FCC RADIO TEST REPORT

FCC ID	:	**2AQ68T99W373PC15**
Equipment	:	**5G WWAN Module**
Brand Name	:	**Foxconn**
Model Name	:	**T99W373**
Applicant	:	**Hon Lin Technology Co., Ltd** **11F, No.32, Jihu Rd., Neihu Dist., Taipei City 114, Taiwan R.O.C.**
Manufacturer	:	**Hon Lin Technology Co., Ltd** **11F, No.32, Jihu Rd., Neihu Dist., Taipei City 114, Taiwan R.O.C.**
Standard	:	**FCC 47 CFR Part 2, 27D**

The product was received on Jun. 27, 2023 and testing was performed from Jul. 04, 2023 to Aug. 31, 2023. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval from Sporton International Inc. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issue Date
FG262904-10	01	Initial issue of report	Dec. 22, 2023

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power	Reporting only	-
	§27.50 (h)(2)	Equivalent Isotropic Radiated Power (n41)	Pass	
3.3	-	Peak-to-Average Ratio	Reporting only	-
3.4	§2.1049	Occupied Bandwidth	Reporting only	-
3.5	§2.1051 §27.53 (m)(4)	Conducted Band Edge Measurement (n41)	Pass	-
3.6	§2.1051 §27.53 (m)(4)	Conducted Spurious Emission (n41)	Pass	-
3.7	§2.1055 §27.54	Frequency Stability Temperature & Voltage	Pass	-
4.2	§2.1051 §27.53 (m)(4)	Radiated Spurious Emission (n41)	Pass	19.74 dB under the limit at 4998.00 MHz
Remark: This is a variant report by updating 5G NR n41 PC1.5 RF Exposure Max Antenna Gain. After assessing, since the test result is not affected by the changes, the FG262904-10 report reuses test data from the original report FG262904-08C.				

Conformity Assessment Condition:
1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account. 2. The measurement uncertainty please refer to each test result in the section “Measurement Uncertainty”.
Disclaimer:
The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Keven Cheng

Report Producer: Clio Lo

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature
General Specs WCDMA/LTE/5G NR and GNSS

The following antennas were provided to the EUT

	Band	Brand	Model	Antenna Type	RF Exposure Max Antenna Gain(dBi)
5G NR	n41(PC1.5)	WHA YU	C107-511722-A	PIFA	4
	n41(PC2)	WHA YU	C107-511722-A	PIFA	4.3
	n41(PC3)	WHA YU	C107-511722-A	PIFA	7.3

Remark: The EUT's information above is declared by manufacturer and used for Radiated Spurious Emission test.

1.2 Modification of EUT

No modifications made to the EUT during the testing.

1.3 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory	
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	**Sporton Site No.**	
	TH03-HY	03CH07-HY
Test Engineer	Jimmy Chang	Stsn Hsieh and Howard Huang
Temperature (℃)	23.5~24.1	24.2~27.0
Relative Humidity (%)	48~52	42.0~55.0

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC Designation No.: TW1190

1.4 Applicable Standards

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

- ANSI C63.26-2015
- ANSI / TIA-603-E
- FCC 47 CFR Part 2, 27D
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 414788 D01 Radiated Test Site v01r01.
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Remark:

1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
2. The TAF code is not including all the FCC KDB listed without accreditation.

2 Test Configuration of Equipment Under Test

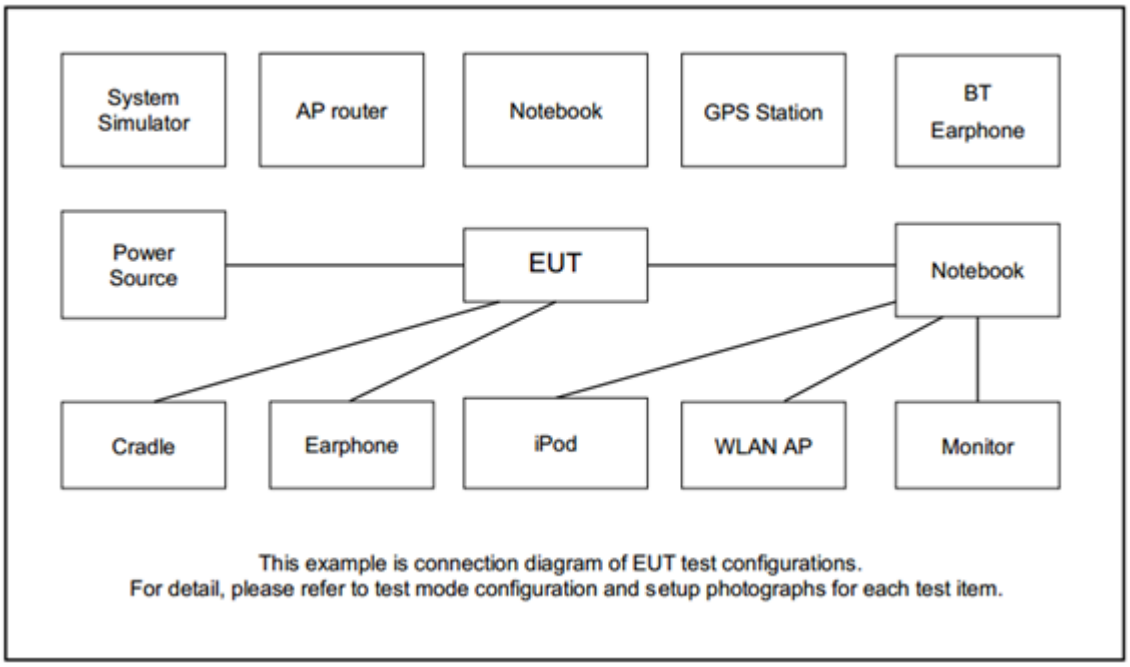
2.1 Test Mode

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.

For radiated measurement, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.26 exploratory test procedures and only the worst case emissions were reported in this report..

Test Items	NR Band	Bandwidth (MHz)													Modulation					RB #			Test Channel		
		5	10	15	20	25	30	40	50	60	70	80	90	100	PI/2 BPSK	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
Max. Output Power	n41	-	-	-	v	-	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
Peak-to-Average Ratio	n41	-	-	-	v	-									v	v	v	v	v			v		v	
26dB and 99% Bandwidth	n41	-	-	-	v	-	v	v	v	v	v	v	v	v	v	v	v	v	v			v		v	
Conducted Band Edge	n41	-	-	-	v	-	v	v	v	v	v	v	v	v	v	v	v	v	v	v		v	v		v
Conducted Spurious Emission	n41	-	-	-	v	-										v				v			v	v	v
Frequency Stability	n41	-	-	-	v	-									v	v						v		v	
E.I.R.P	n41	-	-	-	v	-	v	v	v	v	v	v	v	v	v	v	v	v	v	Max. Power					
Radiated Spurious Emission	n41	Worst Case																					v	v	v
Remark	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. For radiated measurement, pre-scanned in two modes, DFT-s OFDM and CP OFDM. The worst cases (DFT-s OFDM) were recorded in this report, and the worst modes of FR1 and LTE for simultaneous transmission were verified and compliant. 5. One representative bandwidth is selected to perform PAR and frequency stability. 6. 5G NR n41 MIMO mode support Antenna ANT0+ANT1,ANT0+ANT2,ANT0+ANT3,ANT2+ANT1, ANT2+ANT3, ANT1+ANT3,in conducted power are Verified, the worst case is Antenna ANT0+ANT2 test results are included in this report for Radiated is full test.																								

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model No.	FCC ID	Data Cable	Power Cord
1.	Notebook	Dell	E3340	N/A	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
2.	System Simulator	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m
3.	System Simulator	Anritsu	MT8000A	N/A	N/A	Unshielded, 1.8 m
4.	Fixture	Foxconn	95.2580T00	N/A	N/A	N/A

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss 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 4.2 dB and 10dB attenuator.

Example :

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)

2.5 Frequency List of Low/Middle/High Channels

5G NR n41 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
100	Channel	509202	518598	528000
	Frequency	2546.01	2592.99	2640
90	Channel	508200	518598	528996
	Frequency	2541	2592.99	2644.98
80	Channel	507204	518598	529998
	Frequency	2536.02	2592.99	2649.99
70	Channel	506202	518598	531000
	Frequency	2531.01	2592.99	2655
60	Channel	505200	518598	531996
	Frequency	2526	2592.99	2659.98
50	Channel	504204	518598	532998
	Frequency	2521.02	2592.99	2664.99
40	Channel	503202	518598	534000
	Frequency	2516.01	2592.99	2670
30	Channel	502200	518598	534996
	Frequency	2511	2592.99	2674.98
20	Channel	501204	518598	535998
	Frequency	2506.02	2592.99	2679.99

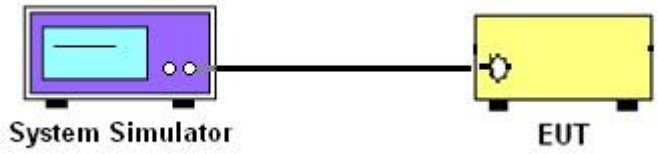
3 Conducted Test Items

3.1 Measuring Instruments

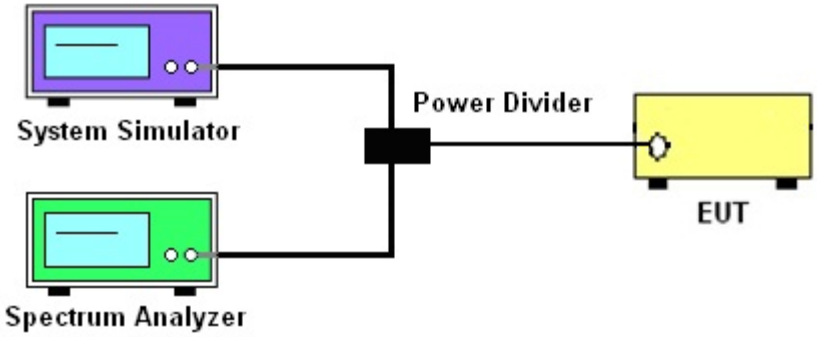
See list of measuring instruments of this test report.

3.1.1 Test Setup

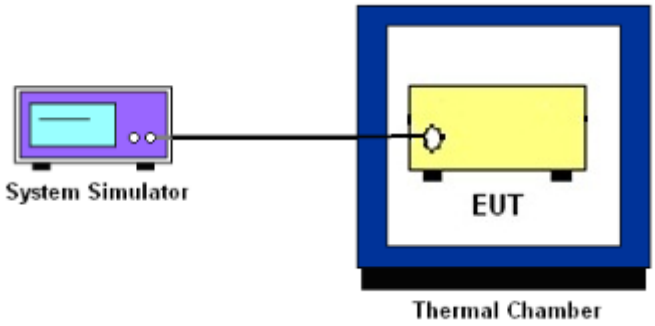
3.1.2 Conducted Output Power



3.1.3 Peak-to-Average Ratio, Occupied Bandwidth ,Conducted Band-Edge and Conducted Spurious Emission



3.1.4 Frequency Stability



3.1.5 Test Result of Conducted Test

Please refer to Appendix A.

3.2 Conducted Output Power and EIRP

3.2.1 Description of the Conducted Output Power Measurement and EIRP Measurement

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

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

According to KDB 412172 D01 Power Approach,

EIRP = $P_T + G_T – L_C$, ERP = EIRP -2.15, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

The MIMO mode is completely uncorrelated, so the directional gain is selected the maximum gain among all antennas.

3.2.2 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through the system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.

3.3 Peak-to-Average Ratio

3.3.1 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.

3.3.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.2.6

1. The EUT was connected to spectrum and system simulator via a power divider.
2. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
3. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
4. Record the deviation as Peak to Average Ratio.

3.4 Occupied Bandwidth

3.4.1 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.

3.4.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.4.3 (26dB) and Section 5.4.4 (99OB)

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. 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.
3. 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.
4. Set the detection mode to peak, and the trace mode to max hold.
5. 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)
6. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
7. 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.
8. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

3.5 Conducted Band Edge

3.5.1 Description of Conducted Band Edge Measurement

27.53(m)(4)

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

3.5.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured.
3. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
4. Beyond the 1 MHz band from the band edge, RBW=1MHz was used.
5. Set spectrum analyzer with RMS detector.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. Checked that all the results comply with the emission limit line.
   The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
   For 5G NR n41
   The other 40 dB, and 55 dB have additionally applied same calculation above.
8. For MIMO mode, add additional MIMO factor 10log(NTX=2) = 3.01dB into the spectrum analyzer offset.

3.6 Conducted Spurious Emission

3.6.1 Description of Conducted Spurious Emission Measurement

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

For 5G NR n41
The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 55 + 10 log (P) dB.
It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10^{th} harmonic.

3.6.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. 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.
3. The conducted spurious emission for the whole frequency range was taken.
4. Make the measurement with the spectrum analyzer's RBW = 100 kHz if the authorized frequency band/block is at or below 1 GHz and 1 MHz if the authorized frequency band/block is above 1 GH, VBW = 3 * RBW.
5. Set spectrum analyzer with RMS detector.
6. Taking the record of maximum spurious emission.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)

   For 5G NR n41
   The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)
9. For MIMO mode, add additional MIMO factor 10log(NTX=2) = 3.01dB into the spectrum analyzer offset.

3.7 Frequency Stability

3.7.1 Description of Frequency Stability Measurement

27.54

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

3.7.2 Test Procedures for Temperature Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

1. The EUT was set up in the thermal chamber and connected with the system simulator.
2. 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.
3. 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.

3.7.3 Test Procedures for Voltage Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

1. The EUT was placed in a temperature chamber at 20±5° C and connected with the system simulator.
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

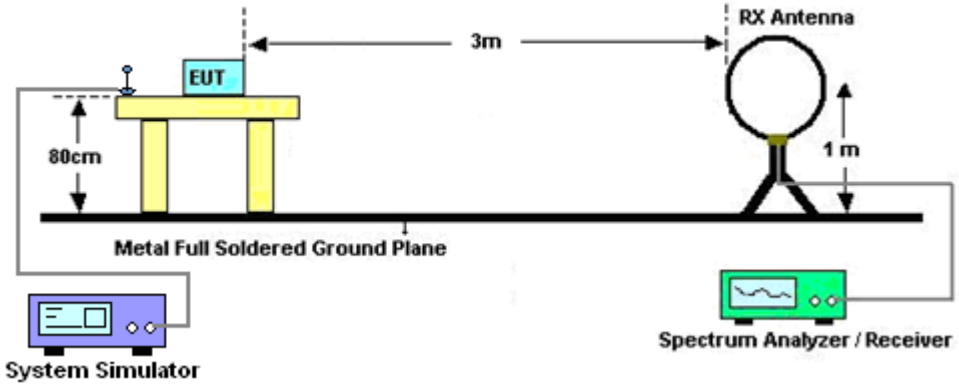
4 Radiated Test Items

4.1 Measuring Instruments

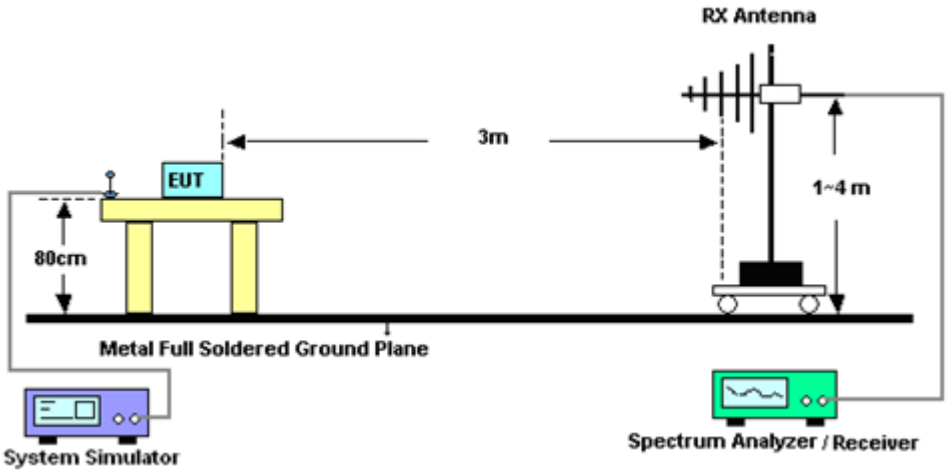
See list of measuring instruments of this test report.

