FCC RF Test Report

APPLICANT	:	Casa Systems, Inc.
EQUIPMENT	:	Apex Enterprise Femto cell (E-Femto) (B4/B13/B66 Plus N48/N77)
BRAND NAME	:	APEX Femto for Enterprise (eFemto)
MODEL NAME	:	5G2101-48
FCC ID	:	2AO385G2101-48
STANDARD	:	47 CFR Part 2, 27(O)
CLASSIFICATION	:	Licensed Non-Broadcast Station Transmitter (TNB)
TEST DATE(S)	:	Oct. 17, 2022 ~ Nov. 03, 2022

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown compliance with the applicable technical standards.

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

Jason Jia

Approved by: Jason Jia

ACCREDITED Cert #5145.02

Sporton International Inc. (Kunshan)
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG282511B	Rev. 01	Initial issue of report	Nov. 04, 2022

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting Only	PASS	-
	§27.50(j)(2)	Equivalent Isotropic Radiated Power (5G NR n77)	EIRP < 1640 Watt		
3.5	§24.232(d) §27.50(j)(4)	Peak-to-Average Ratio	<13 dB	PASS	-
3.6	§2.1049	Occupied Bandwidth	Reporting Only	PASS	-
3.7	§2.1051 §27.53(l)(2)	Conducted Band Edge (5G NR n77)	< -13 dBm/MHz	PASS	-
3.8	§2.1051 §27.53(l)(1)	Conducted Spurious Emission (5G NR n77)	< -13 dBm/MHz	PASS	-
3.9	§2.1055 §27.54	Frequency Stability Temperature & Voltage	Within Authorized Band	PASS	-
4.4	§2.1053 §27.53(l)(2)	Radiated Spurious Emission (5G NR n77)	< -13 dBm/MHz	PASS	Under limit 45.59 dB at 15180.00 MHz

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Applicant

Casa Systems, Inc.
100 Old River Road Andover MA 01810 USA

1.2 Manufacturer

Casa Systems, Inc.
100 Old River Road Andover MA 01810 USA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Apex Enterprise Femto cell (E-Femto) (B4/B13/B66 Plus N48/N77)
Brand Name	APEX Femto for Enterprise (eFemto)
Model Name	5G2101-48
FCC ID	2AO385G2101-48
HW Version	V02
SW Version	R1.0
EUT Stage	Production Unit

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	5G NR n77: 3700 MHz ~ 3980 MHz
Rx Frequency	5G NR n77: 3700 MHz ~ 3980 MHz
EN-DC	4A_n77A, 13A_n77A, 66A_n77A
SCS	30kHz
Bandwidth	n77: 60 / 100MHz
Maximum Conducted Power	External Ant.<1+2>: 30.75 dBm Internal Ant.<3+4>: 30.34 dBm
Antenna Gain	**External Ant. 3:** n77 : 8.0 dBi **External Ant. 4:** n77 : 8.0 dBi **Internal Ant. 3:** n77 : 6.18 dBi **Internal Ant. 4:** n77 : 7.35 dBi
Type of Modulation	5G NR: CP-OFDM (64QAM / 256QAM)

Remark:

1. The maximum ERP/EIRP is calculated from max output power and max antenna gain, only the maximum ERP/EIRP of External Antenna is shown on the report for MIMO mode.
2. 5GNR Tx is non-signaling mode.
3. The base station only support 5GNR full RB.
4. For SISO & MIMO mode, the testing has assessed only MIMO mode by referring to the higher

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

5. For Internal & External Antenna, they are the same transmitter, thus Conducted items only test External antenna port by referring to higher output power, and RSE test both Internal & External Antenna.
6. The Internal Antenna and External Antenna support manual switch, the Internal & External antenna can't work at the same time, thus MIMO mode only support MIMO <Internal Ant.3+4> or MIMO <External Ant.3+4>, not support MIMO <Internal Ant.3/4 + External Ant.3/4>.
7. The UUT supports SA and NSA, RSE has assessed FTM mode "LTE + 5G NR simultaneous transmission" to cover EN-DC test requirements.

1.5 Modification of EUT

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

1.6 Maximum EIRP Power and Emission Designator

5G NR n77 SA		64QAM / 256QAM	
BW (MHz)	**Frequency Range (MHz)**	**Maximum EIRP(W)**	**Emission Designator (99%OBW)**
60	3730.02 ~ 3949.98	7.2778	58M4W7D
100	3750.00 ~ 3930.00	7.4989	98M1W7D

Note: All modulations have been tested, only the worst test results are shown in the report.

1.7 Testing Location

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

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	03CH04-KS TH01-KS	CN1257	314309

1.8 Test Software

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

1.9 Applicable Standards

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

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

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

2 Test Configuration of Equipment Under Test

2.1 Test Mode

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

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

The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.

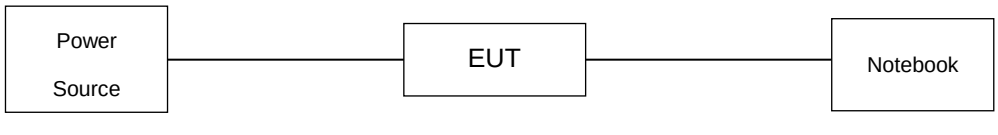
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			

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

Note

1. The mark "**v** " means that this configuration is chosen for testing
2. The mark "-" means that this bandwidth is not supported.
3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.
4. Based on engineering evaluation, only the worst modulations test results are shown in the report.
5. Frequency Stability：Normal Voltage = 12V ；Low Voltage =11.4V.；High Voltage =12.6V

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.	DC Power Supply	GW	GPS-3030D	N/A	N/A	Unshielded, 1.8 m
2.	Notebook	Lenovo	G480	QDS-BRCM1050I	N/A	Unshielded AC I/P cable 1.8m

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 7.8 dB and 10dB attenuator.

Example :

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

= 7.8 + 10 = 17.8 (dB)

2.5 Frequency List of Low/Middle/High Channels

5G n77 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
100	Channel	650000	656000	662000
	Frequency	3750	3840	3930
60	Channel	648668	656000	663332
	Frequency	3730.02	3840	3949.98

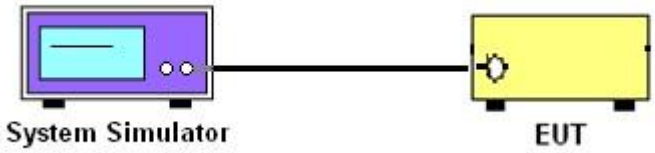
3 Conducted Test Items

3.1 Measuring Instruments

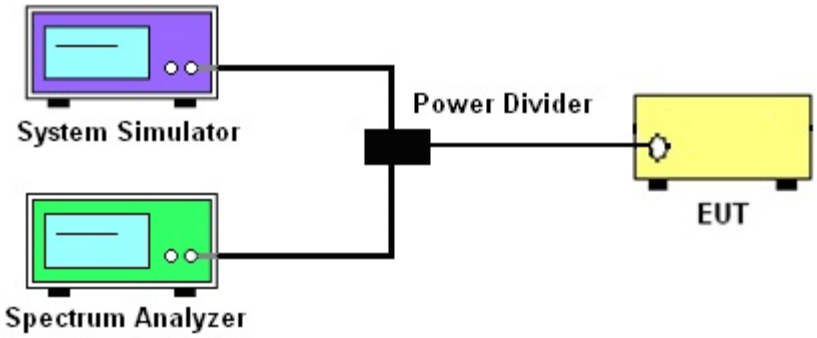
See list of measuring instruments of this test report.

3.2 Test Setup

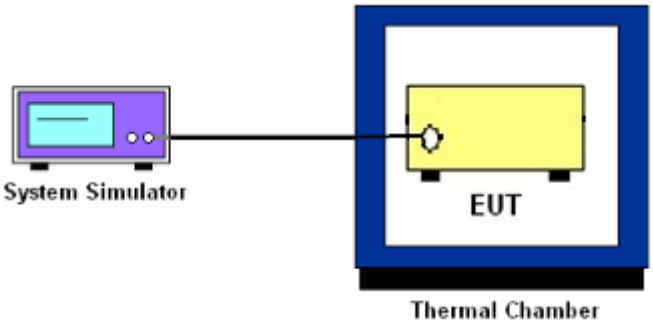
3.2.1 Conducted Output Power



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



3.2.3 Frequency Stability



3.3 Test Result of Conducted Test

Please refer to Appendix A.

3.4 Conducted Output Power and EIRP

3.4.1 Description of the Conducted Output Power Measurement and EIRP Measurement

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

The EIRP of base station must not exceed 1640 Watts for 5G NR n77 (3700~3980MHz).

According to KDB 412172 D01 Power Approach,

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

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

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

3.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2
2. The transmitter output port was connected to the system simulator.
3. Set EUT at maximum power through the system simulator.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure and record the power level from the system simulator.

3.5 Peak-to-Average Ratio

3.5.1 Description of the PAR Measurement

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

3.5.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2.3.4 (CCDF).
2. The EUT was connected to spectrum and system simulator via a power divider.
3. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
4. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
5. Record the deviation as Peak to Average Ratio.

3.6 Occupied Bandwidth

3.6.1 Description of Occupied Bandwidth Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

3.6.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.4
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be between two and five times the anticipated OBW.
4. The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
5. Set the detection mode to peak, and the trace mode to max hold.
6. Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace. (this is the reference value)
7. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
8. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “–X dB down amplitude” determined in step 6. If a marker is below this “-X dB down amplitude” value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.
9. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

3.7 Conducted Band Edge

3.7.1 Description of Conducted Band Edge Measurement

27.53(l)(1)

For base station operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz.

Compliance with this paragraph (l)(1) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

3.7.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured.
4. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
5. Beyond the 1 MHz band from the band edge, RBW=1MHz was used or a narrower RBW was used (generally limited to no less than 1% of the OBW) and the measured power was integrated over the full required measurement bandwidth.
6. Set spectrum analyzer with RMS detector.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. Offset has included the duty factor for Band n77. Duty factor =10 log (1/x), where x is the measured duty cycle
9. Checked that all the results comply with the emission limit line.
   Example:
   The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB) = -13dBm.
10. When using the integration method, the starting frequency of the integration shall be centered at one-half of the RBW away from the band edge.

3.8 Conducted Spurious Emission

3.8.1 Description of Conducted Spurious Emission Measurement

For base station operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10^{th} harmonic.

3.8.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
7. Set spectrum analyzer with RMS detector.
8. Taking the record of maximum spurious emission.
9. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
10. Offset has included the duty factor for Band n77. Duty factor =10 log (1/x), where x is the measured duty cycle
11. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.

3.9 Frequency Stability

3.9.1 Description of Frequency Stability Measurement

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

3.9.2 Test Procedures for Temperature Variation

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

3.9.3 Test Procedures for Voltage Variation

1. The testing follows ANSI C63.26 section 5.6.5
2. The EUT was placed in a temperature chamber at 20±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.

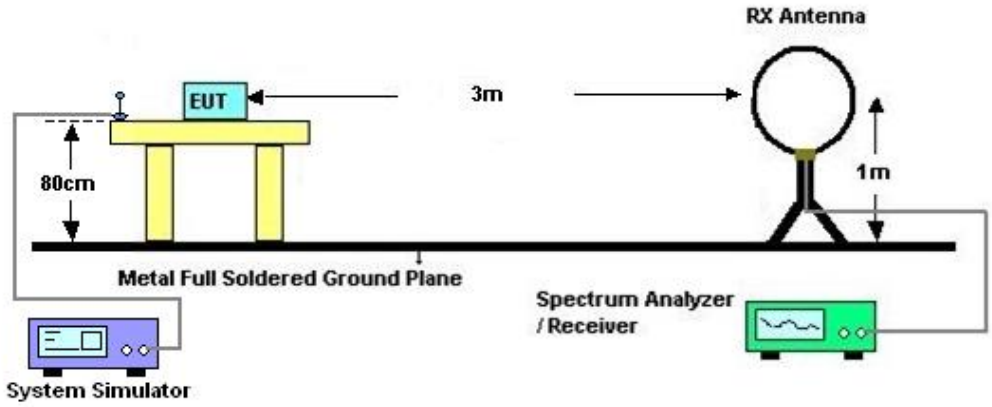
4 Radiated Test Items

4.1 Measuring Instruments

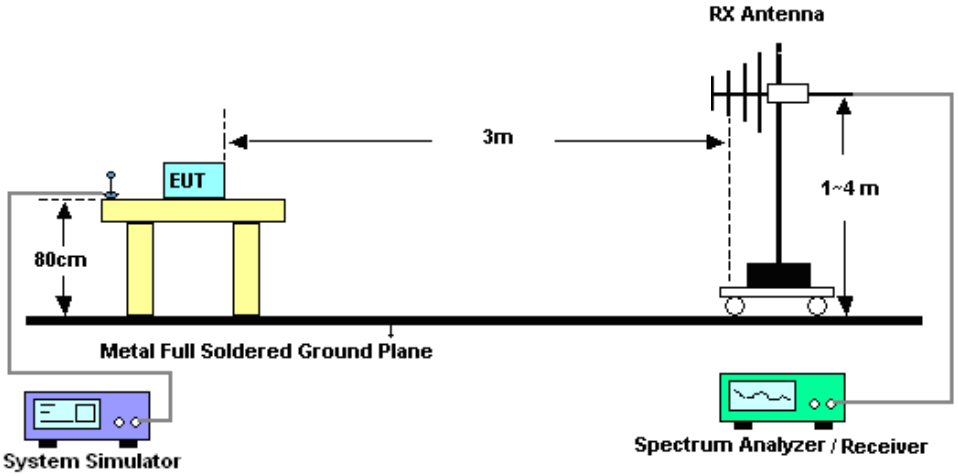
See list of measuring instruments of this test report.

