



FCC RF Test Report

APPLICANT : ASUSTeK COMPUTER INC.
EQUIPMENT : ASUS Phone(Mobile Phone)
BRAND NAME : ASUS
MODEL NAME : ASUS_AI2401_E
FCC ID : MSQAI2401
STANDARD : 47 CFR Part 2, 27 Subpart O (3700-3980MHz)
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)
TEST DATE(S) : Oct. 28, 2023 ~ Dec 18, 2023

We, Sporton International Inc. (ShenZhen), 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.

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

Jason Jia

Approved by: Jason Jia



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People's Republic of China



TABLE OF CONTENTS

REVISION HISTORY	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Applicant	5
1.2 Manufacturer	5
1.3 Product Feature of Equipment Under Test	5
1.4 Product Specification of Equipment Under Test	6
1.5 Modification of EUT	6
1.6 Maximum EIRP and Emission Designator	7
1.7 Testing Location	8
1.8 Test Software	8
1.9 Applicable Standards	8
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	9
2.1 Test Mode	9
2.2 Connection Diagram of Test System	10
2.3 Support Unit used in test configuration and system	10
2.4 Measurement Results Explanation Example	10
2.5 Frequency List of Low/Middle/High Channels	11
3 CONDUCTED TEST ITEMS	12
3.1 Measuring Instruments	12
3.2 Test Setup	12
3.3 Test Result of Conducted Test	12
3.4 Conducted Output Power and EIRP	13
3.5 Peak-to-Average Ratio	14
3.6 Occupied Bandwidth	15
3.7 Conducted Band Edge	16
3.8 Conducted Spurious Emission	17
3.9 Frequency Stability	18
4 RADIATED TEST ITEMS	19
4.1 Measuring Instruments	19
4.2 Test Setup	19
4.3 Test Result of Radiated Test	20
4.4 Radiated Spurious Emission	21
5 LIST OF MEASURING EQUIPMENT	22
6 MEASUREMENT UNCERTAINTY	23
APPENDIX A. TEST RESULTS OF CONDUCTED TEST	
APPENDIX B. TEST RESULTS OF RADIATED TEST	
APPENDIX C. TEST SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG391308M	Rev. 01	Initial issue of report	Jan. 18, 2024



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting Only	PASS	-
	§27.50(j)(3)	Equivalent Isotropic Radiated Power (5G NR n77)	EIRP < 1Watt		
3.5	§27.50(j)(4)	Peak-to-Average Ratio	<13 dB	PASS	-
3.6	§2.1049	Occupied Bandwidth	Reporting Only	PASS	-
3.7	§2.1051 §27.53(l)(2)	Conducted Band Edge Measurement (5G NR n77)	< 43+10log ₁₀ (P[Watts])	PASS	-
3.8	§2.1051 §27.53(l)(2)	Conducted Spurious Emission (5G NR n77)	< 43+10log ₁₀ (P[Watts])	PASS	-
3.9	§27.54	Frequency Stability Temperature & Voltage	Within Authorized Band	PASS	-
4.4	§2.1053 §27.53(l)(2)	Radiated Spurious Emission (5G NR n77)	< 43+10log ₁₀ (P[Watts])	PASS	Under limit 2.45 dB at 6916.50 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/manufacture 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

ASUSTeK COMPUTER INC.

1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan

1.2 Manufacturer

ASUSTeK COMPUTER INC.

1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	ASUS Phone(Mobile Phone)
Brand Name	ASUS
Model Name	ASUS_AI2401_E
FCC ID	MSQAI2401
IMEI Code	Conducted : 356313810100658/356313810100666 Radiation : 356313810100674/356313810100682 for Sample 1 350619900100671/350619900100689 for Sample 2
HW Version	R2.0
SW Version	Android 14
EUT Stage	Identical Prototype

Remark: There are four SKUs of EUT for this project. The differences between them are summary below, According to the difference, we evaluate SKU1 to perform full test and SKU2 is verified worse case for RSE testing.

Sample list				
	SKU1	SKU2	SKU3	SKU4
Model	ASUS_AI2401_E	ASUS_AI2401_E	ASUS_AI2401_E	ASUS_AI2401_E
Config.	US(Pro)	US(Enrty)	US(Pro)	US(Enrty)
RF module board	US(Pro)	US(Enrty)	US(Pro)	US(Enrty)
LCD+Touch front frame module	AI2401 FRONT CASE ASSY	AI2401 FRONT CASE ASSY	AI2401 FRONT CASE ASSY	AI2401 FRONT CASE ASSY
DDR	16G(HYNIX) HYNIX / H58G76BK8HX095	16G(Micron) Micron / MT62F2G64D8ZA-023 WT:C	16G(HYNIX) HYNIX / H58G76BK8HX095	16G(Micron) Micron / MT62F2G64D8ZA-023 WT:C
UFS	1TB(Samsung) Samsung / KLUGGARHHD-B0G1	512G(HYNIX) (UFS4.0) HYNIX / HN8T274EJKX130	1TB(Samsung) Samsung / KLUGGARHHD-B0G1	512G(HYNIX) (UFS4.0) HYNIX / HN8T274EJKX130
MB	AI2401_MB	AI2401_MB	AI2401_MB	AI2401_MB
Back cover SKU	WW Pro(Mini LED)	WW Entry(LGF)	WW Pro(Mini LED)	WW Entry(LGF)
Battery	SCUD / C21P2301	SCUD / C21P2301	SCUD / C21P2301	SCUD / C21P2301
Main 50+13M	SHINETECH / DDN03B	RAYPRUS / CASDJ-000A	RAYPRUS / CASDJ-000A	SHINETECH / DDN03B
Tele 32M	Kunshan Q-TECH / C3HS01	SHINETECH / DHG01B	SHINETECH / DHG01B	Kunshan Q-TECH / C3HS01

Front 32M	TSPRECISION / TVHF3046	RAYPRUS / CASG-000A	RAYPRUS / CASG-000A	TSPRECISION / TVHF3046
PCB	COMPEQ	COMPEQ	COMPEQ	COMPEQ
CPU	QUALCOMM SM-8650 MPSP1629	QUALCOMM SM-8650 MPSP1629	QUALCOMM SM-8650 MPSP1629	QUALCOMM SM-8650 MPSP1629
WPC antenna	ASAP	INPAQ	INPAQ	ASAP
NFC antenna	ASAP	INPAQ	INPAQ	ASAP
WWAN/WLAN /BT/GPS antenna	INPAQ	ASAP	ASAP	INPAQ

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency	5G NR n77: 3700 MHz ~ 3980 MHz
SCS	30kHz
Bandwidth	n77(30kHz): 10 / 15 / 20 / 25 / 30 / 40 / 50 / 60 / 70 / 80 / 90 / 100MHz
Antenna Gain	<Ant. 7> 5G NR n77: -2.90 dBi <Ant. 8> 5G NR n77: -1.40 dBi <Ant. 9> 5G NR n77: -3.00 dBi <Ant. 10> 5G NR n77: -6.50 dBi
Type of Modulation	CP-OFDM: QPSK / 16QAM / 64QAM / 256QAM DFT-s-OFDM: PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM

Remark:

1. The maximum EIRP is calculated from max output power and max antenna gain, only the maximum EIRP of Antenna 8 is shown in the report.
2. The device supports n77(1T4R) SRS resources on Antenna 7/8/9/10, only the test data of worst Antenna 8 is showed in the report according to the maximum power.
3. 5G NR n77 support SA and NSA mode. The whole testing has assessed SA mode for n77 by referring to the higher conducted power for conducted test items.
4. The device supports HPUE mode for 5G NR n77 SA only.
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 and Emission Designator

5G NR n77 SA		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)
10	3705.00 ~ 3975.00	0.3846	8M56G7D	0.3184	8M59W7D
15	3705.52 ~ 3972.48	0.3681	13M6G7D	0.2958	13M6W7D
20	3710.01 ~ 3969.99	0.3664	18M3G7D	0.2951	18M2W7D
25	3712.50 ~ 3967.50	0.3828	23M1G7D	0.3105	23M3W7D
30	3715.02 ~ 3964.98	0.3802	27M8G7D	0.3062	27M9W7D
40	3720.00 ~ 3960.00	0.3622	38M0G7D	0.2911	37M9W7D
50	3725.01 ~ 3954.99	0.3793	47M4G7D	0.3034	47M6W7D
60	3730.02 ~ 3949.98	0.3733	57M8G7D	0.3041	57M9W7D
70	3735.00 ~ 3945.00	0.3837	67M3G7D	0.3133	67M6W7D
80	3740.01 ~ 3939.99	0.3908	77M6G7D	0.3170	77M5W7D
90	3745.02 ~ 3934.98	0.3945	87M5G7D	0.3097	87M6W7D
100	3750.00 ~ 3930.00	0.4074	97M4G7D	0.3412	97M8W7D

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

1.7 Testing Location

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 Firm	Sporton International Inc. (ShenZhen)		
Test Site Location	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City, Guangdong Province 518103 People's Republic of China TEL: +86-755-86066985		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	03CH03-SZ	CN1256	421272

1.8 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH03-SZ	AUDIX	E3	6.2009-8-24

1.9 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.

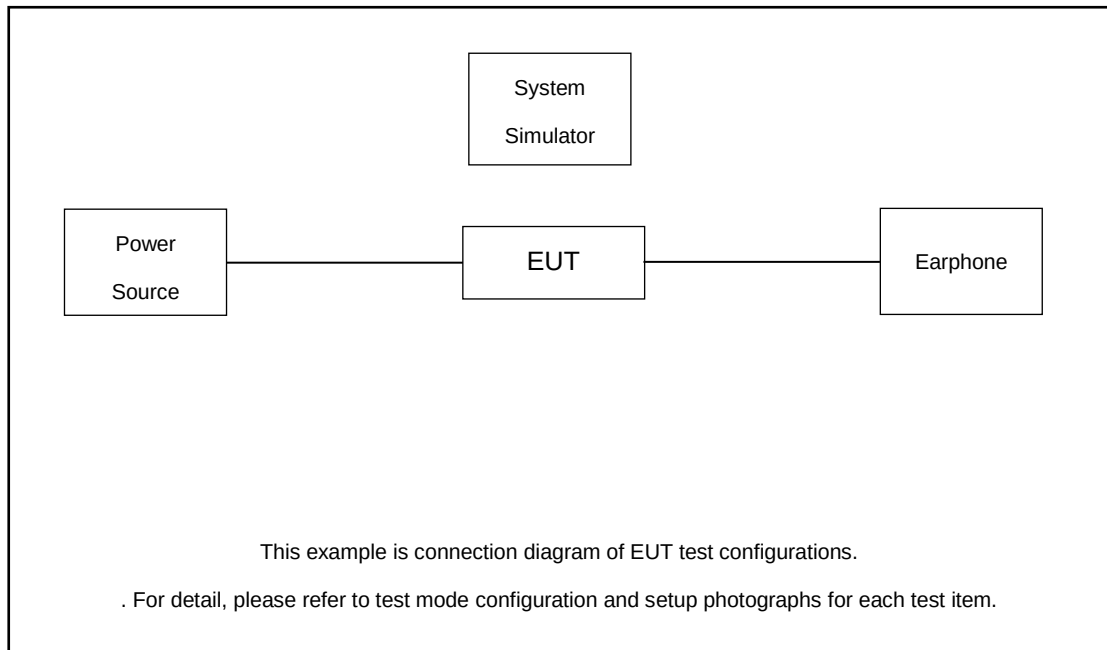
For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

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		
		10	15	20	25	30	40	50	60	70~90	100	PI/2 BPSK	QPSK	16 QAM	64 QAM	256 QAM	1	Part	Full	L	M	H
Max. Output Power	n77	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v		v	v	v	v
Peak-to-Average Ratio	n77			v								v	v				v		v		v	
26dB and 99% Bandwidth	n77	v	v	v	v	v	v	v	v	v	v		v	v	v	v			v		v	
Conducted Band Edge	n77	v						v			v	v	v				v		v	v		v
Conducted Spurious Emission	n77	v						v			v	v	v				v			v	v	v
Frequency Stability	n77			v									v						v		v	
E.I.R.P	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v		v	v	v	v
Radiated Spurious Emission	n77	Worst Case																			v	
Note	1. The mark “v ” means that this configuration is chosen for testing 2. The mark “-” means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported. 4. Frequency Stability : Normal Voltage = 7.78V; Low Voltage =7.20V; High Voltage =8.70V.																					

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.	DC Power Supply	GW	GPS-3030D	N/A	N/A	Unshielded, 1.8 m
2.	LTE Base Station	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m
3.	NR Base Station	Anritsu	MT8000A	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

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

The spectrum analyzer offset is derived from RF cable loss.

Offset = RF cable loss

Following shows an offset computation example with cable loss 8.90 dB.

Example :

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)}. \\ &= 8.90(\text{dB}) \end{aligned}$$



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	650000	656000	662000
	Frequency	3750	3840	3930
90	Channel	649668	656000	662332
	Frequency	3745.02	3840	3934.98
80	Channel	649334	656000	662666
	Frequency	3740.01	3840	3939.99
70	Channel	649000	656000	663000
	Frequency	3735	3840	3945
60	Channel	648668	656000	663332
	Frequency	3730.02	3840	3949.98
50	Channel	648334	656000	663666
	Frequency	3725.01	3840	3954.99
40	Channel	648000	656000	664000
	Frequency	3720	3840	3960
30	Channel	647668	656000	664332
	Frequency	3715.02	3840	3964.98
25	Channel	647500	656000	664500
	Frequency	3712.5	3840	3967.5
20	Channel	647334	656000	664666
	Frequency	3710.01	3840	3969.99
15	Channel	647168	656000	664832
	Frequency	3707.52	3840	3972.48
10	Channel	647000	656000	665000
	Frequency	3705	3840	3975

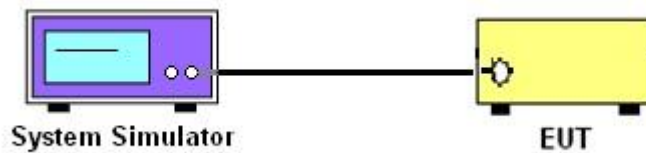
3 Conducted Test Items

3.1 Measuring Instruments

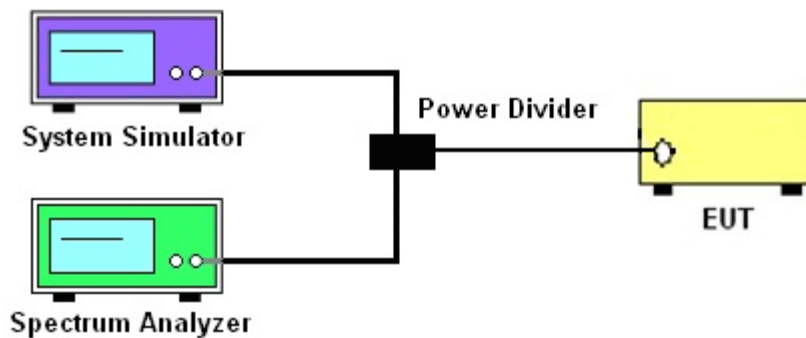
See list of measuring instruments of this test report.

