FCC RF Test Report

APPLICANT	:	**Motorola Mobility LLC**
EQUIPMENT	:	**Mobile Cellular Phone**
BRAND NAME	:	**Motorola**
MODEL NAME	:	**XT2405-1, XT2405V**
FCC ID	:	**IHDT56AN6**
STANDARD	:	**47 CFR Part 2, 27**
CLASSIFICATION	:	**PCS Licensed Transmitter Held to Ear (PCE)**
TEST DATE(S)	:	**Feb. 01, 2024 ~ Feb. 29, 2024**

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

ilac-MRA A2LA ACCREDITED Cert #5145.01

Sporton International Inc. (ShenZhen)

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People's Republic of China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG411619N	Rev. 01	Initial issue of report	Mar. 22, 2024

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	—	Report Only	-
3.5	-	Peak-to-Average Ratio	—	Report Only	
3.6	§27.50 (a)(3)	EIRP	EIRP < 250mW/5MHz	PASS	-
3.7	§2.1049	Occupied Bandwidth	—	Report Only	-
3.8	§2.1051 §27.53 (a)(4)	Conducted Band Edge Measurement	Refer standard	PASS	-
3.9	§2.1051 §27.53 (a)(4)	Conducted Spurious Emission	$< 70+10\log_{10}(P[Watts])$	PASS	-
3.10	§2.1055 §27.54	Frequency Stability Temperature & Voltage	Within the band	PASS	-
4.4	§2.1053 §27.53 (a)(4)	Radiated Spurious Emission	$< 70+10\log_{10}(P[Watts])$	PASS	Under limit 14.90 dB at 6931.200 MHz

Declaration of Conformity:

1. 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	XT2405-1, XT2405V
FCC ID	IHDT56AN6
IMEI Code	Conducted: 353533390038357/353533390038365 Radiation: 353533390042094/353533390042102
HW Version	DVT2
SW Version	U2UAN34.50
EUT Stage	Identical Prototype

Note: The two models XT2405-1, XT2405V is only for market segment purpose, no other difference.

1.4 Product Specification of Equipment Under Test

Product Feature	
Tx Frequency	5G NR n30 : 2305 MHz ~ 2315 MHz
Rx Frequency	5G NR n30 : 2350 MHz ~ 2360 MHz
Bandwidth	5MHz / 10MHz
SCS	15kHz
Antenna Gain	<Ant. 1>: -1.0 dBi <Ant. 9>: -5.5 dBi
Type of Modulation	CP-OFDM: QPSK / 16QAM / 64QAM / 256QAM DFT-s-OFDM: PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM

Note: The maximum EIRP is calculated from max output power and antenna gain, only the maximum EIRP of Ant.1 is shown in the report.

1.5 Modification of EUT

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

1.6 Maximum EIRP Power and Emission Designator

5G NR n30		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)
5	2307.5 ~ 2312.5	0.1432	4M48G7D	0.1300	4M49W7D
10	2310.0	0.1493	9M27G7D	0.1268	9M29W7D

1.7 Testing Site

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 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(D)
- 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.

1.10 Specification of Accessory

Specification of Accessory				
AC Adapter 1(US)	**Brand Name**	Motorola (Chenyang)	**Model Name**	MC-681N
AC Adapter 2(US)	**Brand Name**	Motorola (Acbel)	**Model Name**	MC-681N
Battery	**Brand Name**	Motorola (NVT)	**Model Name**	QC50
USB Cable 1	**Brand Name**	Motorola (Saibao)	**Model Name**	SC18D71644
USB Cable 2	**Brand Name**	Motorola (Saibao)	**Model Name**	SC18D86731
USB Cable 3	**Brand Name**	Motorola (Luxshare)	**Model Name**	SC18E08104
USB Cable 4	**Brand Name**	Motorola (Luxshare)	**Model Name**	SC18E08103
Wireless Earphones	**Brand Name**	Motorola	**Model Name**	XT2441-1

2 Test Configuration of Equipment Under Test

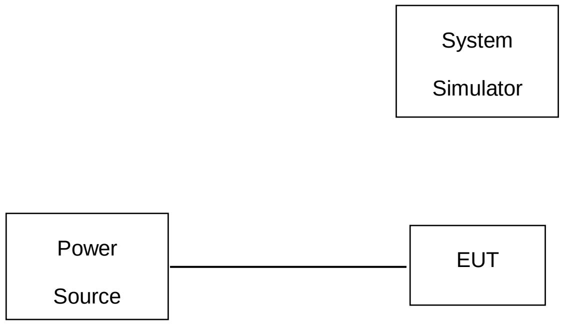
2.1 Test Mode

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.

Conducted Test Cases	Band	Bandwidth (MHz)						Modulation					RB #			Test Channel		
		1.4	3	5	10	15	20	PI/2 BPSK	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
Max. Output Power	n30	-	-	v		-	-	v	v	v	v	v	v		v	v	v	v
		-	-		v	-	-	v	v	v	v	v	v		v		v	
Peak-to-Average Ratio	n30	-	-		v	-	-	v	v				v		v		v	
E.I.R.P	n30	-	-	v		-	-	v	v	v	v	v	v		v	v	v	v
		-	-		v	-	-	v	v	v	v	v	v		v		v	
26dB and 99% Bandwidth	n30	-	-	v		-	-	v	v	v	v	v			v		v	
		-	-		v	-	-	v	v	v	v	v			v		v	
Conducted Band Edge	n30	-	-	v		-	-	v	v				v		v	v		v
		-	-		v	-	-	v	v				v		v		v	
Conducted Spurious Emission	n30	-	-	v		-	-	v	v				v			v	v	v
		-	-		v	-	-	v	v				v				v	
Frequency Stability	n30	-	-		v	-	-		v						v		v	
Radiated Spurious Emission	n30	Worst Case														v	v	v
Note	1. The mark "v " means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported. 4. Frequency Stability : Normal Voltage = 3.91V ; Low Voltage =3.6V. ; High Voltage =4.45V																	

2.2 Connection Diagram of Test System



This example is connection diagram of EUT test configurations.

For detail, please refer to test mode configuration and setup photographs for each test item.

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.	NR Base Station	Anritsu	MT8000A	N/A	N/A	Unshielded, 1.8 m
3.	LTE Base Station	Anritsu	MT8821C	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 and attenuator factor 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 and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 8.60 dB

Example :

Offset(dB) = RF cable loss(dB)

= 8.60(dB)

2.5 Frequency List of Low/Middle/High Channels

5G NR n30 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
10	Channel	-	27710	-
	Frequency	-	2310	-
5	Channel	27685	27710	27735
	Frequency	2307.5	2310	2312.5

3 Conducted Test Items

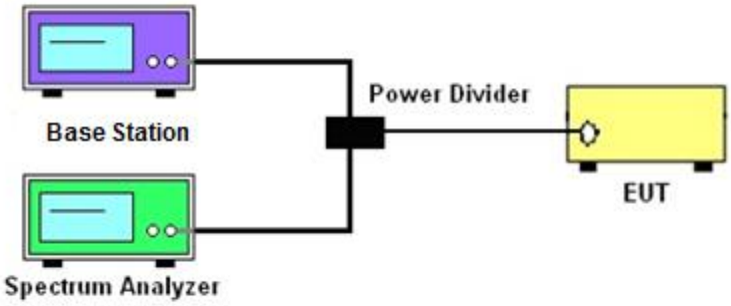
3.1 Measuring Instruments

See list of measuring instruments of this test report.

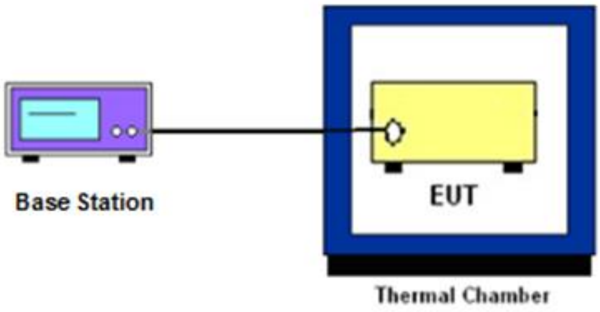
3.2 Test Setup

3.2.1 Conducted Output Power

3.2.2 Peak-to-Average Ratio, Occupied / 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

For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, *except that* for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth. For mobile and portable stations using time division duplexing (TDD) technology, the duty cycle must not exceed 38 percent in the 2305-2315 MHz and 2350-2360 MHz bands. Mobile and portable stations using FDD technology are restricted to transmitting in the 2305-2315 MHz band. Power averaging shall not include intervals in which the transmitter is off.

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 (a)(4)

For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

(i) By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337 MHz;

(ii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300 MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296 MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292 MHz, and 70 + 10 log (P) dB below 2288 MHz;

(iii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

3.8.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured.
4. Set RBW >= 1% EBW 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 and the measured power was integrated over the full required measurement bandwidth of 1 MHz.
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.