4.2 Test Setup

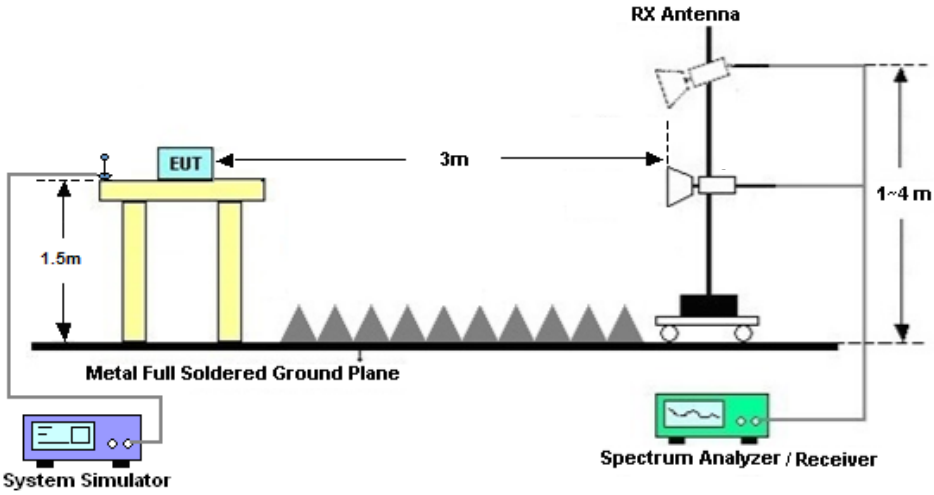
4.2.1 For radiated test below 30MHz



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

4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI C63.26.

For base station operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz.

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

4.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
2. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
6. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
7. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
8. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
9. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
10. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
11. ERP (dBm) = EIRP - 2.15
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
    The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 12, 2022	Oct. 17, 2022~ Nov. 03, 2022	Oct. 11, 2023	Conducted (TH01-KS)
Power divider	STI	STI08-0055	-	0.5~40GHz	Aug. 25, 2022	Oct. 17, 2022~ Nov. 03, 2022	Aug. 24, 2023	Conducted (TH01-KS)
Temperature & humidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 15, 2022	Oct. 17, 2022~ Nov. 03, 2022	Jul. 14, 2023	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY57471079	10Hz-44G,MAX 30dB	Oct. 12, 2022	Oct. 20, 2022	Oct. 11, 2023	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 30, 2021	Oct. 20, 2022	Oct. 29, 2022	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	May 24, 2022	Oct. 20, 2022	May 23, 2023	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1284	1GHz~18GHz	Jan. 05, 2022	Oct. 20, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2022	Oct. 20, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Jan. 05, 2022	Oct. 20, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
Amplifier	Agilent	8449B	3008A02370	1Ghz-18Ghz	Oct. 12, 2022	Oct. 20, 2022	Oct. 11, 2023	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40G GA	060728	18~40GHz	Jan. 05, 2022	Oct. 20, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Oct. 20, 2022	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Oct. 20, 2022	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Oct. 20, 2022	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required

6 Uncertainty of Evaluation

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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.3dB**

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.8dB**

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

Appendix A. Test Results of Conducted Test

Test Engineer :	Simle Wang	Temperature :	22~23℃
		Relative Humidity :	40~42%

Conducted Output Power(Average power) and EIRP

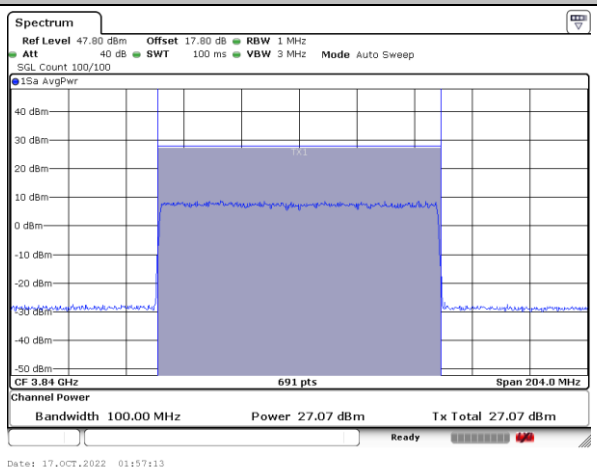
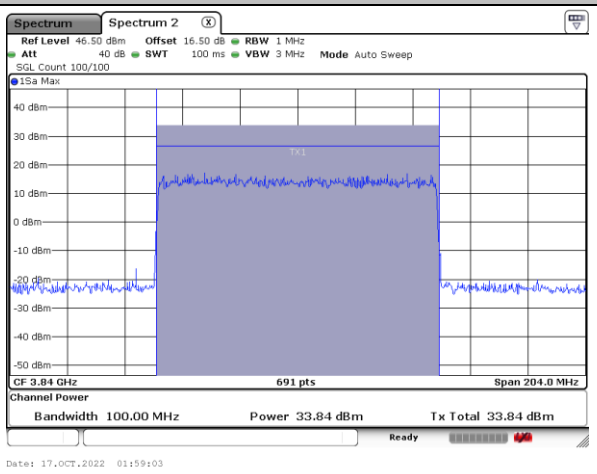
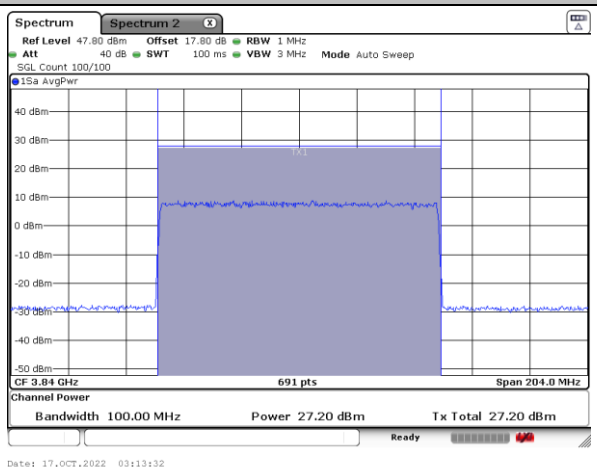
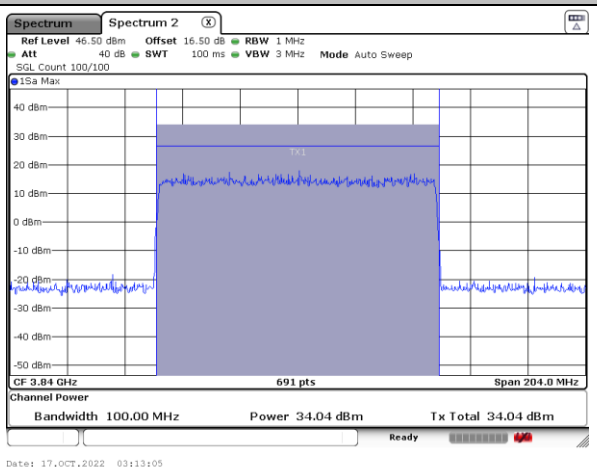
MIMO External Antenna <3+4>:

Ant	BW	Type of Modulation	Channel	Frequency MHz	Power	Gain	EIRP
3+4	60M	64QAM	648668	3730.02	30.46	8	7.0146
		64QAM	656000	3840	30.43	8	6.9663
		64QAM	663332	3949.98	30.26	8	6.6988
	100M	64QAM	650000	3750	30.75	8	7.4989
		64QAM	656000	3840	30.49	8	7.0632
		64QAM	662000	3930	30.49	8	7.0632
3+4	60M	256QAM	648668	3730.02	30.58	8	7.2111
		256QAM	656000	3840	30.62	8	7.2778
		256QAM	663332	3949.98	30.26	8	6.6988
	100M	256QAM	650000	3750	30.59	8	7.2277
		256QAM	656000	3840	30.41	8	6.9343
		256QAM	662000	3930	30.39	8	6.9024

n77_MIMO Ant 3

Peak-to-Average Ratio

Mode	FR1 n77 / 100MHz / OFDM		
Mod.	100M		Limit: 13dB
RB Size	64QAM	256QAM	Result
Middle CH	6.77	6.84	PASS

64QAM-Average	64QAM-Peak
	
256QAM-Average	**256QAM-Peak**
	

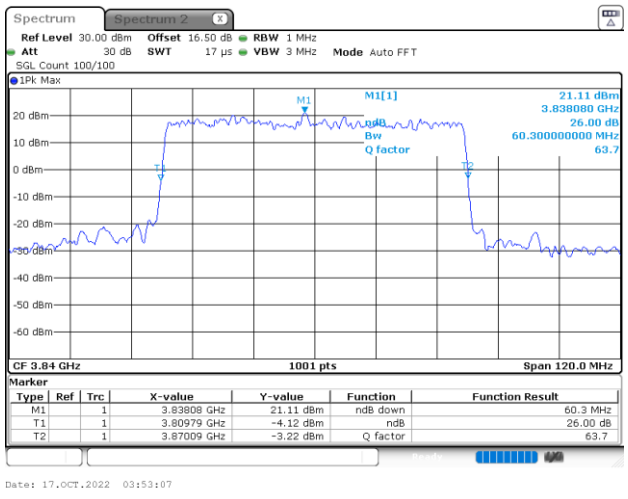
Note: PAR = Peak - Average

26dB Bandwidth

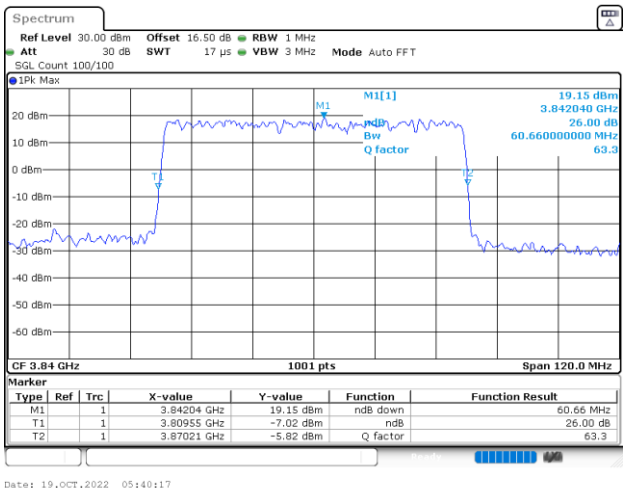
Mode	FR1 n77 : 26dB BW(MHz) / OFDM	
BW	60M	
Mod.	64QAM	256QAM
Middle CH	60.3	60.66
BW	100M	
Mod.	64QAM	256QAM
Middle CH	102.5	102.5

60M

64QAM

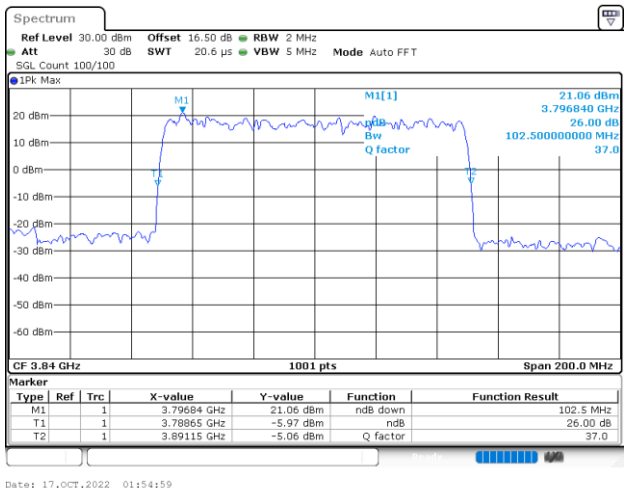


256QAM

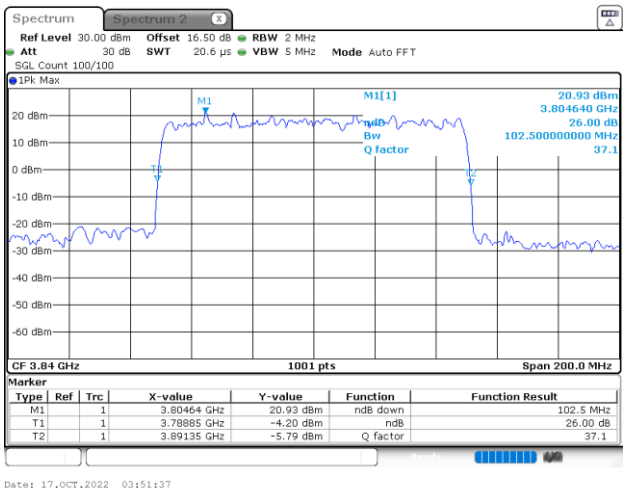


100M

64QAM



256QAM

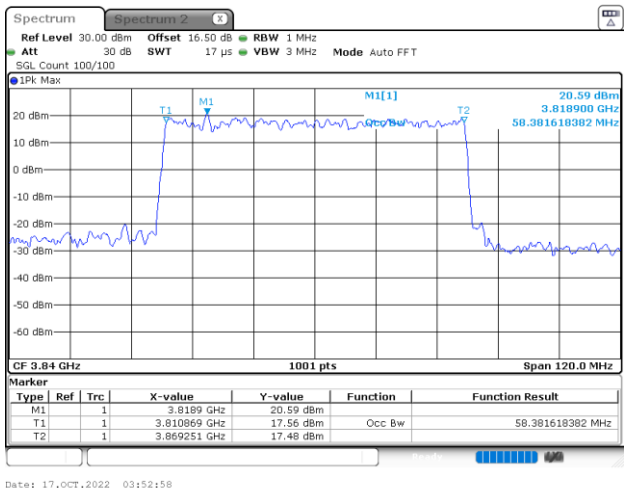


Occupied Bandwidth

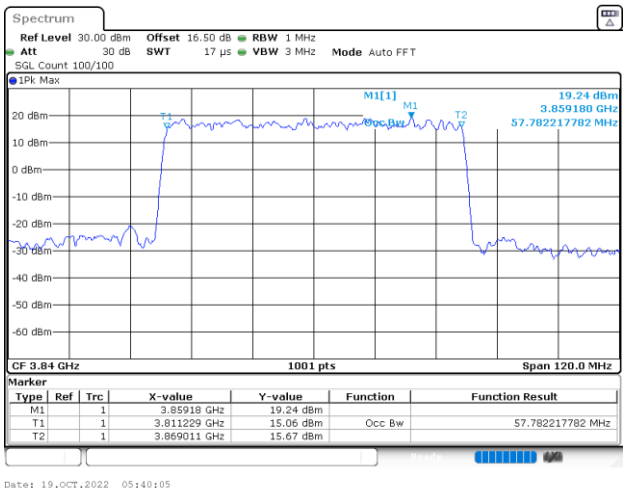
Mode	FR1 n77: OB BW(MHz) / OFDM	
BW	60M	
Mod.	64QAM	256QAM
Middle CH	58.38	57.78
BW	100M	
Mod.	64QAM	256QAM
Middle CH	98.10	97.70

