



# FCC RF Test Report

**APPLICANT** : Motorola Mobility LLC  
**EQUIPMENT** : Mobile Cellular Phone  
**BRAND NAME** : Motorola  
**MODEL NAME** : XT2169-1  
**FCC ID** : IHDT56ZW3  
**STANDARD** : 47 CFR Part 2, Part 27 Subpart Q  
**CLASSIFICATION** : PCS Licensed Transmitter Held to Ear (PCE)  
**TEST DATE(S)** : Sep. 09, 2021 ~ Sep. 11, 2021

We, Sporton International (Kunshan) Inc., 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 (Shenzhen) Inc.

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

*Jason Jia*

Reviewed by: Jason Jia / Supervisor

*Alex Wang*

Approved by: Alex Wang / Manager



**Sporton International (Kunshan) Inc.**

**No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300  
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..... 5
1.5 Specification of Accessory..... 6
1.6 Modification of EUT ..... 6
1.7 Maximum EIRP Power and Emission Designator ..... 7
1.8 Testing Site..... 8
1.9 Test Software..... 8
1.10 Applied Standards ..... 9
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST ..... 10
2.1 Test Mode..... 10
2.2 Connection Diagram of Test System..... 11
2.3 Support Unit used in test configuration and system ..... 11
2.4 Measurement Results Explanation Example..... 11
2.5 Frequency List of Low/Middle/High Channels ..... 12
3 CONDUCTED TEST ITEMS ..... 13
3.1 Measuring Instruments ..... 13
3.2 Test Setup ..... 13
3.3 Test Result of Conducted Test ..... 13
3.4 Conducted Output Power Measurement ..... 14
3.5 Peak-to-Average Ratio ..... 15
3.6 EIRP ..... 16
3.7 Occupied Bandwidth..... 17
3.8 Conducted Band Edge Measurement ..... 18
3.9 Conducted Spurious Emission Measurement ..... 19
3.10 Frequency Stability Measurement..... 20
4 RADIATED TEST ITEMS ..... 21
4.1 Measuring Instruments ..... 21
4.2 Test Setup ..... 21
4.3 Test Result of Radiated Test ..... 22
4.4 Radiated Spurious Emission Measurement ..... 23
5 LIST OF MEASURING EQUIPMENT ..... 24
6 UNCERTAINTY OF EVALUATION ..... 25
APPENDIX A. TEST RESULTS OF CONDUCTED TEST
APPENDIX B. TEST RESULTS OF RADIATED TEST
APPENDIX C. TEST SETUP PHOTOGRAPHS



## SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting Only	PASS	-
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	Reporting Only	PASS	-
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 43.18 dB at 10374.00 MHz

**Declaration of Conformity:**

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

**Comments and Explanations:**

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



# 1 General Description

## 1.1 Applicant

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

## 1.2 Manufacturer

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

## 1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2169-1
FCC ID	IHDT56ZW3
IMEI Code	Conducted: 350662070020055/350662070020063 Radiation: 350662070021939
HW Version	DVT2
SW Version	RRUB31.Q3-46
EUT Stage	Identical Prototype

## 1.4 Product Specification of Equipment Under Test

Product Feature	
Tx/Rx Frequency	5G NR n77/n78: 3450 MHz ~ 3550 MHz
Bandwidth	5G NR n77/n78 : 20MHz / 30MHz / 40MHz / 50MHz / 60MHz / 70MHz / 80MHz / 90MHz / 100MHz
SCS	30kHz
Maximum Output Power to Antenna	5G NR n77 : 23.11 dBm 5G NR n78 : 23.05 dBm
Antenna Gain	5G NR n77 : 0.20 dBi 5G NR n78 : 0.20 dBi
Type of Modulation	CP-OFDM: QPSK / 16QAM / 64QAM / 256QAM DFT-s-OFDM: PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM

**Remark:**

1. 5G NR bands supports NSA mode only. For NSA mode of all 5G NR, we only show the combination of the maximum power among all NSA combinations in the report.
2. For modulation of CP-OFDM and DFT-s-OFDM, the maximum power of CP-OFDM is lower than DFT-s-OFDM modulation, therefore, we chose higher power (DFT-s-OFDM modulation) to perform all tests and show in the report.

3. The EN-DC combinations declared by the manufacturer are as follows: DC\_5A\_n78A, DC\_7A\_n78A, DC\_38A\_n78A, DC\_41A\_n77A, DC\_41A\_n78A and DC\_66A\_n78A.

### 1.5 Specification of Accessory

Specification of Accessory				
AC Adapter 1(US)	Brand Name	Motorola (Salcomp)	Model Name	MC-331
AC Adapter 1(EU)	Brand Name	Motorola (Salcomp)	Model Name	MC-332
AC Adapter 1(UK)	Brand Name	Motorola (Salcomp)	Model Name	MC-333
AC Adapter 1(AU)	Brand Name	Motorola (Salcomp)	Model Name	MC-335
AC Adapter 1(AR)	Brand Name	Motorola (Salcomp)	Model Name	MC-336
AC Adapter 1(BR)	Brand Name	Motorola (Salcomp)	Model Name	MC-337
AC Adapter 1(PRC)	Brand Name	Motorola (Salcomp)	Model Name	MC-338
AC Adapter 1(Chile)	Brand Name	Motorola (Salcomp)	Model Name	MC-339
AC Adapter 2(IN)	Brand Name	Motorola (Salcomp)	Model Name	MC-334
AC Adapter 3(US)	Brand Name	Motorola (Chenyang)	Model Name	MC-331
AC Adapter 3(EU)	Brand Name	Motorola (Chenyang)	Model Name	MC-332
AC Adapter 3(AU)	Brand Name	Motorola (Chenyang)	Model Name	MC-335
AC Adapter 3(AR)	Brand Name	Motorola (Chenyang)	Model Name	MC-336
AC Adapter 3(BR)	Brand Name	Motorola (Chenyang)	Model Name	MC-337
AC Adapter 4(US)	Brand Name	Motorola (Acbel)	Model Name	MC-331
AC Adapter 4(EU)	Brand Name	Motorola (Acbel)	Model Name	MC-332
AC Adapter 4(UK)	Brand Name	Motorola (Acbel)	Model Name	MC-333
Battery 1	Brand Name	Motorola (ATL)	Model Name	NG50
Battery 2	Brand Name	Motorola (Sunwoda)	Model Name	NG50
Earphone 1	Brand Name	Motorola (Lyand)	Model Name	MH191(SH38C81577)
Earphone 2	Brand Name	Motorola(LCHSE)	Model Name	MH191(SH38C81576)
USB Cable 1	Brand Name	Motorola (Saibao)	Model Name	SC18D22297
USB Cable 2	Brand Name	Motorola (Cabletech)	Model Name	SC18D22298
USB Cable 3	Brand Name	Motorola (Luxshare)	Model Name	SC18D22299

### 1.6 Modification of EUT

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

### 1.7 Maximum EIRP Power and Emission Designator

5G NR n77 (EN DC_41A-n77A)		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)
20	3460.02 ~ 3540.00	0.2143	18M2G7D	0.1683	18M2W7D
30	3465.00 ~ 3534.99	0.2028	27M9G7D	0.1622	27M8W7D
40	3470.01 ~ 3529.98	0.2042	37M8G7D	0.1629	37M8W7D
50	3475.02 ~ 3525.00	0.1945	47M4G7D	0.1535	47M6W7D
60	3480.00 ~ 3519.99	0.1954	57M9G7D	0.1549	57M8W7D
70	3485.01 ~ 3514.98	0.1888	67M5G7D	0.1517	67M5W7D
80	3490.02 ~ 3510.00	0.1871	77M4G7D	0.1496	77M6W7D
90	3495.00 ~ 3504.99	0.1914	87M4G7D	0.1524	87M4W7D
100	3500.01 ~ 3500.01	0.1866	97M3G7D	0.1486	97M6W7D
5G NR n78 (EN DC_5A-n78A)		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)
20	3460.02 ~ 3540.00	0.2061	18M2G7D	0.2094	18M2W7D
30	3465.00 ~ 3534.99	0.2113	27M9G7D	0.2061	27M8W7D
40	3470.01 ~ 3529.98	0.2089	37M8G7D	0.2046	37M8W7D
50	3475.02 ~ 3525.00	0.195	47M4G7D	0.1968	47M6W7D
60	3480.00 ~ 3519.99	0.1945	57M9G7D	0.1919	57M8W7D
70	3485.01 ~ 3514.98	0.1888	67M5G7D	0.1884	67M5W7D
80	3490.02 ~ 3510.00	0.1897	77M4G7D	0.1923	77M6W7D
90	3495.00 ~ 3504.99	0.1892	87M4G7D	0.1862	87M4W7D
100	3500.01 ~ 3500.01	0.1862	97M3G7D	0.1866	97M6W7D

**Note:**

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

### 1.8 Testing Site

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

<b>Test Firm</b>	Sporton International (Kunshan) Inc.		
<b>Test Site Location</b>	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958		
<b>Test Site No.</b>	<b>Sporton Site No.</b>	<b>FCC Designation No.</b>	<b>FCC Test Firm Registration No.</b>
	03CH04-KS	CN1257	314309

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

<b>Test Firm</b>	Sporton International (Shenzhen) Inc.		
<b>Test Site Location</b>	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		
<b>Test Site No.</b>	<b>Sporton Site No.</b>	<b>FCC Designation No.</b>	<b>FCC Test Firm Registration No.</b>
	TH01-SZ	CN1256	421272

Test data subcontracted: conducted test items in section 3.4 ~ 3.10 of this report.

### 1.9 Test Software

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





## 1.10 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.

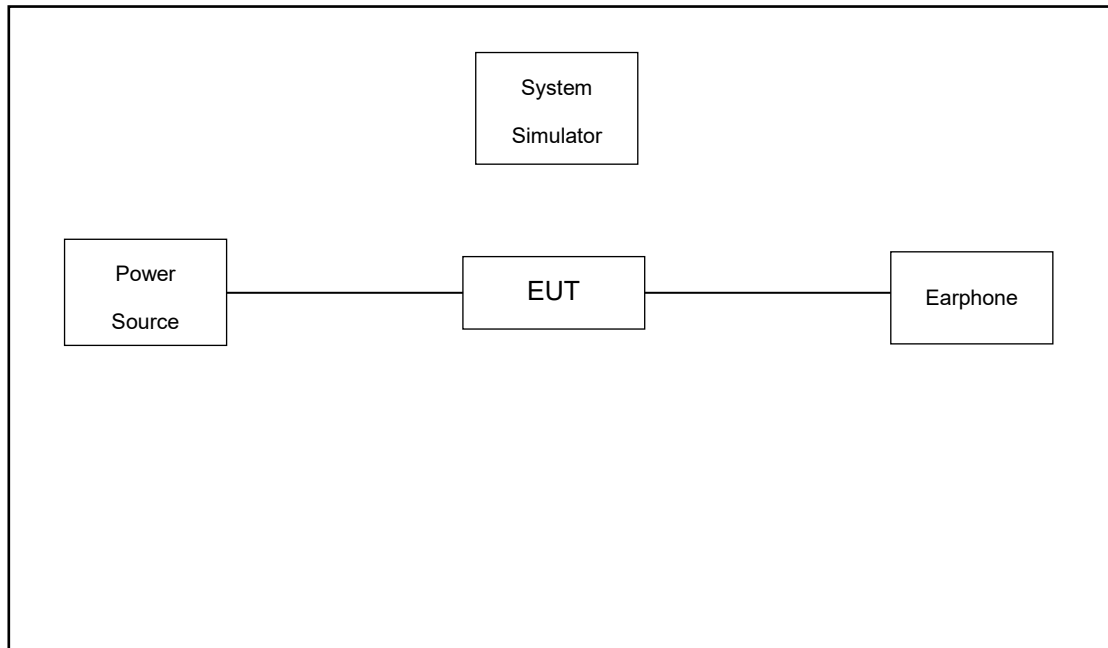
Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

Test Cases	Band	Bandwidth (MHz)	Modulation	RB #	Test Channel
		eg. 5M, 10M, 15M, 20M	eg. QPSK, 16QAM, 64QAM	1RB, Partial RB, Full RB	L/M/H
Max. Output Power	5G n77	20M, 30M, 40M, 50M, 60M, 70M, 80M, 90M, 100M	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	1RB, Partial RB, Full RB	L, M, H
Peak-to-Average Ratio	5G n77	20M	PI/2 BPSK, QPSK	1RB, Full RB	L, M, H
E.I.R.P	5G n77	20M, 30M, 40M, 50M, 60M, 70M, 80M, 90M, 100M	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	1RB, Partial RB, Full RB	L, M, H
26dB and 99% Bandwidth	5G n77	20M, 30M, 40M, 50M, 60M, 70M, 80M, 90M, 100M	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	1RB, 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
	5G n78	Worst case from maximum power			M

**Note:**

- 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.
- Based on engineering evaluation, only the worst modulations test results are shown in the report.

## 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	MT8821C	N/A	N/A	Unshielded, 1.8 m
3.	LTE Base Station	Anritsu	MT8000A	N/A	N/A	Unshielded, 1.8 m

## 2.4 Measurement Results Explanation Example

### For all conducted test items:

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

The spectrum analyzer offset is derived from RF cable loss.

*Offset = RF cable loss.*

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

Example :

*Offset(dB) = RF cable loss(dB).*  
*= 4.8 (dB)*

## 2.5 Frequency List of Low/Middle/High Channels

5G n77/n78 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
100	Channel	-	633334	-
	Frequency	-	3500.01	-
90	Channel	633000	633334	633666
	Frequency	3495.00	3500.01	3504.99
80	Channel	632668	633334	634000
	Frequency	3490.02	3500.01	3510.00
70	Channel	632334	633334	634332
	Frequency	3485.01	3500.01	3514.98
60	Channel	632000	633334	634666
	Frequency	3480.00	3500.01	3519.99
50	Channel	631668	633334	635000
	Frequency	3475.02	3500.01	3525.00
40	Channel	631334	633334	635332
	Frequency	3470.01	3500.01	3529.98
30	Channel	631000	633334	635666
	Frequency	3465.00	3500.01	3534.99
20	Channel	630668	633334	636000
	Frequency	3460.02	3500.01	3540.00

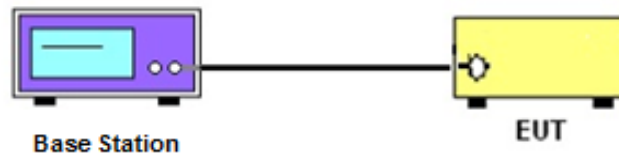
### 3 Conducted Test Items

#### 3.1 Measuring Instruments

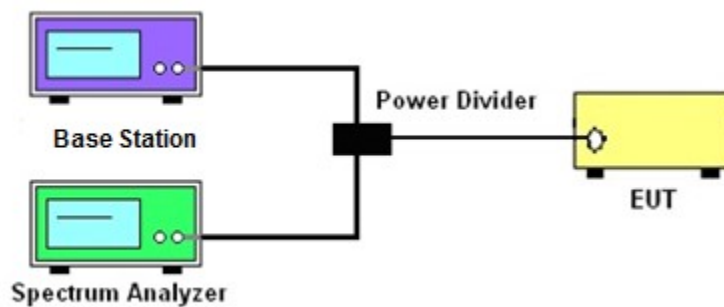
See list of measuring instruments of this test report.

#### 3.2 Test Setup

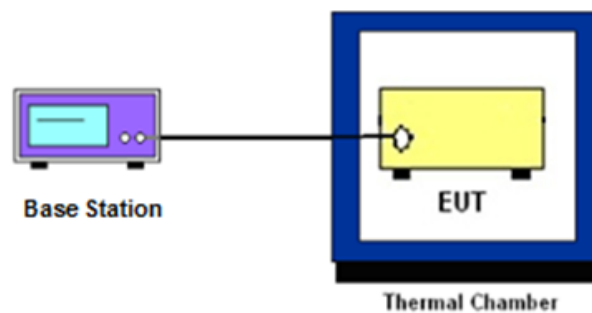
##### 3.2.1 Conducted Output Power



##### 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  $\geq 1\%$  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  $\geq 500$ KHz.
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 30MHz up to a frequency including its 10<sup>th</sup> 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  $-30^{\circ}\text{C}$  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  $10^{\circ}\text{C}$  step up to  $50^{\circ}\text{C}$ . 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  $20\pm 5^{\circ}\text{C}$  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.