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 must be lower than the transmitter power (P) by a factor of at least 70 + 10 log (P) dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 9 kHz up to a frequency including its 10^{th} 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. The limit line is derived from 70 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [70 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [70 + 10log(P)] (dB)
    = -40dBm

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. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

3.10.2 Test Procedures for Temperature Variation

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

3.10.3 Test Procedures for Voltage Variation

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

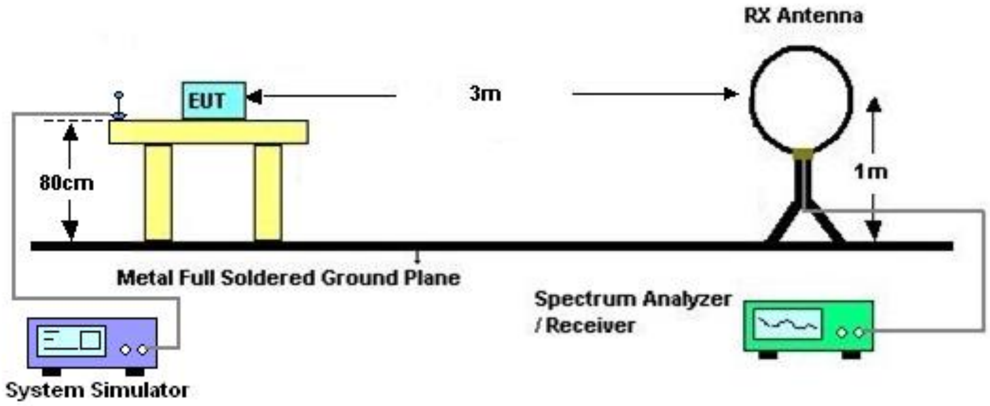
4 Radiated Test Items

4.1 Measuring Instruments

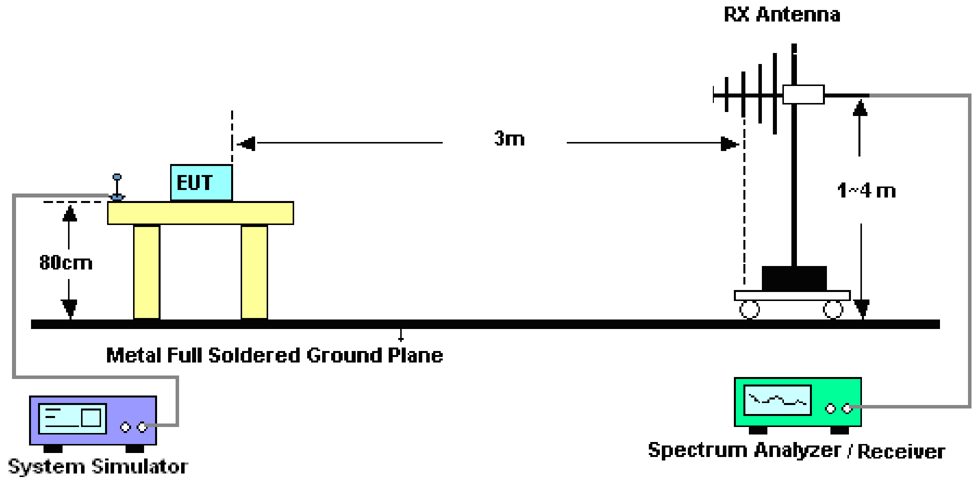
See list of measuring instruments of this test report.

4.2 Test Setup

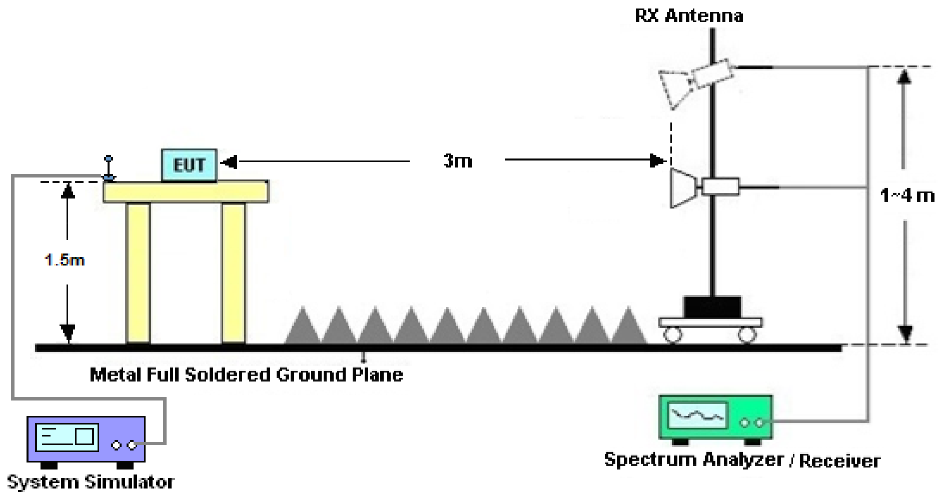
4.2.1 For radiated test below 30MHz



4.2.2 For radiated test from 30MHz to 1GHz



4.2.3 For radiated test above 1GHz



4.3 Test Result of Radiated Test

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

Please refer to Appendix B.

4.4 Radiated Spurious Emission Measurement

4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI/TIA-603-E. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 70 + 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.
   EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
   ERP (dBm) = EIRP - 2.15
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
    The limit line is derived from 70 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [70 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [70 + 10log(P)] (dB)
    = -40dBm.

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	Feb. 01, 2024 ~Feb. 29, 2024	Apr. 05, 2024	Conducted (TH01-SZ)
DC Power Supply	TTI	PL330P	290070	Max 32V，3A	Oct. 16, 2023	Feb. 01, 2024 ~Feb. 29, 2024	Oct. 15, 2024	Conducted (TH01-SZ)
Power Divider	TOJOIN	PS-2SM-04 265	60.06.020.007 7	0.4GHz~26.5GHz	Dec. 25, 2023	Feb. 01, 2024 ~Feb. 29, 2024	Dec. 24, 2024	Conducted (TH01-SZ)
Thermal Chamber	Ten Billion Hongzhangroup	LP-150U	H2014081803	-40~+150°C	Jul. 05, 2023	Feb. 01, 2024 ~Feb. 29, 2024	Jul. 04, 2024	Conducted (TH01-SZ)
EMI Test Receiver&SA	KEYSIGHT	N9038A	MY54450083	20Hz~8.4GHz	Apr. 04, 2023	Feb. 26, 2024	Apr. 03, 2024	Radiation (03CH03-SZ)
EXA Spectrum Anaiyzer	KEYSIGHT	N9010A	MY55150246	10Hz~44GHz;	Apr. 04, 2023	Feb. 26, 2024	Apr. 03, 2024	Radiation (03CH03-SZ
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	Jun. 28, 2022	Feb. 26, 2024	Jun. 27, 2024	Radiation (03CH03-SZ)
Bilog Antenna	TeseQ	CBL6112D	35408	30MHz-2GHz	Aug. 20, 2023	Feb. 26, 2024	Aug. 19, 2025	Radiation (03CH03-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1355	1GHz~18GHz	Apr. 08, 2023	Feb. 26, 2024	Apr. 07, 2024	Radiation (03CH03-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz-40GHz	Apr. 08, 2023	Feb. 26, 2024	Apr. 07, 2024	Radiation (03CH03-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz ~3000MHz	Oct. 18, 2023	Feb. 26, 2024	Oct. 17, 2024	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	TTA1840-35 -HG	1871923	18GHz~40GHz	Jul. 07, 2023	Feb. 26, 2024	Jul.06, 2024	Radiation (03CH03-SZ)
Amplifier	Agilent Technologies	83017A	MY39501302	500MHz~26.5GHz	Dec. 27, 2023	Feb. 26, 2024	Dec. 26, 2024	Radiation (03CH03-SZ)
AC Power Source	Chroma	61601	616010002729	N/A	Oct. 18, 2023	Feb. 26, 2024	Oct. 17, 2024	Radiation (03CH03-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Feb. 26, 2024	NCR	Radiation (03CH03-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Feb. 26, 2024	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 (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.0dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.9dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.0dB