60M

64QAM

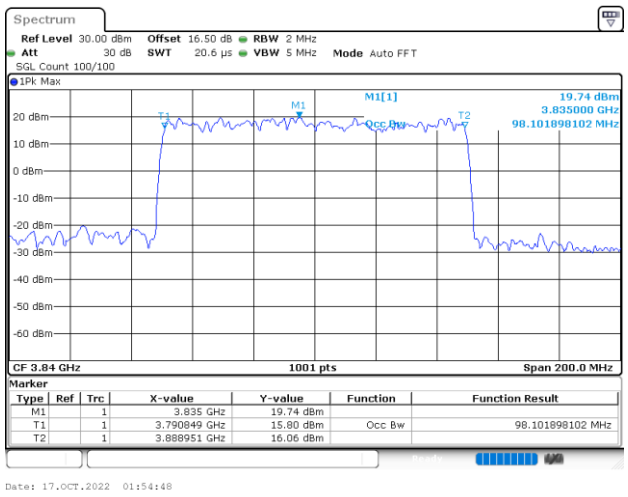


256QAM

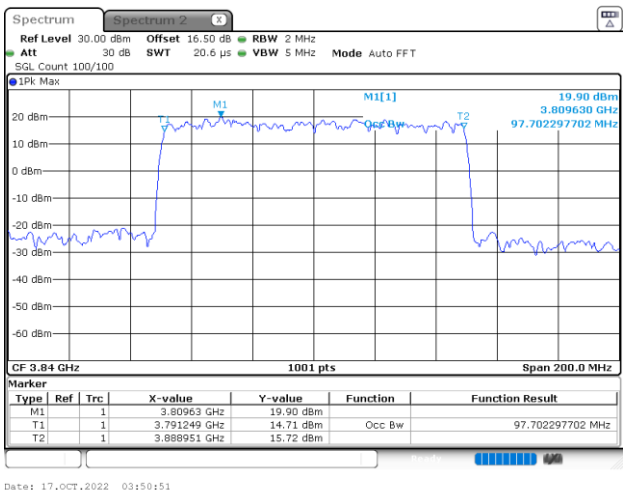


100M

64QAM



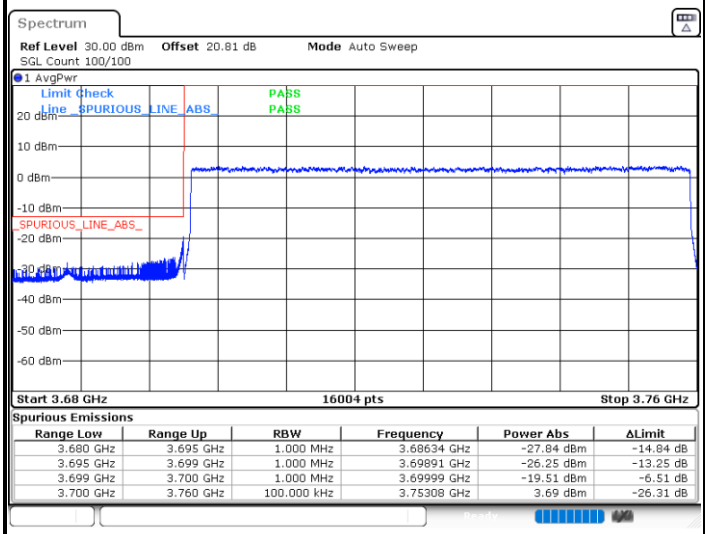
256QAM



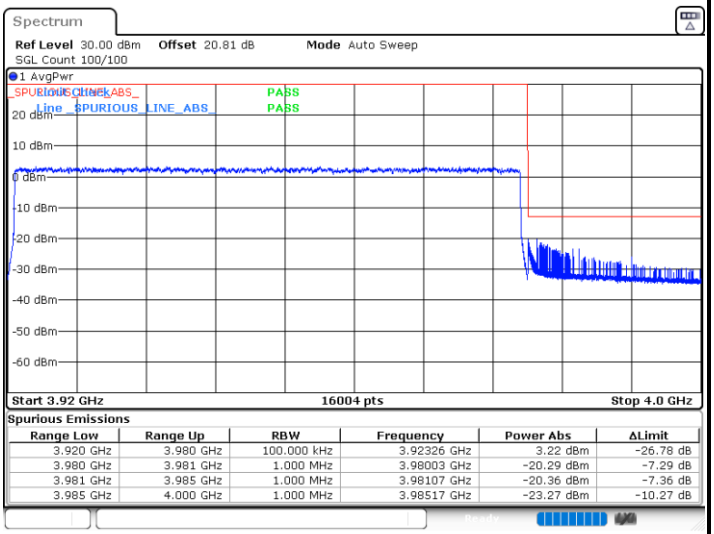
Conducted Band Edge

FR1 n77/ 60MHz / 64QAM

Lowest Band Edge / Full RB

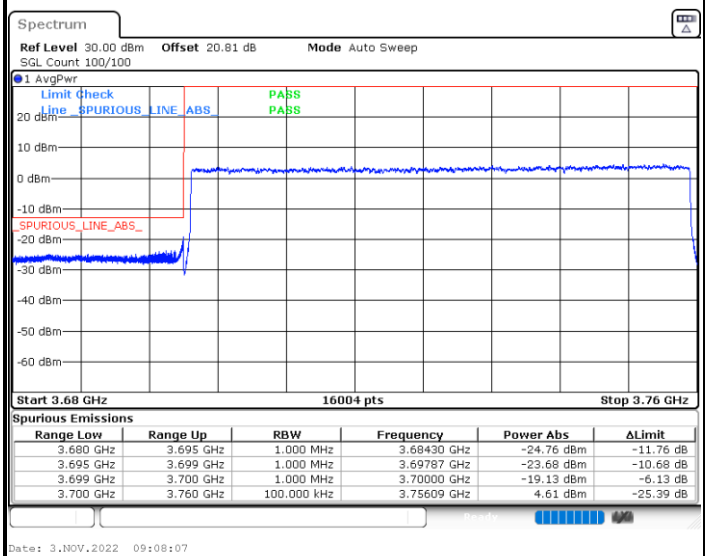


Highest Band Edge / Full RB

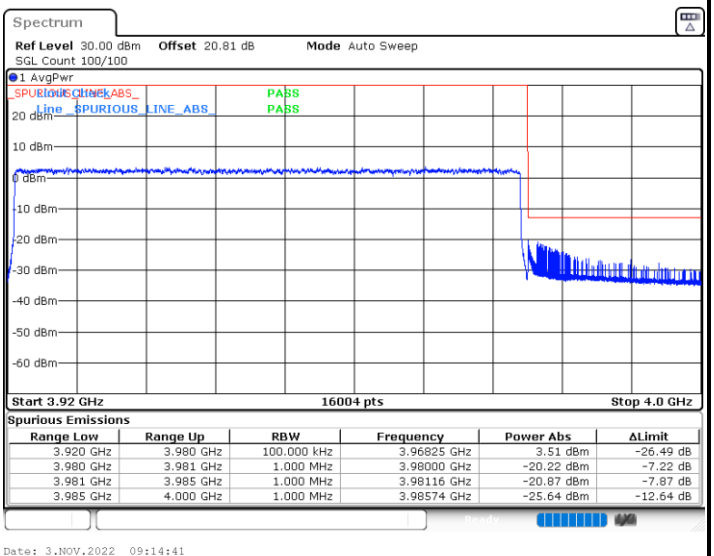


FR1 n77 / 60MHz / 256QAM

Lowest Band Edge / Full RB

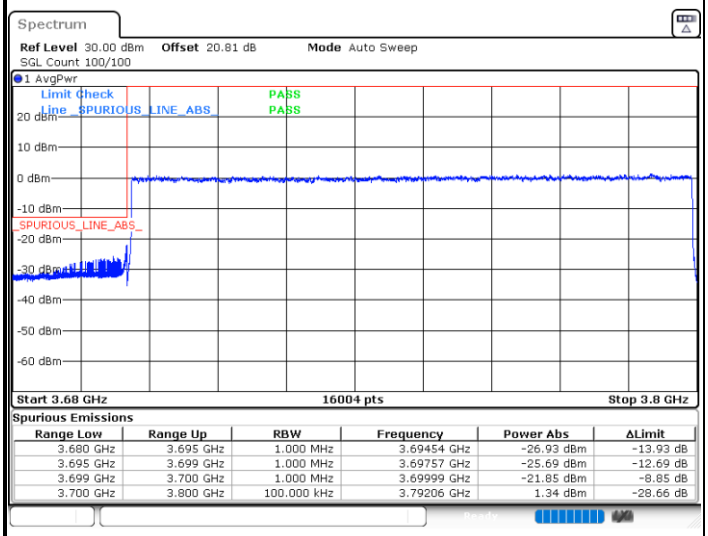


Highest Band Edge / Full RB

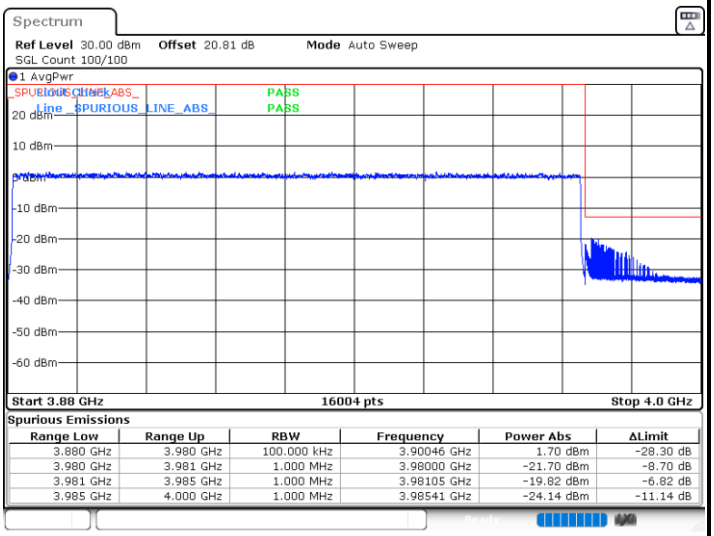


FR1 n77 / 100MHz / OFDM / 64QAM

Lowest Band Edge / Full RB

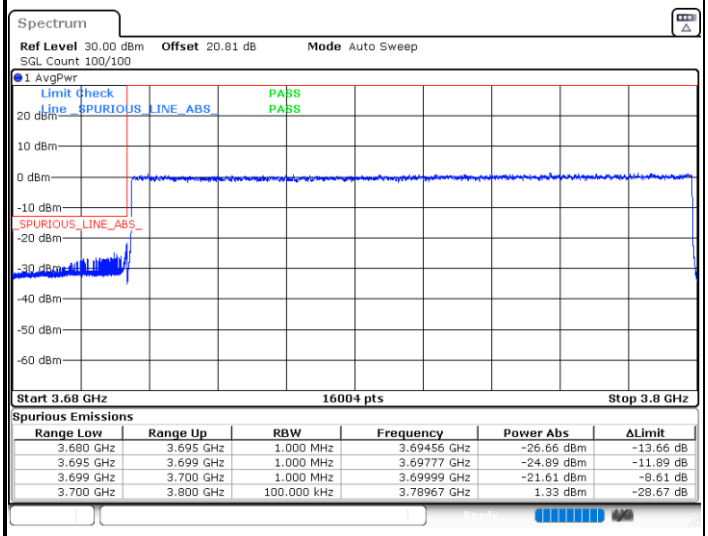


Highest Band Edge / Full RB

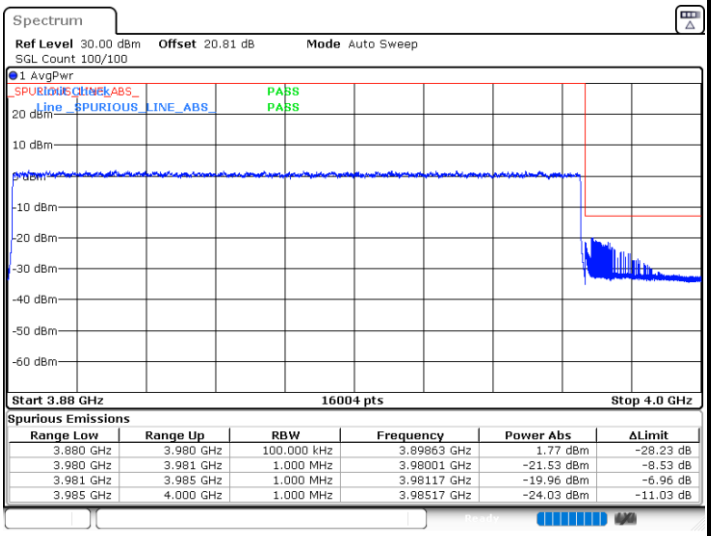


FR1 n77 / 100MHz / OFDM / 256QAM

Lowest Band Edge / Full RB



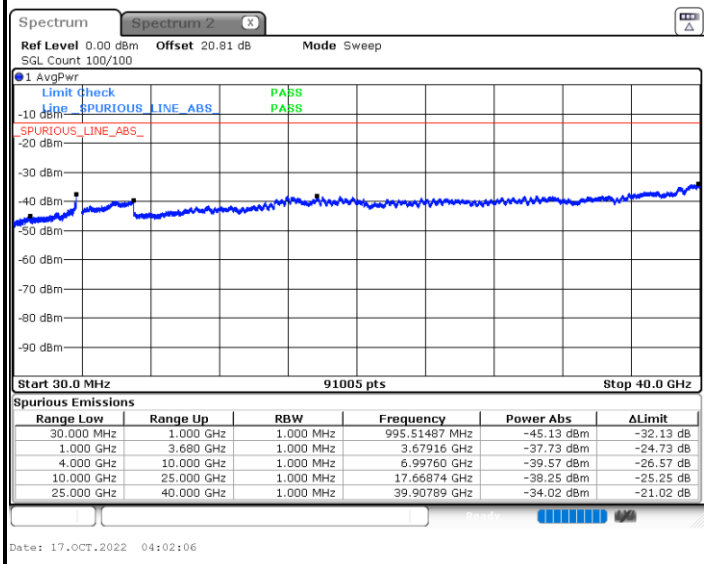
Highest Band Edge / Full RB



Conducted Spurious Emission

FR1 n77 / 60MHz / OFDM / 64QAM

Lowest Channel / FULL

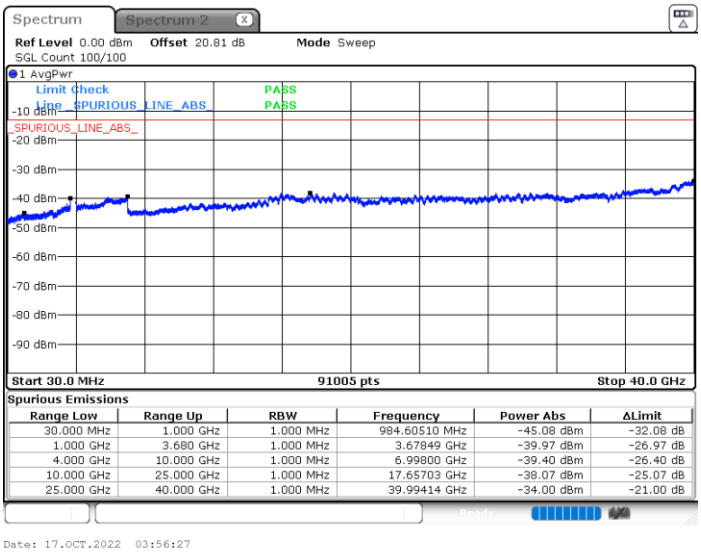


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	995.51487 MHz	-45.13 dBm	-32.13 dB
1.000 GHz	3.680 GHz	1.000 MHz	3.67916 GHz	-37.73 dBm	-24.73 dB
4.000 GHz	10.000 GHz	1.000 MHz	6.99760 GHz	-39.57 dBm	-26.57 dB
10.000 GHz	25.000 GHz	1.000 MHz	17.66874 GHz	-38.25 dBm	-25.25 dB
25.000 GHz	40.000 GHz	1.000 MHz	39.90789 GHz	-34.02 dBm	-21.02 dB

Date: 17.OCT.2022 04:02:06

Middle Channel / FULL

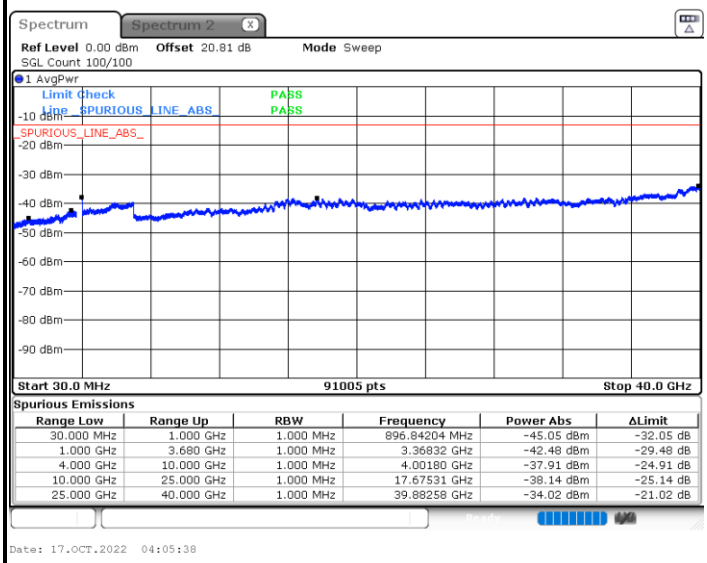


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	984.60510 MHz	-45.08 dBm	-32.08 dB
1.000 GHz	3.680 GHz	1.000 MHz	3.67849 GHz	-39.97 dBm	-26.97 dB
4.000 GHz	10.000 GHz	1.000 MHz	6.99800 GHz	-39.40 dBm	-26.40 dB
10.000 GHz	25.000 GHz	1.000 MHz	17.65703 GHz	-38.07 dBm	-25.07 dB
25.000 GHz	40.000 GHz	1.000 MHz	39.99414 GHz	-34.00 dBm	-21.00 dB

Date: 17.OCT.2022 03:56:27

Highest Channel / FULL



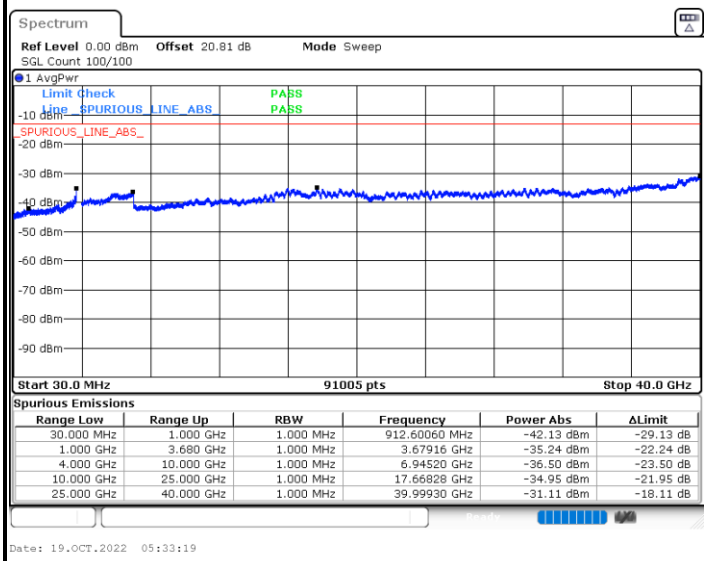
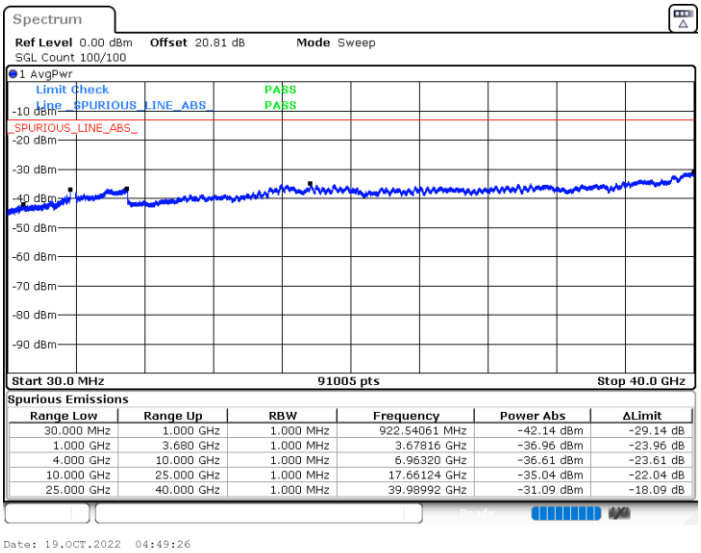
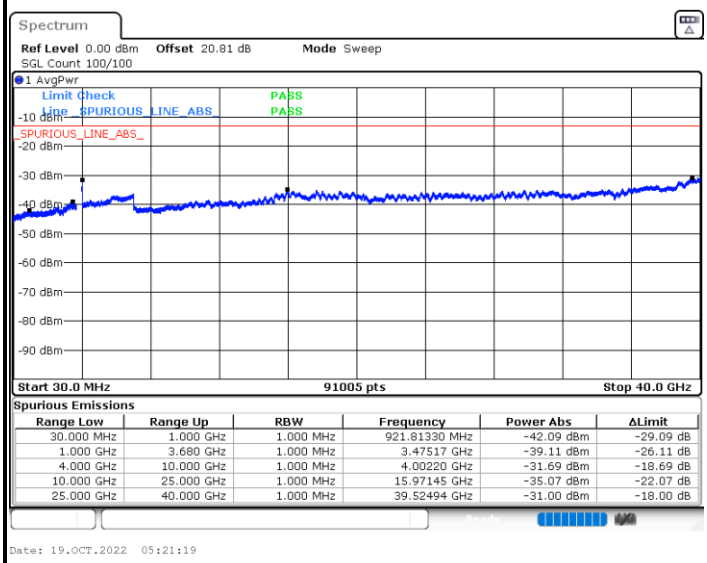
Spurious Emissions

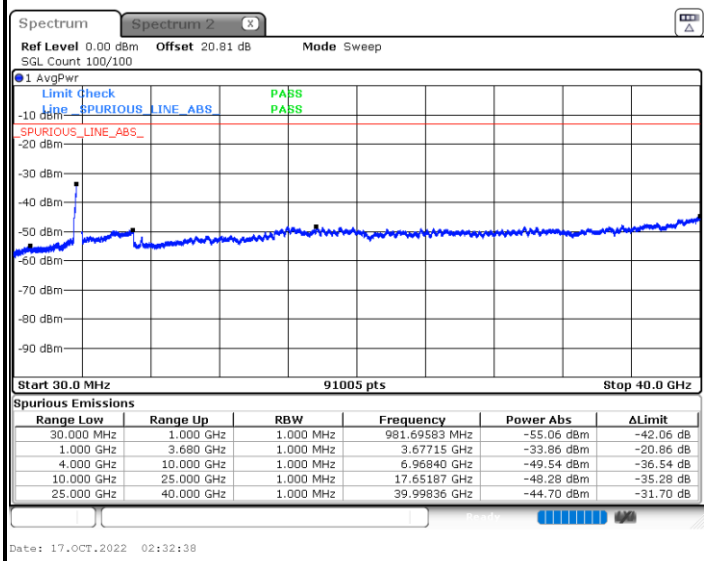
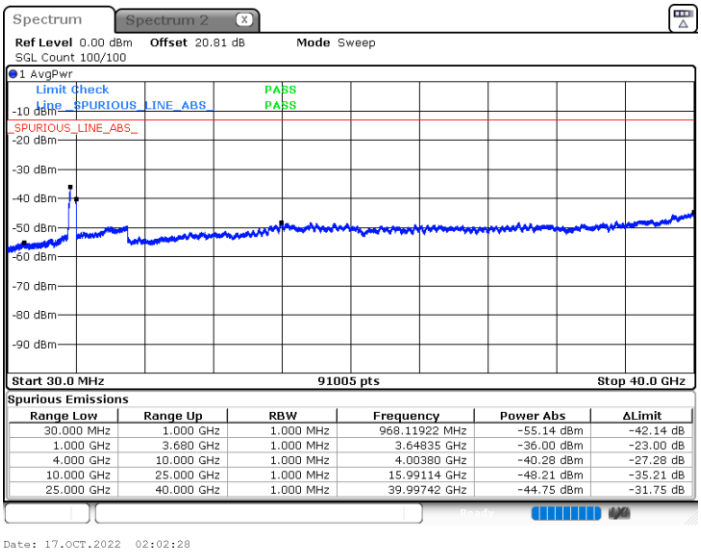
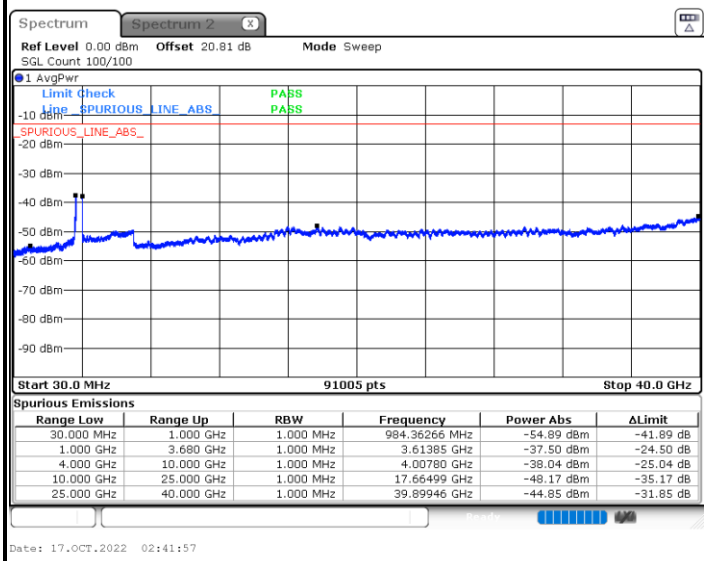
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	896.84204 MHz	-45.05 dBm	-32.05 dB
1.000 GHz	3.680 GHz	1.000 MHz	3.36832 GHz	-42.48 dBm	-29.48 dB
4.000 GHz	10.000 GHz	1.000 MHz	4.00180 GHz	-37.91 dBm	-24.91 dB
10.000 GHz	25.000 GHz	1.000 MHz	17.67531 GHz	-38.14 dBm	-25.14 dB
25.000 GHz	40.000 GHz	1.000 MHz	39.88258 GHz	-34.02 dBm	-21.02 dB