3.2 Test Setup

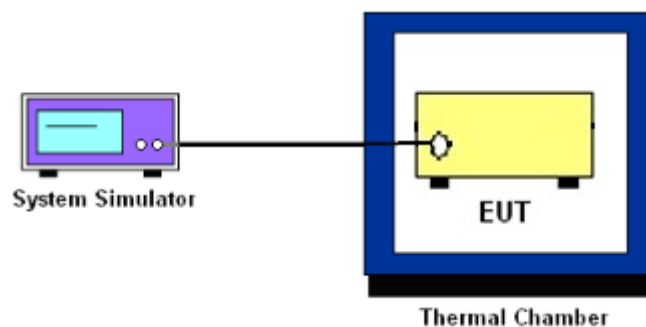
3.2.1 Conducted Output Power



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 EIRP

3.4.1 Description of the Conducted Output Power Measurement and 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 EIRP of mobile transmitters must not exceed 1 Watts for 5G NR n77.

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(l)(2)

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

3.7.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured.
4. Set RBW $\geq$ 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
5. Beyond the 1 MHz band from the band edge, RBW=1MHz was used or a narrower RBW was used (generally limited to no less than 1% of the OBW) and the measured power was integrated over the full required measurement bandwidth.
6. Set spectrum analyzer with RMS detector.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. Checked that all the results comply with the emission limit line.

Example:

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)

$$= P(W) - [43 + 10\log(P)] \text{ (dB)}$$

$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)} = -13\text{dBm}.$$

9. When using the integration method, the starting frequency of the integration shall be centered at one-half of the RBW away from the band edge.

3.8 Conducted Spurious Emission

3.8.1 Description of Conducted Spurious Emission Measurement

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

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th 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 $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)]$ (dB)
 $= [30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB)
 $= -13$ dBm.

3.9 Frequency Stability

3.9.1 Description of Frequency Stability Measurement

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

3.9.2 Test Procedures for Temperature Variation

1. The testing follows ANSI C63.26 section 5.6.4
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10°C step up to 50°C . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.9.3 Test Procedures for Voltage Variation

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

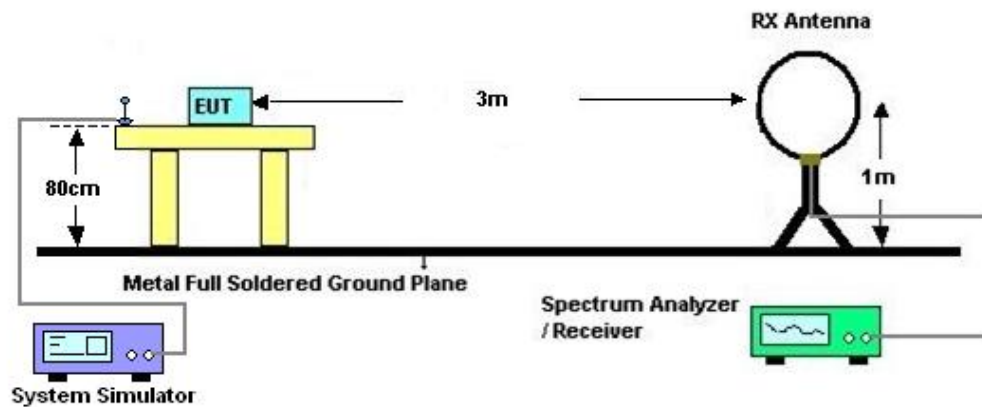
4 Radiated Test Items

4.1 Measuring Instruments

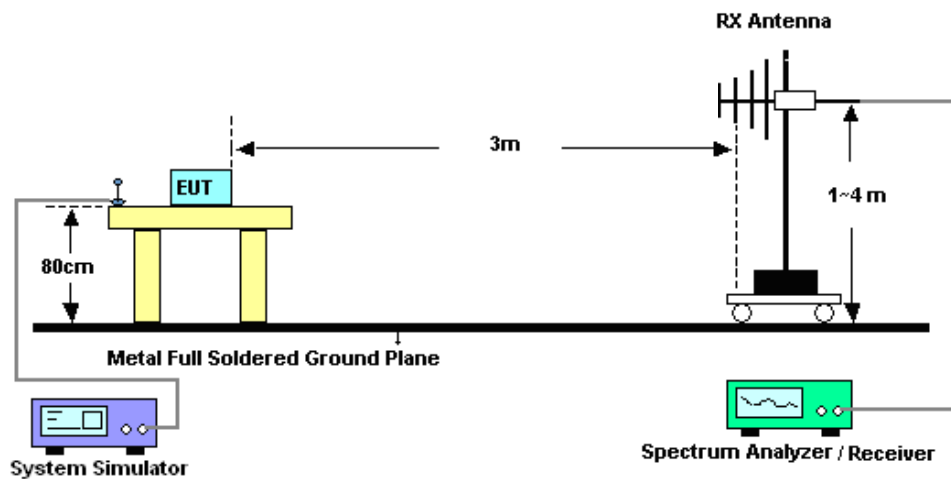
See list of measuring instruments of this test report.

4.2 Test Setup

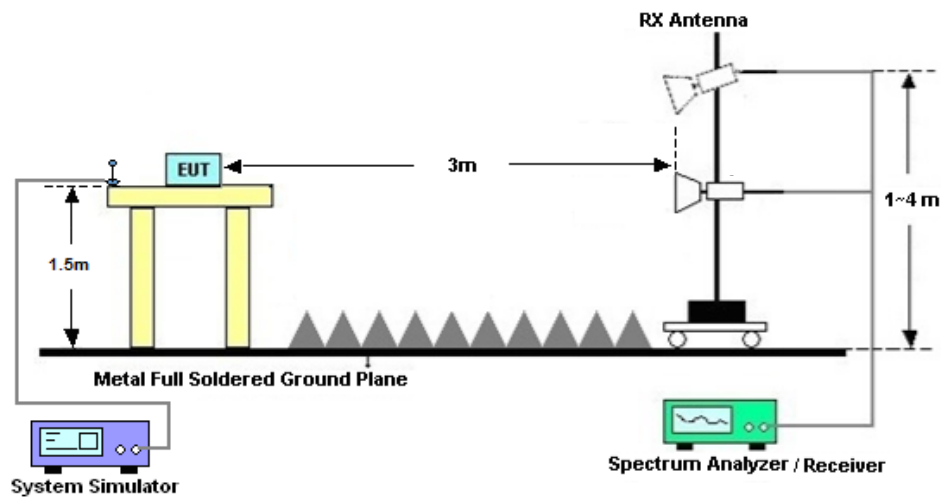
4.2.1 For radiated test below 30MHz



4.2.2 For radiated test from 30MHz to 1GHz



4.2.3 For radiated test above 1GHz



4.3 Test Result of Radiated Test

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

Please refer to Appendix B.

4.4 Radiated Spurious Emission

4.4.1 Description of Radiated Spurious Emission

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

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

4.4.2 Test Procedures

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

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$



5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 06, 2023	Oct. 28, 2023	Apr. 05, 2024	Conducted (TH01-SZ)
DC Power Supply	TTI	PL330P	290070	Max 32V , 3A	Oct. 16, 2023	Oct. 28, 2023	Oct. 15, 2024	Conducted (TH01-SZ)
Power Divider	TOJOIN	PS-2SM-04 265	60.06.020.007 7	0.4GHz~26.5GHz	Dec. 25, 2022	Oct. 28, 2023	Dec. 24, 2023	Conducted (TH01-SZ)
Thermal Chamber	Ten Billion Hongzhangroup	LP-150U	H2014081803	-40~+150°C	Jul. 05, 2023	Oct. 28, 2023	Jul. 04, 2024	Conducted (TH01-SZ)
EMI Test Receiver&SA	KEYSIGHT	N9038A	MY54450083	20Hz~8.4GHz	Apr. 04, 2023	Dec. 18, 2023	Apr. 03, 2024	Radiation (03CH03-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	Jun. 28, 2022	Dec. 18, 2023	Jun. 27, 2024	Radiation (03CH03-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150246	10Hz~44GHz;	Apr. 04, 2023	Dec. 18, 2023	Apr. 03, 2024	Radiation (03CH03-SZ)
Bilog Antenna	TeseQ	CBL6112D	35408	30MHz~2GHz	Aug. 20, 2023	Dec. 18, 2023	Aug. 19, 2025	Radiation (03CH03-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1355	1GHz~18GHz	Apr. 08, 2023	Dec. 18, 2023	Apr. 07, 2024	Radiation (03CH03-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz ~3000MHz	Oct. 18, 2023	Dec. 18, 2023	Oct. 17, 2024	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	TTA1840-35 -HG	1871923	18GHz~40GHz	Jul. 07, 2023	Dec. 18, 2023	Jul.06, 2024	Radiation (03CH03-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz~40GHz	Apr. 08, 2023	Dec. 18, 2023	Apr. 07, 2024	Radiation (03CH03-SZ)
Amplifier	Agilent Technologies	83017A	MY39501302	500MHz~26.5GHz	Dec. 26, 2022	Dec. 18, 2023	Dec. 25, 2023	Radiation (03CH03-SZ)
AC Power Source	Chroma	61601	616010002729	N/A	Oct. 18, 2023	Dec. 18, 2023	Oct. 17, 2024	Radiation (03CH03-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Dec. 18, 2023	NCR	Radiation (03CH03-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Dec. 18, 2023	NCR	Radiation (03CH03-SZ)

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 (9 KHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.0
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.6
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.8
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----- THE END -----



Appendix A. Test Results of Conducted Test

Test Engineer :	Khan Zhen	Temperature :	22~23°C
		Relative Humidity :	40~42%

FR1 N77(ANT8)

Transmitter Conducted Output Power And EIRP, ($G_T - L_C$)=-1.4dB

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Conducted Power(dBm)	EIRP (dBm)	EIRP (W)
77	30	10	647000	3705.0	DFT-s-OFDM QPSK	1@1	26.69	25.29	0.3381
77	30	10	647000	3705.0	DFT-s-OFDM 16 QAM	1@1	25.74	24.34	0.2716
77	30	10	656000	3840.0	DFT-s-OFDM QPSK	1@1	27.04	25.64	0.3664
77	30	10	656000	3840.0	DFT-s-OFDM 16 QAM	1@1	26.08	24.68	0.2938
77	30	10	665000	3975.0	DFT-s-OFDM QPSK	1@1	27.25	25.85	0.3846
77	30	10	665000	3975.0	DFT-s-OFDM 16 QAM	1@1	26.43	25.03	0.3184
77	30	15	647168	3707.52	DFT-s-OFDM QPSK	1@1	26.63	25.23	0.3334
77	30	15	647168	3707.52	DFT-s-OFDM 16 QAM	1@1	25.69	24.29	0.2685
77	30	15	656000	3840.0	DFT-s-OFDM QPSK	1@1	26.89	25.49	0.3540
77	30	15	656000	3840.0	DFT-s-OFDM 16 QAM	1@1	25.92	24.52	0.2831
77	30	15	664832	3972.48	DFT-s-OFDM QPSK	1@1	27.06	25.66	0.3681
77	30	15	664832	3972.48	DFT-s-OFDM 16 QAM	1@1	26.11	24.71	0.2958
77	30	20	647334	3710.01	DFT-s-OFDM QPSK	1@1	26.51	25.11	0.3243
77	30	20	647334	3710.01	DFT-s-OFDM 16 QAM	1@1	25.58	24.18	0.2618
77	30	20	656000	3840.0	DFT-s-OFDM QPSK	1@1	26.78	25.38	0.3451
77	30	20	656000	3840.0	DFT-s-OFDM 16 QAM	1@1	25.93	24.53	0.2838
77	30	20	664666	3969.99	DFT-s-OFDM QPSK	1@1	27.04	25.64	0.3664
77	30	20	664666	3969.99	DFT-s-OFDM 16 QAM	1@1	26.1	24.7	0.2951
77	30	25	647500	3712.5	DFT-s-OFDM QPSK	1@1	26.72	25.32	0.3404
77	30	25	647500	3712.5	DFT-s-OFDM 16 QAM	1@1	25.78	24.38	0.2742
77	30	25	656000	3840.0	DFT-s-OFDM QPSK	1@1	27.01	25.61	0.3639
77	30	25	656000	3840.0	DFT-s-OFDM 16 QAM	1@1	26.02	24.62	0.2897
77	30	25	664500	3967.5	DFT-s-OFDM QPSK	1@1	27.23	25.83	0.3828
77	30	25	664500	3967.5	DFT-s-OFDM 16 QAM	1@1	26.32	24.92	0.3105
77	30	30	647668	3715.02	DFT-s-OFDM QPSK	1@1	26.72	25.32	0.3404
77	30	30	647668	3715.02	DFT-s-OFDM 16 QAM	1@1	25.82	24.42	0.2767
77	30	30	656000	3840.0	DFT-s-OFDM QPSK	1@1	27.03	25.63	0.3656
77	30	30	656000	3840.0	DFT-s-OFDM 16 QAM	1@1	26.04	24.64	0.2911
77	30	30	664332	3964.98	DFT-s-OFDM QPSK	1@1	27.2	25.8	0.3802