4.1.1 Test Setup

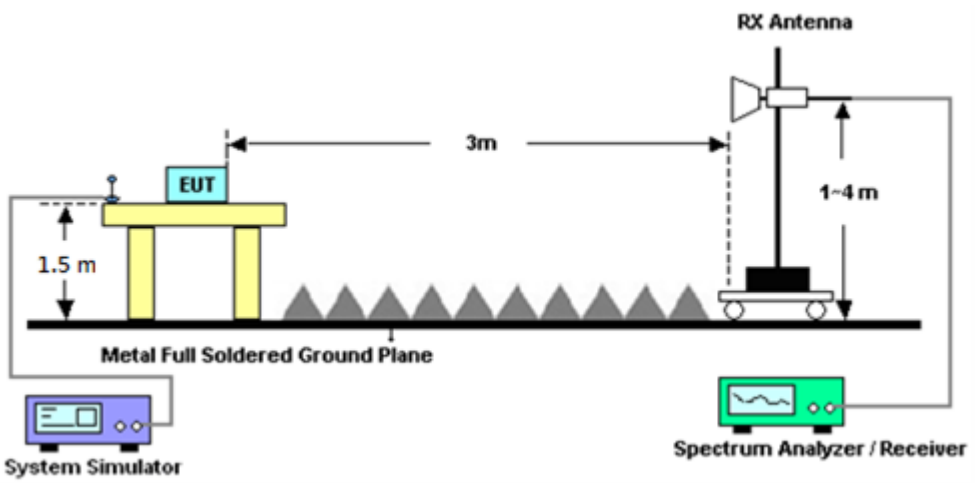
For radiated test below 30MHz



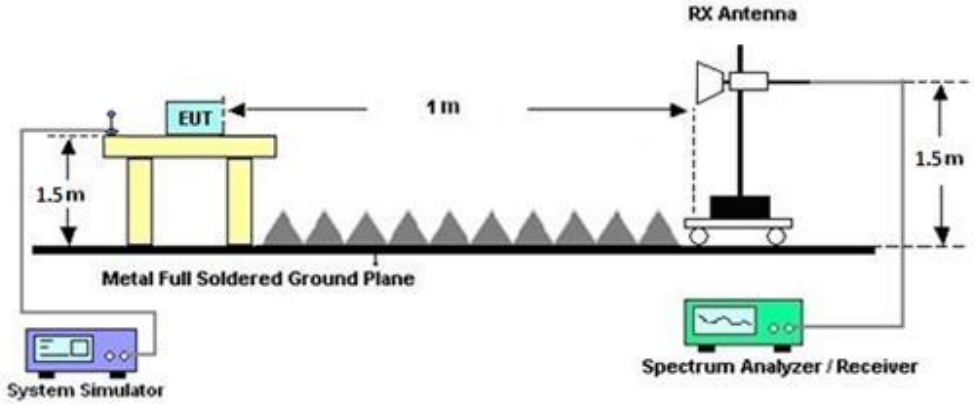
For radiated test from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



4.1.2 Test Result of Radiated Test

Please refer to Appendix B.

Note:

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.

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

4.2 Radiated Spurious Emission Measurement

4.2.1 Description of Radiated Spurious Emission Measurement

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 43 + 10 log (P) dB

For 5G NR n41

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 55 + 10 log (P) dB.

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

4.2.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI / TIA-603-E Section 2.2.12.

1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
    The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
    For 5G NR n41
    The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)
    EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
    ERP (dBm) = EIRP - 2.15

5 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	608-H1	34893241	N/A	Mar. 28, 2023	Jul. 04, 2023~ Aug. 31, 2023	Mar. 27, 2024	Conducted (TH03-HY)
Radio Communication Test Station	Anritsu	MT8000A	6272337370	N/A	Oct. 28, 2022	Jul. 04, 2023~ Aug. 31, 2023	Oct. 27, 2023	Conducted (TH03-HY)
Base Station (Measure)	Anritsu	MT8821C	6262116725	LTE FDD/TDD LTE-3CC DLCA/2CC ULCA	Oct. 13, 2022	Jul. 04, 2023~ Aug. 31, 2023	Oct. 12, 2023	Conducted (TH03-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	35419 & 03	30MHz~1GHz	Apr. 23, 2023	Jul. 06, 2023~ Jul. 11, 2023	Apr. 22, 2024	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Dec. 01, 2022	Jul. 06, 2023~ Jul. 11, 2023	Nov. 30, 2023	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590075	1GHz~18GHz	Apr. 20, 2023	Jul. 06, 2023~ Jul. 11, 2023	Apr. 19, 2024	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	Oct. 03, 2022	Jul. 06, 2023~ Jul. 11, 2023	Oct. 02, 2023	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~26.5GHz	Mar. 24, 2023	Jul. 06, 2023~ Jul. 11, 2023	Mar. 23, 2024	Radiation (03CH07-HY)
Preamplifier	EMEC	EM18G40G	0600789	18-40GHz	Jul. 21, 2022	Jul. 06, 2023~ Jul. 11, 2023	Jul. 20, 2023	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9030A	MY52350276	3Hz~44GHz	Mar. 28, 2023	Jul. 06, 2023~ Jul. 11, 2023	Mar. 27, 2024	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY15682/4	30MHz to 18GHz	Feb. 22, 2023	Jul. 06, 2023~ Jul. 11, 2023	Feb. 21, 2024	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24971/4	9kHz to 18GHz	Feb. 22, 2023	Jul. 06, 2023~ Jul. 11, 2023	Feb. 21, 2024	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4	9kHz to 18GHz	Feb. 22, 2023	Jul. 06, 2023~ Jul. 11, 2023	Feb. 21, 2024	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2858/2	18GHz~40GHz	Feb. 22, 2023	Jul. 06, 2023~ Jul. 11, 2023	Feb. 21, 2024	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	801606/2	9KHz ~ 40GHz	Apr. 20, 2023	Jul. 06, 2023~ Jul. 11, 2023	Apr. 19, 2024	Radiation (03CH07-HY)
Controller	EMEC	EM1000	N/A	Control Ant Mast	N/A	Jul. 06, 2023~ Jul. 11, 2023	N/A	Radiation (03CH07-HY)
Controller	MF	MF-7802	N/A	Control Turn table	N/A	Jul. 06, 2023~ Jul. 11, 2023	N/A	Radiation (03CH07-HY)
Antenna Mast	EMEC	AM-BS-4500E	N/A	Boresight mast 1M~4M	N/A	Jul. 06, 2023~ Jul. 11, 2023	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Jul. 06, 2023~ Jul. 11, 2023	N/A	Radiation (03CH07-HY)
Software	Audix	E3	N/A	N/A	N/A	Jul. 06, 2023~ Jul. 11, 2023	N/A	Radiation (03CH07-HY)
USB Data Logger	TECPEL	TR-32	HE17XB2495	N/A	Mar. 14, 2023	Jul. 06, 2023~ Jul. 11, 2023	Mar. 13, 2024	Radiation (03CH07-HY)
Horn Antenna	ETS-Lindgren	3117	00143261	1GHz~18GHz	Feb. 24, 2023	Jul. 06, 2023~ Jul. 11, 2023	Feb. 23, 2024	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz~40GHz	Nov. 24, 2022	Jul. 06, 2023~ Jul. 11, 2023	Nov. 23, 2023	Radiation (03CH07-HY)
Signal Generator	Rohde & Schwarz	SMF100A	101107	100kHz~40GHz	Jan. 11, 2023	Jul. 06, 2023~ Jul. 11, 2023	Jan. 10, 2024	Radiation (03CH07-HY)

6 Measurement Uncertainty

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.46 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.33 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.91 dB**

Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power) and EIRP

NR n41 PC1.5 Maximum Average Power [dBm], DG = 4 dBi														
BW	RB	RB	Mod	Antenna 0			Antenna 2			Combine			EIRP	EIRP
(MHz)	Size	Offset		Lowest	Middle	Highest	Lowest	Middle	Highest	Lowest	Middle	Highest	(dBm)	(W)
20	1	1	BPSK	24.25	25.35	24.75	25.21	25.18	24.70	27.77	28.28	27.74	32.66	1.845
20	1	49		25.47	25.70	25.54	25.53	25.59	25.39	28.51	28.66	28.48		
20	25	12		24.90	25.58	25.62	25.37	25.64	25.34	28.15	28.62	28.49		
20	1	0		19.23	19.60	19.50	19.36	19.62	19.46	22.31	22.62	22.49		
20	1	50		19.60	25.54	19.62	19.46	25.50	19.45	22.54	28.53	22.55		
20	50	0		23.92	24.01	24.22	23.92	24.13	23.93	26.93	27.08	27.09		
20	1	1	QPSK	24.21	25.50	25.50	25.24	25.60	25.24	27.77	28.56	28.38	32.61	1.8239
20	1	49		25.42	25.62	25.36	25.52	25.50	25.33	28.48	28.57	28.36		
20	25	12		24.94	25.54	25.61	25.37	25.65	25.34	28.17	28.61	28.49		
20	1	0		18.82	19.12	19.08	18.85	19.14	18.83	21.85	22.14	21.97		
20	1	50		19.00	25.62	19.18	18.85	25.50	18.90	21.94	28.57	22.05		
20	50	0		23.42	23.52	23.68	23.45	23.62	23.42	26.45	26.58	26.56		
20	1	1	16-QAM	23.03	24.50	24.57	24.20	24.45	24.16	26.66	27.49	27.38	31.49	1.4093
20	1	1	64-QAM	21.96	22.35	22.46	22.24	22.57	22.21	25.11	25.47	25.35		
20	1	1	256-QAM	19.71	20.13	20.13	19.77	20.17	19.83	22.75	23.16	22.99		
Limit	EIRP < 2W			Result									Pass	

NR n41 PC1.5 Maximum Average Power [dBm], DG = 4 dBi														
BW	RB	RB	Mod	Antenna 0			Antenna 2			Combine			EIRP	EIRP
(MHz)	Size	Offset		Lowest	Middle	Highest	Lowest	Middle	Highest	Lowest	Middle	Highest	(dBm)	(W)
30	1	1	BPSK	24.30	25.53	25.02	25.17	25.69	25.03	27.77	28.62	28.04	32.65	1.8408
30	1	76		25.67	25.60	25.32	25.61	25.67	25.34	28.65	28.65	28.34		
30	36	18		25.38	25.58	25.41	25.36	25.62	25.21	28.38	28.61	28.32		
30	1	0		19.35	19.14	19.42	19.34	19.65	19.46	22.36	22.41	22.45		
30	1	77		19.75	19.70	19.65	19.57	19.60	19.53	22.67	22.66	22.60		
30	75	0		24.00	24.12	24.16	23.92	24.14	23.96	26.97	27.14	27.07		
30	1	1	QPSK	24.13	25.53	25.15	25.14	25.58	25.17	27.67	28.57	28.17	32.62	1.8281
30	1	76		25.65	25.62	25.35	25.54	25.60	25.23	28.61	28.62	28.30		
30	36	18		25.28	25.58	25.45	25.34	25.59	25.24	28.32	28.60	28.36		
30	1	0		18.70	19.05	18.85	18.80	19.05	18.90	21.76	22.06	21.89		
30	1	77		19.05	19.00	19.24	19.04	19.03	19.02	22.06	22.03	22.14		
30	75	0		23.44	23.56	23.67	23.45	23.62	23.43	26.46	26.60	26.56		
30	1	1	16-QAM	23.12	24.30	22.62	24.10	24.41	22.47	26.65	27.37	25.56	31.37	1.3709
30	1	1	64-QAM	22.04	22.32	22.18	22.11	22.42	21.98	25.09	25.38	25.09		
30	1	1	256-QAM	19.75	19.85	20.10	19.73	20.09	19.93	22.75	22.98	23.03		
Limit	EIRP < 2W			Result									Pass	

NR n41 PC1.5 Maximum Average Power [dBm], DG = 4 dBi															
BW	RB	RB	Mod	Antenna 0			Antenna 2			Combine			EIRP	EIRP
(MHz)	Size	Offset		Lowest	Middle	Highest	Lowest	Middle	Highest	Lowest	Middle	Highest	(dBm)	(W)
40	1	1	BPSK	24.26	25.63	25.00	25.17	25.68	25.24	27.75	28.67	28.13	32.75	1.8836
40	1	104		25.13	25.67	25.32	25.30	25.80	25.11	28.23	28.75	28.23		
40	50	25		25.53	25.64	25.18	25.53	25.76	25.18	28.54	28.71	28.19		
40	1	0		19.42	19.65	19.60	19.48	19.73	19.69	22.46	22.70	22.66		
40	1	105		19.75	19.79	19.67	19.65	19.71	19.66	22.71	22.76	22.68		
40	100	0		24.01	24.16	24.22	24.00	24.26	24.11	27.02	27.22	27.18		
40	1	1	QPSK	24.25	25.66	25.05	25.21	25.73	25.16	27.77	28.71	28.12	32.78	1.8967
40	1	104		25.82	25.73	25.21	25.72	25.68	25.26	28.78	28.72	28.25		
40	50	25		25.54	25.60	25.30	25.45	25.71	25.30	28.51	28.67	28.31		
40	1	0		18.95	19.13	19.00	18.97	19.22	19.24	21.97	22.19	22.13		
40	1	105		19.30	19.20	19.16	19.14	19.23	19.09	22.23	22.23	22.14		
40	100	0		23.20	23.63	23.42	23.48	23.78	23.60	26.35	26.72	26.52		
40	1	1	16-QAM	22.46	24.46	24.54	23.85	24.56	24.33	26.22	27.52	27.45	31.52	1.4191
40	1	1	64-QAM	22.40	22.40	22.54	22.47	22.53	22.43	25.45	25.48	25.50		
40	1	1	256-QAM	20.01	20.00	20.00	19.97	20.14	19.96	23.00	23.08	22.99		
Limit	EIRP < 2W			Result									Pass	

NR n41 PC1.5 Maximum Average Power [dBm], DG = 4 dBi															
BW	RB	RB	Mod	Antenna 0			Antenna 2			Combine			EIRP	EIRP
(MHz)	Size	Offset		Lowest	Middle	Highest	Lowest	Middle	Highest	Lowest	Middle	Highest	(dBm)	(W)
50	1	1	BPSK	24.25	25.50	25.45	25.08	25.57	25.27	27.70	28.55	28.37	32.72	1.8707
50	1	131		25.65	25.76	25.52	25.69	25.66	25.33	28.68	28.72	28.44		
50	64	32		25.60	25.60	25.30	25.50	25.70	25.21	28.56	28.66	28.27		
50	1	0		19.50	19.50	19.45	19.52	19.57	19.58	22.52	22.55	22.53		
50	1	132		19.76	19.68	19.65	19.64	19.62	19.44	22.71	22.66	22.56		
50	128	0		24.09	24.13	24.15	23.99	24.20	23.96	27.05	27.18	27.07		
50	1	1	QPSK	24.12	25.40	25.38	25.12	25.50	25.33	27.66	28.46	28.37	32.79	1.9011
50	1	131		25.85	25.64	25.20	25.70	25.59	25.19	28.79	28.63	28.21		
50	64	32		25.60	25.60	25.13	25.46	25.62	25.17	28.54	28.62	28.16		
50	1	0		18.95	18.86	19.13	18.95	19.00	19.07	21.96	21.94	22.11		
50	1	132		19.39	19.20	19.15	19.20	19.08	18.92	22.31	22.15	22.05		
50	128	0		23.58	23.62	23.69	23.46	23.70	23.51	26.53	26.67	26.61		
50	1	1	16-QAM	23.20	24.30	24.50	24.15	24.40	24.25	26.71	27.36	27.39	31.39	1.3772
50	1	1	64-QAM	22.06	22.01	22.57	21.96	22.44	22.34	25.02	25.24	25.47		
50	1	1	256-QAM	19.32	20.15	19.90	19.33	20.06	19.83	22.34	23.12	22.88		
Limit	EIRP < 2W			Result									Pass	