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

Appendix A. Test Results of Conducted Test

Test Engineer :	Khan Zhen	**Temperature :**	22~23℃
		Relative Humidity :	40~42%

Software Version: 23.06.1602

FR1 N30_ANT 1

Transmitter Conducted Output Power And EIRP, (G_T - L_C)=-1dB

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Conducted Power(dBm)	EIRP (dBm)	EIRP (W)
30	15	5	461500	2307.5	DFT-s-OFDM QPSK	1@1	22.45	21.45	0.1396
30	15	5	461500	2307.5	DFT-s-OFDM 16 QAM	1@1	22.14	21.14	0.1300
30	15	5	462000	2310	DFT-s-OFDM QPSK	1@1	22.38	21.38	0.1374
30	15	5	462000	2310	DFT-s-OFDM 16 QAM	1@1	22.12	21.12	0.1294
30	15	5	462500	2312.5	DFT-s-OFDM QPSK	1@1	22.56	21.56	0.1432
30	15	5	462500	2312.5	DFT-s-OFDM 16 QAM	1@1	22.14	21.14	0.1300
30	15	10	462000	2310	DFT-s-OFDM PI/2 BPSK	25@12	22.48	21.48	0.1406
30	15	10	462000	2310	DFT-s-OFDM PI/2 BPSK	1@1	22.46	21.46	0.1400
30	15	10	462000	2310	DFT-s-OFDM PI/2 BPSK	1@50	22.32	21.32	0.1355
30	15	10	462000	2310	DFT-s-OFDM QPSK	25@12	22.49	21.49	0.1409
30	15	10	462000	2310	DFT-s-OFDM QPSK	1@1	22.74	21.74	0.1493
30	15	10	462000	2310	DFT-s-OFDM QPSK	1@50	22.54	21.54	0.1426
30	15	10	462000	2310	DFT-s-OFDM 16 QAM	25@12	22.01	21.01	0.1262
30	15	10	462000	2310	DFT-s-OFDM 16 QAM	1@1	22.03	21.03	0.1268
30	15	10	462000	2310	DFT-s-OFDM 16 QAM	1@50	21.81	20.81	0.1205
30	15	10	462000	2310	DFT-s-OFDM 64 QAM	25@12	20.72	19.72	0.0938
30	15	10	462000	2310	DFT-s-OFDM 64 QAM	1@1	20.82	19.82	0.0959
30	15	10	462000	2310	DFT-s-OFDM 64 QAM	1@50	20.58	19.58	0.0908
30	15	10	462000	2310	DFT-s-OFDM 256 QAM	25@12	18.22	17.22	0.0527
30	15	10	462000	2310	DFT-s-OFDM 256 QAM	1@1	18.28	17.28	0.0535
30	15	10	462000	2310	DFT-s-OFDM 256 QAM	1@50	18.21	17.21	0.0526
30	15	10	462000	2310	CP-OFDM QPSK	26@13	21.48	20.48	0.1117
30	15	10	462000	2310	CP-OFDM QPSK	1@1	21.59	20.59	0.1146
30	15	10	462000	2310	CP-OFDM QPSK	1@50	21.12	20.12	0.1028

Frequency Stability

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Deviation (ppm)	Verdict	Environment
30	15	10	462000	2310.0	DFT-s-OFDM QPSK	50@0	0.0030	**PASS**	NV
30	15	10	462000	2310.0	DFT-s-OFDM QPSK	50@0	0.0067	**PASS**	LV
30	15	10	462000	2310.0	DFT-s-OFDM QPSK	50@0	0.0022	**PASS**	HV
30	15	10	462000	2310.0	DFT-s-OFDM QPSK	50@0	0.0037	**PASS**	-30℃
30	15	10	462000	2310.0	DFT-s-OFDM QPSK	50@0	0.0051	**PASS**	-20℃
30	15	10	462000	2310.0	DFT-s-OFDM QPSK	50@0	0.0068	**PASS**	-10℃
30	15	10	462000	2310.0	DFT-s-OFDM QPSK	50@0	0.0043	**PASS**	0℃
30	15	10	462000	2310.0	DFT-s-OFDM QPSK	50@0	0.0061	**PASS**	10℃
30	15	10	462000	2310.0	DFT-s-OFDM QPSK	50@0	0.0030	**PASS**	20℃
30	15	10	462000	2310.0	DFT-s-OFDM QPSK	50@0	0.0042	**PASS**	30℃
30	15	10	462000	2310.0	DFT-s-OFDM QPSK	50@0	0.0021	**PASS**	40℃
30	15	10	462000	2310.0	DFT-s-OFDM QPSK	50@0	0.0023	**PASS**	50℃

Peak to Average Ratio

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Result (dB)	Limit (dB)	Verdict
30	15	10	462000	2310.0	DFT-s-OFDM PI/2 BPSK	50@0	4.01	13	**PASS**
30	15	10	462000	2310.0	DFT-s-OFDM QPSK	50@0	5.36	13	**PASS**

N30(10M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_Low_CH

N30(10M)_DFT-s-OFDM_QPSK_Outer_Full_Low_CH

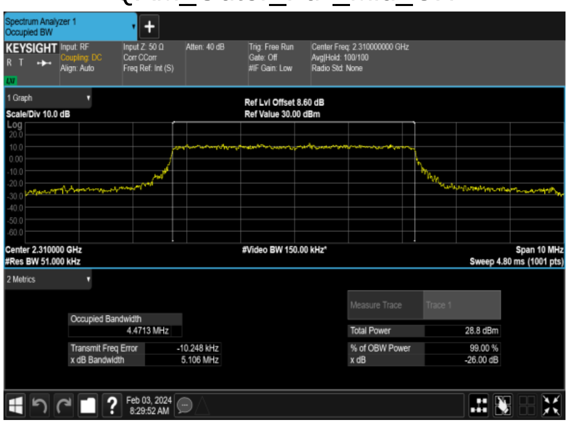
Occupied Bandwidth

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	OBW (MHz)	26dB BW (MHz)
30	15	5	462000	2310.0	CP-OFDM QPSK	25@0	4.478	5.035
30	15	5	462000	2310.0	CP-OFDM 16 QAM	25@0	4.4907	5.18
30	15	5	462000	2310.0	CP-OFDM 64 QAM	25@0	4.4713	5.106
30	15	5	462000	2310.0	CP-OFDM 256 QAM	25@0	4.4803	4.956
30	15	10	462000	2310.0	CP-OFDM QPSK	52@0	9.271	10.12
30	15	10	462000	2310.0	CP-OFDM 16 QAM	52@0	9.2939	9.989
30	15	10	462000	2310.0	CP-OFDM 64 QAM	52@0	9.277	9.989
30	15	10	462000	2310.0	CP-OFDM 256 QAM	52@0	9.2946	10.05

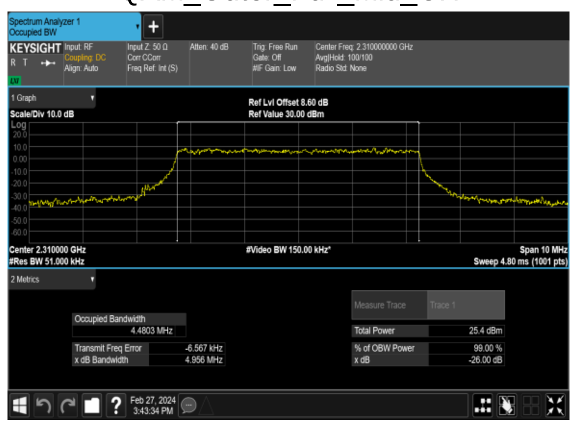
N30(5M)_CP-OFDM_QPSK_Outer_Full_Mid_CH

N30(5M)_CP-OFDM_16 QAM_Outer_Full_Mid_CH

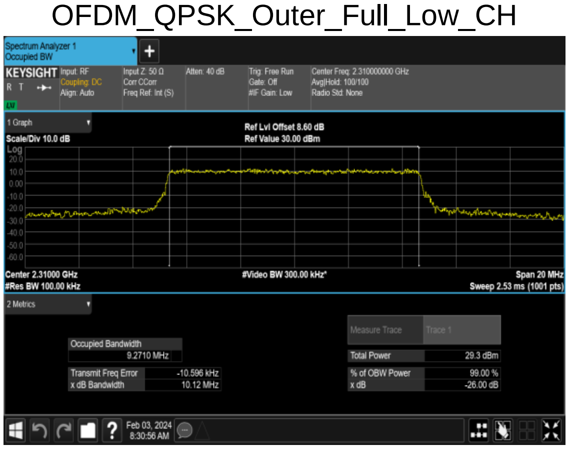
N30(5M)_CP-OFDM_64 QAM_Outer_Full_Mid_CH



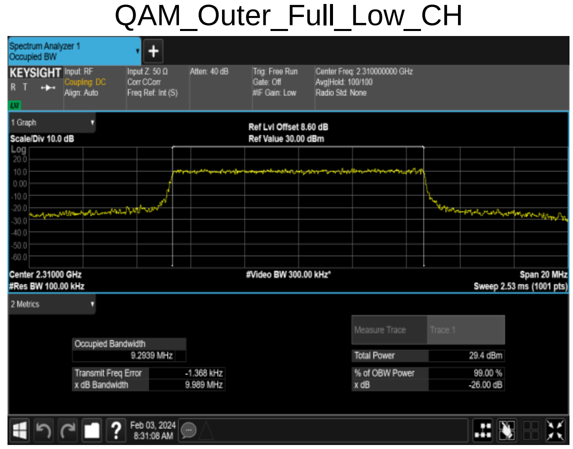
N30(5M)_CP-OFDM_256 QAM_Outer_Full_Mid_CH



