FCC RF Test Report

APPLICANT	**:**	**Nokia Shanghai Bell Co., Ltd.**
EQUIPMENT	**:**	**Nokia FastMile 5G Gateway 12**
BRAND NAME	**:**	**Nokia**
MODEL NAME	**:**	**5G31-03W-B**
FCC ID	**:**	**2ADZR5G3103WB**
STANDARD	**:**	**47 CFR Part 2, Part 27 Subpart Q**
CLASSIFICATION	**:**	**PCS Licensed Transmitter (PCB)**
TEST DATE(S)	**:**	**Apr. 04, 2024 ~ May 09, 2024**

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
FG432101N	Rev. 01	Initial issue of report	Jun. 21, 2024

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	—	Report Only	-
3.5	§27.50 (k)(4)	Peak-to-Average Ratio	<13dB	PASS	
3.6	§27.50 (k)(3)	EIRP	EIRP < 1W (30dBm)	PASS	-
3.7	§2.1049	Occupied Bandwidth	—	Report Only	-
3.8	§2.1051 §27.53 (n)(2)	Conducted Band Edge Measurement	-13dBm/MHz	PASS	-
3.9	§2.1051 §27.53 (n)(2)	Conducted Spurious Emission	-13dBm/MHz	PASS	-
3.10	§2.1055 §27.54	Frequency Stability Temperature & Voltage	Within the band	PASS	-
4.4	§2.1053 §27.53 (n)(2)	Radiated Spurious Emission	-13dBm/MHz	PASS	Under limit 22.27 dB at 6900.00 MHz

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section “Measurement Uncertainty”

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

1 General Description

1.1 Applicant

Nokia Shanghai Bell Co., Ltd.
388#, Ningqiao Road, China (Shanghai) Pilot Free Trade Zone, Shanghai 201206, China

1.2 Manufacturer

Nokia Solutions and Networks Oy
Karakaari 7, 02610 Espoo, Finland

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Nokia FastMile 5G Gateway 12
Brand Name	Nokia
Model Name	5G31-03W-B
FCC ID	2ADZR5G3103WB
SN / IMEI Code	Conducted: KLT241102369(SN) Radiation: 355630740001412(IMEI)
HW Version	3TG03021Exxx (x may be from A to Z)
SW Version	5GGW-QCOM7X_D240200B31T0601E0496
EUT Stage	Identical Prototype

Remark: There are three samples under test, only different for the antenna manufacturers as below. According to the difference, we choose sample 1 to full test and the sample 2/3 are verified the RSE worse cases of LTE/NR in another report.

Ant Description	P/N	Vendor_1	Vendor_2	Vendor_3
Ant0&WiFi3_2.4G	3TG03393AAAA	GW12-A0W3	N42NKASA-PK1-D1X95BUD150U4LI	NKH049-15-000-R
Ant1&WiFi2_6G	3TG03394AAAA	GW12-A1W2	N40NKASB-PK1-E1X190BUE110U4LI	NKH050-15-000-R
Ant 2,Ant3,Ant5,Ant7	3TG03395AAAA	GW12-A2357	N40NKASC-PK1-R150U4LID115U4LI E165U4LIA105U4LI	NKH051-15-000-R
Ant4,Ant6&Ant9	3TG03396AAAA	GW12-A469	N40NKASD-PK1-A135U4LID170U4LI E200U4LI	NKH052-15-000-R
WiFi1_6G	3TG03397AAAA	GW12-W1	N06NKASF-PK1-A1X95BU	NKH053-15-000-R
WiFi4_2.4G	3TG03398AAAA	GW12-W4	N01NKASG-PK1-R1X160BU	NKH054-15-000-R
WiFi5_5G	3TG03399AAAA	GW12-W5	N02NKASH-PK1-D1X90BU	NKH055-15-000-R
Ant8&WiFi6_5G	3TG03400AAAA	GW12-A8W6	N43NKASE-PK1-E1X95BUA165U4LI	NKH056-15-000-R
WiFi7_5G	3TG03401AAAA	GW12-W7	N02NKASJ-PK1-A1X95BU	NKH057-15-000-R
WiFi8_5G	3TG03402AAAA	GW12-W8	N02NKASK-PK1-R1X115BU	NKH058-15-000-R

1.4 Product Specification of Equipment Under Test

Product Feature	
Tx/Rx Frequency	5G NR n77: 3450 MHz ~ 3550 MHz
SCS	30kHz
Bandwidth	n77: 20 / 30 / 40 / 50 / 60 / 70 / 80 / 90 / 100MHz
Antenna Gain	**<Ant. 1>** 5G NR n77: 4.0 dBi **<MIMO Ant. 0+1>(See Remark2)** 5G NR n77: 1.7 dBi
Type of Modulation	CP-OFDM: QPSK / 16QAM / 64QAM / 256QAM DFT-s-OFDM: PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM

Remark:

1. 5G NR n77 supports SA&NSA mode work on Ant.1 and UL MIMO mode work on Ant.1+0. According to the maximum power between SA and NSA mode, NSA covers SA mode.
2. For UL MIMO mode, MIMO Antenna gain is calculated according to KDB 662911 D01.
3. For UL MIMO mode, the conducted BE/Spurious are tested at single antenna port and add 10*log(NANT) according to KDB 662911 D01.
4. 5G NR n77 supports SISO mode for Power class 2 and UL MIMO mode for Power class 1.5.
5. All the supported EN-DC combinations are verified conducted power, only the EN-DC combination with highest power are shown in the report.
6. 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 Maximum EIRP Power and Emission Designator

5G NR n77 SISO		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	3460.02 ~ 3540.00	0.9572	18M2G7D	0.7482	18M3W7D
30	3465.00 ~ 3534.99	0.9772	27M8G7D	0.7780	27M9W7D
40	3470.01 ~ 3529.98	0.9419	37M8G7D	0.7691	38M0W7D
50	3475.02 ~ 3525.00	0.9638	47M6G7D	0.7980	47M6W7D
60	3480.00 ~ 3519.99	0.9795	57M8G7D	0.7780	58M0W7D
70	3485.01 ~ 3514.98	0.9705	67M5G7D	0.7907	67M7W7D
80	3490.02 ~ 3510.00	0.9795	77M4G7D	0.7925	77M7W7D
90	3495.00 ~ 3504.99	0.9795	87M6G7D	0.8054	87M7W7D
100	3500.01	0.9863	97M6G7D	0.8091	97M7W7D

5G NR n77 UL MIMO		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	3460.02 ~ 3540.00	0.7691	18M3G7D	0.6124	18M3W7D
30	3465.00 ~ 3534.99	0.7980	27M8G7D	0.6281	27M9W7D
40	3470.01 ~ 3529.98	0.7852	37M9G7D	0.6152	37M9W7D
50	3475.02 ~ 3525.00	0.8147	47M5G7D	0.6531	47M6W7D
60	3480.00 ~ 3519.99	0.7907	57M8G7D	0.6223	58M0W7D
70	3485.01 ~ 3514.98	0.7943	67M6G7D	0.6324	67M6W7D
80	3490.02 ~ 3510.00	0.8035	77M6G7D	0.6427	77M7W7D
90	3495.00 ~ 3504.99	0.8110	87M6G7D	0.6516	87M7W7D
100	3500.01	0.8166	97M3G7D	0.6486	97M6W7D

Note: All modulations have been tested, and only the worst test results of PSK & QAM are shown in the report.

1.7 Testing Site

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		
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.

1.8 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH04-KS	AUDIX	E3	210616

1.9 Applied Standards

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

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

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

2.1 Test Mode

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

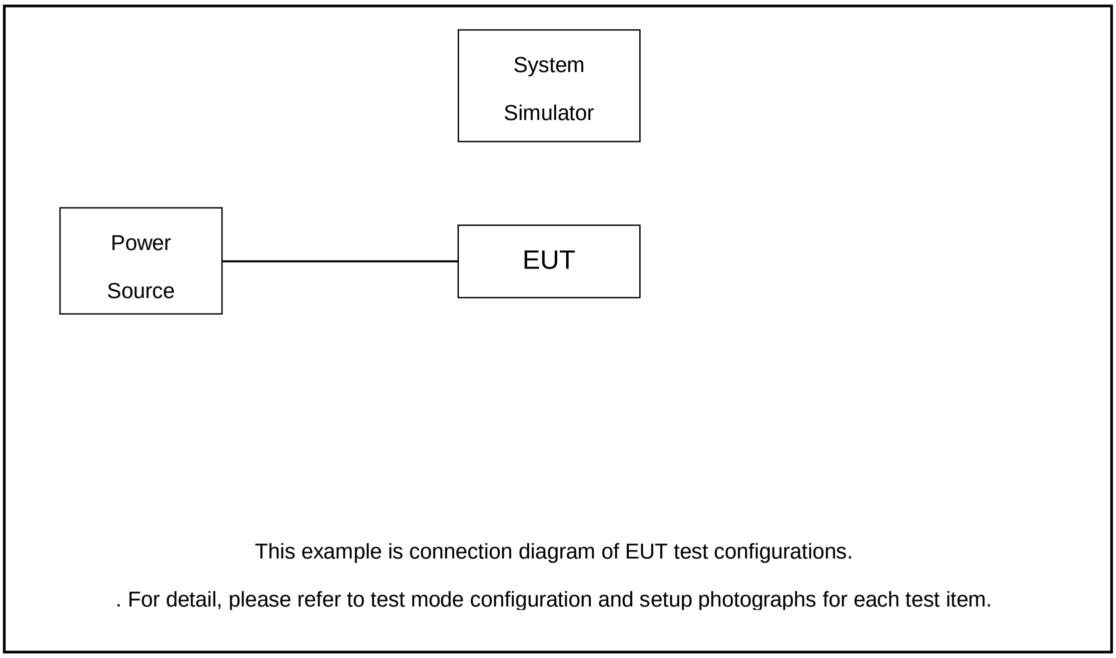
Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission. (Y plane)

Test Cases	Band	Bandwidth (MHz)	Modulation	RB #	Test Channel
		eg. 5M, 10M, 15M, 20M	eg. PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	1RB, Partial RB, Full RB	L/M/H
Max. Output Power	5G n77	20M, 30M, 40M, 50M, 60M, 70M, 80M, 90M ,100M	All Modulations	1RB, Full RB	L, M, H
Peak-to-Average Ratio	5G n77	20M	PI/2 BPSK, QPSK	Full RB	M
E.I.R.P	5G n77	20M, 30M, 40M, 50M, 60M, 70M, 80M, 90M ,100M	All Modulations	1RB, Full RB	L, M, H
26dB and 99% Bandwidth	5G n77	20M, 30M, 40M, 50M, 60M, 70M, 80M, 90M ,100M	QPSK, 16QAM, 64QAM, 256QAM	Full RB	M
Conducted Band Edge	5G n77	20M, 60M, 100M	PI/2 BPSK, QPSK	1RB, Full RB	L, H
Conducted Spurious Emission	5G n77	20M, 60M, 100M	PI/2 BPSK, QPSK	1RB	L, M, H
Frequency Stability	5G n77	20M	QPSK	Full RB	M
Radiated Spurious Emission	5G n77	Worst case from maximum power			M

Note:

1. 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.
2. Frequency Stability: Normal Voltage = 12.0V ; Low Voltage =10.8V.; High Voltage =13.2V.

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	Power Supply	GWINSTEK	PSS-2002	N/A	N/A	Unshielded, 1.8 m
2.	LTE Base Station	Anritsu	MT8820C	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 8.9 dB.

Example :

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

= 8.9 (dB)

2.5 Frequency List of Low/Middle/High Channels

5G n77 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
100	Channel	-	633334	-
	Frequency	-	3500.01	-
90	Channel	633000	633334	633666
	Frequency	3495	3500.01	3504.99
80	Channel	632668	633334	634000
	Frequency	3490.02	3500.01	3510
70	Channel	632334	633334	634332
	Frequency	3485.01	3500.01	3514.98
60	Channel	632000	633334	634666
	Frequency	3480	3500.01	3519.99
50	Channel	631668	633334	635000
	Frequency	3475.02	3500.01	3525
40	Channel	631334	633334	635332
	Frequency	3470.01	3500.01	3529.98
30	Channel	631000	633334	635666
	Frequency	3465	3500.01	3534.99
20	Channel	630668	633334	636000
	Frequency	3460.02	3500.01	3540

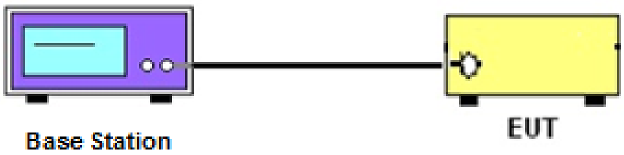
3 Conducted Test Items

3.1 Measuring Instruments

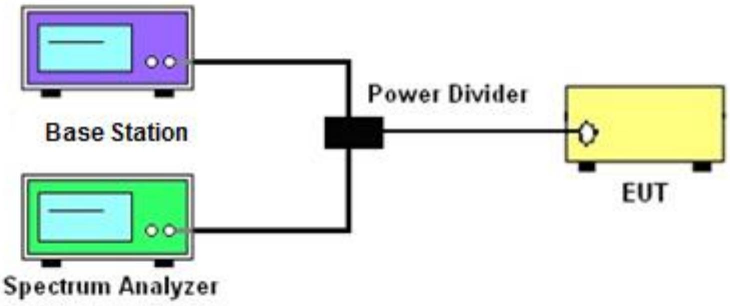
See list of measuring instruments of this test report.