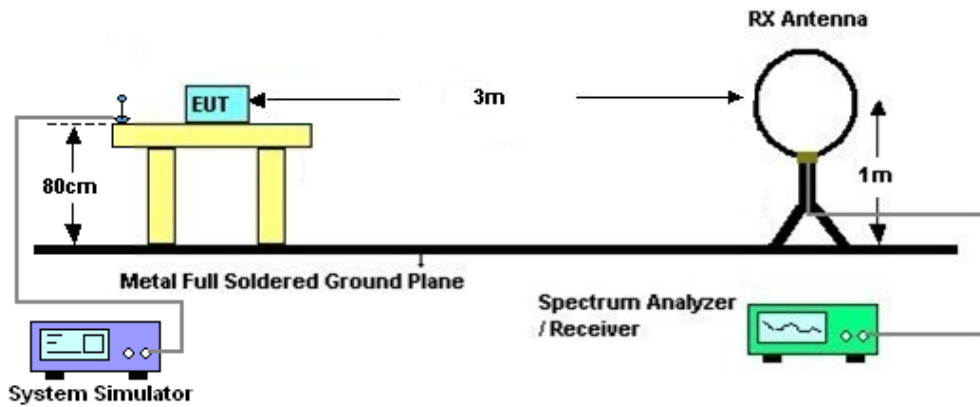
## 4 Radiated Test Items

### 4.1 Measuring Instruments

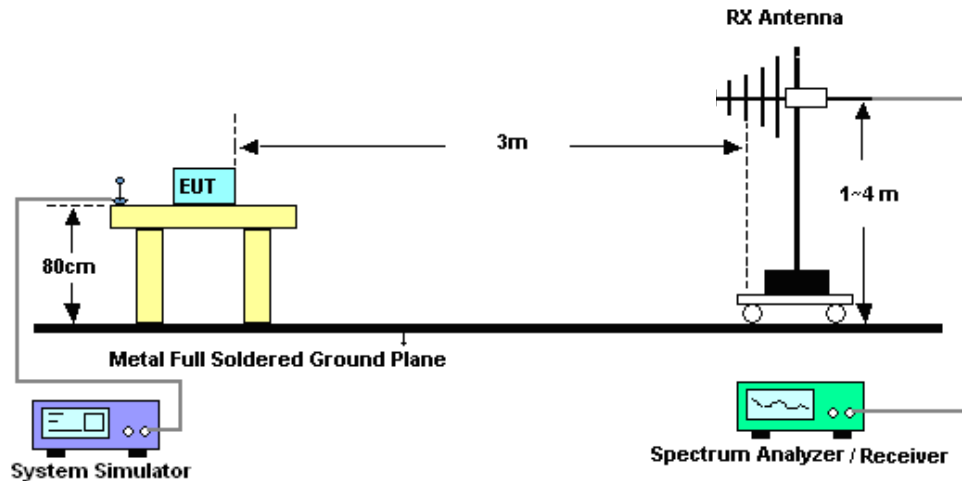
See list of measuring instruments of this test report.

### 4.2 Test Setup

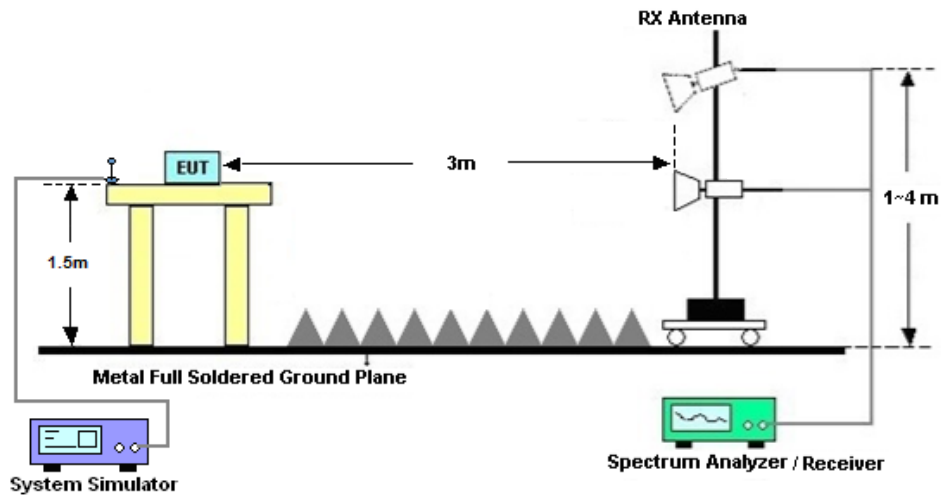
#### 4.2.1 For radiated test below 30MHz



#### 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 Measurement

### 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 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.  
$$\text{EIRP (dBm)} = \text{S.G. Power} - \text{Tx Cable Loss} + \text{Tx Antenna Gain}$$
$$\text{ERP (dBm)} = \text{EIRP} - 2.15$$
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 Signal Analyzer	KEYSIGHT	N9010B	MY60240803	10Hz~44GHz	Apr. 03, 2021	Sep. 11, 2021	Apr. 02, 2022	Conducted (TH01-SZ)
Power Divider	TOJOIN	PS-2SM-04 265	60.06.020.007 7	0.4GHz~26.5GHz	Dec. 26, 2020	Sep. 11, 2021	Dec. 25, 2021	Conducted (TH01-SZ)
Thermal Chamber	Ten Billion Hongzhangroup	LP-150U	H2014081803	-40~+150°C	Jul. 14, 2021	Sep. 11, 2021	Jul. 13, 2022	Conducted (TH01-SZ)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44G,MAX 30dB	Apr. 13, 2021	Sep. 09, 2021	Apr. 12, 2022	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 01, 2020	Sep. 09, 2021	Oct. 31, 2021	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	Jun. 07, 2021	Sep. 09, 2021	Jun. 06, 2022	Radiation (03CH04-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Nov. 01, 2020	Sep. 09, 2021	Oct. 31, 2021	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101115	18GHz~40GHz	Jan. 06, 2021	Sep. 09, 2021	Jan. 05, 2022	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Jan. 06, 2021	Sep. 09, 2021	Jan. 05, 2022	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40G GA	060728	18~40GHz	Jan. 07, 2021	Sep. 09, 2021	Jan. 06, 2022	Radiation (03CH04-KS)
high gain Amplifier	MITEQ	AMF-7D-00 101800-30-1 0P	2025788	1Ghz-18Ghz	Jan. 06, 2021	Sep. 09, 2021	Jan. 05, 2022	Radiation (03CH04-KS)
Amplifier	Keysight	83017A	MY57280106	500MHz~26.5GHz	Oct. 14, 2020	Sep. 09, 2021	Oct. 13, 2021	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Sep. 09, 2021	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Sep. 09, 2021	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Sep. 09, 2021	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required



## 6 Uncertainty of Evaluation

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

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	3.3dB
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### Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	2.8dB
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### Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

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



## **Appendix A. Test Results of Conducted Test**

**FR1 N77**

LTE Band: 41, LTE BW: 20M, LTE ARFCN: Mid

**Transmitter Conducted Output Power And ERP/EIRP, ( $G_T - L_C$ )=0.2dB**

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Conducted Power (dBm)	EIRP (dBm)	EIRP (W)
77	30	20	636000	3540	DFT-s-OFDM PI/2 BPSK	25@12	22.97	23.17	0.2075
77	30	20	636000	3540	DFT-s-OFDM PI/2 BPSK	1@1	22.91	23.11	0.2046
77	30	20	636000	3540	DFT-s-OFDM PI/2 BPSK	1@49	22.86	23.06	0.2023
77	30	20	636000	3540	DFT-s-OFDM QPSK	25@12	22.94	23.14	0.2061
77	30	20	636000	3540	DFT-s-OFDM QPSK	1@1	22.98	23.18	0.2080
77	30	20	636000	3540	DFT-s-OFDM QPSK	1@49	22.87	23.07	0.2028
77	30	20	636000	3540	DFT-s-OFDM 16 QAM	25@12	21.99	22.19	0.1656
77	30	20	636000	3540	DFT-s-OFDM 16 QAM	1@1	22.02	22.22	0.1667
77	30	20	636000	3540	DFT-s-OFDM 16 QAM	1@49	21.94	22.14	0.1637
77	30	20	636000	3540	DFT-s-OFDM 64 QAM	25@12	20.51	20.71	0.1178
77	30	20	636000	3540	DFT-s-OFDM 64 QAM	1@1	20.65	20.85	0.1216
77	30	20	636000	3540	DFT-s-OFDM 64 QAM	1@49	20.6	20.8	0.1202
77	30	20	636000	3540	DFT-s-OFDM 256 QAM	25@12	18.59	18.79	0.0757
77	30	20	636000	3540	DFT-s-OFDM 256 QAM	1@1	18.63	18.83	0.0764
77	30	20	636000	3540	DFT-s-OFDM 256 QAM	1@49	18.54	18.74	0.0748
77	30	20	636000	3540	CP-OFDM QPSK	25@12	21.47	21.67	0.1469
77	30	20	636000	3540	CP-OFDM QPSK	1@1	21.5	21.7	0.1479
77	30	20	636000	3540	CP-OFDM QPSK	1@49	21.5	21.7	0.1479

77	30	20	633334	3500.01	DFT-s-OFDM PI/2 BPSK	25@12	22.98	23.18	0.2080
77	30	20	633334	3500.01	DFT-s-OFDM PI/2 BPSK	1@1	22.97	23.17	0.2075
77	30	20	633334	3500.01	DFT-s-OFDM PI/2 BPSK	1@49	22.88	23.08	0.2032
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	25@12	23.11	23.31	0.2143
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	1@1	22.96	23.16	0.2070
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	1@49	22.91	23.11	0.2046
77	30	20	633334	3500.01	DFT-s-OFDM 16 QAM	25@12	22.06	22.26	0.1683
77	30	20	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	22.01	22.21	0.1663
77	30	20	633334	3500.01	DFT-s-OFDM 16 QAM	1@49	21.96	22.16	0.1644
77	30	20	633334	3500.01	DFT-s-OFDM 64 QAM	25@12	20.51	20.71	0.1178
77	30	20	633334	3500.01	DFT-s-OFDM 64 QAM	1@1	20.65	20.85	0.1216
77	30	20	633334	3500.01	DFT-s-OFDM 64 QAM	1@49	20.61	20.81	0.1205
77	30	20	633334	3500.01	DFT-s-OFDM 256 QAM	25@12	18.61	18.81	0.0760
77	30	20	633334	3500.01	DFT-s-OFDM 256 QAM	1@1	18.59	18.79	0.0757
77	30	20	633334	3500.01	DFT-s-OFDM 256 QAM	1@49	18.53	18.73	0.0746
77	30	20	633334	3500.01	CP-OFDM QPSK	25@12	21.56	21.76	0.1500
77	30	20	633334	3500.01	CP-OFDM QPSK	1@1	21.61	21.81	0.1517
77	30	20	633334	3500.01	CP-OFDM QPSK	1@49	21.5	21.7	0.1479
77	30	20	630668	3460.02	DFT-s-OFDM PI/2 BPSK	25@12	22.65	22.85	0.1928
77	30	20	630668	3460.02	DFT-s-OFDM PI/2 BPSK	1@1	22.7	22.9	0.1950
77	30	20	630668	3460.02	DFT-s-OFDM PI/2 BPSK	1@49	22.62	22.82	0.1914
77	30	20	630668	3460.02	DFT-s-OFDM QPSK	25@12	22.63	22.83	0.1919
77	30	20	630668	3460.02	DFT-s-OFDM QPSK	1@1	22.74	22.94	0.1968
77	30	20	630668	3460.02	DFT-s-OFDM QPSK	1@49	22.6	22.8	0.1905
77	30	20	630668	3460.02	DFT-s-	25@12	21.68	21.88	0.1542

					OFDM 16 QAM					
77	30	20	630668	3460.02	DFT-s- OFDM 16 QAM	1@1	21.68	21.88	0.1542	
77	30	20	630668	3460.02	DFT-s- OFDM 16 QAM	1@49	21.56	21.76	0.1500	
77	30	20	630668	3460.02	DFT-s- OFDM 64 QAM	25@12	20.2	20.4	0.1096	
77	30	20	630668	3460.02	DFT-s- OFDM 64 QAM	1@1	20.49	20.69	0.1172	
77	30	20	630668	3460.02	DFT-s- OFDM 64 QAM	1@49	20.35	20.55	0.1135	
77	30	20	630668	3460.02	DFT-s- OFDM 256 QAM	25@12	18.23	18.43	0.0697	
77	30	20	630668	3460.02	DFT-s- OFDM 256 QAM	1@1	18.31	18.51	0.0710	
77	30	20	630668	3460.02	DFT-s- OFDM 256 QAM	1@49	18.16	18.36	0.0685	
77	30	20	630668	3460.02	CP-OFDM QPSK	25@12	21.14	21.34	0.1361	
77	30	20	630668	3460.02	CP-OFDM QPSK	1@1	21.24	21.44	0.1393	
77	30	20	630668	3460.02	CP-OFDM QPSK	1@49	21.16	21.36	0.1368	
77	30	30	635666	3534.99	DFT-s- OFDM PI/2 BPSK	36@18	22.72	22.92	0.1959	
77	30	30	635666	3534.99	DFT-s- OFDM PI/2 BPSK	1@1	22.87	23.07	0.2028	
77	30	30	635666	3534.99	DFT-s- OFDM PI/2 BPSK	1@76	22.66	22.86	0.1932	
77	30	30	635666	3534.99	DFT-s- OFDM QPSK	36@18	22.7	22.9	0.1950	
77	30	30	635666	3534.99	DFT-s- OFDM QPSK	1@1	22.82	23.02	0.2004	
77	30	30	635666	3534.99	DFT-s- OFDM QPSK	1@76	22.68	22.88	0.1941	
77	30	30	635666	3534.99	DFT-s- OFDM 16 QAM	36@18	21.74	21.94	0.1563	
77	30	30	635666	3534.99	DFT-s- OFDM 16 QAM	1@1	21.87	22.07	0.1611	
77	30	30	635666	3534.99	DFT-s- OFDM 16 QAM	1@76	21.72	21.92	0.1556	
77	30	30	635666	3534.99	DFT-s- OFDM 64 QAM	36@18	20.27	20.47	0.1114	
77	30	30	635666	3534.99	DFT-s- OFDM 64 QAM	1@1	20.41	20.61	0.1151	
77	30	30	635666	3534.99	DFT-s- OFDM 64 QAM	1@76	20.24	20.44	0.1107	
77	30	30	635666	3534.99	DFT-s- OFDM 256	36@18	18.22	18.42	0.0695	