77	30	30	664332	3964.98	DFT-s-OFDM 16 QAM	1@1	26.26	24.86	0.3062
77	30	40	648000	3720.0	DFT-s-OFDM QPSK	1@1	26.71	25.31	0.3396
77	30	40	648000	3720.0	DFT-s-OFDM 16 QAM	1@1	25.76	24.36	0.2729
77	30	40	656000	3840.0	DFT-s-OFDM QPSK	1@1	26.91	25.51	0.3556
77	30	40	656000	3840.0	DFT-s-OFDM 16 QAM	1@1	26	24.6	0.2884
77	30	40	664000	3960.0	DFT-s-OFDM QPSK	1@1	26.99	25.59	0.3622
77	30	40	664000	3960.0	DFT-s-OFDM 16 QAM	1@1	26.04	24.64	0.2911
77	30	50	648334	3725.01	DFT-s-OFDM QPSK	1@1	26.83	25.43	0.3491
77	30	50	648334	3725.01	DFT-s-OFDM 16 QAM	1@1	25.92	24.52	0.2831
77	30	50	656000	3840.0	DFT-s-OFDM QPSK	1@1	27.19	25.79	0.3793
77	30	50	656000	3840.0	DFT-s-OFDM 16 QAM	1@1	26.22	24.82	0.3034
77	30	50	663666	3954.99	DFT-s-OFDM QPSK	1@1	27.02	25.62	0.3648
77	30	50	663666	3954.99	DFT-s-OFDM 16 QAM	1@1	26.03	24.63	0.2904
77	30	60	648668	3730.02	DFT-s-OFDM QPSK	1@1	26.64	25.24	0.3342
77	30	60	648668	3730.02	DFT-s-OFDM 16 QAM	1@1	25.72	24.32	0.2704
77	30	60	656000	3840.0	DFT-s-OFDM QPSK	1@1	27.12	25.72	0.3733
77	30	60	656000	3840.0	DFT-s-OFDM 16 QAM	1@1	26.23	24.83	0.3041
77	30	60	663332	3949.98	DFT-s-OFDM QPSK	1@1	26.91	25.51	0.3556
77	30	60	663332	3949.98	DFT-s-OFDM 16 QAM	1@1	25.96	24.56	0.2858
77	30	70	649000	3735.0	DFT-s-OFDM QPSK	1@1	26.83	25.43	0.3491
77	30	70	649000	3735.0	DFT-s-OFDM 16 QAM	1@1	25.97	24.57	0.2864
77	30	70	656000	3840.0	DFT-s-OFDM QPSK	1@1	27.22	25.82	0.3819
77	30	70	656000	3840.0	DFT-s-OFDM 16 QAM	1@1	26.36	24.96	0.3133
77	30	70	663000	3945.0	DFT-s-OFDM QPSK	1@1	27.24	25.84	0.3837
77	30	70	663000	3945.0	DFT-s-OFDM 16 QAM	1@1	26.31	24.91	0.3097
77	30	80	649334	3740.01	DFT-s-OFDM QPSK	1@1	26.84	25.44	0.3499
77	30	80	649334	3740.01	DFT-s-OFDM 16 QAM	1@1	25.93	24.53	0.2838
77	30	80	656000	3840.0	DFT-s-OFDM QPSK	1@1	27.32	25.92	0.3908
77	30	80	656000	3840.0	DFT-s-OFDM 16 QAM	1@1	26.41	25.01	0.3170
77	30	80	662666	3939.99	DFT-s-OFDM QPSK	1@1	27.18	25.78	0.3784
77	30	80	662666	3939.99	DFT-s-OFDM 16 QAM	1@1	26.18	24.78	0.3006
77	30	90	649668	3745.02	DFT-s-OFDM QPSK	1@1	26.96	25.56	0.3597
77	30	90	649668	3745.02	DFT-s-OFDM 16 QAM	1@1	26.02	24.62	0.2897
77	30	90	656000	3840.0	DFT-s-OFDM QPSK	1@1	27.12	25.72	0.3733
77	30	90	656000	3840.0	DFT-s-OFDM 16 QAM	1@1	26.24	24.84	0.3048

77	30	90	662332	3934.98	DFT-s-OFDM QPSK	1@1	27.36	25.96	0.3945
77	30	90	662332	3934.98	DFT-s-OFDM 16 QAM	1@1	26.31	24.91	0.3097
77	30	100	650000	3750.0	DFT-s-OFDM PI/2 BPSK	135@67	27.06	25.66	0.3681
77	30	100	650000	3750.0	DFT-s-OFDM PI/2 BPSK	1@1	27	25.6	0.3631
77	30	100	650000	3750.0	DFT-s-OFDM PI/2 BPSK	1@271	27.27	25.87	0.3864
77	30	100	650000	3750.0	DFT-s-OFDM QPSK	135@67	27	25.6	0.3631
77	30	100	650000	3750.0	DFT-s-OFDM QPSK	1@1	26.99	25.59	0.3622
77	30	100	650000	3750.0	DFT-s-OFDM QPSK	1@271	27.26	25.86	0.3855
77	30	100	650000	3750.0	DFT-s-OFDM 16 QAM	135@67	26	24.6	0.2884
77	30	100	650000	3750.0	DFT-s-OFDM 16 QAM	1@1	26.01	24.61	0.2891
77	30	100	650000	3750.0	DFT-s-OFDM 16 QAM	1@271	26.31	24.91	0.3097
77	30	100	650000	3750.0	DFT-s-OFDM 64 QAM	135@67	24.52	23.12	0.2051
77	30	100	650000	3750.0	DFT-s-OFDM 64 QAM	1@1	24.46	23.06	0.2023
77	30	100	650000	3750.0	DFT-s-OFDM 64 QAM	1@271	24.81	23.41	0.2193
77	30	100	650000	3750.0	DFT-s-OFDM 256 QAM	135@67	22.55	21.15	0.1303
77	30	100	650000	3750.0	DFT-s-OFDM 256 QAM	1@1	22.22	20.82	0.1208
77	30	100	650000	3750.0	DFT-s-OFDM 256 QAM	1@271	22.45	21.05	0.1274
77	30	100	650000	3750.0	CP-OFDM QPSK	137@68	25.36	23.96	0.2489
77	30	100	650000	3750.0	CP-OFDM QPSK	1@1	25.51	24.11	0.2576
77	30	100	650000	3750.0	CP-OFDM QPSK	1@271	25.83	24.43	0.2773
77	30	100	656000	3840.0	DFT-s-OFDM PI/2 BPSK	135@67	27.03	25.63	0.3656
77	30	100	656000	3840.0	DFT-s-OFDM PI/2 BPSK	1@1	27.15	25.75	0.3758
77	30	100	656000	3840.0	DFT-s-OFDM PI/2 BPSK	1@271	27.15	25.75	0.3758
77	30	100	656000	3840.0	DFT-s-OFDM QPSK	135@67	26.96	25.56	0.3597
77	30	100	656000	3840.0	DFT-s-OFDM QPSK	1@1	27.16	25.76	0.3767
77	30	100	656000	3840.0	DFT-s-OFDM QPSK	1@271	27.12	25.72	0.3733
77	30	100	656000	3840.0	DFT-s-OFDM 16 QAM	135@67	25.97	24.57	0.2864
77	30	100	656000	3840.0	DFT-s-OFDM 16 QAM	1@1	26.18	24.78	0.3006
77	30	100	656000	3840.0	DFT-s-OFDM 16 QAM	1@271	26.2	24.8	0.3020
77	30	100	656000	3840.0	DFT-s-OFDM 64 QAM	135@67	24.55	23.15	0.2065
77	30	100	656000	3840.0	DFT-s-OFDM 64 QAM	1@1	24.64	23.24	0.2109
77	30	100	656000	3840.0	DFT-s-OFDM 64 QAM	1@271	24.59	23.19	0.2084
77	30	100	656000	3840.0	DFT-s-OFDM 256 QAM	135@67	22.57	21.17	0.1309
77	30	100	656000	3840.0	DFT-s-OFDM 256 QAM	1@1	22.4	21	0.1259
77	30	100	656000	3840.0	DFT-s-OFDM 256 QAM	1@271	22.33	20.93	0.1239

77	30	100	656000	3840.0	CP-OFDM QPSK	137@68	25.39	23.99	0.2506
77	30	100	656000	3840.0	CP-OFDM QPSK	1@1	25.7	24.3	0.2692
77	30	100	656000	3840.0	CP-OFDM QPSK	1@271	25.69	24.29	0.2685
77	30	100	662000	3930.0	DFT-s-OFDM PI/2 BPSK	135@67	27.06	25.66	0.3681
77	30	100	662000	3930.0	DFT-s-OFDM PI/2 BPSK	1@1	27.5	26.1	0.4074
77	30	100	662000	3930.0	DFT-s-OFDM PI/2 BPSK	1@271	27.04	25.64	0.3664
77	30	100	662000	3930.0	DFT-s-OFDM QPSK	135@67	27.05	25.65	0.3673
77	30	100	662000	3930.0	DFT-s-OFDM QPSK	1@1	27.48	26.08	0.4055
77	30	100	662000	3930.0	DFT-s-OFDM QPSK	1@271	27.04	25.64	0.3664
77	30	100	662000	3930.0	DFT-s-OFDM 16 QAM	135@67	25.99	24.59	0.2877
77	30	100	662000	3930.0	DFT-s-OFDM 16 QAM	1@1	26.73	25.33	0.3412
77	30	100	662000	3930.0	DFT-s-OFDM 16 QAM	1@271	26.14	24.74	0.2979
77	30	100	662000	3930.0	DFT-s-OFDM 64 QAM	135@67	24.55	23.15	0.2065
77	30	100	662000	3930.0	DFT-s-OFDM 64 QAM	1@1	25.25	23.85	0.2427
77	30	100	662000	3930.0	DFT-s-OFDM 64 QAM	1@271	24.59	23.19	0.2084
77	30	100	662000	3930.0	DFT-s-OFDM 256 QAM	135@67	22.56	21.16	0.1306
77	30	100	662000	3930.0	DFT-s-OFDM 256 QAM	1@1	22.88	21.48	0.1406
77	30	100	662000	3930.0	DFT-s-OFDM 256 QAM	1@271	22.33	20.93	0.1239
77	30	100	662000	3930.0	CP-OFDM QPSK	137@68	25.41	24.01	0.2518
77	30	100	662000	3930.0	CP-OFDM QPSK	1@1	26.26	24.86	0.3062
77	30	100	662000	3930.0	CP-OFDM QPSK	1@271	25.68	24.28	0.2679

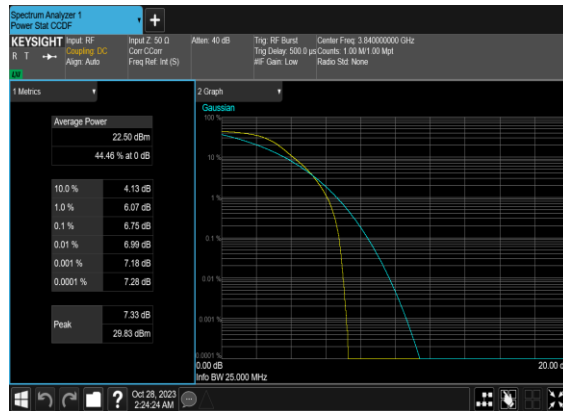
Frequency Stability

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Deviation (ppm)	Verdict	Environment
77	30	20	656000	3840.0	DFT-s-OFDM QPSK	50@0	0.0046	PASS	NV
77	30	20	656000	3840.0	DFT-s-OFDM QPSK	50@0	0.0059	PASS	LV
77	30	20	656000	3840.0	DFT-s-OFDM QPSK	50@0	0.0022	PASS	HV
77	30	20	656000	3840.0	DFT-s-OFDM QPSK	50@0	0.0044	PASS	-10°C
77	30	20	656000	3840.0	DFT-s-OFDM QPSK	50@0	0.0025	PASS	0°C
77	30	20	656000	3840.0	DFT-s-OFDM QPSK	50@0	0.0042	PASS	10°C
77	30	20	656000	3840.0	DFT-s-OFDM QPSK	50@0	0.0046	PASS	20°C
77	30	20	656000	3840.0	DFT-s-OFDM QPSK	50@0	0.0046	PASS	30°C
77	30	20	656000	3840.0	DFT-s-OFDM QPSK	50@0	0.0041	PASS	40°C
77	30	20	656000	3840.0	DFT-s-OFDM QPSK	50@0	0.0036	PASS	50°C

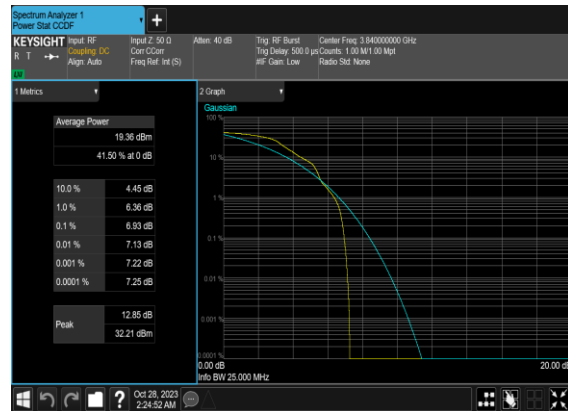
Peak to Average Ratio

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Result (dB)	Limit (dB)	Verdict
77	30	20	656000	3840.0	DFT-s-OFDM PI/2 BPSK	50@0	6.75	13	PASS
77	30	20	656000	3840.0	DFT-s-OFDM PI/2 BPSK	1@0	6.93	13	PASS
77	30	20	656000	3840.0	DFT-s-OFDM QPSK	50@0	7.35	13	PASS
77	30	20	656000	3840.0	DFT-s-OFDM QPSK	1@0	7.8	13	PASS

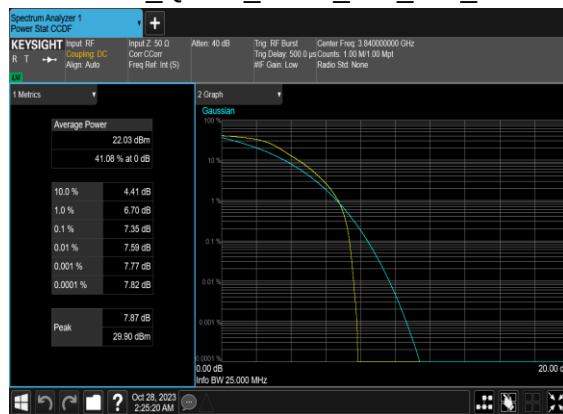
N77(20M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_Mid_CH



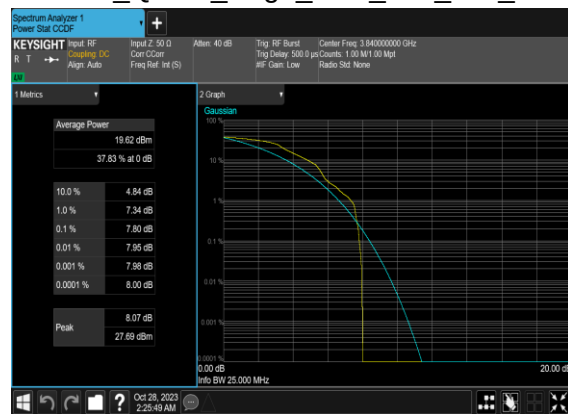
N77(20M)_DFT-s-OFDM_PI_2-BPSK_Edge_1RB_Left_Mid_CH