NR n41 PC1.5 Maximum Average Power [dBm], DG = 4 dBi																
BW	RB	RB	Mod	Antenna 0			Antenna 2			Combine			EIRP	EIRP
(MHz)	Size	Offset		Lowest	Middle	Highest	Lowest	Middle	Highest	Lowest	Middle	Highest	(dBm)	(W)
60	1	1	BPSK	24.27	25.52	25.54	25.07	25.58	25.51	27.70	28.56	28.54	32.56	1.803
60	1	160		25.40	25.28	25.00	25.22	25.18	24.99	28.32	28.24	28.01		
60	81	40		25.12	25.14	24.86	25.09	25.22	24.77	28.12	28.19	27.83		
60	1	0		19.00	18.95	19.15	19.00	19.11	19.17	22.01	22.04	22.17		
60	1	161		19.20	19.23	19.15	19.18	19.14	18.96	22.20	22.20	22.07		
60	162	0		23.64	23.60	23.72	23.58	23.69	23.56	26.62	26.66	26.65		
60	1	1	QPSK	23.65	24.95	25.03	24.50	25.09	24.89	27.11	28.03	27.97	32.23	1.6711
60	1	160		25.30	25.17	25.00	25.14	25.15	24.83	28.23	28.17	27.93		
60	81	40		25.17	25.15	25.00	25.06	25.23	24.86	28.13	28.20	27.94		
60	1	0		18.47	18.28	18.52	18.47	18.53	18.61	21.48	21.42	21.58		
60	1	161		18.67	18.70	18.60	18.60	18.60	18.41	21.65	21.66	21.52		
60	162	0		23.17	23.07	23.15	23.05	23.20	23.05	26.12	26.15	26.11		
60	1	1	16-QAM	22.70	23.64	23.92	23.50	23.90	23.78	26.13	26.78	26.86	30.86	1.219
60	1	1	64-QAM	21.46	21.65	21.80	21.46	21.98	21.86	24.47	24.83	24.84		
60	1	1	256-QAM	19.20	19.34	19.50	19.25	19.55	19.35	22.24	22.46	22.44		
Limit	EIRP < 2W			Result									Pass	

NR n41 PC1.5 Maximum Average Power [dBm], DG = 4 dBi																
BW	RB	RB	Mod	Antenna 0			Antenna 2			Combine			EIRP	EIRP
(MHz)	Size	Offset		Lowest	Middle	Highest	Lowest	Middle	Highest	Lowest	Middle	Highest	(dBm)	(W)
70	1	1	BPSK	24.85	25.20	25.22	24.50	25.00	24.79	27.69	28.11	28.02	32.25	1.6788
70	1	187		25.44	25.45	25.50	25.03	25.00	24.95	28.25	28.24	28.24		
70	90	45		25.23	25.18	25.36	24.89	25.00	24.92	28.07	28.10	28.16		
70	1	0		19.02	18.92	19.18	18.92	18.89	19.06	21.98	21.92	22.13		
70	1	188		19.35	19.23	19.25	19.09	18.90	19.00	22.23	22.08	22.14		
70	180	0		23.82	23.80	23.86	23.42	23.45	23.43	26.63	26.64	26.66		
70	1	1	QPSK	24.88	24.86	25.08	24.56	24.84	24.72	27.73	27.86	27.91	32.17	1.6482
70	1	187		25.28	25.37	25.40	24.93	24.94	24.84	28.12	28.17	28.14		
70	90	45		25.20	25.20	25.32	24.85	24.98	24.90	28.04	28.10	28.13		
70	1	0		18.55	18.35	18.57	18.30	18.33	18.55	21.44	21.35	21.57		
70	1	188		18.86	18.84	18.80	18.54	18.41	18.32	21.71	21.64	21.58		
70	180	0		23.20	23.20	23.45	22.98	22.95	23.00	26.10	26.09	26.24		
70	1	1	16-QAM	23.88	23.90	24.05	23.62	23.90	23.80	26.76	26.91	26.94	30.94	1.2417
70	1	1	64-QAM	21.82	22.08	22.11	21.56	22.02	21.82	24.70	25.06	24.98		
70	1	1	256-QAM	19.45	19.48	19.70	19.20	19.58	19.29	22.34	22.54	22.51		
Limit	EIRP < 2W			Result									Pass	

NR n41 PC1.5 Maximum Average Power [dBm], DG = 4 dBi															
BW	RB	RB	Mod	Antenna 0			Antenna 2			Combine			EIRP	EIRP
(MHz)	Size	Offset		Lowest	Middle	Highest	Lowest	Middle	Highest	Lowest	Middle	Highest	(dBm)	(W)
80	1	1	BPSK	24.90	25.91	24.85	24.65	24.92	24.67	27.79	28.45	27.77	32.45	1.7579
80	1	215		25.54	25.42	25.42	25.16	24.93	24.90	28.36	28.19	28.18		
80	108	54		25.35	25.20	25.33	25.01	24.96	24.96	28.19	28.09	28.16		
80	1	0		19.02	18.90	18.80	18.95	18.88	19.02	22.00	21.90	21.92		
80	1	216		19.60	19.47	19.33	19.20	18.94	18.99	22.41	22.22	22.17		
80	216	0		23.72	23.70	23.85	23.47	23.53	23.44	26.61	26.63	26.66		
80	1	1	QPSK	24.95	25.00	24.90	24.57	24.84	24.64	27.77	27.93	27.78	32.44	1.7539
80	1	215		25.65	25.50	25.26	25.20	25.00	24.83	28.44	28.27	28.06		
80	108	54		25.27	25.20	25.35	25.01	25.00	24.96	28.15	28.11	28.17		
80	1	0		18.46	18.57	18.57	18.37	18.35	18.50	21.43	21.47	21.55		
80	1	216		18.90	18.80	18.60	18.72	18.46	18.47	21.82	21.64	21.55		
80	216	0		23.30	23.26	23.45	23.00	23.06	22.95	26.16	26.17	26.22		
80	1	1	16-QAM	23.75	23.60	23.70	23.56	23.73	23.47	26.67	26.68	26.60	30.68	1.1695
80	1	1	64-QAM	21.78	21.75	21.95	21.37	21.56	21.65	24.59	24.67	24.81		
80	1	1	256-QAM	19.25	19.62	19.44	18.95	19.32	19.20	22.11	22.48	22.33		
Limit	EIRP < 2W			Result									Pass	

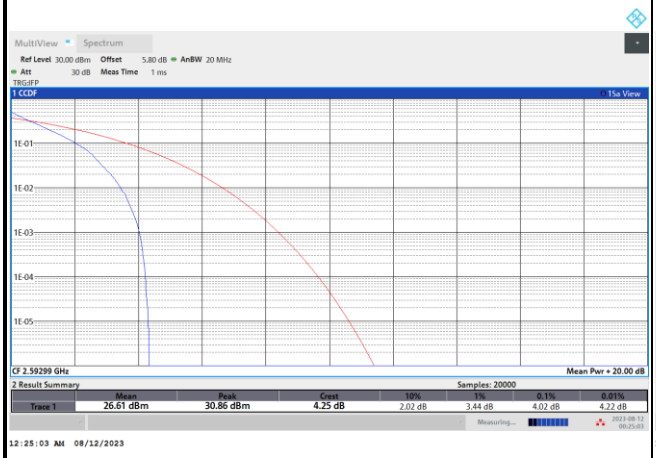
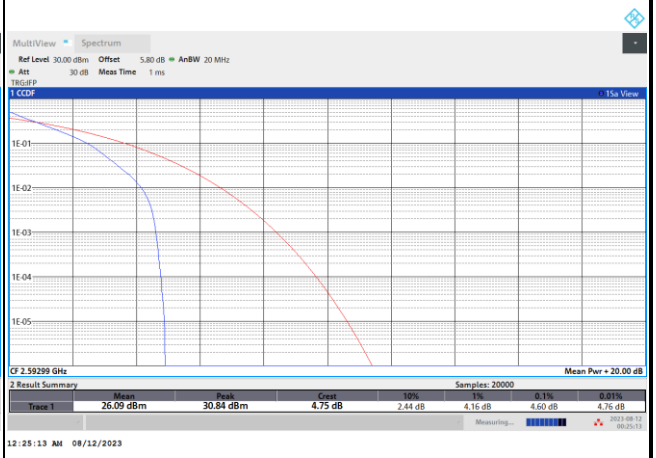
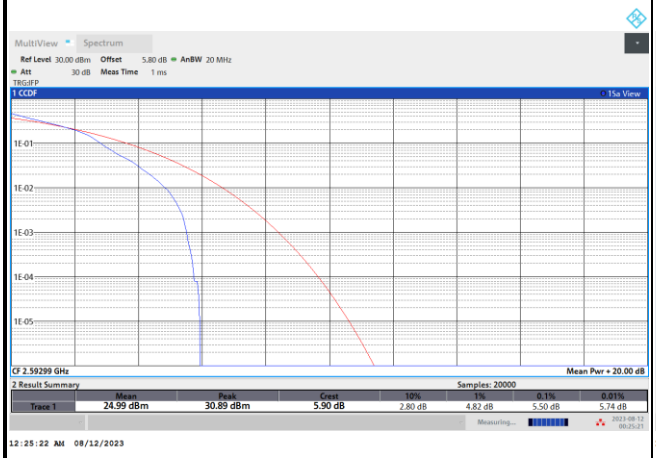
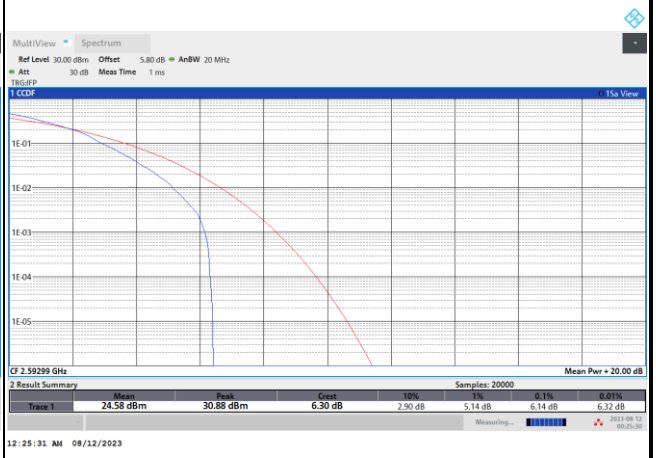
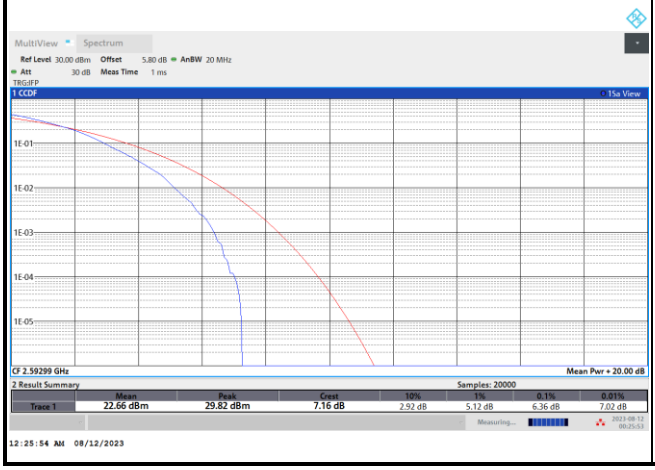
NR n41 PC1.5 Maximum Average Power [dBm], DG = 4 dBi															
BW	RB	RB	Mod	Antenna 0			Antenna 2			Combine			EIRP	EIRP
(MHz)	Size	Offset		Lowest	Middle	Highest	Lowest	Middle	Highest	Lowest	Middle	Highest	(dBm)	(W)
90	1	1	BPSK	24.89	25.02	24.94	24.56	25.00	24.83	27.74	28.02	27.90	32.44	1.7539
90	1	243		25.60	25.14	25.35	25.25	25.03	25.07	28.44	28.10	28.22		
90	120	60		25.36	25.27	25.33	25.08	25.06	24.93	28.23	28.18	28.14		
90	1	0		19.20	19.12	19.23	19.06	19.01	19.00	22.14	22.08	22.13		
90	1	244		19.45	19.32	19.25	19.25	19.03	19.00	22.36	22.19	22.14		
90	243	0		23.85	23.76	23.80	23.59	23.47	23.43	26.73	26.63	26.63		
90	1	1	QPSK	24.94	24.85	24.84	24.70	25.04	24.71	27.83	27.96	27.79	32.41	1.7418
90	1	243		25.51	25.45	25.30	25.29	24.94	24.92	28.41	28.21	28.12		
90	120	60		25.32	25.28	25.27	25.08	25.06	24.96	28.21	28.18	28.13		
90	1	0		18.80	18.50	18.41	18.54	18.45	18.54	21.68	21.49	21.49		
90	1	244		19.13	18.80	18.90	18.78	18.42	18.52	21.97	21.62	21.72		
90	243	0		23.30	23.22	23.36	23.02	22.96	22.92	26.17	26.10	26.16		
90	1	1	16-QAM	23.84	23.80	23.80	23.50	23.81	23.72	26.68	26.82	26.77	30.82	1.2078
90	1	1	64-QAM	22.15	21.65	21.72	21.65	21.70	21.56	24.92	24.69	24.65		
90	1	1	256-QAM	19.47	19.32	19.45	19.12	19.35	19.29	22.31	22.35	22.38		
Limit	EIRP < 2W			Result									Pass	

NR n41 PC1.5 Maximum Average Power [dBm], DG = 4 dBi														
BW	RB	RB	Mod	Antenna 0			Antenna 2			Combine			EIRP	EIRP
(MHz)	Size	Offset		Lowest	Middle	Highest	Lowest	Middle	Highest	Lowest	Middle	Highest	(dBm)	(W)
100	1	1	BPSK	25.00	25.00	25.04	24.75	25.05	24.93	27.89	28.04	28.00	32.45	1.7579
100	1	271		25.56	25.58	25.35	25.31	25.06	25.07	28.45	28.34	28.22		
100	135	67		25.44	25.24	25.34	25.11	25.00	25.03	28.29	28.13	28.20		
100	1	0		19.30	19.04	18.97	19.12	18.99	19.15	22.22	22.03	22.07		
100	1	272		19.48	19.52	19.50	19.33	19.08	19.17	22.42	22.32	22.35		
100	270	0		23.85	23.70	23.72	23.61	23.56	23.48	26.74	26.64	26.61		
100	1	1	QPSK	25.00	25.12	25.15	24.60	24.99	24.88	27.81	28.07	28.03	32.43	1.7498
100	1	271		25.50	25.70	25.42	25.28	25.13	25.01	28.40	28.43	28.23		
100	135	67		25.37	25.24	25.40	25.14	24.97	25.04	28.27	28.12	28.23		
100	1	0		18.62	18.56	18.52	18.60	18.53	18.60	21.62	21.56	21.57		
100	1	272		18.92	19.24	19.00	18.87	18.56	18.49	21.91	21.92	21.76		
100	270	0		23.40	23.25	23.30	23.15	23.07	23.05	26.29	26.17	26.19		
100	1	1	16-QAM	24.00	23.70	23.82	23.45	23.83	23.60	26.74	26.78	26.72	30.78	1.1967
100	1	1	64-QAM	21.85	21.85	21.82	21.55	21.85	21.73	24.71	24.86	24.79		
100	1	1	256-QAM	19.52	19.56	19.50	19.20	19.60	19.39	22.37	22.59	22.46		
Limit	EIRP < 2W			Result									Pass	