QAM									
77	30	30	635666	3534.99	DFT-s-OFDM 256 QAM	1@1	18.48	18.68	0.0738
77	30	30	635666	3534.99	DFT-s-OFDM 256 QAM	1@76	18.27	18.47	0.0703
77	30	30	635666	3534.99	CP-OFDM QPSK	39@19	21.25	21.45	0.1396
77	30	30	635666	3534.99	CP-OFDM QPSK	1@1	21.38	21.58	0.1439
77	30	30	635666	3534.99	CP-OFDM QPSK	1@76	21.11	21.31	0.1352
77	30	30	633334	3500.01	DFT-s-OFDM PI/2 BPSK	36@18	22.7	22.9	0.1950
77	30	30	633334	3500.01	DFT-s-OFDM PI/2 BPSK	1@1	22.79	22.99	0.1991
77	30	30	633334	3500.01	DFT-s-OFDM PI/2 BPSK	1@76	22.61	22.81	0.1910
77	30	30	633334	3500.01	DFT-s-OFDM QPSK	36@18	22.71	22.91	0.1954
77	30	30	633334	3500.01	DFT-s-OFDM QPSK	1@1	22.83	23.03	0.2009
77	30	30	633334	3500.01	DFT-s-OFDM QPSK	1@76	22.7	22.9	0.1950
77	30	30	633334	3500.01	DFT-s-OFDM 16 QAM	36@18	21.72	21.92	0.1556
77	30	30	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	21.81	22.01	0.1589
77	30	30	633334	3500.01	DFT-s-OFDM 16 QAM	1@76	21.67	21.87	0.1538
77	30	30	633334	3500.01	DFT-s-OFDM 64 QAM	36@18	20.28	20.48	0.1117
77	30	30	633334	3500.01	DFT-s-OFDM 64 QAM	1@1	20.33	20.53	0.1130
77	30	30	633334	3500.01	DFT-s-OFDM 64 QAM	1@76	20.27	20.47	0.1114
77	30	30	633334	3500.01	DFT-s-OFDM 256 QAM	36@18	18.22	18.42	0.0695
77	30	30	633334	3500.01	DFT-s-OFDM 256 QAM	1@1	18.4	18.6	0.0724
77	30	30	633334	3500.01	DFT-s-OFDM 256 QAM	1@76	18.31	18.51	0.0710
77	30	30	633334	3500.01	CP-OFDM QPSK	39@19	21.22	21.42	0.1387
77	30	30	633334	3500.01	CP-OFDM QPSK	1@1	21.33	21.53	0.1422
77	30	30	633334	3500.01	CP-OFDM QPSK	1@76	21.14	21.34	0.1361
77	30	30	631000	3465	DFT-s-OFDM PI/2 BPSK	36@18	22.66	22.86	0.1932
77	30	30	631000	3465	DFT-s-OFDM PI/2 BPSK	1@1	22.76	22.96	0.1977

77	30	30	631000	3465	DFT-s-OFDM PI/2 BPSK	1@76	22.69	22.89	0.1945
77	30	30	631000	3465	DFT-s-OFDM QPSK	36@18	22.68	22.88	0.1941
77	30	30	631000	3465	DFT-s-OFDM QPSK	1@1	22.86	23.06	0.2023
77	30	30	631000	3465	DFT-s-OFDM QPSK	1@76	22.64	22.84	0.1923
77	30	30	631000	3465	DFT-s-OFDM 16 QAM	36@18	21.7	21.9	0.1549
77	30	30	631000	3465	DFT-s-OFDM 16 QAM	1@1	21.9	22.1	0.1622
77	30	30	631000	3465	DFT-s-OFDM 16 QAM	1@76	21.69	21.89	0.1545
77	30	30	631000	3465	DFT-s-OFDM 64 QAM	36@18	20.26	20.46	0.1112
77	30	30	631000	3465	DFT-s-OFDM 64 QAM	1@1	20.37	20.57	0.1140
77	30	30	631000	3465	DFT-s-OFDM 64 QAM	1@76	20.22	20.42	0.1102
77	30	30	631000	3465	DFT-s-OFDM 256 QAM	36@18	18.17	18.37	0.0687
77	30	30	631000	3465	DFT-s-OFDM 256 QAM	1@1	18.44	18.64	0.0731
77	30	30	631000	3465	DFT-s-OFDM 256 QAM	1@76	18.29	18.49	0.0706
77	30	30	631000	3465	CP-OFDM QPSK	39@19	21.26	21.46	0.1400
77	30	30	631000	3465	CP-OFDM QPSK	1@1	21.32	21.52	0.1419
77	30	30	631000	3465	CP-OFDM QPSK	1@76	21.14	21.34	0.1361
77	30	40	635332	3529.98	DFT-s-OFDM PI/2 BPSK	50@25	22.76	22.96	0.1977
77	30	40	635332	3529.98	DFT-s-OFDM PI/2 BPSK	1@1	22.87	23.07	0.2028
77	30	40	635332	3529.98	DFT-s-OFDM PI/2 BPSK	1@104	22.72	22.92	0.1959
77	30	40	635332	3529.98	DFT-s-OFDM QPSK	50@25	22.73	22.93	0.1963
77	30	40	635332	3529.98	DFT-s-OFDM QPSK	1@1	22.9	23.1	0.2042
77	30	40	635332	3529.98	DFT-s-OFDM QPSK	1@104	22.74	22.94	0.1968
77	30	40	635332	3529.98	DFT-s-OFDM 16 QAM	50@25	21.78	21.98	0.1578
77	30	40	635332	3529.98	DFT-s-OFDM 16 QAM	1@1	21.92	22.12	0.1629
77	30	40	635332	3529.98	DFT-s-	1@104	21.82	22.02	0.1592

					OFDM 16 QAM					
77	30	40	635332	3529.98	DFT-s- OFDM 64 QAM	50@25	20.26	20.46	0.1112	
77	30	40	635332	3529.98	DFT-s- OFDM 64 QAM	1@1	20.58	20.78	0.1197	
77	30	40	635332	3529.98	DFT-s- OFDM 64 QAM	1@104	20.42	20.62	0.1153	
77	30	40	635332	3529.98	DFT-s- OFDM 256 QAM	50@25	18.26	18.46	0.0701	
77	30	40	635332	3529.98	DFT-s- OFDM 256 QAM	1@1	18.4	18.6	0.0724	
77	30	40	635332	3529.98	DFT-s- OFDM 256 QAM	1@104	18.27	18.47	0.0703	
77	30	40	635332	3529.98	CP-OFDM QPSK	53@26	21.23	21.43	0.1390	
77	30	40	635332	3529.98	CP-OFDM QPSK	1@1	21.41	21.61	0.1449	
77	30	40	635332	3529.98	CP-OFDM QPSK	1@104	21.3	21.5	0.1413	
77	30	40	633334	3500.01	DFT-s- OFDM PI/2 BPSK	50@25	22.78	22.98	0.1986	
77	30	40	633334	3500.01	DFT-s- OFDM PI/2 BPSK	1@1	22.84	23.04	0.2014	
77	30	40	633334	3500.01	DFT-s- OFDM PI/2 BPSK	1@104	22.74	22.94	0.1968	
77	30	40	633334	3500.01	DFT-s- OFDM QPSK	50@25	22.75	22.95	0.1972	
77	30	40	633334	3500.01	DFT-s- OFDM QPSK	1@1	22.79	22.99	0.1991	
77	30	40	633334	3500.01	DFT-s- OFDM QPSK	1@104	22.79	22.99	0.1991	
77	30	40	633334	3500.01	DFT-s- OFDM 16 QAM	50@25	21.84	22.04	0.1600	
77	30	40	633334	3500.01	DFT-s- OFDM 16 QAM	1@1	21.86	22.06	0.1607	
77	30	40	633334	3500.01	DFT-s- OFDM 16 QAM	1@104	21.66	21.86	0.1535	
77	30	40	633334	3500.01	DFT-s- OFDM 64 QAM	50@25	20.29	20.49	0.1119	
77	30	40	633334	3500.01	DFT-s- OFDM 64 QAM	1@1	20.49	20.69	0.1172	
77	30	40	633334	3500.01	DFT-s- OFDM 64 QAM	1@104	20.4	20.6	0.1148	
77	30	40	633334	3500.01	DFT-s- OFDM 256 QAM	50@25	18.29	18.49	0.0706	
77	30	40	633334	3500.01	DFT-s- OFDM 256 QAM	1@1	18.36	18.56	0.0718	
77	30	40	633334	3500.01	DFT-s- OFDM 256 QAM	1@104	18.32	18.52	0.0711	



QAM									
77	30	40	633334	3500.01	CP-OFDM QPSK	53@26	21.25	21.45	0.1396
77	30	40	633334	3500.01	CP-OFDM QPSK	1@1	21.37	21.57	0.1435
77	30	40	633334	3500.01	CP-OFDM QPSK	1@104	21.3	21.5	0.1413
77	30	40	631334	3470.01	DFT-s-OFDM PI/2 BPSK	50@25	22.72	22.92	0.1959
77	30	40	631334	3470.01	DFT-s-OFDM PI/2 BPSK	1@1	22.85	23.05	0.2018
77	30	40	631334	3470.01	DFT-s-OFDM PI/2 BPSK	1@104	22.77	22.97	0.1982
77	30	40	631334	3470.01	DFT-s-OFDM QPSK	50@25	22.74	22.94	0.1968
77	30	40	631334	3470.01	DFT-s-OFDM QPSK	1@1	22.88	23.08	0.2032
77	30	40	631334	3470.01	DFT-s-OFDM QPSK	1@104	22.81	23.01	0.2000
77	30	40	631334	3470.01	DFT-s-OFDM 16 QAM	50@25	21.76	21.96	0.1570
77	30	40	631334	3470.01	DFT-s-OFDM 16 QAM	1@1	21.88	22.08	0.1614
77	30	40	631334	3470.01	DFT-s-OFDM 16 QAM	1@104	21.64	21.84	0.1528
77	30	40	631334	3470.01	DFT-s-OFDM 64 QAM	50@25	20.25	20.45	0.1109
77	30	40	631334	3470.01	DFT-s-OFDM 64 QAM	1@1	20.51	20.71	0.1178
77	30	40	631334	3470.01	DFT-s-OFDM 64 QAM	1@104	20.44	20.64	0.1159
77	30	40	631334	3470.01	DFT-s-OFDM 256 QAM	50@25	18.3	18.5	0.0708
77	30	40	631334	3470.01	DFT-s-OFDM 256 QAM	1@1	18.43	18.63	0.0729
77	30	40	631334	3470.01	DFT-s-OFDM 256 QAM	1@104	18.33	18.53	0.0713
77	30	40	631334	3470.01	CP-OFDM QPSK	53@26	21.28	21.48	0.1406
77	30	40	631334	3470.01	CP-OFDM QPSK	1@1	21.38	21.58	0.1439
77	30	40	631334	3470.01	CP-OFDM QPSK	1@104	21.31	21.51	0.1416
77	30	50	635000	3525	DFT-s-OFDM PI/2 BPSK	64@32	22.53	22.73	0.1875
77	30	50	635000	3525	DFT-s-OFDM PI/2 BPSK	1@1	22.6	22.8	0.1905
77	30	50	635000	3525	DFT-s-OFDM PI/2 BPSK	1@131	22.31	22.51	0.1782
77	30	50	635000	3525	DFT-s-OFDM QPSK	64@32	22.58	22.78	0.1897

77	30	50	635000	3525	DFT-s-OFDM QPSK	1@1	22.68	22.88	0.1941
77	30	50	635000	3525	DFT-s-OFDM QPSK	1@131	22.36	22.56	0.1803
77	30	50	635000	3525	DFT-s-OFDM 16 QAM	64@32	21.55	21.75	0.1496
77	30	50	635000	3525	DFT-s-OFDM 16 QAM	1@1	21.61	21.81	0.1517
77	30	50	635000	3525	DFT-s-OFDM 16 QAM	1@131	21.39	21.59	0.1442
77	30	50	635000	3525	DFT-s-OFDM 64 QAM	64@32	20.1	20.3	0.1072
77	30	50	635000	3525	DFT-s-OFDM 64 QAM	1@1	20.25	20.45	0.1109
77	30	50	635000	3525	DFT-s-OFDM 64 QAM	1@131	20	20.2	0.1047
77	30	50	635000	3525	DFT-s-OFDM 256 QAM	64@32	18.09	18.29	0.0675
77	30	50	635000	3525	DFT-s-OFDM 256 QAM	1@1	18.19	18.39	0.0690
77	30	50	635000	3525	DFT-s-OFDM 256 QAM	1@131	17.91	18.11	0.0647
77	30	50	635000	3525	CP-OFDM QPSK	67@33	21.08	21.28	0.1343
77	30	50	635000	3525	CP-OFDM QPSK	1@1	21.16	21.36	0.1368
77	30	50	635000	3525	CP-OFDM QPSK	1@131	20.93	21.13	0.1297
77	30	50	633334	3500.01	DFT-s-OFDM PI/2 BPSK	64@32	22.59	22.79	0.1901
77	30	50	633334	3500.01	DFT-s-OFDM PI/2 BPSK	1@1	22.61	22.81	0.1910
77	30	50	633334	3500.01	DFT-s-OFDM PI/2 BPSK	1@131	22.31	22.51	0.1782
77	30	50	633334	3500.01	DFT-s-OFDM QPSK	64@32	22.58	22.78	0.1897
77	30	50	633334	3500.01	DFT-s-OFDM QPSK	1@1	22.59	22.79	0.1901
77	30	50	633334	3500.01	DFT-s-OFDM QPSK	1@131	22.38	22.58	0.1811
77	30	50	633334	3500.01	DFT-s-OFDM 16 QAM	64@32	21.61	21.81	0.1517
77	30	50	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	21.66	21.86	0.1535
77	30	50	633334	3500.01	DFT-s-OFDM 16 QAM	1@131	21.43	21.63	0.1455
77	30	50	633334	3500.01	DFT-s-OFDM 64 QAM	64@32	20.14	20.34	0.1081
77	30	50	633334	3500.01	DFT-s-	1@1	20.18	20.38	0.1091

						OFDM 64 QAM				
77	30	50	633334	3500.01	DFT-s- OFDM 64 QAM	1@131	19.93	20.13	0.1030	
77	30	50	633334	3500.01	DFT-s- OFDM 256 QAM	64@32	18.07	18.27	0.0671	
77	30	50	633334	3500.01	DFT-s- OFDM 256 QAM	1@1	18.18	18.38	0.0689	
77	30	50	633334	3500.01	DFT-s- OFDM 256 QAM	1@131	17.94	18.14	0.0652	
77	30	50	633334	3500.01	CP-OFDM QPSK	67@33	21.12	21.32	0.1355	
77	30	50	633334	3500.01	CP-OFDM QPSK	1@1	21.16	21.36	0.1368	
77	30	50	633334	3500.01	CP-OFDM QPSK	1@131	21	21.2	0.1318	
77	30	50	631668	3475.02	DFT-s- OFDM PI/2 BPSK	64@32	22.54	22.74	0.1879	
77	30	50	631668	3475.02	DFT-s- OFDM PI/2 BPSK	1@1	22.61	22.81	0.1910	
77	30	50	631668	3475.02	DFT-s- OFDM PI/2 BPSK	1@131	22.41	22.61	0.1824	
77	30	50	631668	3475.02	DFT-s- OFDM QPSK	64@32	22.58	22.78	0.1897	
77	30	50	631668	3475.02	DFT-s- OFDM QPSK	1@1	22.69	22.89	0.1945	
77	30	50	631668	3475.02	DFT-s- OFDM QPSK	1@131	22.43	22.63	0.1832	
77	30	50	631668	3475.02	DFT-s- OFDM 16 QAM	64@32	21.58	21.78	0.1507	
77	30	50	631668	3475.02	DFT-s- OFDM 16 QAM	1@1	21.64	21.84	0.1528	
77	30	50	631668	3475.02	DFT-s- OFDM 16 QAM	1@131	21.47	21.67	0.1469	
77	30	50	631668	3475.02	DFT-s- OFDM 64 QAM	64@32	20.1	20.3	0.1072	
77	30	50	631668	3475.02	DFT-s- OFDM 64 QAM	1@1	20.22	20.42	0.1102	
77	30	50	631668	3475.02	DFT-s- OFDM 64 QAM	1@131	20.03	20.23	0.1054	
77	30	50	631668	3475.02	DFT-s- OFDM 256 QAM	64@32	18.08	18.28	0.0673	
77	30	50	631668	3475.02	DFT-s- OFDM 256 QAM	1@1	18.19	18.39	0.0690	
77	30	50	631668	3475.02	DFT-s- OFDM 256 QAM	1@131	17.98	18.18	0.0658	
77	30	50	631668	3475.02	CP-OFDM QPSK	67@33	21.05	21.25	0.1334	
77	30	50	631668	3475.02	CP-OFDM QPSK	1@1	21.14	21.34	0.1361	
77	30	50	631668	3475.02	CP-OFDM	1@131	20.9	21.1	0.1288	