N77(20M)_DFT-s-OFDM_QPSK_Outer_Full_Mid_CH



N77(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Mid_CH

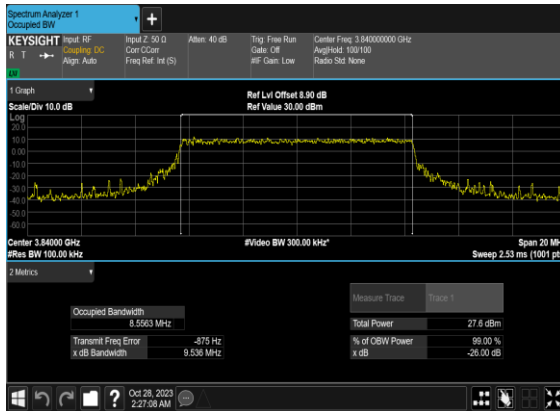


Occupied Bandwidth

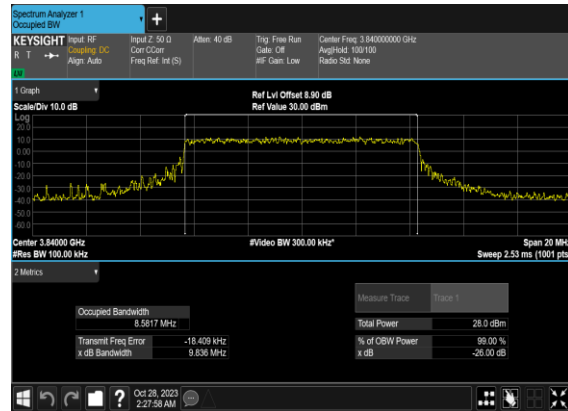
NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	OBW (MHz)	26dB BW (MHz)
77	30	10	656000	3840.0	CP-OFDM QPSK	24@0	8.5563	9.536
77	30	10	656000	3840.0	CP-OFDM 16 QAM	24@0	8.5817	9.836
77	30	10	656000	3840.0	CP-OFDM 64 QAM	24@0	8.5798	9.461
77	30	10	656000	3840.0	CP-OFDM 256 QAM	24@0	8.5918	10.01
77	30	15	656000	3840.0	CP-OFDM QPSK	38@0	13.572	14.73
77	30	15	656000	3840.0	CP-OFDM 16 QAM	38@0	13.565	14.88
77	30	15	656000	3840.0	CP-OFDM 64 QAM	38@0	13.581	14.77
77	30	15	656000	3840.0	CP-OFDM 256 QAM	38@0	13.557	14.79
77	30	20	656000	3840.0	CP-OFDM QPSK	51@0	18.253	19.5
77	30	20	656000	3840.0	CP-OFDM 16 QAM	51@0	18.243	19.58
77	30	20	656000	3840.0	CP-OFDM 64 QAM	51@0	18.182	19.21
77	30	20	656000	3840.0	CP-OFDM 256 QAM	51@0	18.226	19.23
77	30	25	656000	3840.0	CP-OFDM QPSK	65@0	23.145	24.55
77	30	25	656000	3840.0	CP-OFDM 16 QAM	65@0	23.279	24.52
77	30	25	656000	3840.0	CP-OFDM 64 QAM	65@0	23.285	24.75
77	30	25	656000	3840.0	CP-OFDM 256 QAM	65@0	23.152	24.42
77	30	30	656000	3840.0	CP-OFDM QPSK	78@0	27.828	29.31
77	30	30	656000	3840.0	CP-OFDM 16 QAM	78@0	27.777	29.03
77	30	30	656000	3840.0	CP-OFDM 64 QAM	78@0	27.91	29.94
77	30	30	656000	3840.0	CP-OFDM 256 QAM	78@0	27.846	29.11
77	30	40	656000	3840.0	CP-OFDM QPSK	106@0	37.952	39.4
77	30	40	656000	3840.0	CP-OFDM 16 QAM	106@0	37.869	39.5
77	30	40	656000	3840.0	CP-OFDM 64 QAM	106@0	37.865	39.24
77	30	40	656000	3840.0	CP-OFDM 256 QAM	106@0	37.893	39.56
77	30	50	656000	3840.0	CP-OFDM QPSK	133@0	47.446	49.34

77	30	50	656000	3840.0	CP-OFDM 16 QAM	133@0	47.634	49.07
77	30	50	656000	3840.0	CP-OFDM 64 QAM	133@0	47.507	49.14
77	30	50	656000	3840.0	CP-OFDM 256 QAM	133@0	47.443	49.09
77	30	60	656000	3840.0	CP-OFDM QPSK	162@0	57.75	59.64
77	30	60	656000	3840.0	CP-OFDM 16 QAM	162@0	57.82	59.99
77	30	60	656000	3840.0	CP-OFDM 64 QAM	162@0	57.871	59.66
77	30	60	656000	3840.0	CP-OFDM 256 QAM	162@0	57.93	59.63
77	30	70	656000	3840.0	CP-OFDM QPSK	189@0	67.345	69.91
77	30	70	656000	3840.0	CP-OFDM 16 QAM	189@0	67.282	69.58
77	30	70	656000	3840.0	CP-OFDM 64 QAM	189@0	67.604	69.61
77	30	70	656000	3840.0	CP-OFDM 256 QAM	189@0	67.403	69.5
77	30	80	656000	3840.0	CP-OFDM QPSK	217@0	77.588	79.95
77	30	80	656000	3840.0	CP-OFDM 16 QAM	217@0	77.504	79.99
77	30	80	656000	3840.0	CP-OFDM 64 QAM	217@0	77.51	79.95
77	30	80	656000	3840.0	CP-OFDM 256 QAM	217@0	77.505	80.13
77	30	90	656000	3840.0	CP-OFDM QPSK	245@0	87.521	90.46
77	30	90	656000	3840.0	CP-OFDM 16 QAM	245@0	87.378	90.22
77	30	90	656000	3840.0	CP-OFDM 64 QAM	245@0	87.404	90.26
77	30	90	656000	3840.0	CP-OFDM 256 QAM	245@0	87.597	90.4
77	30	100	656000	3840.0	CP-OFDM QPSK	273@0	97.448	100.7
77	30	100	656000	3840.0	CP-OFDM 16 QAM	273@0	97.397	100.5
77	30	100	656000	3840.0	CP-OFDM 64 QAM	273@0	97.302	100.5
77	30	100	656000	3840.0	CP-OFDM 256 QAM	273@0	97.756	100.5

N77(10M)_CP-
OFDM_QPSK_Outer_Full_Mid_CH



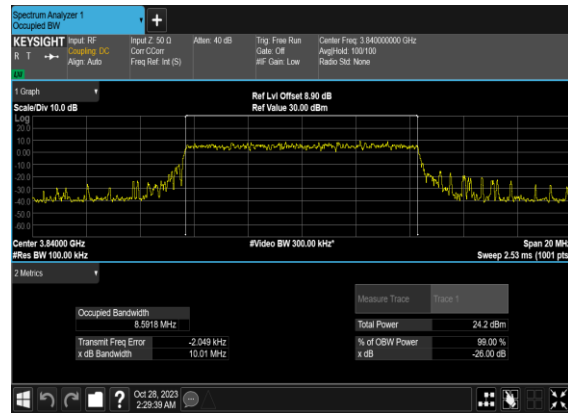
N77(10M)_CP-OFDM_16
QAM_Outer_Full_Mid_CH



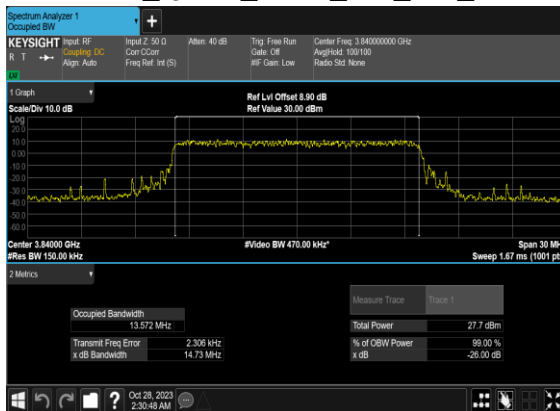
N77(10M)_CP-OFDM_64
QAM_Outer_Full_Mid_CH



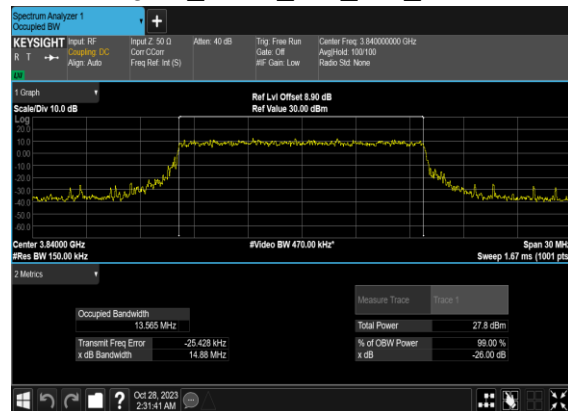
N77(10M)_CP-OFDM_256
QAM_Outer_Full_Mid_CH



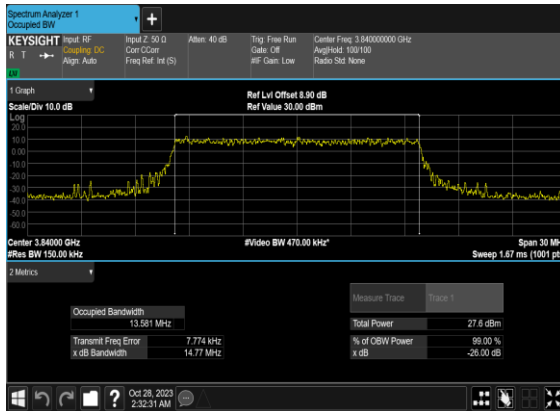
N77(15M)_CP-
OFDM_QPSK_Outer_Full_Mid_CH



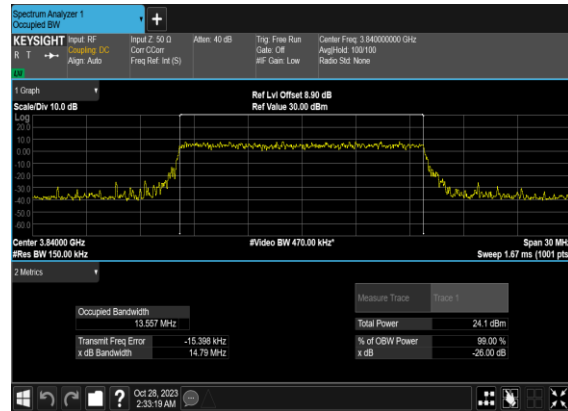
N77(15M)_CP-OFDM_16
QAM_Outer_Full_Mid_CH



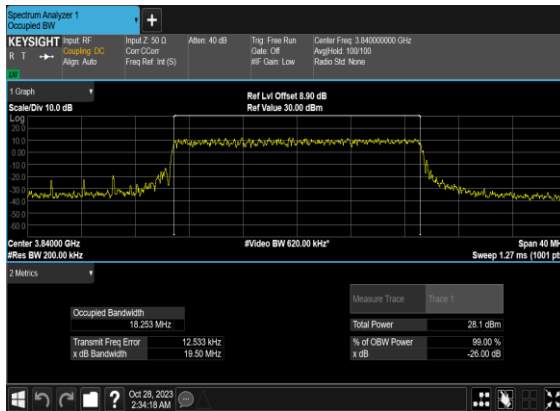
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QAM_Outer_Full_Mid_CH



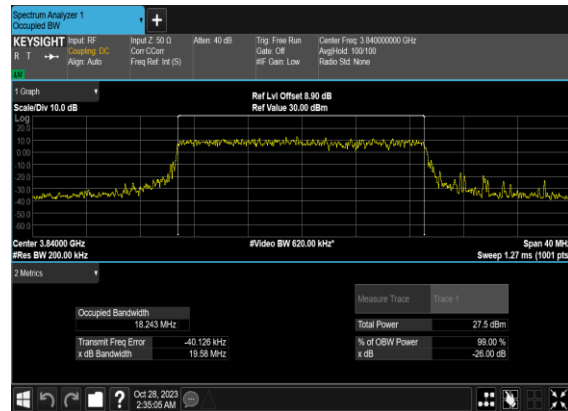
N77(15M)_CP-OFDM_256
QAM_Outer_Full_Mid_CH



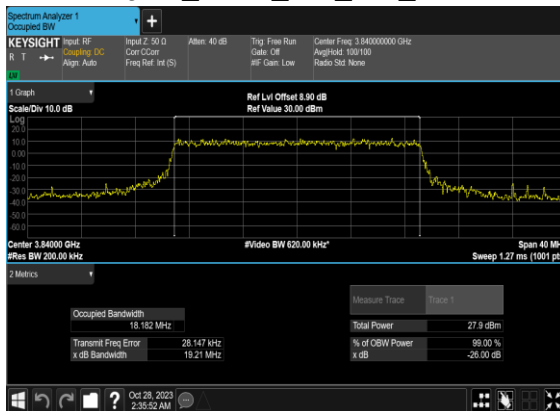
N77(20M)_CP-
OFDM_QPSK_Outer_Full_Mid_CH



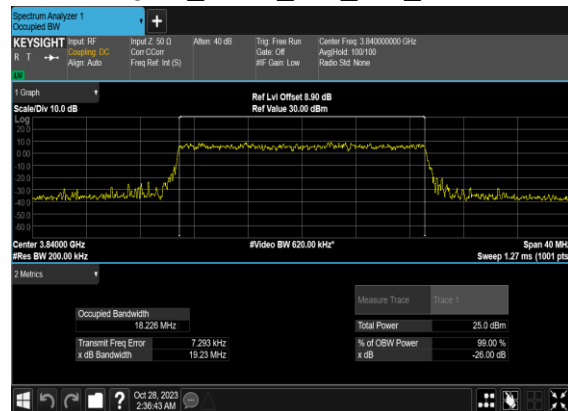
N77(20M)_CP-OFDM_16
QAM_Outer_Full_Mid_CH



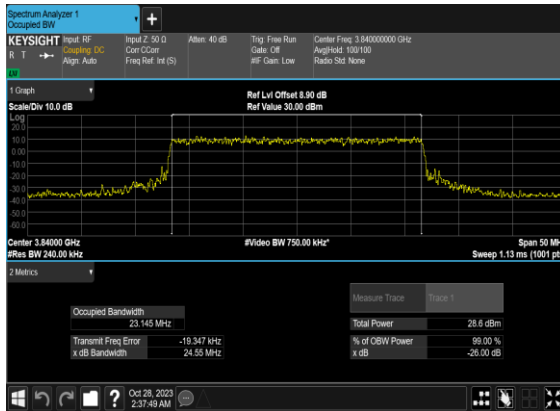
N77(20M)_CP-OFDM_64
QAM_Outer_Full_Mid_CH



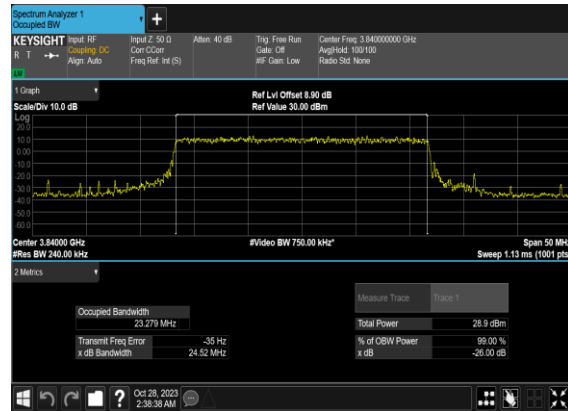
N77(20M)_CP-OFDM_256
QAM_Outer_Full_Mid_CH



N77(25M)_CP-OFDM_QPSK_Outer_Full_Mid_CH



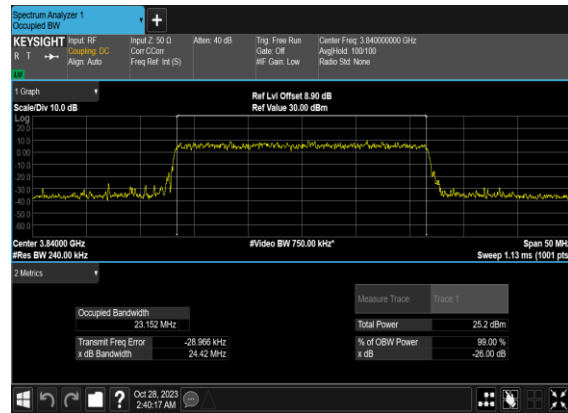
N77(25M)_CP-OFDM_16QAM_Outer_Full_Mid_CH