N30(10M)_CP-OFDM_QPSK_Outer_Full_Low_CH



N30(10M)_CP-OFDM_16 QAM_Outer_Full_Low_CH



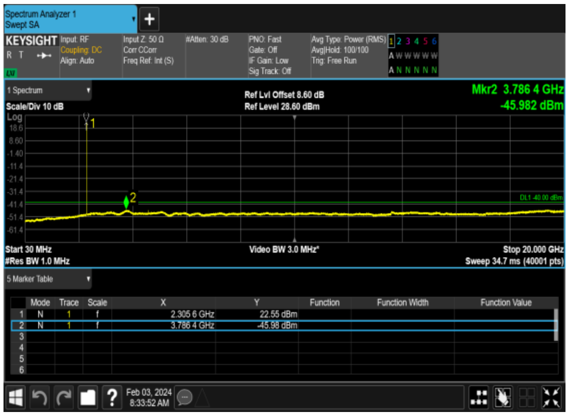
N30(10M)_CP-OFDM_64 QAM_Outer_Full_Low_CH

N30(10M)_CP-OFDM_256 QAM_Outer_Full_Low_CH

Conducted Spurious Emissions

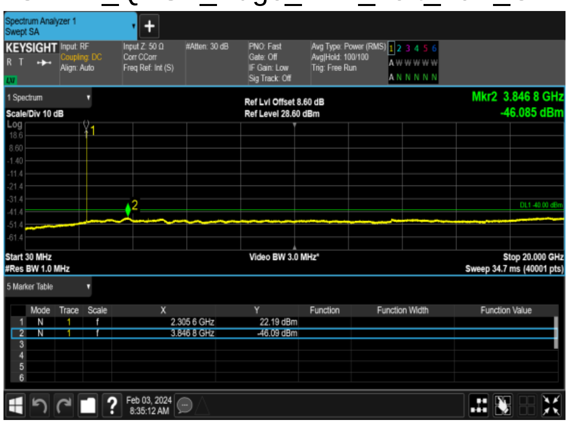
NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Result	Verdict
30	15	5	461500	2307.5	DFT-s-OFDM BPSK	1@0	see graph	**---**
30	15	5	461500	2307.5	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
30	15	5	461500	2307.5	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
30	15	5	461500	2307.5	DFT-s-OFDM QPSK	1@0	see graph	**---**
30	15	5	461500	2307.5	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
30	15	5	461500	2307.5	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
30	15	5	462000	2310.0	DFT-s-OFDM BPSK	1@0	see graph	**---**
30	15	5	462000	2310.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
30	15	5	462000	2310.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
30	15	5	462000	2310.0	DFT-s-OFDM QPSK	1@0	see graph	**---**
30	15	5	462000	2310.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
30	15	5	462000	2310.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
30	15	5	462500	2312.5	DFT-s-OFDM BPSK	1@0	see graph	**---**
30	15	5	462500	2312.5	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
30	15	5	462500	2312.5	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
30	15	5	462500	2312.5	DFT-s-OFDM QPSK	1@0	see graph	**---**
30	15	5	462500	2312.5	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
30	15	5	462500	2312.5	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
30	15	10	462000	2310.0	DFT-s-OFDM BPSK	1@0	see graph	**---**
30	15	10	462000	2310.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
30	15	10	462000	2310.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
30	15	10	462000	2310.0	DFT-s-OFDM QPSK	1@0	see graph	**---**
30	15	10	462000	2310.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
30	15	10	462000	2310.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**

N30(5M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Low_CH

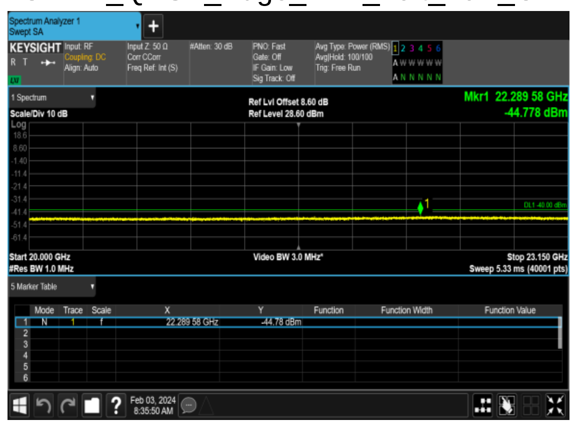


N30(5M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Low_CH

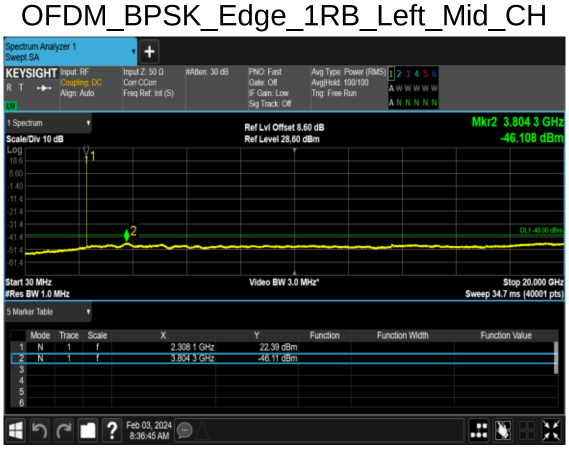
N30(5M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low_CH



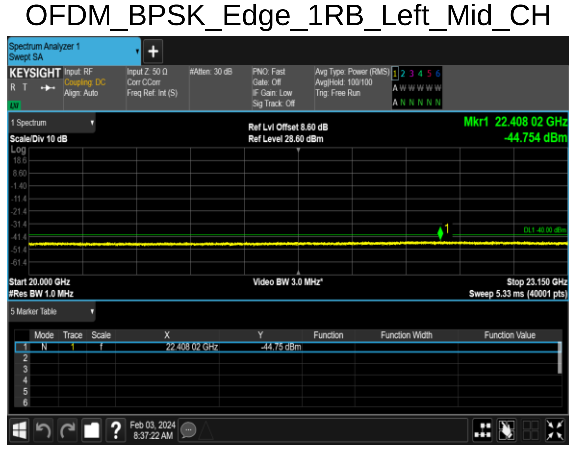
N30(5M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low_CH



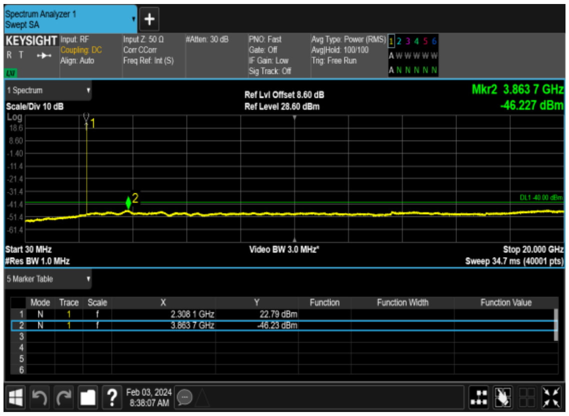
N30(5M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH



N30(5M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH

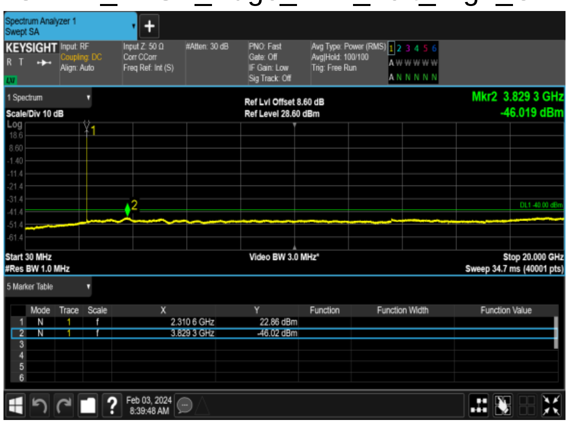


N30(5M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Mid_CH

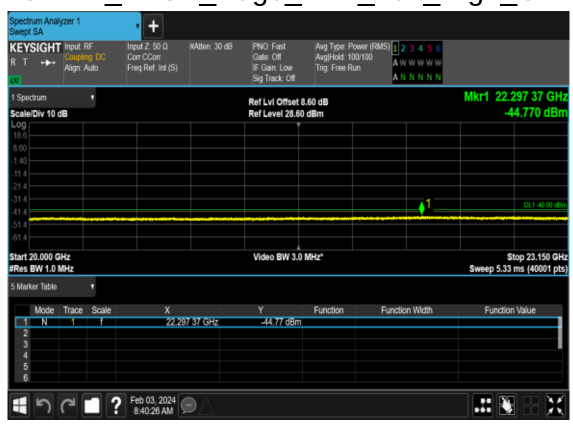


N30(5M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Mid_CH

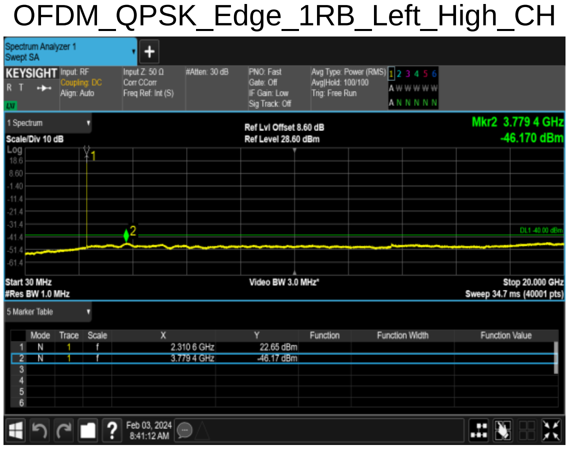
N30(5M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_High_CH