FR1 n41 MIMO ANT0

Peak-to-Average Ratio

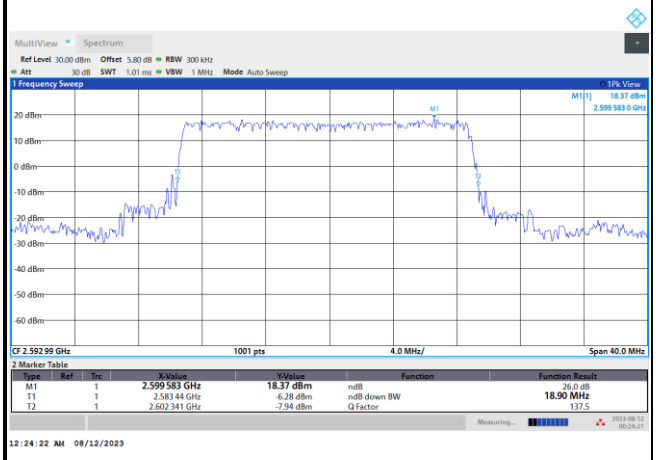
Mode	FR1 n41 / 20MHz / DFT-S OFDM				
Mod.	PI/2 BPSK	QPSK	16QAM	64QAM	Limit: 13dB
RB Size	Full RB	Full RB	Full RB	Full RB	Result
Middle CH	4.02	4.60	5.50	6.14	PASS
Mode	FR1 n41 / 20MHz / DFT-S OFDM				
Mod.	256QAM				Limit: 13dB
RB Size	Full RB				Result
Middle CH	6.36				PASS

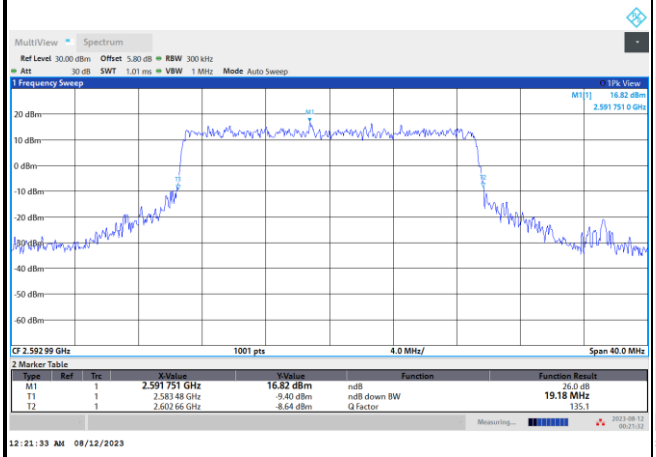
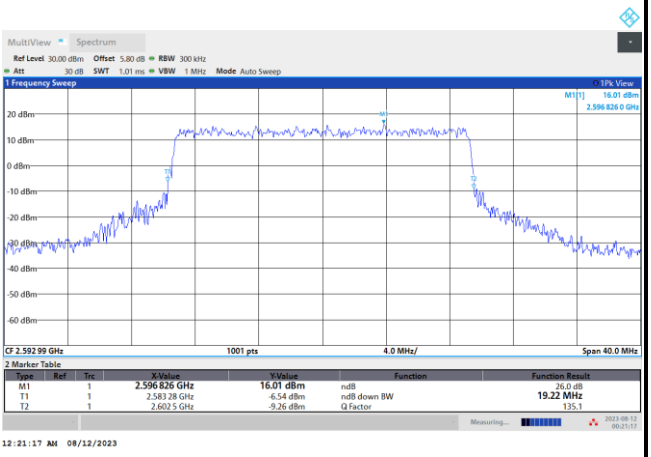
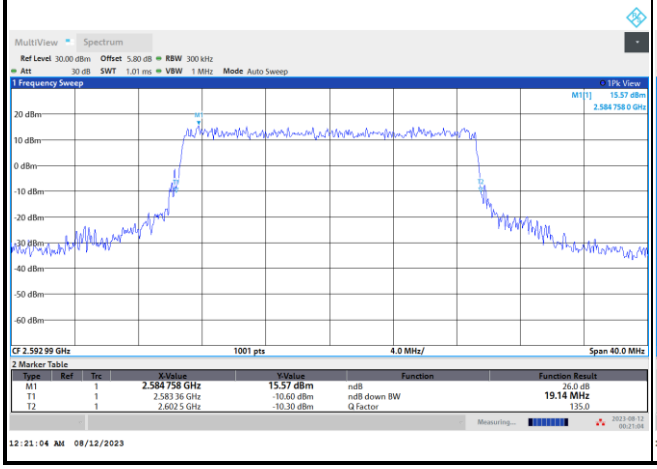
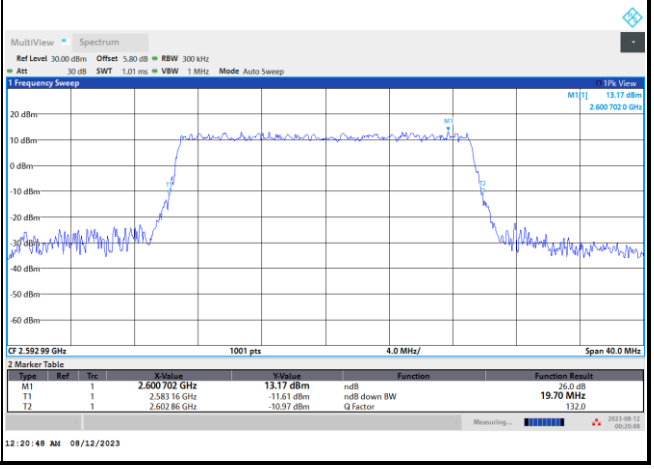
FR1 n41 / 20MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	QPSK
	
16QAM	64QAM
	
256QAM	
	

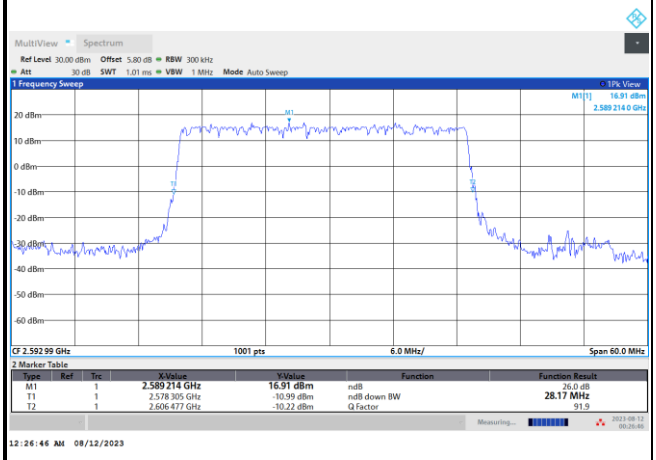
26dB Bandwidth

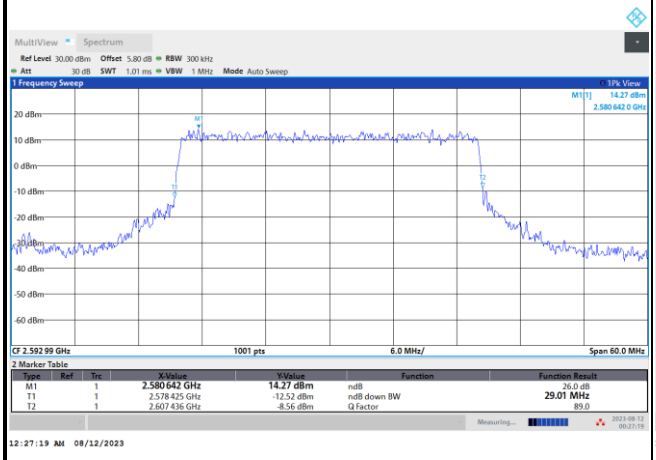
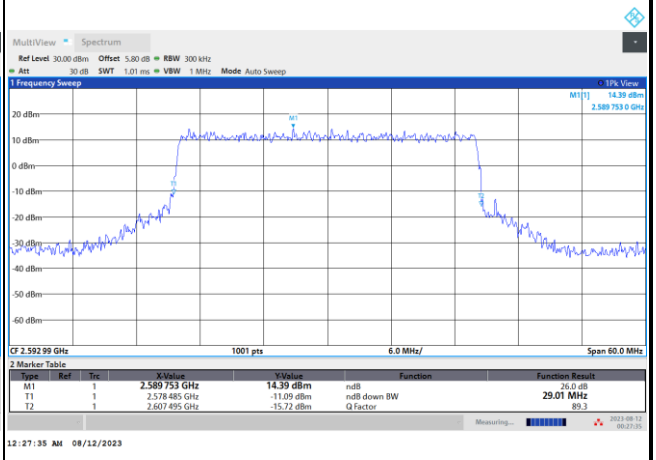
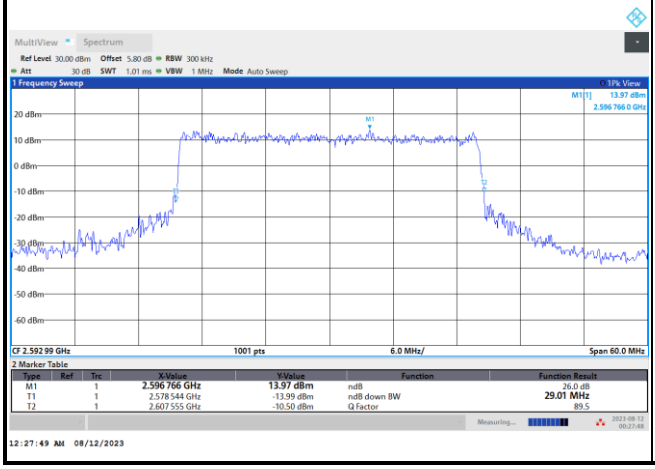
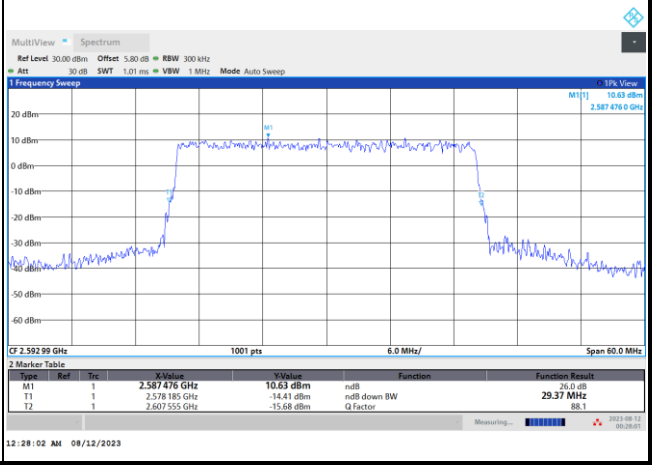
Mode	FR1 n41 : 26dB BW(MHz) / DFT-S OFDM							
BW	20MHz	30MHz	40MHz	50MHz	60MHz	70MHz	80MHz	90MHz
Mod.	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK
Middle CH	18.90	28.17	38.20	48.35	60.90	66.99	79.92	89.55
BW	100MHz							
Mod.	PI/2 BPSK							
Middle CH	99.30							

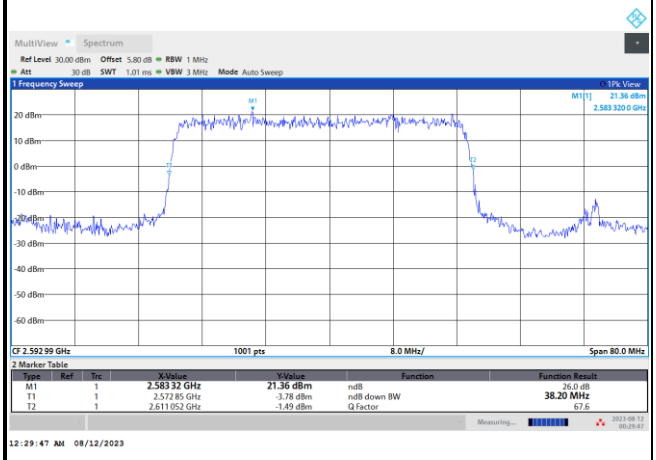
Mode	FR1 n41 : 26dB BW(MHz) / CP OFDM							
BW	20MHz		30MHz		40MHz		50MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	QPSK
Middle CH	19.18	19.22	29.01	29.01	29.01	29.01	50.25	50.25
Mod.	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM	64QAM	64QAM
Middle CH	19.14	19.70	29.01	29.37	29.01	29.37	50.25	50.25
BW	60MHz		70MHz		80MHz		90MHz	
Mod.	QPSK	16QAM	QPSK	QPSK	16QAM	QPSK	QPSK	16QAM
Middle CH	60.78	60.78	70.21	60.78	60.78	70.21	90.27	90.45
Mod.	64QAM	256QAM	64QAM	64QAM	256QAM	64QAM	64QAM	256QAM
Middle CH	60.66	60.66	70.21	60.66	60.66	70.21	90.27	90.27
BW	100MHz							
Mod.	QPSK	QPSK						
Middle CH	100.70	100.70						
Mod.	64QAM	64QAM						
Middle CH	100.70	100.70						

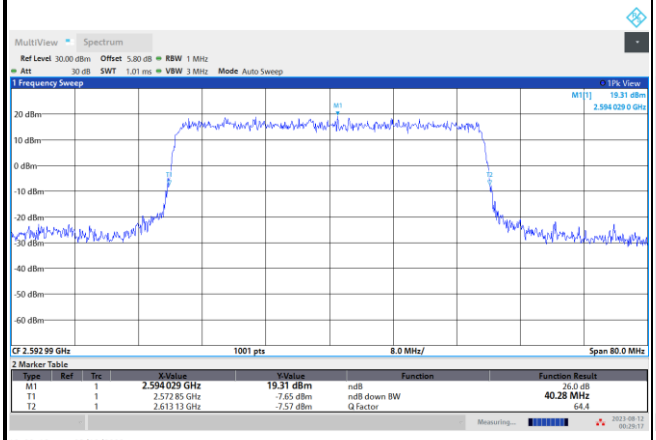
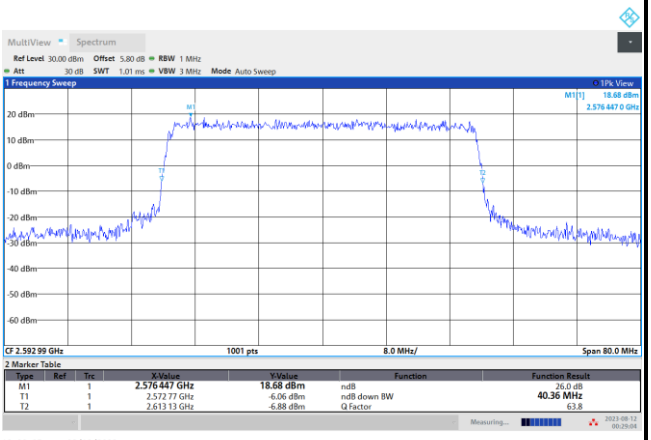
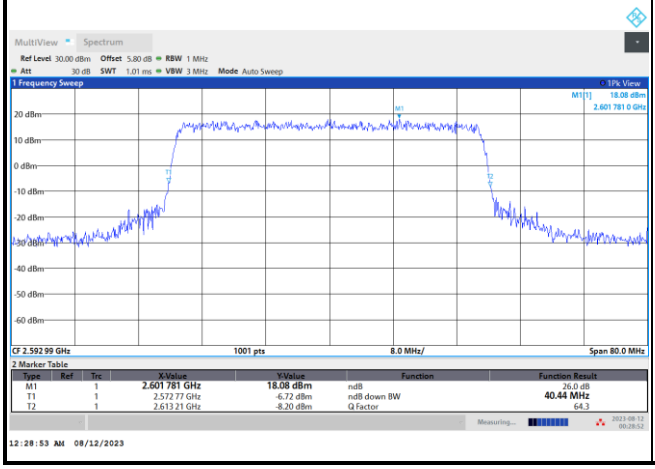
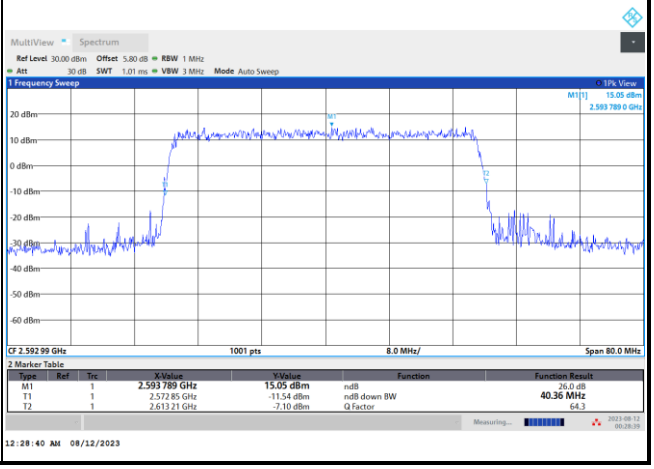
FR1 n41 / 20MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