QPSK									
77	30	60	634666	3519.99	DFT-s-OFDM PI/2 BPSK	81@40	22.62	22.82	0.1914
77	30	60	634666	3519.99	DFT-s-OFDM PI/2 BPSK	1@1	22.66	22.86	0.1932
77	30	60	634666	3519.99	DFT-s-OFDM PI/2 BPSK	1@160	22.4	22.6	0.1820
77	30	60	634666	3519.99	DFT-s-OFDM QPSK	81@40	22.64	22.84	0.1923
77	30	60	634666	3519.99	DFT-s-OFDM QPSK	1@1	22.66	22.86	0.1932
77	30	60	634666	3519.99	DFT-s-OFDM QPSK	1@160	22.47	22.67	0.1849
77	30	60	634666	3519.99	DFT-s-OFDM 16 QAM	81@40	21.65	21.85	0.1531
77	30	60	634666	3519.99	DFT-s-OFDM 16 QAM	1@1	21.65	21.85	0.1531
77	30	60	634666	3519.99	DFT-s-OFDM 16 QAM	1@160	21.44	21.64	0.1459
77	30	60	634666	3519.99	DFT-s-OFDM 64 QAM	81@40	20.1	20.3	0.1072
77	30	60	634666	3519.99	DFT-s-OFDM 64 QAM	1@1	20.21	20.41	0.1099
77	30	60	634666	3519.99	DFT-s-OFDM 64 QAM	1@160	19.97	20.17	0.1040
77	30	60	634666	3519.99	DFT-s-OFDM 256 QAM	81@40	18.16	18.36	0.0685
77	30	60	634666	3519.99	DFT-s-OFDM 256 QAM	1@1	18.25	18.45	0.0700
77	30	60	634666	3519.99	DFT-s-OFDM 256 QAM	1@160	18.06	18.26	0.0670
77	30	60	634666	3519.99	CP-OFDM QPSK	81@40	21.1	21.3	0.1349
77	30	60	634666	3519.99	CP-OFDM QPSK	1@1	21.21	21.41	0.1384
77	30	60	634666	3519.99	CP-OFDM QPSK	1@160	20.97	21.17	0.1309
77	30	60	633334	3500.01	DFT-s-OFDM PI/2 BPSK	81@40	22.64	22.84	0.1923
77	30	60	633334	3500.01	DFT-s-OFDM PI/2 BPSK	1@1	22.6	22.8	0.1905
77	30	60	633334	3500.01	DFT-s-OFDM PI/2 BPSK	1@160	22.45	22.65	0.1841
77	30	60	633334	3500.01	DFT-s-OFDM QPSK	81@40	22.62	22.82	0.1914
77	30	60	633334	3500.01	DFT-s-OFDM QPSK	1@1	22.61	22.81	0.1910
77	30	60	633334	3500.01	DFT-s-OFDM QPSK	1@160	22.42	22.62	0.1828

77	30	60	633334	3500.01	DFT-s-OFDM 16 QAM	81@40	21.64	21.84	0.1528
77	30	60	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	21.69	21.89	0.1545
77	30	60	633334	3500.01	DFT-s-OFDM 16 QAM	1@160	21.46	21.66	0.1466
77	30	60	633334	3500.01	DFT-s-OFDM 64 QAM	81@40	20.16	20.36	0.1086
77	30	60	633334	3500.01	DFT-s-OFDM 64 QAM	1@1	20.14	20.34	0.1081
77	30	60	633334	3500.01	DFT-s-OFDM 64 QAM	1@160	20.03	20.23	0.1054
77	30	60	633334	3500.01	DFT-s-OFDM 256 QAM	81@40	18.15	18.35	0.0684
77	30	60	633334	3500.01	DFT-s-OFDM 256 QAM	1@1	18.21	18.41	0.0693
77	30	60	633334	3500.01	DFT-s-OFDM 256 QAM	1@160	18.06	18.26	0.0670
77	30	60	633334	3500.01	CP-OFDM QPSK	81@40	21.17	21.37	0.1371
77	30	60	633334	3500.01	CP-OFDM QPSK	1@1	21.11	21.31	0.1352
77	30	60	633334	3500.01	CP-OFDM QPSK	1@160	21.01	21.21	0.1321
77	30	60	632000	3480	DFT-s-OFDM PI/2 BPSK	81@40	22.61	22.81	0.1910
77	30	60	632000	3480	DFT-s-OFDM PI/2 BPSK	1@1	22.71	22.91	0.1954
77	30	60	632000	3480	DFT-s-OFDM PI/2 BPSK	1@160	22.54	22.74	0.1879
77	30	60	632000	3480	DFT-s-OFDM QPSK	81@40	22.66	22.86	0.1932
77	30	60	632000	3480	DFT-s-OFDM QPSK	1@1	22.71	22.91	0.1954
77	30	60	632000	3480	DFT-s-OFDM QPSK	1@160	22.52	22.72	0.1871
77	30	60	632000	3480	DFT-s-OFDM 16 QAM	81@40	21.7	21.9	0.1549
77	30	60	632000	3480	DFT-s-OFDM 16 QAM	1@1	21.66	21.86	0.1535
77	30	60	632000	3480	DFT-s-OFDM 16 QAM	1@160	21.52	21.72	0.1486
77	30	60	632000	3480	DFT-s-OFDM 64 QAM	81@40	20.22	20.42	0.1102
77	30	60	632000	3480	DFT-s-OFDM 64 QAM	1@1	20.22	20.42	0.1102
77	30	60	632000	3480	DFT-s-OFDM 64 QAM	1@160	20.04	20.24	0.1057
77	30	60	632000	3480	DFT-s-	81@40	18.19	18.39	0.0690

					OFDM 256 QAM					
77	30	60	632000	3480	DFT-s- OFDM 256 QAM	1@1	18.26	18.46	0.0701	
77	30	60	632000	3480	DFT-s- OFDM 256 QAM	1@160	18.11	18.31	0.0678	
77	30	60	632000	3480	CP-OFDM QPSK	81@40	21.14	21.34	0.1361	
77	30	60	632000	3480	CP-OFDM QPSK	1@1	21.17	21.37	0.1371	
77	30	60	632000	3480	CP-OFDM QPSK	1@160	21	21.2	0.1318	
77	30	70	634332	3514.98	DFT-s- OFDM PI/2 BPSK	90@45	22.48	22.68	0.1854	
77	30	70	634332	3514.98	DFT-s- OFDM PI/2 BPSK	1@1	22.5	22.7	0.1862	
77	30	70	634332	3514.98	DFT-s- OFDM PI/2 BPSK	1@187	22.21	22.41	0.1742	
77	30	70	634332	3514.98	DFT-s- OFDM QPSK	90@45	22.44	22.64	0.1837	
77	30	70	634332	3514.98	DFT-s- OFDM QPSK	1@1	22.52	22.72	0.1871	
77	30	70	634332	3514.98	DFT-s- OFDM QPSK	1@187	22.26	22.46	0.1762	
77	30	70	634332	3514.98	DFT-s- OFDM 16 QAM	90@45	21.48	21.68	0.1472	
77	30	70	634332	3514.98	DFT-s- OFDM 16 QAM	1@1	21.57	21.77	0.1503	
77	30	70	634332	3514.98	DFT-s- OFDM 16 QAM	1@187	21.27	21.47	0.1403	
77	30	70	634332	3514.98	DFT-s- OFDM 64 QAM	90@45	19.99	20.19	0.1045	
77	30	70	634332	3514.98	DFT-s- OFDM 64 QAM	1@1	20.07	20.27	0.1064	
77	30	70	634332	3514.98	DFT-s- OFDM 64 QAM	1@187	19.79	19.99	0.0998	
77	30	70	634332	3514.98	DFT-s- OFDM 256 QAM	90@45	18.04	18.24	0.0667	
77	30	70	634332	3514.98	DFT-s- OFDM 256 QAM	1@1	18.11	18.31	0.0678	
77	30	70	634332	3514.98	DFT-s- OFDM 256 QAM	1@187	17.83	18.03	0.0635	
77	30	70	634332	3514.98	CP-OFDM QPSK	95@47	20.92	21.12	0.1294	
77	30	70	634332	3514.98	CP-OFDM QPSK	1@1	21.05	21.25	0.1334	
77	30	70	634332	3514.98	CP-OFDM QPSK	1@187	20.75	20.95	0.1245	
77	30	70	633334	3500.01	DFT-s- OFDM PI/2 BPSK	90@45	22.46	22.66	0.1845	
77	30	70	633334	3500.01	DFT-s- OFDM PI/2	1@1	22.49	22.69	0.1858	

BPSK									
77	30	70	633334	3500.01	DFT-s-OFDM PI/2 BPSK	1@187	22.21	22.41	0.1742
77	30	70	633334	3500.01	DFT-s-OFDM QPSK	90@45	22.45	22.65	0.1841
77	30	70	633334	3500.01	DFT-s-OFDM QPSK	1@1	22.5	22.7	0.1862
77	30	70	633334	3500.01	DFT-s-OFDM QPSK	1@187	22.27	22.47	0.1766
77	30	70	633334	3500.01	DFT-s-OFDM 16 QAM	90@45	21.47	21.67	0.1469
77	30	70	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	21.59	21.79	0.1510
77	30	70	633334	3500.01	DFT-s-OFDM 16 QAM	1@187	21.27	21.47	0.1403
77	30	70	633334	3500.01	DFT-s-OFDM 64 QAM	90@45	19.99	20.19	0.1045
77	30	70	633334	3500.01	DFT-s-OFDM 64 QAM	1@1	20.07	20.27	0.1064
77	30	70	633334	3500.01	DFT-s-OFDM 64 QAM	1@187	19.8	20	0.1000
77	30	70	633334	3500.01	DFT-s-OFDM 256 QAM	90@45	18.01	18.21	0.0662
77	30	70	633334	3500.01	DFT-s-OFDM 256 QAM	1@1	18.12	18.32	0.0679
77	30	70	633334	3500.01	DFT-s-OFDM 256 QAM	1@187	17.85	18.05	0.0638
77	30	70	633334	3500.01	CP-OFDM QPSK	95@47	20.95	21.15	0.1303
77	30	70	633334	3500.01	CP-OFDM QPSK	1@1	21.06	21.26	0.1337
77	30	70	633334	3500.01	CP-OFDM QPSK	1@187	20.76	20.96	0.1247
77	30	70	632334	3485.01	DFT-s-OFDM PI/2 BPSK	90@45	22.42	22.62	0.1828
77	30	70	632334	3485.01	DFT-s-OFDM PI/2 BPSK	1@1	22.48	22.68	0.1854
77	30	70	632334	3485.01	DFT-s-OFDM PI/2 BPSK	1@187	22.23	22.43	0.1750
77	30	70	632334	3485.01	DFT-s-OFDM QPSK	90@45	22.46	22.66	0.1845
77	30	70	632334	3485.01	DFT-s-OFDM QPSK	1@1	22.56	22.76	0.1888
77	30	70	632334	3485.01	DFT-s-OFDM QPSK	1@187	22.28	22.48	0.1770
77	30	70	632334	3485.01	DFT-s-OFDM 16 QAM	90@45	21.44	21.64	0.1459
77	30	70	632334	3485.01	DFT-s-OFDM 16 QAM	1@1	21.61	21.81	0.1517

77	30	70	632334	3485.01	DFT-s-OFDM 16 QAM	1@187	21.33	21.53	0.1422
77	30	70	632334	3485.01	DFT-s-OFDM 64 QAM	90@45	19.97	20.17	0.1040
77	30	70	632334	3485.01	DFT-s-OFDM 64 QAM	1@1	20.06	20.26	0.1062
77	30	70	632334	3485.01	DFT-s-OFDM 64 QAM	1@187	19.81	20.01	0.1002
77	30	70	632334	3485.01	DFT-s-OFDM 256 QAM	90@45	17.97	18.17	0.0656
77	30	70	632334	3485.01	DFT-s-OFDM 256 QAM	1@1	18.09	18.29	0.0675
77	30	70	632334	3485.01	DFT-s-OFDM 256 QAM	1@187	17.85	18.05	0.0638
77	30	70	632334	3485.01	CP-OFDM QPSK	95@47	20.93	21.13	0.1297
77	30	70	632334	3485.01	CP-OFDM QPSK	1@1	21.09	21.29	0.1346
77	30	70	632334	3485.01	CP-OFDM QPSK	1@187	20.82	21.02	0.1265
77	30	80	634000	3510	DFT-s-OFDM PI/2 BPSK	108@54	22.48	22.68	0.1854
77	30	80	634000	3510	DFT-s-OFDM PI/2 BPSK	1@1	22.46	22.66	0.1845
77	30	80	634000	3510	DFT-s-OFDM PI/2 BPSK	1@215	22.19	22.39	0.1734
77	30	80	634000	3510	DFT-s-OFDM QPSK	108@54	22.45	22.65	0.1841
77	30	80	634000	3510	DFT-s-OFDM QPSK	1@1	22.48	22.68	0.1854
77	30	80	634000	3510	DFT-s-OFDM QPSK	1@215	22.24	22.44	0.1754
77	30	80	634000	3510	DFT-s-OFDM 16 QAM	108@54	21.47	21.67	0.1469
77	30	80	634000	3510	DFT-s-OFDM 16 QAM	1@1	21.46	21.66	0.1466
77	30	80	634000	3510	DFT-s-OFDM 16 QAM	1@215	21.31	21.51	0.1416
77	30	80	634000	3510	DFT-s-OFDM 64 QAM	108@54	20.02	20.22	0.1052
77	30	80	634000	3510	DFT-s-OFDM 64 QAM	1@1	20.14	20.34	0.1081
77	30	80	634000	3510	DFT-s-OFDM 64 QAM	1@215	19.9	20.1	0.1023
77	30	80	634000	3510	DFT-s-OFDM 256 QAM	108@54	18	18.2	0.0661
77	30	80	634000	3510	DFT-s-OFDM 256 QAM	1@1	17.99	18.19	0.0659
77	30	80	634000	3510	DFT-s-	1@215	17.77	17.97	0.0627



					OFDM 256 QAM					
77	30	80	634000	3510	CP-OFDM QPSK	109@54	21.02	21.22	0.1324	
77	30	80	634000	3510	CP-OFDM QPSK	1@1	20.99	21.19	0.1315	
77	30	80	634000	3510	CP-OFDM QPSK	1@215	20.78	20.98	0.1253	
77	30	80	633334	3500.01	DFT-s- OFDM PI/2 BPSK	108@54	22.45	22.65	0.1841	
77	30	80	633334	3500.01	DFT-s- OFDM PI/2 BPSK	1@1	22.5	22.7	0.1862	
77	30	80	633334	3500.01	DFT-s- OFDM PI/2 BPSK	1@215	22.24	22.44	0.1754	
77	30	80	633334	3500.01	DFT-s- OFDM QPSK	108@54	22.44	22.64	0.1837	
77	30	80	633334	3500.01	DFT-s- OFDM QPSK	1@1	22.52	22.72	0.1871	
77	30	80	633334	3500.01	DFT-s- OFDM QPSK	1@215	22.25	22.45	0.1758	
77	30	80	633334	3500.01	DFT-s- OFDM 16 QAM	108@54	21.55	21.75	0.1496	
77	30	80	633334	3500.01	DFT-s- OFDM 16 QAM	1@1	21.52	21.72	0.1486	
77	30	80	633334	3500.01	DFT-s- OFDM 16 QAM	1@215	21.34	21.54	0.1426	
77	30	80	633334	3500.01	DFT-s- OFDM 64 QAM	108@54	20.04	20.24	0.1057	
77	30	80	633334	3500.01	DFT-s- OFDM 64 QAM	1@1	20.11	20.31	0.1074	
77	30	80	633334	3500.01	DFT-s- OFDM 64 QAM	1@215	19.91	20.11	0.1026	
77	30	80	633334	3500.01	DFT-s- OFDM 256 QAM	108@54	18	18.2	0.0661	
77	30	80	633334	3500.01	DFT-s- OFDM 256 QAM	1@1	18.03	18.23	0.0665	
77	30	80	633334	3500.01	DFT-s- OFDM 256 QAM	1@215	17.83	18.03	0.0635	
77	30	80	633334	3500.01	CP-OFDM QPSK	109@54	20.95	21.15	0.1303	
77	30	80	633334	3500.01	CP-OFDM QPSK	1@1	21.01	21.21	0.1321	
77	30	80	633334	3500.01	CP-OFDM QPSK	1@215	20.71	20.91	0.1233	
77	30	80	632668	3490.02	DFT-s- OFDM PI/2 BPSK	108@54	22.46	22.66	0.1845	
77	30	80	632668	3490.02	DFT-s- OFDM PI/2 BPSK	1@1	22.48	22.68	0.1854	
77	30	80	632668	3490.02	DFT-s- OFDM PI/2 BPSK	1@215	22.26	22.46	0.1762	
77	30	80	632668	3490.02	DFT-s- OFDM	108@54	22.45	22.65	0.1841	