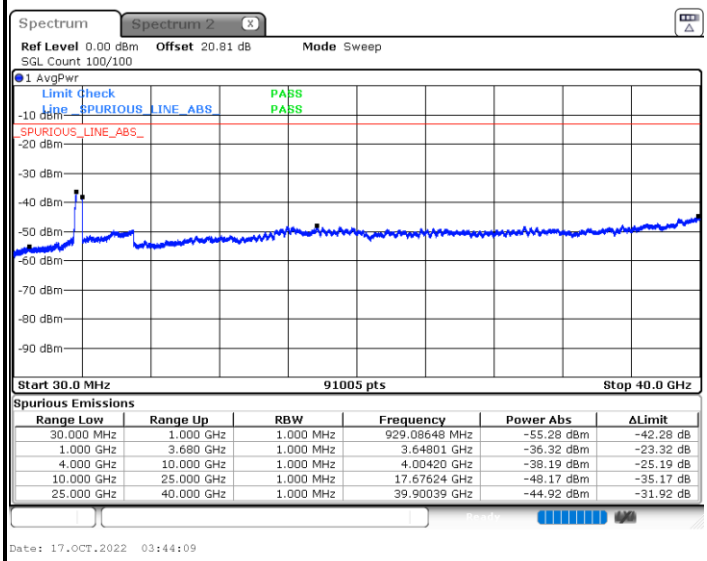
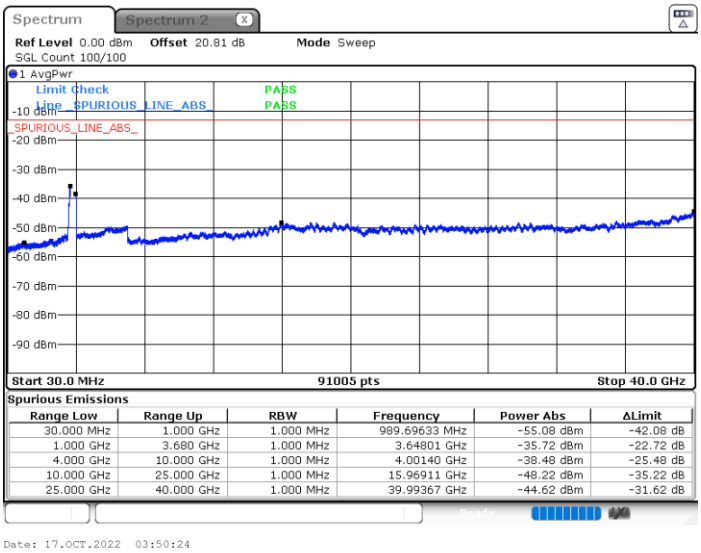
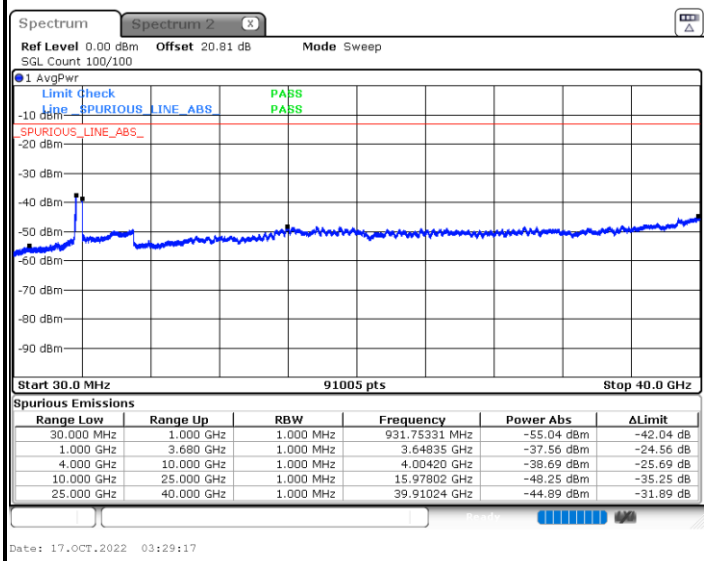
Date: 17.OCT.2022 04:05:38

N/A

N/A

FR1 n77 / 60MHz / OFDM / 256QAM	
Lowest Channel / FULL	**Middle Channel / FULL**
	
Highest Channel / FULL	**N/A**
	**N/A**

FR1 n77 / 100MHz / OFDM / 64QAM	
Lowest Channel / FULL	**Middle Channel / FULL**
 Spurious Emissions Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit 30.000 MHz | 1.000 GHz | 1.000 MHz | 981.69583 MHz | -55.06 dBm | -42.06 dB 1.000 GHz | 3.680 GHz | 1.000 MHz | 3.67715 GHz | -33.86 dBm | -20.86 dB 4.000 GHz | 10.000 GHz | 1.000 MHz | 6.96840 GHz | -49.54 dBm | -36.54 dB 10.000 GHz | 25.000 GHz | 1.000 MHz | 17.65187 GHz | -48.28 dBm | -35.28 dB 25.000 GHz | 40.000 GHz | 1.000 MHz | 39.99836 GHz | -44.70 dBm | -31.70 dB Date: 17.OCT.2022 02:32:38	 Spurious Emissions Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit 30.000 MHz | 1.000 GHz | 1.000 MHz | 968.11922 MHz | -55.14 dBm | -42.14 dB 1.000 GHz | 3.680 GHz | 1.000 MHz | 3.64835 GHz | -36.00 dBm | -23.00 dB 4.000 GHz | 10.000 GHz | 1.000 MHz | 4.00380 GHz | -40.28 dBm | -27.28 dB 10.000 GHz | 25.000 GHz | 1.000 MHz | 15.99114 GHz | -48.21 dBm | -35.21 dB 25.000 GHz | 40.000 GHz | 1.000 MHz | 39.99742 GHz | -44.75 dBm | -31.75 dB Date: 17.OCT.2022 02:02:28
Highest Channel / FULL	**N/A**
 Spurious Emissions Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit 30.000 MHz | 1.000 GHz | 1.000 MHz | 984.36266 MHz | -54.89 dBm | -41.89 dB 1.000 GHz | 3.680 GHz | 1.000 MHz | 3.61385 GHz | -37.50 dBm | -24.50 dB 4.000 GHz | 10.000 GHz | 1.000 MHz | 4.00780 GHz | -38.04 dBm | -25.04 dB 10.000 GHz | 25.000 GHz | 1.000 MHz | 17.66499 GHz | -48.17 dBm | -35.17 dB 25.000 GHz | 40.000 GHz | 1.000 MHz | 39.89946 GHz | -44.85 dBm | -31.85 dB Date: 17.OCT.2022 02:41:57	**N/A**

FR1 n77 / 100MHz / OFDM / 256QAM	
Lowest Channel / FULL	**Middle Channel / FULL**
	
Highest Channel / FULL	**N/A**
	**N/A**

Frequency Stability

Test Conditions		FR1 n77 (256QAM) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 60MHz	Note 2.
		Deviation (ppm)	Result
50	Normal Voltage	0.0012	PASS
40	Normal Voltage	0.0002	
30	Normal Voltage	0.0026	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0010	
0	Normal Voltage	0.0014	
-10	Normal Voltage	0.0021	
-20	Normal Voltage	0.0006	
-30	Normal Voltage	0.0030	
20	Maximum Voltage	0.0066	
20	Normal Voltage	0.0036	
20	Low Voltage	0.0031	

Note:

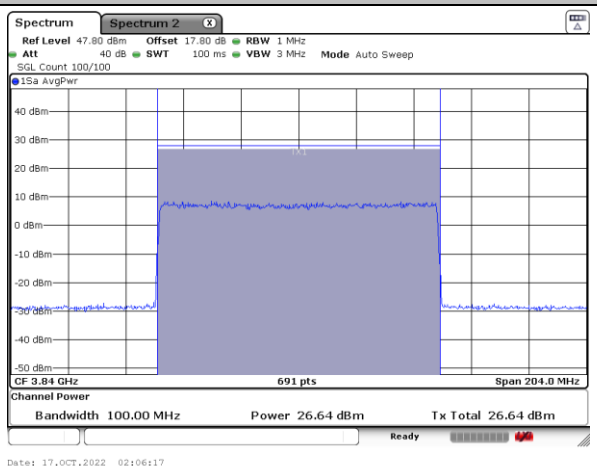
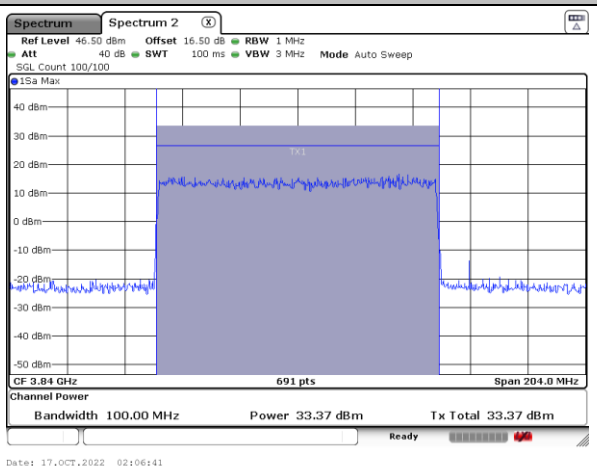
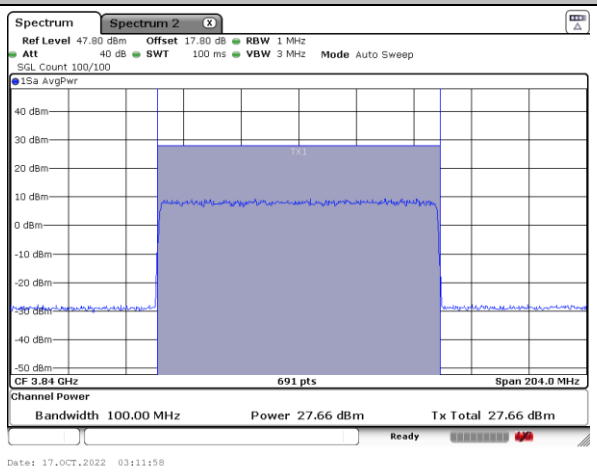
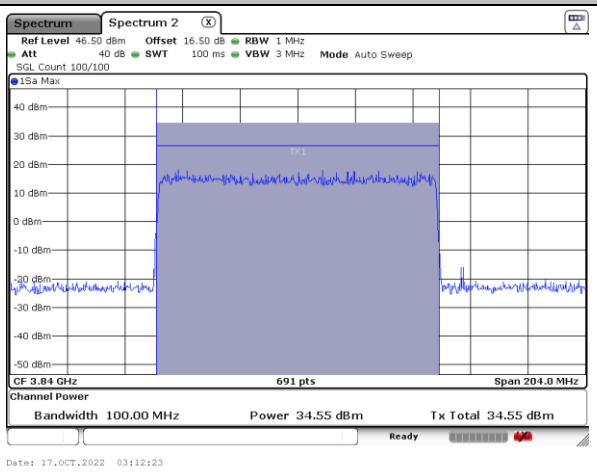
1. Normal Voltage = 12V ；Low Voltage =11.4V.；High Voltage =12.6V.

2. Note: The frequency fundamental emissions stay within the authorized frequency block.

n77_MIMO Ant 4

Peak-to-Average Ratio

Mode	FR1 n77 / 100MHz / OFDM		
Mod.	100M		Limit: 13dB
RB Size	64QAM	256QAM	Result
Middle CH	6.73	6.89	PASS

64QAM-Average	64QAM-Peak
	
256QAM-Average	**256QAM-Peak**
	

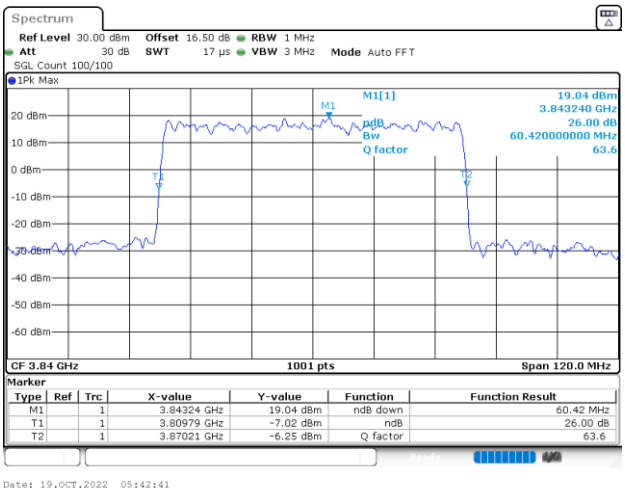
Note: PAR = Peak - Average

26dB Bandwidth

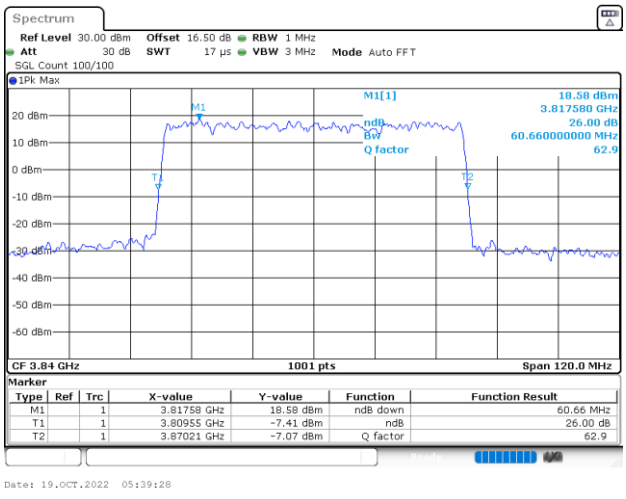
Mode	FR1 n77 : 26dB BW(MHz) / OFDM	
BW	60M	
Mod.	64QAM	256QAM
Middle CH	60.42	60.66
BW	100M	
Mod.	64QAM	256QAM
Middle CH	102.7	102.7