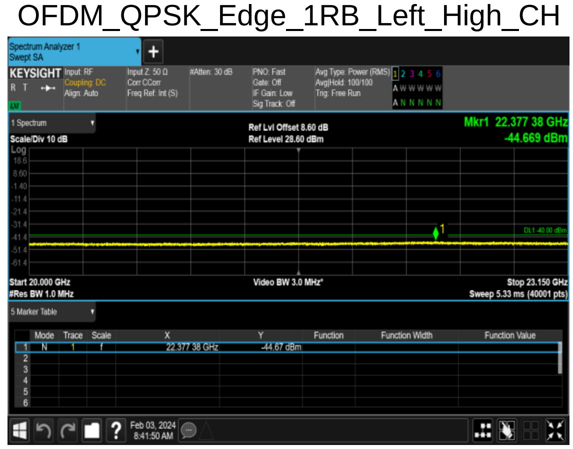
N30(5M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_High_CH



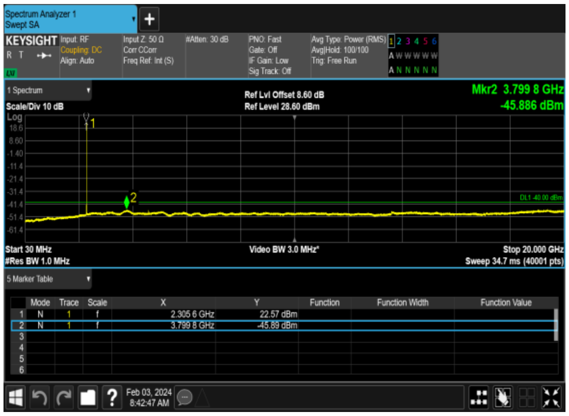
N30(5M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_High_CH



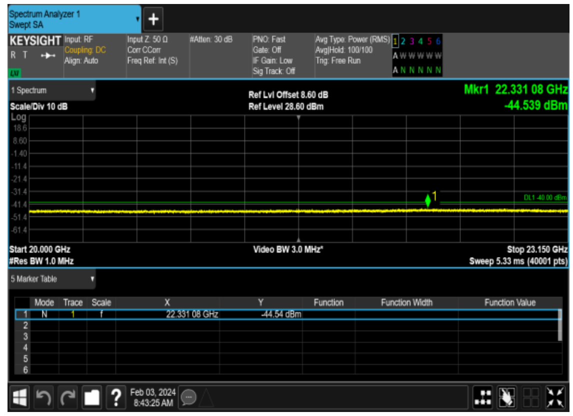
N30(5M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_High_CH



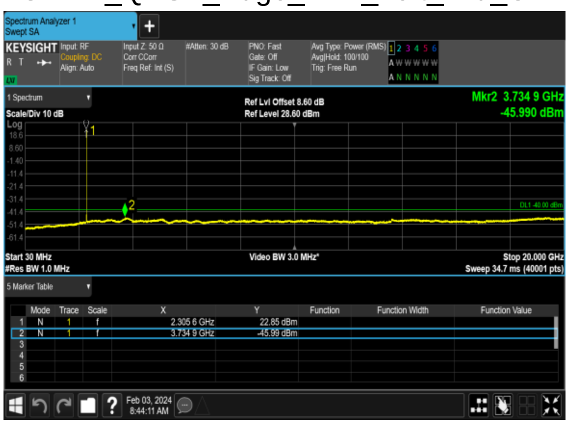
N30(10M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH



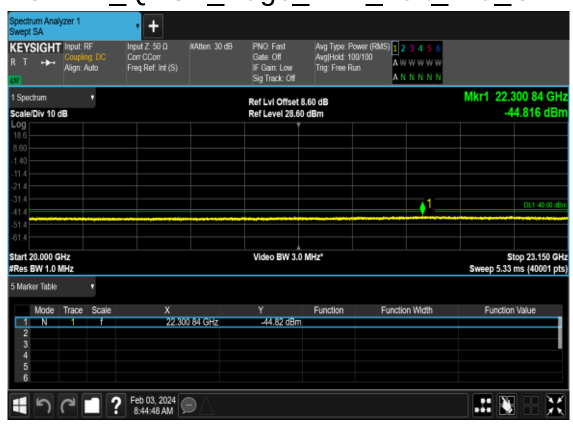
N30(10M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH



N30(10M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Mid_CH



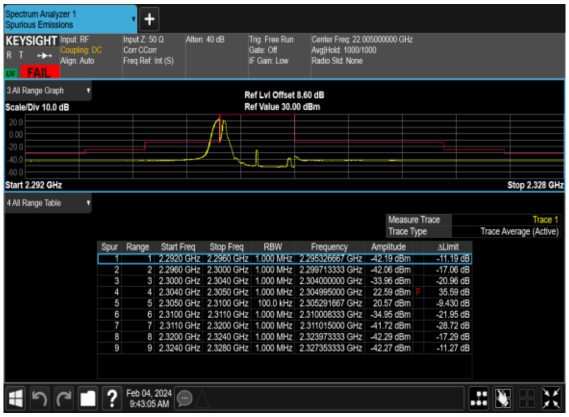
N30(10M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Mid_CH



Conducted Band Edge

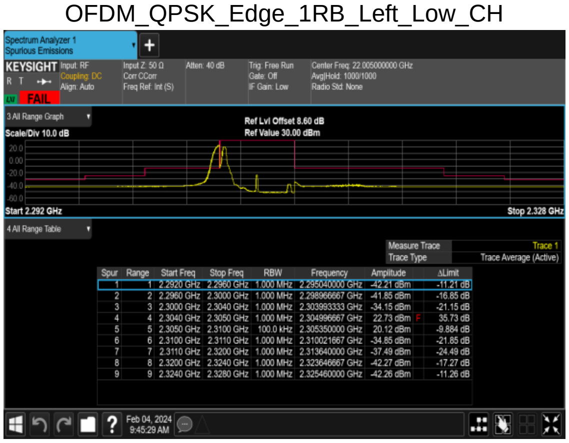
NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Result	Verdict
30	15	5	461500	2307.5	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
30	15	5	461500	2307.5	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
30	15	5	461500	2307.5	DFT-s-OFDM BPSK	25@0	see graph	**PASS**
30	15	5	461500	2307.5	DFT-s-OFDM QPSK	25@0	see graph	**PASS**
30	15	5	462500	2312.5	DFT-s-OFDM BPSK	1@24	see graph	**PASS**
30	15	5	462500	2312.5	DFT-s-OFDM QPSK	1@24	see graph	**PASS**
30	15	5	462500	2312.5	DFT-s-OFDM BPSK	25@0	see graph	**PASS**
30	15	5	462500	2312.5	DFT-s-OFDM QPSK	25@0	see graph	**PASS**
30	15	10	462000	2310.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
30	15	10	462000	2310.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
30	15	10	462000	2310.0	DFT-s-OFDM BPSK	1@51	see graph	**PASS**
30	15	10	462000	2310.0	DFT-s-OFDM QPSK	1@51	see graph	**PASS**
30	15	10	462000	2310.0	DFT-s-OFDM BPSK	50@0	see graph	**PASS**
30	15	10	462000	2310.0	DFT-s-OFDM QPSK	50@0	see graph	**PASS**

N30(5M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Low_CH

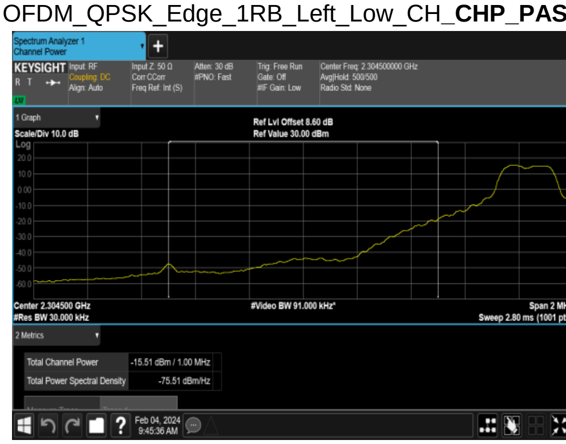


N30(5M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Low_CH_**CHP_PASS**

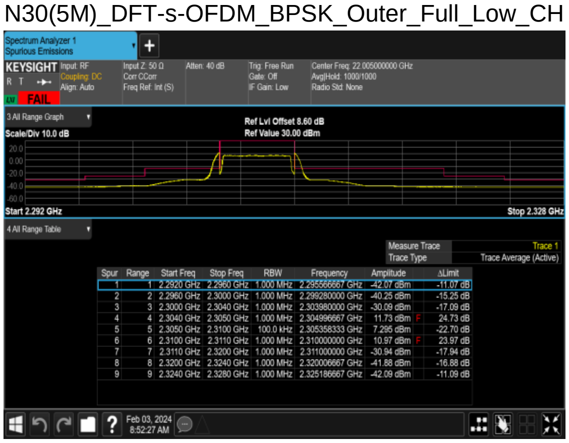
N30(5M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low_CH



