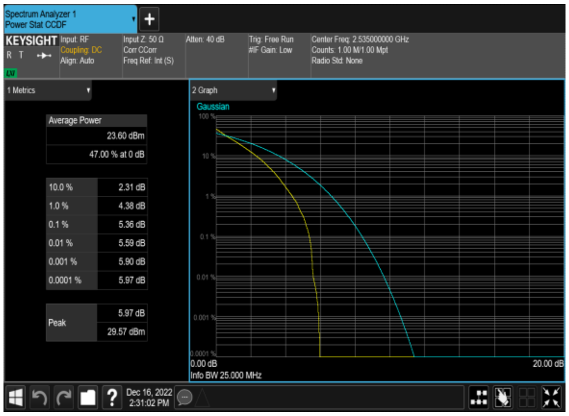
N7(20M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_Mid_CH



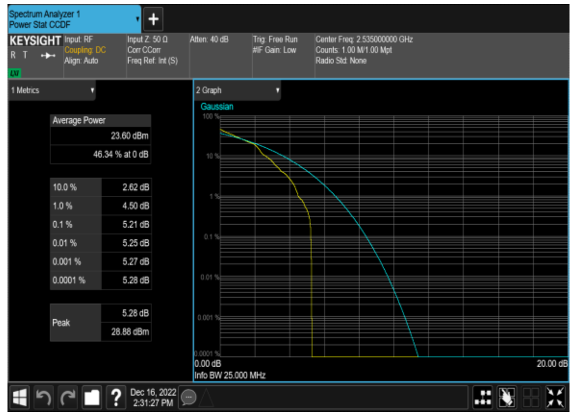
N7(20M)_DFT-s-OFDM_PI_2-BPSK_Edge_1RB_Left_Mid_CH



N7(20M)_DFT-s-OFDM_QPSK_Outer_Full_Mid_CH



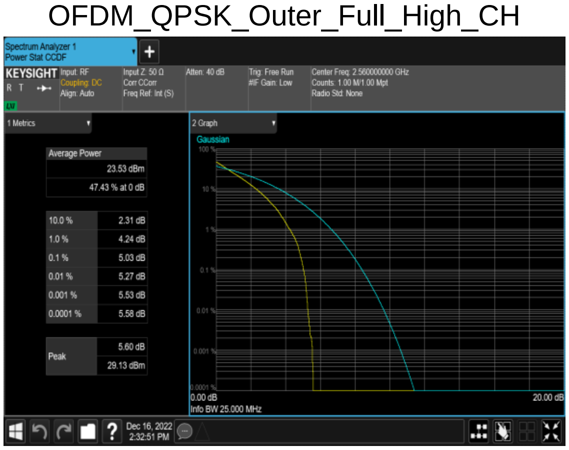
N7(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Mid_CH



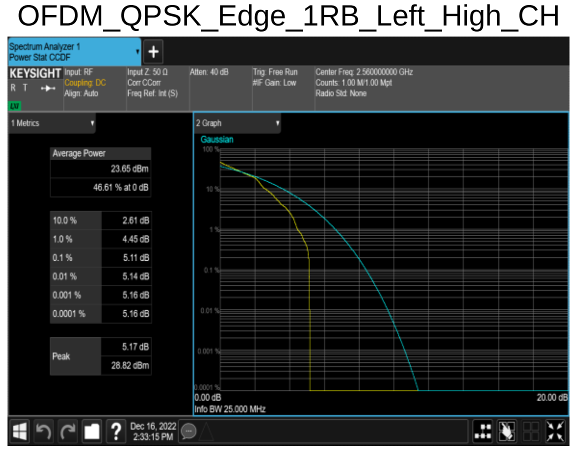
N7(20M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_High_CH

N7(20M)_DFT-s-OFDM_PI_2-BPSK_Edge_1RB_Left_High_CH

N7(20M)_DFT-s-OFDM_QPSK_Outer_Full_High_CH



N7(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_High_CH

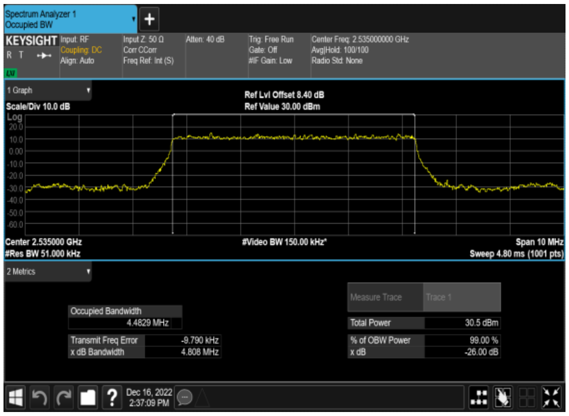


Occupied Bandwidth

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	OBW (MHz)	26dB BW (MHz)
7	15	5	507000	2535.0	DFT-s-OFDM PI/2 BPSK	25@0	4.4829	4.808
7	15	5	507000	2535.0	DFT-s-OFDM QPSK	25@0	4.4718	4.919
7	15	5	507000	2535.0	CP-OFDM QPSK	25@0	4.4637	4.852
7	15	5	507000	2535.0	CP-OFDM 16 QAM	25@0	4.4947	4.98
7	15	5	507000	2535.0	CP-OFDM 64 QAM	25@0	4.4582	4.879
7	15	5	507000	2535.0	CP-OFDM 256 QAM	25@0	4.4813	4.901
7	15	10	507000	2535.0	DFT-s-OFDM PI/2 BPSK	50@0	8.9033	9.45
7	15	10	507000	2535.0	DFT-s-OFDM QPSK	50@0	8.9258	9.527
7	15	10	507000	2535.0	CP-OFDM QPSK	52@0	9.2867	9.87
7	15	10	507000	2535.0	CP-OFDM 16 QAM	52@0	9.3039	9.82
7	15	10	507000	2535.0	CP-OFDM 64 QAM	52@0	9.2782	9.808
7	15	10	507000	2535.0	CP-OFDM 256 QAM	52@0	9.2817	9.896
7	15	15	507000	2535.0	DFT-s-OFDM PI/2 BPSK	75@0	13.383	14.11
7	15	15	507000	2535.0	DFT-s-OFDM QPSK	75@0	13.394	14.08
7	15	15	507000	2535.0	CP-OFDM QPSK	79@0	14.094	14.74
7	15	15	507000	2535.0	CP-OFDM 16 QAM	79@0	14.089	14.78
7	15	15	507000	2535.0	CP-OFDM 64 QAM	79@0	14.14	14.77
7	15	15	507000	2535.0	CP-OFDM 256 QAM	79@0	14.107	14.75
7	15	20	507000	2535.0	DFT-s-OFDM PI/2 BPSK	100@0	17.926	18.68
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	17.89	18.77
7	15	20	507000	2535.0	CP-OFDM QPSK	106@0	18.933	19.68
7	15	20	507000	2535.0	CP-OFDM 16 QAM	106@0	18.99	20.59
7	15	20	507000	2535.0	CP-OFDM 64 QAM	106@0	18.898	19.66
7	15	20	507000	2535.0	CP-OFDM 256 QAM	106@0	18.944	19.64