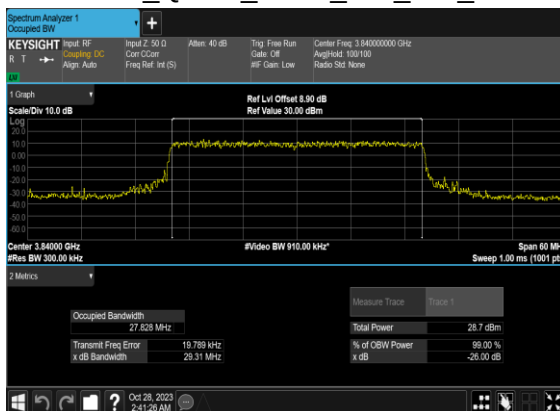
N77(25M)_CP-OFDM_64QAM_Outer_Full_Mid_CH



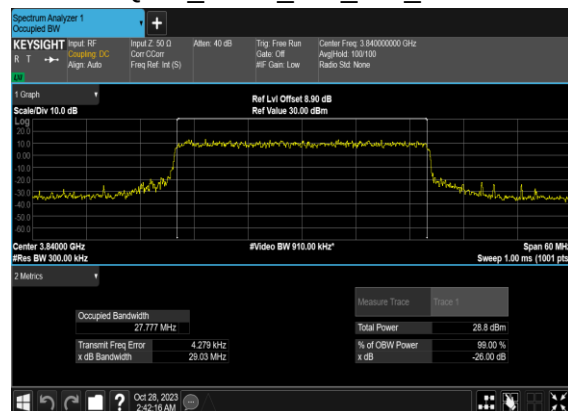
N77(25M)_CP-OFDM_256QAM_Outer_Full_Mid_CH



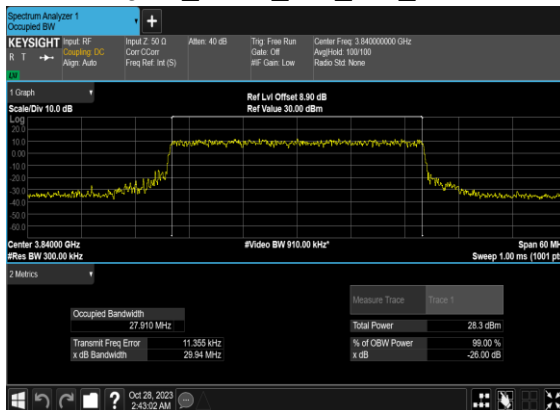
N77(30M)_CP-OFDM_QPSK_Outer_Full_Mid_CH



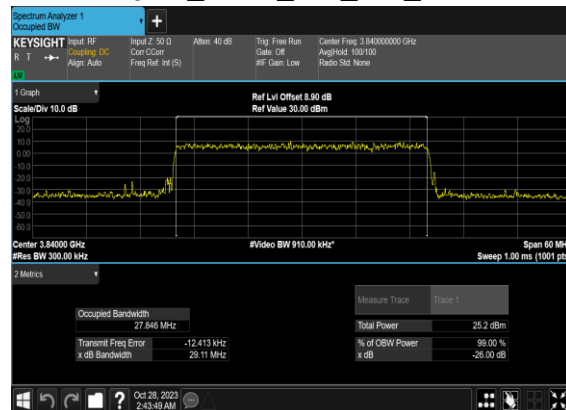
N77(30M)_CP-OFDM_16QAM_Outer_Full_Mid_CH



N77(30M)_CP-OFDM_64
QAM_Outer_Full_Mid_CH



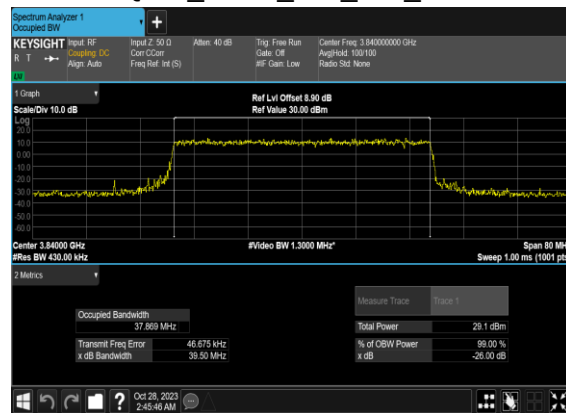
N77(30M)_CP-OFDM_256
QAM_Outer_Full_Mid_CH



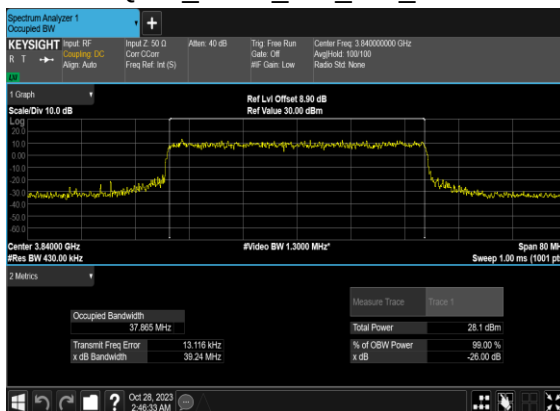
N77(40M)_CP-
OFDM_QPSK_Outer_Full_Mid_CH



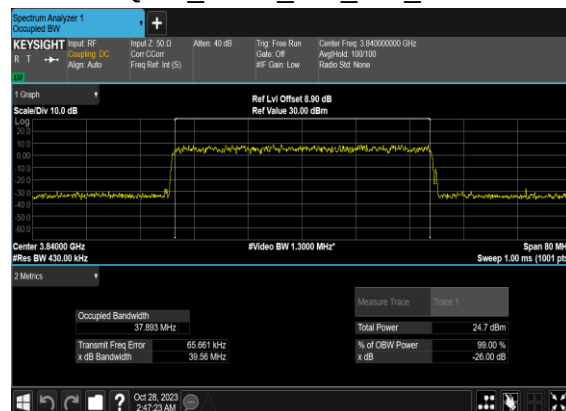
N77(40M)_CP-OFDM_16
QAM_Outer_Full_Mid_CH



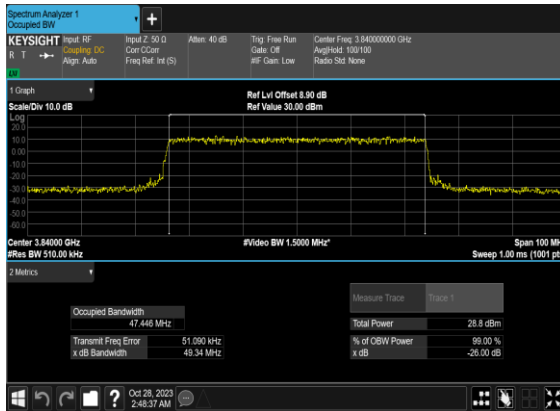
N77(40M)_CP-OFDM_64
QAM_Outer_Full_Mid_CH



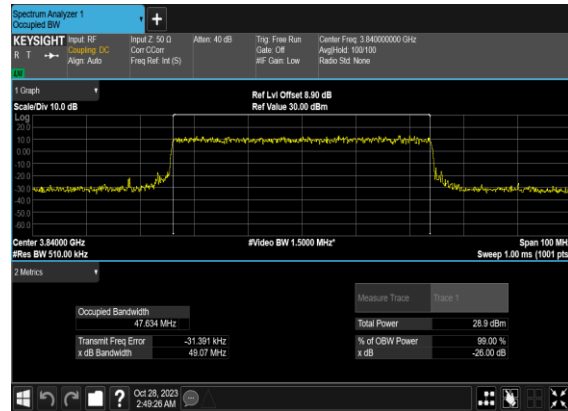
N77(40M)_CP-OFDM_256
QAM_Outer_Full_Mid_CH



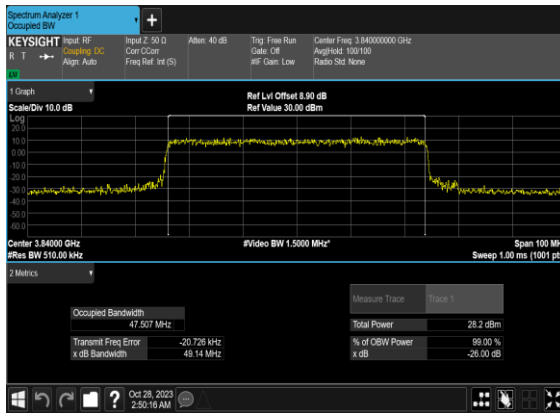
N77(50M)_CP- OFDM_QPSK_Outer_Full_Mid_CH



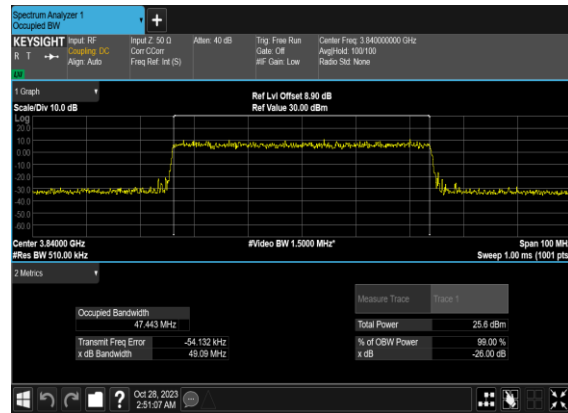
N77(50M)_CP-OFDM_16 QAM_Outer_Full_Mid_CH



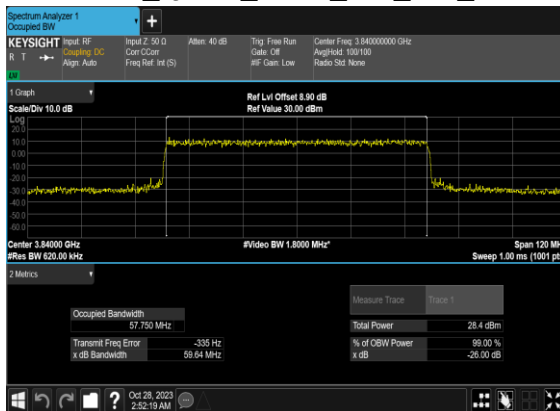
N77(50M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH



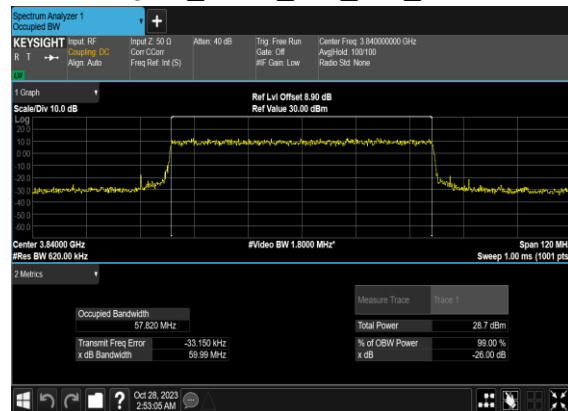
N77(50M)_CP-OFDM_256 QAM_Outer_Full_Mid_CH



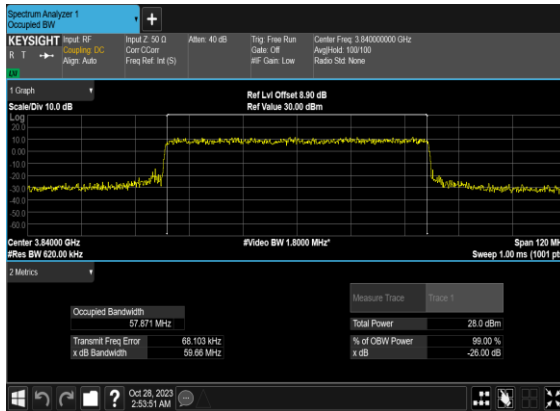
N77(60M)_CP- OFDM_QPSK_Outer_Full_Mid_CH



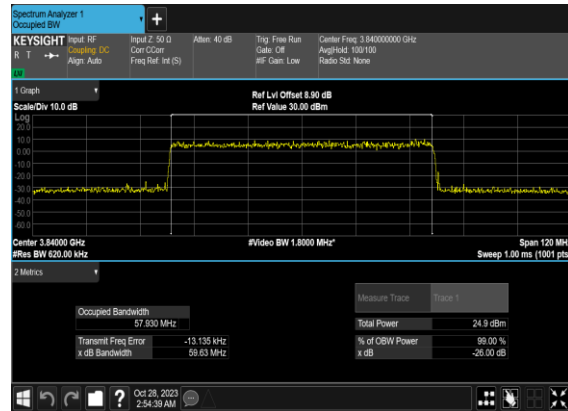
N77(60M)_CP-OFDM_16 QAM_Outer_Full_Mid_CH



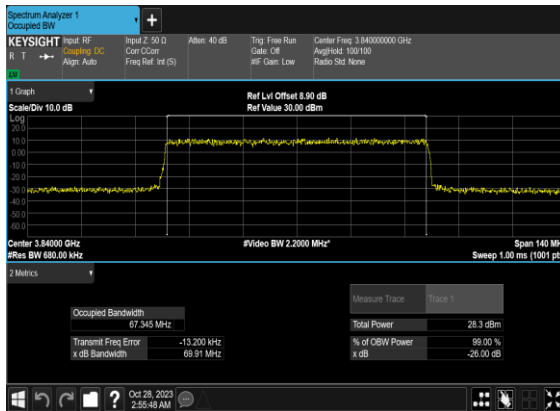
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QAM_Outer_Full_Mid_CH



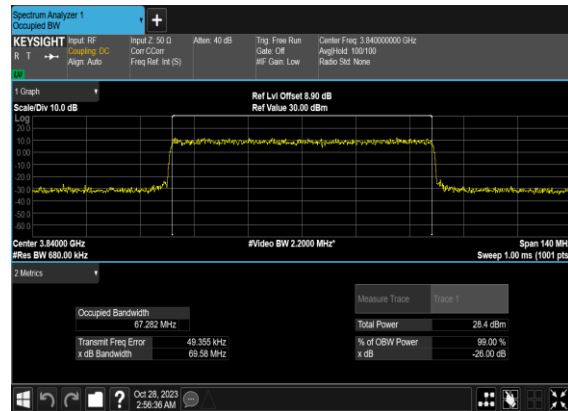
N77(60M)_CP-OFDM_256
QAM_Outer_Full_Mid_CH