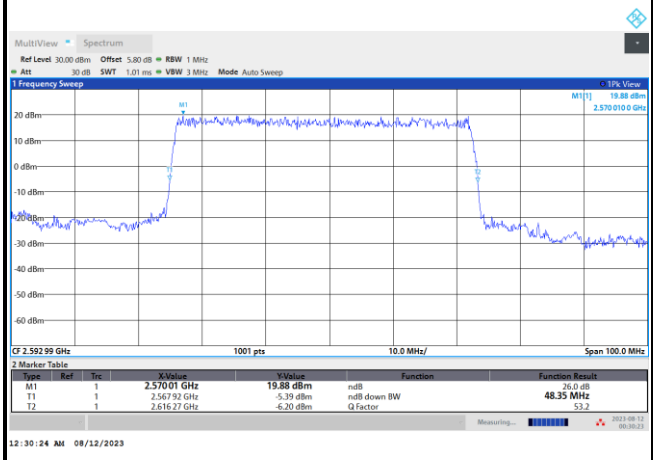
FR1 n41 / 20MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

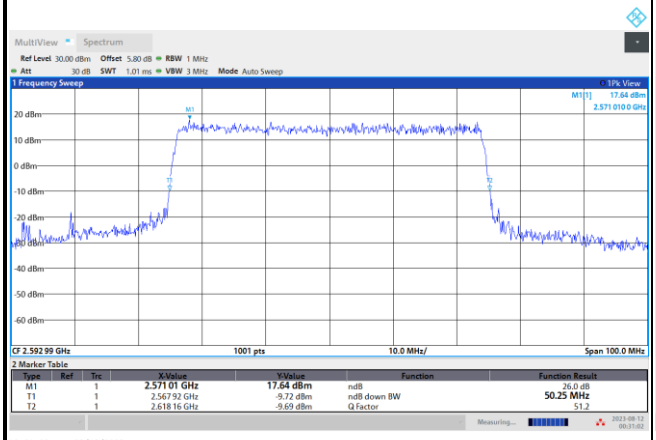
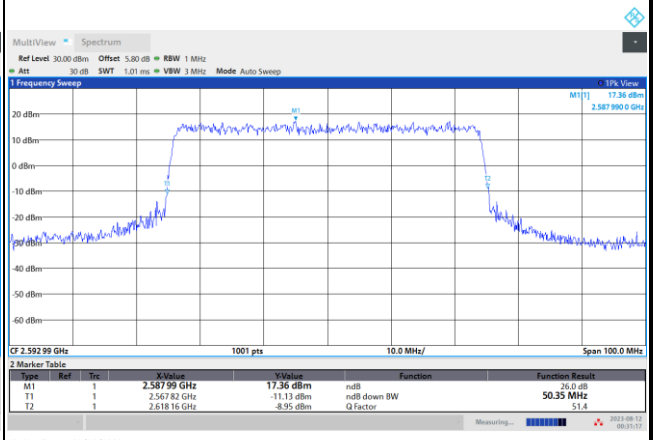
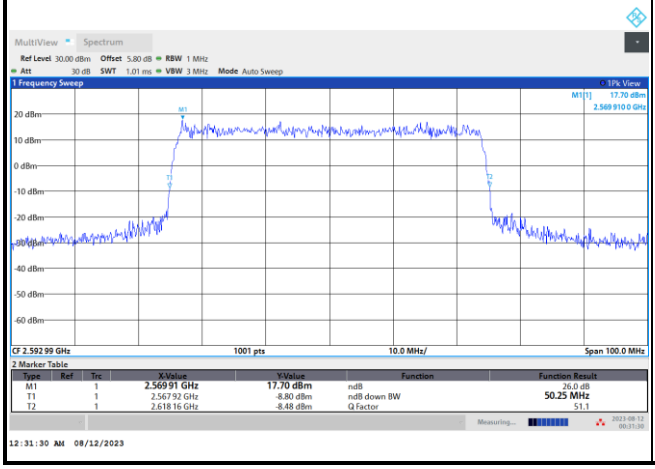
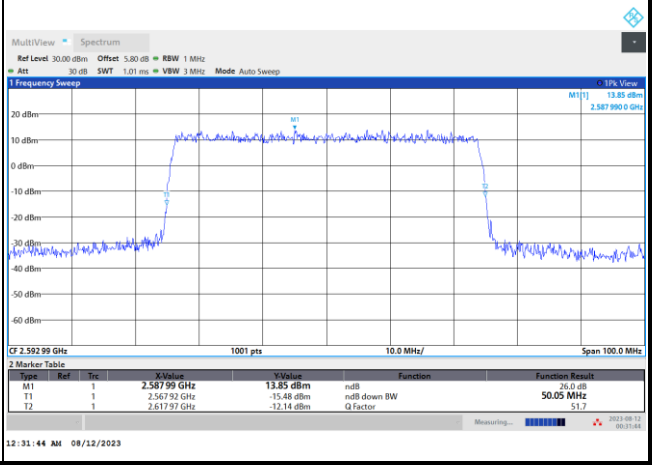
FR1 n41 / 30MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

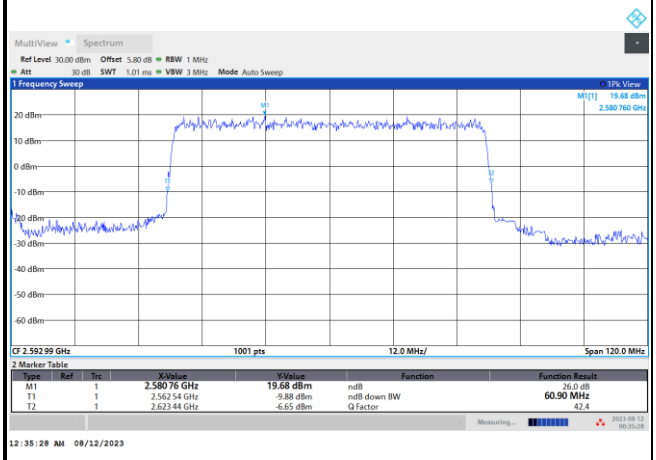
FR1 n41 / 30MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

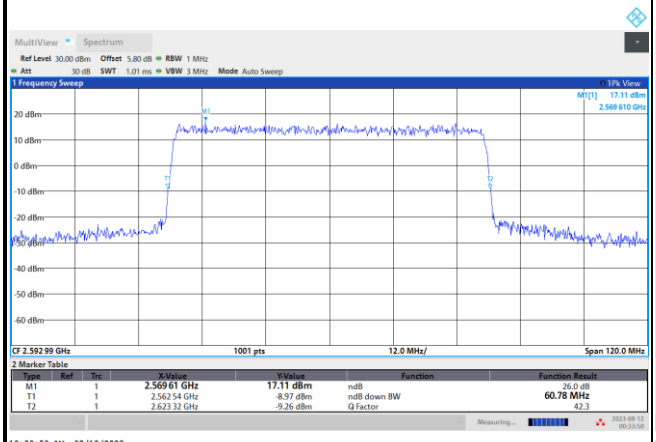
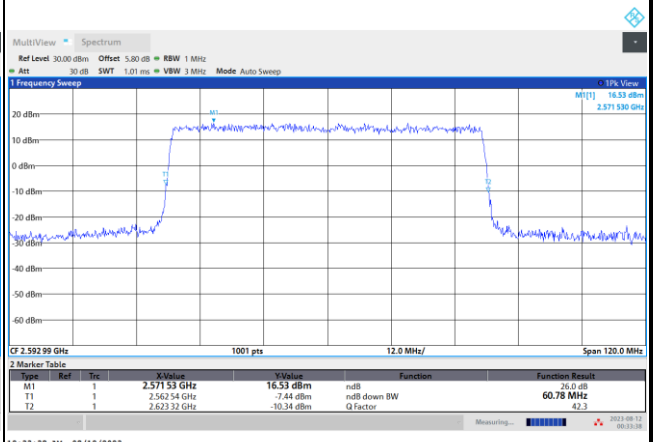
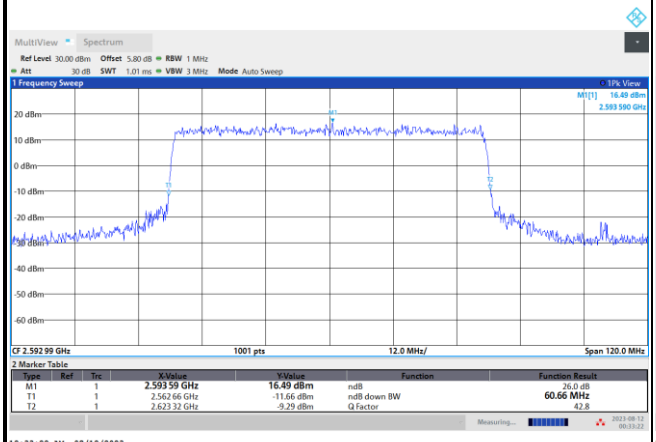
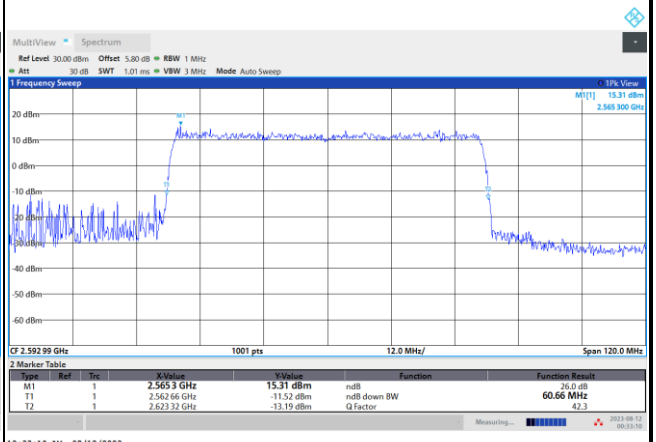
FR1 n41 / 40MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

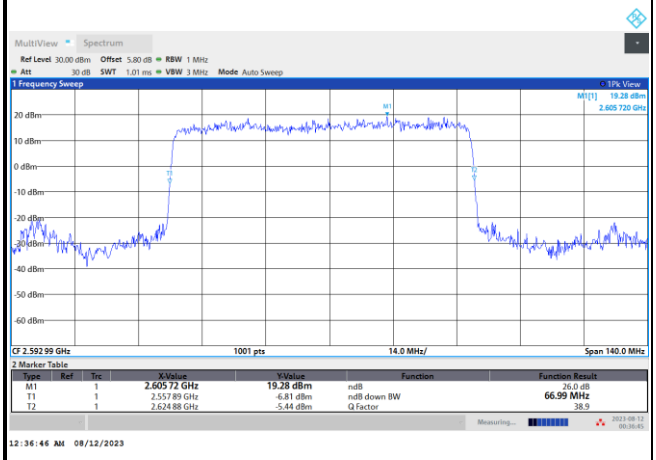
FR1 n41 / 40MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

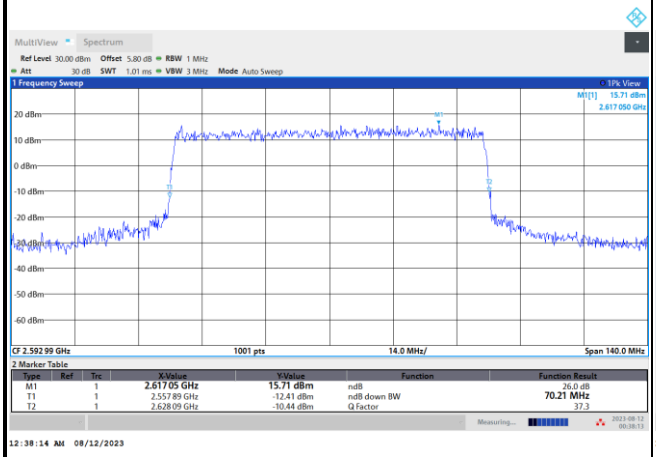
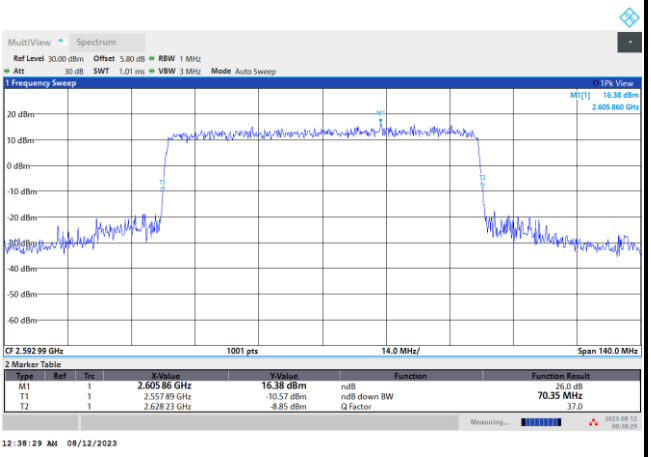
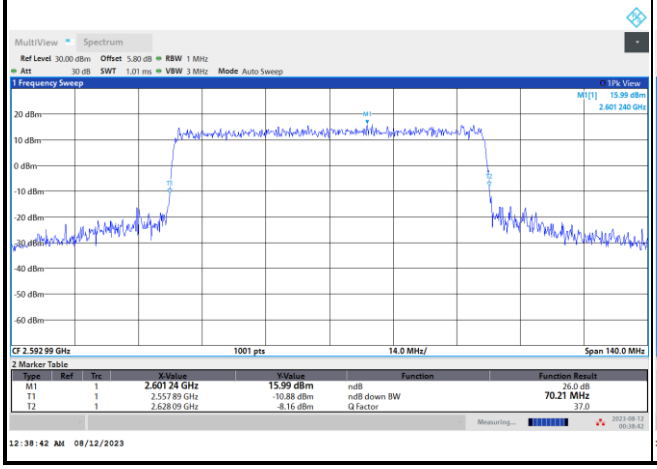
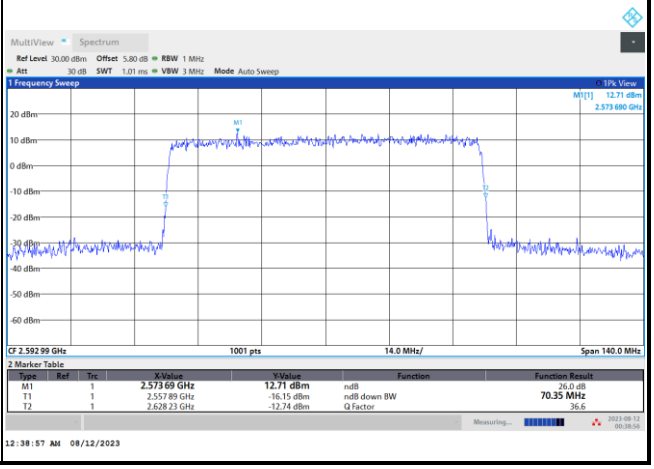
FR1 n41 / 50MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