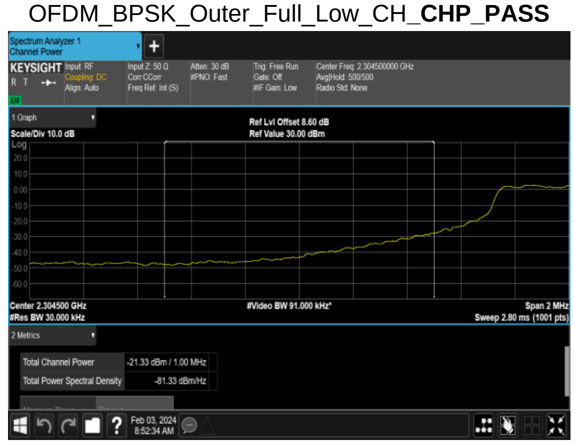
N30(5M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Low_CH_**CHP_PASS**



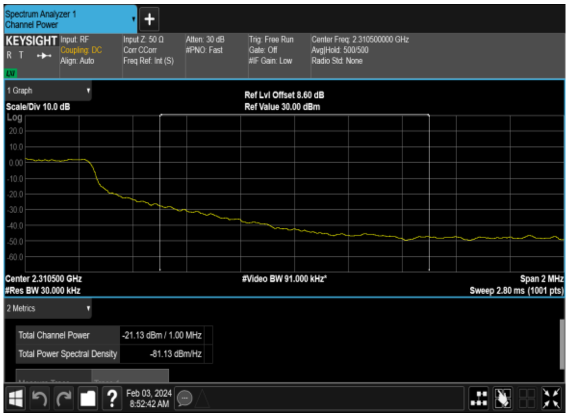
N30(5M)_DFT-s-OFDM_BPSK_Outer_Full_Low_CH



N30(5M)_DFT-s-OFDM_BPSK_Outer_Full_Low_CH_**CHP_PASS**

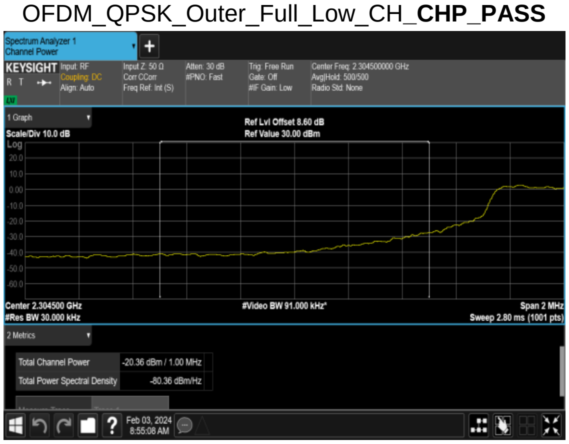


N30(5M)_DFT-s-OFDM_BPSK_Outer_Full_Low_CH_**CHP_PASS**

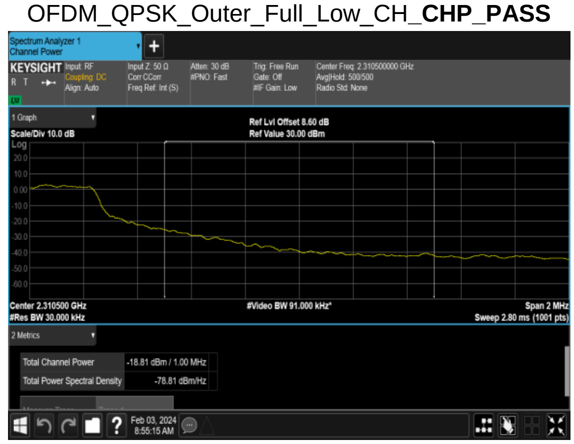


N30(5M)_DFT-s-OFDM_QPSK_Outer_Full_Low_CH

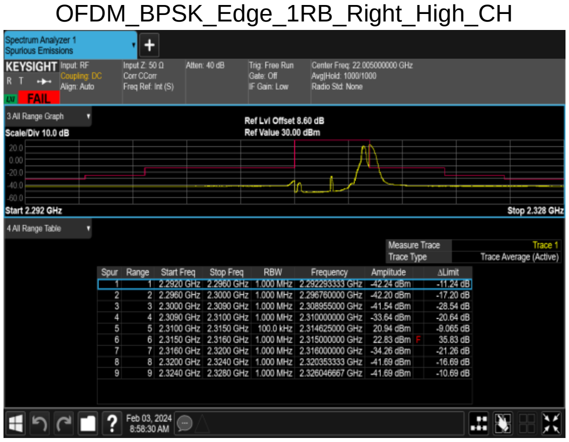
N30(5M)_DFT-s-OFDM_QPSK_Outer_Full_Low_CH_**CHP_PASS**



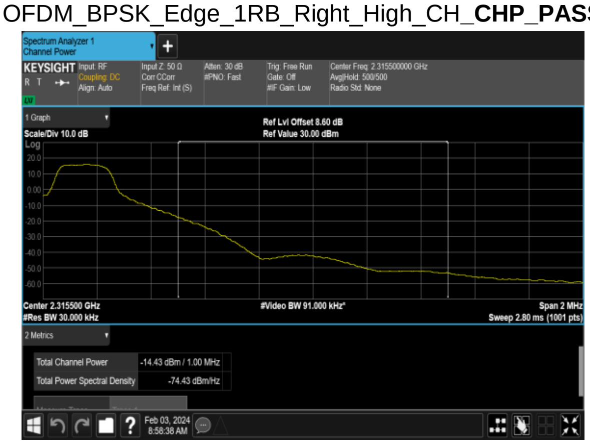
N30(5M)_DFT-s-OFDM_QPSK_Outer_Full_Low_CH_**CHP_PASS**



N30(5M)_DFT-s-OFDM_BPSK_Edge_1RB_Right_High_CH

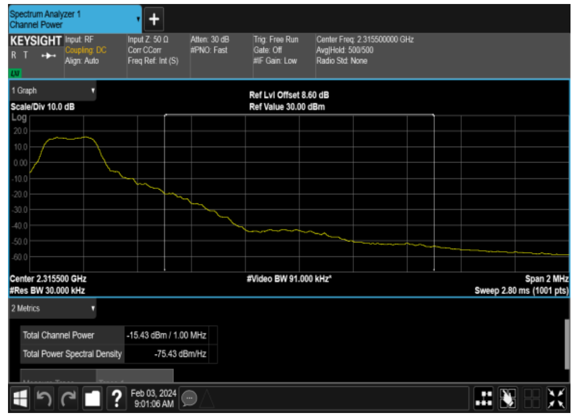


N30(5M)_DFT-s-OFDM_BPSK_Edge_1RB_Right_High_CH_**CHP_PASS**

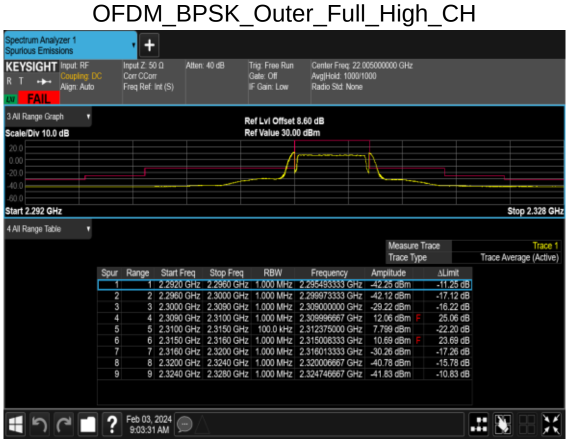


N30(5M)_DFT-s-OFDM_QPSK_Edge_1RB_Right_High_CH

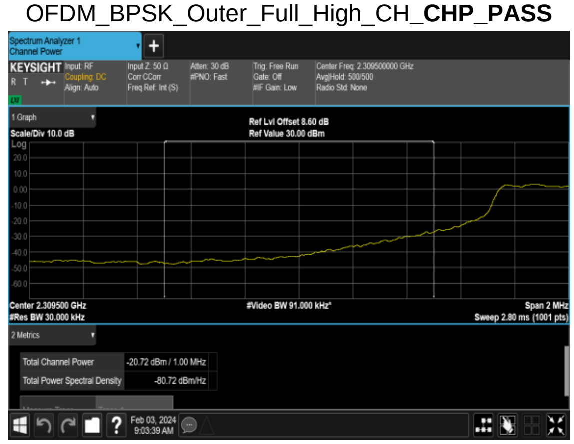
N30(5M)_DFT-s-OFDM_QPSK_Edge_1RB_Right_High_CH_**CHP_PASS**