7	15	25	507000	2535.0	DFT-s-OFDM PI/2 BPSK	128@0	22.907	23.75
7	15	25	507000	2535.0	DFT-s-OFDM QPSK	128@0	22.858	23.72
7	15	25	507000	2535.0	CP-OFDM QPSK	133@0	23.749	24.68
7	15	25	507000	2535.0	CP-OFDM 16 QAM	133@0	23.786	24.74
7	15	25	507000	2535.0	CP-OFDM 64 QAM	133@0	23.769	24.7
7	15	25	507000	2535.0	CP-OFDM 256 QAM	133@0	23.766	24.64
7	15	30	507000	2535.0	DFT-s-OFDM PI/2 BPSK	160@0	28.595	29.59
7	15	30	507000	2535.0	DFT-s-OFDM QPSK	160@0	28.628	29.59
7	15	30	507000	2535.0	CP-OFDM QPSK	160@0	28.58	29.62
7	15	30	507000	2535.0	CP-OFDM 16 QAM	160@0	28.584	29.61
7	15	30	507000	2535.0	CP-OFDM 64 QAM	160@0	28.642	31.17
7	15	30	507000	2535.0	CP-OFDM 256 QAM	160@0	28.56	29.59
7	15	40	507000	2535.0	DFT-s-OFDM PI/2 BPSK	216@0	38.598	39.85
7	15	40	507000	2535.0	DFT-s-OFDM QPSK	216@0	38.588	39.95
7	15	40	507000	2535.0	CP-OFDM QPSK	216@0	38.542	39.86
7	15	40	507000	2535.0	CP-OFDM 16 QAM	216@0	38.558	39.94
7	15	40	507000	2535.0	CP-OFDM 64 QAM	216@0	38.644	39.86
7	15	40	507000	2535.0	CP-OFDM 256 QAM	216@0	38.558	39.83

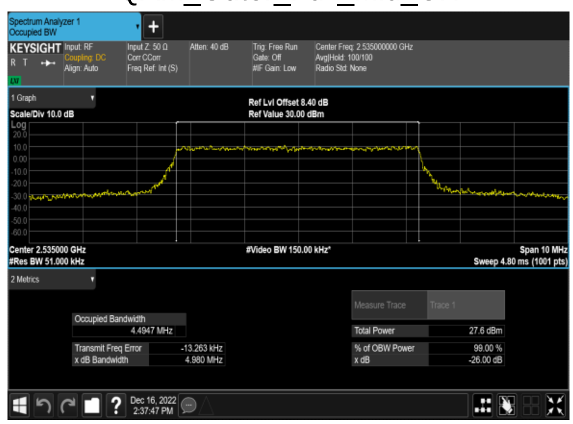
N7(5M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_Mid_CH



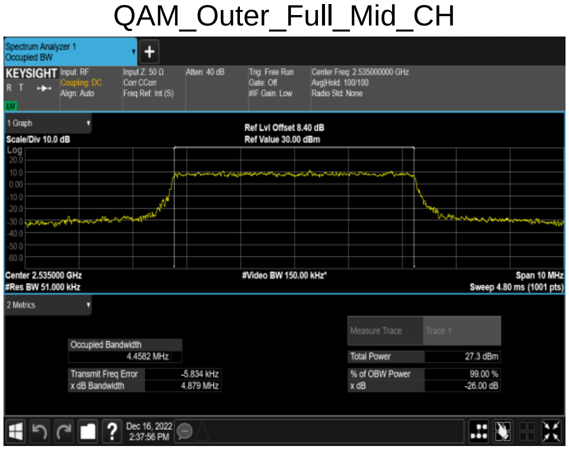
N7(5M)_DFT-s-OFDM_QPSK_Outer_Full_Mid_CH

N7(5M)_CP-OFDM_QPSK_Outer_Full_Mid_CH

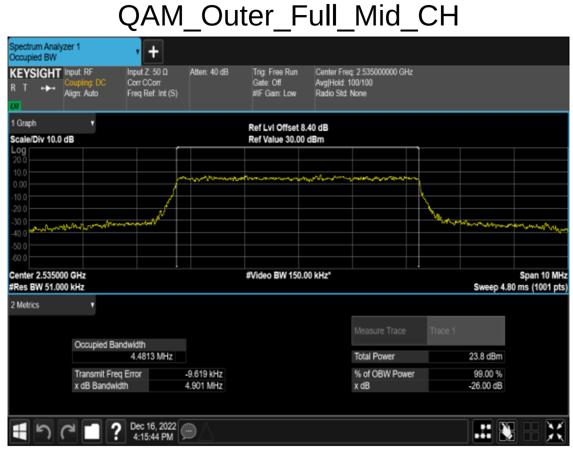
N7(5M)_CP-OFDM_16 QAM_Outer_Full_Mid_CH



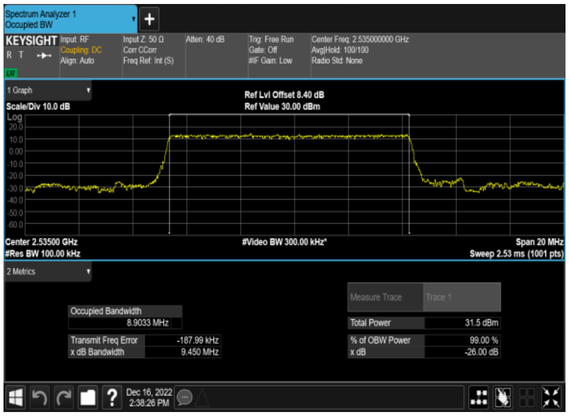
N7(5M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH



N7(5M)_CP-OFDM_256 QAM_Outer_Full_Mid_CH



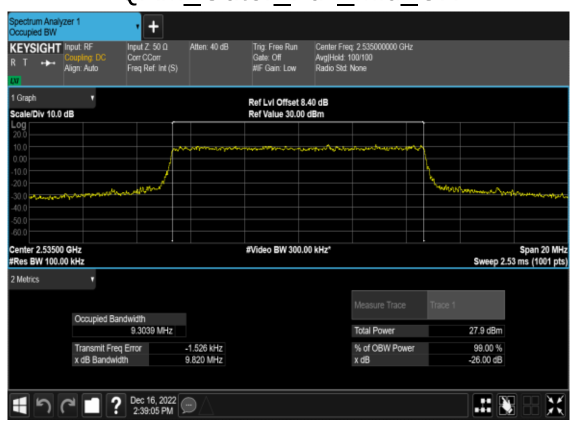
N7(10M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_Mid_CH



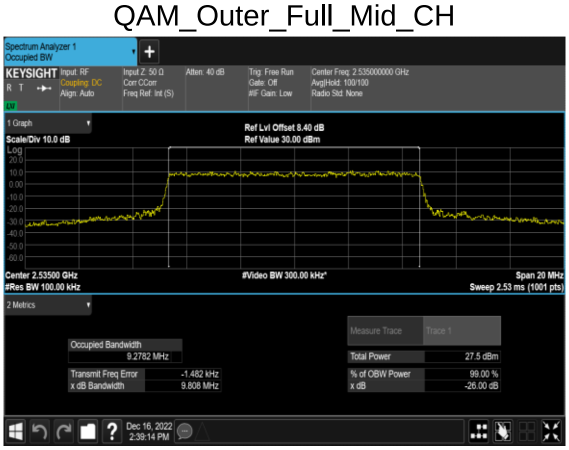
N7(10M)_DFT-s-OFDM_QPSK_Outer_Full_Mid_CH

N7(10M)_CP-OFDM_QPSK_Outer_Full_Mid_CH

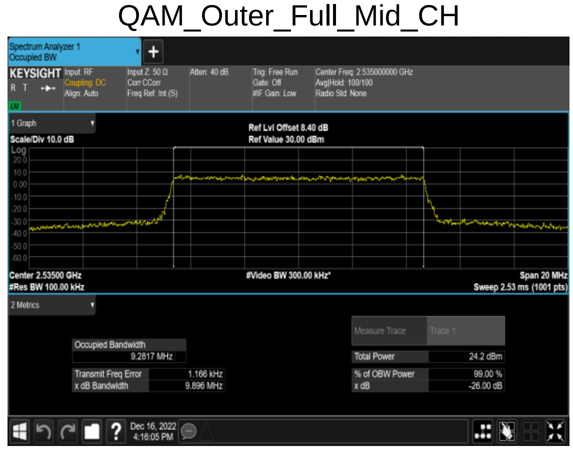
N7(10M)_CP-OFDM_16 QAM_Outer_Full_Mid_CH