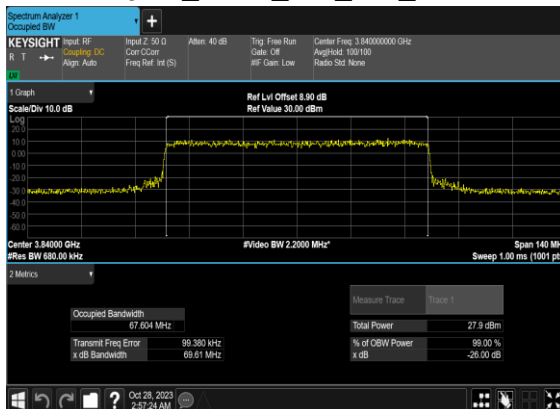
N77(70M)_CP-
OFDM_QPSK_Outer_Full_Mid_CH



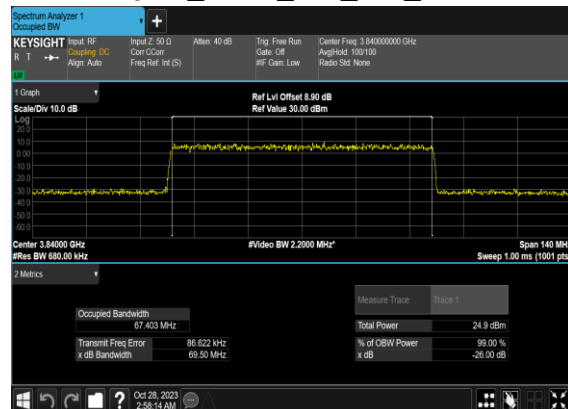
N77(70M)_CP-OFDM_16
QAM_Outer_Full_Mid_CH



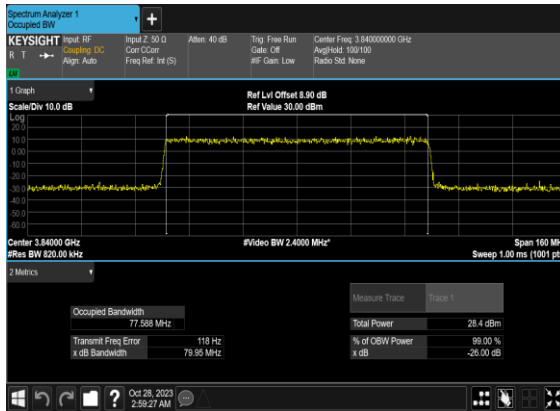
N77(70M)_CP-OFDM_64
QAM_Outer_Full_Mid_CH



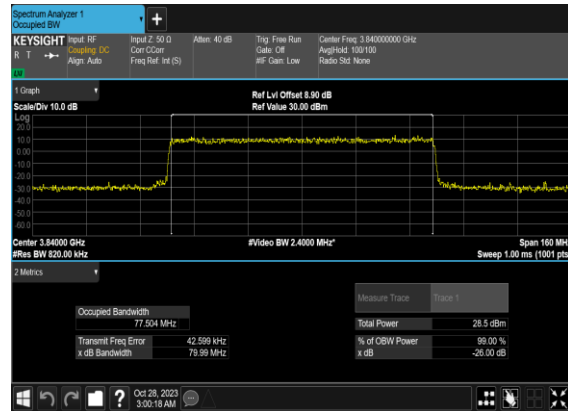
N77(70M)_CP-OFDM_256
QAM_Outer_Full_Mid_CH



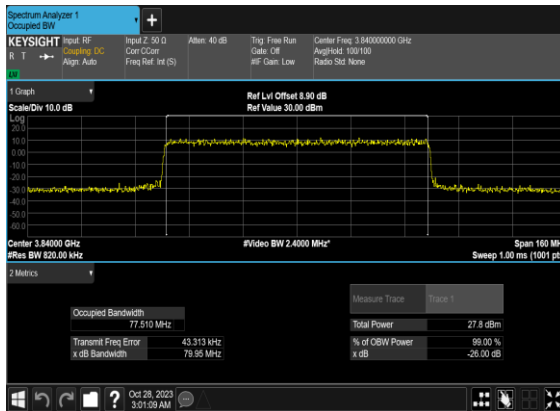
N77(80M)_CP-
OFDM_QPSK_Outer_Full_Mid_CH



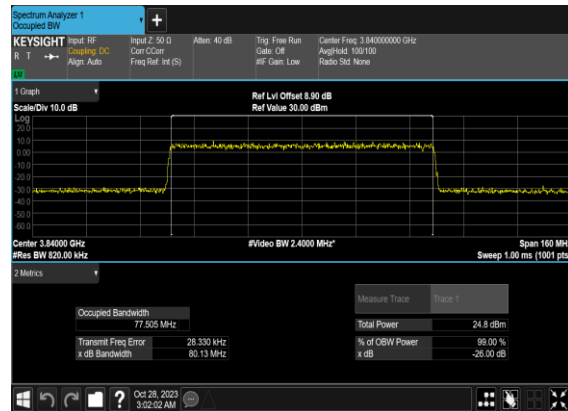
N77(80M)_CP-OFDM_16
QAM_Outer_Full_Mid_CH



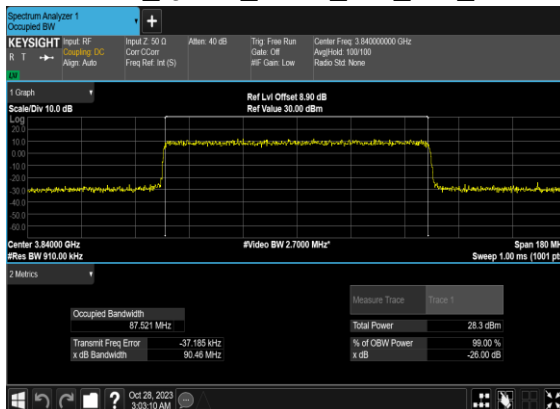
N77(80M)_CP-OFDM_64
QAM_Outer_Full_Mid_CH



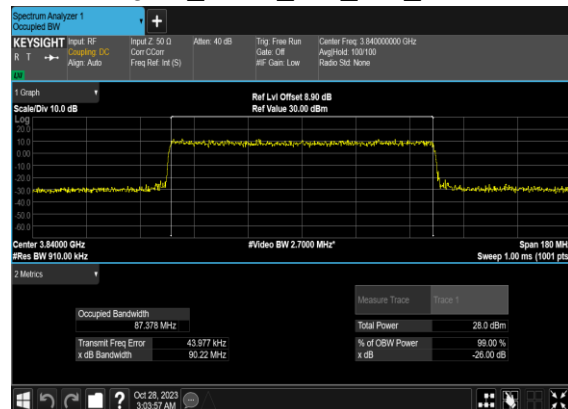
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QAM_Outer_Full_Mid_CH



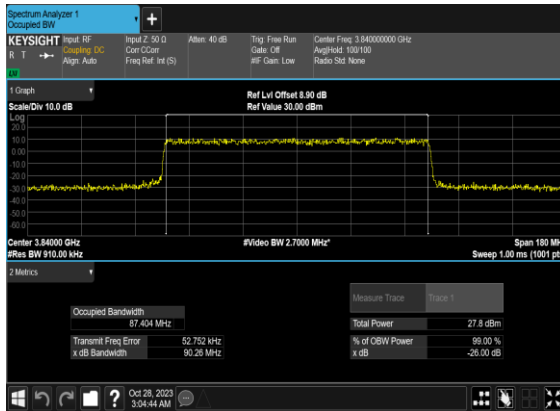
N77(90M)_CP-
OFDM_QPSK_Outer_Full_Mid_CH



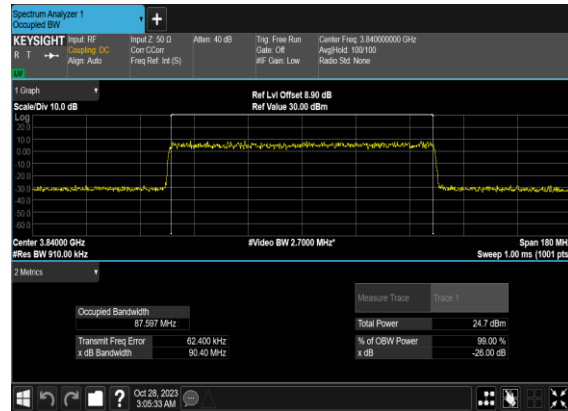
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QAM_Outer_Full_Mid_CH



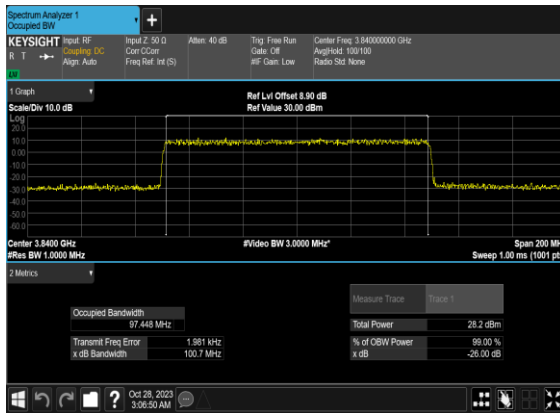
N77(90M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH



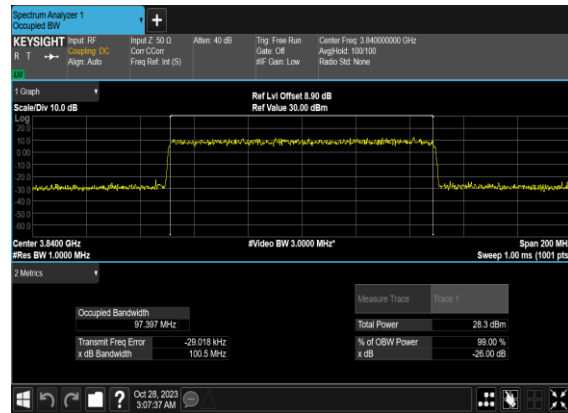
N77(90M)_CP-OFDM_256 QAM_Outer_Full_Mid_CH



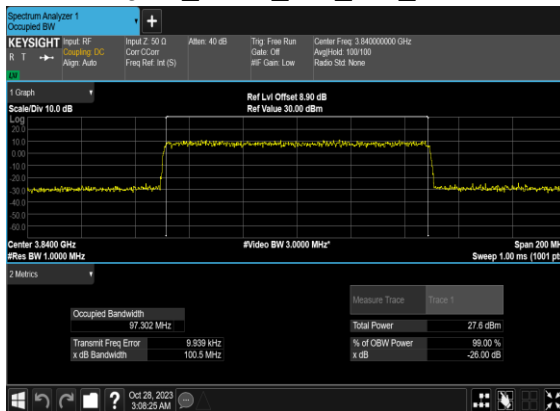
N77(100M)_CP- OFDM_QPSK_Outer_Full_Mid_CH



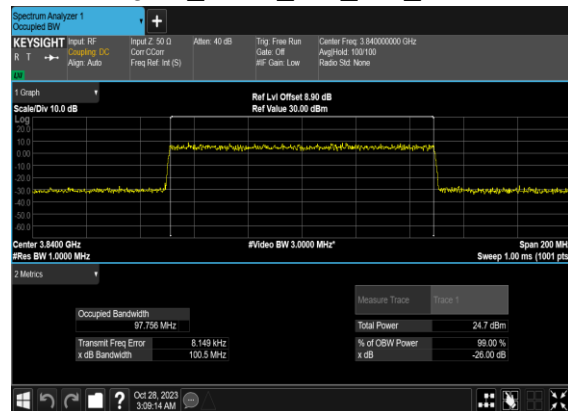
N77(100M)_CP-OFDM_16 QAM_Outer_Full_Mid_CH



N77(100M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH



N77(100M)_CP-OFDM_256 QAM_Outer_Full_Mid_CH



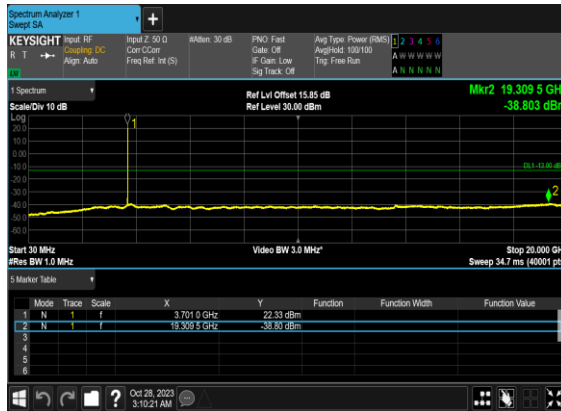
Conducted Spurious Emissions

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Result	Verdict
77	30	10	647000	3705.0	DFT-s-OFDM BPSK	1@0	see graph	---
77	30	10	647000	3705.0	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	10	647000	3705.0	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	10	647000	3705.0	DFT-s-OFDM QPSK	1@0	see graph	---
77	30	10	647000	3705.0	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	10	647000	3705.0	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	10	656000	3840.0	DFT-s-OFDM BPSK	1@0	see graph	---
77	30	10	656000	3840.0	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	10	656000	3840.0	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	10	656000	3840.0	DFT-s-OFDM QPSK	1@0	see graph	---
77	30	10	656000	3840.0	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	10	656000	3840.0	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	10	665000	3975.0	DFT-s-OFDM BPSK	1@0	see graph	---
77	30	10	665000	3975.0	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	10	665000	3975.0	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	10	665000	3975.0	DFT-s-OFDM QPSK	1@0	see graph	---
77	30	10	665000	3975.0	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	10	665000	3975.0	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	50	648334	3725.01	DFT-s-OFDM BPSK	1@0	see graph	---
77	30	50	648334	3725.01	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	50	648334	3725.01	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	50	648334	3725.01	DFT-s-OFDM QPSK	1@0	see graph	---

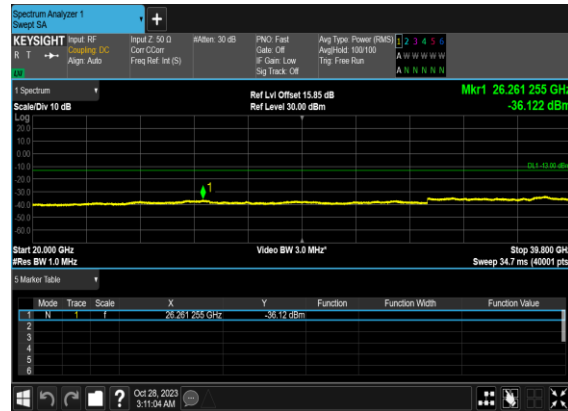
77	30	50	648334	3725.01	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	50	648334	3725.01	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	50	656000	3840.0	DFT-s-OFDM BPSK	1@0	see graph	---
77	30	50	656000	3840.0	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	50	656000	3840.0	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	50	656000	3840.0	DFT-s-OFDM QPSK	1@0	see graph	---
77	30	50	656000	3840.0	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	50	656000	3840.0	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	50	663666	3954.99	DFT-s-OFDM BPSK	1@0	see graph	---
77	30	50	663666	3954.99	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	50	663666	3954.99	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	50	663666	3954.99	DFT-s-OFDM QPSK	1@0	see graph	---
77	30	50	663666	3954.99	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	50	663666	3954.99	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	100	650000	3750.0	DFT-s-OFDM BPSK	1@0	see graph	---
77	30	100	650000	3750.0	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	100	650000	3750.0	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	100	650000	3750.0	DFT-s-OFDM QPSK	1@0	see graph	---
77	30	100	650000	3750.0	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	100	650000	3750.0	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	100	656000	3840.0	DFT-s-OFDM BPSK	1@0	see graph	---
77	30	100	656000	3840.0	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	100	656000	3840.0	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	100	656000	3840.0	DFT-s-OFDM QPSK	1@0	see graph	---