3.2 Test Setup

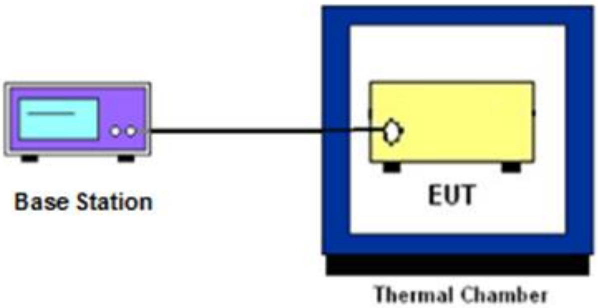
3.2.1 Conducted Output Power



3.2.2 Peak-to-Average Ratio, Occupied / 26dB Bandwidth, 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 Measurement

3.4.1 Description of the Conducted Output Power Measurement

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

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 EIRP

3.6.1 Description of EIRP Limit

§ 27.50 (k)(3)

Mobile devices are limited to 1Watt (30 dBm) EIRP. Mobile devices operating in these bands must employ a means for limiting power to the minimum necessary for successful communications

3.6.2 Test Procedures

1. According to KDB 412172 D01 Power Approach,
2. $EIRP = P_T + G_T – L_C$, 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

3.7 Occupied Bandwidth

3.7.1 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.

3.7.2 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.

3.8 Conducted Band Edge Measurement

3.8.1 Description of Conducted Band Edge Measurement

§ 27.53 (n)(2)

For mobile operations in the 3450-3550 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, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed, but limited to a maximum of 200 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.

3.8.2 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 band edges of low and high channels for the highest RF powers were measured.
4. Set RBW ≥ 1% EBW but limited to a maximum of 200 kHz in the 1MHz band immediately outside and adjacent to the band edge.
5. Beyond the 1 MHz and 5 MHz removed from the band edge, set RBW ≥ 500KHz.
6. Beyond the 5 MHz removed from the band edge, set RBW = 1MHz.
7. Set spectrum analyzer with RMS detector.
8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
9. Checked that all the results comply with the emission limit line.

3.9 Conducted Spurious Emission Measurement

3.9.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges shall not exceed −13 dBm/MHz.

It is measured by means of a calibrated spectrum analyzer and scanned from 9 kHz up to a frequency including its 10th harmonic.

3.9.2 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. Checked that all the results comply with the emission limit line.

3.10 Frequency Stability Measurement

3.10.1 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.

3.10.2 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.

3.10.3 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.

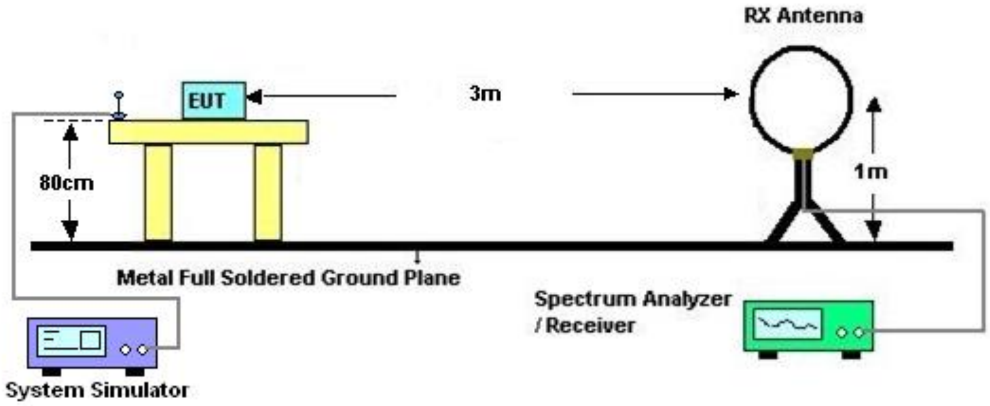
4 Radiated Test Items

4.1 Measuring Instruments

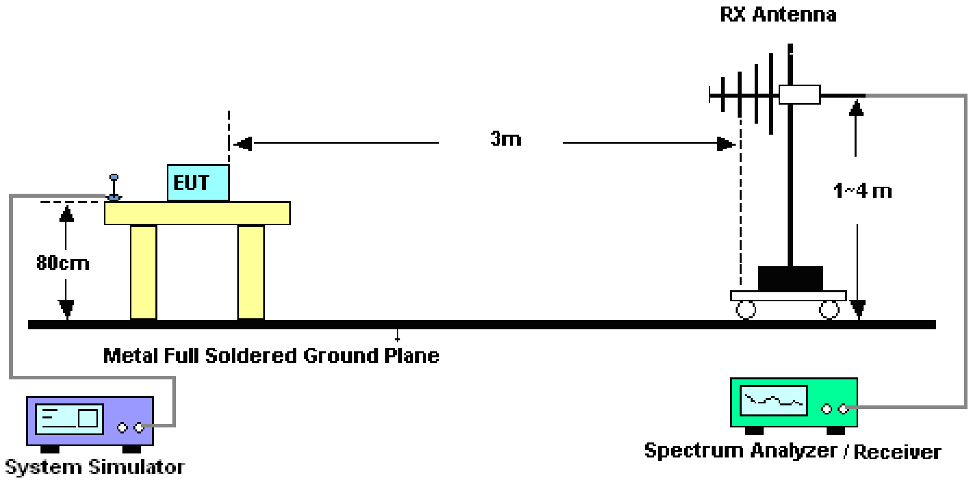
See list of measuring instruments of this test report.

4.2 Test Setup

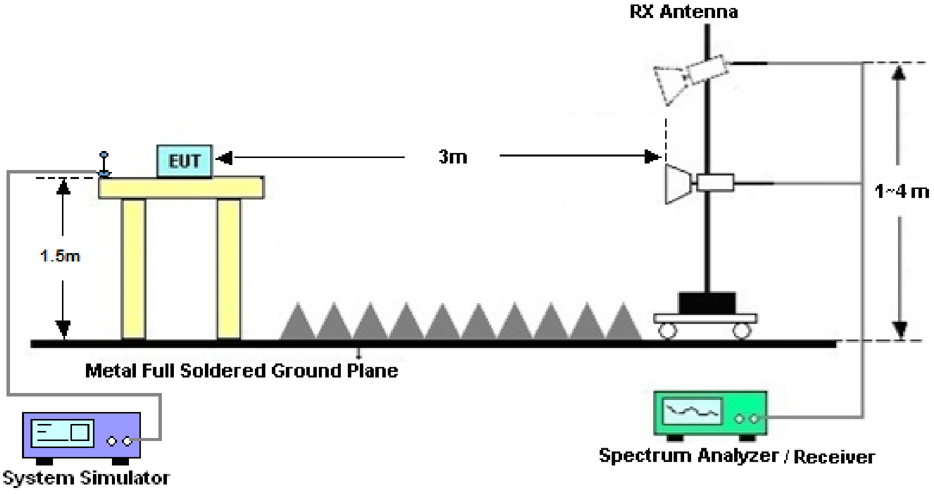
4.2.1 For radiated test below 30MHz



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 Measurement

4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI/TIA-603-E.

The power of any emission outside of the authorized operating frequency ranges shall not exceed −13 dBm/MHz.

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.
   EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
   ERP (dBm) = EIRP - 2.15
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Jul. 07, 2023	Apr. 04, 2024~ Apr. 23, 2024	Jul. 06, 2024	Conducted (TH01-SZ)
DC Power Supply	TTI	PL330P	290070	Max 32V，3A	Oct. 16, 2023	Apr. 04, 2024~ Apr. 23, 2024	Oct. 15, 2024	Conducted (TH01-SZ)
Power Divider	TOJOIN	PS-2SM-04 265	60.06.020.0077	0.4GHz~26.5GHz	Dec. 25, 2023	Apr. 04, 2024~ Apr. 23, 2024	Dec. 24, 2024	Conducted (TH01-SZ)
Thermal Chamber	Ten Billion Hongzhangroup	LP-150U	H2014081803	-40~+150°C	Jul. 05, 2023	Apr. 04, 2024~ Apr. 23, 2024	Jul. 04, 2024	Conducted (TH01-SZ)
EXA Spectrum Analyzer	Keysight	N9010B	MY57471079	10Hz-44G,MAX 30dB	Oct. 10, 2023	May 09, 2024	Oct. 09, 2024	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 11, 2023	May 09, 2024	Sep. 10, 2024	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	59913	30MHz-1GHz	Aug. 19, 2023	May 09, 2024	Aug. 18, 2024	Radiation (03CH04-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00251694	1GHz~18GHz	Jul. 12, 2023	May 09, 2024	Jul. 11, 2024	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2024	May 09, 2024	Jan. 04, 2025	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	380827	9KHz-1GHz	Jul. 06, 2023	May 09, 2024	Jul. 05, 2024	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40G GA	060728	18~40GHz	Jan. 05, 2024	May 09, 2024	Jan. 04, 2025	Radiation (03CH04-KS)
high gain Amplifier	EM	EM01G18G A	060840	1Ghz-18Ghz	Oct. 10, 2023	May 09, 2024	Oct. 09, 2024	Radiation (03CH04-KS)
Amplifier	Agilent	8449B	3008A02370	1Ghz-18Ghz	Oct. 10, 2023	May 09, 2024	Oct. 09, 2024	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	May 09, 2024	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	May 09, 2024	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	May 09, 2024	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required

6 Measurement Uncertainty

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 Spurious Emission & Bandedge	**±1.34 dB**
Occupied Channel Bandwidth	**±0.012 MHz**
Conducted Power	**±1.34 dB**
Peak to Average Ratio	**±1.34 dB**
Frequency Stability	**±1.3 Hz**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.83 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.83 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.82 dB**

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

Appendix A. Test Results of Conducted Test

Test Engineer :	Lorenzo Liu	**Temperature :**	24~26℃
		Relative Humidity :	50~53%

Software Version: 23.06.1602

FR1 N77(ANT1)

LTE Band: 2(ANT0), LTE BW: 10M, LTE ARFCN: Mid

Transmitter Conducted Output Power And EIRP, $(G_T - L_C)$=4dB

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Conducted Power(dBm)	EIRP (dBm)	EIRP (W)
77	30	20	630668	3460.02	DFT-s-OFDM QPSK	1@1	25.81	29.81	0.9572
77	30	20	630668	3460.02	DFT-s-OFDM 16 QAM	1@1	24.74	28.74	0.7482
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	1@1	25.74	29.74	0.9419
77	30	20	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	24.69	28.69	0.7396
77	30	20	636000	3540	DFT-s-OFDM QPSK	1@1	25.61	29.61	0.9141
77	30	20	636000	3540	DFT-s-OFDM 16 QAM	1@1	24.45	28.45	0.6998
77	30	30	631000	3465	DFT-s-OFDM QPSK	1@1	25.89	29.89	0.9750
77	30	30	631000	3465	DFT-s-OFDM 16 QAM	1@1	24.91	28.91	0.7780
77	30	30	633334	3500.01	DFT-s-OFDM QPSK	1@1	25.9	29.9	0.9772
77	30	30	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	24.87	28.87	0.7709
77	30	30	635666	3534.99	DFT-s-OFDM QPSK	1@1	25.62	29.62	0.9162
77	30	30	635666	3534.99	DFT-s-OFDM 16 QAM	1@1	24.65	28.65	0.7328
77	30	40	631334	3470.01	DFT-s-OFDM QPSK	1@1	25.74	29.74	0.9419
77	30	40	631334	3470.01	DFT-s-OFDM 16 QAM	1@1	24.86	28.86	0.7691
77	30	40	633334	3500.01	DFT-s-OFDM QPSK	1@1	25.68	29.68	0.9290
77	30	40	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	24.79	28.79	0.7568
77	30	40	635332	3529.98	DFT-s-OFDM QPSK	1@1	25.71	29.71	0.9354
77	30	40	635332	3529.98	DFT-s-OFDM 16 QAM	1@1	24.68	28.68	0.7379
77	30	50	631668	3475.02	DFT-s-OFDM QPSK	1@1	25.51	29.51	0.8933
77	30	50	631668	3475.02	DFT-s-OFDM 16 QAM	1@1	25.02	29.02	0.7980
77	30	50	633334	3500.01	DFT-s-OFDM QPSK	1@1	25.44	29.44	0.8790
77	30	50	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	25	29	0.7943
77	30	50	635000	3525	DFT-s-OFDM QPSK	1@1	25.84	29.84	0.9638
77	30	50	635000	3525	DFT-s-OFDM 16 QAM	1@1	24.68	28.68	0.7379
77	30	60	632000	3480	DFT-s-OFDM QPSK	1@1	25.91	29.91	0.9795
77	30	60	632000	3480	DFT-s-OFDM 16 QAM	1@1	24.85	28.85	0.7674
77	30	60	633334	3500.01	DFT-s-OFDM QPSK	1@1	25.46	29.46	0.8831
77	30	60	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	24.91	28.91	0.7780
77	30	60	634666	3519.99	DFT-s-OFDM QPSK	1@1	25.82	29.82	0.9594
77	30	60	634666	3519.99	DFT-s-OFDM 16 QAM	1@1	24.71	28.71	0.7430
77	30	70	632334	3485.01	DFT-s-OFDM QPSK	1@1	25.72	29.72	0.9376
77	30	70	632334	3485.01	DFT-s-OFDM 16 QAM	1@1	24.98	28.98	0.7907
77	30	70	633334	3500.01	DFT-s-OFDM QPSK	1@1	25.87	29.87	0.9705
77	30	70	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	24.97	28.97	0.7889
77	30	70	634332	3514.98	DFT-s-OFDM QPSK	1@1	25.73	29.73	0.9397