N7(10M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH



N7(10M)_CP-OFDM_256 QAM_Outer_Full_Mid_CH

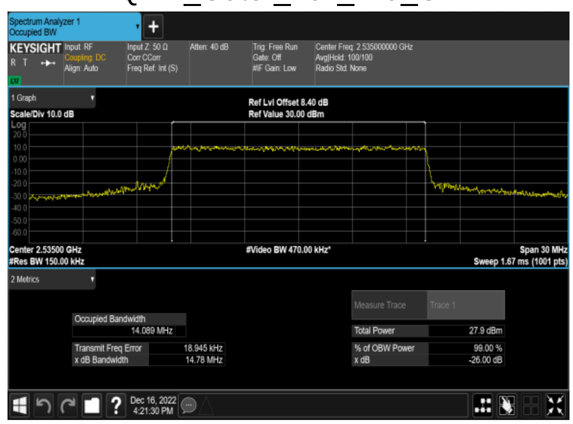


N7(15M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_Mid_CH

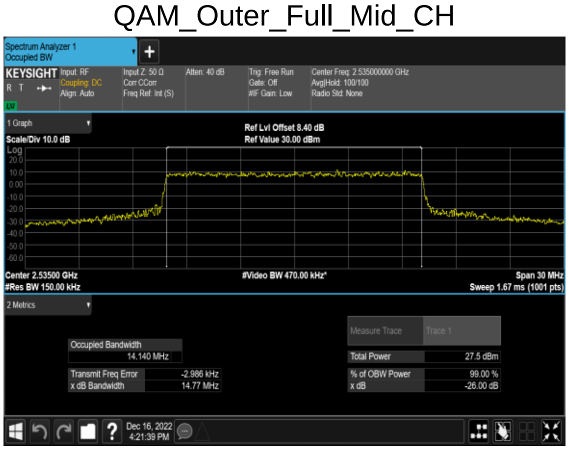
N7(15M)_DFT-s-OFDM_QPSK_Outer_Full_Mid_CH

N7(15M)_CP-OFDM_QPSK_Outer_Full_Mid_CH

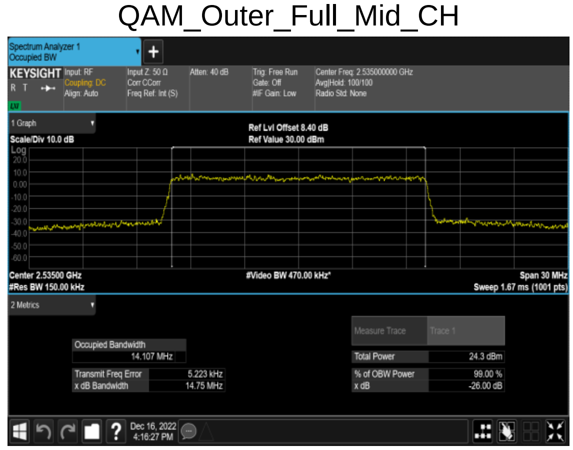
N7(15M)_CP-OFDM_16 QAM_Outer_Full_Mid_CH



N7(15M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH



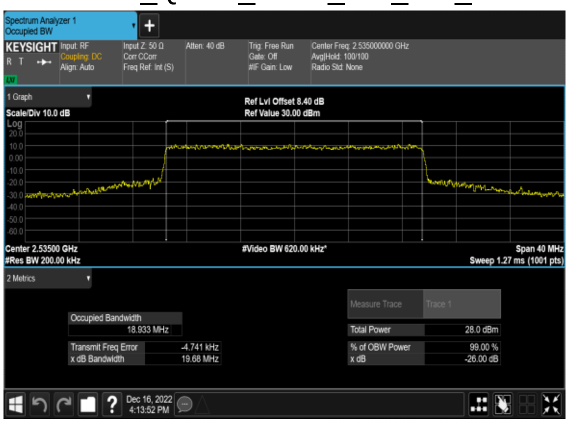
N7(15M)_CP-OFDM_256 QAM_Outer_Full_Mid_CH



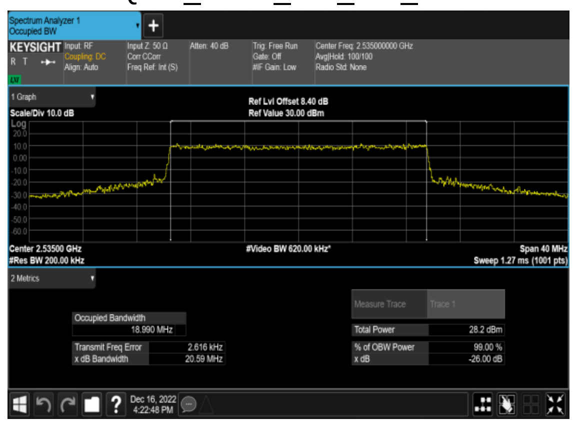
N7(20M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_Mid_CH

N7(20M)_DFT-s-OFDM_QPSK_Outer_Full_Mid_CH

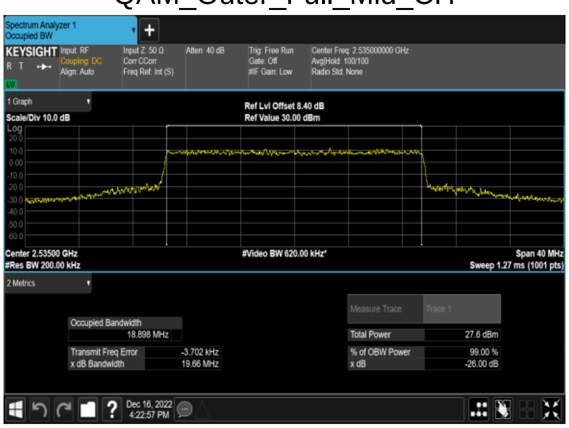
N7(20M)_CP-OFDM_QPSK_Outer_Full_Mid_CH



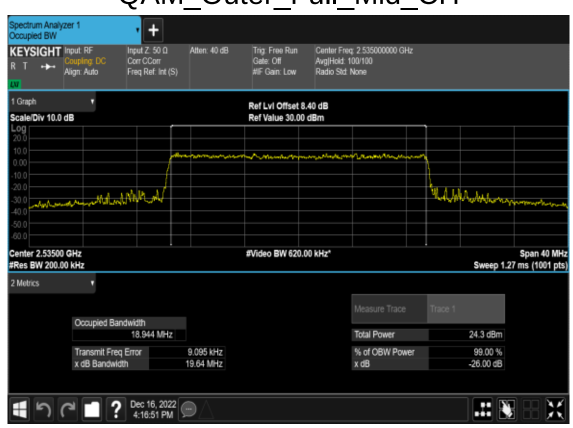
N7(20M)_CP-OFDM_16 QAM_Outer_Full_Mid_CH