77	30	100	656000	3840.0	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	100	656000	3840.0	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	100	662000	3930.0	DFT-s-OFDM BPSK	1@0	see graph	---
77	30	100	662000	3930.0	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	100	662000	3930.0	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	100	662000	3930.0	DFT-s-OFDM QPSK	1@0	see graph	---
77	30	100	662000	3930.0	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	100	662000	3930.0	DFT-s-OFDM QPSK	1@0	see graph	PASS

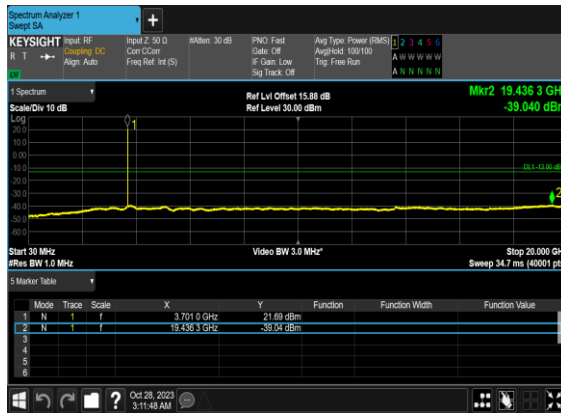
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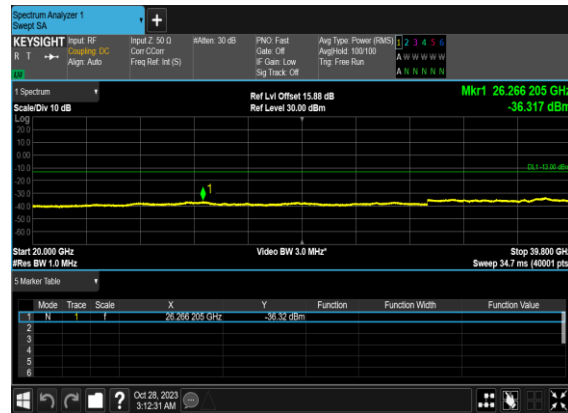
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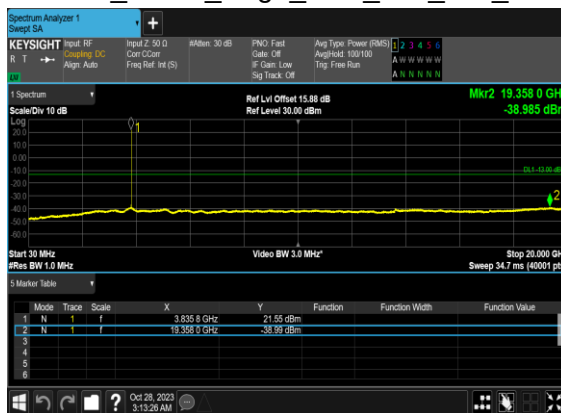
N77(10M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low_CH



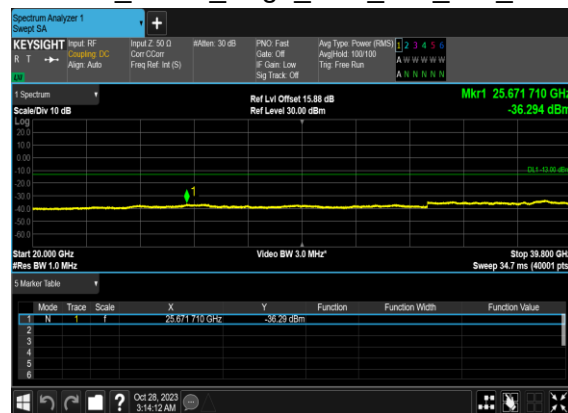
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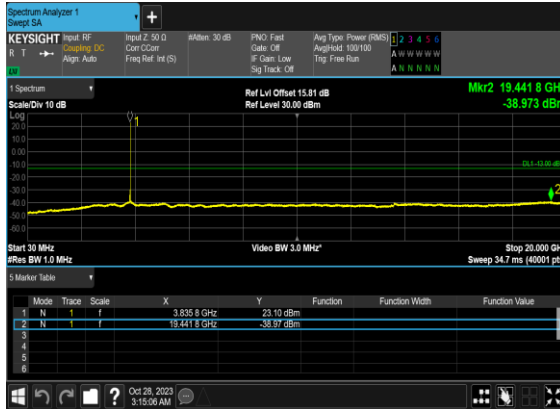
N77(10M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH



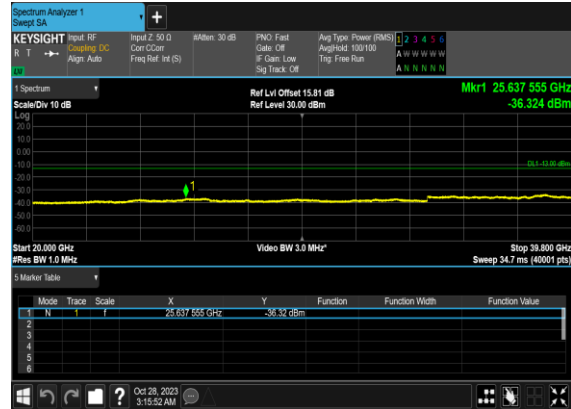
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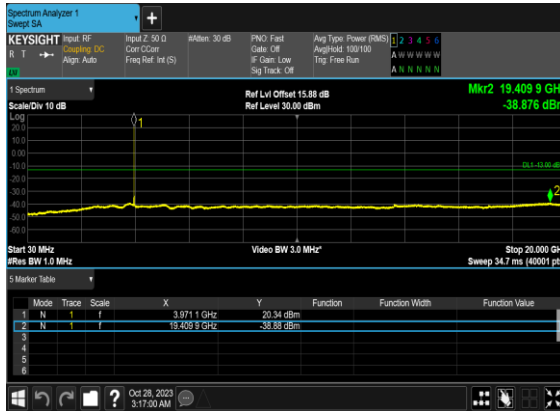
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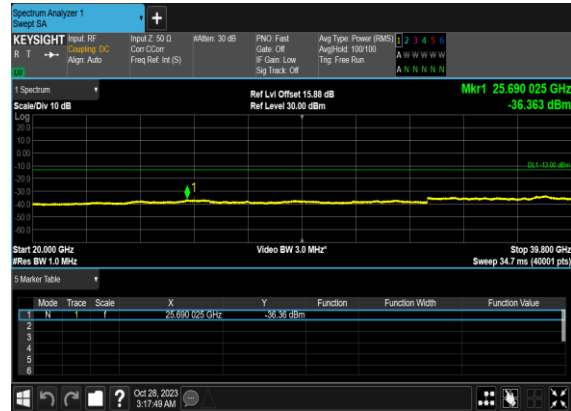
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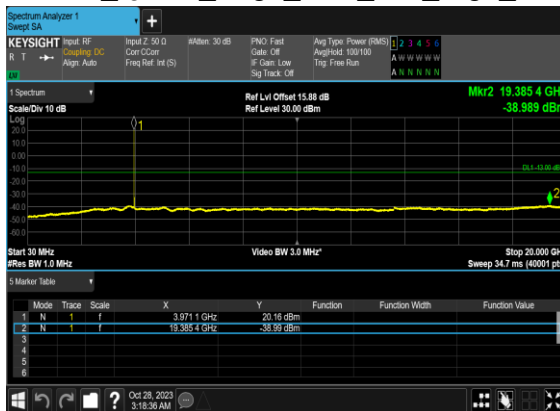
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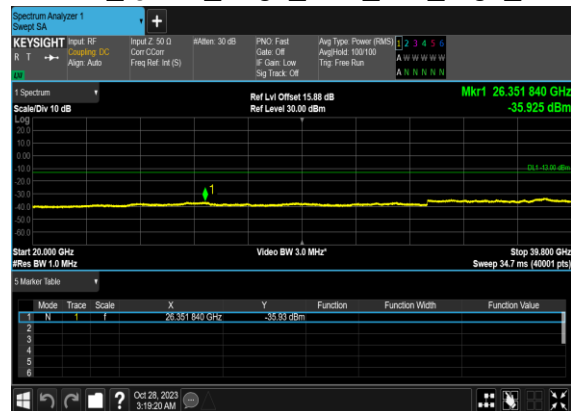
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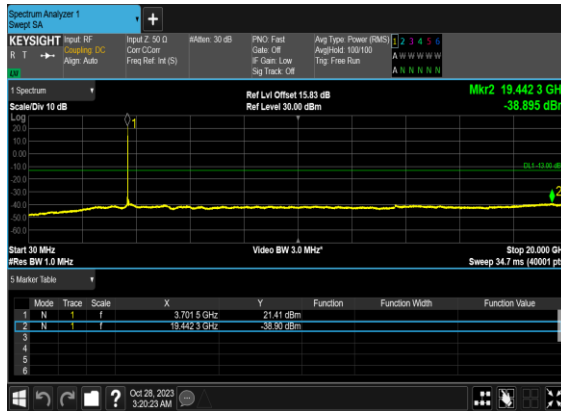
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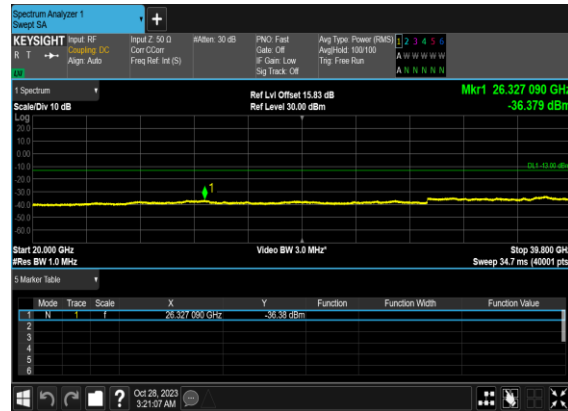
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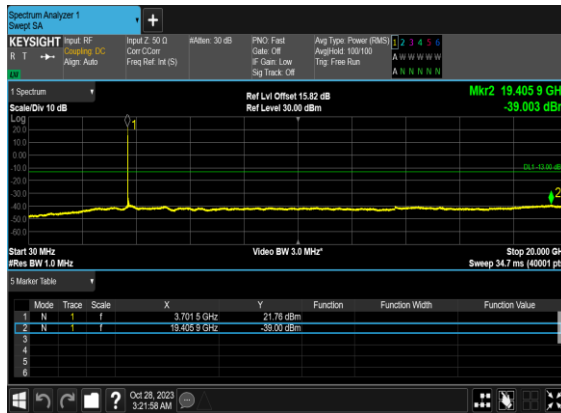
N77(50M)_DFT-s- OFDM_BPSK_Edge_1RB_Left_Low_CH



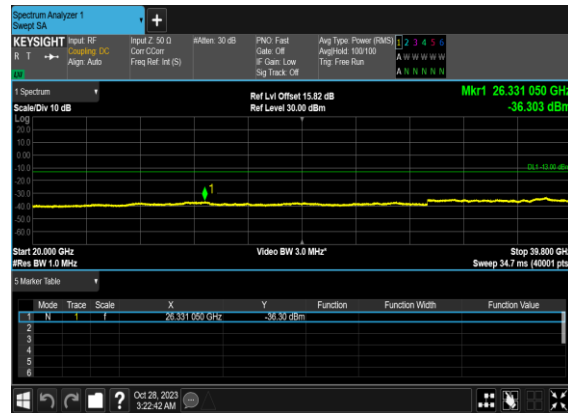
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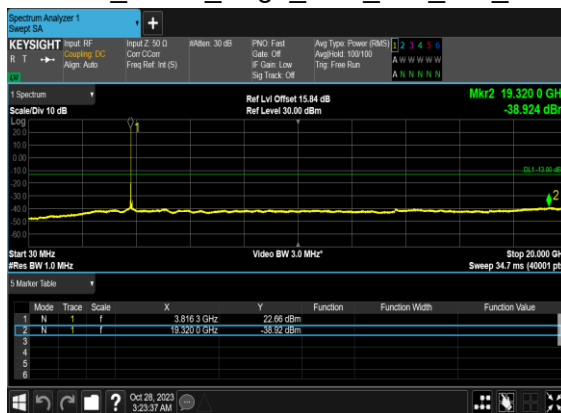
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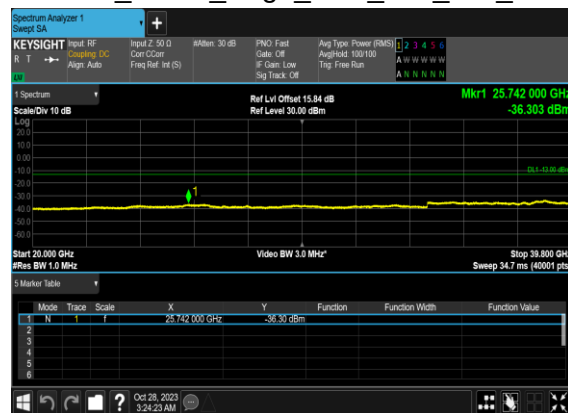
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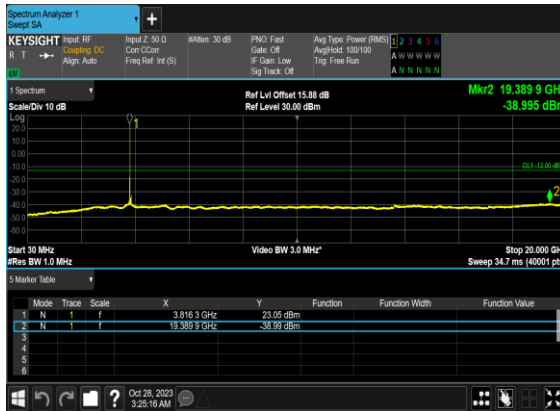
N77(50M)_DFT-s- OFDM_BPSK_Edge_1RB_Left_Mid_CH