					QPSK					
77	30	80	632668	3490.02	DFT-s-OFDM QPSK	1@1	22.49	22.69	0.1858	
77	30	80	632668	3490.02	DFT-s-OFDM QPSK	1@215	22.29	22.49	0.1774	
77	30	80	632668	3490.02	DFT-s-OFDM 16 QAM	108@54	21.47	21.67	0.1469	
77	30	80	632668	3490.02	DFT-s-OFDM 16 QAM	1@1	21.5	21.7	0.1479	
77	30	80	632668	3490.02	DFT-s-OFDM 16 QAM	1@215	21.33	21.53	0.1422	
77	30	80	632668	3490.02	DFT-s-OFDM 64 QAM	108@54	20.01	20.21	0.1050	
77	30	80	632668	3490.02	DFT-s-OFDM 64 QAM	1@1	20.13	20.33	0.1079	
77	30	80	632668	3490.02	DFT-s-OFDM 64 QAM	1@215	19.94	20.14	0.1033	
77	30	80	632668	3490.02	DFT-s-OFDM 256 QAM	108@54	17.99	18.19	0.0659	
77	30	80	632668	3490.02	DFT-s-OFDM 256 QAM	1@1	18.11	18.31	0.0678	
77	30	80	632668	3490.02	DFT-s-OFDM 256 QAM	1@215	17.89	18.09	0.0644	
77	30	80	632668	3490.02	CP-OFDM QPSK	109@54	20.99	21.19	0.1315	
77	30	80	632668	3490.02	CP-OFDM QPSK	1@1	21.07	21.27	0.1340	
77	30	80	632668	3490.02	CP-OFDM QPSK	1@215	20.8	21	0.1259	
77	30	90	633666	3504.99	DFT-s-OFDM PI/2 BPSK	120@60	22.48	22.68	0.1854	
77	30	90	633666	3504.99	DFT-s-OFDM PI/2 BPSK	1@1	22.61	22.81	0.1910	
77	30	90	633666	3504.99	DFT-s-OFDM PI/2 BPSK	1@243	22.25	22.45	0.1758	
77	30	90	633666	3504.99	DFT-s-OFDM QPSK	120@60	22.48	22.68	0.1854	
77	30	90	633666	3504.99	DFT-s-OFDM QPSK	1@1	22.62	22.82	0.1914	
77	30	90	633666	3504.99	DFT-s-OFDM QPSK	1@243	22.36	22.56	0.1803	
77	30	90	633666	3504.99	DFT-s-OFDM 16 QAM	120@60	21.58	21.78	0.1507	
77	30	90	633666	3504.99	DFT-s-OFDM 16 QAM	1@1	21.63	21.83	0.1524	
77	30	90	633666	3504.99	DFT-s-OFDM 16 QAM	1@243	21.36	21.56	0.1432	
77	30	90	633666	3504.99	DFT-s-OFDM 64 QAM	120@60	20.03	20.23	0.1054	

77	30	90	633666	3504.99	DFT-s-OFDM 64 QAM	1@1	20.25	20.45	0.1109
77	30	90	633666	3504.99	DFT-s-OFDM 64 QAM	1@243	19.96	20.16	0.1038
77	30	90	633666	3504.99	DFT-s-OFDM 256 QAM	120@60	18.03	18.23	0.0665
77	30	90	633666	3504.99	DFT-s-OFDM 256 QAM	1@1	18.11	18.31	0.0678
77	30	90	633666	3504.99	DFT-s-OFDM 256 QAM	1@243	17.82	18.02	0.0634
77	30	90	633666	3504.99	CP-OFDM QPSK	123@61	20.93	21.13	0.1297
77	30	90	633666	3504.99	CP-OFDM QPSK	1@1	21.17	21.37	0.1371
77	30	90	633666	3504.99	CP-OFDM QPSK	1@243	20.76	20.96	0.1247
77	30	90	633334	3500.01	DFT-s-OFDM PI/2 BPSK	120@60	22.49	22.69	0.1858
77	30	90	633334	3500.01	DFT-s-OFDM PI/2 BPSK	1@1	22.51	22.71	0.1866
77	30	90	633334	3500.01	DFT-s-OFDM PI/2 BPSK	1@243	22.28	22.48	0.1770
77	30	90	633334	3500.01	DFT-s-OFDM QPSK	120@60	22.51	22.71	0.1866
77	30	90	633334	3500.01	DFT-s-OFDM QPSK	1@1	22.51	22.71	0.1866
77	30	90	633334	3500.01	DFT-s-OFDM QPSK	1@243	22.25	22.45	0.1758
77	30	90	633334	3500.01	DFT-s-OFDM 16 QAM	120@60	21.55	21.75	0.1496
77	30	90	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	21.58	21.78	0.1507
77	30	90	633334	3500.01	DFT-s-OFDM 16 QAM	1@243	21.35	21.55	0.1429
77	30	90	633334	3500.01	DFT-s-OFDM 64 QAM	120@60	20.05	20.25	0.1059
77	30	90	633334	3500.01	DFT-s-OFDM 64 QAM	1@1	20.15	20.35	0.1084
77	30	90	633334	3500.01	DFT-s-OFDM 64 QAM	1@243	19.94	20.14	0.1033
77	30	90	633334	3500.01	DFT-s-OFDM 256 QAM	120@60	18.06	18.26	0.0670
77	30	90	633334	3500.01	DFT-s-OFDM 256 QAM	1@1	18.06	18.26	0.0670
77	30	90	633334	3500.01	DFT-s-OFDM 256 QAM	1@243	17.91	18.11	0.0647
77	30	90	633334	3500.01	CP-OFDM QPSK	123@61	21	21.2	0.1318
77	30	90	633334	3500.01	CP-OFDM QPSK	1@1	21.09	21.29	0.1346

77	30	90	633334	3500.01	CP-OFDM QPSK	1@243	20.83	21.03	0.1268
77	30	90	633000	3495	DFT-s- OFDM PI/2 BPSK	120@60	22.48	22.68	0.1854
77	30	90	633000	3495	DFT-s- OFDM PI/2 BPSK	1@1	22.51	22.71	0.1866
77	30	90	633000	3495	DFT-s- OFDM PI/2 BPSK	1@243	22.24	22.44	0.1754
77	30	90	633000	3495	DFT-s- OFDM QPSK	120@60	22.47	22.67	0.1849
77	30	90	633000	3495	DFT-s- OFDM QPSK	1@1	22.47	22.67	0.1849
77	30	90	633000	3495	DFT-s- OFDM QPSK	1@243	22.32	22.52	0.1786
77	30	90	633000	3495	DFT-s- OFDM 16 QAM	120@60	21.54	21.74	0.1493
77	30	90	633000	3495	DFT-s- OFDM 16 QAM	1@1	21.57	21.77	0.1503
77	30	90	633000	3495	DFT-s- OFDM 16 QAM	1@243	21.36	21.56	0.1432
77	30	90	633000	3495	DFT-s- OFDM 64 QAM	120@60	20.01	20.21	0.1050
77	30	90	633000	3495	DFT-s- OFDM 64 QAM	1@1	20.13	20.33	0.1079
77	30	90	633000	3495	DFT-s- OFDM 64 QAM	1@243	19.92	20.12	0.1028
77	30	90	633000	3495	DFT-s- OFDM 256 QAM	120@60	17.98	18.18	0.0658
77	30	90	633000	3495	DFT-s- OFDM 256 QAM	1@1	18.04	18.24	0.0667
77	30	90	633000	3495	DFT-s- OFDM 256 QAM	1@243	17.82	18.02	0.0634
77	30	90	633000	3495	CP-OFDM QPSK	123@61	20.97	21.17	0.1309
77	30	90	633000	3495	CP-OFDM QPSK	1@1	21.02	21.22	0.1324
77	30	90	633000	3495	CP-OFDM QPSK	1@243	20.79	20.99	0.1256
77	30	100	633334	3500.01	DFT-s- OFDM PI/2 BPSK	135@67	22.5	22.7	0.1862
77	30	100	633334	3500.01	DFT-s- OFDM PI/2 BPSK	1@1	22.48	22.68	0.1854
77	30	100	633334	3500.01	DFT-s- OFDM PI/2 BPSK	1@271	22.32	22.52	0.1786
77	30	100	633334	3500.01	DFT-s- OFDM QPSK	135@67	22.49	22.69	0.1858
77	30	100	633334	3500.01	DFT-s- OFDM QPSK	1@1	22.51	22.71	0.1866
77	30	100	633334	3500.01	DFT-s- OFDM QPSK	1@271	22.35	22.55	0.1799

77	30	100	633334	3500.01	DFT-s-OFDM 16 QAM	135@67	21.52	21.72	0.1486
77	30	100	633334	3500.01	DFT-s-OFDM 16 QAM	1@1	21.52	21.72	0.1486
77	30	100	633334	3500.01	DFT-s-OFDM 16 QAM	1@271	21.3	21.5	0.1413
77	30	100	633334	3500.01	DFT-s-OFDM 64 QAM	135@67	19.86	20.06	0.1014
77	30	100	633334	3500.01	DFT-s-OFDM 64 QAM	1@1	19.94	20.14	0.1033
77	30	100	633334	3500.01	DFT-s-OFDM 64 QAM	1@271	19.78	19.98	0.0995
77	30	100	633334	3500.01	DFT-s-OFDM 256 QAM	135@67	17.97	18.17	0.0656
77	30	100	633334	3500.01	DFT-s-OFDM 256 QAM	1@1	18.02	18.22	0.0664
77	30	100	633334	3500.01	DFT-s-OFDM 256 QAM	1@271	17.81	18.01	0.0632
77	30	100	633334	3500.01	CP-OFDM QPSK	137@68	20.94	21.14	0.1300
77	30	100	633334	3500.01	CP-OFDM QPSK	1@1	21.01	21.21	0.1321
77	30	100	633334	3500.01	CP-OFDM QPSK	1@271	20.73	20.93	0.1239

## 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	-0.00309	PASS	NV
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	-0.00521	PASS	LV
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	-0.00142	PASS	HV
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	-0.00532	PASS	-30°C
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	-0.00553	PASS	-20°C
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	-0.00154	PASS	-10°C
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	-0.00235	PASS	0°C
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	-0.00351	PASS	10°C
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	-0.00351	PASS	20°C
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	-0.00359	PASS	30°C
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	-0.00547	PASS	40°C
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	-0.00531	PASS	50°C

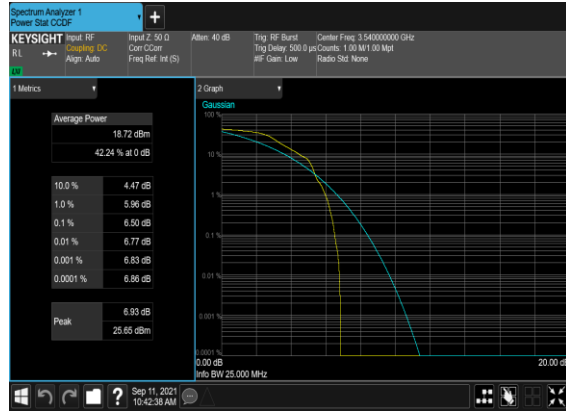
## Peak to Average Ratio

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Result (dB)	Limit (dB)	Verdict
77	30	20	636000	3540.0	DFT-s-OFDM PI/2 BPSK	50@0	7.05	13	PASS
77	30	20	636000	3540.0	DFT-s-OFDM PI/2 BPSK	1@0	6.5	13	PASS
77	30	20	636000	3540.0	DFT-s-OFDM PI/2 BPSK	1@50	6.52	13	PASS
77	30	20	636000	3540.0	DFT-s-OFDM QPSK	50@0	8.2	13	PASS
77	30	20	636000	3540.0	DFT-s-OFDM QPSK	1@0	8.9	13	PASS
77	30	20	636000	3540.0	DFT-s-OFDM QPSK	1@50	8.3	13	PASS
77	30	20	633334	3500.01	DFT-s-OFDM PI/2 BPSK	50@0	6.91	13	PASS
77	30	20	633334	3500.01	DFT-s-OFDM PI/2 BPSK	1@0	6.51	13	PASS
77	30	20	633334	3500.01	DFT-s-OFDM PI/2 BPSK	1@50	6.53	13	PASS
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	8.12	13	PASS
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	1@0	8.38	13	PASS
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	1@50	8.28	13	PASS
77	30	20	630668	3460.02	DFT-s-OFDM PI/2 BPSK	50@0	7.01	13	PASS
77	30	20	630668	3460.02	DFT-s-OFDM PI/2 BPSK	1@0	6.51	13	PASS
77	30	20	630668	3460.02	DFT-s-OFDM PI/2 BPSK	1@50	6.52	13	PASS
77	30	20	630668	3460.02	DFT-s-OFDM QPSK	50@0	8.2	13	PASS
77	30	20	630668	3460.02	DFT-s-OFDM QPSK	1@0	8.71	13	PASS
77	30	20	630668	3460.02	DFT-s-OFDM QPSK	1@50	8.32	13	PASS

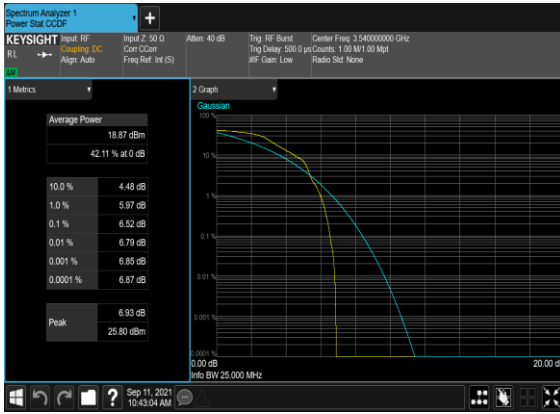
B41\_N77(20M)\_DFT-s-OFDM\_PI\_2-BPSK\_Outer\_Full\_High\_CH



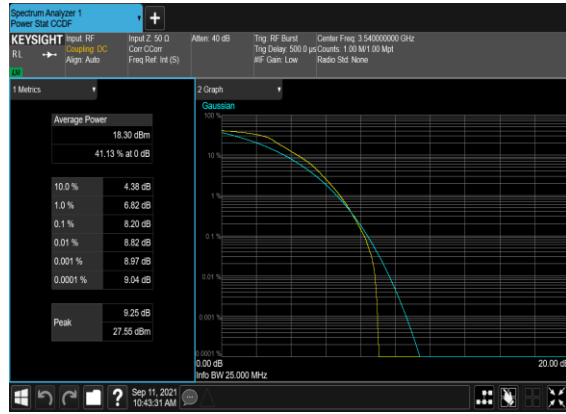
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B41\_N77(20M)\_DFT-s-OFDM\_PI\_2-BPSK\_Edge\_1RB\_Right\_High\_CH