N7(20M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH



N7(20M)_CP-OFDM_256 QAM_Outer_Full_Mid_CH

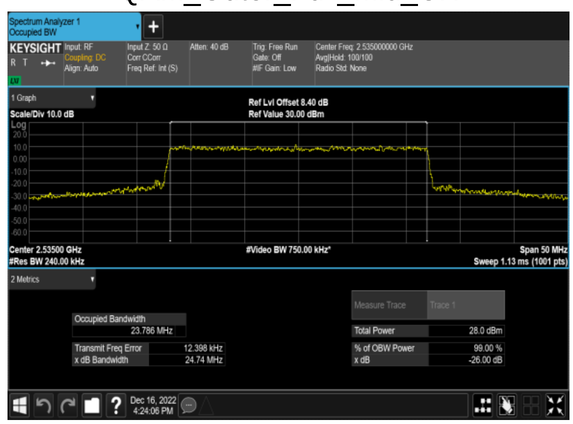


N7(25M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_Mid_CH

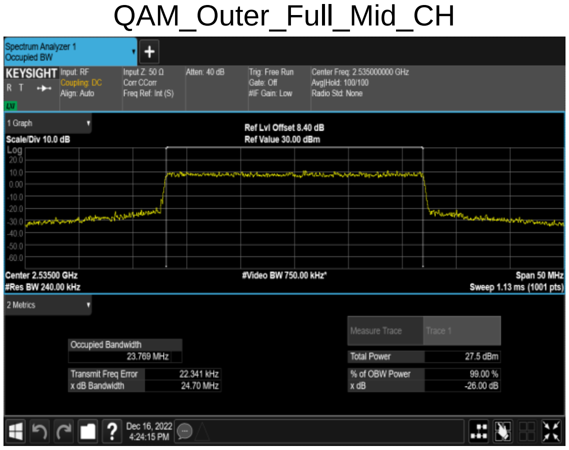
N7(25M)_DFT-s-OFDM_QPSK_Outer_Full_Mid_CH

N7(25M)_CP-OFDM_QPSK_Outer_Full_Mid_CH

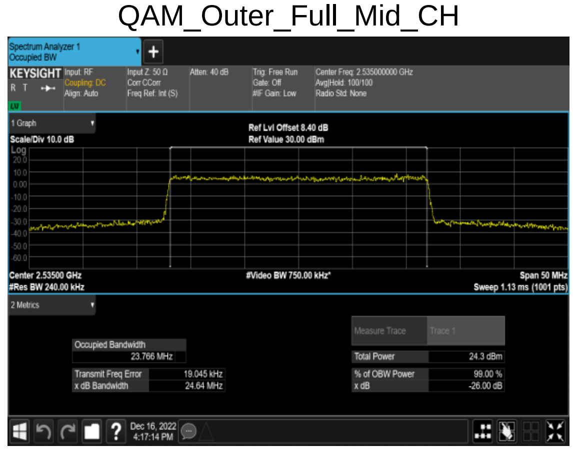
N7(25M)_CP-OFDM_16 QAM_Outer_Full_Mid_CH



N7(25M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH



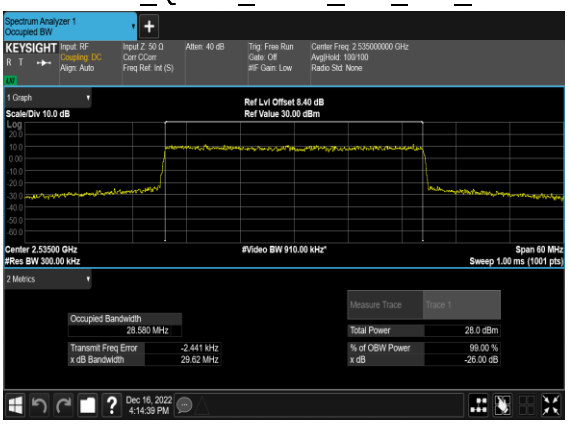
N7(25M)_CP-OFDM_256 QAM_Outer_Full_Mid_CH



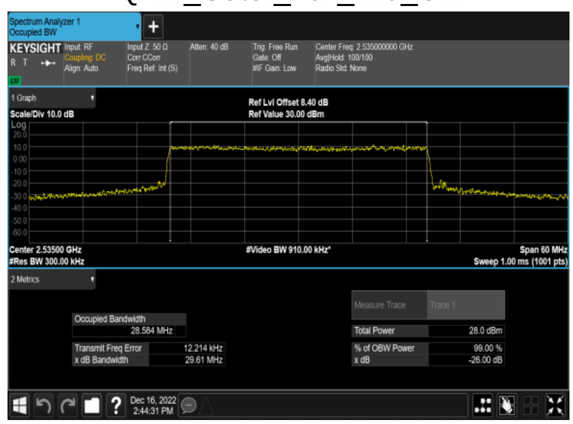
N7(30M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_Mid_CH

N7(30M)_DFT-s-OFDM_QPSK_Outer_Full_Mid_CH

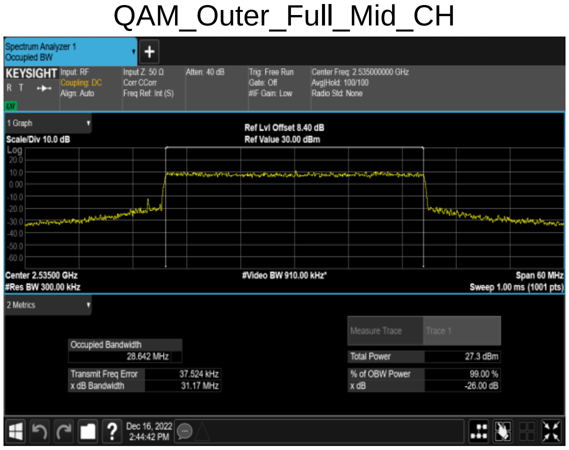
N7(30M)_CP-OFDM_QPSK_Outer_Full_Mid_CH



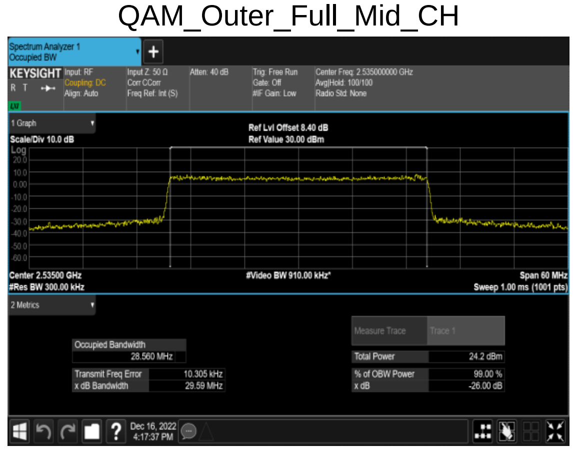
N7(30M)_CP-OFDM_16 QAM_Outer_Full_Mid_CH



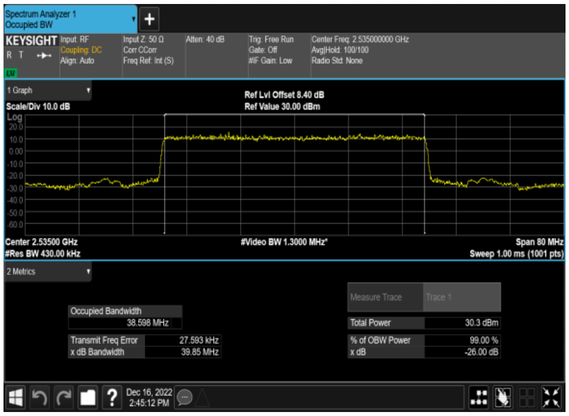
N7(30M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH



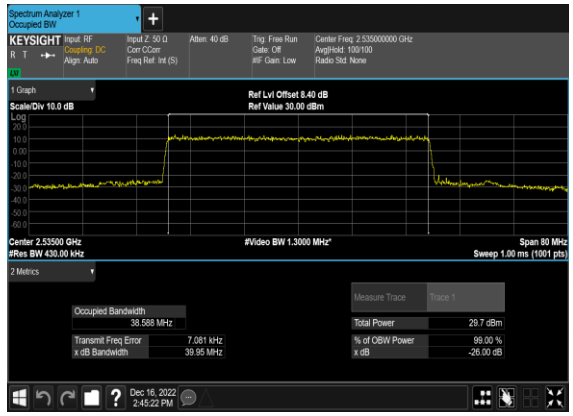
N7(30M)_CP-OFDM_256 QAM_Outer_Full_Mid_CH