N30(5M)_DFT-s-OFDM_BPSK_Outer_Full_High_CH



N30(5M)_DFT-s-OFDM_BPSK_Outer_Full_High_CH_**CHP_PASS**



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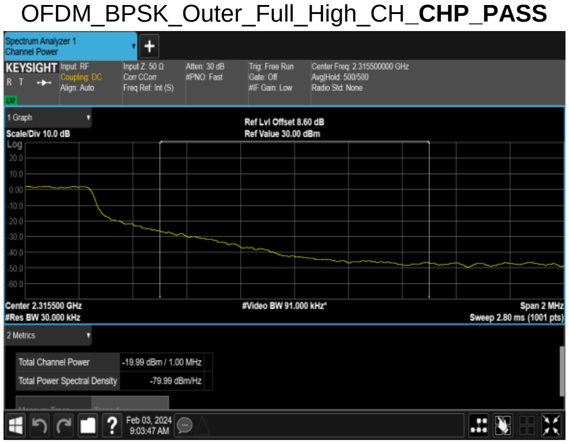
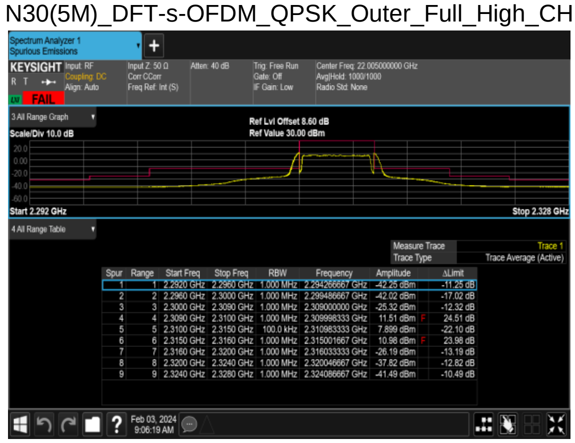
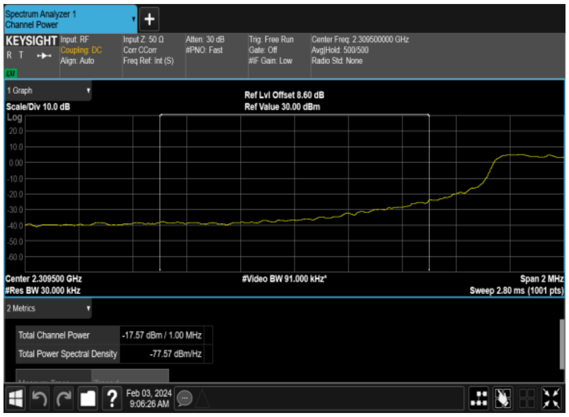


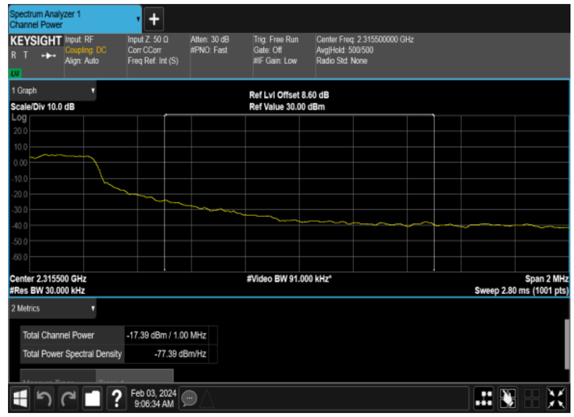
N30(5M)_DFT-s-OFDM_QPSK_Outer_Full_High_CH



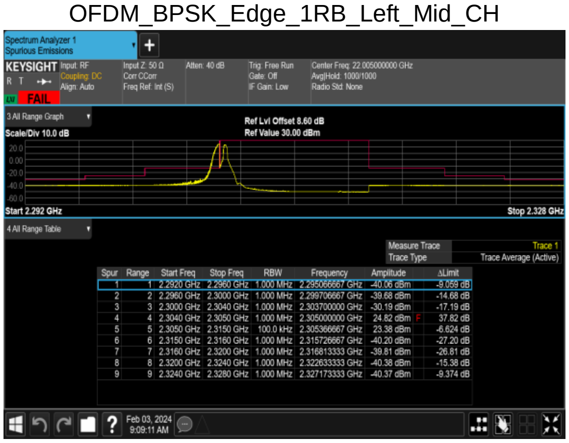
N30(5M)_DFT-s-OFDM_QPSK_Outer_Full_High_CH_**CHP_PASS**



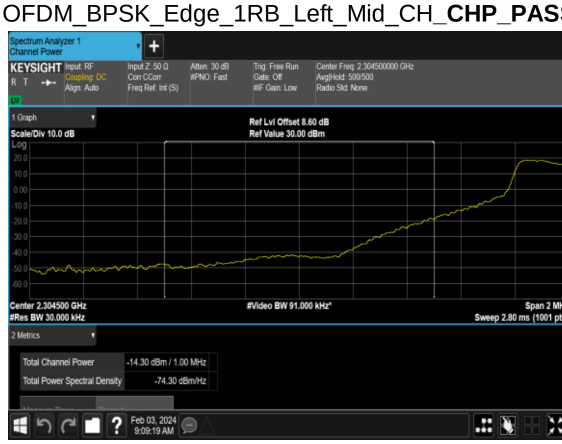
N30(5M)_DFT-s-OFDM_QPSK_Outer_Full_High_CH_**CHP_PASS**



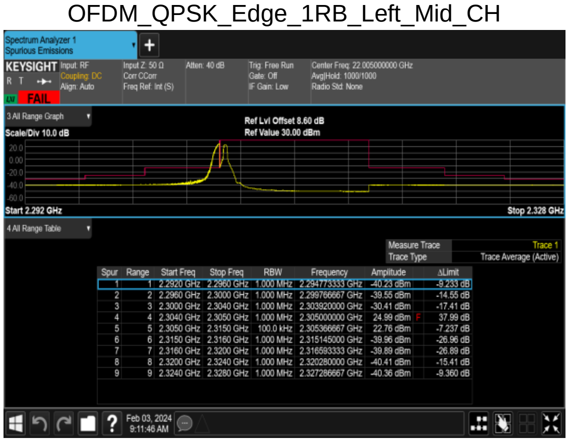
N30(10M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH



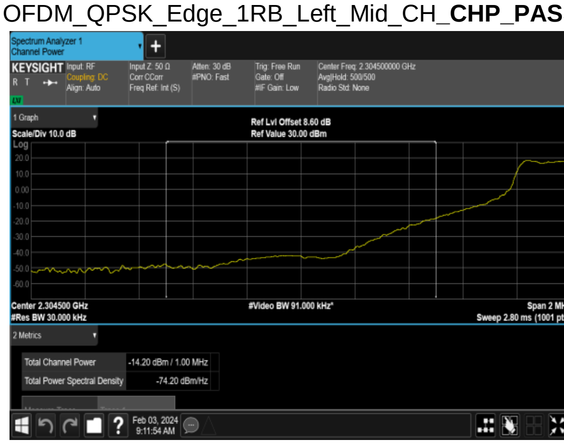
N30(10M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_Mid_CH_**CHP_PASS**



N30(10M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Mid_CH

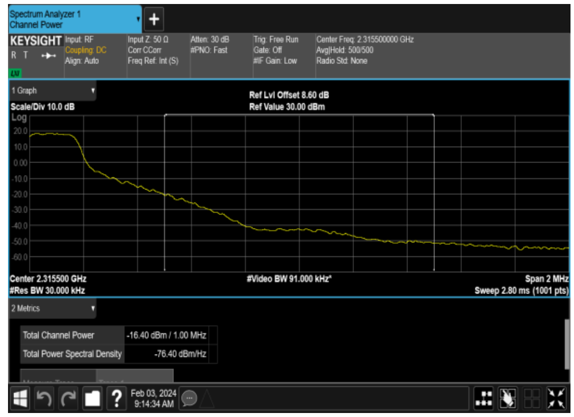


N30(10M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_Mid_CH_**CHP_PASS**

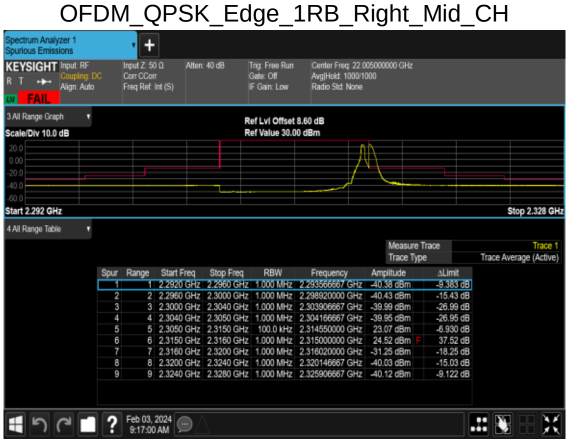


N30(10M)_DFT-s-OFDM_BPSK_Edge_1RB_Right_Mid_CH

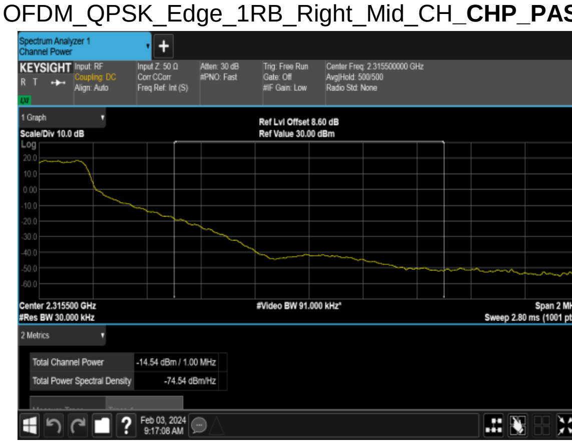
N30(10M)_DFT-s-OFDM_BPSK_Edge_1RB_Right_Mid_CH_**CHP_PASS**