FR1 n41 / 50MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

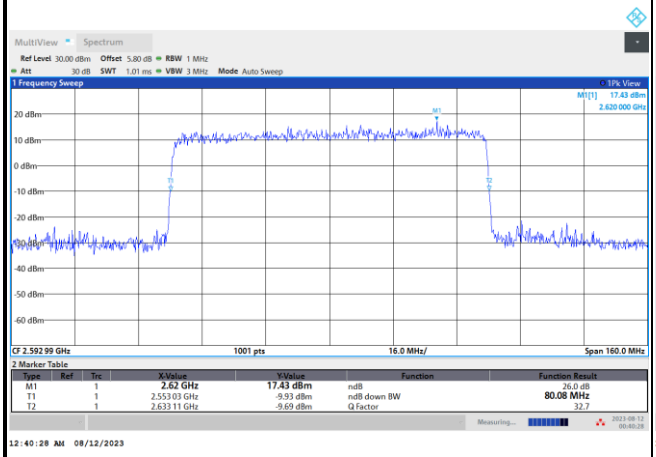
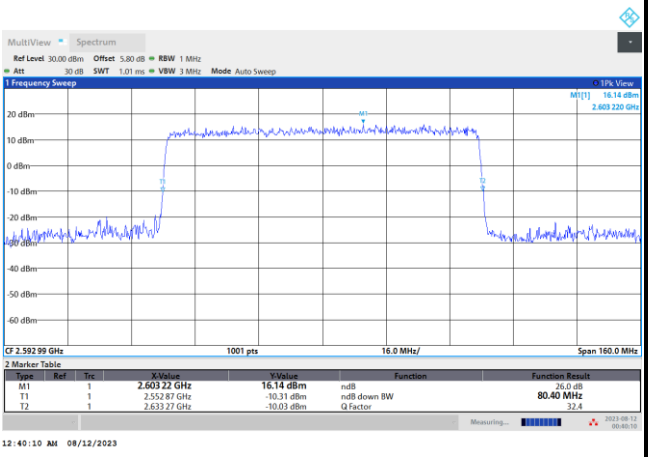
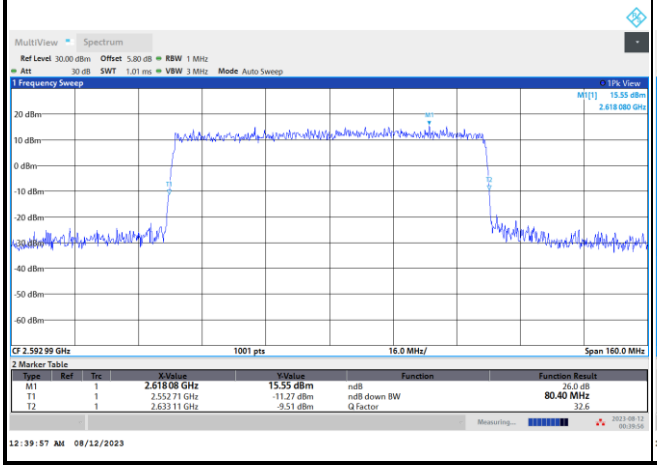
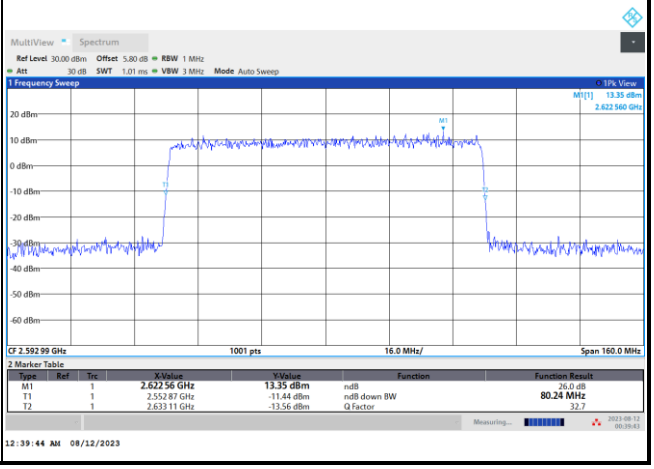
FR1 n41 / 60MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

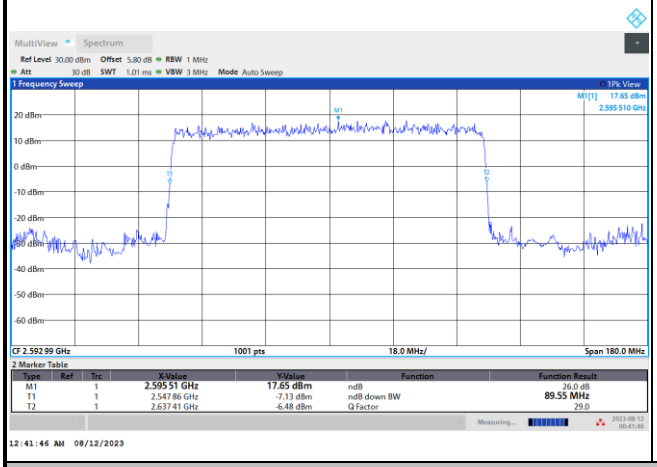
FR1 n41 / 60MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

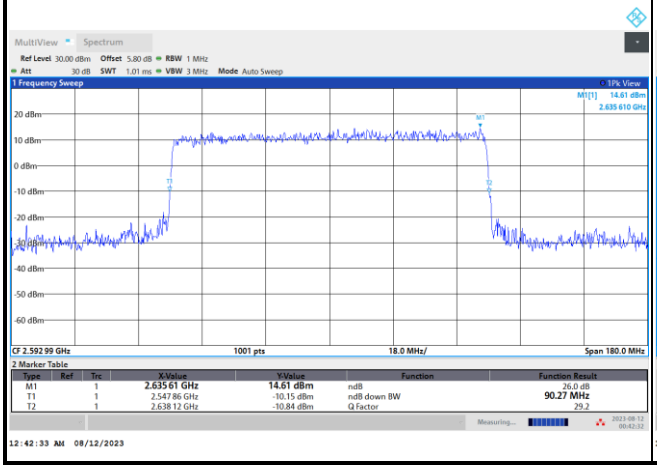
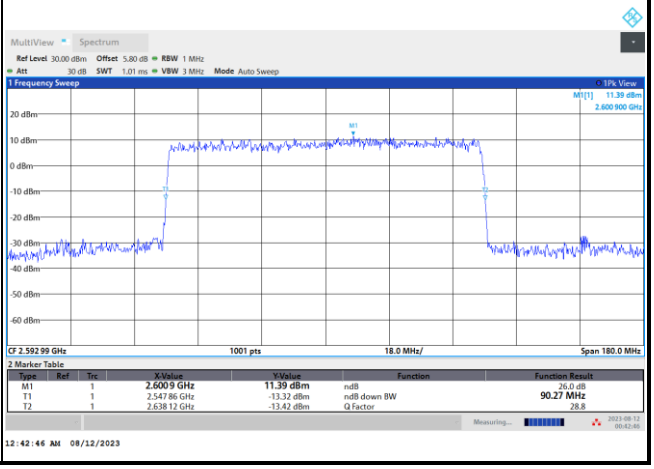
FR1 n41 / 70MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

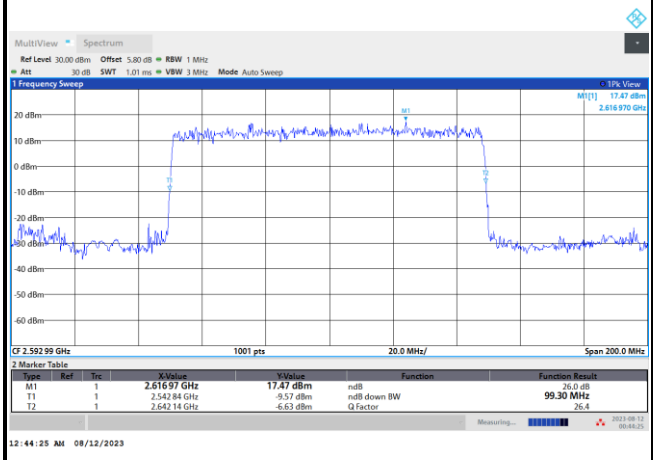
FR1 n41 / 70MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

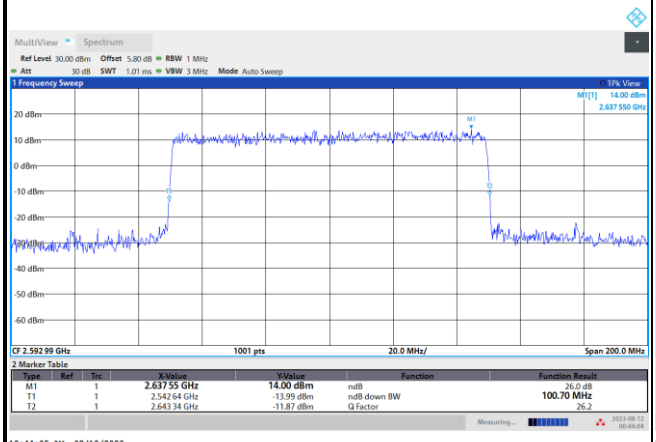
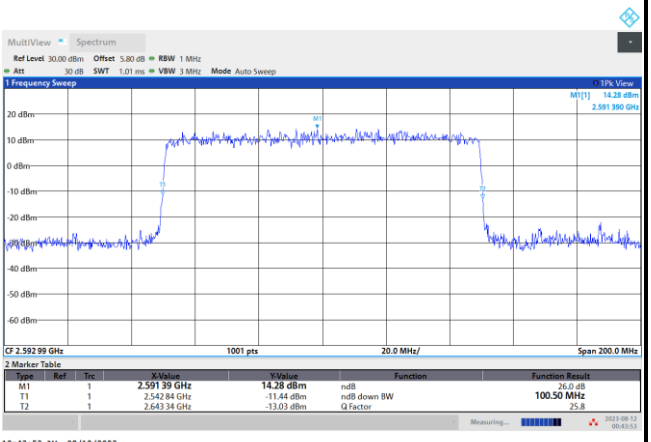
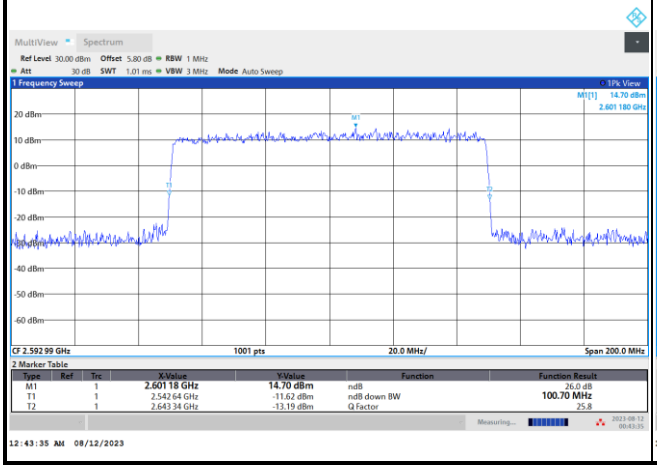
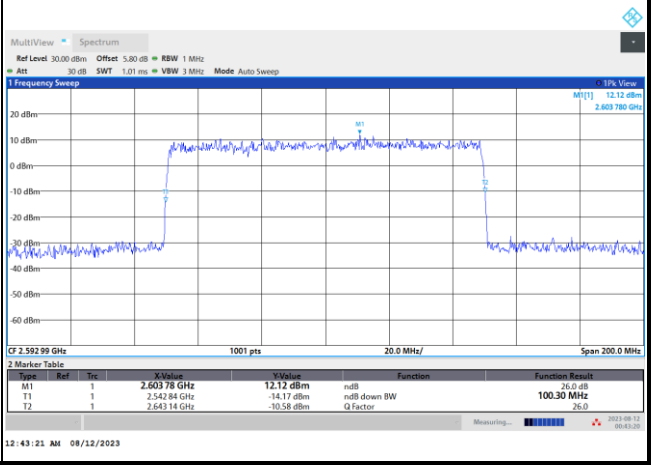
FR1 n41 / 80MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

FR1 n41 / 80MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

FR1 n41 / 90MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

FR1 n41 / 90MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

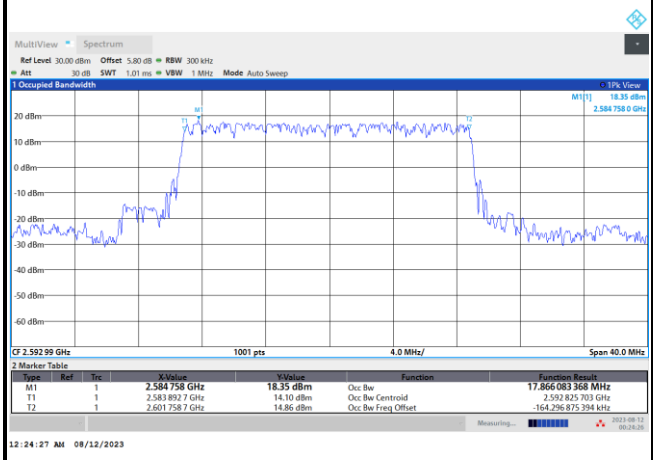
FR1 n41 / 100MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

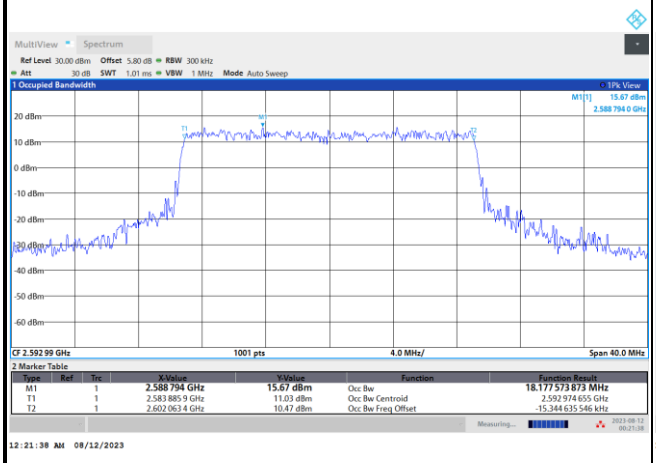
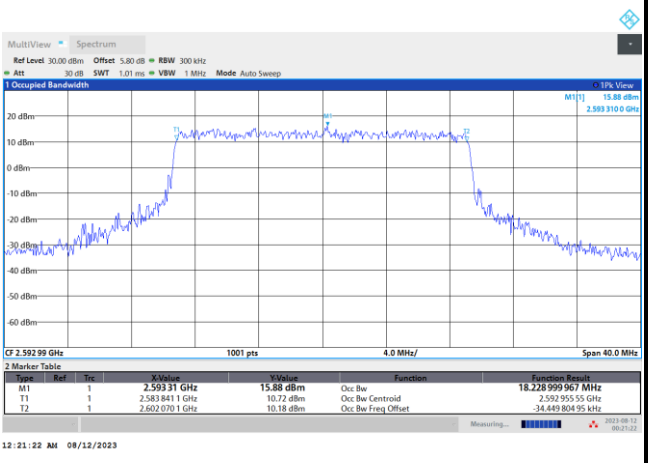
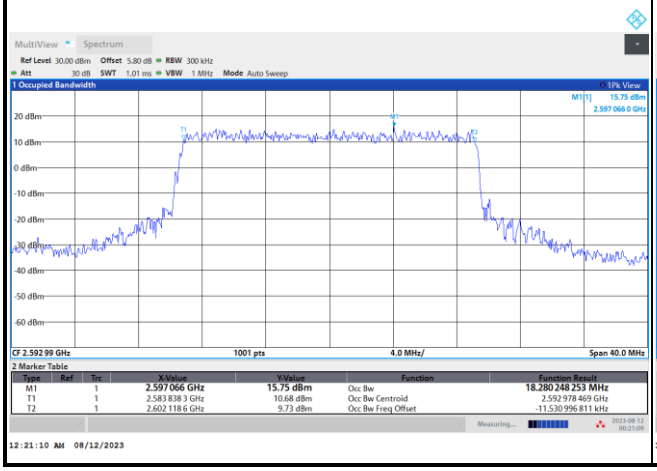
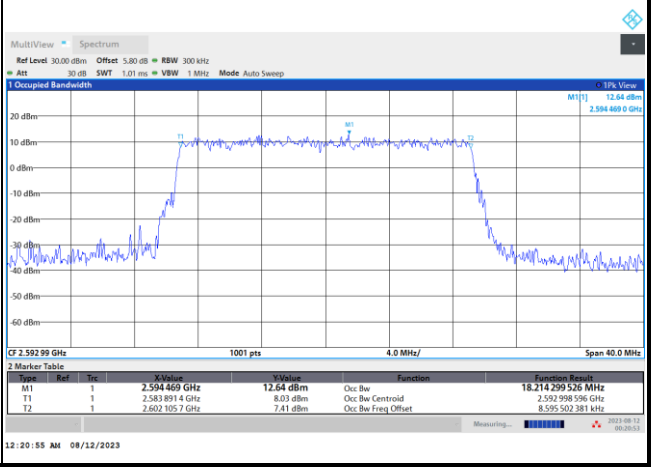
FR1 n41 / 100MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