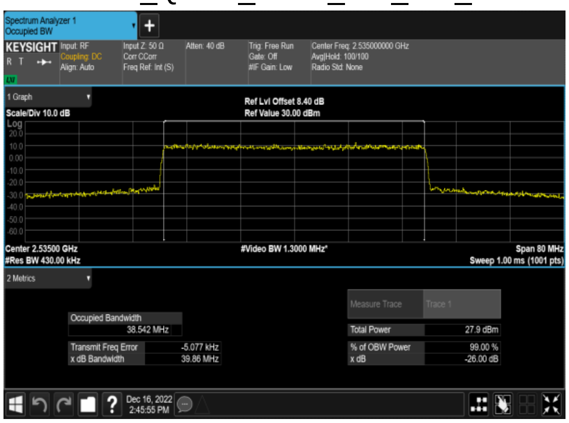
N7(40M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_Mid_CH



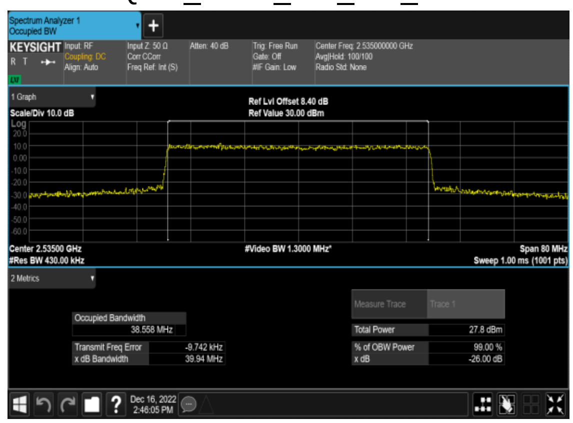
N7(40M)_DFT-s-OFDM_QPSK_Outer_Full_Mid_CH



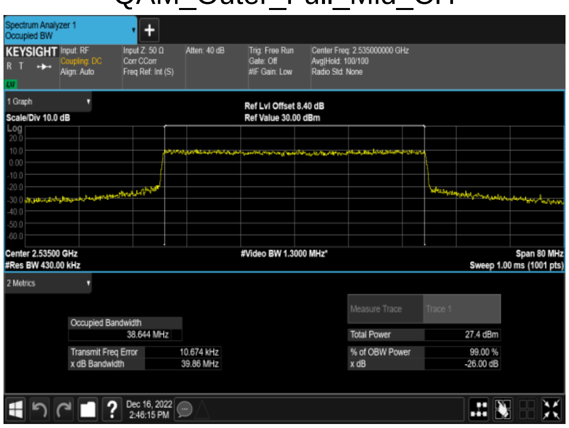
N7(40M)_CP-OFDM_QPSK_Outer_Full_Mid_CH



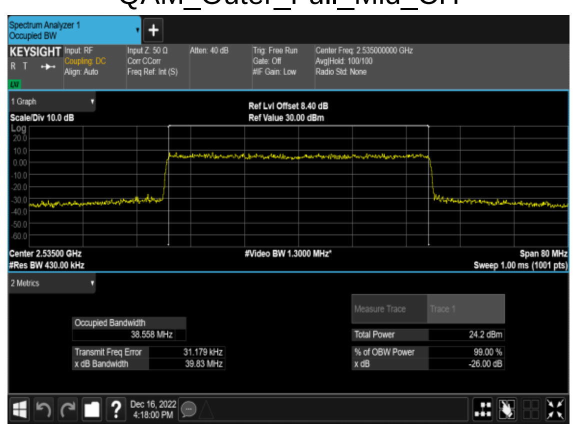
N7(40M)_CP-OFDM_16 QAM_Outer_Full_Mid_CH



N7(40M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH



N7(40M)_CP-OFDM_256 QAM_Outer_Full_Mid_CH



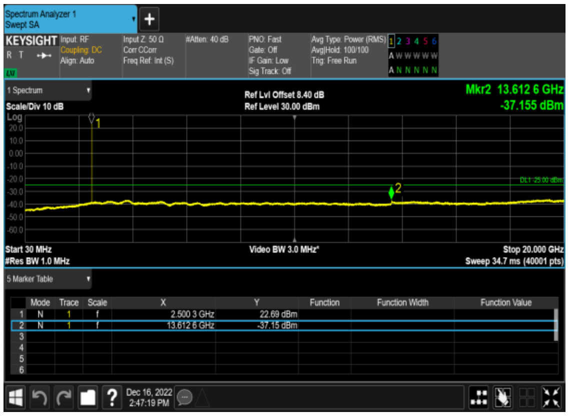
Conducted Spurious Emissions

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Result	Verdict
7	15	5	500500	2502.5	DFT-s-OFDM BPSK	1@0	see graph	**---**
7	15	5	500500	2502.5	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	5	500500	2502.5	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	5	500500	2502.5	DFT-s-OFDM QPSK	1@0	see graph	**---**
7	15	5	500500	2502.5	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	5	500500	2502.5	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	5	507000	2535.0	DFT-s-OFDM BPSK	1@0	see graph	**---**
7	15	5	507000	2535.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	5	507000	2535.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	5	507000	2535.0	DFT-s-OFDM QPSK	1@0	see graph	**---**
7	15	5	507000	2535.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	5	507000	2535.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	5	513500	2567.5	DFT-s-OFDM BPSK	1@0	see graph	**---**
7	15	5	513500	2567.5	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	5	513500	2567.5	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	5	513500	2567.5	DFT-s-OFDM QPSK	1@0	see graph	**---**
7	15	5	513500	2567.5	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	5	513500	2567.5	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	20	502000	2510.0	DFT-s-OFDM BPSK	1@0	see graph	**---**
7	15	20	502000	2510.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	20	502000	2510.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	20	502000	2510.0	DFT-s-OFDM QPSK	1@0	see graph	**---**

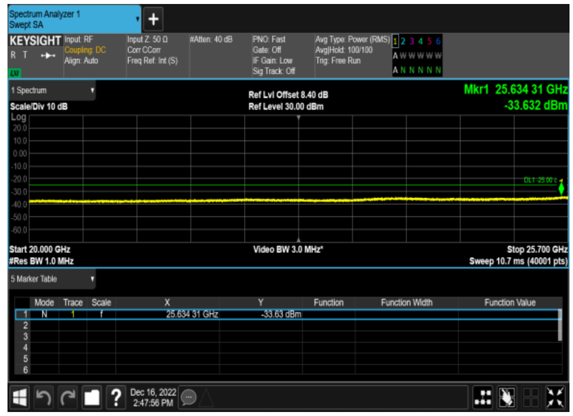
7	15	20	502000	2510.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	20	502000	2510.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	20	507000	2535.0	DFT-s-OFDM BPSK	1@0	see graph	**---**
7	15	20	507000	2535.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	20	507000	2535.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	1@0	see graph	**---**
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	20	512000	2560.0	DFT-s-OFDM BPSK	1@0	see graph	**---**
7	15	20	512000	2560.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	20	512000	2560.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	20	512000	2560.0	DFT-s-OFDM QPSK	1@0	see graph	**---**
7	15	20	512000	2560.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	20	512000	2560.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	40	504000	2520.0	DFT-s-OFDM BPSK	1@0	see graph	**---**
7	15	40	504000	2520.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	40	504000	2520.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	40	504000	2520.0	DFT-s-OFDM QPSK	1@0	see graph	**---**
7	15	40	504000	2520.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	40	504000	2520.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	40	507000	2535.0	DFT-s-OFDM BPSK	1@0	see graph	**---**
7	15	40	507000	2535.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	40	507000	2535.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	40	507000	2535.0	DFT-s-OFDM QPSK	1@0	see graph	**---**

7	15	40	507000	2535.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	40	507000	2535.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	40	510000	2550.0	DFT-s-OFDM BPSK	1@0	see graph	**---**
7	15	40	510000	2550.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	40	510000	2550.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	40	510000	2550.0	DFT-s-OFDM QPSK	1@0	see graph	**---**
7	15	40	510000	2550.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	40	510000	2550.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**