77	30	70	634332	3514.98	DFT-s-OFDM 16 QAM	1@1	24.77	28.77	0.7534
77	30	80	632668	3490.02	DFT-s-OFDM QPSK	1@1	25.91	29.91	0.9795
77	30	80	632668	3490.02	DFT-s-OFDM 16 QAM	1@1	24.96	28.96	0.7870
77	30	80	633334	3500.01	DFT-s-OFDM QPSK	1@1	25.51	29.51	0.8933
77	30	80	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	24.99	28.99	0.7925
77	30	80	634000	3510	DFT-s-OFDM QPSK	1@1	25.82	29.82	0.9594
77	30	80	634000	3510	DFT-s-OFDM 16 QAM	1@1	24.9	28.9	0.7762
77	30	90	633000	3495	DFT-s-OFDM QPSK	1@1	25.46	29.46	0.8831
77	30	90	633000	3495	DFT-s-OFDM 16 QAM	1@1	25.06	29.06	0.8054
77	30	90	633334	3500.01	DFT-s-OFDM QPSK	1@1	25.49	29.49	0.8892
77	30	90	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	25.03	29.03	0.7998
77	30	90	633666	3504.99	DFT-s-OFDM QPSK	1@1	25.91	29.91	0.9795
77	30	90	633666	3504.99	DFT-s-OFDM 16 QAM	1@1	24.95	28.95	0.7852
77	30	100	633334	3500.01	DFT-s-OFDM PI/2 BPSK	135@67	25.94	29.94	0.9863
77	30	100	633334	3500.01	DFT-s-OFDM PI/2 BPSK	1@1	25.79	29.79	0.9528
77	30	100	633334	3500.01	DFT-s-OFDM PI/2 BPSK	1@271	24.8	28.8	0.7586
77	30	100	633334	3500.01	DFT-s-OFDM QPSK	135@67	25.63	29.63	0.9183
77	30	100	633334	3500.01	DFT-s-OFDM QPSK	1@1	25.68	29.68	0.9290
77	30	100	633334	3500.01	DFT-s-OFDM QPSK	1@271	24.74	28.74	0.7482
77	30	100	633334	3500.01	DFT-s-OFDM 16 QAM	135@67	24.69	28.69	0.7396
77	30	100	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	25.08	29.08	0.8091
77	30	100	633334	3500.01	DFT-s-OFDM 16 QAM	1@271	23.88	27.88	0.6138
77	30	100	633334	3500.01	DFT-s-OFDM 64 QAM	135@67	23.23	27.23	0.5284
77	30	100	633334	3500.01	DFT-s-OFDM 64 QAM	1@1	23.63	27.63	0.5794
77	30	100	633334	3500.01	DFT-s-OFDM 64 QAM	1@271	22.35	26.35	0.4315
77	30	100	633334	3500.01	DFT-s-OFDM 256 QAM	135@67	21.25	25.25	0.3350
77	30	100	633334	3500.01	DFT-s-OFDM 256 QAM	1@1	21.69	25.69	0.3707
77	30	100	633334	3500.01	DFT-s-OFDM 256 QAM	1@271	20.29	24.29	0.2685
77	30	100	633334	3500.01	CP-OFDM QPSK	137@68	24.09	28.09	0.6442
77	30	100	633334	3500.01	CP-OFDM QPSK	1@1	24.66	28.66	0.7345
77	30	100	633334	3500.01	CP-OFDM QPSK	1@271	23.55	27.55	0.5689

Frequency Stability

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Deviation (ppm)	Verdict	Environment
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0025	**PASS**	NV
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0066	**PASS**	LV
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0049	**PASS**	HV
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0043	**PASS**	-30℃
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0044	**PASS**	-20℃
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0021	**PASS**	-10℃
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0023	**PASS**	0℃
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0047	**PASS**	10℃
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0025	**PASS**	20℃
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0045	**PASS**	30℃
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0053	**PASS**	40℃
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0055	**PASS**	50℃

Peak to Average Ratio

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Result (dB)	Limit (dB)	Verdict
77	30	20	633334	3500.01	DFT-s-OFDM PI/2 BPSK	50@0	4.23	13	**PASS**
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	4.87	13	**PASS**

B2_N77(20M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_Mid_CH

B2_N77(20M)_DFT-s-OFDM_QPSK_Outer_Full_Mid_CH

Occupied Bandwidth

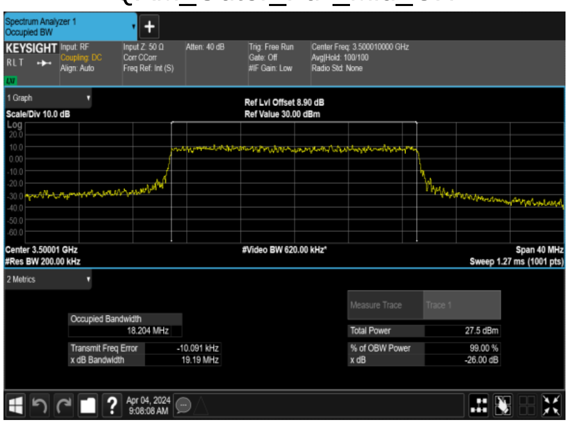
NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	OBW (MHz)	26dB BW (MHz)
77	30	20	633334	3500.01	CP-OFDM QPSK	51@0	18.226	19.71
77	30	20	633334	3500.01	CP-OFDM 16 QAM	51@0	18.282	19.34
77	30	20	633334	3500.01	CP-OFDM 64 QAM	51@0	18.204	19.19
77	30	20	633334	3500.01	CP-OFDM 256 QAM	51@0	18.144	19.43
77	30	30	633334	3500.01	CP-OFDM QPSK	78@0	27.757	29.36
77	30	30	633334	3500.01	CP-OFDM 16 QAM	78@0	27.811	29.28
77	30	30	633334	3500.01	CP-OFDM 64 QAM	78@0	27.881	29.35
77	30	30	633334	3500.01	CP-OFDM 256 QAM	78@0	27.772	29.26
77	30	40	633334	3500.01	CP-OFDM QPSK	106@0	37.802	39.46
77	30	40	633334	3500.01	CP-OFDM 16 QAM	106@0	37.867	39.65
77	30	40	633334	3500.01	CP-OFDM 64 QAM	106@0	37.863	39.12
77	30	40	633334	3500.01	CP-OFDM 256 QAM	106@0	37.98	39.31
77	30	50	633334	3500.01	CP-OFDM QPSK	133@0	47.581	49.03
77	30	50	633334	3500.01	CP-OFDM 16 QAM	133@0	47.446	49.36
77	30	50	633334	3500.01	CP-OFDM 64 QAM	133@0	47.6	49.28
77	30	50	633334	3500.01	CP-OFDM 256 QAM	133@0	47.577	49.28
77	30	60	633334	3500.01	CP-OFDM QPSK	162@0	57.806	60.08
77	30	60	633334	3500.01	CP-OFDM 16 QAM	162@0	57.832	59.84
77	30	60	633334	3500.01	CP-OFDM 64 QAM	162@0	57.727	59.93
77	30	60	633334	3500.01	CP-OFDM 256 QAM	162@0	57.966	59.84
77	30	70	633334	3500.01	CP-OFDM QPSK	189@0	67.494	70.05
77	30	70	633334	3500.01	CP-OFDM 16 QAM	189@0	67.665	69.95
77	30	70	633334	3500.01	CP-OFDM 64 QAM	189@0	67.492	69.79
77	30	70	633334	3500.01	CP-OFDM 256 QAM	189@0	67.573	69.91
77	30	80	633334	3500.01	CP-OFDM QPSK	217@0	77.432	80.05

77	30	80	633334	3500.01	CP-OFDM 16 QAM	217@0	77.557	79.9
77	30	80	633334	3500.01	CP-OFDM 64 QAM	217@0	77.411	80.07
77	30	80	633334	3500.01	CP-OFDM 256 QAM	217@0	77.65	80.05
77	30	90	633334	3500.01	CP-OFDM QPSK	245@0	87.556	90.28
77	30	90	633334	3500.01	CP-OFDM 16 QAM	245@0	87.692	90.35
77	30	90	633334	3500.01	CP-OFDM 64 QAM	245@0	87.567	90.28
77	30	90	633334	3500.01	CP-OFDM 256 QAM	245@0	87.503	90.17
77	30	100	633334	3500.01	CP-OFDM QPSK	273@0	97.609	100.7
77	30	100	633334	3500.01	CP-OFDM 16 QAM	273@0	97.561	100.7
77	30	100	633334	3500.01	CP-OFDM 64 QAM	273@0	97.521	100.6
77	30	100	633334	3500.01	CP-OFDM 256 QAM	273@0	97.715	100.5

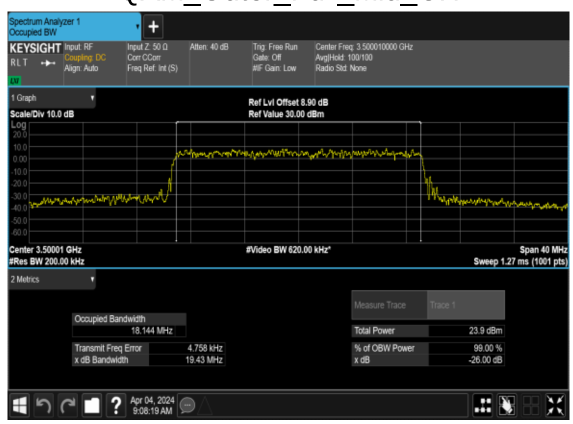
B2_N77(20M)_CP-OFDM_QPSK_Outer_Full_Mid_CH

B2_N77(20M)_CP-OFDM_16 QAM_Outer_Full_Mid_CH

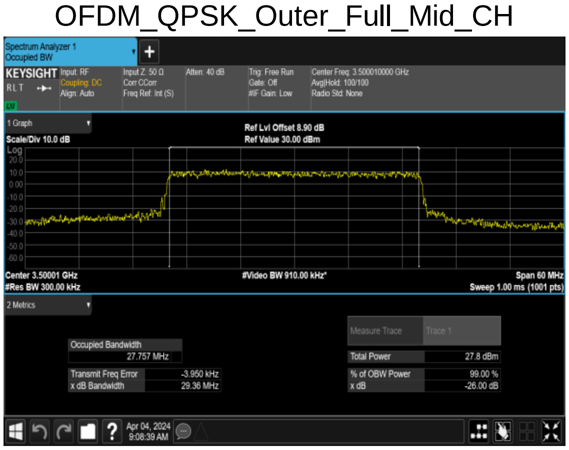
B2_N77(20M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH



B2_N77(20M)_CP-OFDM_256 QAM_Outer_Full_Mid_CH



B2_N77(30M)_CP-OFDM_QPSK_Outer_Full_Mid_CH



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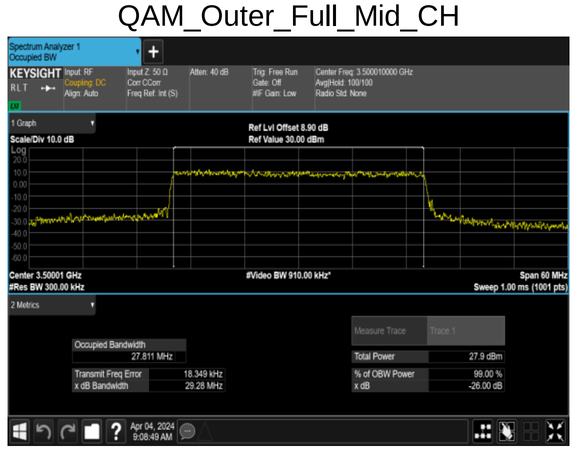
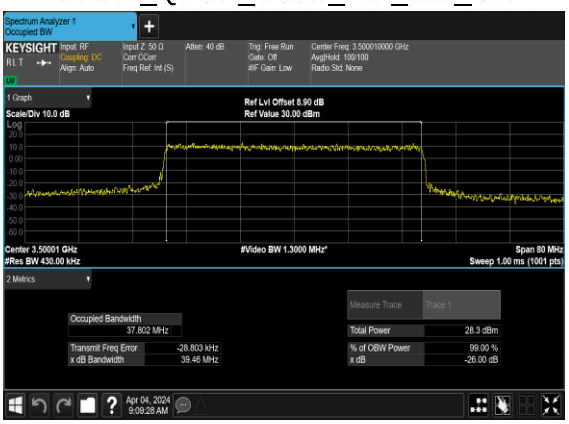


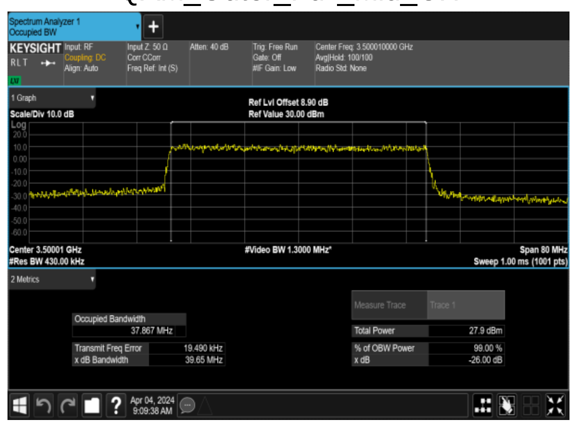
B2_N77(30M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH

B2_N77(30M)_CP-OFDM_256 QAM_Outer_Full_Mid_CH

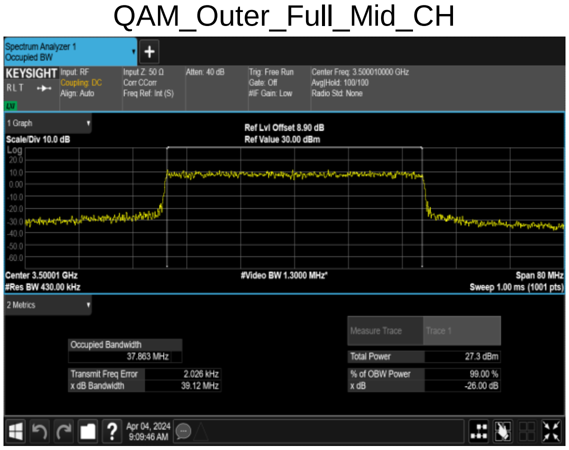
B2_N77(40M)_CP-OFDM_QPSK_Outer_Full_Mid_CH