Occupied Bandwidth

Mode	FR1 n41 : OB BW(MHz) / DFT-S OFDM							
BW	20MHz	30MHz	40MHz	50MHz	60MHz	70MHz	80MHz	90MHz
Mod.	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK	PI/2 BPSK
Middle CH	17.86	26.76	35.86	46.03	57.92	64.23	77.09	86.54
BW	100MHz							
Mod.	PI/2 BPSK							
Middle CH	96.15							

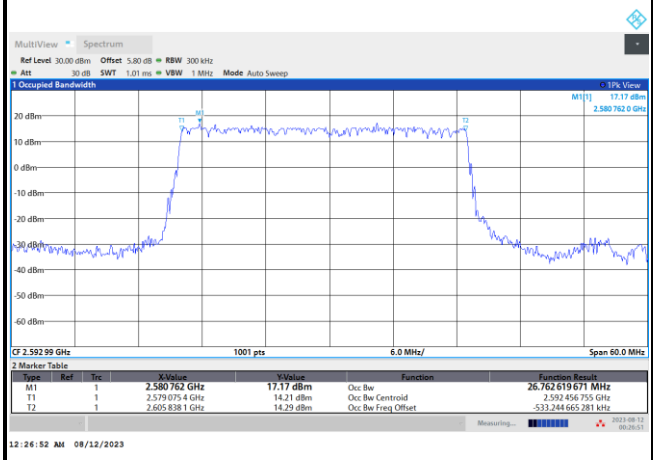
Mode	FR1 n41 : OB BW(MHz) / CP OFDM							
BW	20MHz		30MHz		40MHz		50MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Middle CH	18.17	18.22	27.76	27.81	38.05	37.99	47.58	47.56
Mod.	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM
Middle CH	18.28	18.21	27.79	27.84	37.96	37.98	47.61	47.61
BW	60MHz		70MHz		80MHz		90MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Middle CH	57.96	57.97	67.54	67.23	77.33	77.42	87.32	87.44
Mod.	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM	64QAM	256QAM
Middle CH	57.94	57.63	67.24	67.21	77.16	77.28	87.34	87.05
BW	100MHz							
Mod.	QPSK	16QAM						
Middle CH	97.26	96.97						
Mod.	64QAM	256QAM						
Middle CH	97.24	97.12						

FR1 n41 / 20MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

FR1 n41 / 20MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

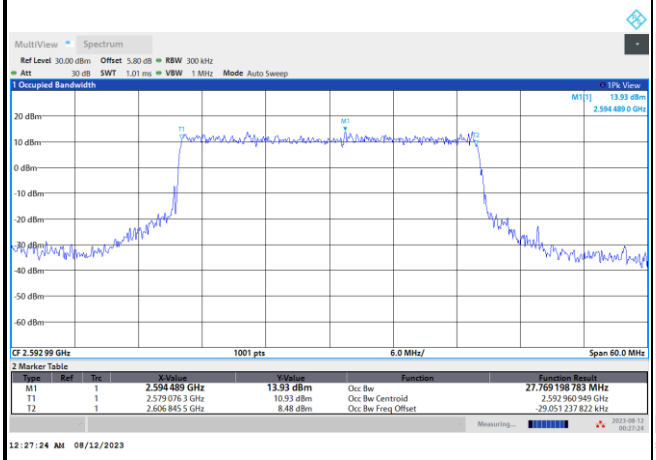
FR1 n41 / 30MHz / DFT-S OFDM / Middle Channel / Full RB

PI/2 BPSK

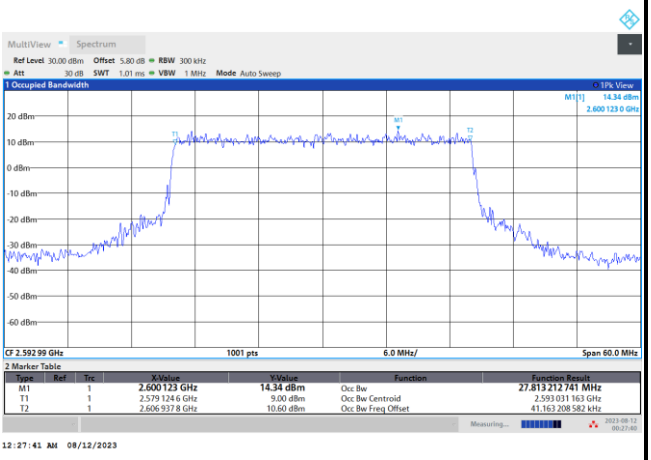


FR1 n41 / 30MHz / CP OFDM / Middle Channel / Full RB

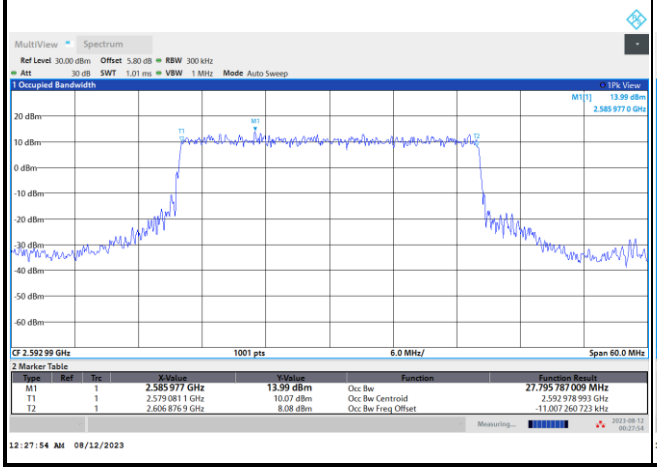
QPSK



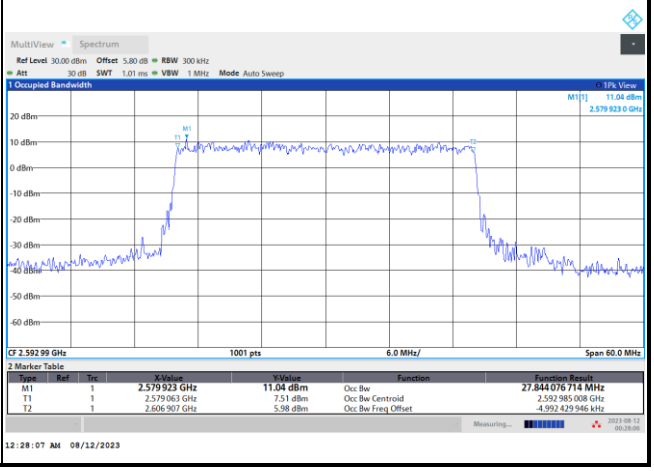
16QAM

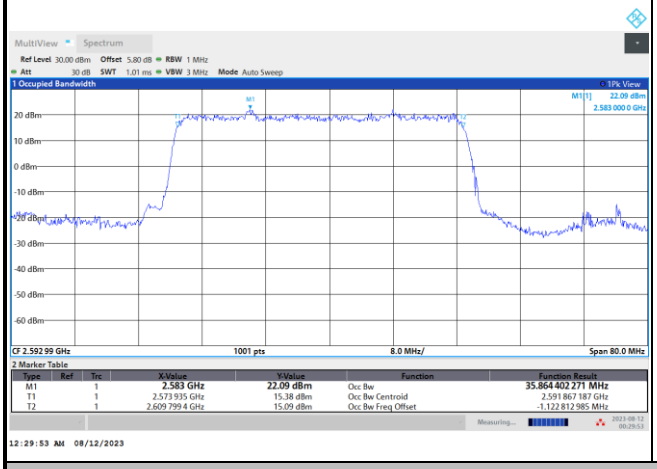


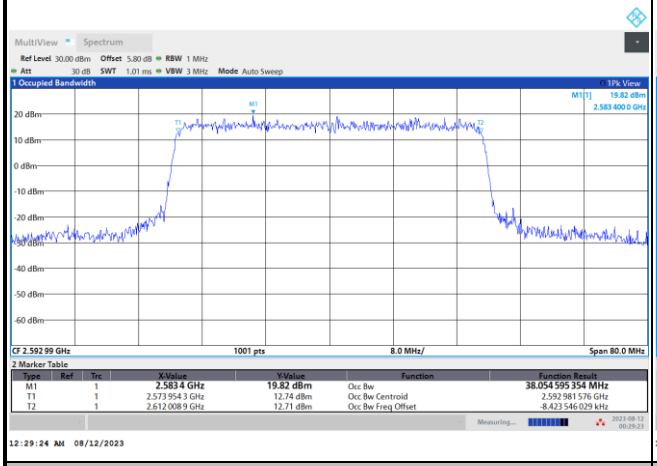
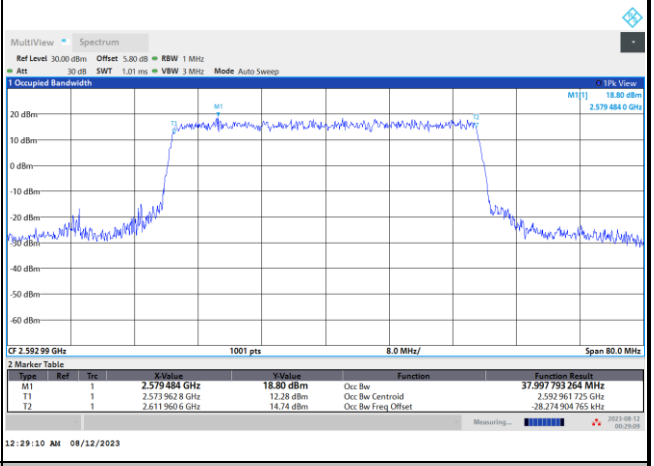
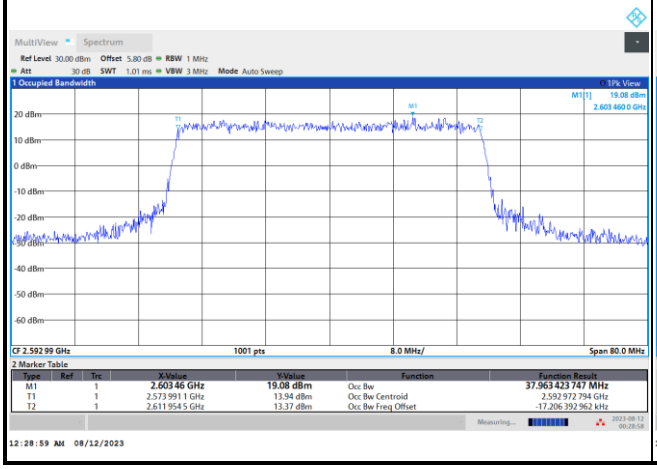
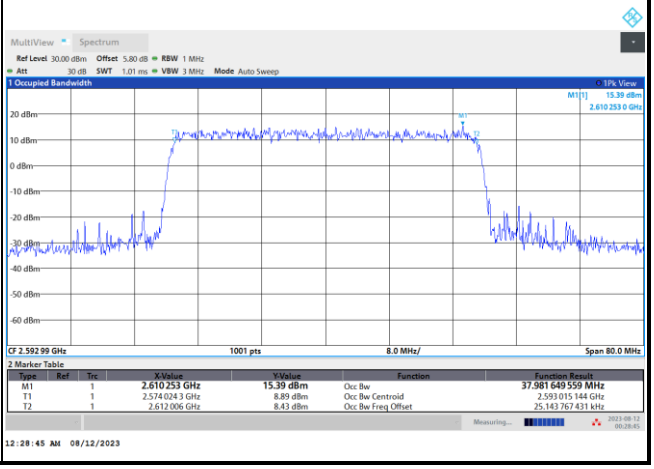
64QAM