60M

64QAM

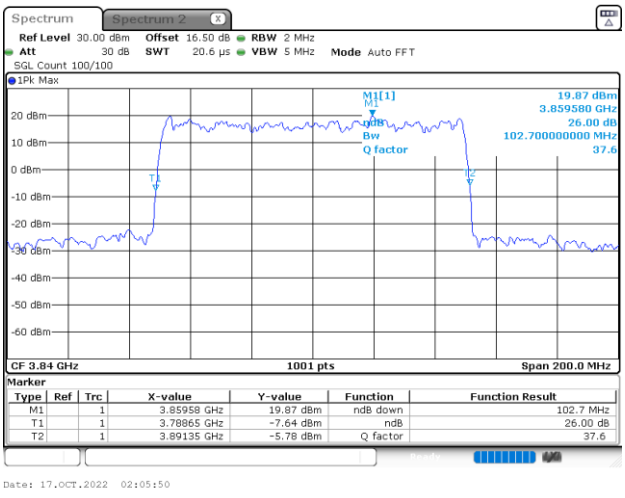


256QAM

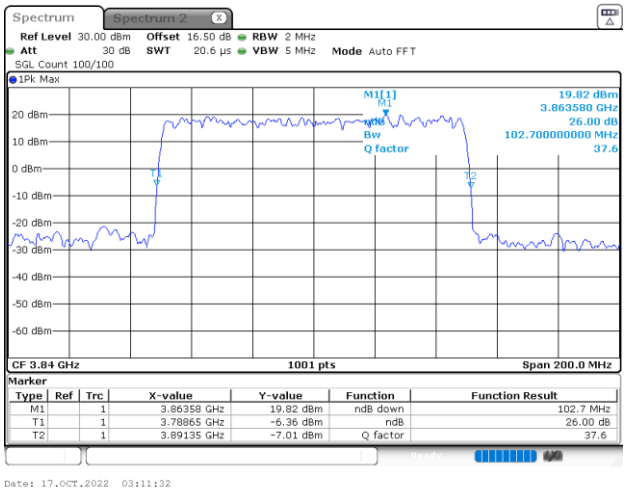


100M

64QAM



256QAM

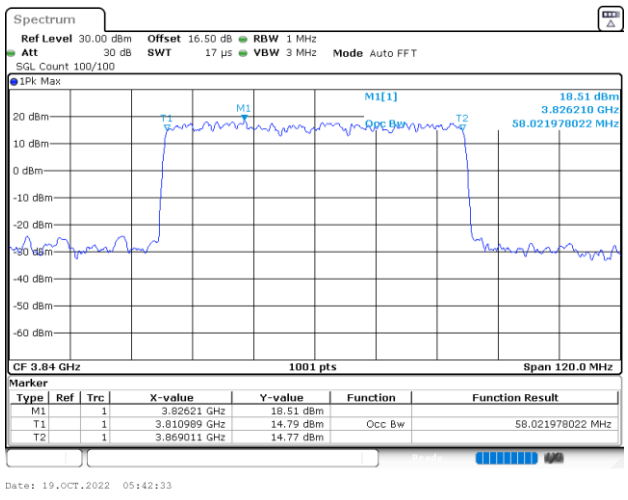


Occupied Bandwidth

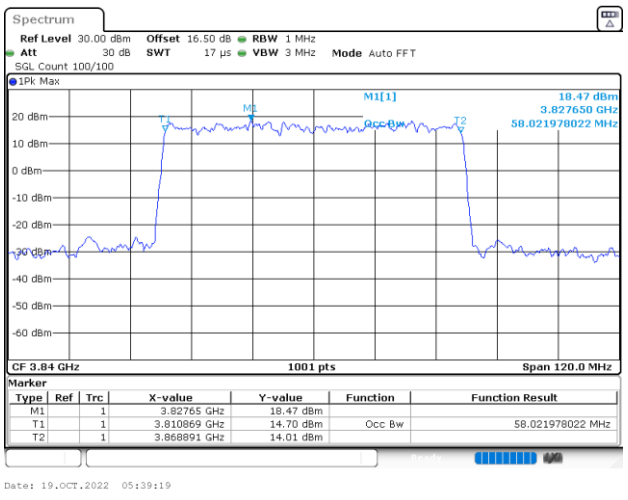
Mode	FR1 n77: OB BW(MHz) / OFDM	
BW	60M	
Mod.	64QAM	256QAM
Middle CH	58.02	58.02
BW	100M	
Mod.	64QAM	256QAM
Middle CH	98.10	97.90