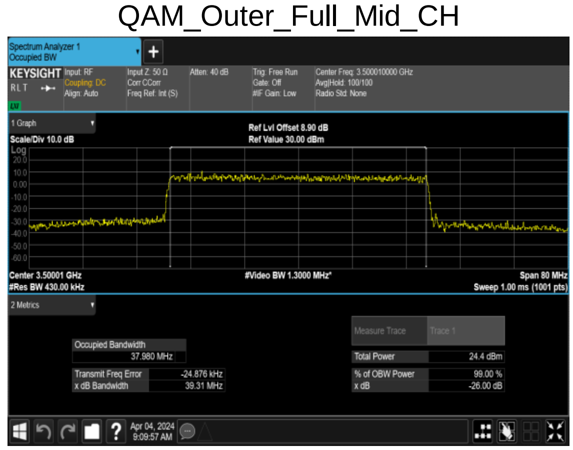
B2_N77(40M)_CP-OFDM_16 QAM_Outer_Full_Mid_CH



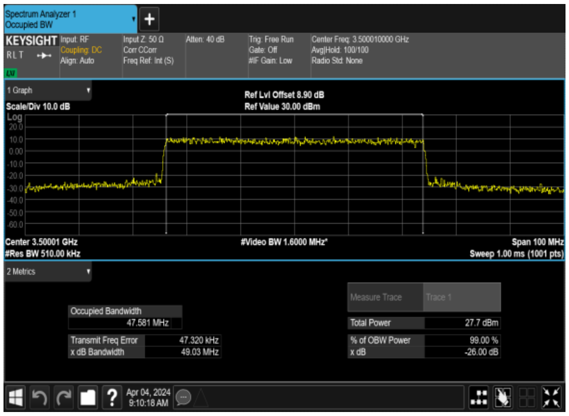
B2_N77(40M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH



B2_N77(40M)_CP-OFDM_256 QAM_Outer_Full_Mid_CH

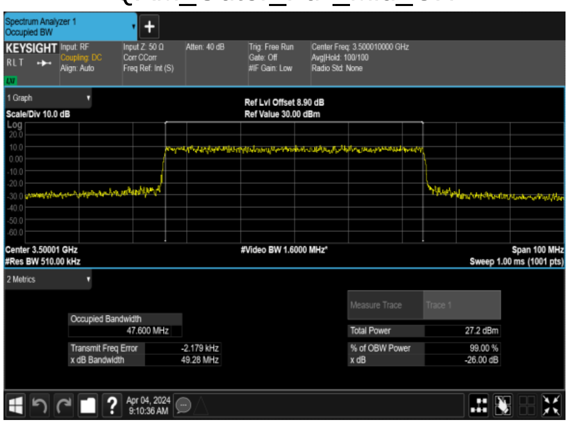


B2_N77(50M)_CP-OFDM_QPSK_Outer_Full_Mid_CH



B2_N77(50M)_CP-OFDM_16 QAM_Outer_Full_Mid_CH

B2_N77(50M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH



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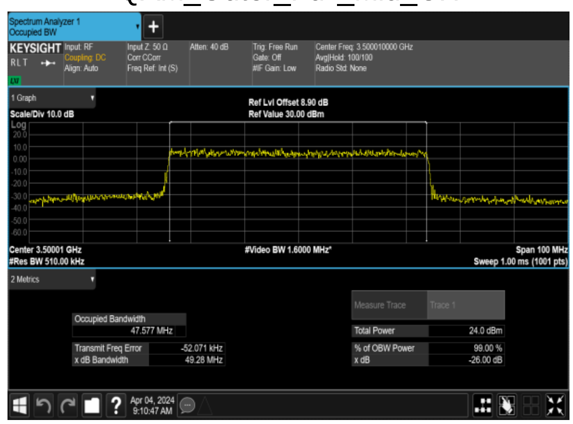
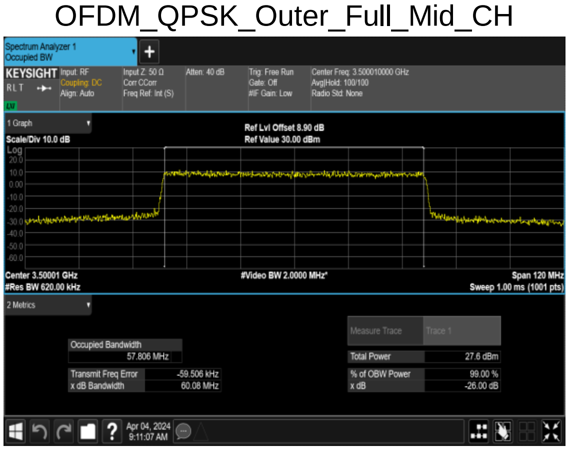
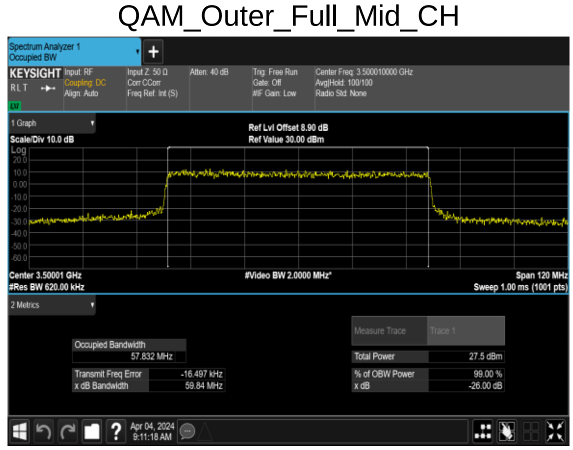


B2_N77(60M)_CP-OFDM_QPSK_Outer_Full_Mid_CH



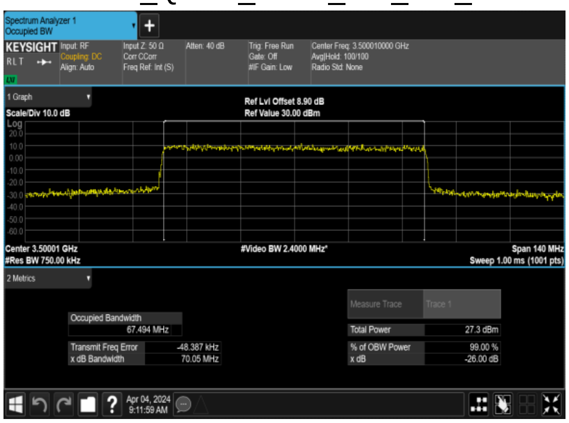
B2_N77(60M)_CP-OFDM_16 QAM_Outer_Full_Mid_CH



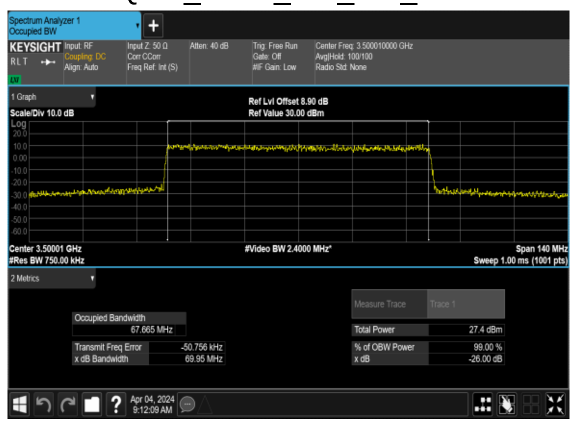
B2_N77(60M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH

B2_N77(60M)_CP-OFDM_256 QAM_Outer_Full_Mid_CH

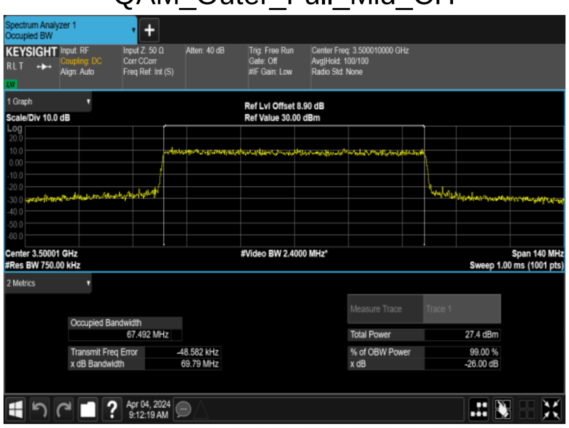
B2_N77(70M)_CP-OFDM_QPSK_Outer_Full_Mid_CH



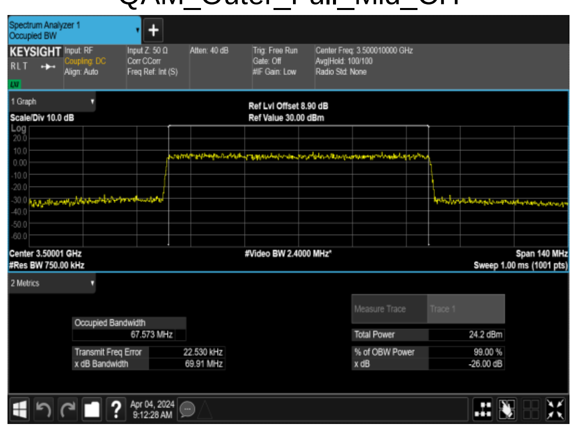
B2_N77(70M)_CP-OFDM_16 QAM_Outer_Full_Mid_CH



B2_N77(70M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH

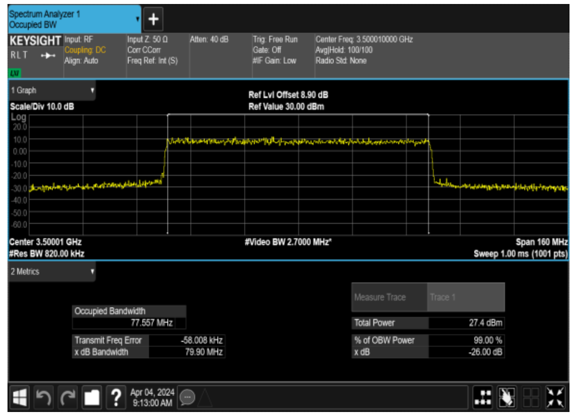


B2_N77(70M)_CP-OFDM_256 QAM_Outer_Full_Mid_CH

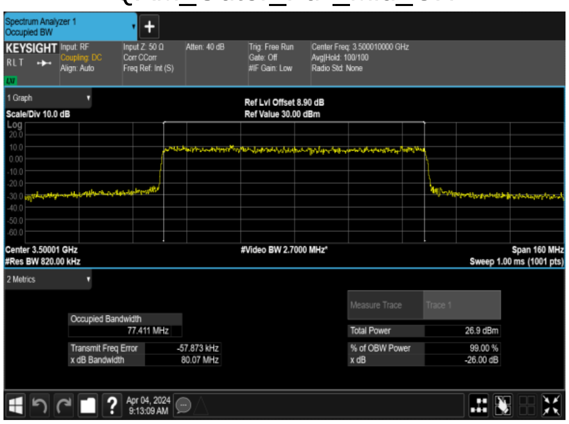


B2_N77(80M)_CP-OFDM_QPSK_Outer_Full_Mid_CH

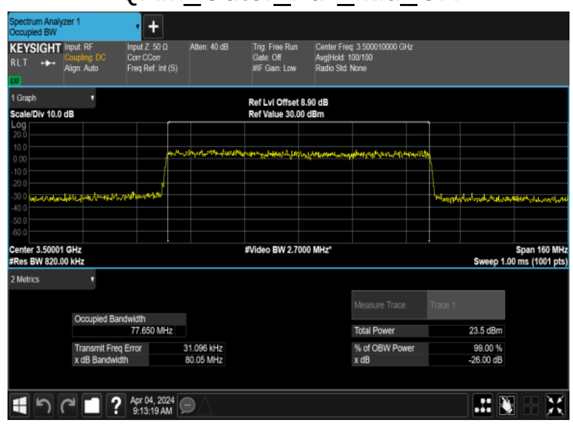
B2_N77(80M)_CP-OFDM_16 QAM_Outer_Full_Mid_CH



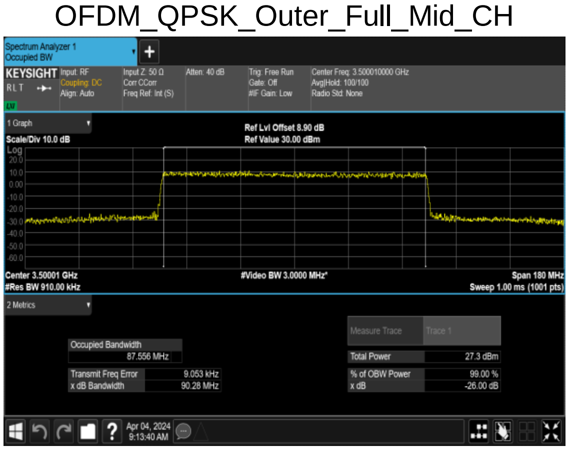
B2_N77(80M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH



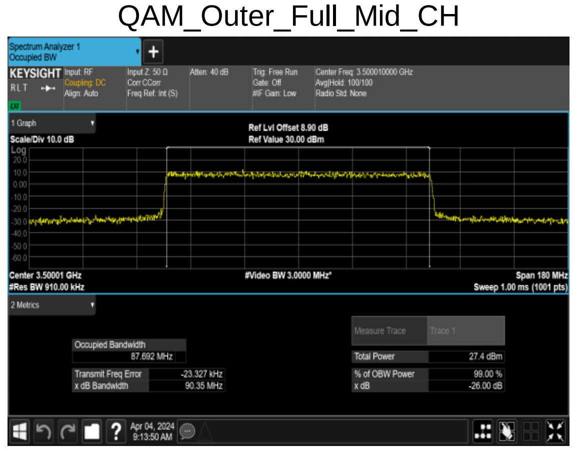
B2_N77(80M)_CP-OFDM_256 QAM_Outer_Full_Mid_CH