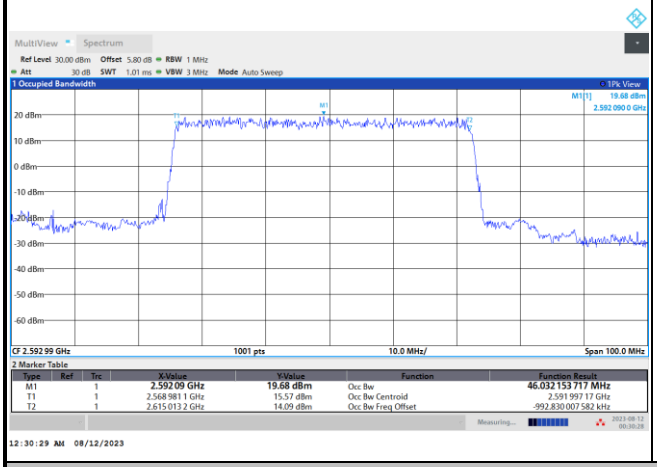


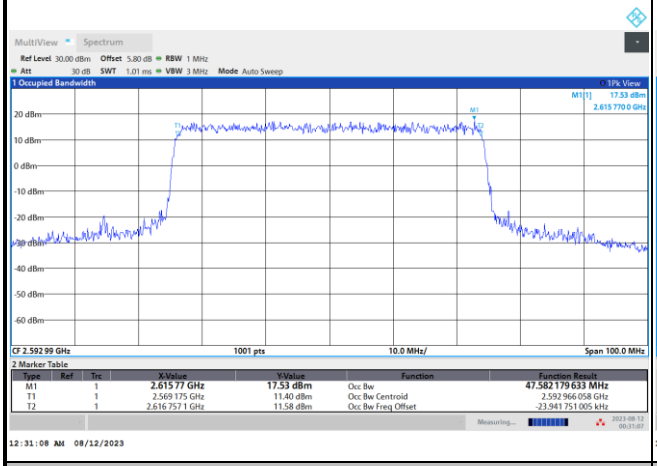
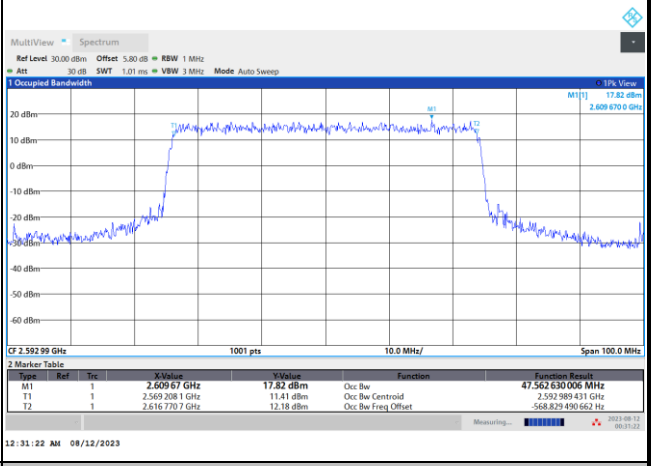
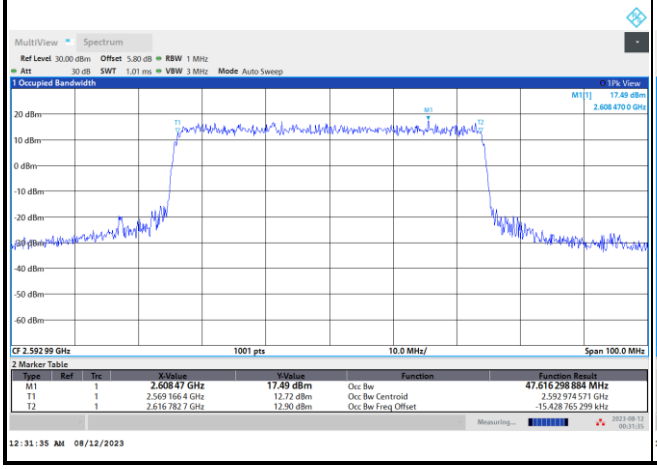
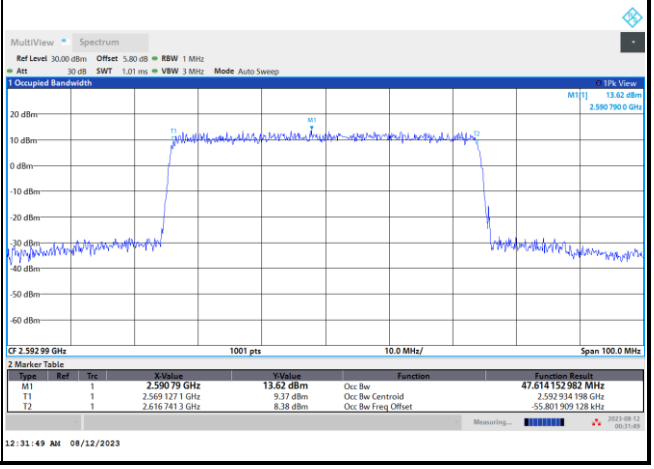
256QAM

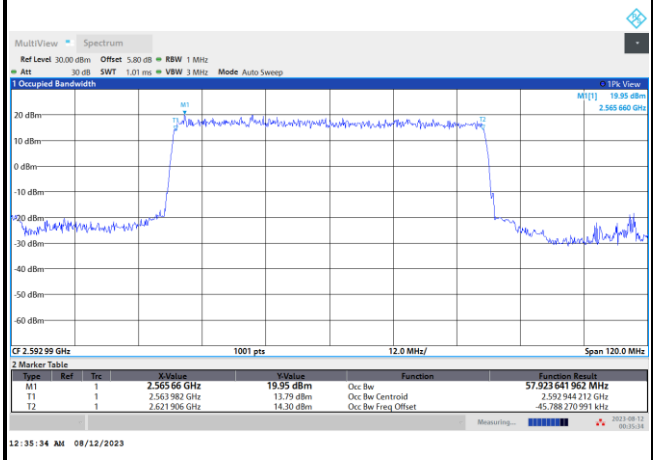


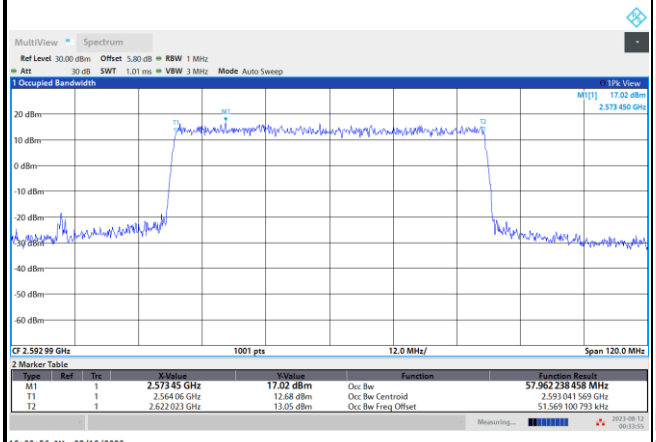
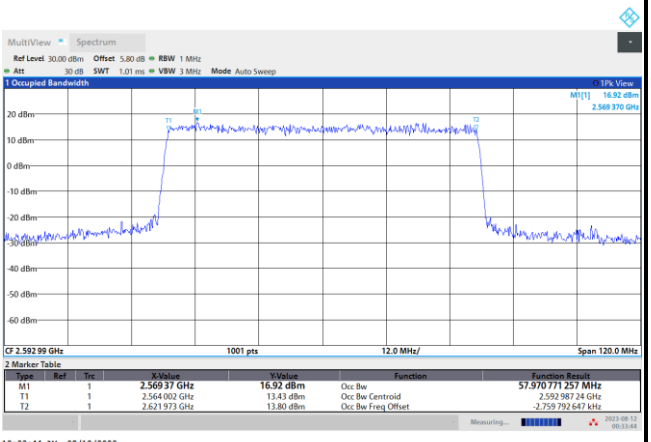
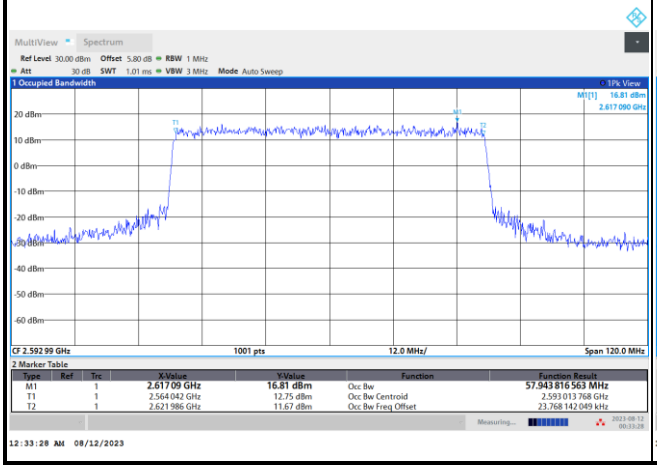
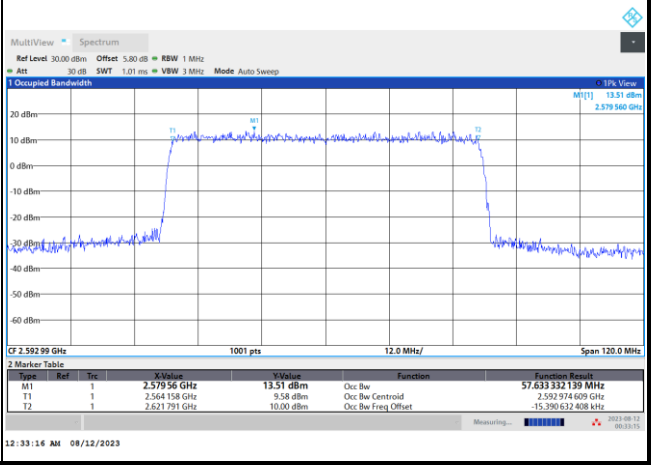
FR1 n41 / 40MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

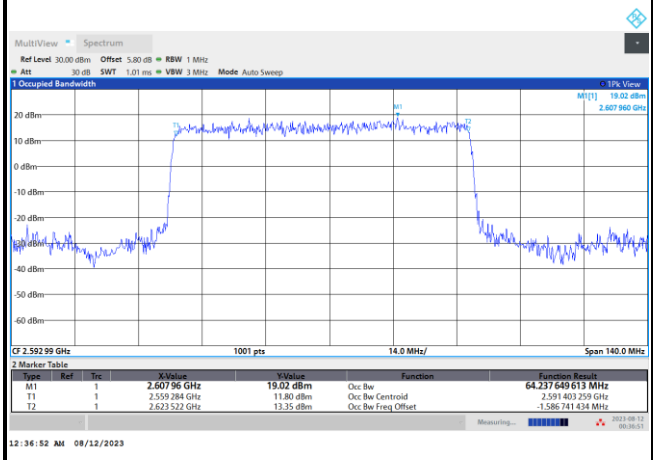
FR1 n41 / 40MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

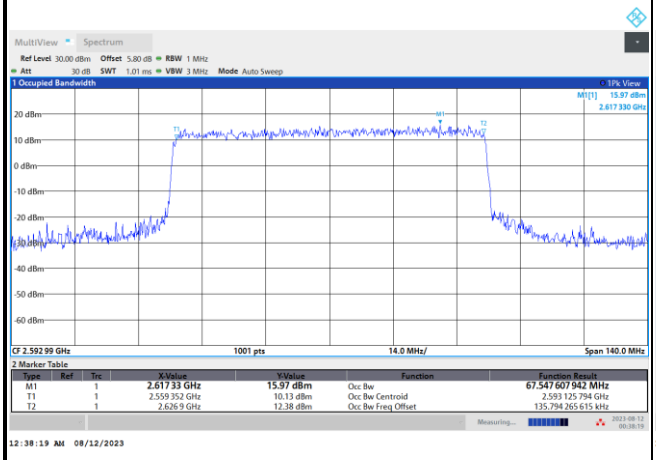
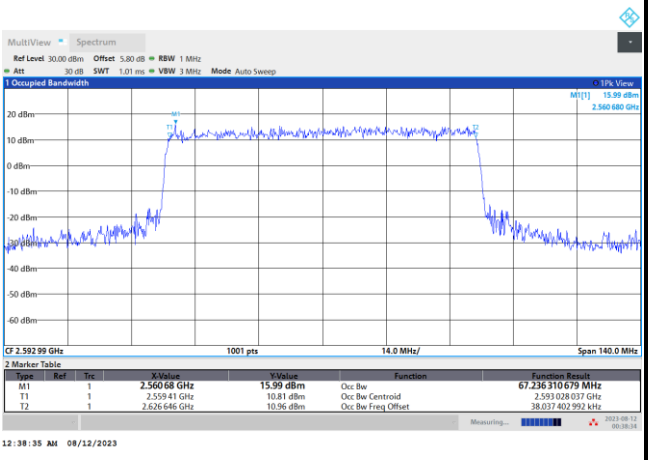
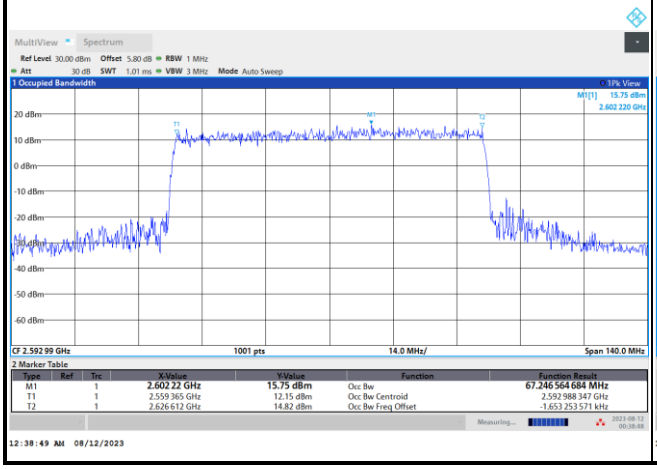
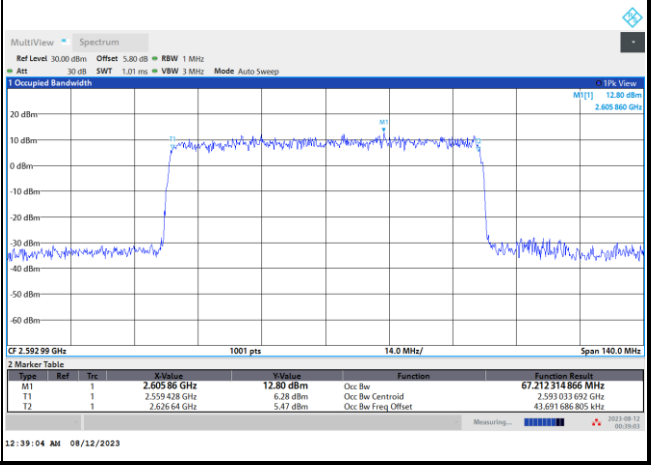
FR1 n41 / 50MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

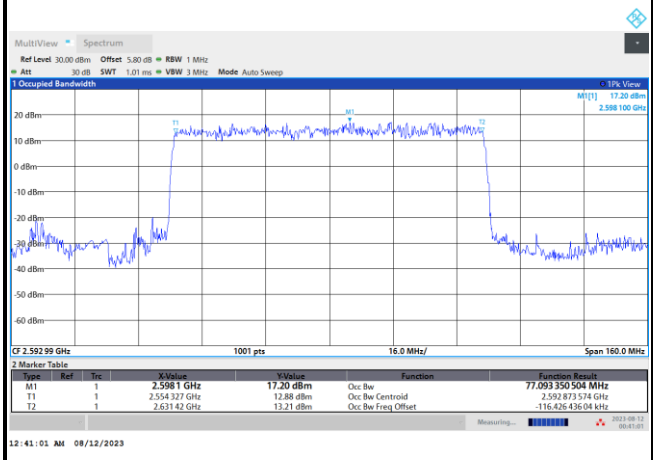
FR1 n41 / 50MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

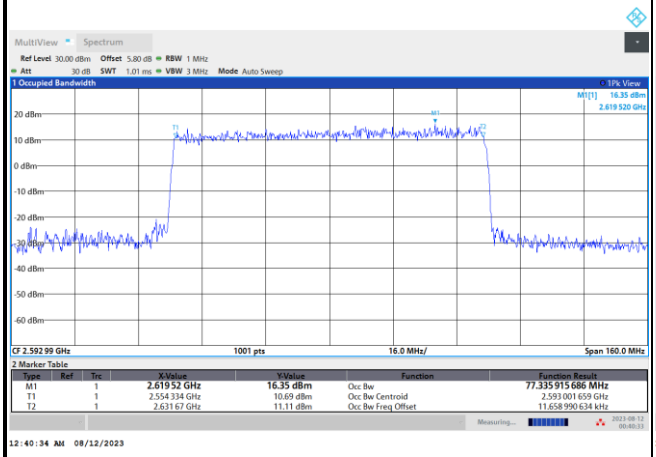
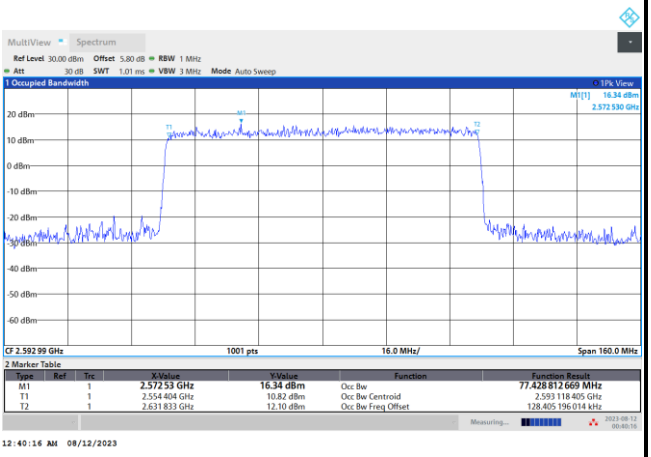
FR1 n41 / 60MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

FR1 n41 / 60MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

FR1 n41 / 70MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

FR1 n41 / 70MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM
	

FR1 n41 / 80MHz / DFT-S OFDM / Middle Channel / Full RB	
PI/2 BPSK	
	

FR1 n41 / 80MHz / CP OFDM / Middle Channel / Full RB	
QPSK	16QAM
	
64QAM	256QAM