60M

64QAM

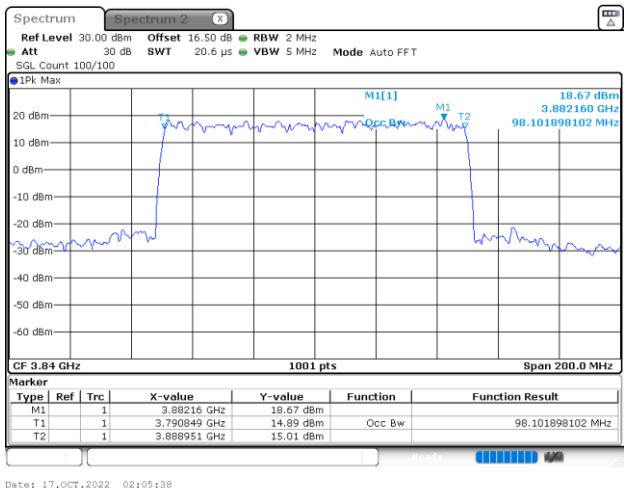


256QAM

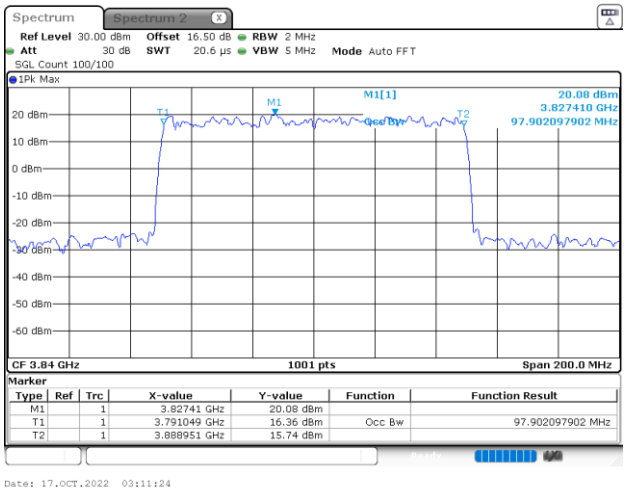


100M

256QAM



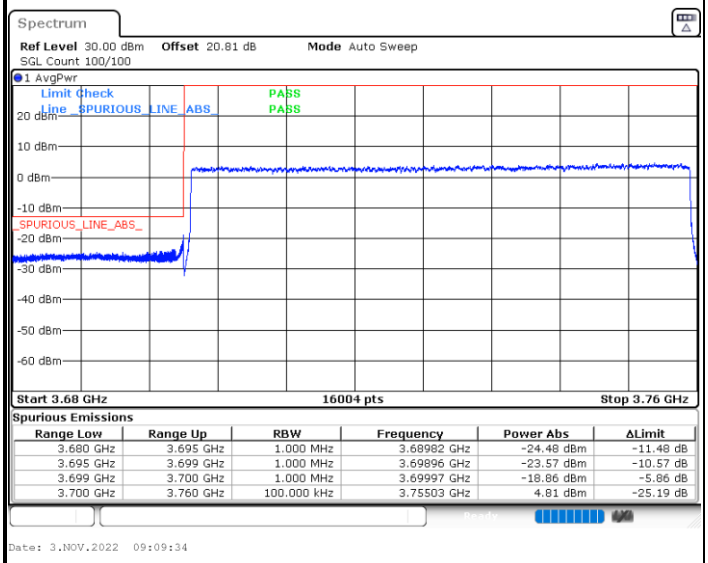
256QAM



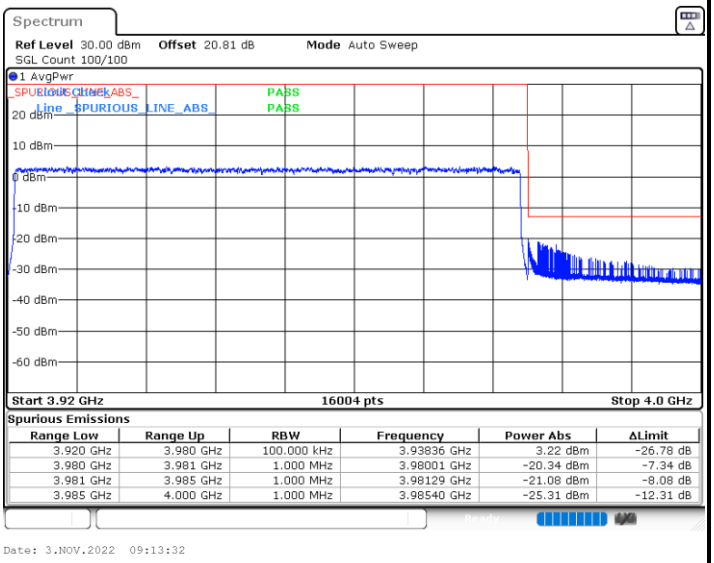
Conducted Band Edge

FR1 n77/ 60MHz / OFDM / 64QAM

Lowest Band Edge / Full RB

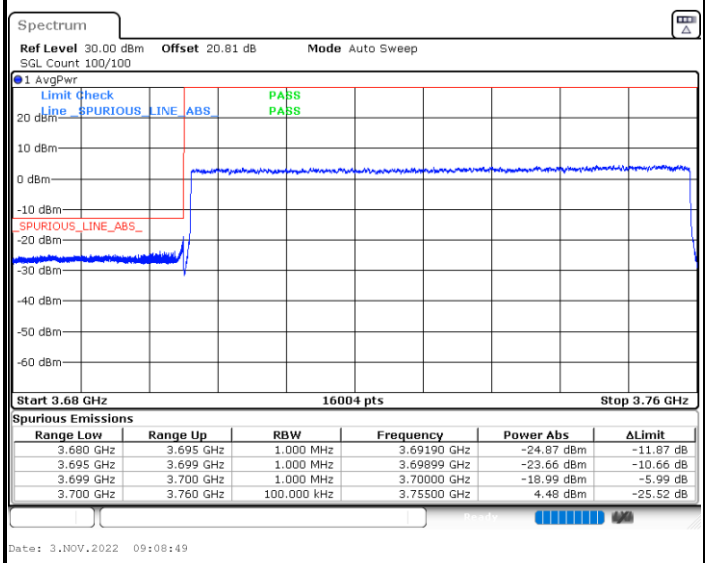


Highest Band Edge / Full RB

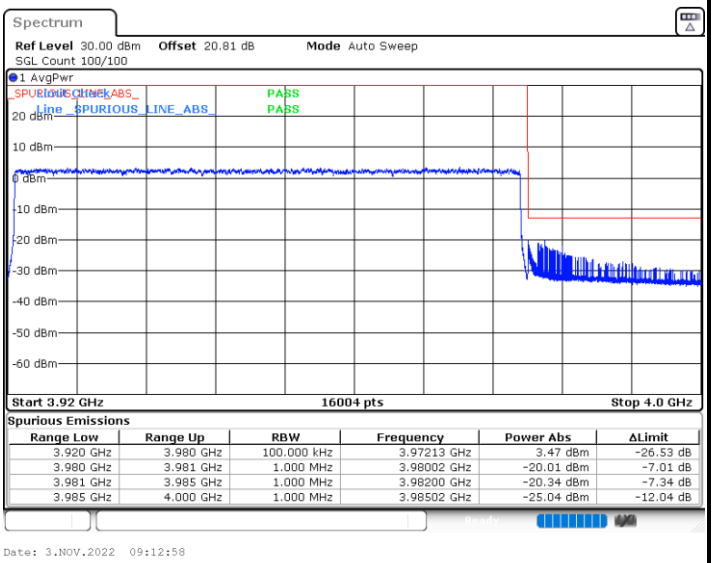


FR1 n77 / 60MHz / OFDM / 256QAM

Lowest Band Edge / Full RB

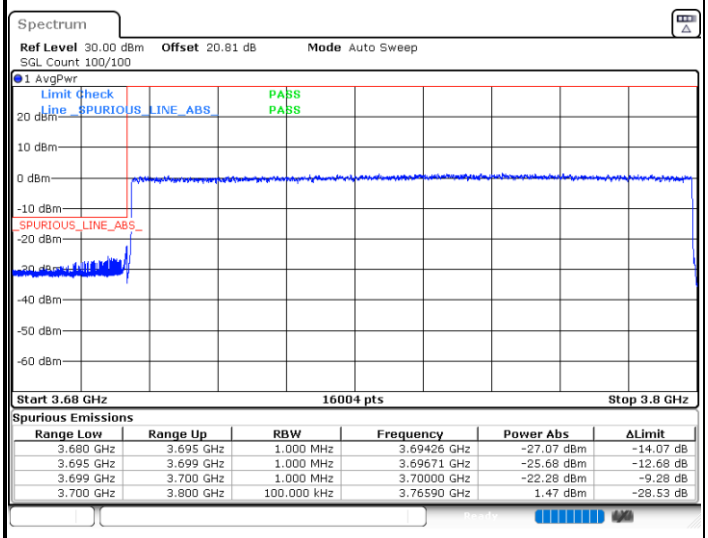


Highest Band Edge / Full RB

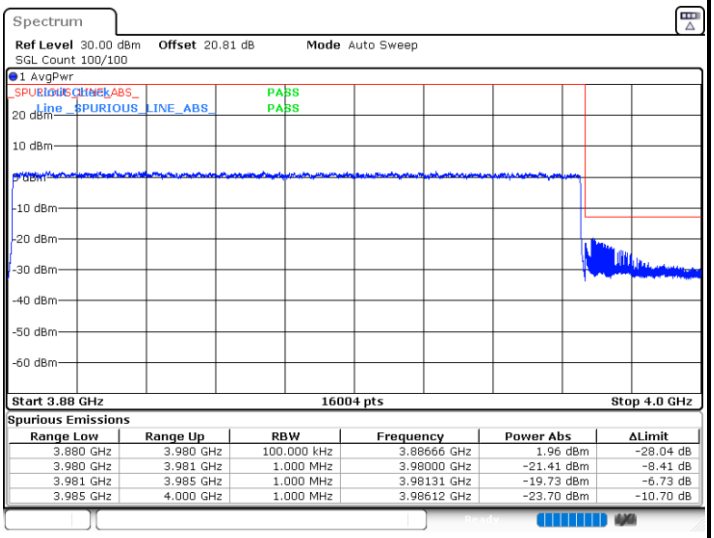


FR1 n77 / 100MHz / OFDM / 64QAM

Lowest Band Edge / Full RB

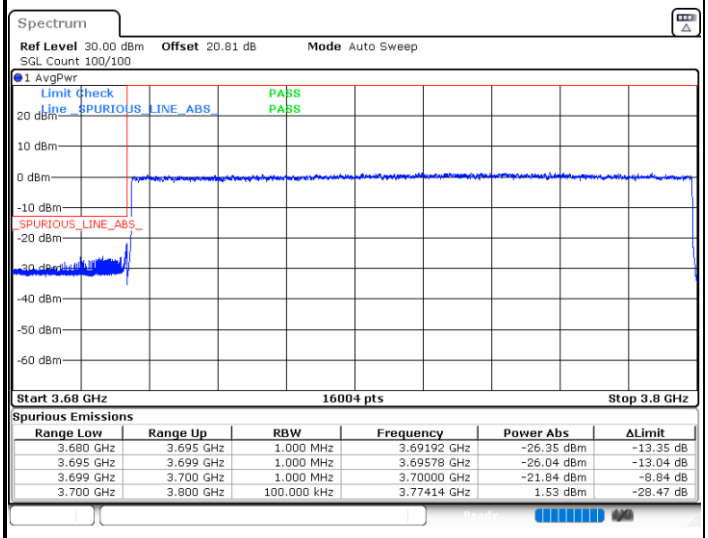


Highest Band Edge / Full RB

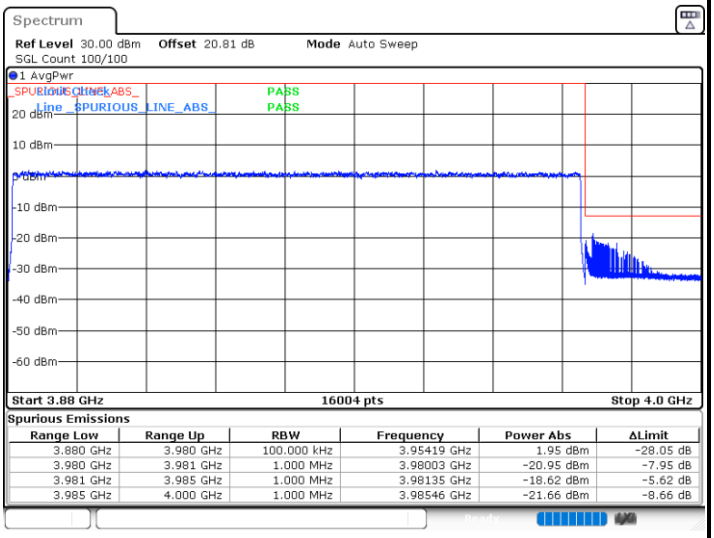


FR1 n77 / 100MHz / OFDM / 256QAM

Lowest Band Edge / Full RB



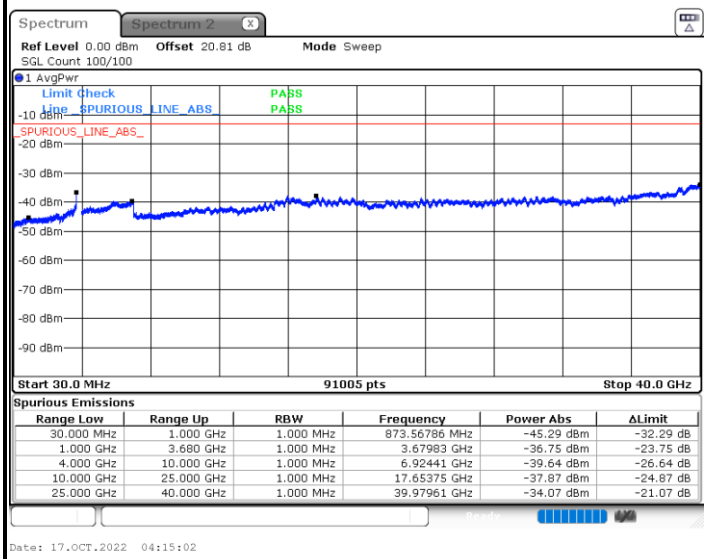
Highest Band Edge / Full RB



Conducted Spurious Emission

FR1 n77 / 60MHz / OFDM / 64QAM

Lowest Channel / FULL

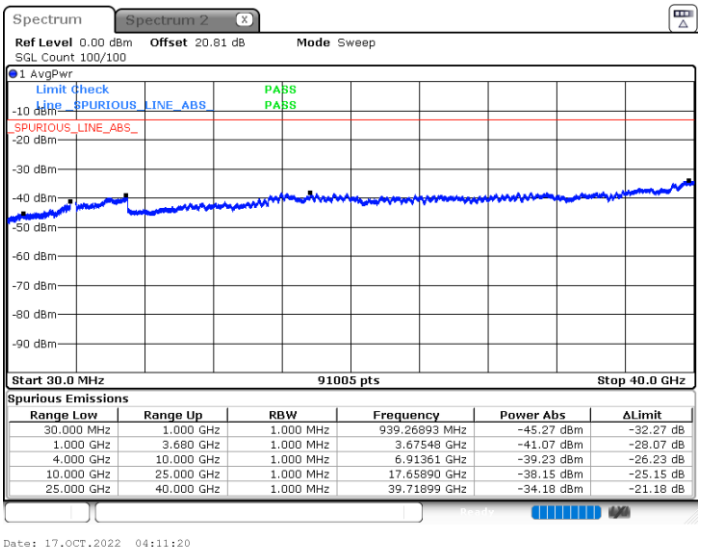


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	873.56786 MHz	-45.29 dBm	-32.29 dB
1.000 GHz	3.680 GHz	1.000 MHz	3.67983 GHz	-36.75 dBm	-23.75 dB
4.000 GHz	10.000 GHz	1.000 MHz	6.92441 GHz	-39.64 dBm	-26.64 dB