B2_N77(90M)_CP-OFDM_QPSK_Outer_Full_Mid_CH



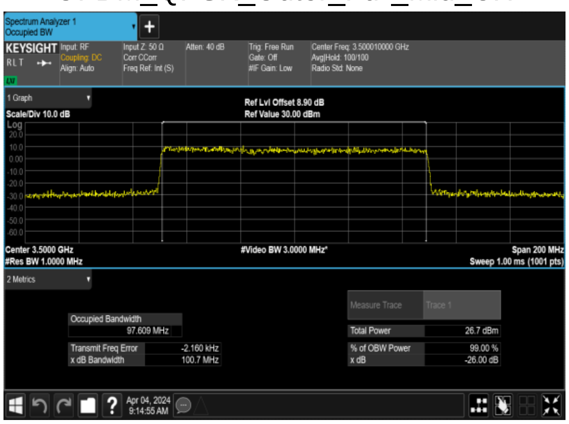
B2_N77(90M)_CP-OFDM_16 QAM_Outer_Full_Mid_CH



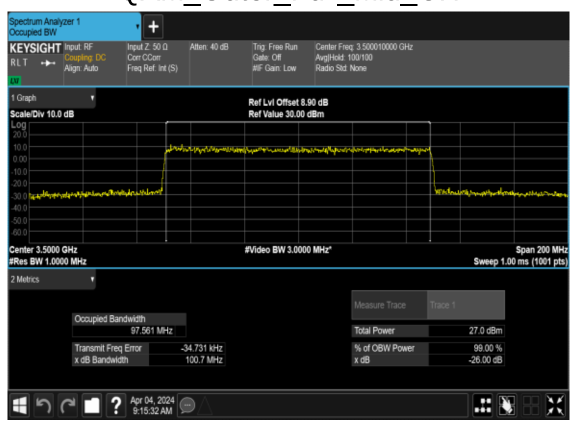
B2_N77(90M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH

B2_N77(90M)_CP-OFDM_256 QAM_Outer_Full_Mid_CH

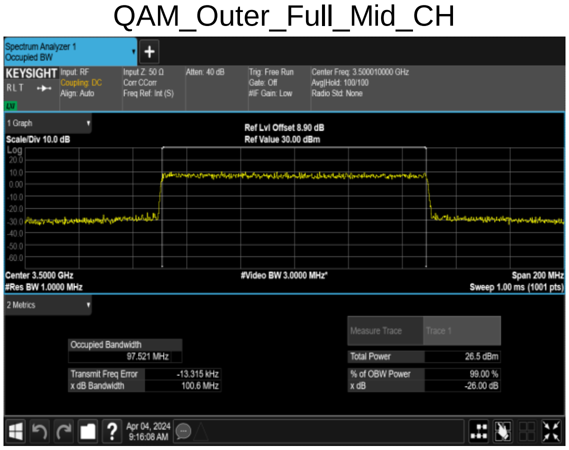
B2_N77(100M)_CP-OFDM_QPSK_Outer_Full_Mid_CH



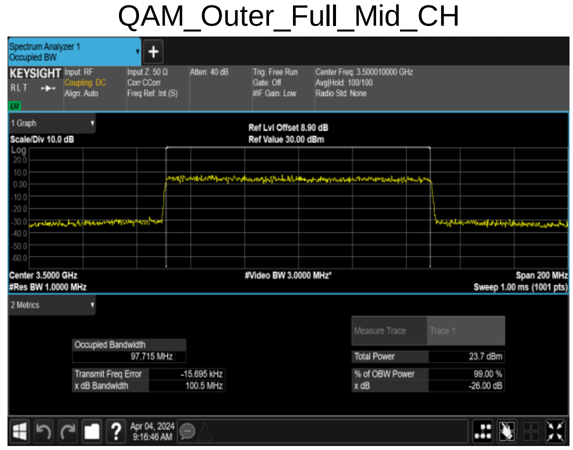
B2_N77(100M)_CP-OFDM_16 QAM_Outer_Full_Mid_CH



B2_N77(100M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH



B2_N77(100M)_CP-OFDM_256 QAM_Outer_Full_Mid_CH

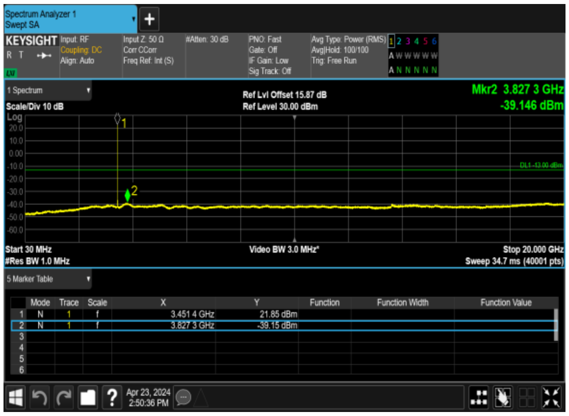


Conducted Spurious Emissions

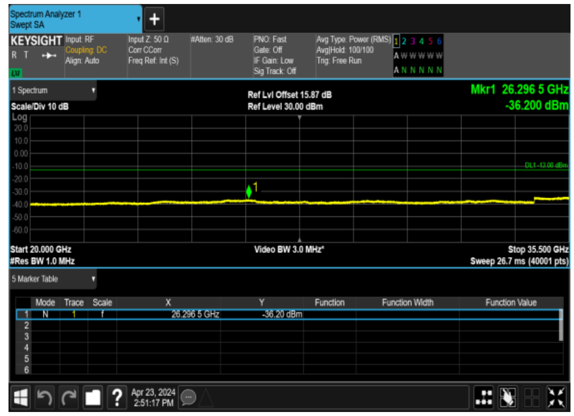
NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Result	Verdict
77	30	20	630668	3460.02	DFT-s-OFDM BPSK	1@0	see graph	**---**
77	30	20	630668	3460.02	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
77	30	20	630668	3460.02	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
77	30	20	630668	3460.02	DFT-s-OFDM QPSK	1@0	see graph	**---**
77	30	20	630668	3460.02	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
77	30	20	630668	3460.02	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
77	30	20	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	**---**
77	30	20	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
77	30	20	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	**---**
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
77	30	20	636000	3540.0	DFT-s-OFDM BPSK	1@0	see graph	**---**
77	30	20	636000	3540.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
77	30	20	636000	3540.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
77	30	20	636000	3540.0	DFT-s-OFDM QPSK	1@0	see graph	**---**
77	30	20	636000	3540.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
77	30	20	636000	3540.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
77	30	60	632000	3480.0	DFT-s-OFDM BPSK	1@0	see graph	**---**
77	30	60	632000	3480.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
77	30	60	632000	3480.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
77	30	60	632000	3480.0	DFT-s-OFDM QPSK	1@0	see graph	**---**

77	30	60	632000	3480.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
77	30	60	632000	3480.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
77	30	60	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	**---**
77	30	60	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
77	30	60	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
77	30	60	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	**---**
77	30	60	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
77	30	60	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
77	30	60	634666	3519.99	DFT-s-OFDM BPSK	1@0	see graph	**---**
77	30	60	634666	3519.99	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
77	30	60	634666	3519.99	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
77	30	60	634666	3519.99	DFT-s-OFDM QPSK	1@0	see graph	**---**
77	30	60	634666	3519.99	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
77	30	60	634666	3519.99	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
77	30	100	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	**---**
77	30	100	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
77	30	100	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
77	30	100	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	**---**
77	30	100	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
77	30	100	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	**PASS**

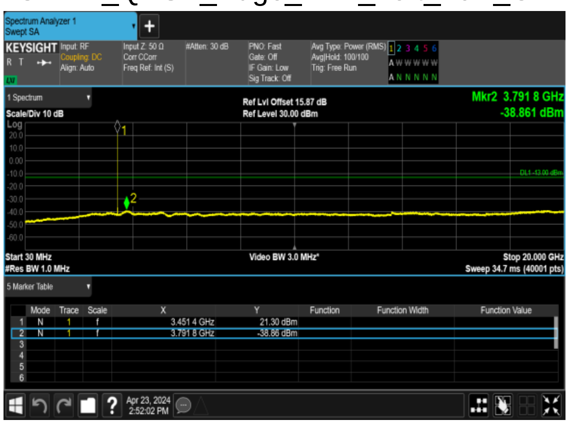
B2_N77(20M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Low_CH



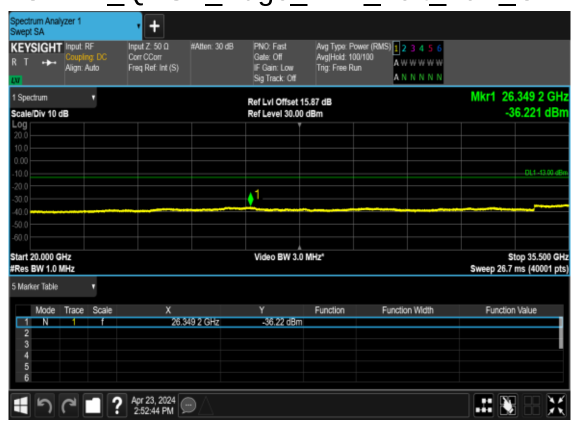
B2_N77(20M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Low_CH



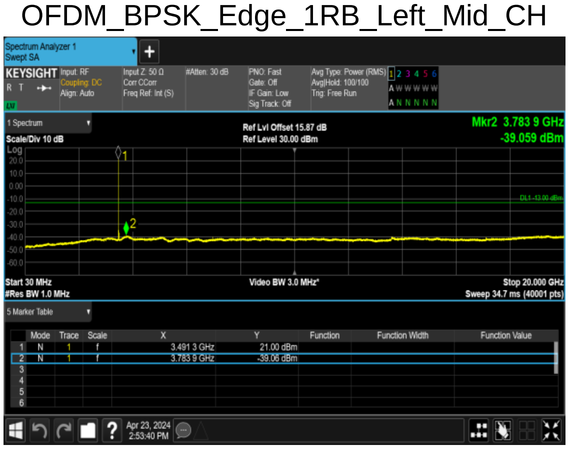
B2_N77(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low_CH



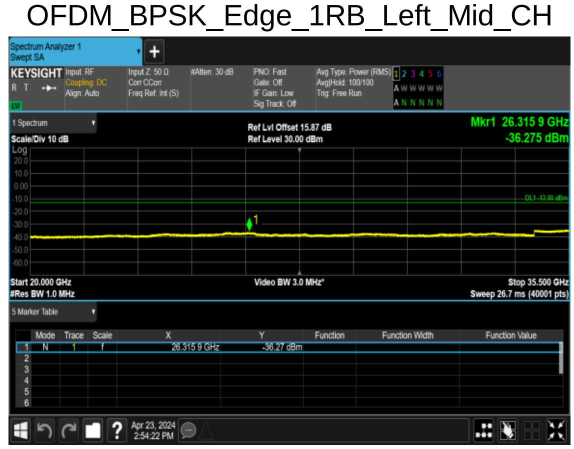
B2_N77(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low_CH



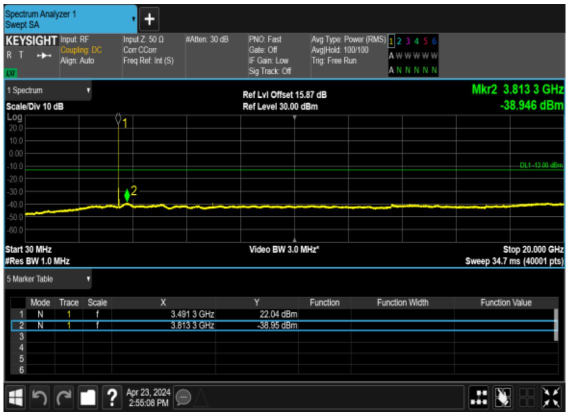
B2_N77(20M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH



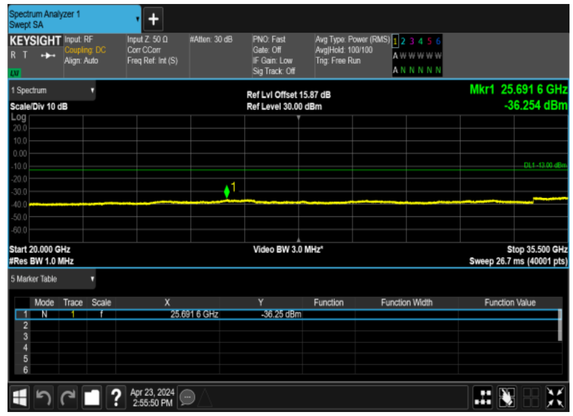
B2_N77(20M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH



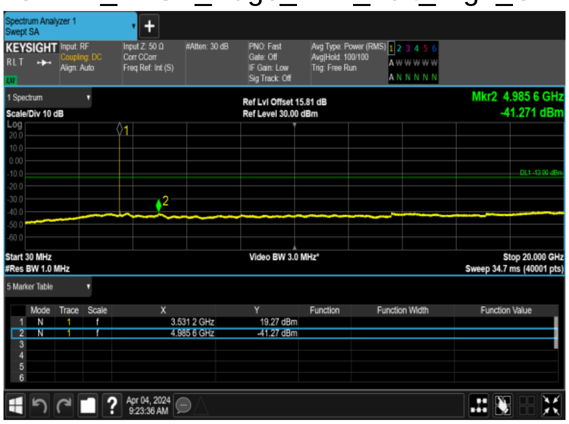
B2_N77(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Mid_CH



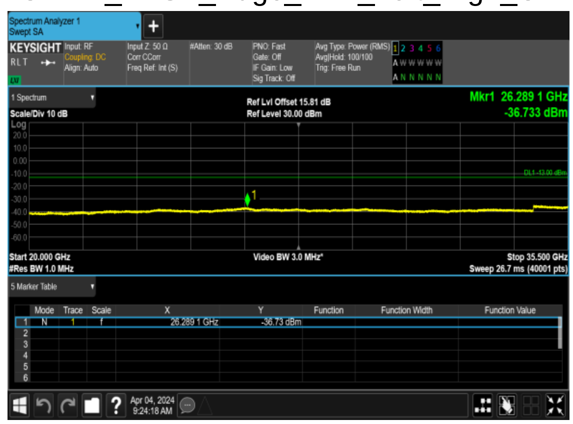
B2_N77(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Mid_CH