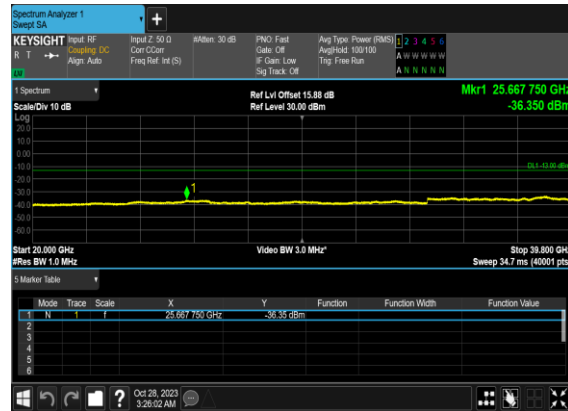
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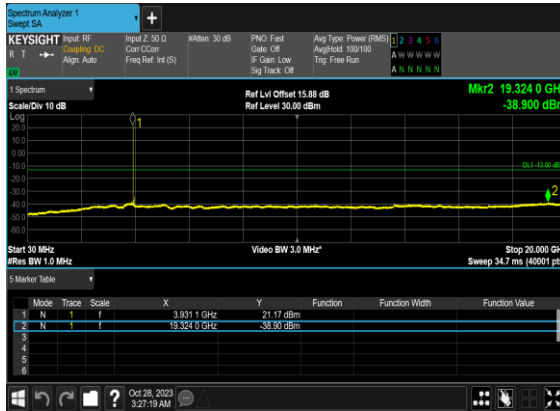
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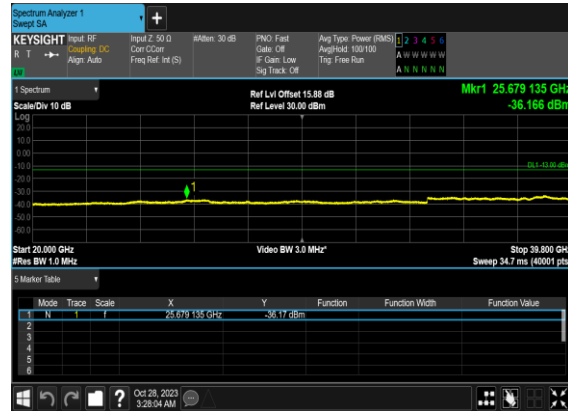
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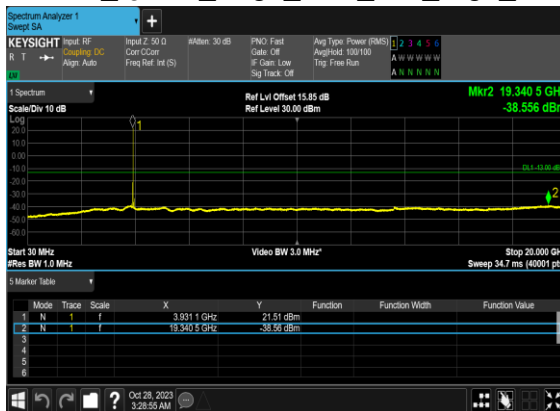
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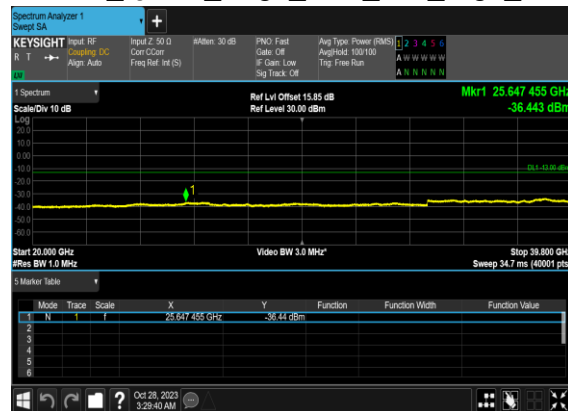
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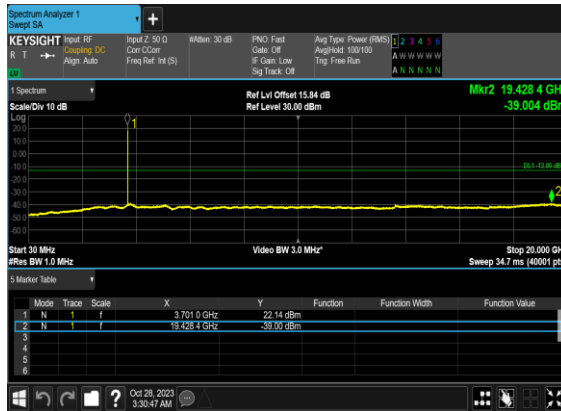
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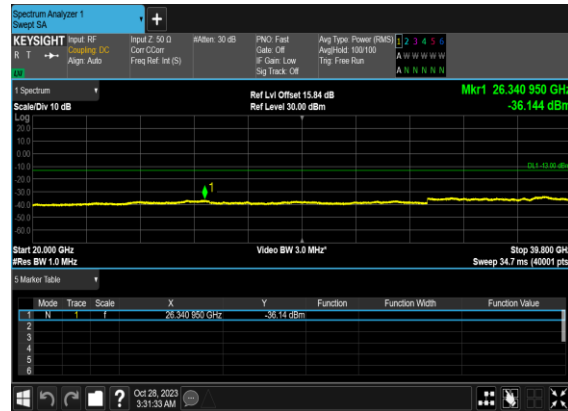
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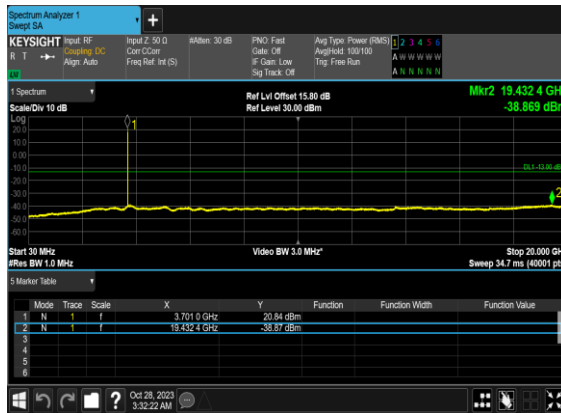
N77(100M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Low_CH



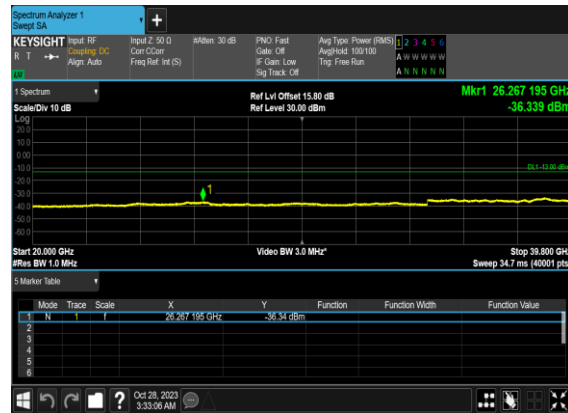
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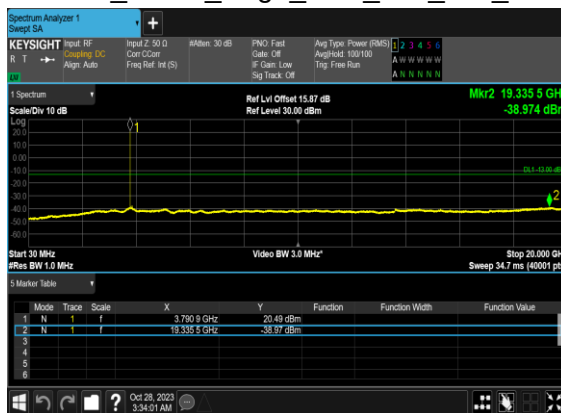
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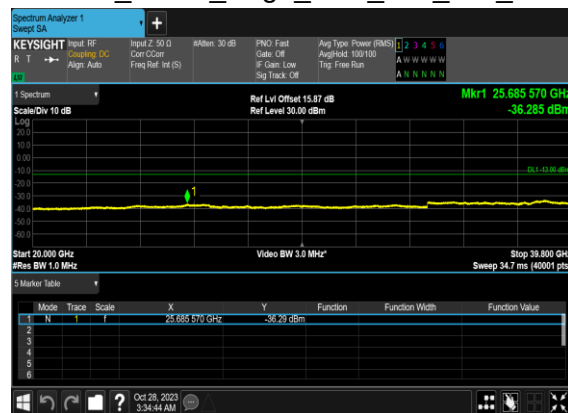
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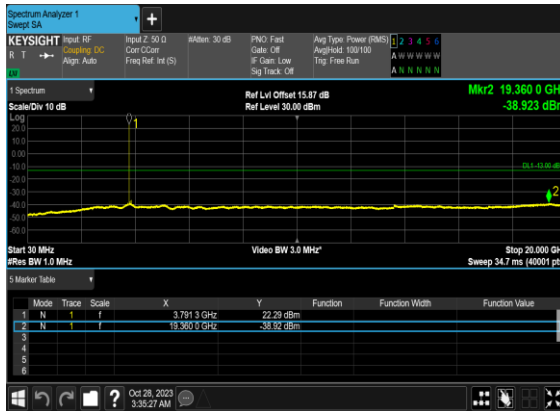
N77(100M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH



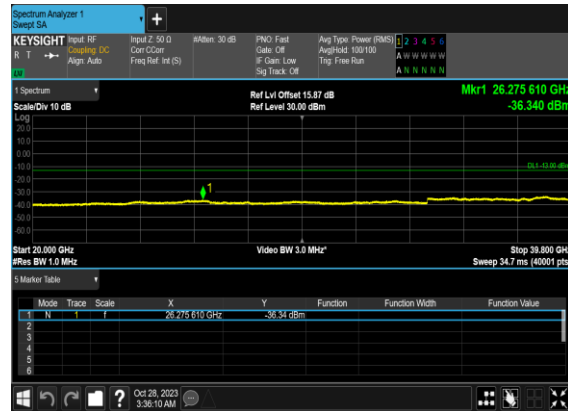
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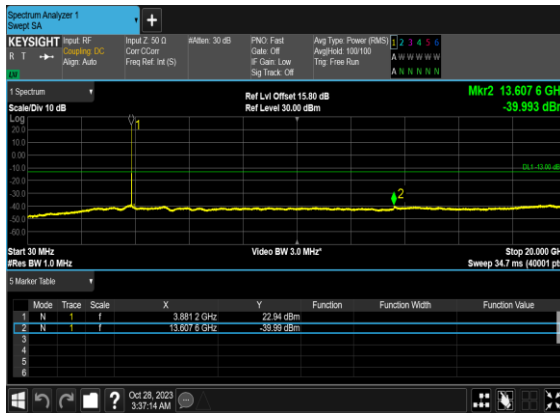
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OFDM_QPSK_Edge_1RB_Left_Mid_CH



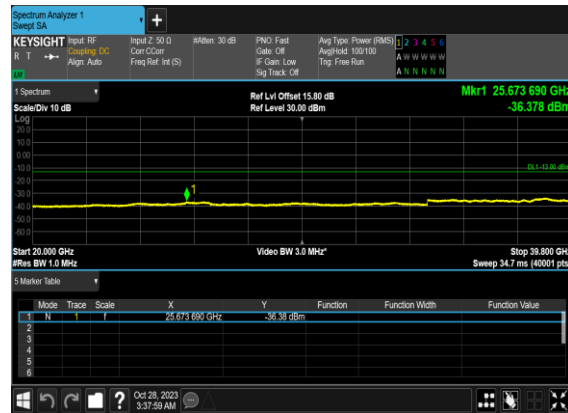
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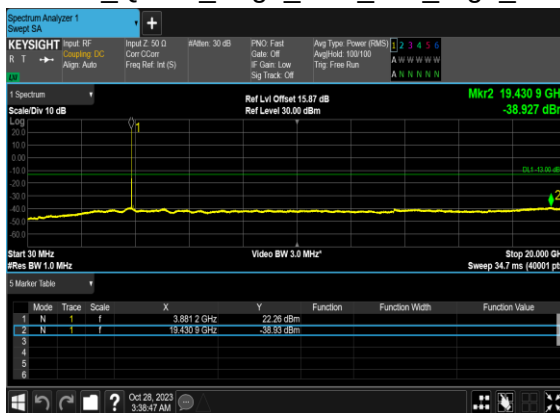
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OFDM_BPSK_Edge_1RB_Left_High_CH



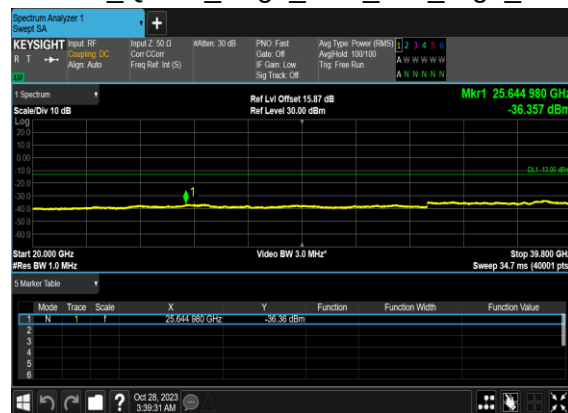
N77(100M)_DFT-s-
OFDM_BPSK_Edge_1RB_Left_High_CH



N77(100M)_DFT-s-
OFDM_QPSK_Edge_1RB_Left_High_CH



N77(100M)_DFT-s-
OFDM_QPSK_Edge_1RB_Left_High_CH



Conducted Band Edge

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Result	Verdict
77	30	10	647000	3705.0	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	10	647000	3705.0	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	10	647000	3705.0	DFT-s-OFDM BPSK	24@0	see graph	PASS
77	30	10	647000	3705.0	DFT-s-OFDM QPSK	24@0	see graph	PASS
77	30	10	665000	3975.0	DFT-s-OFDM BPSK	1@23	see graph	PASS
77	30	10	665000	3975.0	DFT-s-OFDM QPSK	1@23	see graph	PASS
77	30	10	665000	3975.0	DFT-s-OFDM BPSK	24@0	see graph	PASS
77	30	10	665000	3975.0	DFT-s-OFDM QPSK	24@0	see graph	PASS
77	30	50	648334	3725.01	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	50	648334	3725.01	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	50	648334	3725.01	DFT-s-OFDM BPSK	128@0	see graph	PASS
77	30	50	648334	3725.01	DFT-s-OFDM QPSK	128@0	see graph	PASS
77	30	50	663666	3954.99	DFT-s-OFDM BPSK	1@132	see graph	PASS
77	30	50	663666	3954.99	DFT-s-OFDM QPSK	1@132	see graph	PASS
77	30	50	663666	3954.99	DFT-s-OFDM BPSK	128@0	see graph	PASS
77	30	50	663666	3954.99	DFT-s-OFDM QPSK	128@0	see graph	PASS
77	30	100	650000	3750.0	DFT-s-OFDM BPSK	1@0	see graph	PASS
77	30	100	650000	3750.0	DFT-s-OFDM QPSK	1@0	see graph	PASS
77	30	100	650000	3750.0	DFT-s-OFDM BPSK	270@0	see graph	PASS
77	30	100	650000	3750.0	DFT-s-OFDM QPSK	270@0	see graph	PASS
77	30	100	662000	3930.0	DFT-s-OFDM BPSK	1@272	see graph	PASS
77	30	100	662000	3930.0	DFT-s-OFDM QPSK	1@272	see graph	PASS
77	30	100	662000	3930.0	DFT-s-OFDM BPSK	270@0	see graph	PASS
77	30	100	662000	3930.0	DFT-s-OFDM QPSK	270@0	see graph	PASS