10.000 GHz	25.000 GHz	1.000 MHz	17.65375 GHz	-37.87 dBm	-24.87 dB
25.000 GHz	40.000 GHz	1.000 MHz	39.97961 GHz	-34.07 dBm	-21.07 dB

Date: 17.OCT.2022 04:15:02

Middle Channel / FULL

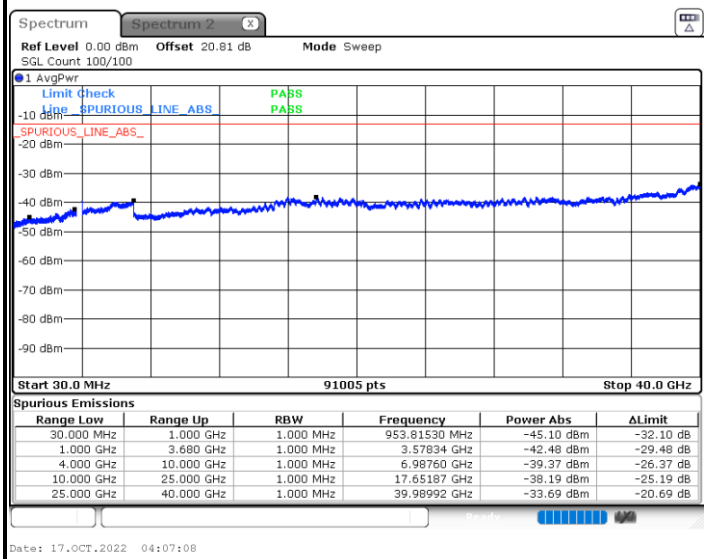


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	939.26893 MHz	-45.27 dBm	-32.27 dB
1.000 GHz	3.680 GHz	1.000 MHz	3.67548 GHz	-41.07 dBm	-28.07 dB
4.000 GHz	10.000 GHz	1.000 MHz	6.91361 GHz	-39.23 dBm	-26.23 dB
10.000 GHz	25.000 GHz	1.000 MHz	17.65890 GHz	-38.15 dBm	-25.15 dB
25.000 GHz	40.000 GHz	1.000 MHz	39.71899 GHz	-34.18 dBm	-21.18 dB

Date: 17.OCT.2022 04:11:20

Highest Channel / FULL



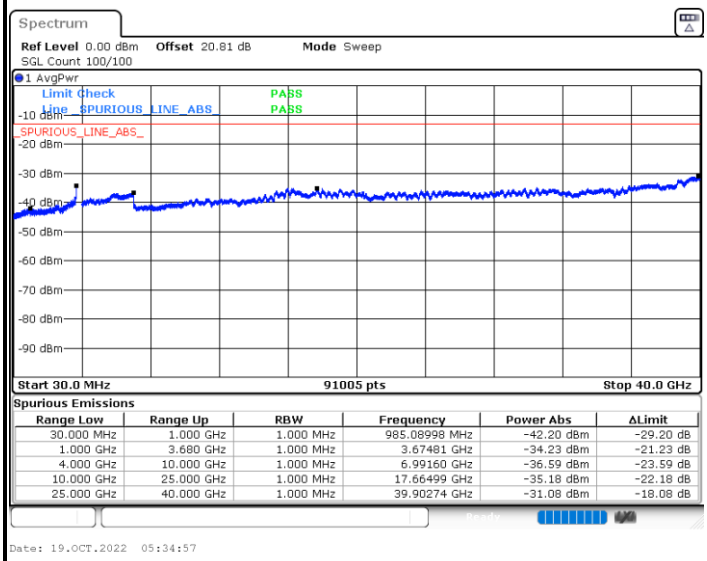
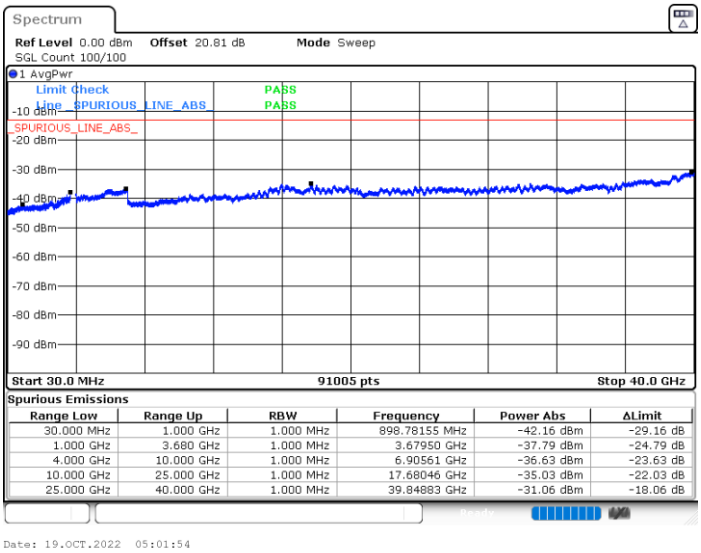
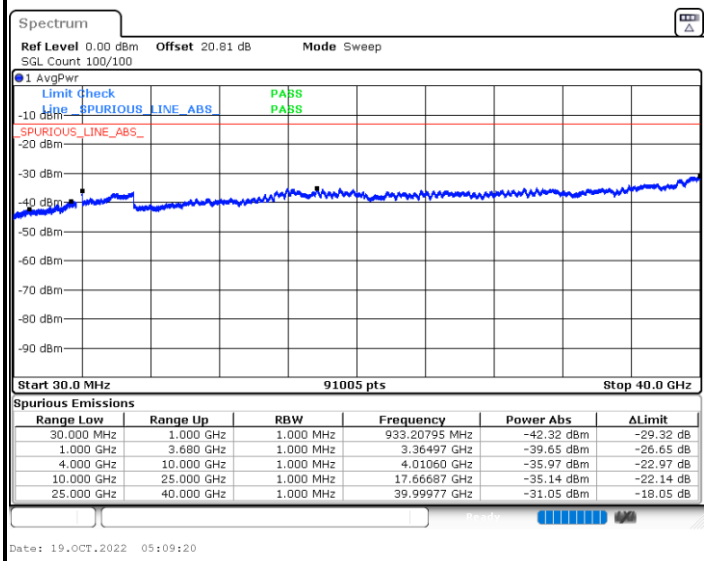
Spurious Emissions

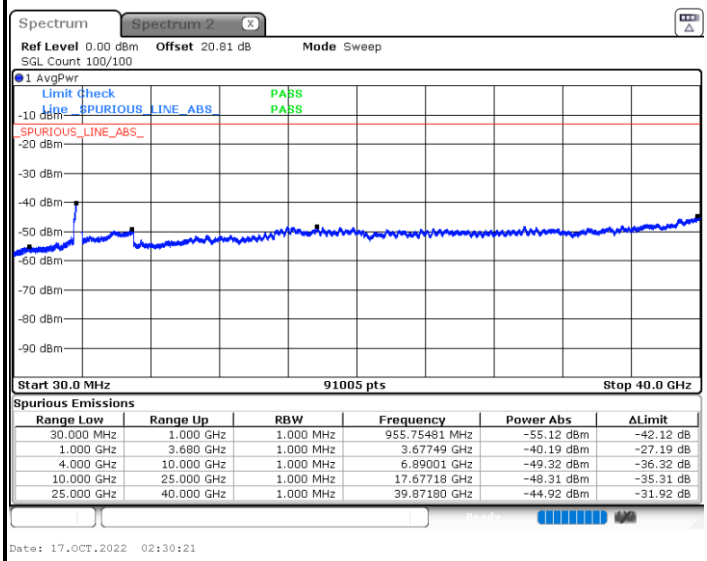
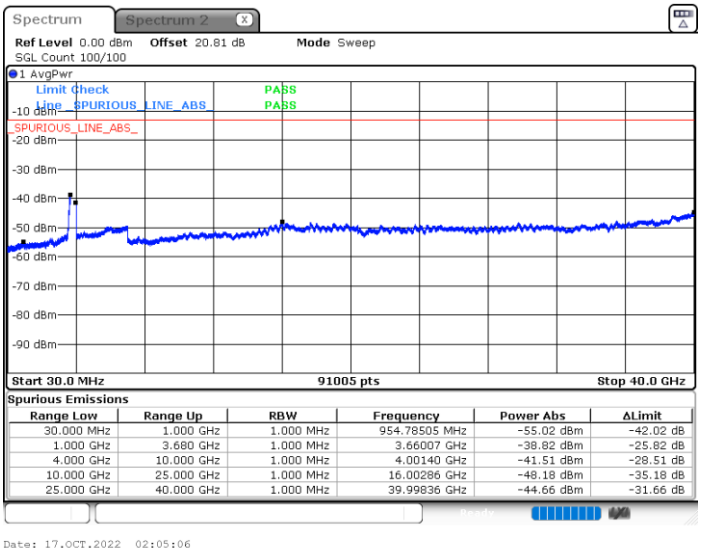
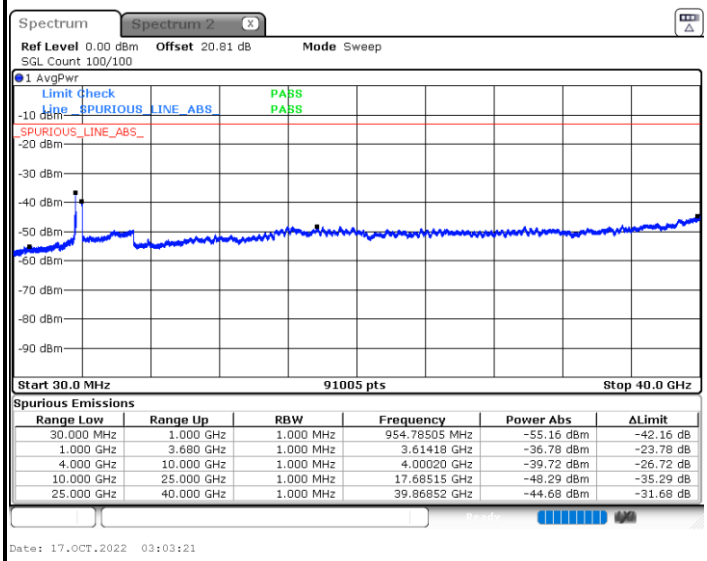
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	953.81530 MHz	-45.10 dBm	-32.10 dB
1.000 GHz	3.680 GHz	1.000 MHz	3.57834 GHz	-42.48 dBm	-29.48 dB
4.000 GHz	10.000 GHz	1.000 MHz	6.98760 GHz	-39.37 dBm	-26.37 dB
10.000 GHz	25.000 GHz	1.000 MHz	17.65187 GHz	-38.19 dBm	-25.19 dB
25.000 GHz	40.000 GHz	1.000 MHz	39.98992 GHz	-33.69 dBm	-20.69 dB