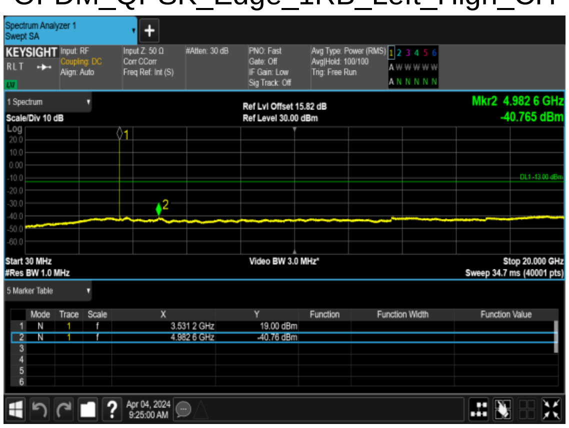
B2_N77(20M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_High_CH



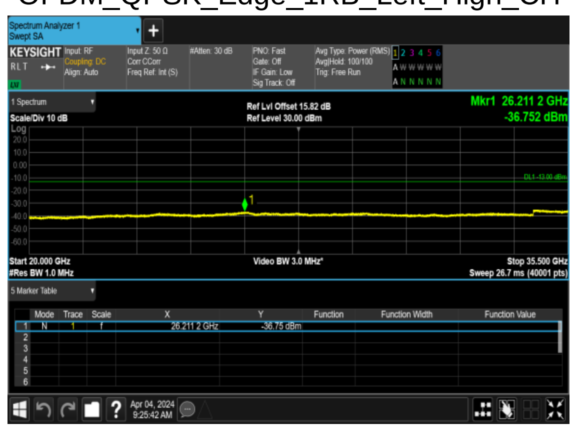
B2_N77(20M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_High_CH



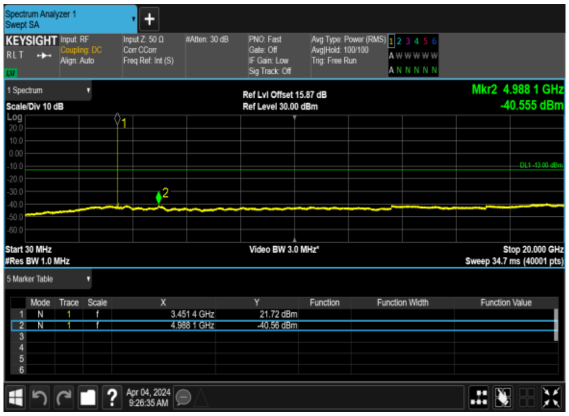
B2_N77(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_High_CH



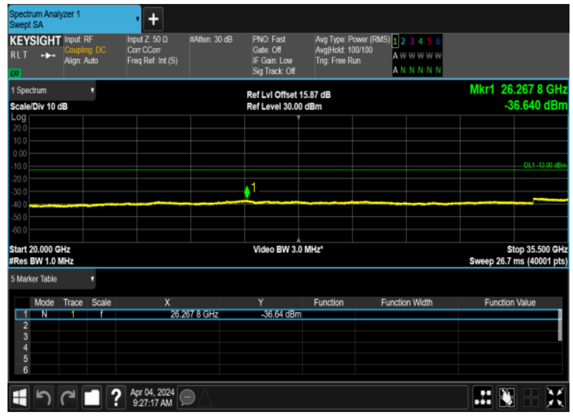
B2_N77(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_High_CH



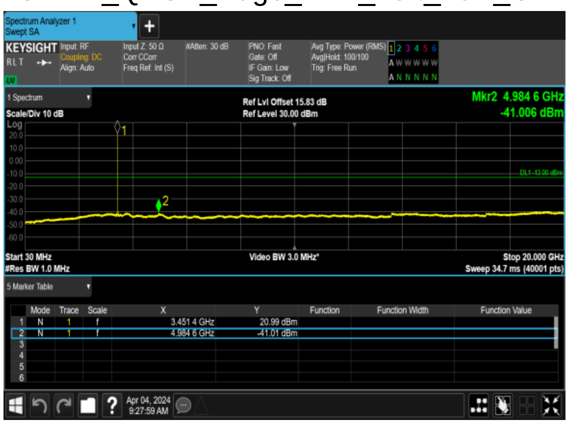
B2_N77(60M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Low_CH



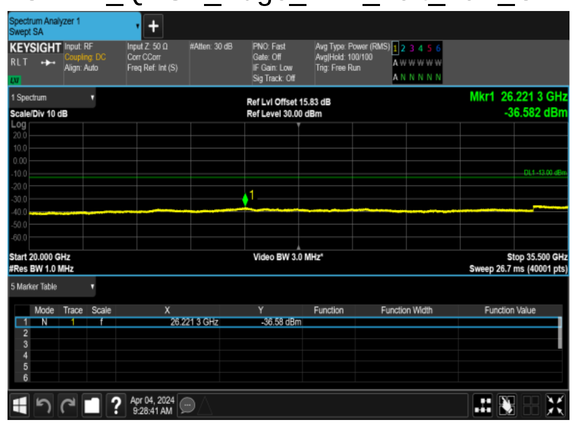
B2_N77(60M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Low_CH



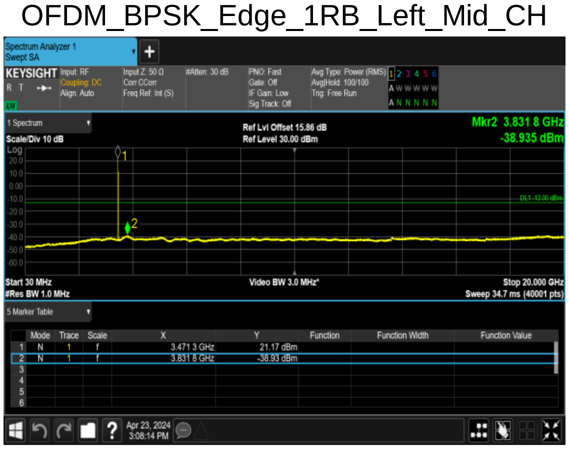
B2_N77(60M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low_CH



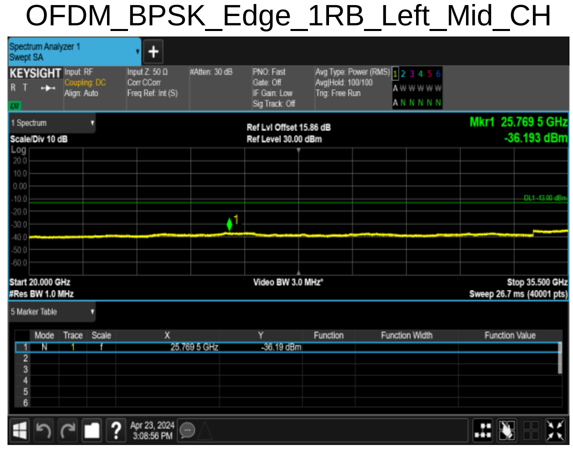
B2_N77(60M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low_CH



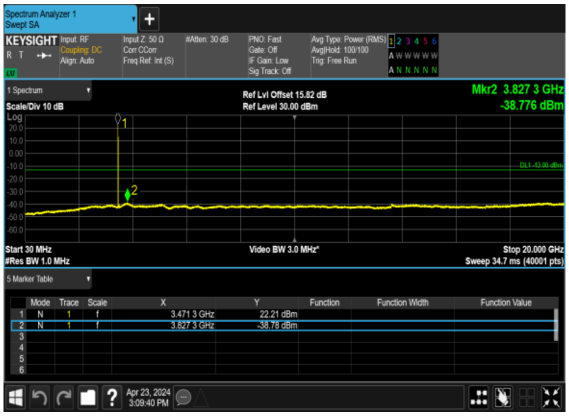
B2_N77(60M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH



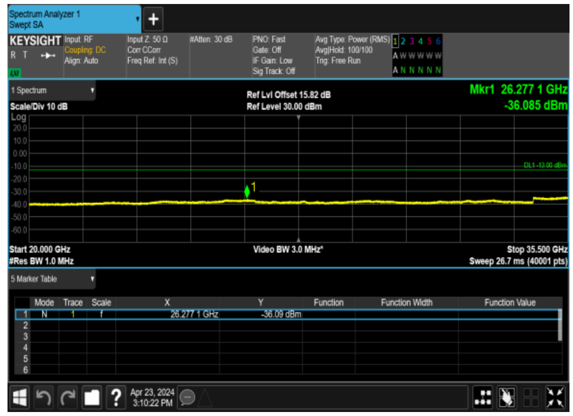
B2_N77(60M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH



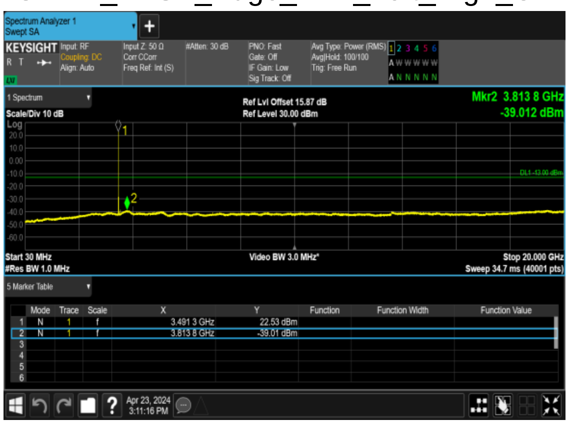
B2_N77(60M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Mid_CH



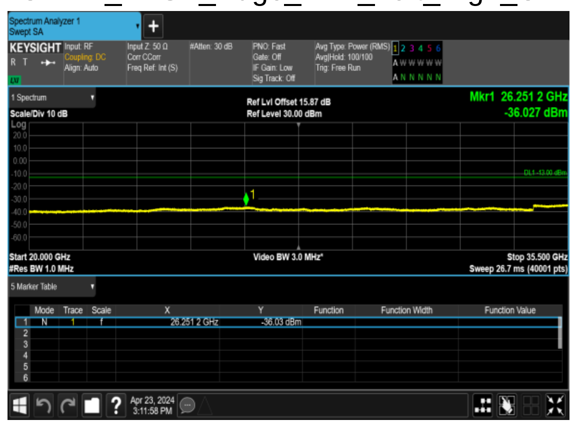
B2_N77(60M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Mid_CH



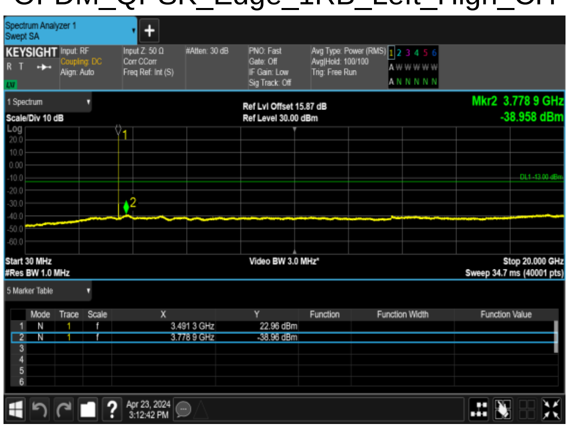
B2_N77(60M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_High_CH



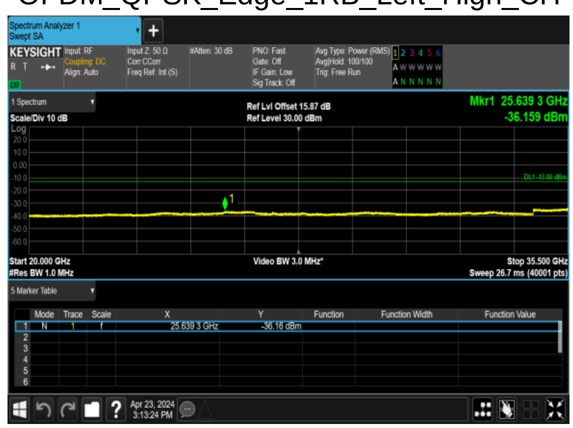
B2_N77(60M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_High_CH



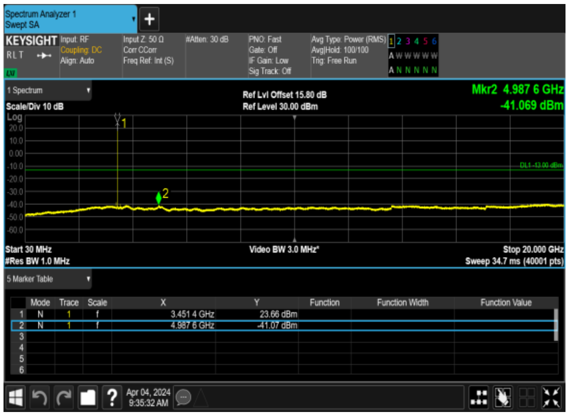
B2_N77(60M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_High_CH



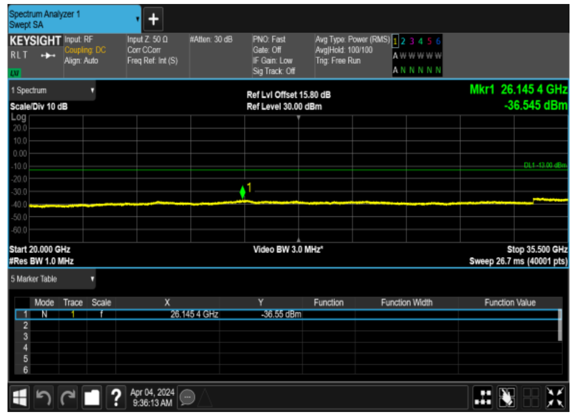
B2_N77(60M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_High_CH