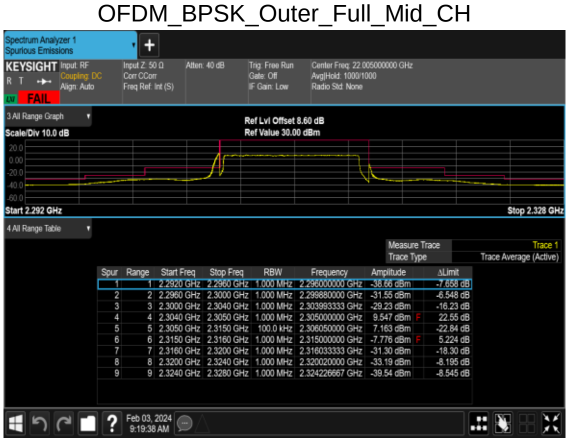
N30(10M)_DFT-s-OFDM_QPSK_Edge_1RB_Right_Mid_CH



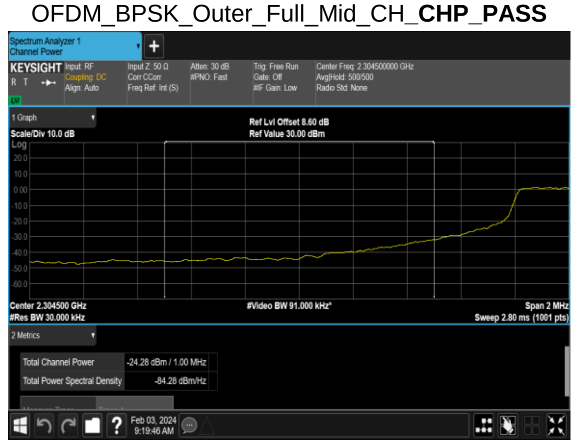
N30(10M)_DFT-s-OFDM_QPSK_Edge_1RB_Right_Mid_CH_**CHP_PASS**



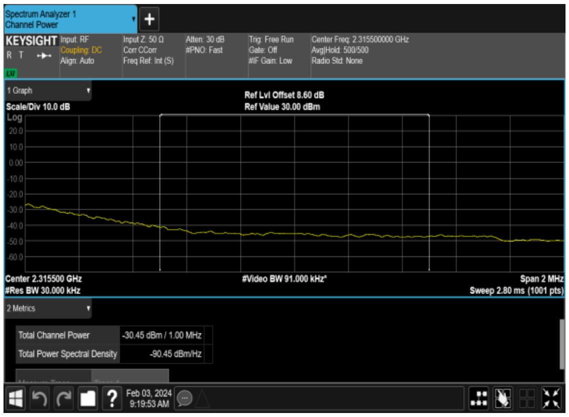
N30(10M)_DFT-s-OFDM_BPSK_Outer_Full_Mid_CH



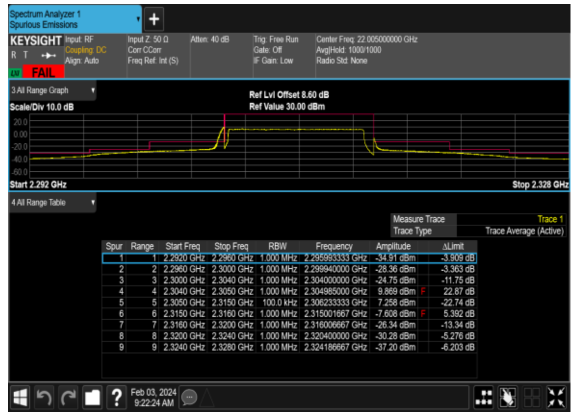
N30(10M)_DFT-s-OFDM_BPSK_Outer_Full_Mid_CH_**CHP_PASS**



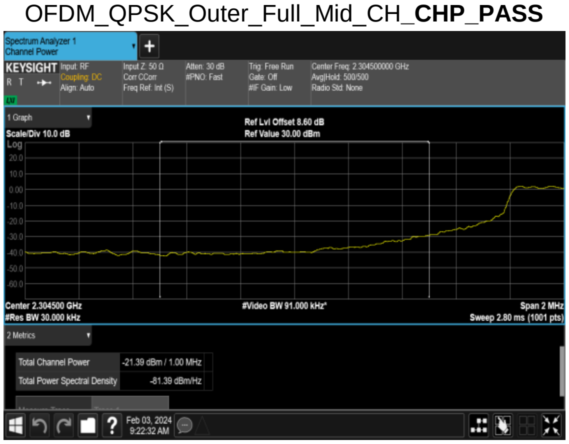
N30(10M)_DFT-s-OFDM_BPSK_Outer_Full_Mid_CH_**CHP_PASS**



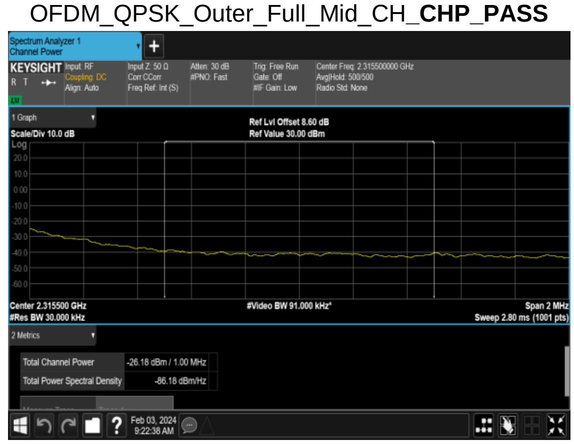
N30(10M)_DFT-s-OFDM_QPSK_Outer_Full_Mid_CH



N30(10M)_DFT-s-OFDM_QPSK_Outer_Full_Mid_CH_**CHP_PASS**



N30(10M)_DFT-s-OFDM_QPSK_Outer_Full_Mid_CH_**CHP_PASS**



Note: for bandedge item, the “CHP” means channel power integration method.

Appendix B. Test Results of Radiated Test

Radiated Spurious Emission

Test Engineer :	Qingsheng He	Temperature :	22~25℃
		Relative Humidity :	48~52%

RSE pretest all the support Antennas, only the worst results are shown in the report.

SA n30 / NR 5MHz / QPSK / Ant.9									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	4610.80	-63.12	-40	-23.12	-55.91	-69.37	6.30	12.55	H
	6916.20	-59.68	-40	-19.68	-55.06	-63.08	8.25	11.65	H
	9221.60	-56.09	-40	-16.09	-57.17	-58.44	9.50	11.85	H
	4610.80	-63.78	-40	-23.78	-56.42	-70.03	6.30	12.55	V
	6916.20	-58.70	-40	-18.70	-54.05	-62.10	8.25	11.65	V
	9221.60	-56.51	-40	-16.51	-57.17	-58.86	9.50	11.85	V
Middle	4615.80	-62.39	-40	-22.39	-55.18	-68.64	6.45	12.70	H
	6923.70	-58.85	-40	-18.85	-54.27	-62.25	8.40	11.80	H
	9231.60	-56.30	-40	-16.30	-57.40	-58.65	9.65	12.00	H
	4615.80	-63.68	-40	-23.68	-56.33	-69.93	6.45	12.70	V
	6923.70	-56.91	-40	-16.91	-52.32	-60.31	8.40	11.80	V
	9231.60	-56.25	-40	-16.25	-56.93	-58.60	9.65	12.00	V
Highest	4620.80	-59.06	-40	-19.06	-51.85	-65.31	6.61	12.86	H
	6931.20	-58.42	-40	-18.42	-53.85	-61.80	8.56	11.94	H
	9241.60	-56.26	-40	-16.26	-57.36	-58.61	9.81	12.16	H
	4620.80	-63.24	-40	-23.24	-55.9	-69.49	6.61	12.86	V
	6931.20	-54.90	-40	-14.90	-50.34	-58.28	8.56	11.94	V
	9241.60	-56.83	-40	-16.83	-57.53	-59.18	9.81	12.16	V

SA n30 / NR 10MHz / QPSK / Ant.9									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	4610.94	-63.57	-40	-23.57	-56.36	-69.82	6.45	12.70	H
	6916.41	-59.73	-40	-19.73	-55.12	-63.13	8.40	11.80	H
	9221.88	-56.18	-40	-16.18	-57.26	-58.53	9.65	12.00	H
	4610.94	-64.30	-40	-24.30	-56.94	-70.55	6.45	12.70	V
	6916.41	-58.21	-40	-18.21	-53.56	-61.61	8.40	11.80	V
	9221.88	-56.75	-40	-16.75	-57.41	-59.10	9.65	12.00	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.