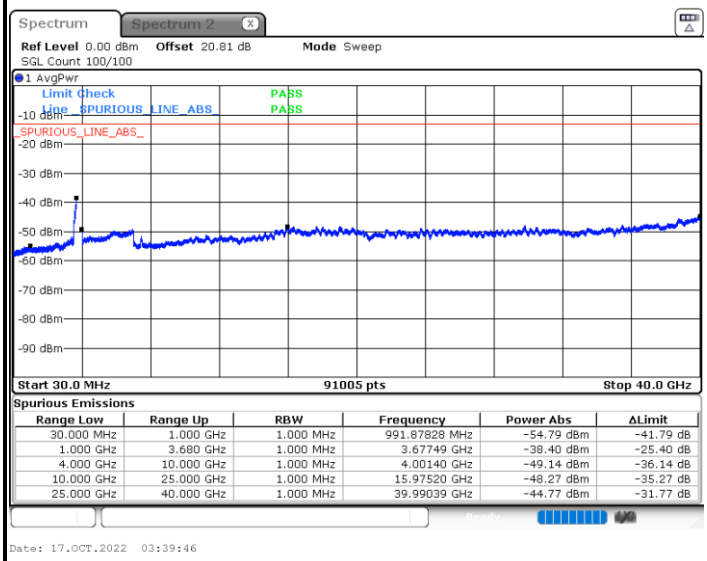
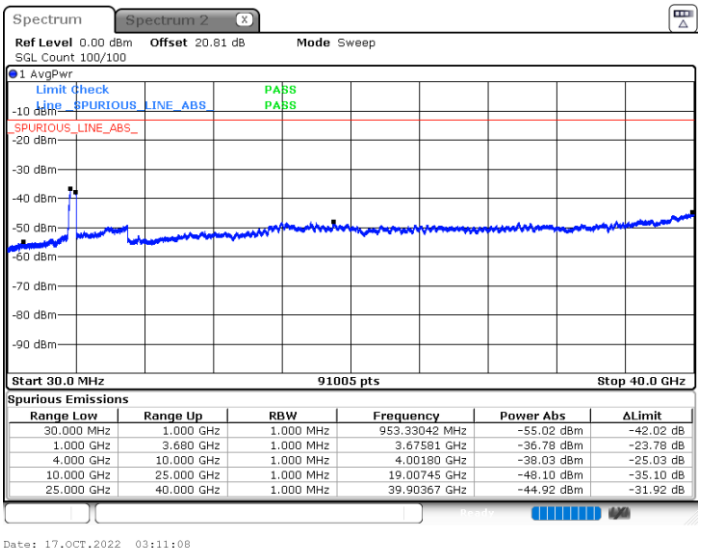
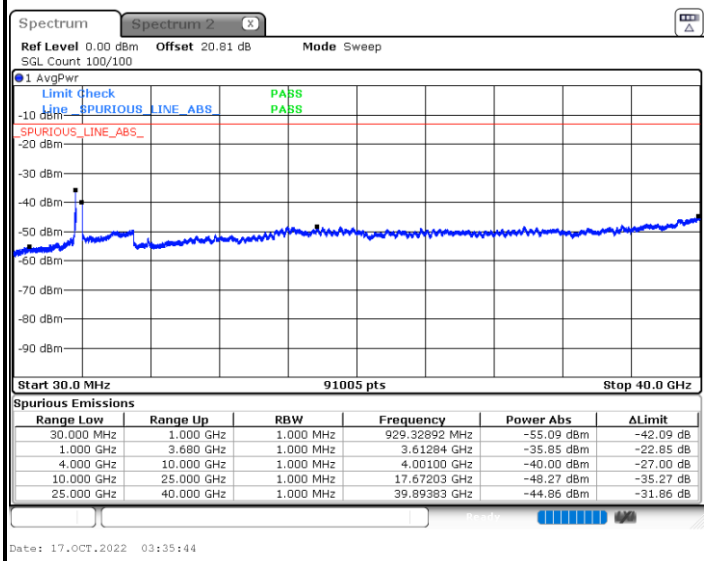
Date: 17.OCT.2022 04:07:08

N/A

N/A

FR1 n77 / 60MHz / OFDM / 256QAM	
Lowest Channel / FULL	**Middle Channel / FULL**
	
Highest Channel / FULL	**N/A**
	**N/A**

FR1 n77 / 100MHz / OFDM / 64QAM	
Lowest Channel / FULL	**Middle Channel / FULL**
 Spurious Emissions Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit 30.000 MHz | 1.000 GHz | 1.000 MHz | 955.75481 MHz | -55.12 dBm | -42.12 dB 1.000 GHz | 3.680 GHz | 1.000 MHz | 3.67749 GHz | -40.19 dBm | -27.19 dB 4.000 GHz | 10.000 GHz | 1.000 MHz | 6.89001 GHz | -49.32 dBm | -36.32 dB 10.000 GHz | 25.000 GHz | 1.000 MHz | 17.67718 GHz | -48.31 dBm | -35.31 dB 25.000 GHz | 40.000 GHz | 1.000 MHz | 39.87180 GHz | -44.92 dBm | -31.92 dB Date: 17.OCT.2022 02:30:21	 Spurious Emissions Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit 30.000 MHz | 1.000 GHz | 1.000 MHz | 954.78505 MHz | -55.02 dBm | -42.02 dB 1.000 GHz | 3.680 GHz | 1.000 MHz | 3.66007 GHz | -38.82 dBm | -25.82 dB 4.000 GHz | 10.000 GHz | 1.000 MHz | 4.00140 GHz | -41.51 dBm | -28.51 dB 10.000 GHz | 25.000 GHz | 1.000 MHz | 16.00286 GHz | -48.18 dBm | -35.18 dB 25.000 GHz | 40.000 GHz | 1.000 MHz | 39.99836 GHz | -44.66 dBm | -31.66 dB Date: 17.OCT.2022 02:05:06
Highest Channel / FULL	**N/A**
 Spurious Emissions Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit 30.000 MHz | 1.000 GHz | 1.000 MHz | 954.78505 MHz | -55.16 dBm | -42.16 dB 1.000 GHz | 3.680 GHz | 1.000 MHz | 3.61418 GHz | -36.78 dBm | -23.78 dB 4.000 GHz | 10.000 GHz | 1.000 MHz | 4.00020 GHz | -39.72 dBm | -26.72 dB 10.000 GHz | 25.000 GHz | 1.000 MHz | 17.68515 GHz | -48.29 dBm | -35.29 dB 25.000 GHz | 40.000 GHz | 1.000 MHz | 39.86852 GHz | -44.68 dBm | -31.68 dB Date: 17.OCT.2022 03:03:21	**N/A**

FR1 n77 / 100MHz / OFDM / 256QAM	
Lowest Channel / FULL	**Middle Channel / FULL**
	
Highest Channel / FULL	**N/A**
	**N/A**

Frequency Stability

Test Conditions		FR1 n77 (256QAM) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 60MHz	Note 2.
		Deviation (ppm)	Result
50	Normal Voltage	0.0008	PASS
40	Normal Voltage	0.0001	
30	Normal Voltage	0.0012	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0001	
0	Normal Voltage	0.0021	
-10	Normal Voltage	0.0011	
-20	Normal Voltage	0.0026	
-30	Normal Voltage	0.0033	
20	Maximum Voltage	0.0026	
20	Normal Voltage	0.0036	
20	Low Voltage	0.0021	

Note:

1. Normal Voltage = 12V ; Low Voltage =11.4V. ; High Voltage =12.6V.

2. Note: The frequency fundamental emissions stay within the authorized frequency block.

Appendix B. Test Results of Radiated Test

Radiated Spurious Emission

Test Engineer :	Peng	Temperature :	23~25℃
		Relative Humidity :	41~42%

<n77 SA mode>

SA n77 / NR 100MHz /64QAM - External Antenna with Adapter mode								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	7590	-62.00	-13	-49.00	-72.21	3.03	13.24	H
	11388	-60.01	-13	-47.01	-69.46	3.56	13.01	H
	15180	-59.60	-13	-46.60	-69.12	3.92	13.44	H
	7590	-62.47	-13	-49.47	-72.68	3.03	13.24	V
	11388	-60.17	-13	-47.17	-69.62	3.56	13.01	V
	15180	-59.45	-13	-46.45	-68.97	3.92	13.44	V

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

SA n77 / NR 100MHz /64QAM - Internal Antenna with Adapter mode								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	7590	-61.92	-13	-48.92	-72.13	3.03	13.24	H
	11388	-59.93	-13	-46.93	-69.38	3.56	13.01	H
	15180	-59.62	-13	-46.62	-69.14	3.92	13.44	H
	7590	-62.34	-13	-49.34	-72.55	3.03	13.24	V
	11388	-60.41	-13	-47.41	-69.86	3.56	13.01	V
	15180	-58.96	-13	-45.96	-68.48	3.92	13.44	V

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

<LTE Band 4 + n77 Simultaneous mode>

LTE Band4 + n77 / LTE 20MHz + NR 100MHz / 64QAM - External Antenna with Adapter mode								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	7590	-62.37	-13	-49.37	-72.58	3.03	13.24	H
	11388	-61.16	-13	-48.16	-70.61	3.56	13.01	H
	15180	-59.30	-13	-46.30	-68.82	3.92	13.44	H
	7590	-62.54	-13	-49.54	-72.75	3.03	13.24	V
	11388	-61.24	-13	-48.24	-70.69	3.56	13.01	V
	15180	-59.59	-13	-46.59	-69.11	3.92	13.44	V

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

LTE Band4 + n77 / LTE 20MHz + NR 100MHz / 64QAM - Internal Antenna with Adapter mode								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	7590	-62.74	-13	-49.74	-72.95	3.03	13.24	H
	11388	-61.08	-13	-48.08	-70.53	3.56	13.01	H
	15180	-58.59	-13	-45.59	-68.11	3.92	13.44	H
	7590	-62.64	-13	-49.64	-72.85	3.03	13.24	V
	11388	-61.70	-13	-48.70	-71.15	3.56	13.01	V
	15180	-59.18	-13	-46.18	-68.70	3.92	13.44	V

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

LTE Band4 + n77 / LTE 20MHz + NR 100MHz / 64QAM - Internal Antenna with POE mode								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	7590	-62.50	-13	-49.50	-72.71	3.03	13.24	H
	11388	-60.98	-13	-47.98	-70.43	3.56	13.01	H
	15180	-59.99	-13	-46.99	-69.51	3.92	13.44	H
	7590	-62.26	-13	-49.26	-72.47	3.03	13.24	V
	11388	-61.03	-13	-48.03	-70.48	3.56	13.01	V
	15180	-59.78	-13	-46.78	-69.30	3.92	13.44	V

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

<LTE Band 13 + n77 Simultaneous mode>

LTE Band13 + n77 / LTE 10MHz + NR 100MHz / 64QAM - External Antenna with Adapter mode								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	7590	-61.93	-13	-48.93	-72.14	3.03	13.24	H
	11388	-61.58	-13	-48.58	-71.03	3.56	13.01	H
	15180	-59.12	-13	-46.12	-68.64	3.92	13.44	H
	7590	-62.30	-13	-49.30	-72.51	3.03	13.24	V
	11388	-61.63	-13	-48.63	-71.08	3.56	13.01	V
	15180	-58.94	-13	-45.94	-68.46	3.92	13.44	V

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

LTE Band4 + n77 / LTE 100MHz + NR 100MHz / 64QAM - Internal Antenna with Adapter mode								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	7590	-61.84	-13	-48.84	-72.05	3.03	13.24	H
	11388	-61.16	-13	-48.16	-70.61	3.56	13.01	H
	15180	-59.27	-13	-46.27	-68.79	3.92	13.44	H
	7590	-62.05	-13	-49.05	-72.26	3.03	13.24	V
	11388	-61.62	-13	-48.62	-71.07	3.56	13.01	V
	15138	-58.65	-13	-45.65	-68.17	3.92	13.44	V

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

<LTE Band 66 + n77 Simultaneous mode>

LTE Band66 + n77 / LTE 20MHz + NR 100MHz / 64QAM - External Antenna with Adapter mode								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	7590	-62.46	-13	-49.46	-72.67	3.03	13.24	H
	11388	-61.41	-13	-48.41	-70.86	3.56	13.01	H
	15180	-58.82	-13	-45.82	-68.34	3.92	13.44	H
	7590	-62.60	-13	-49.60	-72.81	3.03	13.24	V
	11388	-61.84	-13	-48.84	-71.29	3.56	13.01	V
	15180	-59.54	-13	-46.54	-69.06	3.92	13.44	V

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

LTE Band66 + n77 / LTE 20MHz + NR 100MHz / 64QAM - Internal Antenna with Adapter mode								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	7590	-62.23	-13	-49.23	-72.44	3.03	13.24	H
	11388	-61.17	-13	-48.17	-70.62	3.56	13.01	H
	15180	-59.19	-13	-46.19	-68.71	3.92	13.44	H
	7590	-61.51	-13	-48.51	-71.72	3.03	13.24	V
	11388	-61.05	-13	-48.05	-70.50	3.56	13.01	V
	15180	-59.34	-13	-46.34	-68.86	3.92	13.44	V

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