B2_N77(100M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH

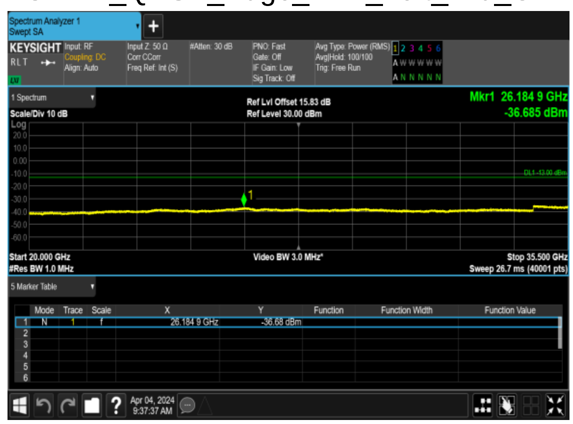


B2_N77(100M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH



B2_N77(100M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Mid_CH

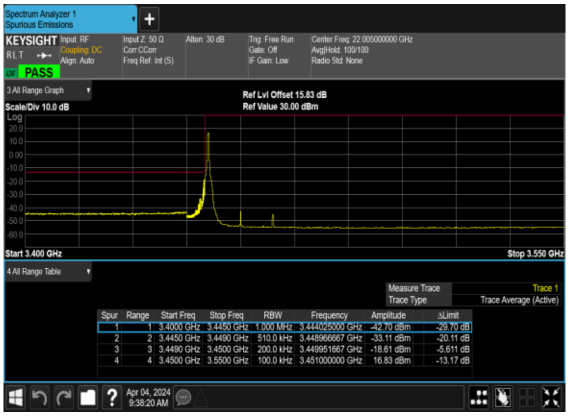
B2_N77(100M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Mid_CH



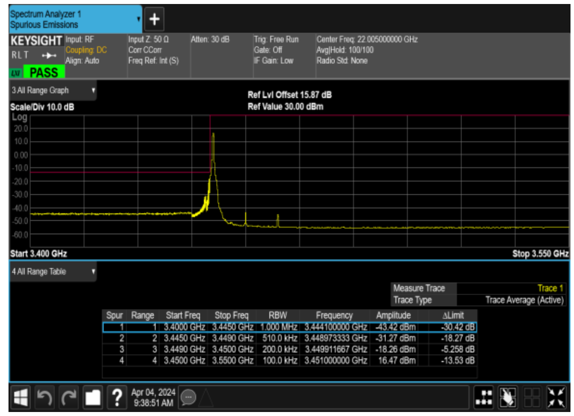
Conducted Band Edge

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Result	Verdict
77	30	20	630668	3460.02	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
77	30	20	630668	3460.02	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
77	30	20	630668	3460.02	DFT-s-OFDM BPSK	50@0	see graph	**PASS**
77	30	20	630668	3460.02	DFT-s-OFDM QPSK	50@0	see graph	**PASS**
77	30	20	636000	3540.0	DFT-s-OFDM BPSK	1@50	see graph	**PASS**
77	30	20	636000	3540.0	DFT-s-OFDM QPSK	1@50	see graph	**PASS**
77	30	20	636000	3540.0	DFT-s-OFDM BPSK	50@0	see graph	**PASS**
77	30	20	636000	3540.0	DFT-s-OFDM QPSK	50@0	see graph	**PASS**
77	30	60	632000	3480.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
77	30	60	632000	3480.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
77	30	60	632000	3480.0	DFT-s-OFDM BPSK	162@0	see graph	**PASS**
77	30	60	632000	3480.0	DFT-s-OFDM QPSK	162@0	see graph	**PASS**
77	30	60	634666	3519.99	DFT-s-OFDM BPSK	1@161	see graph	**PASS**
77	30	60	634666	3519.99	DFT-s-OFDM QPSK	1@161	see graph	**PASS**
77	30	60	634666	3519.99	DFT-s-OFDM BPSK	162@0	see graph	**PASS**
77	30	60	634666	3519.99	DFT-s-OFDM QPSK	162@0	see graph	**PASS**
77	30	100	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
77	30	100	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
77	30	100	633334	3500.01	DFT-s-OFDM BPSK	1@272	see graph	**PASS**
77	30	100	633334	3500.01	DFT-s-OFDM QPSK	1@272	see graph	**PASS**
77	30	100	633334	3500.01	DFT-s-OFDM BPSK	270@0	see graph	**PASS**
77	30	100	633334	3500.01	DFT-s-OFDM QPSK	270@0	see graph	**PASS**

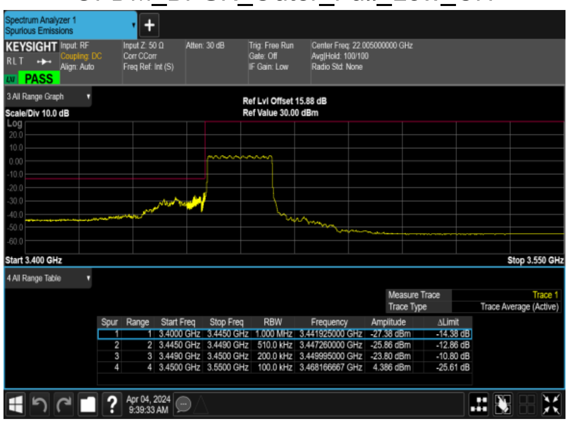
B2_N77(20M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Low_CH



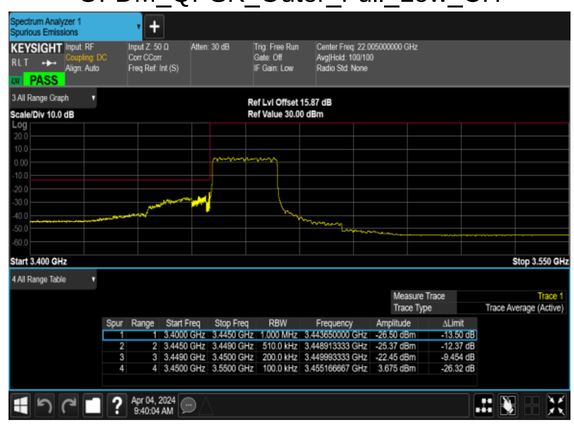
B2_N77(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low_CH



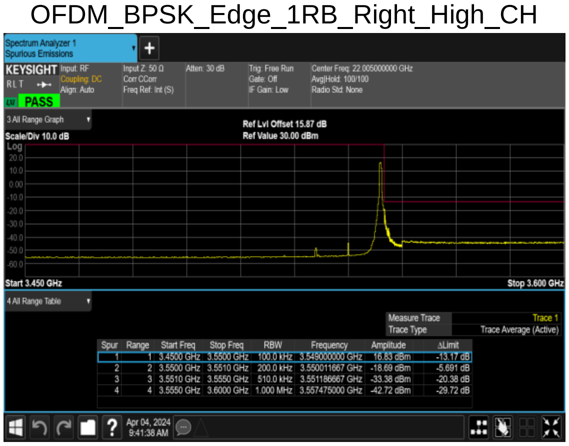
B2_N77(20M)_DFT-s-OFDM_BPSK_Outer_Full_Low_CH



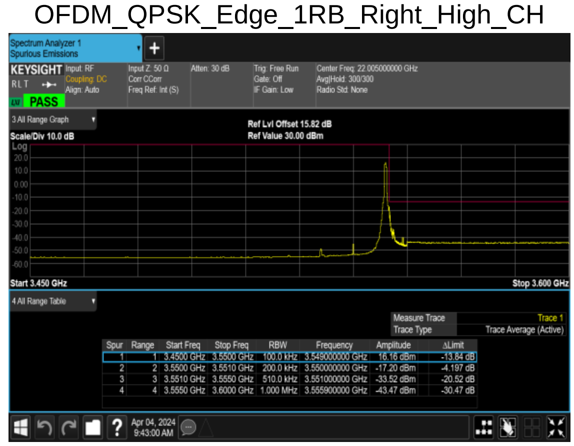
B2_N77(20M)_DFT-s-OFDM_QPSK_Outer_Full_Low_CH



B2_N77(20M)_DFT-s-OFDM_BPSK_Edge_1RB_Right_High_CH



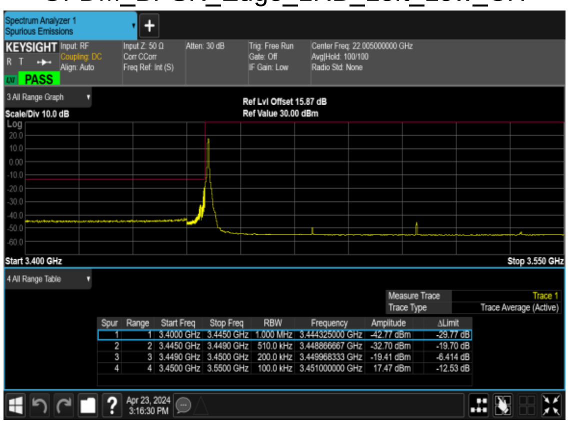
B2_N77(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Right_High_CH



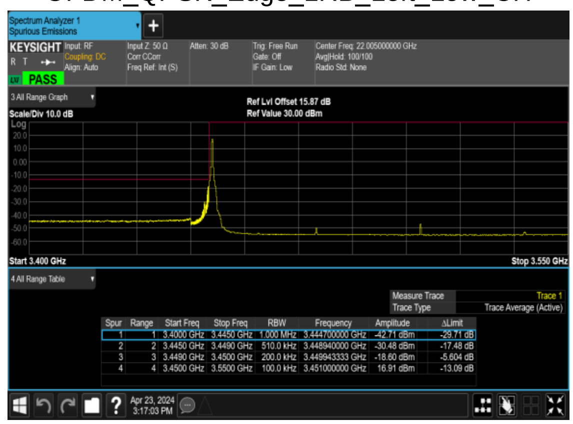
B2_N77(20M)_DFT-s-OFDM_BPSK_Outer_Full_High_CH

B2_N77(20M)_DFT-s-OFDM_QPSK_Outer_Full_High_CH

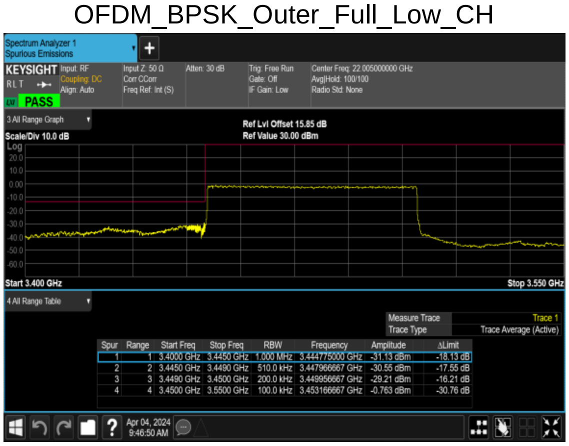
B2_N77(60M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Low_CH



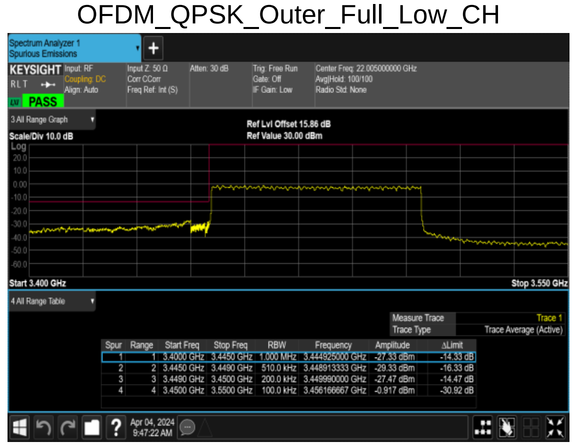
B2_N77(60M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low_CH



B2_N77(60M)_DFT-s-OFDM_BPSK_Outer_Full_Low_CH

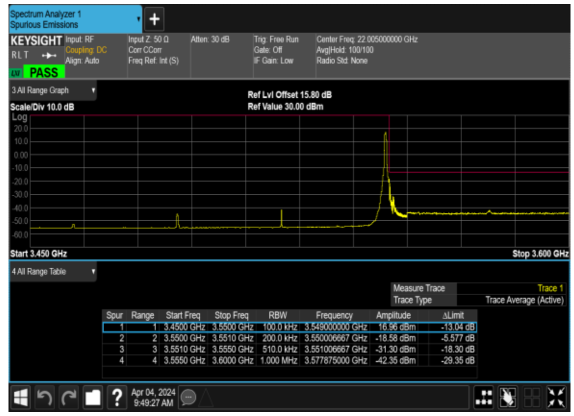


B2_N77(60M)_DFT-s-OFDM_QPSK_Outer_Full_Low_CH

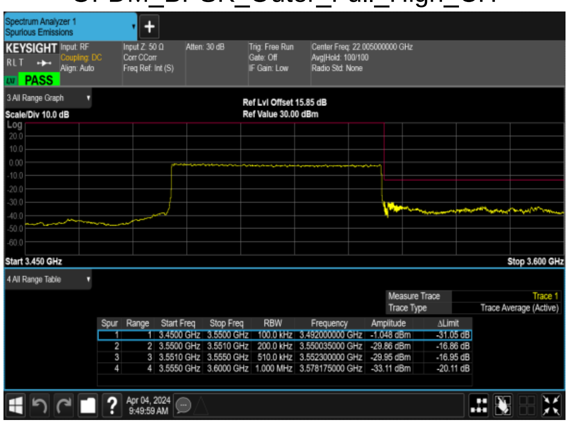


B2_N77(60M)_DFT-s-OFDM_BPSK_Edge_1RB_Right_High_CH

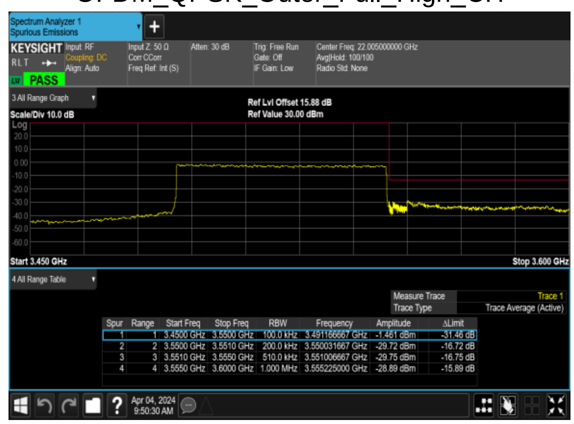
B2_N77(60M)_DFT-s-OFDM_QPSK_Edge_1RB_Right_High_CH