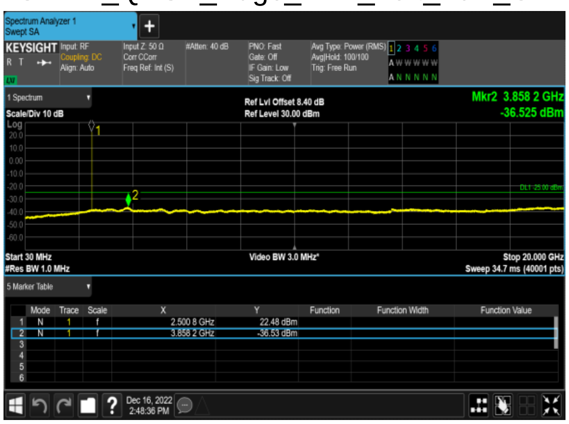
N7(5M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Low_CH



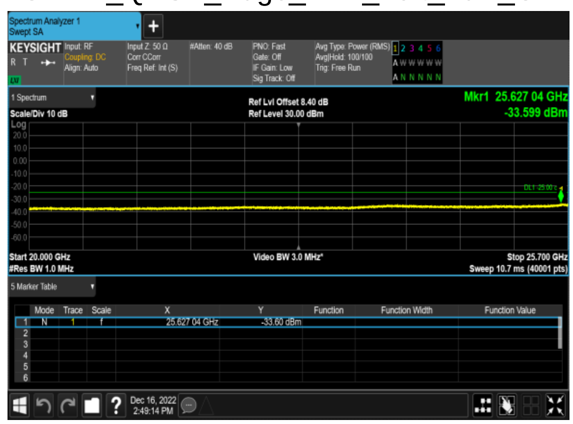
N7(5M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Low_CH



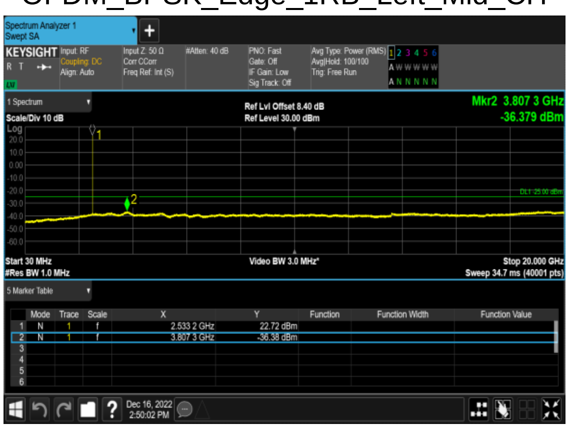
N7(5M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low_CH



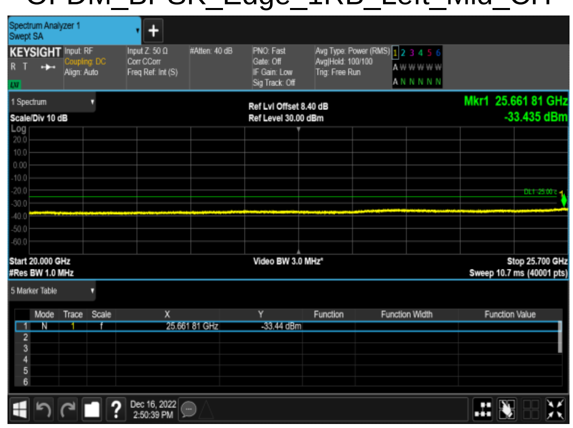
N7(5M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low_CH



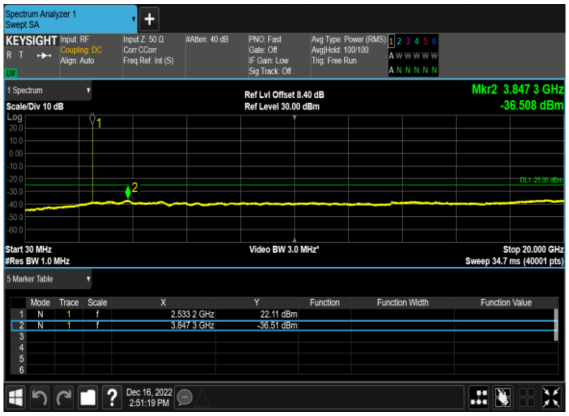
N7(5M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH



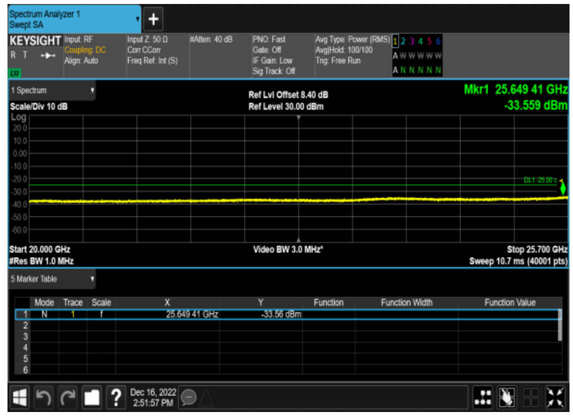
N7(5M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH



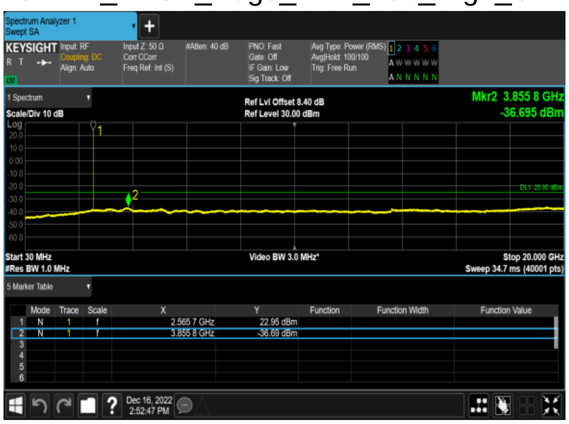
N7(5M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Mid_CH



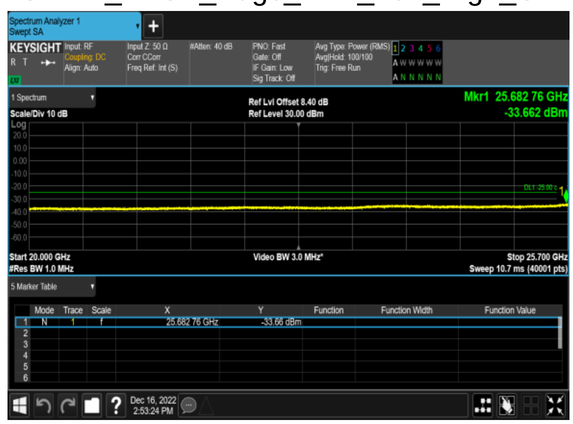
N7(5M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Mid_CH



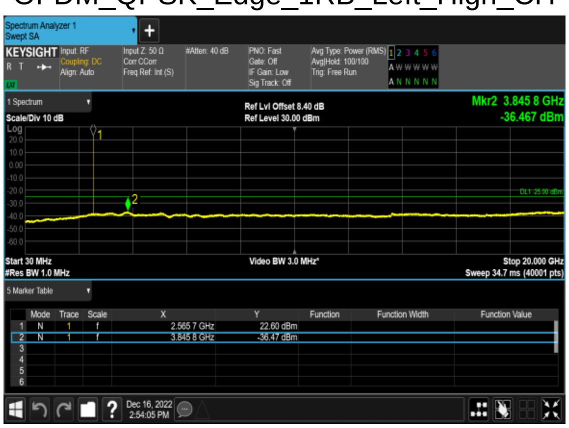
N7(5M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_High_CH