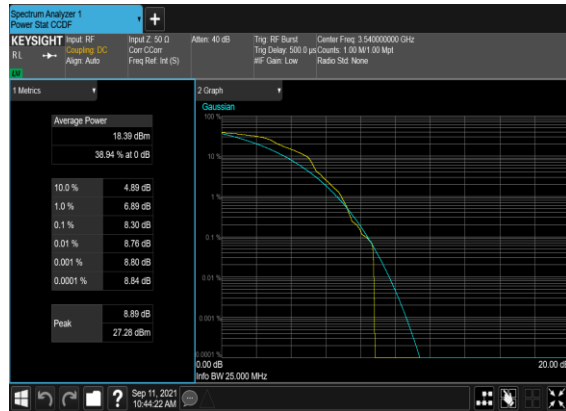
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B41\_N77(20M)\_DFT-s-OFDM\_QPSK\_Edge\_1RB\_Left\_High\_CH

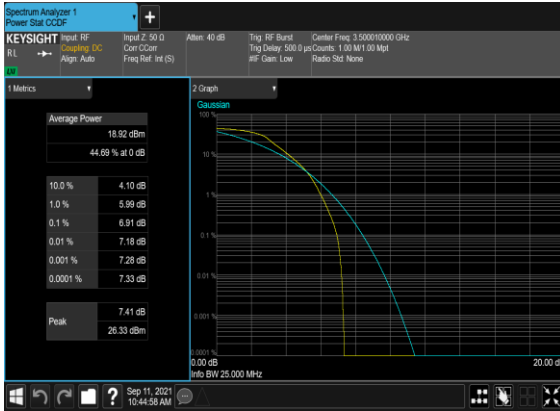


B41\_N77(20M)\_DFT-s-OFDM\_QPSK\_Edge\_1RB\_Right\_High\_CH





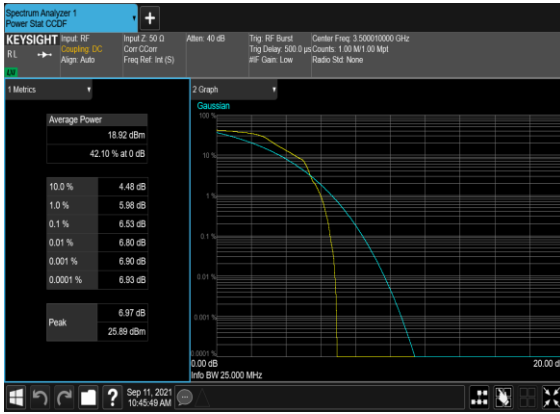
B41\_N77(20M)\_DFT-s-OFDM\_PI\_2-BPSK\_Outer\_Full\_Mid\_CH



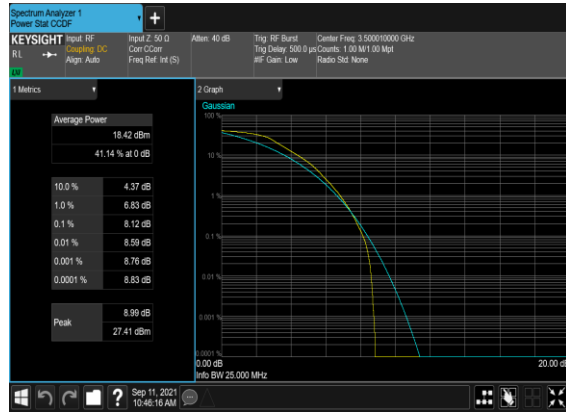
B41\_N77(20M)\_DFT-s-OFDM\_PI\_2-BPSK\_Edge\_1RB\_Left\_Mid\_CH



B41\_N77(20M)\_DFT-s-OFDM\_PI\_2-BPSK\_Edge\_1RB\_Right\_Mid\_CH



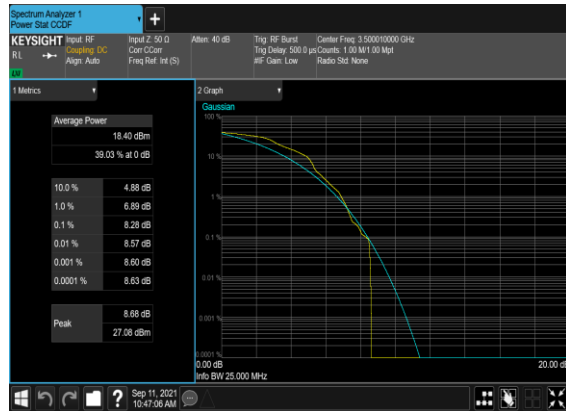
B41\_N77(20M)\_DFT-s-OFDM\_QPSK\_Outer\_Full\_Mid\_CH



B41\_N77(20M)\_DFT-s-OFDM\_QPSK\_Edge\_1RB\_Left\_Mid\_CH



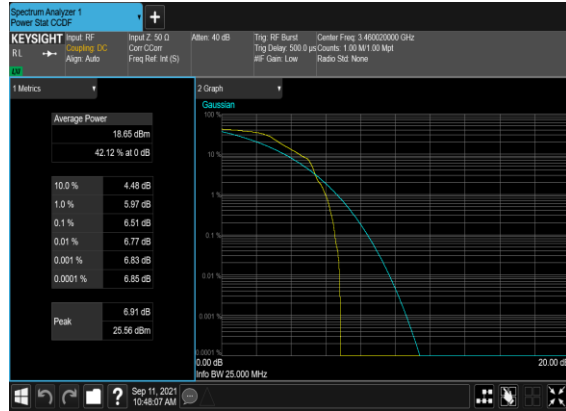
B41\_N77(20M)\_DFT-s-OFDM\_QPSK\_Edge\_1RB\_Right\_Mid\_CH



B41\_N77(20M)\_DFT-s-OFDM\_PI\_2-BPSK\_Outer\_Full\_Low\_CH



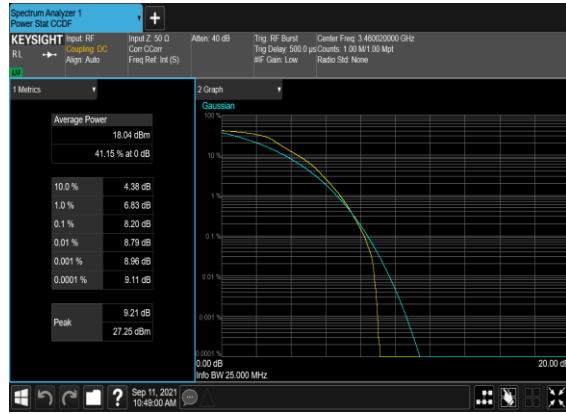
B41\_N77(20M)\_DFT-s-OFDM\_PI\_2-BPSK\_Edge\_1RB\_Left\_Low\_CH



B41\_N77(20M)\_DFT-s-OFDM\_PI\_2-BPSK\_Edge\_1RB\_Right\_Low\_CH



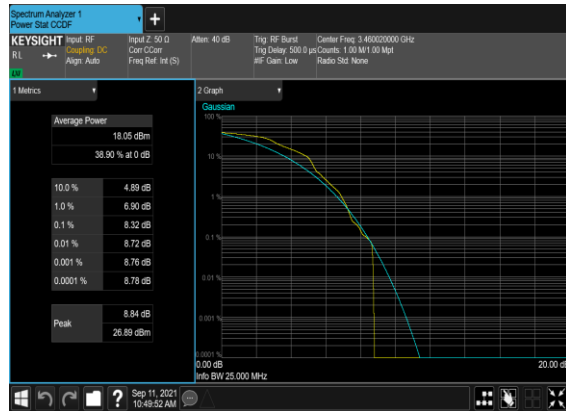
B41\_N77(20M)\_DFT-s-OFDM\_QPSK\_Outer\_Full\_Low\_CH



B41\_N77(20M)\_DFT-s-OFDM\_QPSK\_Edge\_1RB\_Left\_Low\_CH



B41\_N77(20M)\_DFT-s-OFDM\_QPSK\_Edge\_1RB\_Right\_Low\_CH



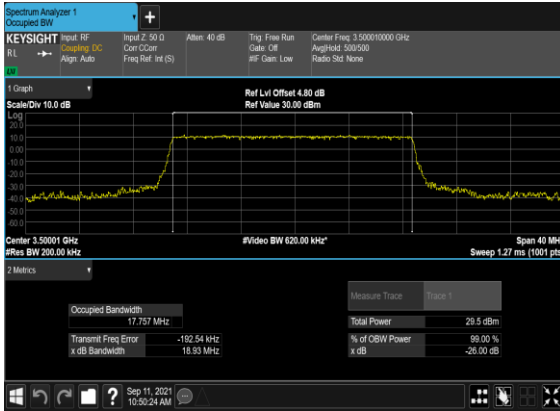
## Occupied Bandwidth

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	OBW (MHz)	26dB OBW (MHz)
77	30	20	633334	3500.01	DFT-s-OFDM PI/2 BPSK	50@0	17.757	18.93
77	30	20	633334	3500.01	DFT-s-OFDM QPSK	50@0	17.795	18.82
77	30	20	633334	3500.01	CP-OFDM QPSK	51@0	18.167	19.54
77	30	20	633334	3500.01	CP-OFDM 16 QAM	51@0	18.221	19.45
77	30	20	633334	3500.01	CP-OFDM 64 QAM	51@0	18.181	19.35
77	30	20	633334	3500.01	CP-OFDM 256 QAM	51@0	18.139	19.42
77	30	30	633334	3500.01	DFT-s-OFDM PI/2 BPSK	75@0	26.81	28.2
77	30	30	633334	3500.01	DFT-s-OFDM QPSK	75@0	26.762	27.98
77	30	30	633334	3500.01	CP-OFDM QPSK	78@0	27.871	29.11
77	30	30	633334	3500.01	CP-OFDM 16 QAM	78@0	27.84	29.18
77	30	30	633334	3500.01	CP-OFDM 64 QAM	78@0	27.783	29.06
77	30	30	633334	3500.01	CP-OFDM 256 QAM	78@0	27.844	29.28
77	30	40	633334	3500.01	DFT-s-OFDM PI/2 BPSK	100@0	35.711	37.33
77	30	40	633334	3500.01	DFT-s-OFDM QPSK	100@0	35.678	37.21
77	30	40	633334	3500.01	CP-OFDM QPSK	106@0	37.759	39.31
77	30	40	633334	3500.01	CP-OFDM 16 QAM	106@0	37.769	39.28
77	30	40	633334	3500.01	CP-OFDM 64 QAM	106@0	37.817	39.39
77	30	40	633334	3500.01	CP-OFDM 256 QAM	106@0	37.763	39.31
77	30	50	633334	3500.01	DFT-s-OFDM PI/2 BPSK	128@0	45.734	47.62
77	30	50	633334	3500.01	DFT-s-OFDM QPSK	128@0	45.758	47.45
77	30	50	633334	3500.01	CP-OFDM QPSK	133@0	47.411	49.16
77	30	50	633334	3500.01	CP-OFDM 16 QAM	133@0	47.427	49.33
77	30	50	633334	3500.01	CP-OFDM 64 QAM	133@0	47.443	49.11
77	30	50	633334	3500.01	CP-OFDM 256 QAM	133@0	47.56	49.29

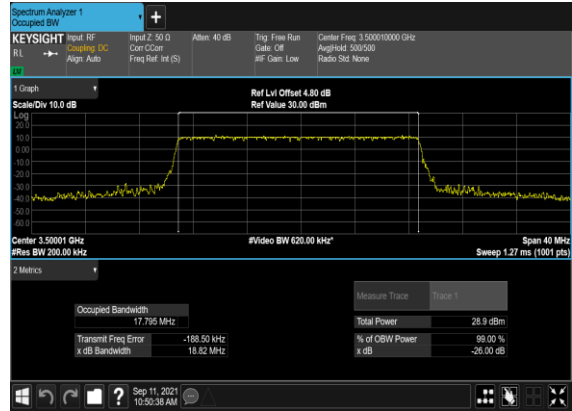
77	30	60	633334	3500.01	DFT-s-OFDM PI/2 BPSK	162@0	57.915	59.89
77	30	60	633334	3500.01	DFT-s-OFDM QPSK	162@0	57.896	59.98
77	30	60	633334	3500.01	CP-OFDM QPSK	162@0	57.738	60.01
77	30	60	633334	3500.01	CP-OFDM 16 QAM	162@0	57.792	59.81
77	30	60	633334	3500.01	CP-OFDM 64 QAM	162@0	57.742	60.02
77	30	60	633334	3500.01	CP-OFDM 256 QAM	162@0	57.681	59.83
77	30	70	633334	3500.01	DFT-s-OFDM PI/2 BPSK	180@0	64.349	66.4
77	30	70	633334	3500.01	DFT-s-OFDM QPSK	180@0	64.332	66.46
77	30	70	633334	3500.01	CP-OFDM QPSK	189@0	67.515	69.85
77	30	70	633334	3500.01	CP-OFDM 16 QAM	189@0	67.383	69.69
77	30	70	633334	3500.01	CP-OFDM 64 QAM	189@0	67.369	69.76
77	30	70	633334	3500.01	CP-OFDM 256 QAM	189@0	67.532	69.79
77	30	80	633334	3500.01	DFT-s-OFDM PI/2 BPSK	216@0	77.175	79.7
77	30	80	633334	3500.01	DFT-s-OFDM QPSK	216@0	77.154	79.66
77	30	80	633334	3500.01	CP-OFDM QPSK	217@0	77.41	79.93
77	30	80	633334	3500.01	CP-OFDM 16 QAM	217@0	77.502	80.04
77	30	80	633334	3500.01	CP-OFDM 64 QAM	217@0	77.568	80.12
77	30	80	633334	3500.01	CP-OFDM 256 QAM	217@0	77.43	80.11
77	30	90	633334	3500.01	DFT-s-OFDM PI/2 BPSK	240@0	85.804	88.63
77	30	90	633334	3500.01	DFT-s-OFDM QPSK	240@0	85.664	88.5
77	30	90	633334	3500.01	CP-OFDM QPSK	245@0	87.396	90.31
77	30	90	633334	3500.01	CP-OFDM 16 QAM	245@0	87.303	90.25
77	30	90	633334	3500.01	CP-OFDM 64 QAM	245@0	87.309	90.4
77	30	90	633334	3500.01	CP-OFDM 256 QAM	245@0	87.402	90.26
77	30	100	633334	3500.01	DFT-s-OFDM PI/2 BPSK	270@0	96.515	99.56
77	30	100	633334	3500.01	DFT-s-OFDM	270@0	96.405	99.52

QPSK								
77	30	100	633334	3500.01	CP-OFDM QPSK	273@0	97.318	100.6
77	30	100	633334	3500.01	CP-OFDM 16 QAM	273@0	97.374	100.7
77	30	100	633334	3500.01	CP-OFDM 64 QAM	273@0	97.421	100.6
77	30	100	633334	3500.01	CP-OFDM 256 QAM	273@0	97.572	100.5

### B41\_N77(20M)\_DFT-s-OFDM\_PI\_2- BPSK\_Outer\_Full\_Mid\_CH



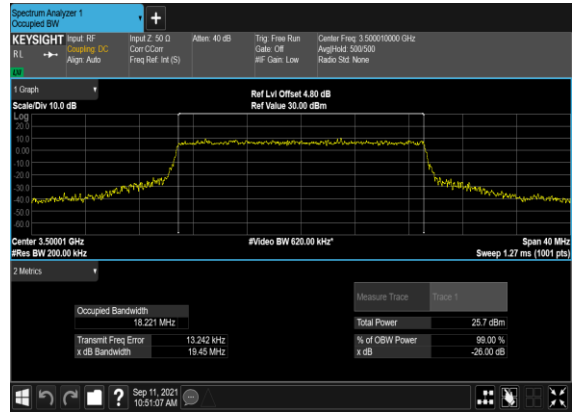
### B41\_N77(20M)\_DFT-s- OFDM\_QPSK\_Outer\_Full\_Mid\_CH