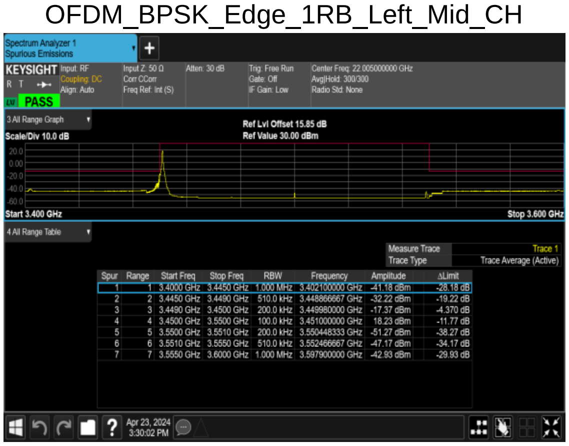
B2_N77(60M)_DFT-s-OFDM_BPSK_Outer_Full_High_CH



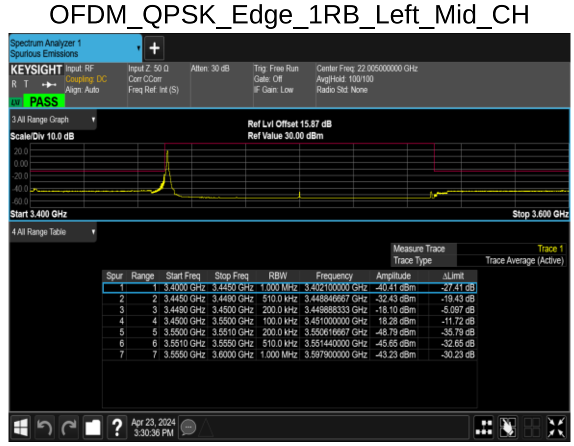
B2_N77(60M)_DFT-s-OFDM_QPSK_Outer_Full_High_CH



B2_N77(100M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH



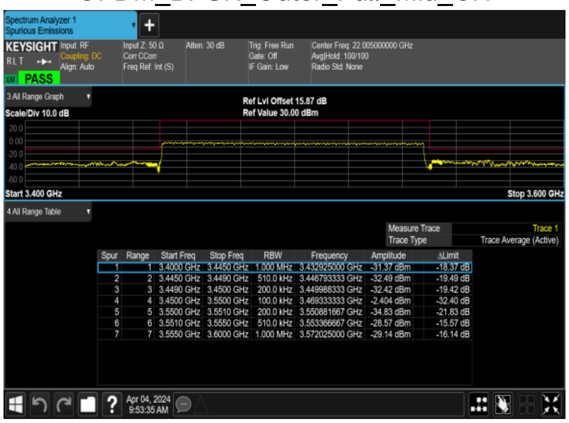
B2_N77(100M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Mid_CH



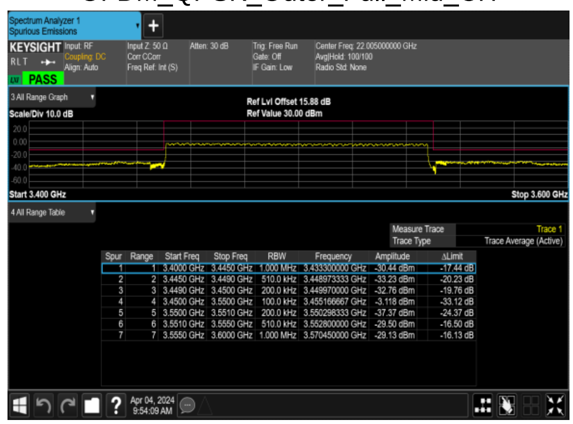
B2_N77(100M)_DFT-s-OFDM_BPSK_Edge_1RB_Right_Mid_CH

B2_N77(100M)_DFT-s-OFDM_QPSK_Edge_1RB_Right_Mid_CH

B2_N77(100M)_DFT-s-OFDM_BPSK_Outer_Full_Mid_CH



B2_N77(100M)_DFT-s-OFDM_QPSK_Outer_Full_Mid_CH



Software Version: 23.06.1602

FR1 N77 MIMO-ANT0+1

Transmitter Conducted Output Power And EIRP, $(G_T - L_C)$=1.7dB

NR Band	SCS (kHz)	Band width (MHz)	Arfcn	Freq (MHz)	Modulation	RB	ANT1 Power (dBm)	ANT0 Power (dBm)	Conducted Power(dBm)	EIRP (dBm)	EIRP (W)
77	30	20	630668	3460.02	DFT-s-OFDM QPSK	1@1	24.44	23.84	27.16	28.86	0.7691
77	30	20	630668	3460.02	DFT-s-OFDM 16 QAM	1@1	23.38	22.77	26.10	27.8	0.6026
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	1@1	24.52	23.42	27.02	28.72	0.7447
77	30	20	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	23.42	22.43	25.96	27.66	0.5834
77	30	20	636000	3540	DFT-s-OFDM QPSK	1@1	24.46	23.78	27.14	28.84	0.7656
77	30	20	636000	3540	DFT-s-OFDM 16 QAM	1@1	23.51	22.78	26.17	27.87	0.6124
77	30	30	631000	3465	DFT-s-OFDM QPSK	1@1	24.58	24.01	27.31	29.01	0.7962
77	30	30	631000	3465	DFT-s-OFDM 16 QAM	1@1	23.42	22.9	26.18	27.88	0.6138
77	30	30	633334	3500.01	DFT-s-OFDM QPSK	1@1	24.64	23.82	27.26	28.96	0.7870
77	30	30	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	23.56	22.68	26.15	27.85	0.6095
77	30	30	635666	3534.99	DFT-s-OFDM QPSK	1@1	24.7	23.87	27.32	29.02	0.7980
77	30	30	635666	3534.99	DFT-s-OFDM 16 QAM	1@1	23.65	22.85	26.28	27.98	0.6281
77	30	40	631334	3470.01	DFT-s-OFDM QPSK	1@1	24.41	23.91	27.18	28.88	0.7727
77	30	40	631334	3470.01	DFT-s-OFDM 16 QAM	1@1	23.41	22.89	26.17	27.87	0.6124
77	30	40	633334	3500.01	DFT-s-OFDM QPSK	1@1	24.37	23.66	27.04	28.74	0.7482
77	30	40	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	23.58	22.73	26.19	27.89	0.6152
77	30	40	635332	3529.98	DFT-s-OFDM QPSK	1@1	24.66	23.77	27.25	28.95	0.7852
77	30	40	635332	3529.98	DFT-s-OFDM 16 QAM	1@1	23.56	22.73	26.18	27.88	0.6138
77	30	50	631668	3475.02	DFT-s-OFDM QPSK	1@1	24.57	24.06	27.33	29.03	0.7998
77	30	50	631668	3475.02	DFT-s-OFDM 16 QAM	1@1	23.56	22.95	26.28	27.98	0.6281
77	30	50	633334	3500.01	DFT-s-OFDM QPSK	1@1	24.51	23.95	27.25	28.95	0.7852
77	30	50	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	23.53	23	26.28	27.98	0.6281
77	30	50	635000	3525	DFT-s-OFDM QPSK	1@1	24.88	23.85	27.41	29.11	0.8147
77	30	50	635000	3525	DFT-s-OFDM 16 QAM	1@1	23.93	22.89	26.45	28.15	0.6531
77	30	60	632000	3480	DFT-s-OFDM QPSK	1@1	24.4	23.99	27.21	28.91	0.7780
77	30	60	632000	3480	DFT-s-OFDM 16 QAM	1@1	23.47	22.89	26.20	27.9	0.6166
77	30	60	633334	3500.01	DFT-s-OFDM QPSK	1@1	24.51	23.99	27.27	28.97	0.7889
77	30	60	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	23.4	23.06	26.24	27.94	0.6223
77	30	60	634666	3519.99	DFT-s-OFDM QPSK	1@1	24.66	23.83	27.28	28.98	0.7907
77	30	60	634666	3519.99	DFT-s-OFDM 16 QAM	1@1	23.58	22.65	26.15	27.85	0.6095
77	30	70	632334	3485.01	DFT-s-OFDM QPSK	1@1	24.5	24.07	27.30	29	0.7943
77	30	70	632334	3485.01	DFT-s-OFDM 16 QAM	1@1	23.49	23.01	26.27	27.97	0.6266
77	30	70	633334	3500.01	DFT-s-OFDM QPSK	1@1	24.53	23.99	27.28	28.98	0.7907
77	30	70	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	23.56	23.03	26.31	28.01	0.6324
77	30	70	634332	3514.98	DFT-s-OFDM QPSK	1@1	24.59	23.97	27.30	29	0.7943
77	30	70	634332	3514.98	DFT-s-OFDM 16 QAM	1@1	23.65	22.88	26.29	27.99	0.6295

77	30	80	632668	3490.02	DFT-s-OFDM QPSK	1@1	24.53	24.15	27.35	29.05	0.8035
77	30	80	632668	3490.02	DFT-s-OFDM 16 QAM	1@1	23.52	23.14	26.34	28.04	0.6368
77	30	80	633334	3500.01	DFT-s-OFDM QPSK	1@1	24.5	24.04	27.29	28.99	0.7925
77	30	80	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	23.53	22.96	26.26	27.96	0.6252
77	30	80	634000	3510	DFT-s-OFDM QPSK	1@1	24.64	24	27.34	29.04	0.8017
77	30	80	634000	3510	DFT-s-OFDM 16 QAM	1@1	23.65	23.06	26.38	28.08	0.6427
77	30	90	633000	3495	DFT-s-OFDM QPSK	1@1	24.56	24.2	27.39	29.09	0.8110
77	30	90	633000	3495	DFT-s-OFDM 16 QAM	1@1	23.59	23.14	26.38	28.08	0.6427
77	30	90	633334	3500.01	DFT-s-OFDM QPSK	1@1	24.61	24.07	27.36	29.06	0.8054
77	30	90	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	23.69	23.11	26.42	28.12	0.6486
77	30	90	633666	3504.99	DFT-s-OFDM QPSK	1@1	24.62	24.1	27.38	29.08	0.8091
77	30	90	633666	3504.99	DFT-s-OFDM 16 QAM	1@1	23.65	23.2	26.44	28.14	0.6516
77	30	100	633334	3500.01	DFT-s-OFDM PI/2 BPSK	135@67	24.55	23.67	27.14	28.84	0.7656
77	30	100	633334	3500.01	DFT-s-OFDM PI/2 BPSK	1@1	24.59	24.22	27.42	29.12	0.8166
77	30	100	633334	3500.01	DFT-s-OFDM PI/2 BPSK	1@271	23.54	23.09	26.33	28.03	0.6353
77	30	100	633334	3500.01	DFT-s-OFDM QPSK	135@67	24.48	23.65	27.10	28.8	0.7586
77	30	100	633334	3500.01	DFT-s-OFDM QPSK	1@1	24.54	24.18	27.37	29.07	0.8072
77	30	100	633334	3500.01	DFT-s-OFDM QPSK	1@271	23.58	23.02	26.32	28.02	0.6339
77	30	100	633334	3500.01	DFT-s-OFDM 16 QAM	135@67	23.56	22.67	26.15	27.85	0.6095
77	30	100	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	23.66	23.15	26.42	28.12	0.6486
77	30	100	633334	3500.01	DFT-s-OFDM 16 QAM	1@271	22.5	22.02	25.28	26.98	0.4989
77	30	100	633334	3500.01	DFT-s-OFDM 64 QAM	135@67	21.58	20.68	24.16	25.86	0.3855
77	30	100	633334	3500.01	DFT-s-OFDM 64 QAM	1@1	21.51	21.29	24.41	26.11	0.4083
77	30	100	633334	3500.01	DFT-s-OFDM 64 QAM	1@271	20.54	20.1	23.34	25.04	0.3192
77	30	100	633334	3500.01	DFT-s-OFDM 256 QAM	135@67	19.08	18.2	21.67	23.37	0.2173
77	30	100	633334	3500.01	DFT-s-OFDM 256 QAM	1@1	19.08	18.71	21.91	23.61	0.2296
77	30	100	633334	3500.01	DFT-s-OFDM 256 QAM	1@271	18.12	17.63	20.89	22.59	0.1816
77	30	100	633334	3500.01	CP-OFDM QPSK	137@68	22.76	21.9	25.36	27.06	0.5082
77	30	100	633334	3500.01	CP-OFDM QPSK	1@1	22.66	22.79	25.74	27.44	0.5546
77	30	100	633334	3500.01	CP-OFDM QPSK	1@271	22.04	21.72	24.89	26.59	0.4560

FR1 N77 MIMO-ANT0+1(ANT0)

Frequency Stability

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Deviation (ppm)	Verdict	Environment
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0061	**PASS**	NV
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0049	**PASS**	LV
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0036	**PASS**	HV
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0068	**PASS**	-30℃
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0026	**PASS**	-20℃
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0043	**PASS**	-10℃
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0021	**PASS**	0℃
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0068	**PASS**	10℃
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0061	**PASS**	20℃
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0044	**PASS**	30℃
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0043	**PASS**	40℃
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	0.0061	**PASS**	50℃