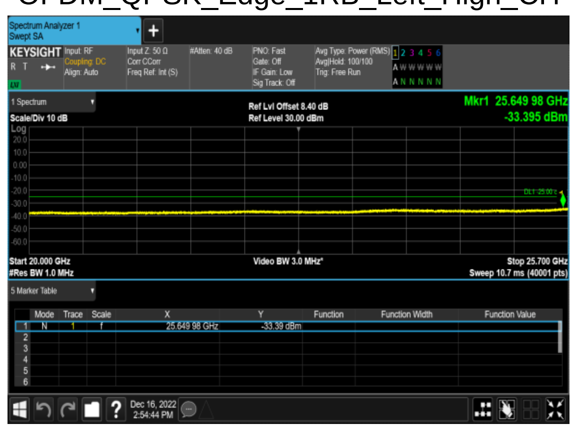
N7(5M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_High_CH



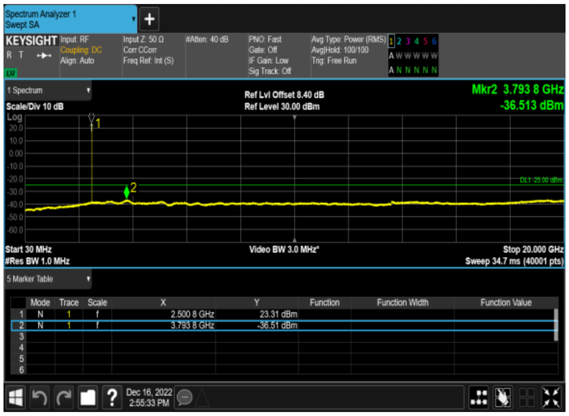
N7(5M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_High_CH



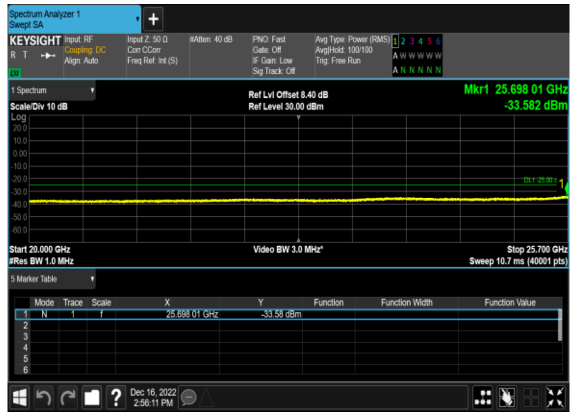
N7(5M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_High_CH



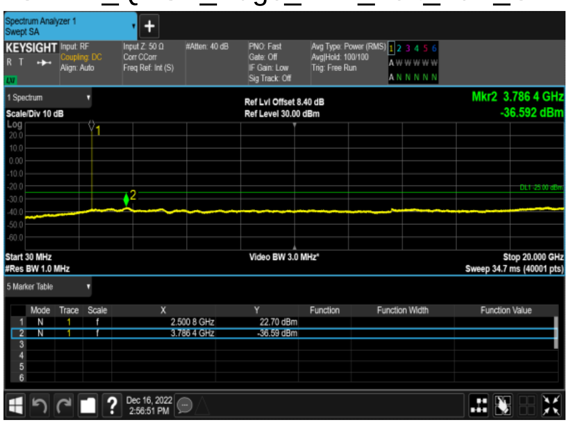
N7(20M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Low_CH



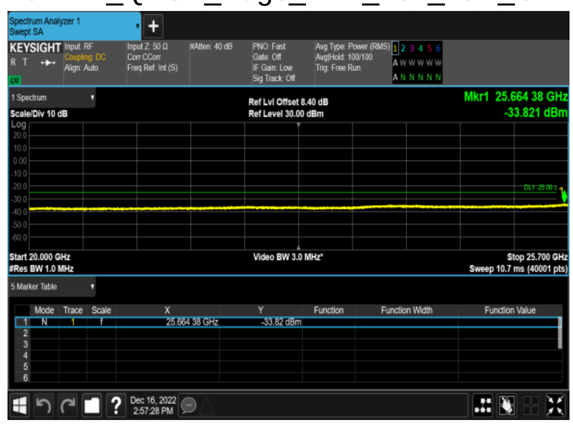
N7(20M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Low_CH



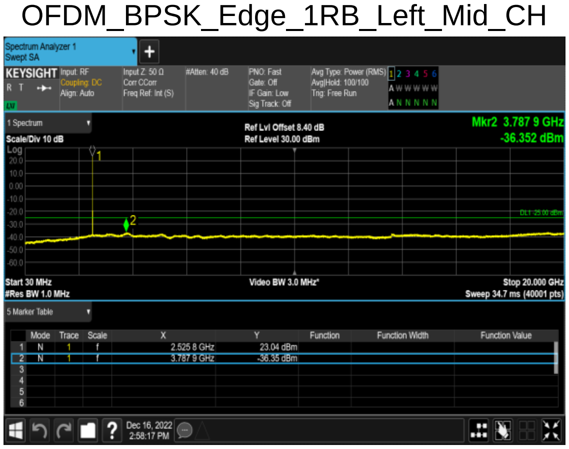
N7(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low_CH



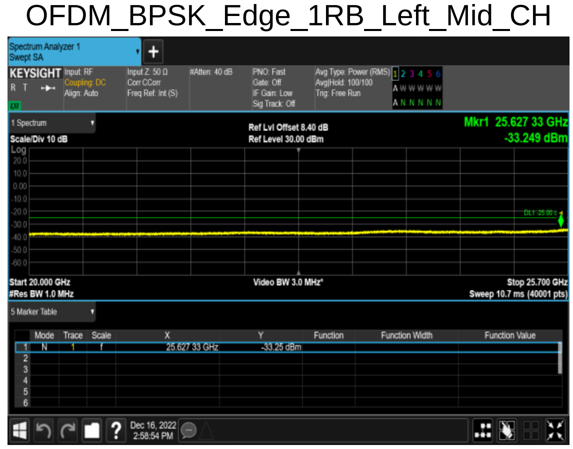
N7(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low_CH



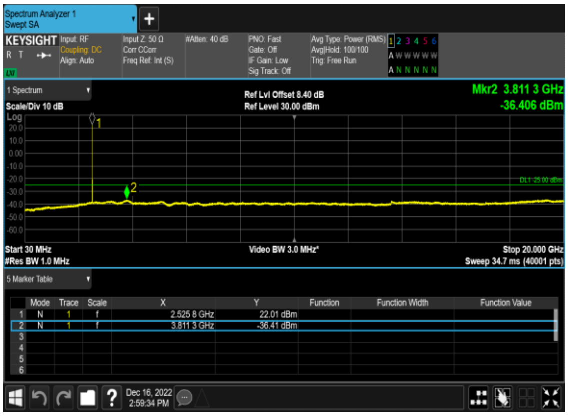
N7(20M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH



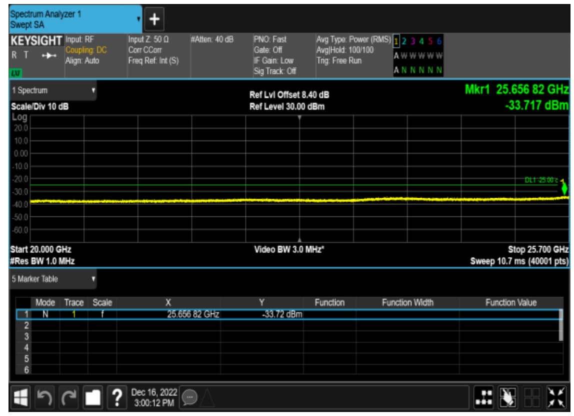
N7(20M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH