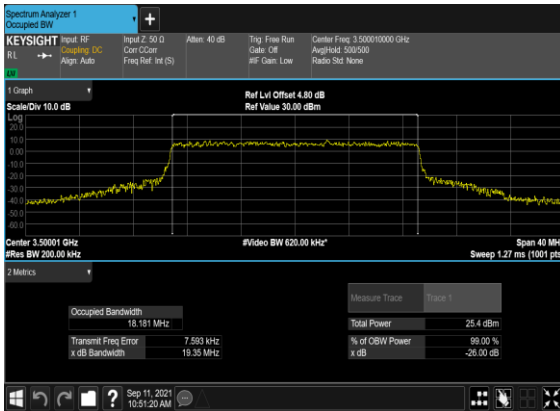
### B41\_N77(20M)\_CP- OFDM\_QPSK\_Outer\_Full\_Mid\_CH



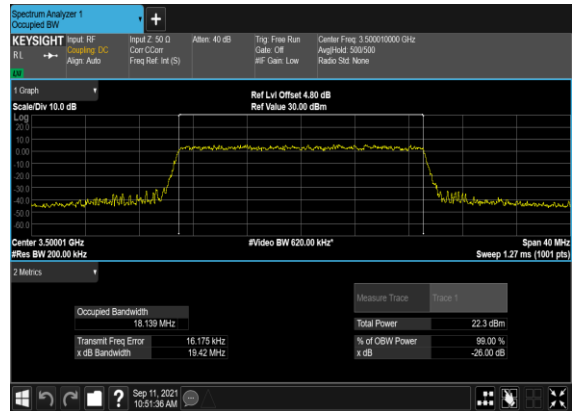
### B41\_N77(20M)\_CP-OFDM\_16 QAM\_Outer\_Full\_Mid\_CH



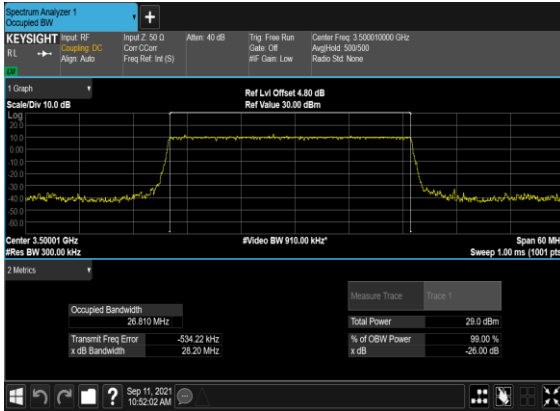
### B41\_N77(20M)\_CP-OFDM\_64 QAM\_Outer\_Full\_Mid\_CH



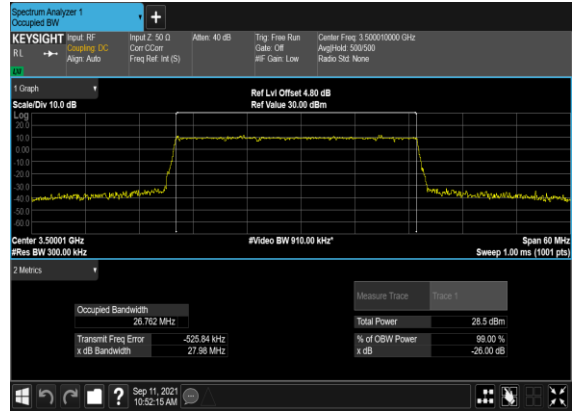
### B41\_N77(20M)\_CP-OFDM\_256 QAM\_Outer\_Full\_Mid\_CH



### B41\_N77(30M)\_DFT-s-OFDM\_PI\_2- BPSK\_Outer\_Full\_Mid\_CH



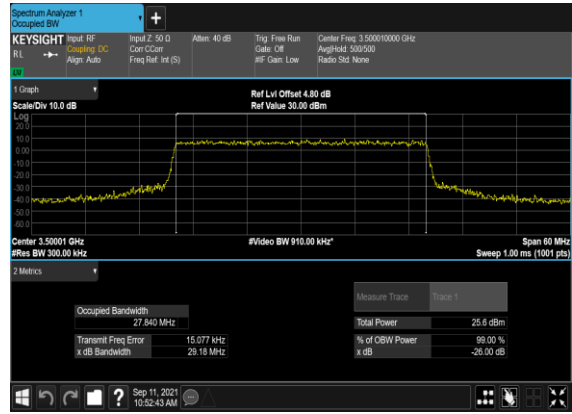
### B41\_N77(30M)\_DFT-s- OFDM\_QPSK\_Outer\_Full\_Mid\_CH



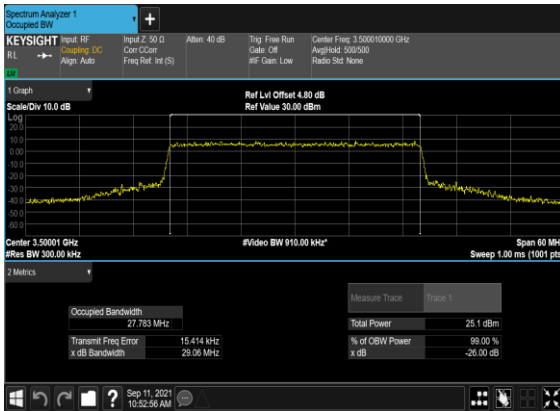
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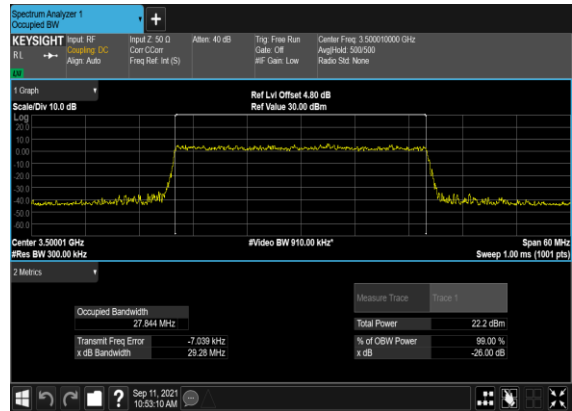
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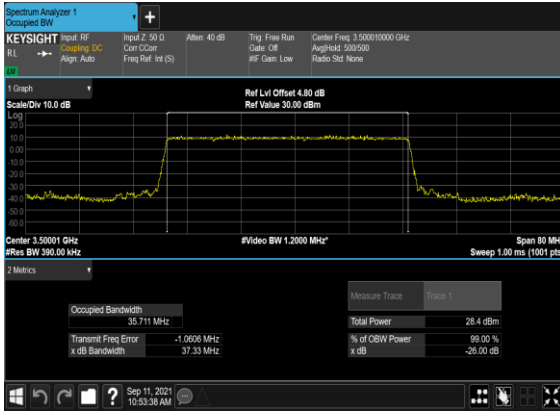
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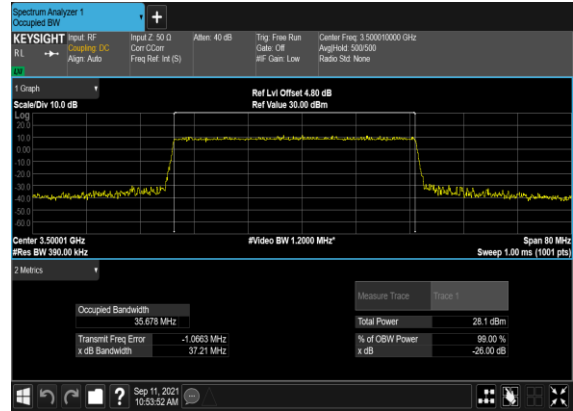
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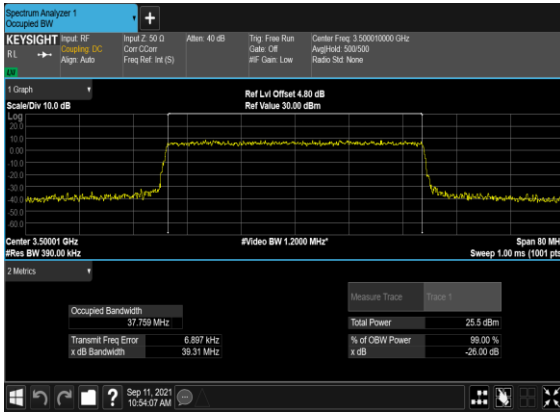
### B41\_N77(40M)\_DFT-s-OFDM\_PI\_2- BPSK\_Outer\_Full\_Mid\_CH



### B41\_N77(40M)\_DFT-s- OFDM\_QPSK\_Outer\_Full\_Mid\_CH



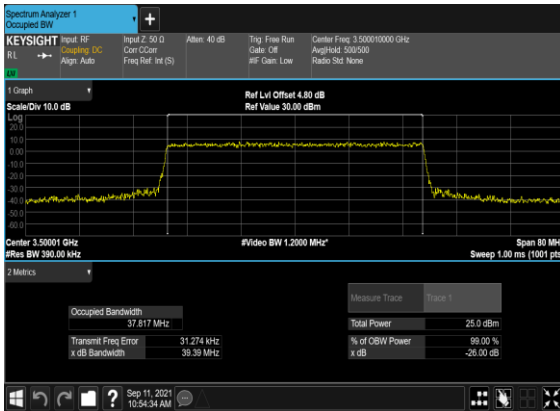
### B41\_N77(40M)\_CP- OFDM\_QPSK\_Outer\_Full\_Mid\_CH



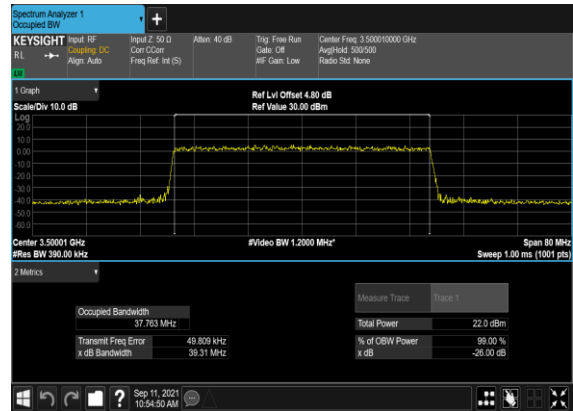
### B41\_N77(40M)\_CP-OFDM\_16 QAM\_Outer\_Full\_Mid\_CH



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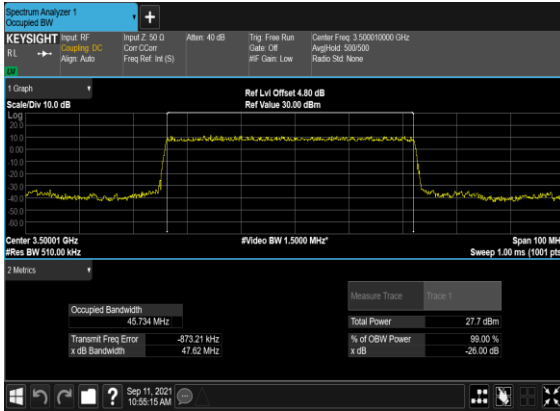


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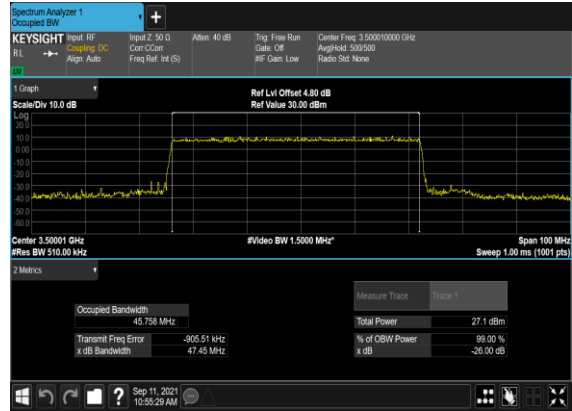




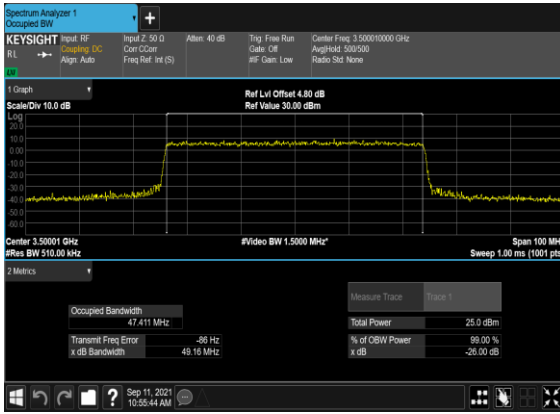
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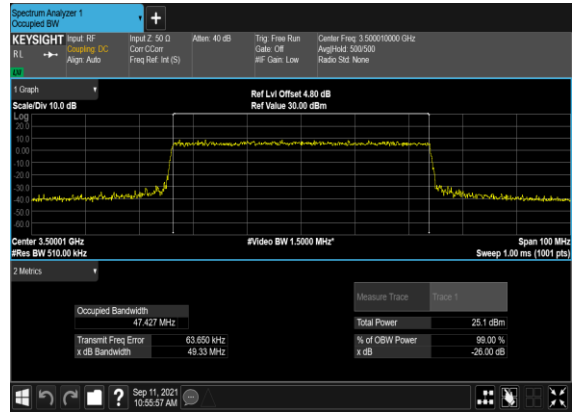
### B41\_N77(50M)\_DFT-s- OFDM\_QPSK\_Outer\_Full\_Mid\_CH



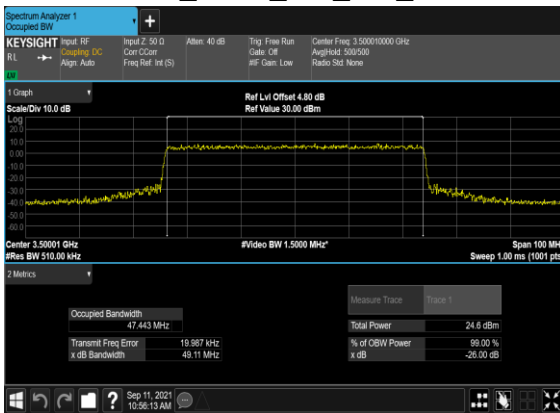
### B41\_N77(50M)\_CP- OFDM\_QPSK\_Outer\_Full\_Mid\_CH



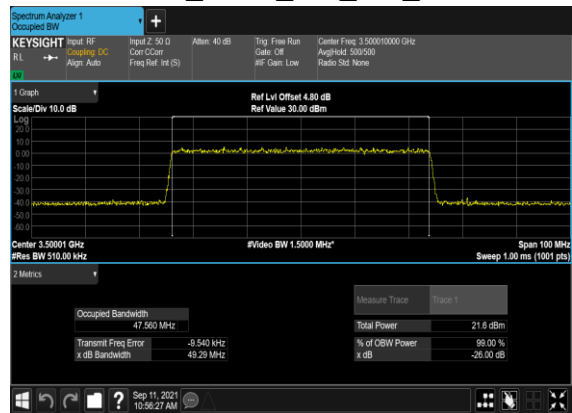
### B41\_N77(50M)\_CP-OFDM\_16 QAM\_Outer\_Full\_Mid\_CH



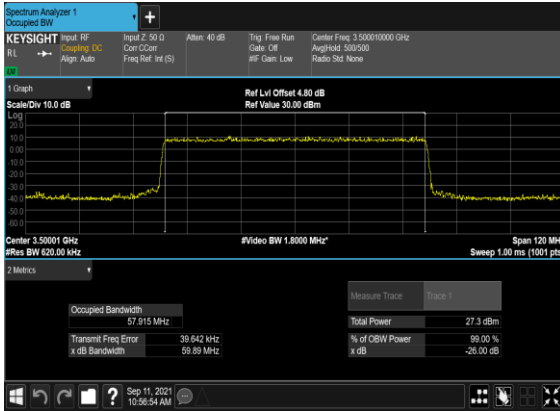
### B41\_N77(50M)\_CP-OFDM\_64 QAM\_Outer\_Full\_Mid\_CH



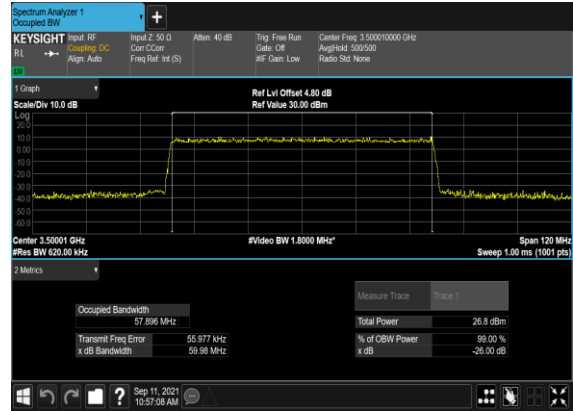
### B41\_N77(50M)\_CP-OFDM\_256 QAM\_Outer\_Full\_Mid\_CH



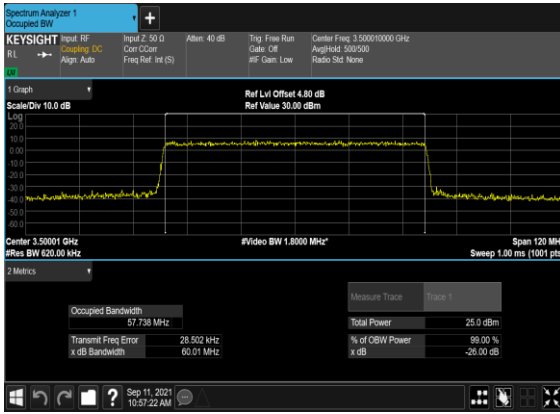
### B41\_N77(60M)\_DFT-s-OFDM\_PI\_2-BPSK\_Outer\_Full\_Mid\_CH



### B41\_N77(60M)\_DFT-s-OFDM\_QPSK\_Outer\_Full\_Mid\_CH



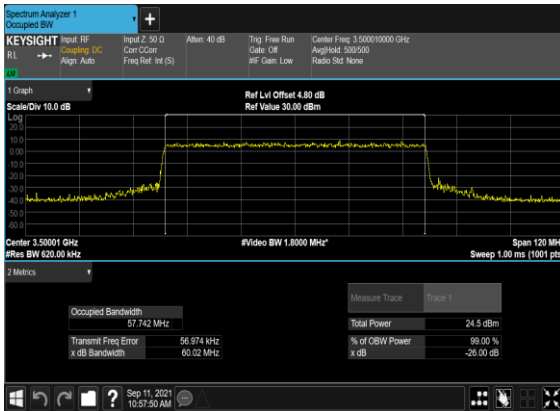
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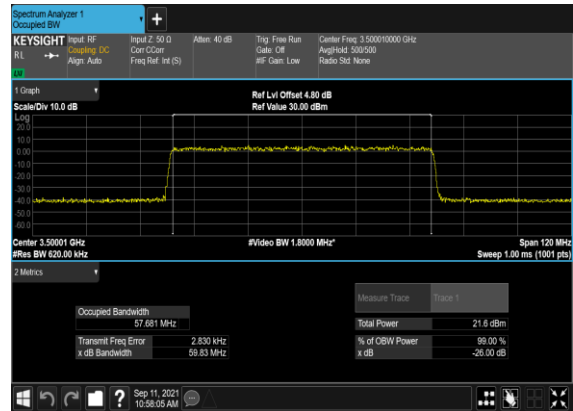
### B41\_N77(60M)\_CP-OFDM\_16QAM\_Outer\_Full\_Mid\_CH



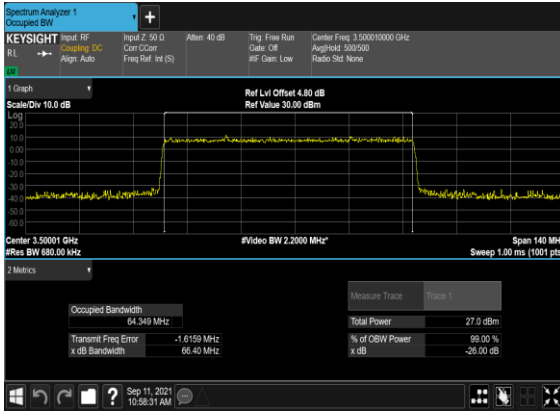
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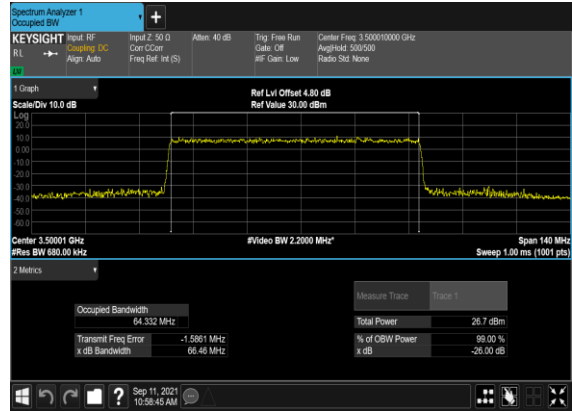
### B41\_N77(60M)\_CP-OFDM\_256QAM\_Outer\_Full\_Mid\_CH



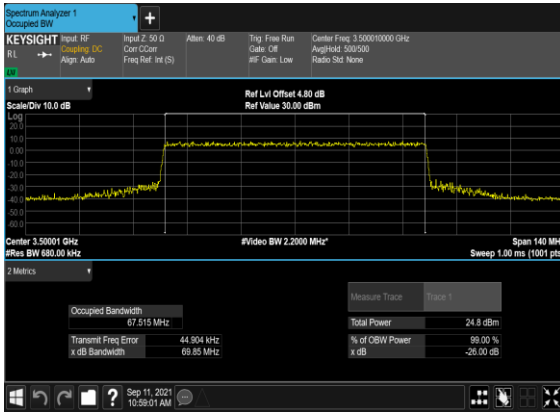
### B41\_N77(70M)\_DFT-s-OFDM\_PI\_2-BPSK\_Outer\_Full\_Mid\_CH



### B41\_N77(70M)\_DFT-s-OFDM\_QPSK\_Outer\_Full\_Mid\_CH



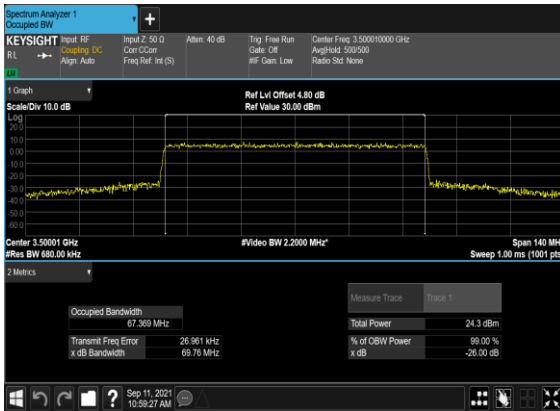
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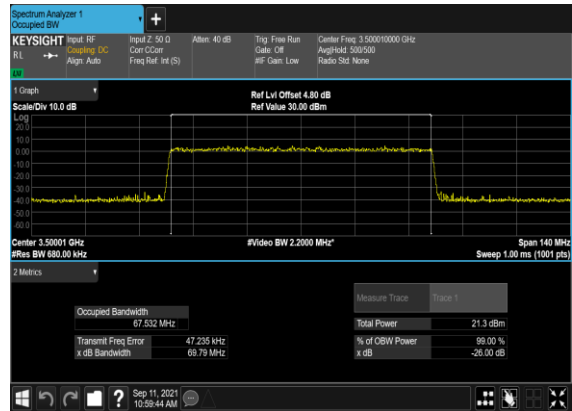
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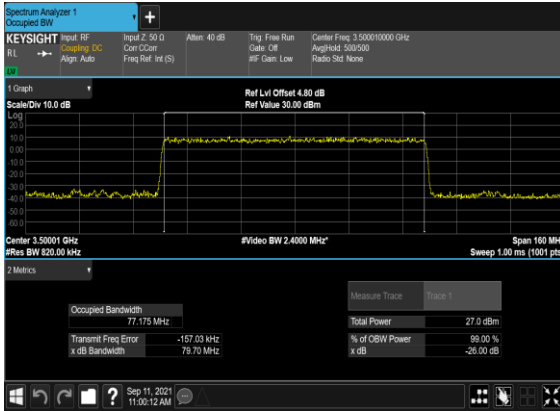
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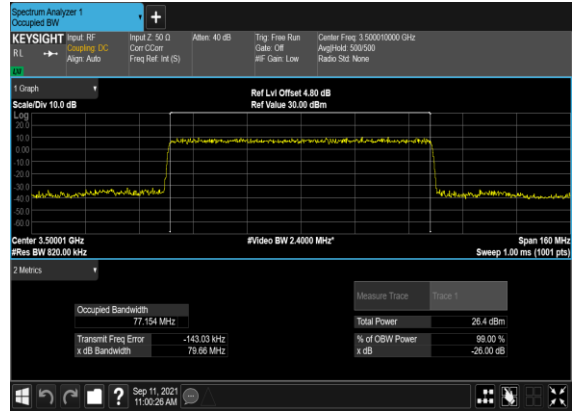
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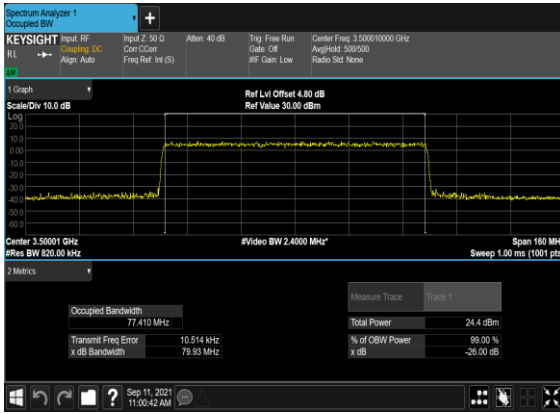
### B41\_N77(80M)\_DFT-s-OFDM\_PI\_2- BPSK\_Outer\_Full\_Mid\_CH



### B41\_N77(80M)\_DFT-s- OFDM\_QPSK\_Outer\_Full\_Mid\_CH



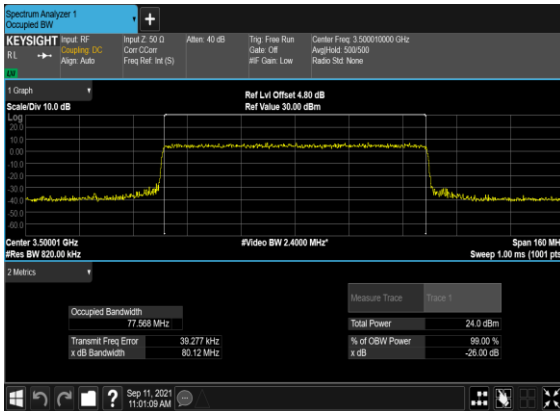
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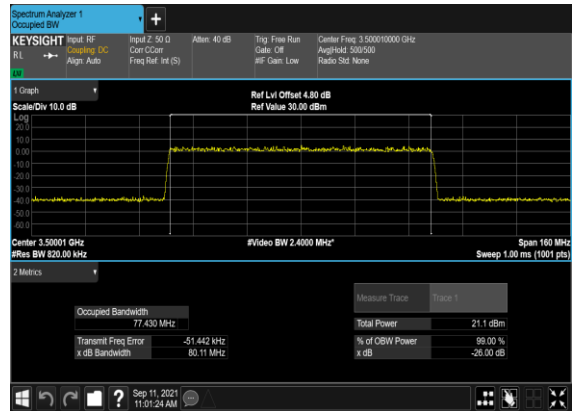
### B41\_N77(80M)\_CP-OFDM\_16 QAM\_Outer\_Full\_Mid\_CH



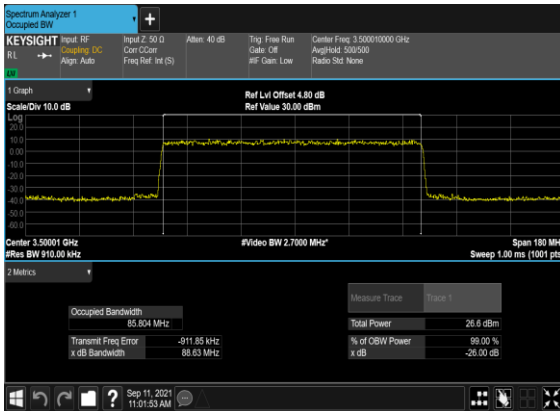
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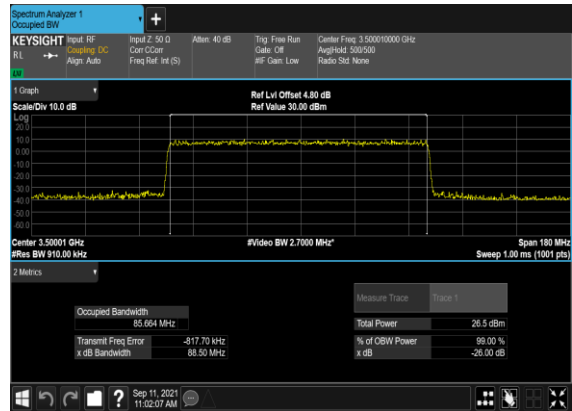
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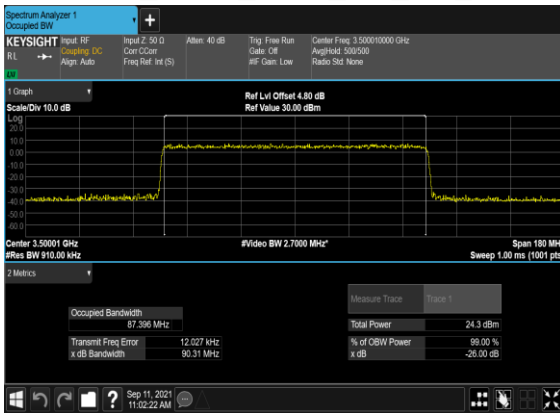
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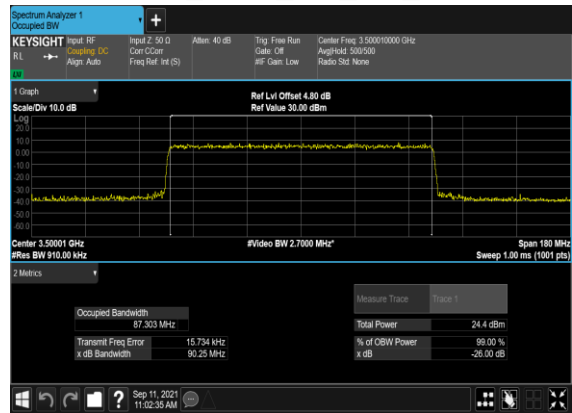
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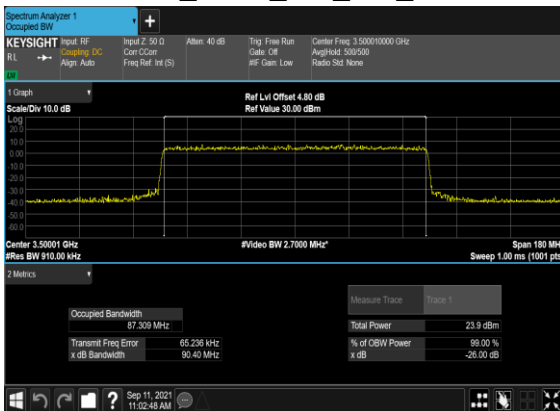
### B41\_N77(90M)\_CP- OFDM\_QPSK\_Outer\_Full\_Mid\_CH



### B41\_N77(90M)\_CP-OFDM\_16 QAM\_Outer\_Full\_Mid\_CH



### B41\_N77(90M)\_CP-OFDM\_64 QAM\_Outer\_Full\_Mid\_CH



### B41\_N77(90M)\_CP-OFDM\_256 QAM\_Outer\_Full\_Mid\_CH