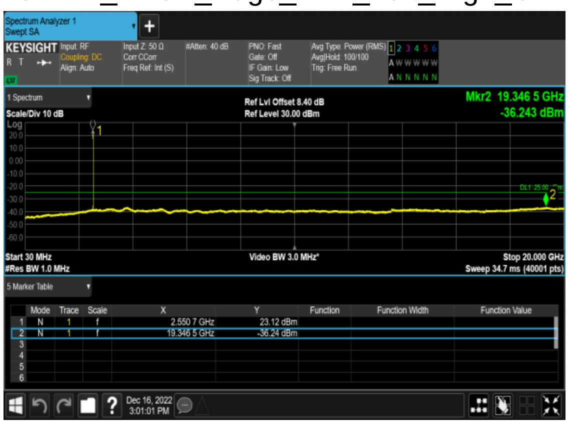
N7(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Mid_CH



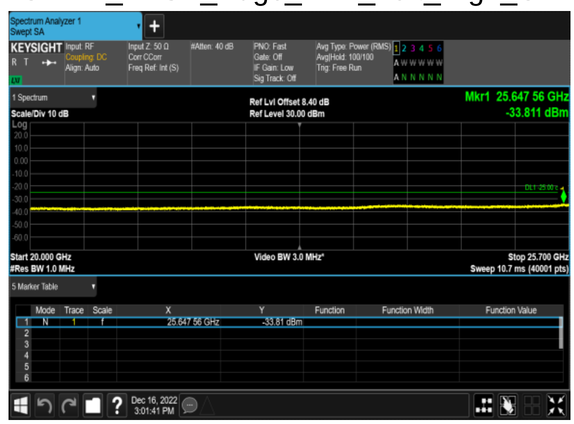
N7(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Mid_CH



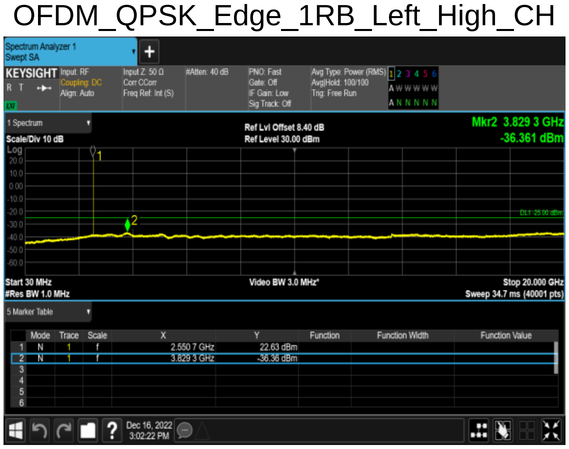
N7(20M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_High_CH



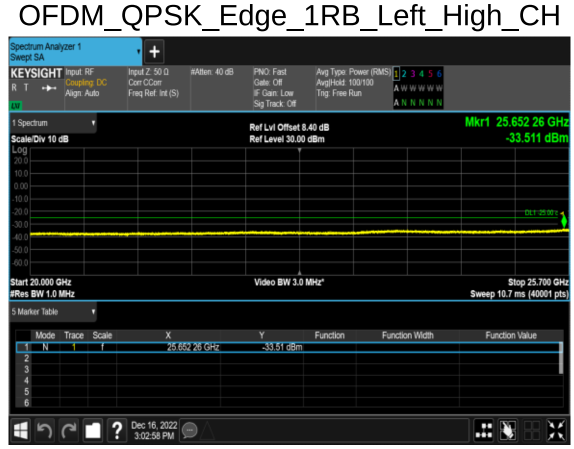
N7(20M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_High_CH



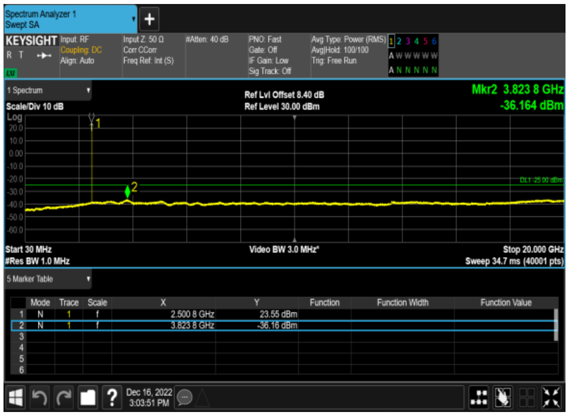
N7(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_High_CH



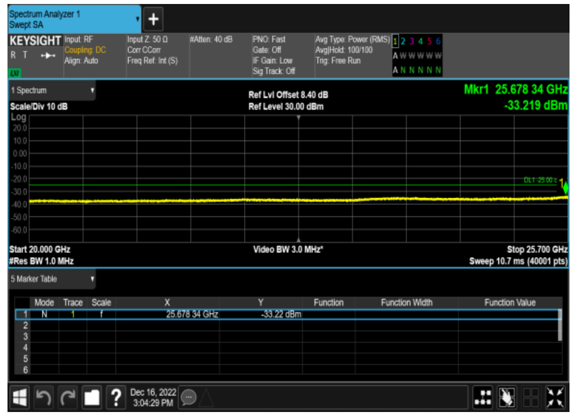
N7(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_High_CH



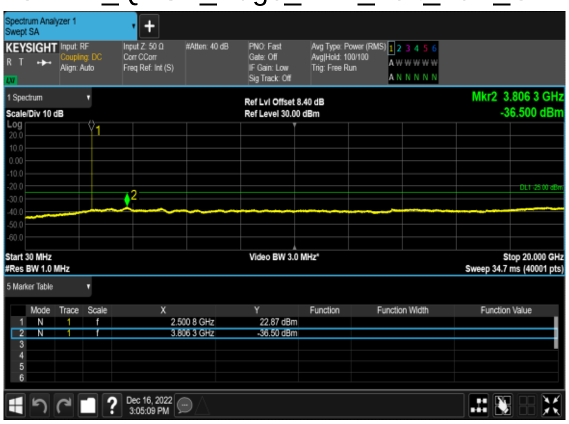
N7(40M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Low_CH



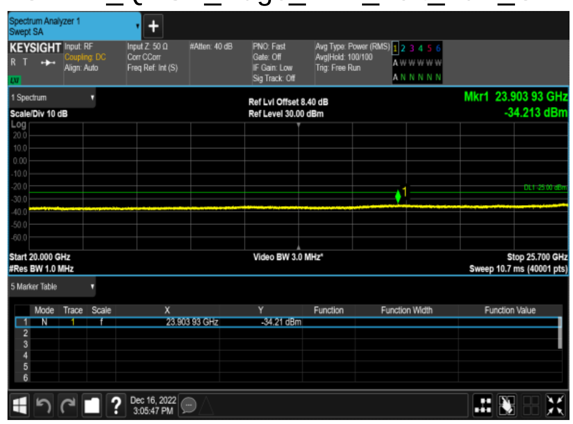
N7(40M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Low_CH



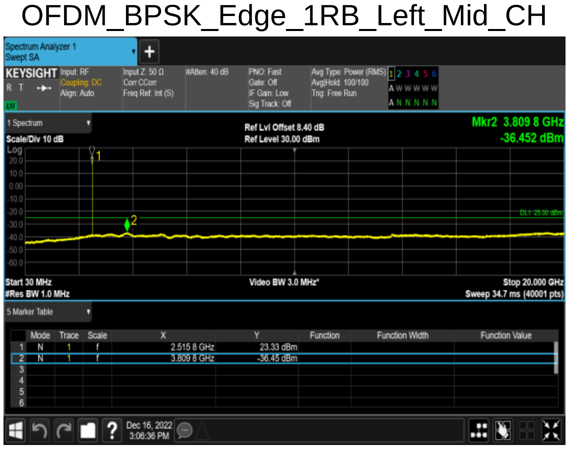
N7(40M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low_CH



N7(40M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low_CH



N7(40M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH



N7(40M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH