FCC RF Test Report

APPLICANT	:	Motorola Mobility LLC
EQUIPMENT	:	Mobile Cellular Phone
BRAND NAME	:	Motorola
MODEL NAME	:	XT2223-2
FCC ID	:	IHDT56AE4
STANDARD	:	47 CFR Part 2, 27
CLASSIFICATION	:	PCS Licensed Transmitter Held to Ear (PCE)
TEST DATE(S)	:	Mar. 15, 2022 ~ Mar. 31, 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

Reviewed by: Jason Jia / Supervisor

Alexwang

Approved by: Alex Wang / Manager

ilac-MRA

ACCREDITED
Cert #5145.02

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APPENDIX A. TEST RESULTS OF CONDUCTED TEST

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG230110-01C	Rev. 01	Initial issue of report	Apr. 18, 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(d)(4)	Equivalent Isotropic Radiated Power (5G NR n66)	EIRP < 1Watt		
3.5	§27.50(j)(4)	Peak-to-Average Ratio	<13 dB	PASS	-
3.6	§2.1049	Occupied Bandwidth	Reporting Only	PASS	-
3.7	§2.1051 §27.53(h)	Conducted Band Edge Measurement (5G NR n66)	< 43+10log10(P[Watts])	PASS	-
3.8	§2.1051 §27.53(h)	Conducted Spurious Emission (5G NR n66)	< 43+10log10(P[Watts])	PASS	-
3.9	§2.1055 §27.54	Frequency Stability Temperature & Voltage	Within Authorized Band	PASS	-
4.4	§2.1053 §27.53(h)	Radiated Spurious Emission (5G NR n66)	< $43+10\log_{10}$(P[Watts])	PASS	Under limit 32.06 dB at 5205.000 MHz
	§2.1053 §27.53(m)(4)	Radiated Spurious Emission (5G NR n7)	< $55+10\log_{10}$(P[Watts])		

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

1 General Description

1.1 Applicant

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

1.2 Manufacturer

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

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2223-2
FCC ID	IHDT56AE4
IMEI Code	Conducted : 356081330018482/356081330018490 Radiation : 356081330020389
HW Version	DVT2
SW Version	S1SS32.31
EUT Stage	Identical Prototype

Remark:
Only 5G NR bands are tested in this report, all the other RF bands are tested in the other reports separately.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	5G NR n7 : 2500 MHz ~ 2570 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz
Rx Frequency	5G NR n7 : 2620 MHz ~ 2690 MHz 5G NR n66 : 2110 MHz~ 2200 MHz
SCS	15kHz
Bandwidth	n7: 5MHz / 10MHz / 15MHz / 20MHz / 25MHz / 30MHz / 40MHz n66: 5MHz / 10MHz / 15MHz / 20MHz / 30MHz / 40MHz
Antenna Gain	**<Ant. 0>:** n7: -0.20 dBi **<Ant. 1>:** n66: -1.60 dBi
Type of Modulation	CP-OFDM: QPSK / 16QAM / 64QAM / 256QAM DFT-s-OFDM: PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM

Remark:

1. For NSA mode of all EN-DC combination, we only show the combination of the maximum power among all NSA combinations in the report.
2. The EN-DC mode combination could be referred to the product spec.

1.5 Modification of EUT

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

1.6 Re-use of Measured Data

1.6.1 Introduction Section

This application re-uses data collected on a similar device. The subject device of this application (Model: XT2223-2, FCC ID: IHDT56AE4) is electrically identical to the reference device (Model: XT2223-1, FCC ID: IHDT56AE3) for the portions of the circuitry corresponding to the data being re-used, as treated by KDB Publication 484596 D01.

1.6.2 Difference Section

The **main** difference between FCC ID: IHDT56AE3 and FCC ID: IHDT56AE4 is as below:

- Remove WCDMA Band XIX, LTE Band 18/19/20/32/39/43 and 5G NR n8/n20/n38/n41/n77.
- Add LTE Band 66 and 5G NR n66.
- Disable HPUE mode for LTE Band 38/41, 5G NR n78 and Uplink_CA mode for LTE Band 41C/42C.

Other differences and all the details of similarity and difference can be found in the confidential documents (XT2223-2_Operational Description of Product Equality Declaration).

1.6.3 Reference detail Section:

Equipment Class	Reference FCC ID	Folder Test	Report Title/Section
PCE	IHDT56AE3	Part22.27 (Report No. FG230110F)	All sections applicable for n7

1.6.4 Spot Check Verification Data Section

Conducted power test against the variant model based on the worst-case condition from the original model was performed in this filing to demonstrate the test data from original model remains representative for the variant model and added RSE testing for EN-DC combinations for n7.

Summary for power spot check for each rule entry and technology is listed as below:

Test Item	Mode	IHDT56AE3 Worst Result	IHDT56AE4 Worst Result	Difference (dB)
Average Conducted Power (dBm)	n7	23.31	23.11	0.20

Conclusion:

We confirm that the test data reuse policy of FCC KDB 484596 D01 Referencing Test Data v01 has been followed and the test data as referenced from the parent model report represents compliance with new FCC ID.

1.7 Maximum EIRP and Emission Designator

5G NR n66 (EN DC_7A-n66A)		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)	**Frequency Range (MHz)**	**Maximum EIRP(W)**	**Emission Designator (99%OBW)**	**Maximum EIRP(W)**	**Emission Designator (99%OBW)**
40	1730.0 ~ 1760.0	0.1607	38M8G7D	0.1445	38M7W7D

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

1.8 Testing Location

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

<table>
<tr><td>Test Firm</td><td colspan="3">Sporton International Inc. (Kunshan)</td></tr>
<tr><td>Test Site Location</td><td colspan="3">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</td></tr>
<tr><td rowspan="2">Test Site No.</td><td>Sporton Site No.</td><td>FCC Designation No.</td><td>FCC Test Firm Registration No.</td></tr>
<tr><td>03CH04-KS
TH01-KS</td><td>CN1257</td><td>314309</td></tr>
</table>

1.9 Test Software

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

1.10 Applicable Standards

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

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

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

1.11 Specification of Accessory

Specification of Accessory				
AC Adapter 1(US)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-101
AC Adapter 1(EU)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-102
AC Adapter 1(UK)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-103
AC Adapter 1(AU)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-105
AC Adapter 1(AR)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-106
AC Adapter 1(CHILE)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-109
AC Adapter 2(US)	**Brand Name**	Motorola(Aohai)	**Model Name**	MC-101
AC Adapter 2(EU)	**Brand Name**	Motorola(Aohai)	**Model Name**	MC-102
AC Adapter 2(UK)	**Brand Name**	Motorola(Aohai)	**Model Name**	MC-103
AC Adapter 2(AU)	**Brand Name**	Motorola(Aohai)	**Model Name**	MC-105
AC Adapter 2(AR)	**Brand Name**	Motorola(Aohai)	**Model Name**	MC-106
AC Adapter 3(US)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-101
AC Adapter 3(EU)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-102
AC Adapter 3(UK)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-103
AC Adapter 3(AU)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-105
AC Adapter 3(AR)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-106
AC Adapter 4(US)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-201
AC Adapter 4(IN)	**Brand Name**	Motorola(Chenyang)	**Model Name**	MC-204
AC Adapter 5(US)	**Brand Name**	Motorola(Acbel)	**Model Name**	MC-201
AC Adapter 6(IN)	**Brand Name**	Motorola(AOHAI)	**Model Name**	MC-204
AC Adapter 7 (BR Local build)	**Brand Name**	Motorola(Salcomp)	**Model Name**	MC-207
AC Adapter 8 (BR Local build)	**Brand Name**	Motorola(Flex)	**Model Name**	MC-207
Battery	**Brand Name**	Motorola(ATL)	**Model Name**	ND50
Earphone 1	**Brand Name**	Motorola(NLD)	**Model Name**	MH202
Earphone 2	**Brand Name**	Motorola(NLD)	**Model Name**	MH191
Earphone 3	**Brand Name**	Motorola(Lyand)	**Model Name**	MH191
Earphone 4	**Brand Name**	Motorola(LCHSE)	**Model Name**	MH191
USB Cable 1	**Brand Name**	Motorola(HX)	**Model Name**	S928D43190
USB Cable 2	**Brand Name**	Motorola(NAEE)	**Model Name**	S928D43191

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.

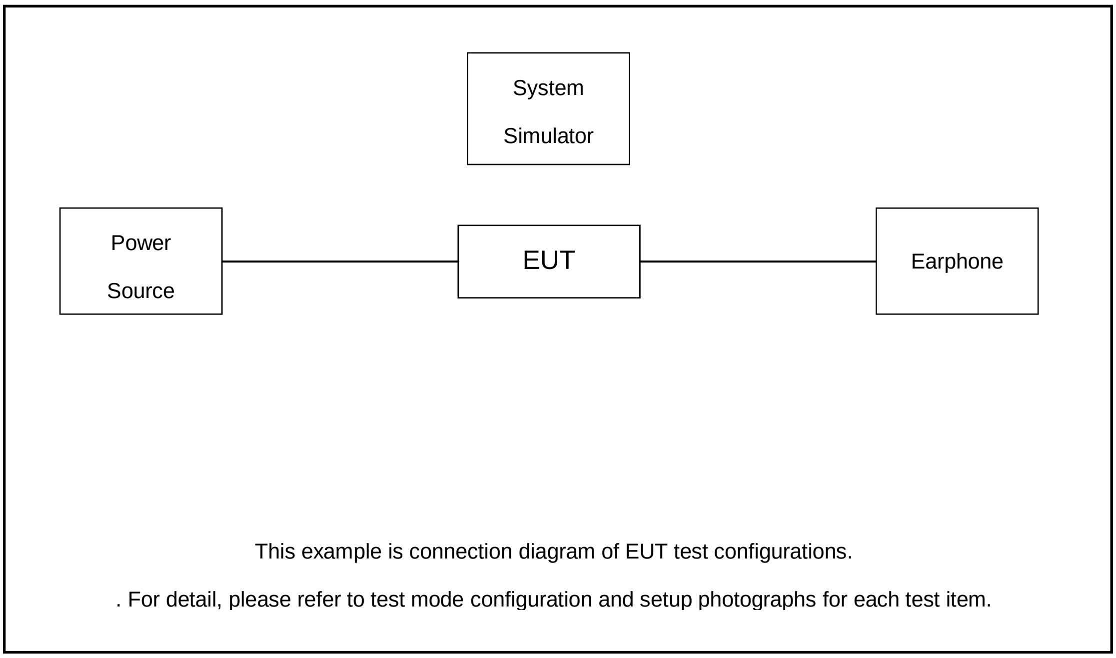
	X Plane	Y Plane	Z Plane
Orthogonal Planes of EUT			

Test Cases	Band	Bandwidth (MHz)	Modulation	RB #	Test Channel
		eg. 5M, 10M, 15M, 20M	eg. QPSK, 16QAM, 64QAM	1RB, Partial RB, Full RB	L/M/H
Max. Output Power	5G n66	5M, 10M, 15M, 20M, 30M, 40M	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	1RB, Partial RB, Full RB	L, M, H
Peak-to-Average Ratio	5G n66	40M	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	Full RB	M
E.I.R.P	5G n66	5M, 10M, 15M, 20M, 30M, 40M	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	1RB, Partial RB, Full RB	L, M, H
26dB and 99% Bandwidth	5G n66	40M	QPSK, 16QAM	Full RB	M
Conducted Band Edge	5G n66	5M, 10M, 15M, 20M, 30M, 40M	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	1RB, Full RB	L, H
Conducted Spurious Emission	5G n66	5M, 10M, 15M, 20M, 30M, 40M	QPSK	1RB	L, M, H
Frequency Stability	5G n66	20M	QPSK	Full RB	M
Radiated Spurious Emission	5G n7	Worst case from maximum power			M
	5G n66	Worst case from maximum power			M

Note:

1. 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.
2. Based on engineering evaluation, only the worst modulations test results are shown in the report.

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	DC Power Supply	GW	GPS-3030D	N/A	N/A	Unshielded, 1.8 m
2.	LTE Base Station	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m
3.	NR Base Station	Anritsu	MT8000A	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

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

The spectrum analyzer offset is derived from RF cable loss.

Offset = RF cable loss.

Following shows an offset computation example with cable loss 5.4 dB.

Example :

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

= 5.4 (dB)

2.5 Frequency List of Low/Middle/High Channels

5G NR n7 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
40	Channel	504000	507000	510000
	Frequency	2520	2535	2550
30	Channel	503000	507000	511000
	Frequency	2515	2535	2555
25	Channel	502500	507000	511500
	Frequency	2512.5	2535	2557.5
20	Channel	502000	507000	512000
	Frequency	2510	2535	2560
15	Channel	501500	507000	512500
	Frequency	2507.5	2535	2562.5
10	Channel	501000	507000	513000
	Frequency	2505	2535	2565
5	Channel	500500	507000	513500
	Frequency	2502.5	2535	2567.5

5G NR n66 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
40	Channel	346000	349000	352000
	Frequency	1730	1745	1760
30	Channel	345000	349000	353000
	Frequency	1725	1745	1765
20	Channel	344000	349000	354000
	Frequency	1720	1745	1770
15	Channel	343500	349000	354500
	Frequency	1717.5	1745	1772.5
10	Channel	343000	349000	355000
	Frequency	1715	1745	1775
5	Channel	342500	349000	355500
	Frequency	1712.5	1745	1777.5

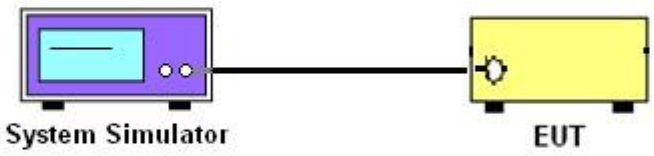
3 Conducted Test Items

3.1 Measuring Instruments

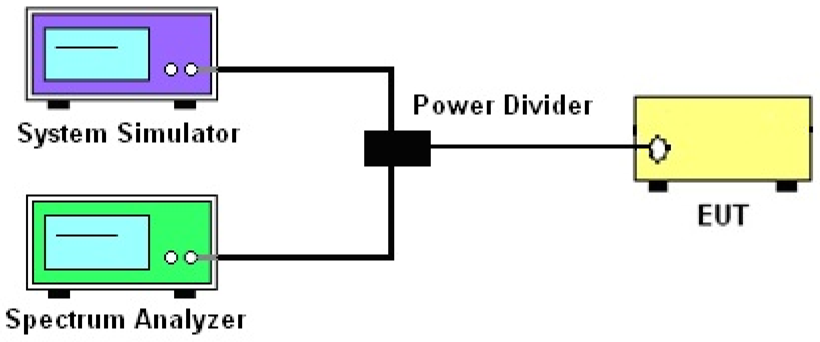
See list of measuring instruments of this test report.

3.2 Test Setup

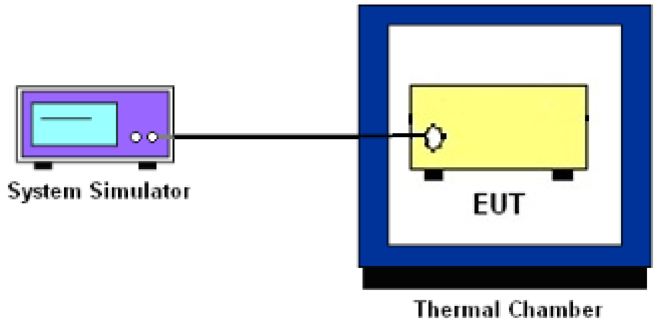
3.2.1 Conducted Output Power



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



3.2.3 Frequency Stability



3.3 Test Result of Conducted Test

Please refer to Appendix A.

3.4 Conducted Output Power and EIRP

3.4.1 Description of the Conducted Output Power Measurement and EIRP Measurement

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

The EIRP of mobile transmitters must not exceed 1 Watts for 5G NR n66

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 5.2.6 (PAPR).
2. The EUT was connected to spectrum and system simulator via a power divider.
3. Set EUT in maximum power output.
4. Set the RBW = 1MHz, VBW = 3MHz, Detector = Peak, Trace mode = max hold, Set span ≥ 2 × OBW in spectrum analyzer.
5. Set the RBW = 1MHz, VBW = 3MHz, Detector = power averaging, Trace mode = max hold, Set span ≥ 2 × OBW in spectrum analyzer.
6. Add [10 log (1/duty cycle)] to the measured maximum power level to compute the average power during continuous transmission.
7. PAPR (dB) = P_{Pk} (dBm) − P_{Avg} (dBm)

   where

   PAPR peak-to-average power ratio, in dB

   P_{Pk} measured peak power level, in dBm

   P_{Avg} measured average power level, in dBm
8. 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 (h)

For operations in the 1710 – 1755 MHz band, the FCC limit is 43 + $10\log_{10}$(P[Watts]) dB below the transmitter power P(Watts) in a 1 MHz bandwidth. However, in the 1MHz 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.
6. Set spectrum analyzer with RMS detector.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. Checked that all the results comply with the emission limit line.

   Example:

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

   = P(W)- [43 + 10log(P)] (dB)

   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB) = -13dBm.
9. For 5G NR n7, the other 40 dB, and 55 dB have additionally applied same calculation above.
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

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 n7:

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.

3.8.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
7. Set spectrum analyzer with RMS detector.
8. Taking the record of maximum spurious emission.
9. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
10. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.
11. For 5G NR n7
    The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [55+ 10log(P)] (dB)
    = [30+ 10log(P)] (dBm) - [55+ 10log(P)] (dB)
    = -25dBm.

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.

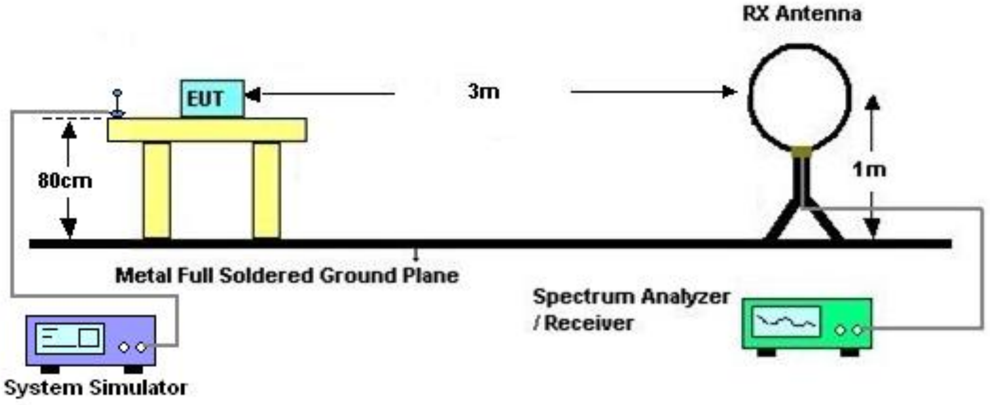
4 Radiated Test Items

4.1 Measuring Instruments

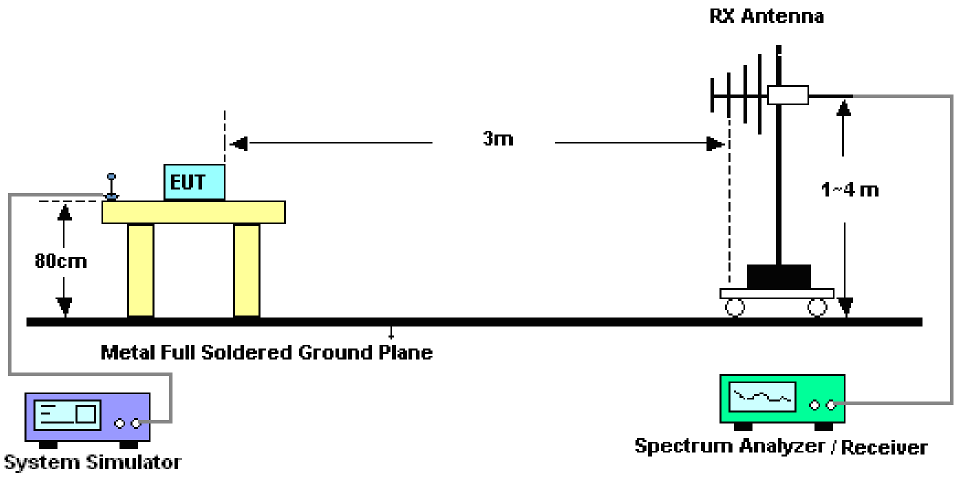
See list of measuring instruments of this test report.

4.2 Test Setup

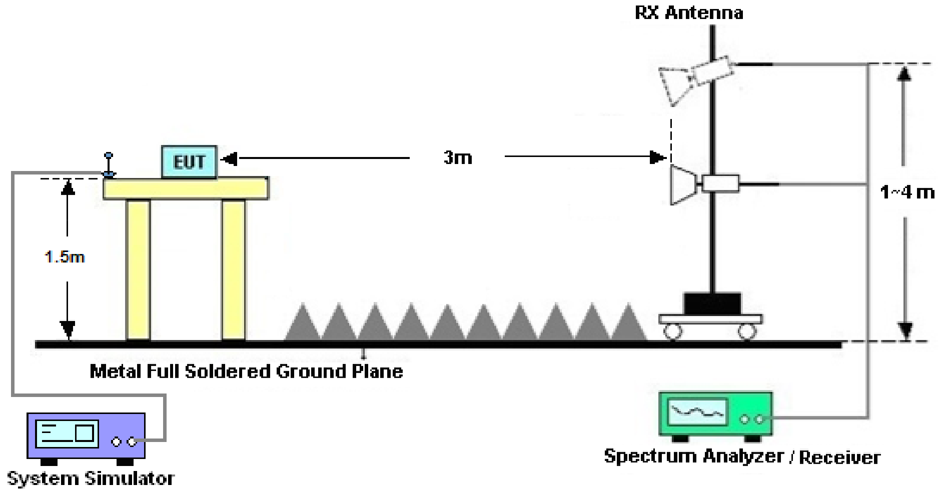
4.2.1 For radiated test below 30MHz



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. 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 n7

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.

4.4.2 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.
13. For 5G NR n7:
    The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)

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. 14, 2021	Mar. 15, 2022~ Mar. 16, 2022	Oct. 13, 2022	Conducted (TH01-KS)
Power divider	STI	STI08-0055	-	0.5~40GHz	Aug. 26, 2021	Mar. 15, 2022~ Mar. 16, 2022	Aug. 25, 2022	Conducted (TH01-KS)
Temperature &humidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 12, 2021	Mar. 15, 2022~ Mar. 16, 2022	Jul. 11, 2022	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44G,MAX 30dB	Apr. 13, 2021	Mar. 31, 2022	Apr. 12, 2022	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 30, 2021	Mar. 31, 2022	Oct. 29, 2022	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	May 30, 2021	Mar. 31, 2022	May 29, 2022	Radiation (03CH04-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	218652	1GHz~18GHz	Nov. 01, 2021	Mar. 31, 2022	Oct. 30, 2022	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2022	Mar. 31, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
Amplifier	Burgeon	BPA-530	102219	0.01MHz ~3000MHz	Nov. 01, 2021	Mar. 31, 2022	Oct. 31, 2022	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 05, 2022	Mar. 31, 2022	Jan. 04, 2023	Radiation (03CH04-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	2025788	1Ghz-18Ghz	Jul. 30, 2021	Mar. 31, 2022	Jul. 29, 2022	Radiation (03CH04-KS)
Amplifier	Keysight	83017A	MY57280106	500MHz~26.5GHz	Oct. 13, 2021	Mar. 31, 2022	Oct. 12, 2022	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Mar. 31, 2022	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Mar. 31, 2022	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Mar. 31, 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 Conducted Measurement

Test Item	Uncertainty
Conducted Power	±0.56 dB
Conducted Emissions	±0.92 dB
Occupied Channel Bandwidth	±0.03 %

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 ~ 18 GHz)

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

Uncertainty of Radiated Emission Measurement (18 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 :	Lew Wu	Temperature :	21~24℃
		Relative Humidity :	45~51%

Conducted Output Power(Average power and EIRP)

5G NR n66:

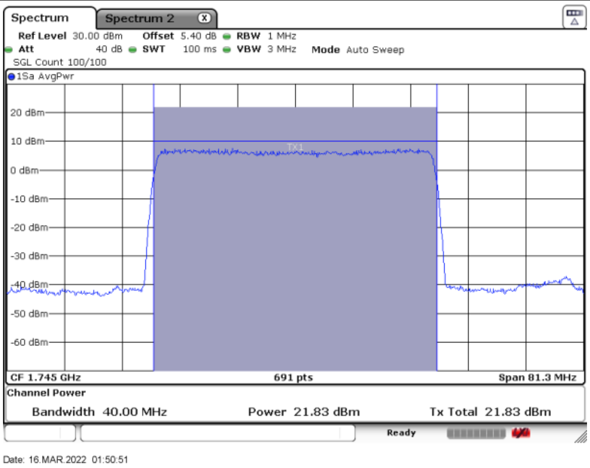
BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Gain	EIRP	EIRP	EIRP
Channel				346000	349000	352000		L	M	H
Frequency (MHz)				1730	1745	1760				
40	PI/2 BPSK	1	1	23.38	23.45	23.58	-1.60	0.1507	0.1531	0.1578
40	QPSK	1	1	23.41	23.48	23.45	-1.60	0.1517	0.1542	0.1531
40	QPSK	1	108	23.30	23.57	23.31	-1.60	0.1479	0.1574	0.1483
40	QPSK	1	214	23.28	23.35	23.33	-1.60	0.1472	0.1496	0.1489
40	QPSK	108	0	22.38	22.59	22.47	-1.60	0.1197	0.1256	0.1222
40	QPSK	108	54	23.45	23.66	23.40	-1.60	0.1531	0.1607	0.1514
40	QPSK	108	108	22.59	22.63	22.35	-1.60	0.1256	0.1268	0.1189
40	QPSK	216	0	22.45	22.56	22.44	-1.60	0.1216	0.1247	0.1213
40	16QAM	1	1	22.48	23.2	23.11	-1.60	0.1225	0.1445	0.1416
40	64QAM	1	1	20.64	20.79	20.87	-1.60	0.0802	0.0830	0.0845
40	256QAM	1	1	18.56	18.81	18.79	-1.60	0.0497	0.0526	0.0524
Channel				345000	349000	353000	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				1725	1745	1765				
30	QPSK	1	1	23.26	23.42	23.25	-1.60	0.1466	0.1521	0.1462
30	16QAM	1	1	22.65	22.92	22.83	-1.60	0.1274	0.1355	0.1327
Channel				344000	349000	354000	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				1720	1745	1770				
20	QPSK	1	1	23.51	23.56	23.49	-1.60	0.1552	0.1570	0.1545
20	16QAM	1	1	22.95	23.01	22.91	-1.60	0.1365	0.1384	0.1352
Channel				343500	349000	354500	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				1717.5	1745	1772.5				
15	QPSK	1	1	23.27	23.54	23.33	-1.60	0.1469	0.1563	0.1489
15	16QAM	1	1	22.53	23.00	22.74	-1.60	0.1239	0.1380	0.1300
Channel				343000	349000	355000	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				1715	1745	1775				
10	QPSK	1	1	23.45	23.52	23.42	-1.60	0.1531	0.1556	0.1521
10	16QAM	1	1	22.84	23.09	22.85	-1.60	0.1330	0.1409	0.1334
Channel				342500	349000	355500	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				1712.5	1745	1777.5				
5	QPSK	1	1	23.52	23.54	23.47	-1.60	0.1556	0.1563	0.1538
5	16QAM	1	1	22.94	22.76	22.87	-1.60	0.1361	0.1306	0.1340

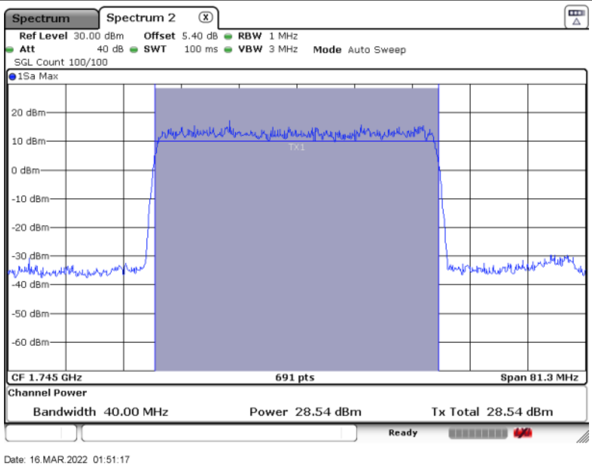
FR1 n66

Peak-to-Average Ratio

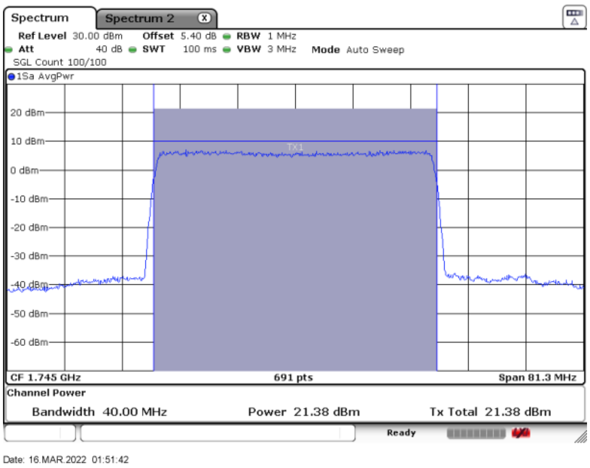
Mode	FR1 n66 / 40MHz / DFT-S OFDM				
Mod.	PI/2 BPSK	QPSK	16QAM	64QAM	Limit: 13dB
RB Size	Full RB	Full RB	Full RB	Full RB	Result
Middle CH	6.71	6.69	6.76	6.90	PASS
Mod.	256QAM				Limit: 13dB
RB Size	Full RB				Result
Middle CH	6.72				PASS

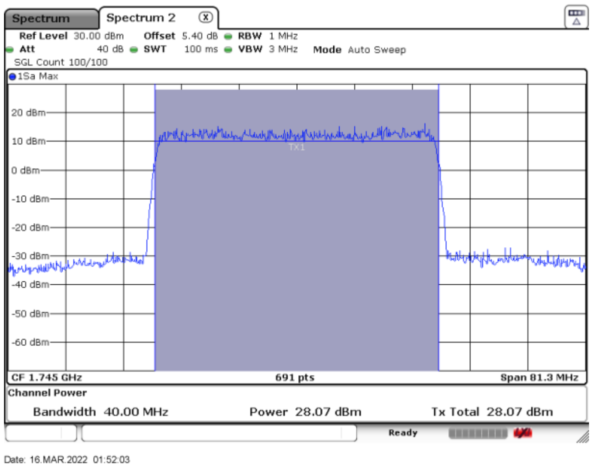
BPSK



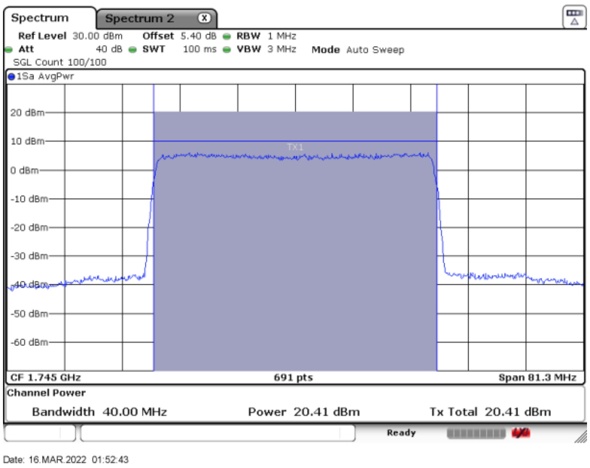


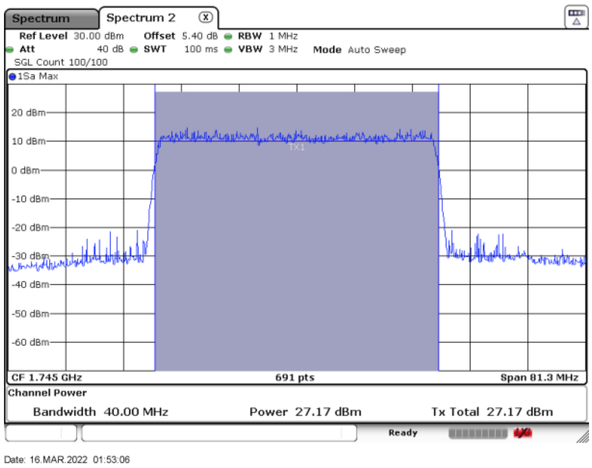
QPSK



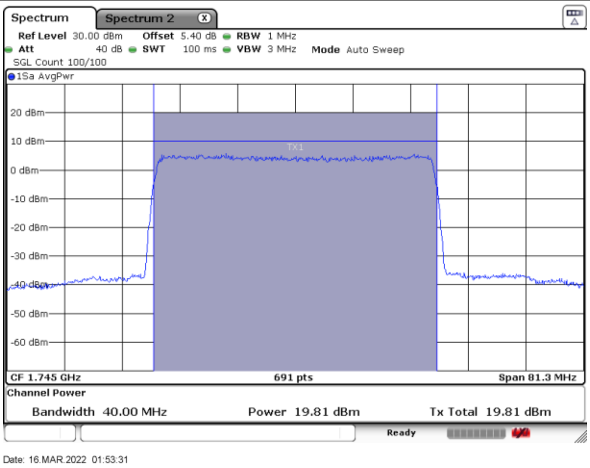


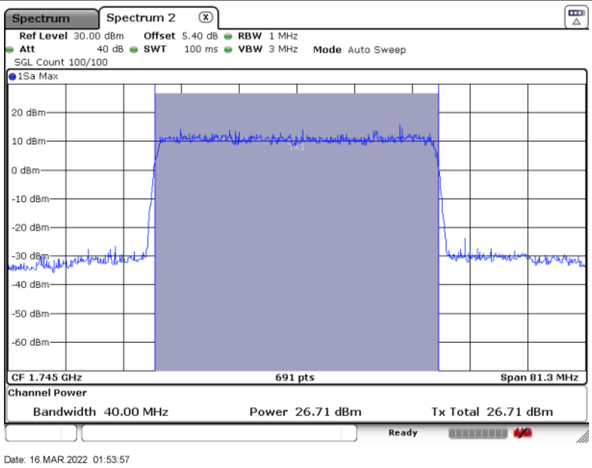
16QAM



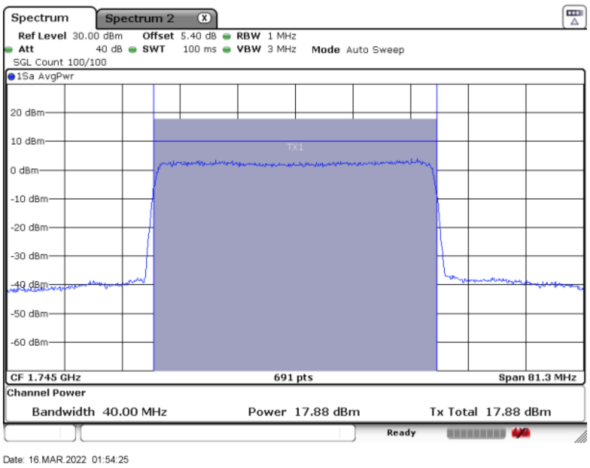


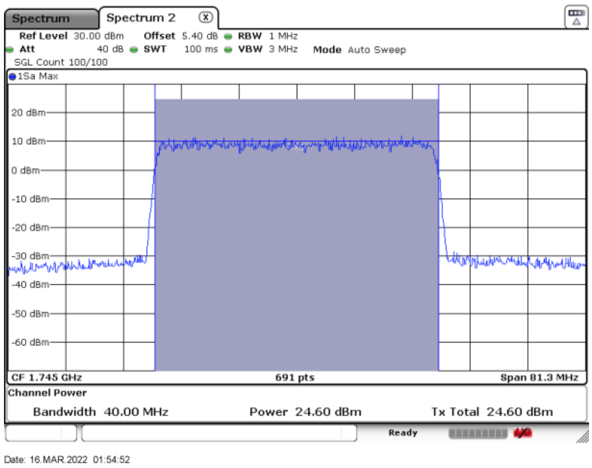
64QAM





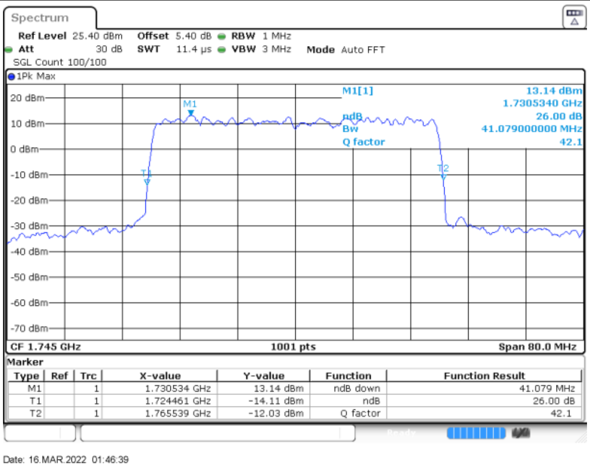
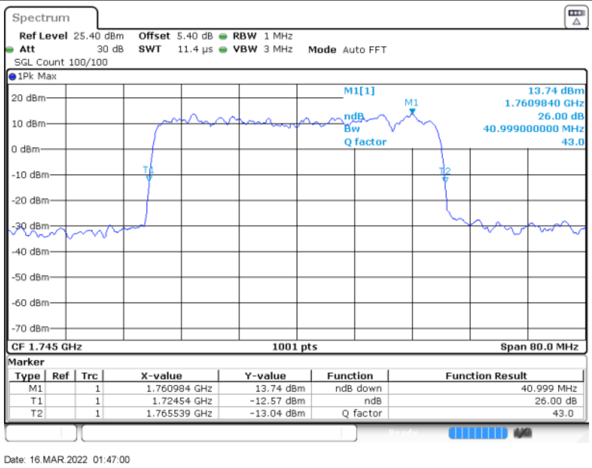
256QAM





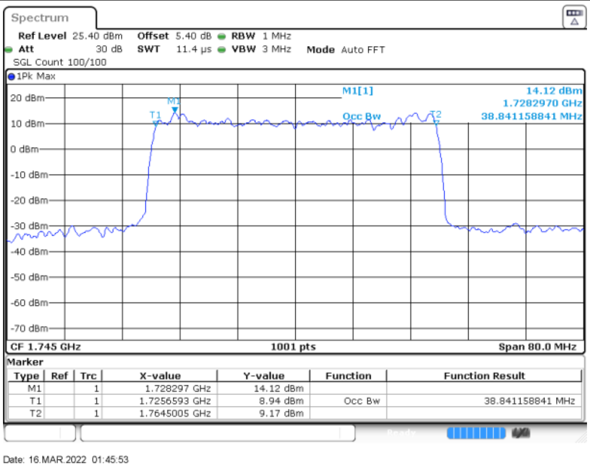
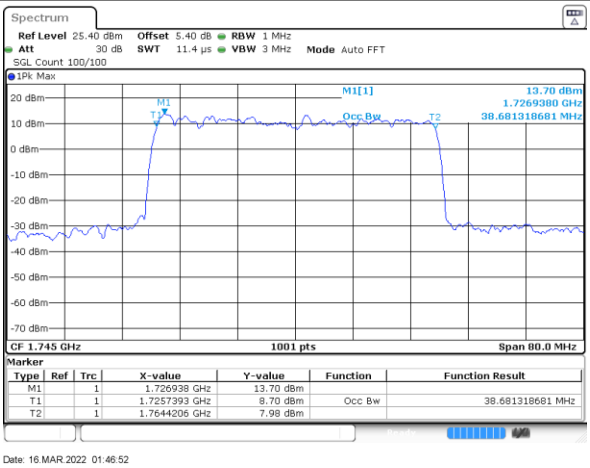
26dB Bandwidth

Mode	FR1 n66 : 26dB BW(MHz) / DFT-S OFDM	
BW	40M	
Mod.	QPSK	16QAM
Middle CH	41.08	41.00

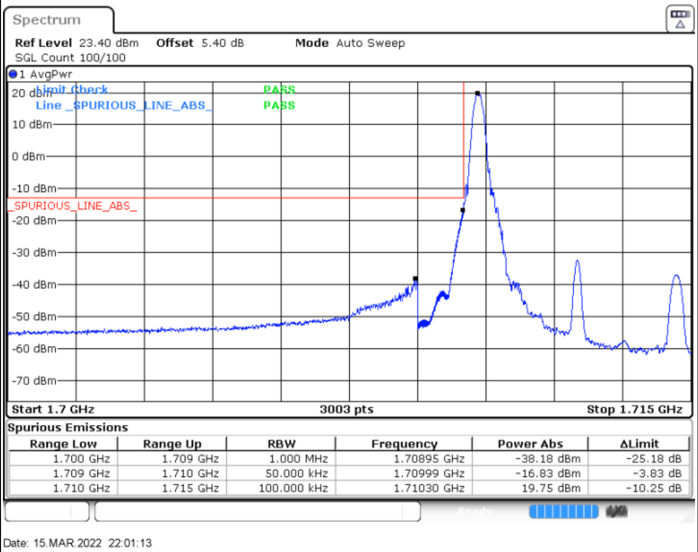
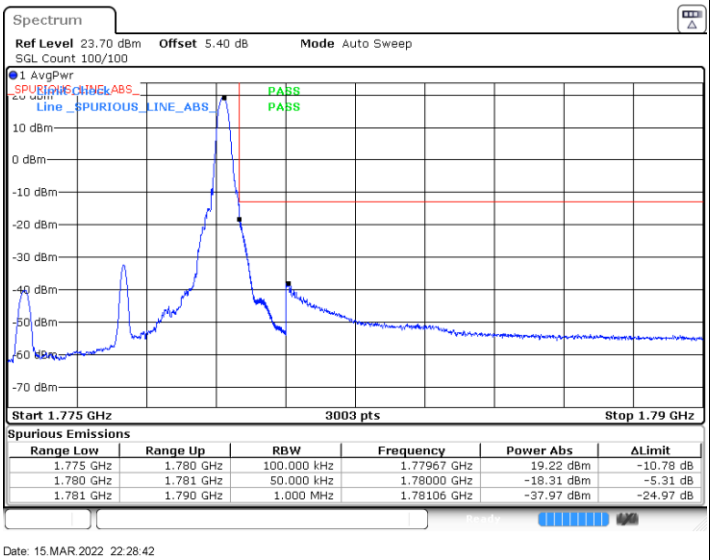
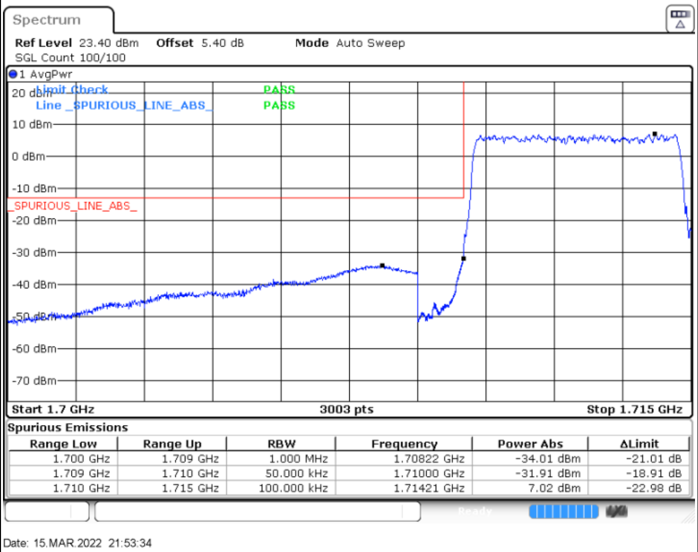
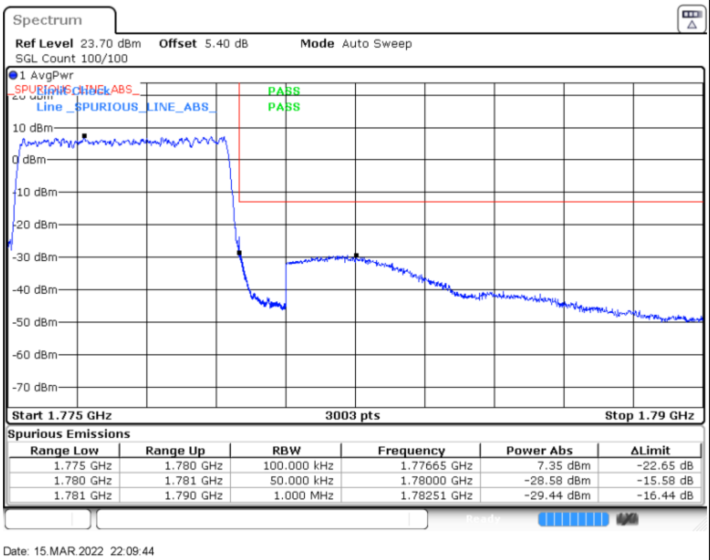
QPSK	16QAM
	

Occupied Bandwidth

Mode	FR1 n66 : 99%OBW(MHz) / DFT-S OFDM	
BW	40M	
Mod.	QPSK	16QAM
Middle CH	38.84	38.68

QPSK	16QAM
	

Conducted Band Edge

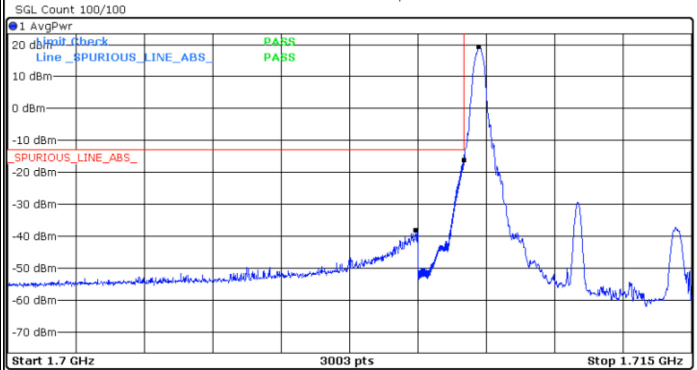
FR1 n66 / 5MHz / DFT-S OFDM / PI/2 BPSK	
Lowest Band Edge / 1RB0	Highest Band Edge / 1RBMAX
	
Lowest Band Edge / Full RB	Highest Band Edge / Full RB
	

FR1 n66 / 5MHz / DFT-S OFDM / QPSK

Lowest Band Edge / 1RB0

Spectrum

Ref Level 23.40 dBm Offset 5.40 dB Mode Auto Sweep
SGL Count 100/100



Spurious Emissions

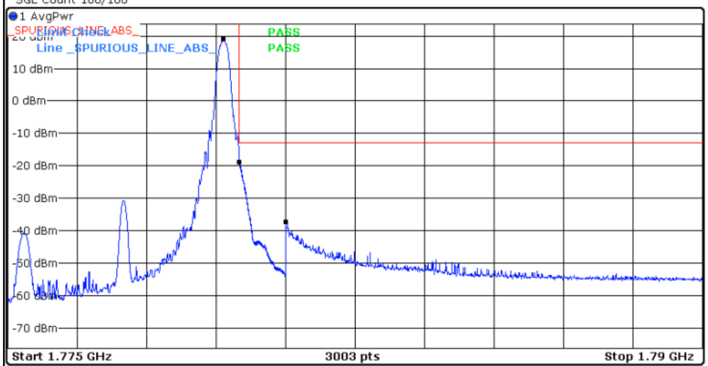
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.700 GHz	1.709 GHz	1.000 MHz	1.70894 GHz	-38.12 dBm	-25.12 dB
1.709 GHz	1.710 GHz	50.000 kHz	1.71000 GHz	-16.05 dBm	-3.05 dB
1.710 GHz	1.715 GHz	100.000 kHz	1.71034 GHz	19.26 dBm	-10.74 dB

Date: 15.MAR.2022 22:00:09

Highest Band Edge / 1RBMAX

Spectrum

Ref Level 23.70 dBm Offset 5.40 dB Mode Auto Sweep
SGL Count 100/100



Spurious Emissions

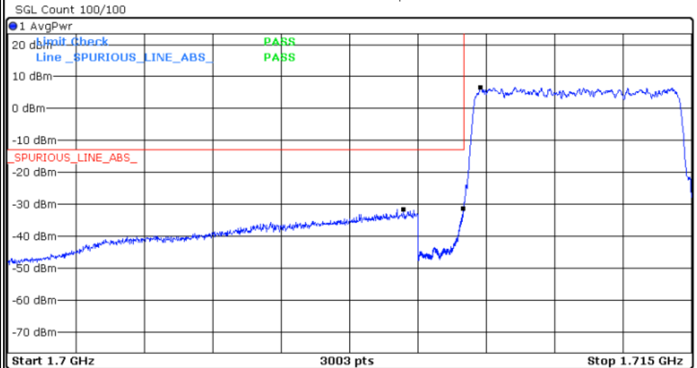
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.775 GHz	1.780 GHz	100.000 kHz	1.77965 GHz	19.02 dBm	-10.98 dB
1.780 GHz	1.781 GHz	50.000 kHz	1.78000 GHz	-18.93 dBm	-5.93 dB
1.781 GHz	1.790 GHz	1.000 MHz	1.78100 GHz	-37.32 dBm	-24.32 dB

Date: 15.MAR.2022 22:25:28

Lowest Band Edge / Full RB

Spectrum

Ref Level 23.40 dBm Offset 5.40 dB Mode Auto Sweep
SGL Count 100/100



Spurious Emissions

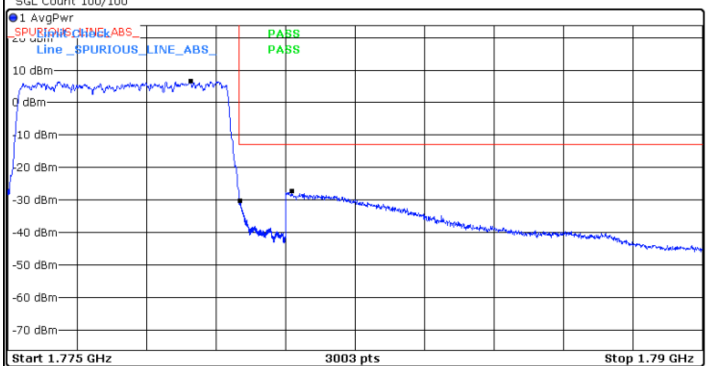
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.700 GHz	1.709 GHz	1.000 MHz	1.70868 GHz	-31.57 dBm	-18.57 dB
1.709 GHz	1.710 GHz	50.000 kHz	1.70999 GHz	-31.34 dBm	-18.34 dB
1.710 GHz	1.715 GHz	100.000 kHz	1.71037 GHz	6.68 dBm	-23.32 dB

Date: 15.MAR.2022 21:54:40

Highest Band Edge / Full RB

Spectrum

Ref Level 23.70 dBm Offset 5.40 dB Mode Auto Sweep
SGL Count 100/100



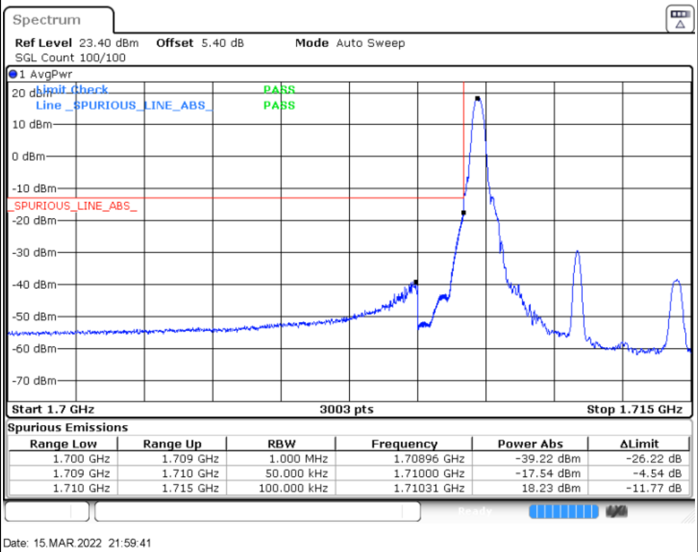
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.775 GHz	1.780 GHz	100.000 kHz	1.77894 GHz	6.50 dBm	-23.50 dB
1.780 GHz	1.781 GHz	50.000 kHz	1.78001 GHz	-30.15 dBm	-17.15 dB
1.781 GHz	1.790 GHz	1.000 MHz	1.78114 GHz	-27.17 dBm	-14.17 dB

Date: 15.MAR.2022 22:10:09

FR1 n66 / 5MHz / DFT-S OFDM / 16Q

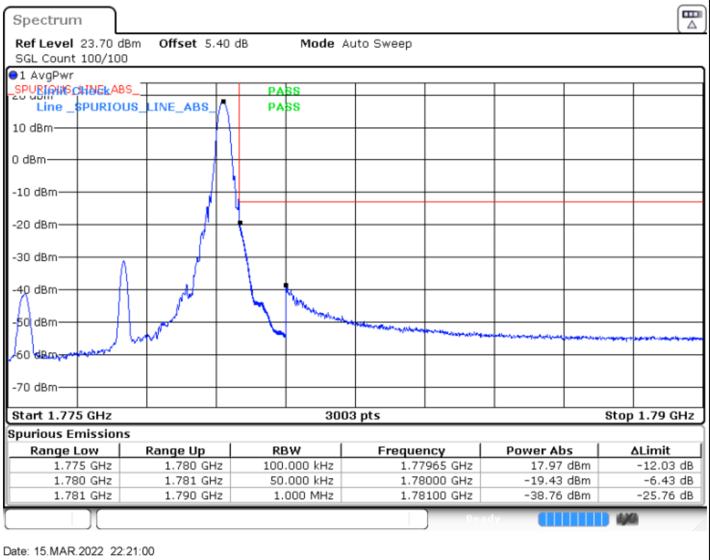
Lowest Band Edge / 1RB0



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.700 GHz	1.709 GHz	1.000 MHz	1.70896 GHz	-39.22 dBm	-26.22 dB
1.709 GHz	1.710 GHz	50.000 kHz	1.71000 GHz	-17.54 dBm	-4.54 dB
1.710 GHz	1.715 GHz	100.000 kHz	1.71031 GHz	18.23 dBm	-11.77 dB

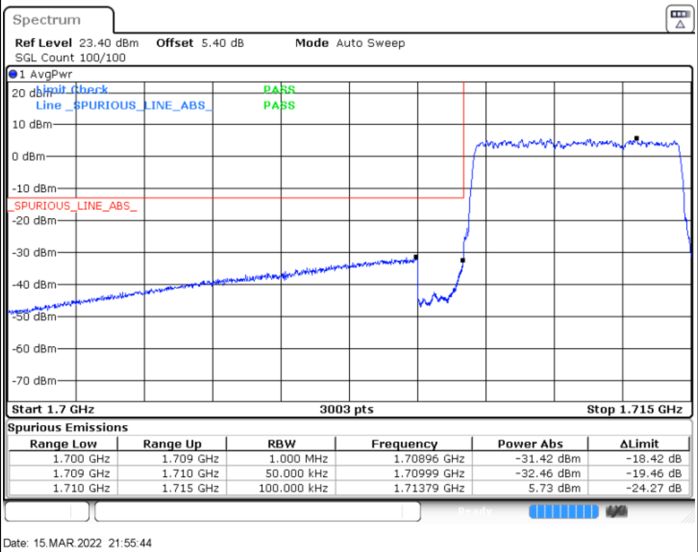
Highest Band Edge / 1RBMAX



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.775 GHz	1.780 GHz	100.000 kHz	1.77965 GHz	17.97 dBm	-12.03 dB
1.780 GHz	1.781 GHz	50.000 kHz	1.78000 GHz	-19.43 dBm	-6.43 dB
1.781 GHz	1.790 GHz	1.000 MHz	1.78100 GHz	-38.76 dBm	-25.76 dB

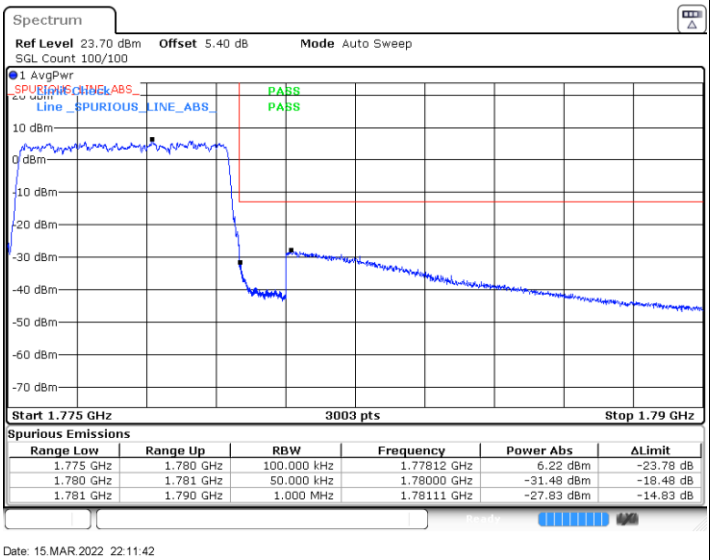
Lowest Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.700 GHz	1.709 GHz	1.000 MHz	1.70896 GHz	-31.42 dBm	-18.42 dB
1.709 GHz	1.710 GHz	50.000 kHz	1.70999 GHz	-32.46 dBm	-19.46 dB
1.710 GHz	1.715 GHz	100.000 kHz	1.71379 GHz	5.73 dBm	-24.27 dB

Highest Band Edge / Full RB

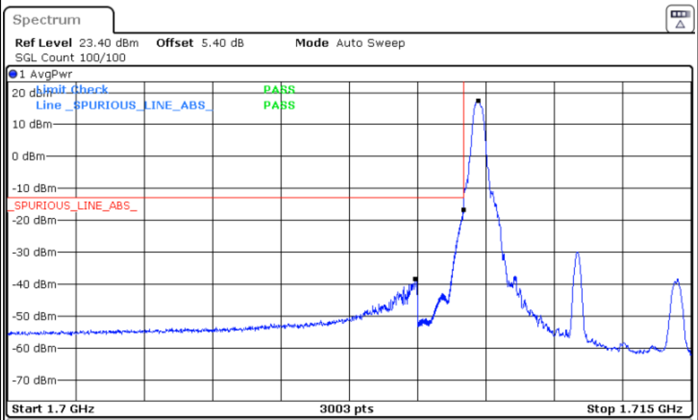


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.775 GHz	1.780 GHz	100.000 kHz	1.77812 GHz	6.22 dBm	-23.78 dB
1.780 GHz	1.781 GHz	50.000 kHz	1.78000 GHz	-31.48 dBm	-18.48 dB
1.781 GHz	1.790 GHz	1.000 MHz	1.78111 GHz	-27.83 dBm	-14.83 dB

FR1 n66 / 5MHz / DFT-S OFDM / 64Q

Lowest Band Edge / 1RB0

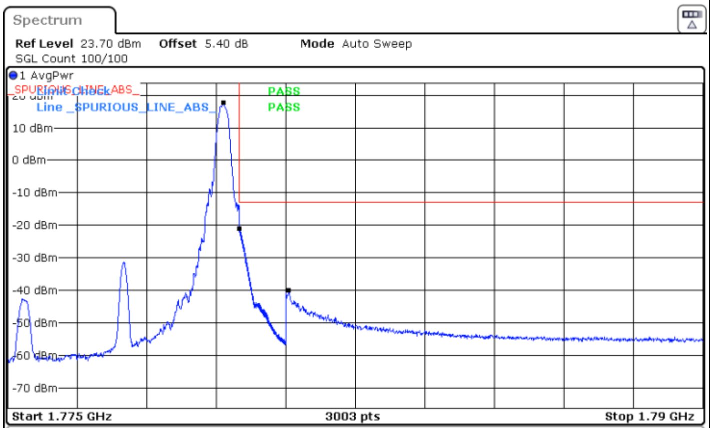


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.700 GHz	1.709 GHz	1.000 MHz	1.70895 GHz	-38.48 dBm	-25.48 dB
1.709 GHz	1.710 GHz	50.000 kHz	1.71000 GHz	-16.83 dBm	-3.83 dB
1.710 GHz	1.715 GHz	100.000 kHz	1.71033 GHz	17.31 dBm	-12.69 dB

Date: 15.MAR.2022 21:59:05

Highest Band Edge / 1RBMAX

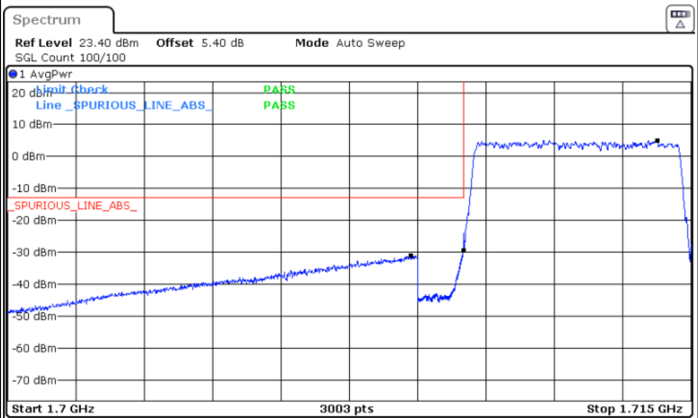


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.775 GHz	1.780 GHz	100.000 kHz	1.77966 GHz	17.76 dBm	-12.24 dB
1.780 GHz	1.781 GHz	50.000 kHz	1.78000 GHz	-21.01 dBm	-8.01 dB
1.781 GHz	1.790 GHz	1.000 MHz	1.78106 GHz	-39.85 dBm	-26.85 dB

Date: 15.MAR.2022 22:19:55

Lowest Band Edge / Full RB

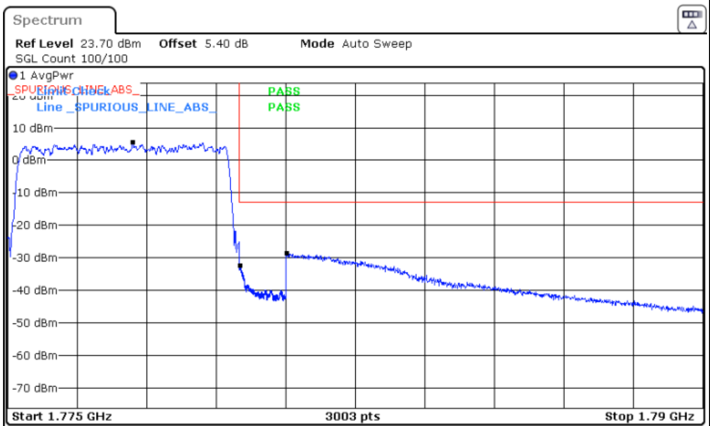


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.700 GHz	1.709 GHz	1.000 MHz	1.70884 GHz	-31.03 dBm	-18.03 dB
1.709 GHz	1.710 GHz	50.000 kHz	1.71000 GHz	-29.47 dBm	-16.47 dB
1.710 GHz	1.715 GHz	100.000 kHz	1.71425 GHz	5.07 dBm	-24.93 dB

Date: 15.MAR.2022 21:56:29

Highest Band Edge / Full RB



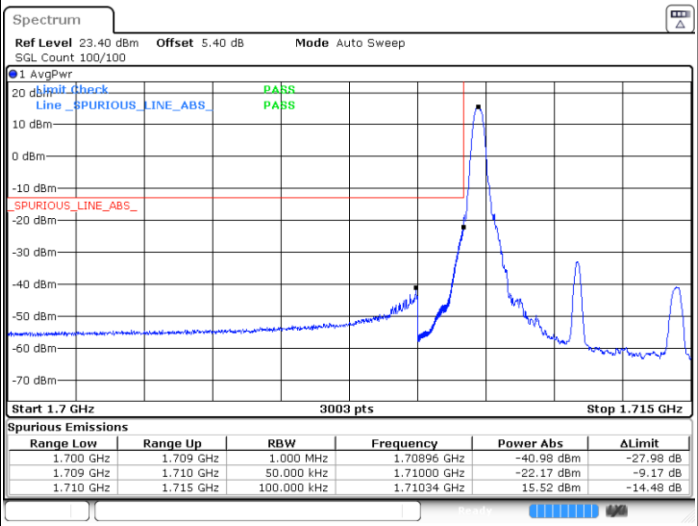
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.775 GHz	1.780 GHz	100.000 kHz	1.77769 GHz	5.41 dBm	-24.59 dB
1.780 GHz	1.781 GHz	50.000 kHz	1.78001 GHz	-32.40 dBm	-19.40 dB
1.781 GHz	1.790 GHz	1.000 MHz	1.78101 GHz	-28.70 dBm	-15.70 dB

Date: 15.MAR.2022 22:15:16

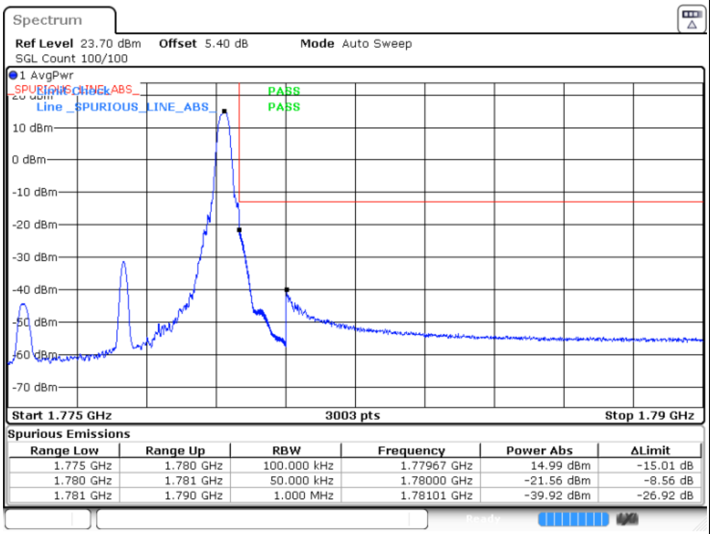
FR1 n66 / 5MHz / DFT-S OFDM / 256Q

Lowest Band Edge / 1RB0



Date: 15.MAR.2022 21:57:57

Highest Band Edge / 1RBMAX



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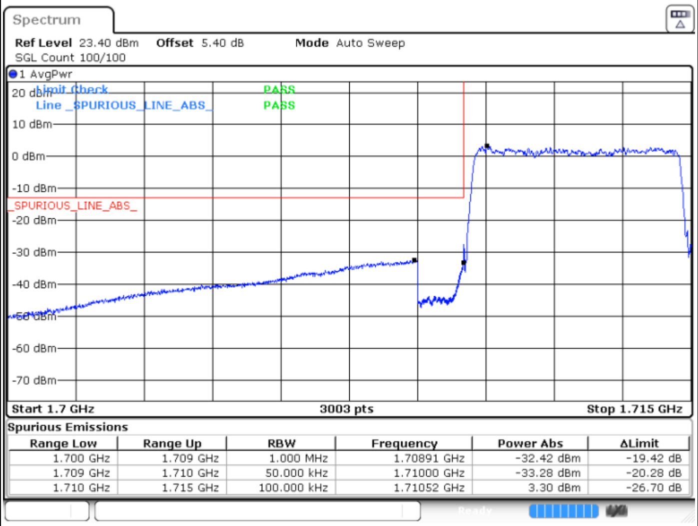
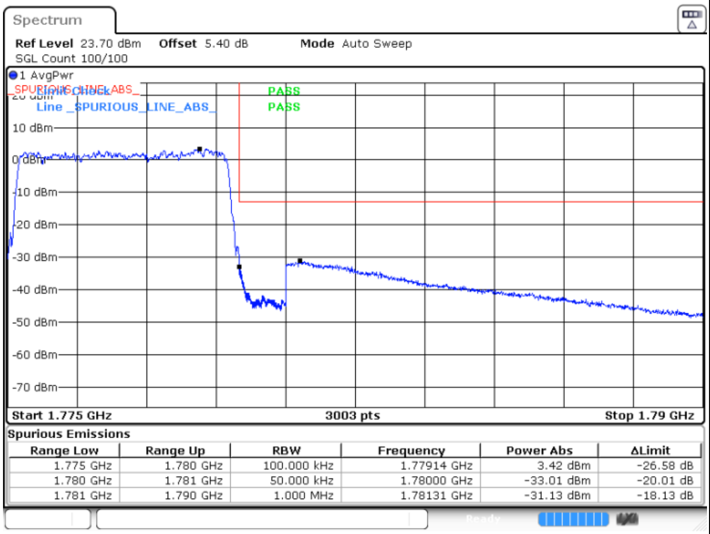
Lowest Band Edge / Full RB

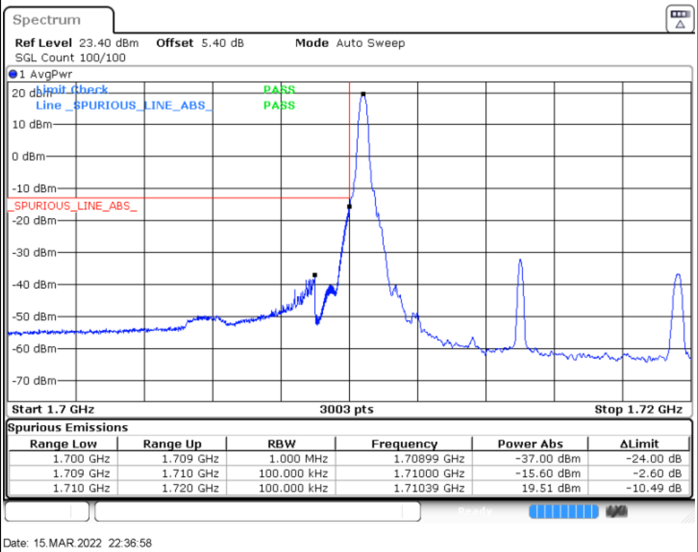
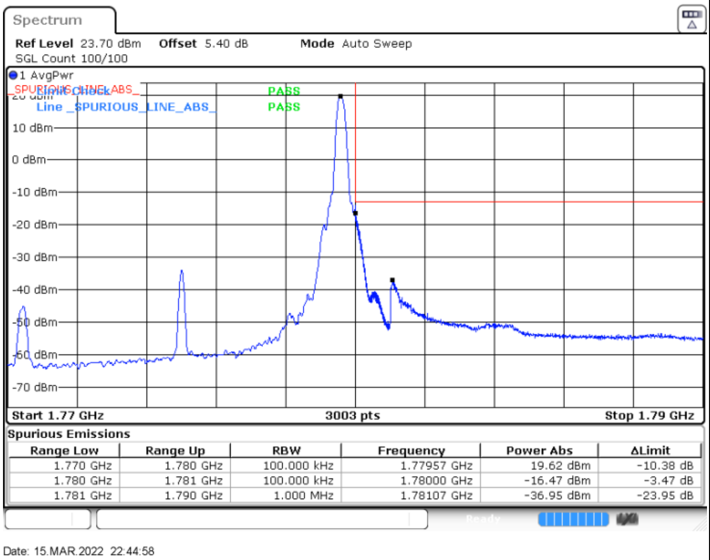
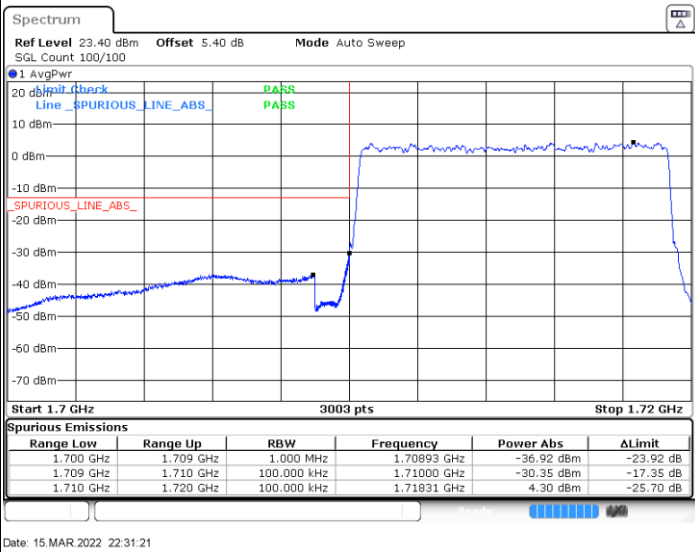
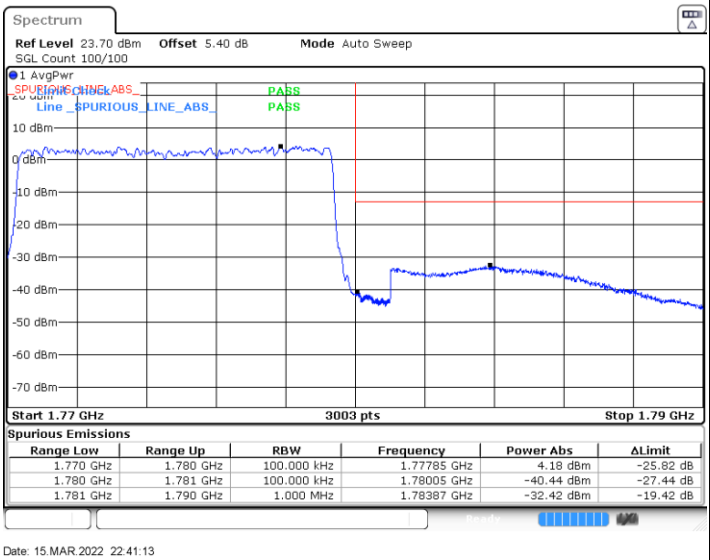


Date: 15.MAR.2022 21:57:19

Highest Band Edge / Full RB

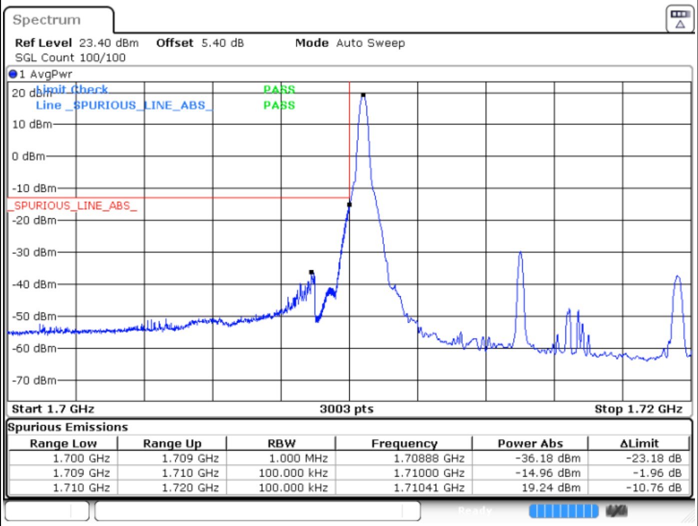


Date: 15.MAR.2022 22:18:30

FR1 n66 / 10MHz / DFT-s-OFDM / PI/2 BPSK	
Lowest Band Edge / 1RB0	Highest Band Edge / 1RBMAX
	
Lowest Band Edge / Full RB	Highest Band Edge / Full RB
	

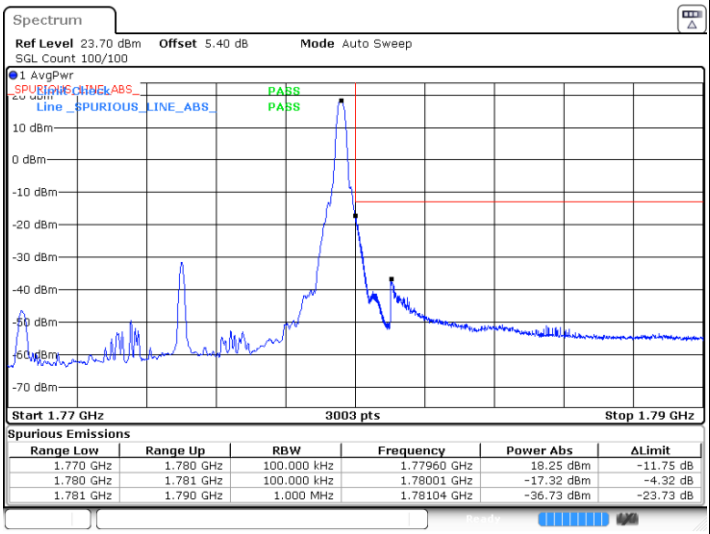
FR1 n66 / 10MHz / DFT-s-OFDM / QPSK

Lowest Band Edge / 1RB0



Date: 15.MAR.2022 22:36:13

Highest Band Edge / 1RBMAX



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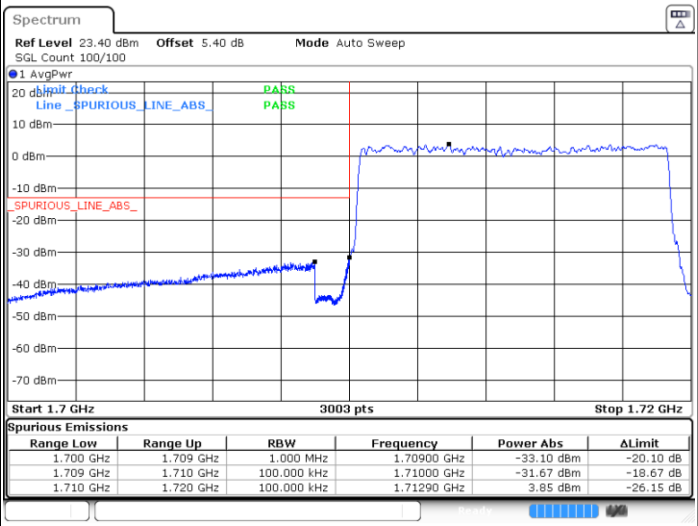
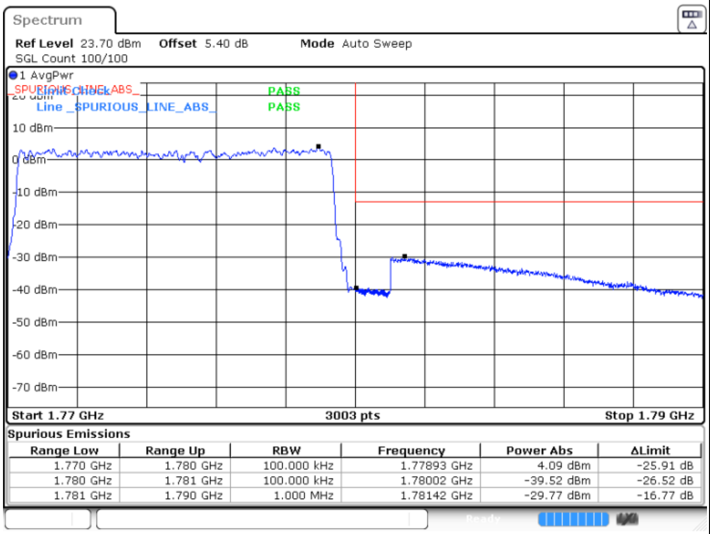
Lowest Band Edge / Full RB



Date: 15.MAR.2022 22:32:42

Highest Band Edge / Full RB



Date: 15.MAR.2022 22:41:32

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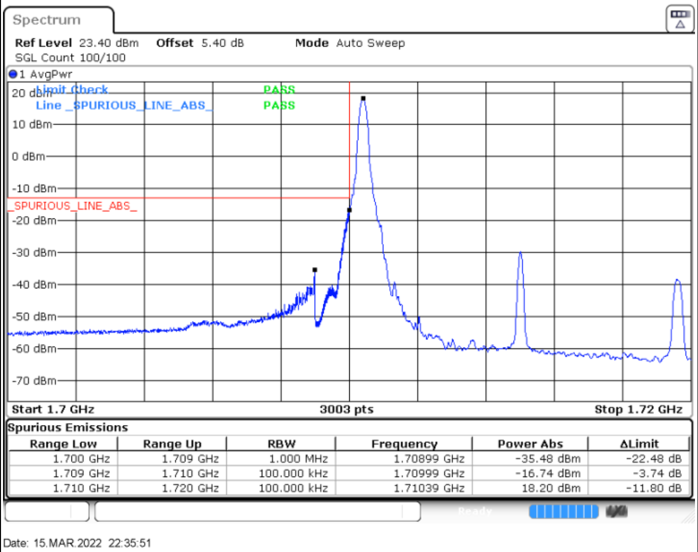
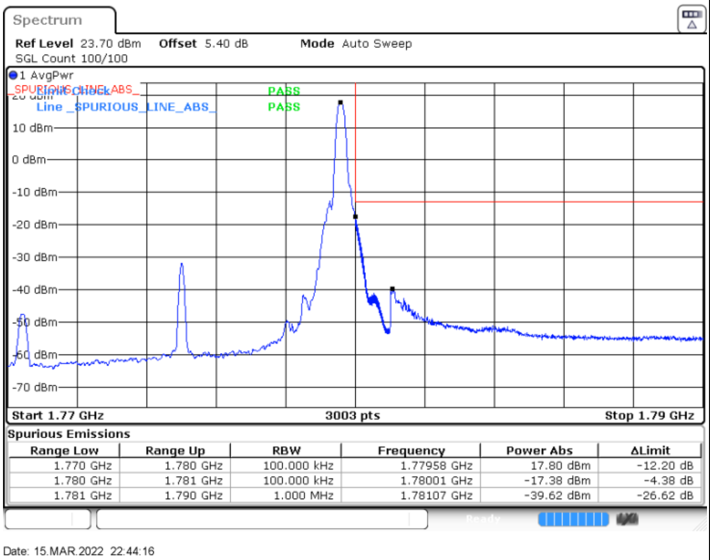
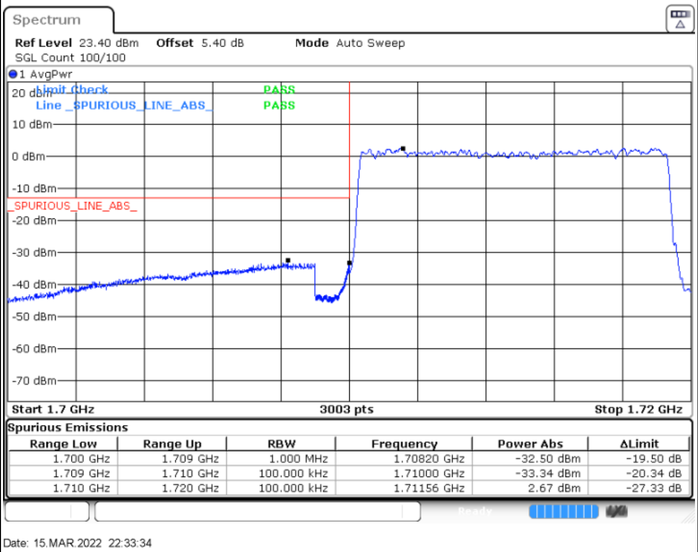
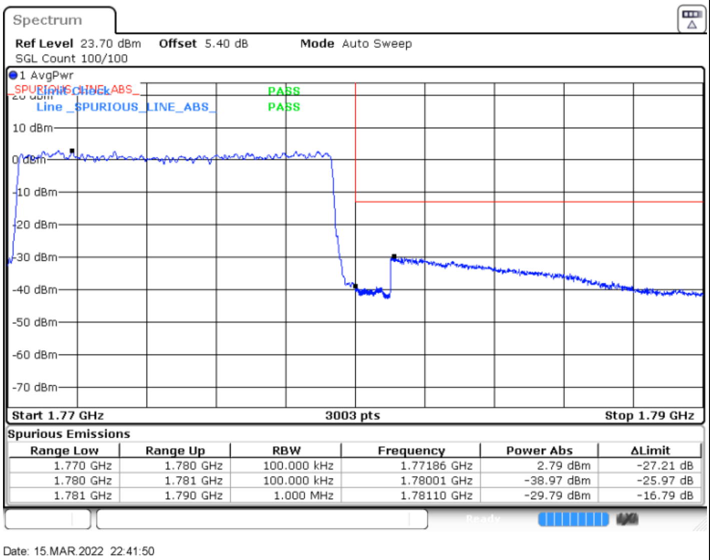
<tr><td></td><td></td></tr>
<tr><th>Lowest Band Edge / Full RB</th><th>Highest Band Edge / Full RB</th></tr>
<tr><td></td><td></td></tr>
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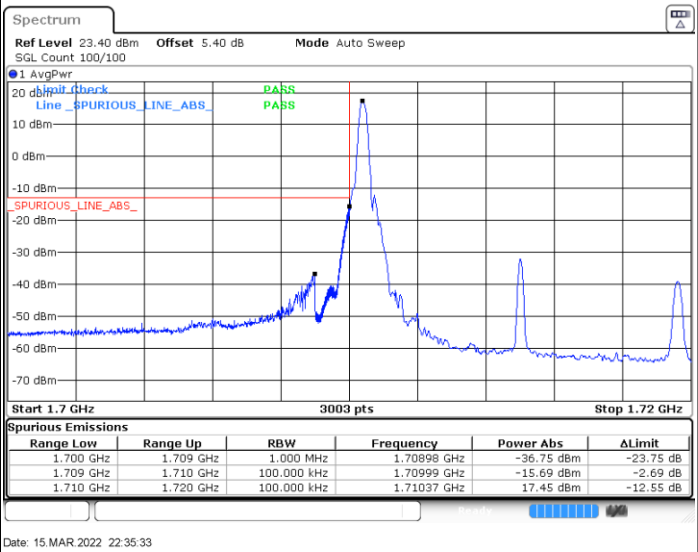
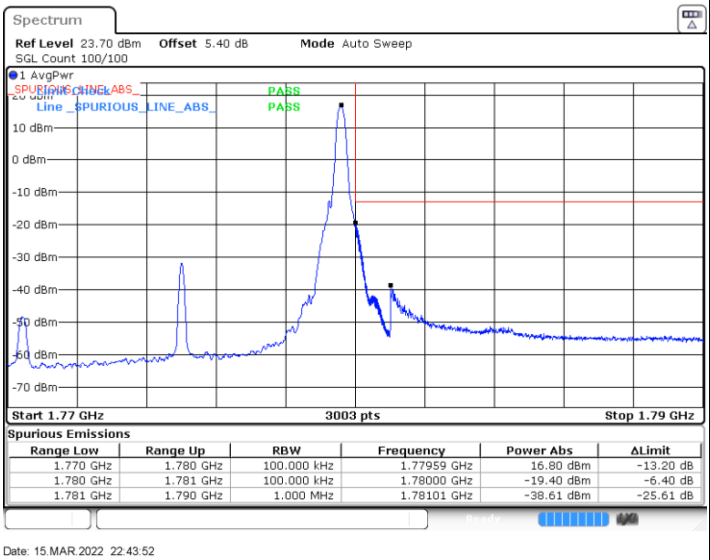
FR1 n66 / 10MHz / DFT-s-OFDM / 64QAM

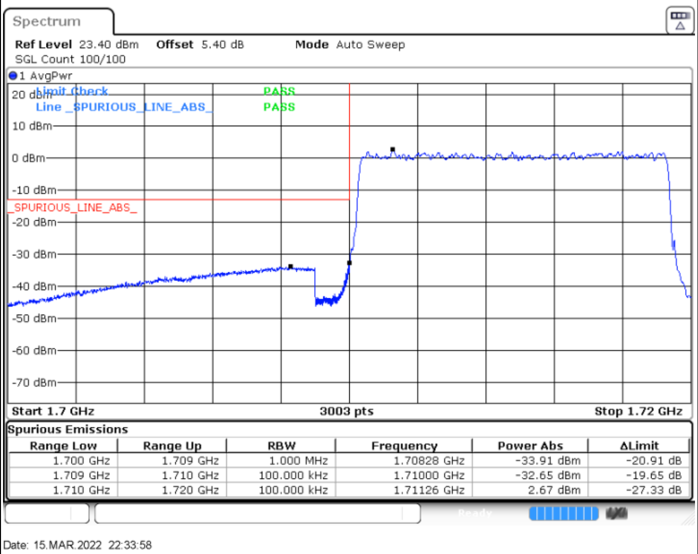
Lowest Band Edge / 1RB0



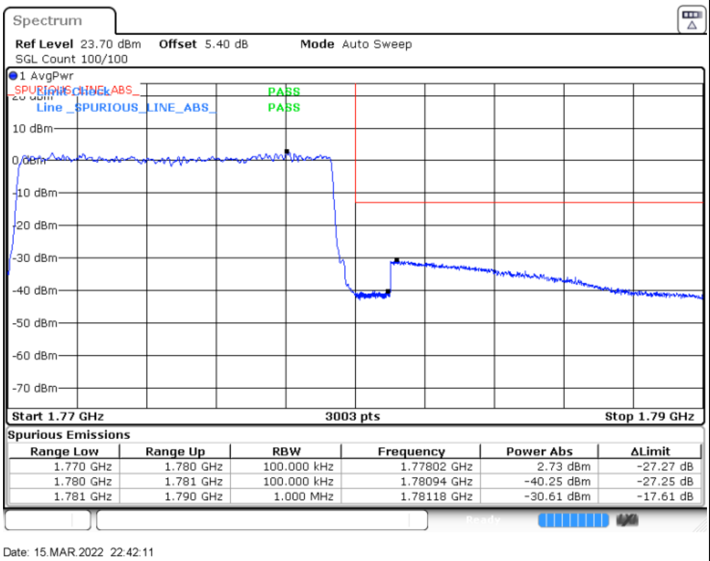
Highest Band Edge / 1RBMAX



Lowest Band Edge / Full RB

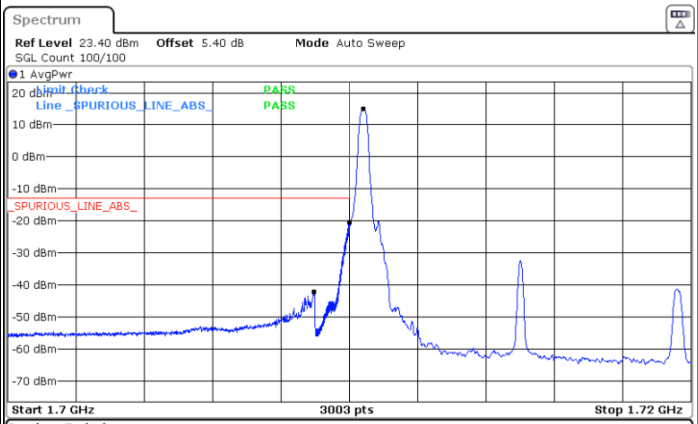


Highest Band Edge / Full RB



FR1 n66 / 10MHz / DFT-s-OFDM / 256QAM

Lowest Band Edge / 1RB0



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.700 GHz	1.709 GHz	1.000 MHz	1.70897 GHz	-42.24 dBm	-29.24 dB
1.709 GHz	1.710 GHz	100.000 kHz	1.71000 GHz	-20.45 dBm	-7.45 dB
1.710 GHz	1.720 GHz	100.000 kHz	1.71041 GHz	15.12 dBm	-14.88 dB

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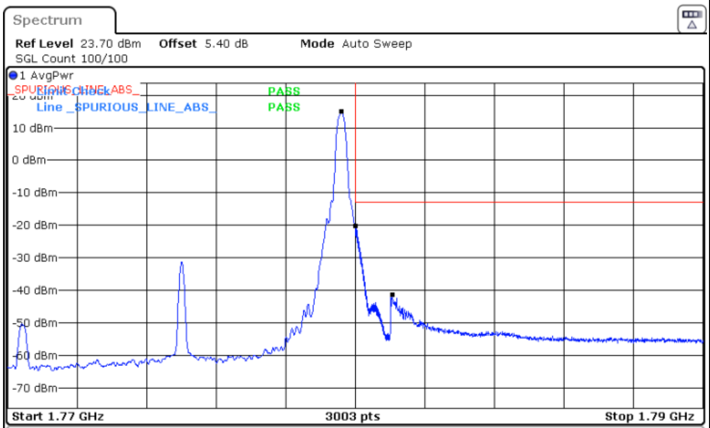
Highest Band Edge / 1RBMAX



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.770 GHz	1.780 GHz	100.000 kHz	1.77961 GHz	15.09 dBm	-14.91 dB
1.780 GHz	1.781 GHz	100.000 kHz	1.78001 GHz	-20.19 dBm	-7.19 dB
1.781 GHz	1.790 GHz	1.000 MHz	1.78106 GHz	-41.25 dBm	-28.25 dB

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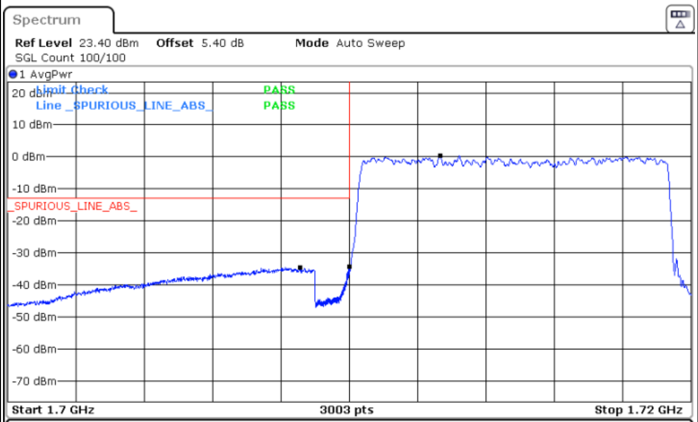
Lowest Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.700 GHz	1.709 GHz	1.000 MHz	1.70855 GHz	-34.54 dBm	-21.54 dB
1.709 GHz	1.710 GHz	100.000 kHz	1.70999 GHz	-34.30 dBm	-21.30 dB
1.710 GHz	1.720 GHz	100.000 kHz	1.71265 GHz	0.40 dBm	-29.60 dB

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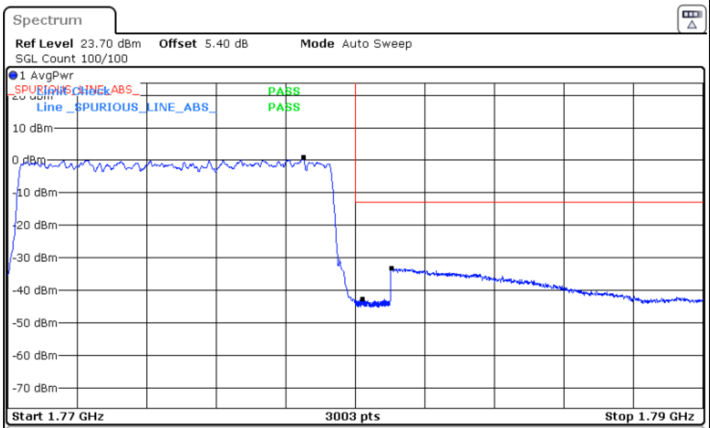
Highest Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.770 GHz	1.780 GHz	100.000 kHz	1.77850 GHz	0.91 dBm	-29.09 dB
1.780 GHz	1.781 GHz	100.000 kHz	1.78020 GHz	-42.58 dBm	-29.58 dB
1.781 GHz	1.790 GHz	1.000 MHz	1.78104 GHz	-33.32 dBm	-20.32 dB

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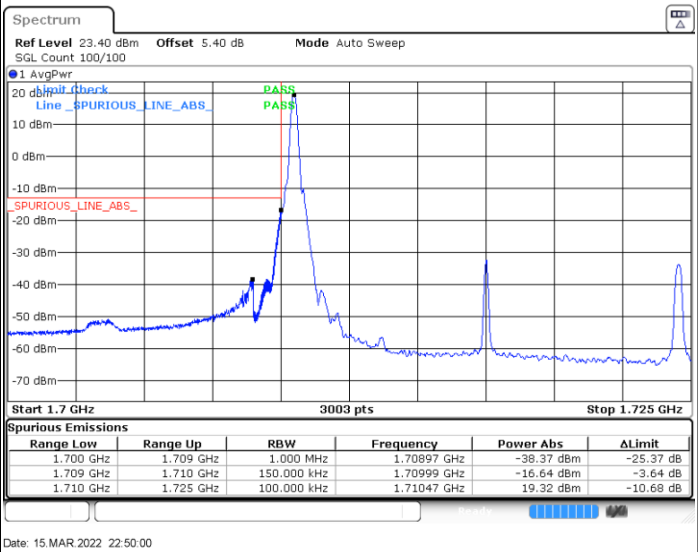
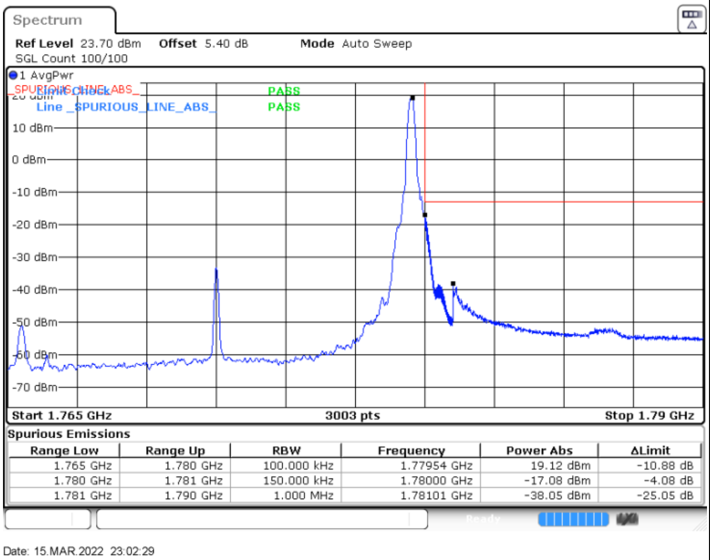
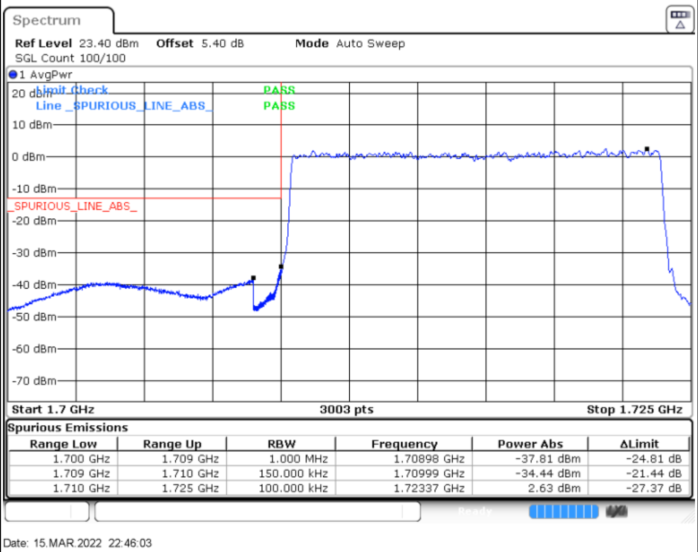
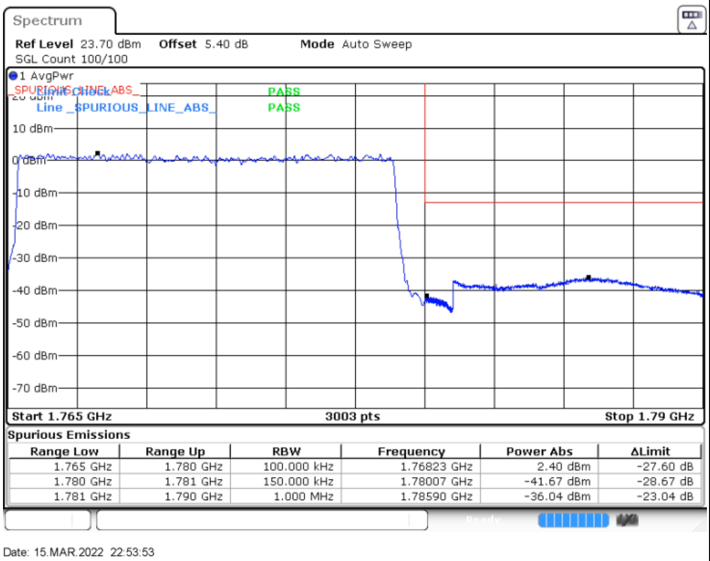
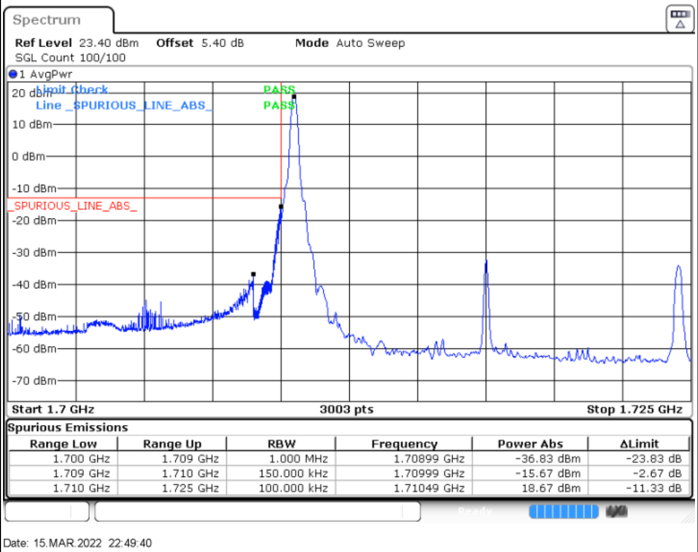
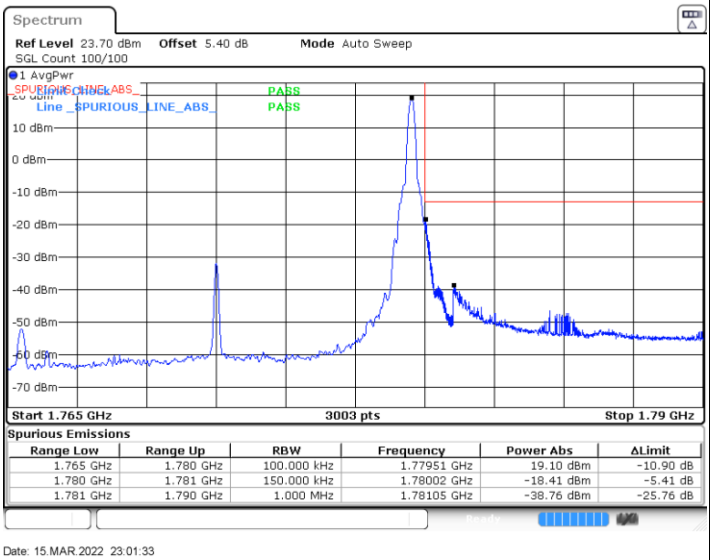
FR1 n66 / 15MHz / DFT-s-OFDM / PI/2 BPSK	
Lowest Band Edge / 1RB0	Highest Band Edge / 1RBMAX
	
Lowest Band Edge / Full RB	Highest Band Edge / Full RB
	

FR1 n66 / 15MHz / DFT-s-OFDM / QPSK	
Lowest Band Edge / 1RB0	**Highest Band Edge / 1RBMAX**

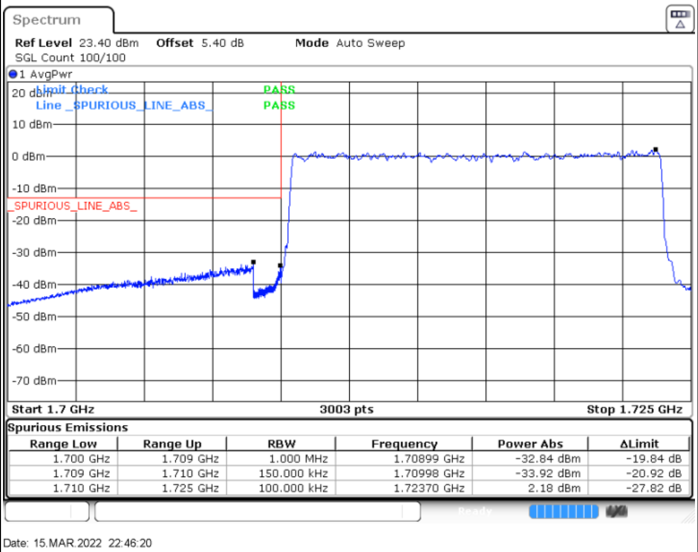


Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.700 GHz	1.709 GHz	1.000 MHz	1.70899 GHz	-36.83 dBm	-23.83 dB
1.709 GHz	1.710 GHz	150.000 kHz	1.70999 GHz	-15.67 dBm	-2.67 dB
1.710 GHz	1.725 GHz	100.000 kHz	1.71049 GHz	18.67 dBm	-11.33 dB

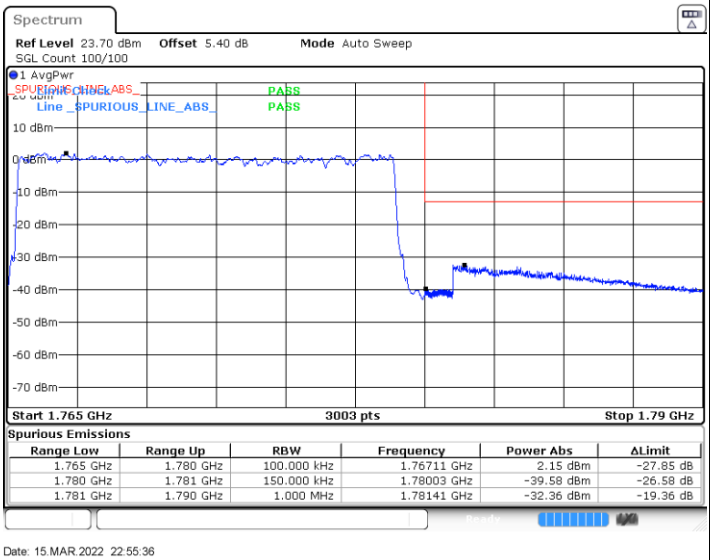


Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.765 GHz	1.780 GHz	100.000 kHz	1.77951 GHz	19.10 dBm	-10.90 dB
1.780 GHz	1.781 GHz	150.000 kHz	1.78002 GHz	-18.41 dBm	-5.41 dB
1.781 GHz	1.790 GHz	1.000 MHz	1.78105 GHz	-38.76 dBm	-25.76 dB

Lowest Band Edge / Full RB	Highest Band Edge / Full RB



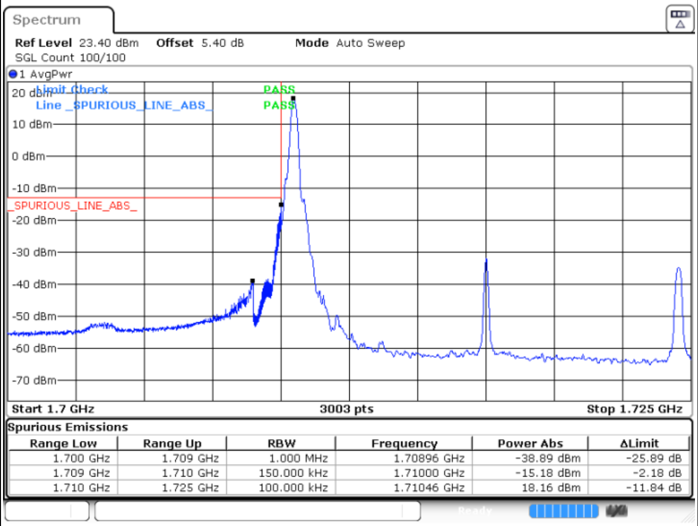
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.700 GHz	1.709 GHz	1.000 MHz	1.70899 GHz	-32.84 dBm	-19.84 dB
1.709 GHz	1.710 GHz	150.000 kHz	1.70998 GHz	-33.92 dBm	-20.92 dB
1.710 GHz	1.725 GHz	100.000 kHz	1.72370 GHz	2.18 dBm	-27.82 dB



Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.765 GHz	1.780 GHz	100.000 kHz	1.76711 GHz	2.15 dBm	-27.85 dB
1.780 GHz	1.781 GHz	150.000 kHz	1.78003 GHz	-39.58 dBm	-26.58 dB
1.781 GHz	1.790 GHz	1.000 MHz	1.78141 GHz	-32.36 dBm	-19.36 dB

FR1 n66 / 15MHz / DFT-s-OFDM / 16QAM

Lowest Band Edge / 1RB0



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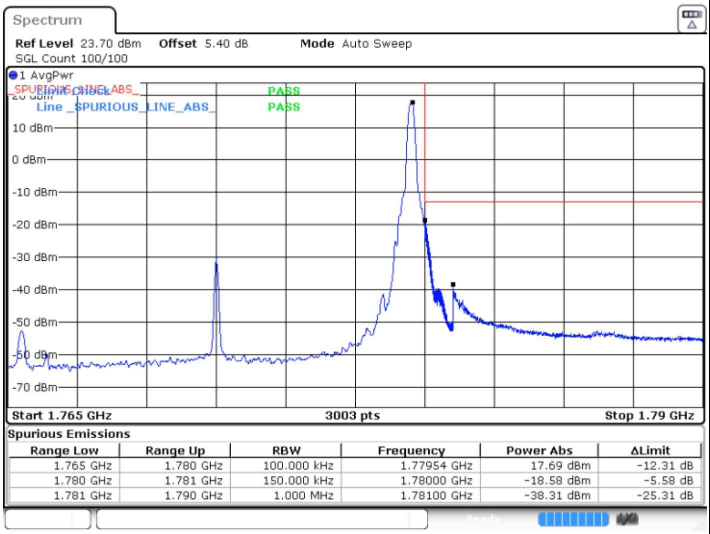
Highest Band Edge / 1RBMAX



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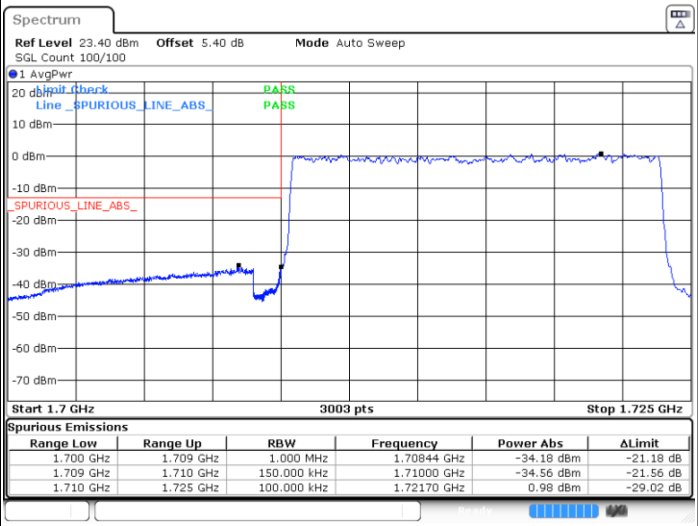
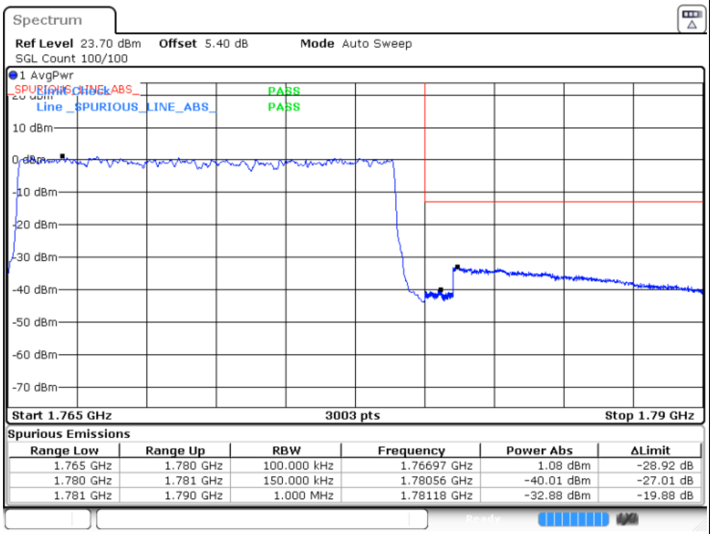
Lowest Band Edge / Full RB



Date: 15.MAR.2022 22:46:52

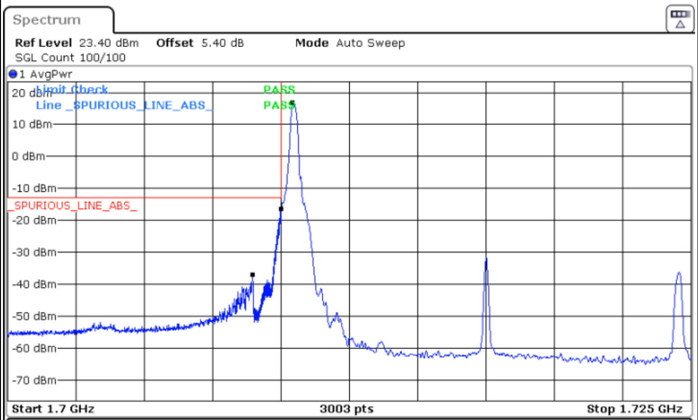
Highest Band Edge / Full RB



Date: 15.MAR.2022 22:56:14

FR1 n66 / 15MHz / DFT-s-OFDM / 64QAM

Lowest Band Edge / 1RB0



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.700 GHz	1.709 GHz	1.000 MHz	1.70895 GHz	-37.03 dBm	-24.03 dB
1.709 GHz	1.710 GHz	150.000 kHz	1.70999 GHz	-16.41 dBm	-3.41 dB
1.710 GHz	1.725 GHz	100.000 kHz	1.71043 GHz	16.97 dBm	-13.03 dB

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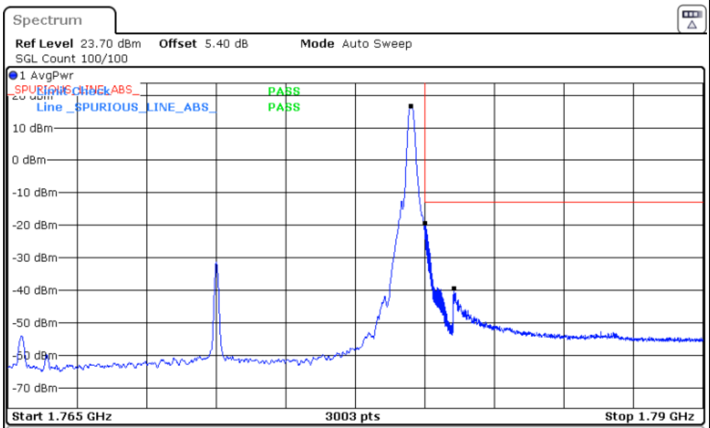
Highest Band Edge / 1RBMAX



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.765 GHz	1.780 GHz	100.000 kHz	1.77948 GHz	16.68 dBm	-13.32 dB
1.780 GHz	1.781 GHz	150.000 kHz	1.78001 GHz	-19.34 dBm	-6.34 dB
1.781 GHz	1.790 GHz	1.000 MHz	1.78106 GHz	-39.52 dBm	-26.52 dB

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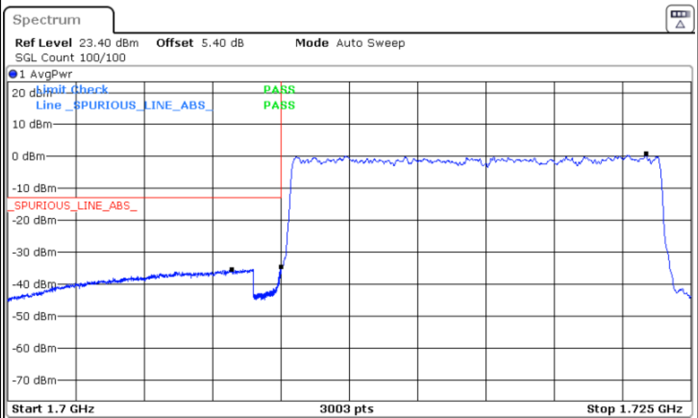
Lowest Band Edge / Full RB

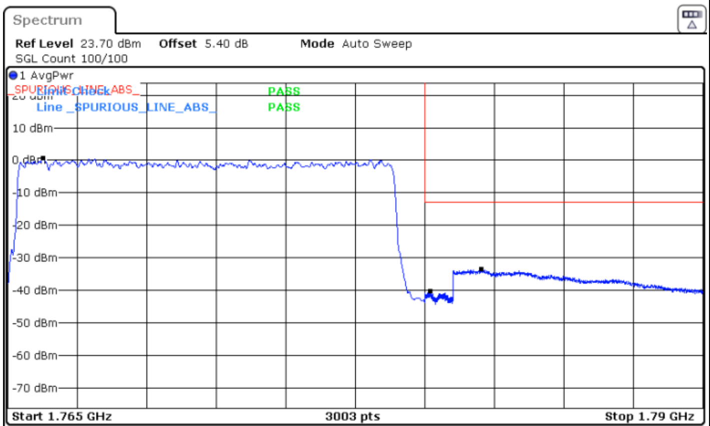


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.700 GHz	1.709 GHz	1.000 MHz	1.70819 GHz	-35.35 dBm	-22.35 dB
1.709 GHz	1.710 GHz	150.000 kHz	1.71000 GHz	-34.65 dBm	-21.65 dB
1.710 GHz	1.725 GHz	100.000 kHz	1.72334 GHz	0.87 dBm	-29.13 dB

Date: 15.MAR.2022 22:47:09

Highest Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.765 GHz	1.780 GHz	100.000 kHz	1.76627 GHz	0.57 dBm	-29.43 dB
1.780 GHz	1.781 GHz	150.000 kHz	1.78018 GHz	-40.31 dBm	-27.31 dB
1.781 GHz	1.790 GHz	1.000 MHz	1.78203 GHz	-33.61 dBm	-20.61 dB

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<table>
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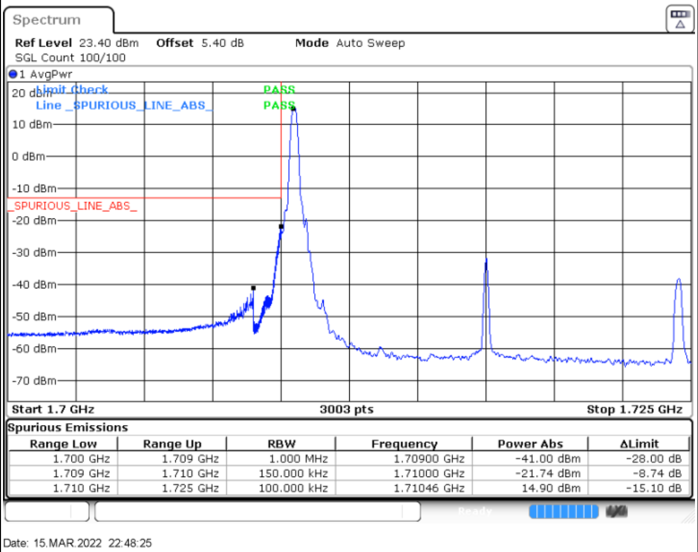
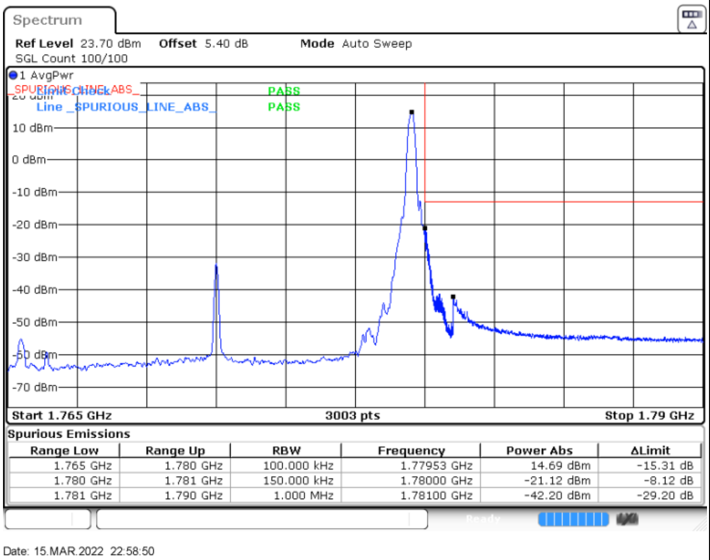
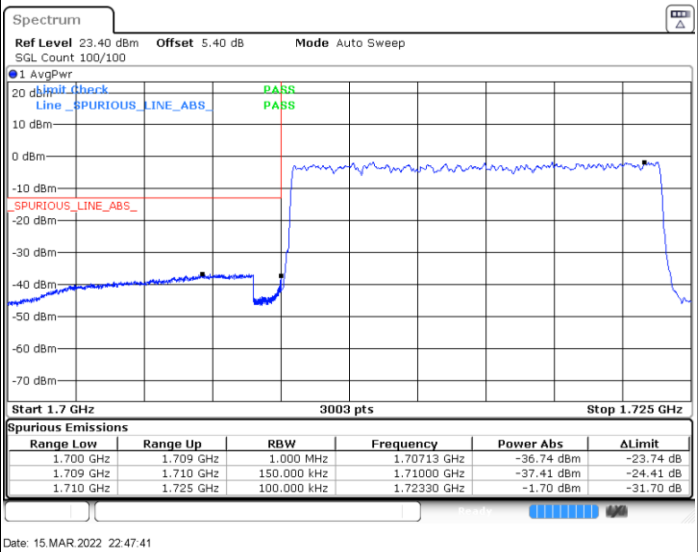
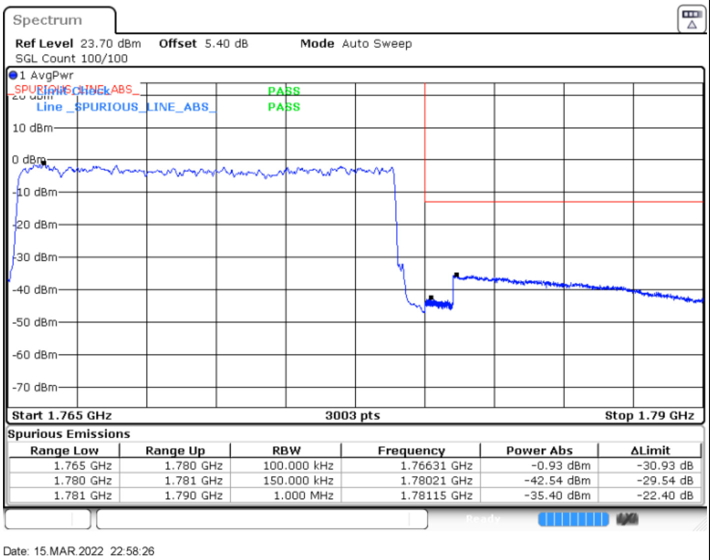
<tr><td></td><td></td></tr>
<tr><th>Lowest Band Edge / Full RB</th><th>Highest Band Edge / Full RB</th></tr>
<tr><td></td><td></td></tr>
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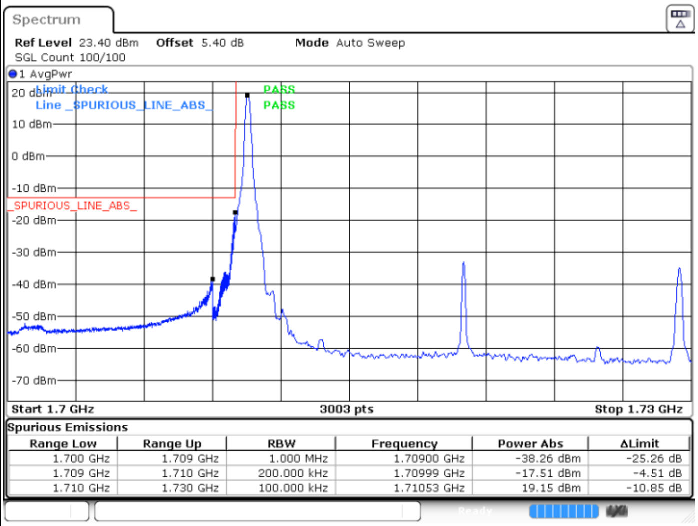
FR1 n66 / 20MHz / DFT-s-OFDM / PI/2 BPSK

Lowest Band Edge / 1RB0



Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.700 GHz	1.709 GHz	1.000 MHz	1.70900 GHz	-38.26 dBm	-25.26 dB
1.709 GHz	1.710 GHz	200.000 kHz	1.70999 GHz	-17.51 dBm	-4.51 dB
1.710 GHz	1.730 GHz	100.000 kHz	1.71053 GHz	19.15 dBm	-10.85 dB

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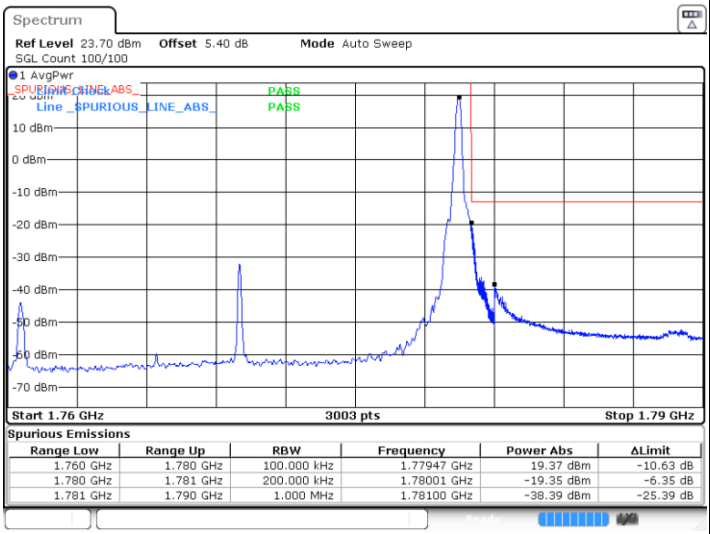
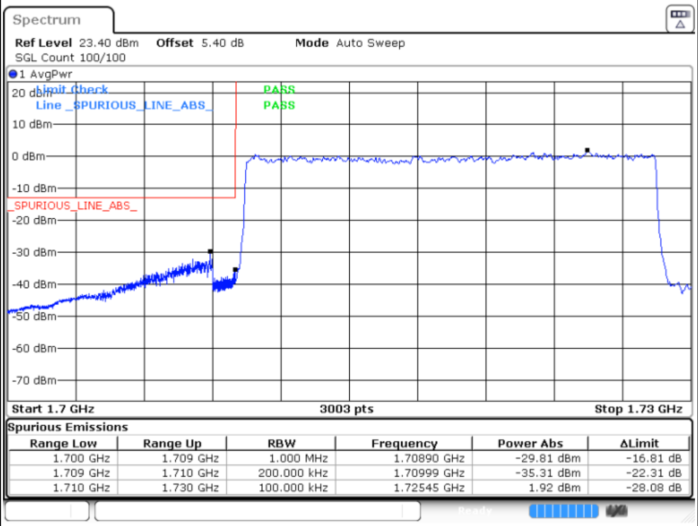
Highest Band Edge / 1RBMAX



Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.760 GHz	1.780 GHz	100.000 kHz	1.77947 GHz	19.37 dBm	-10.63 dB
1.780 GHz	1.781 GHz	200.000 kHz	1.78001 GHz	-19.35 dBm	-6.35 dB
1.781 GHz	1.790 GHz	1.000 MHz	1.78100 GHz	-38.39 dBm	-25.39 dB

Date: 15.MAR.2022 23:43:34

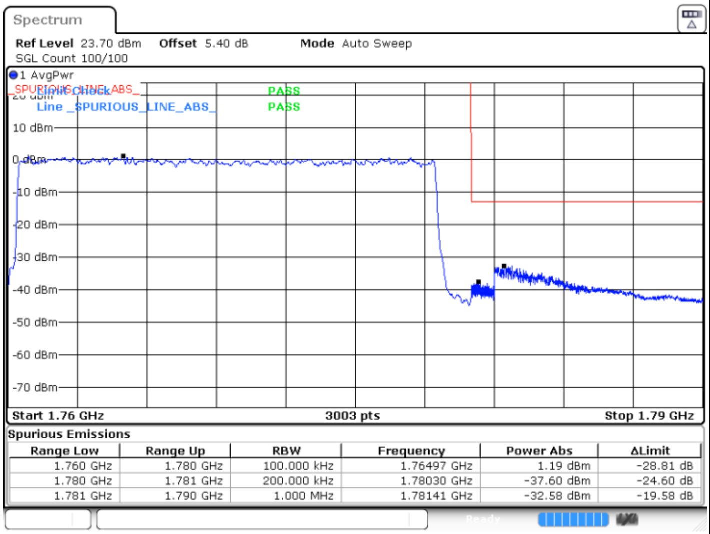
Lowest Band Edge / Full RB



Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.700 GHz	1.709 GHz	1.000 MHz	1.70890 GHz	-29.81 dBm	-16.81 dB
1.709 GHz	1.710 GHz	200.000 kHz	1.70999 GHz	-35.31 dBm	-22.31 dB
1.710 GHz	1.730 GHz	100.000 kHz	1.72545 GHz	1.92 dBm	-28.08 dB

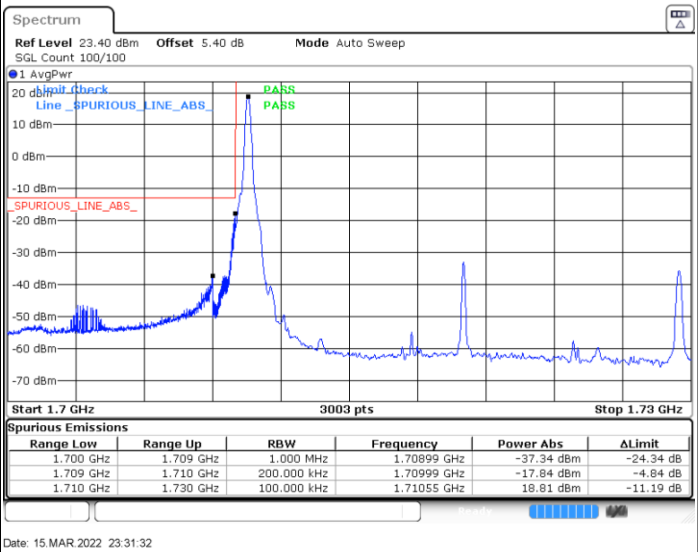
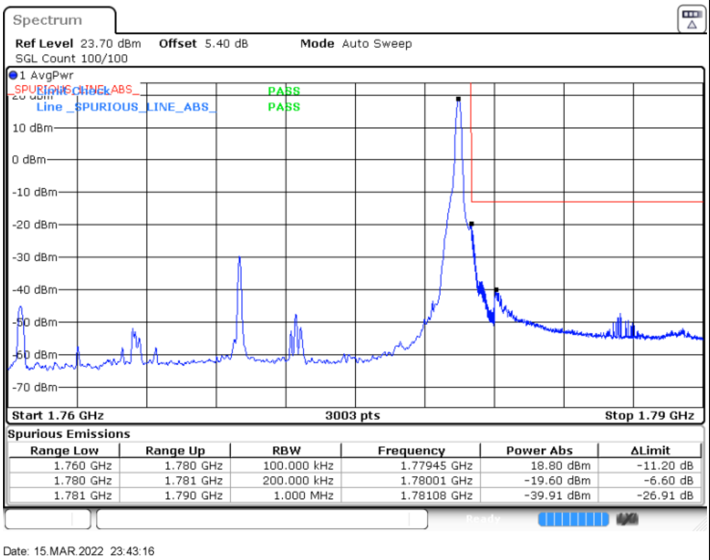
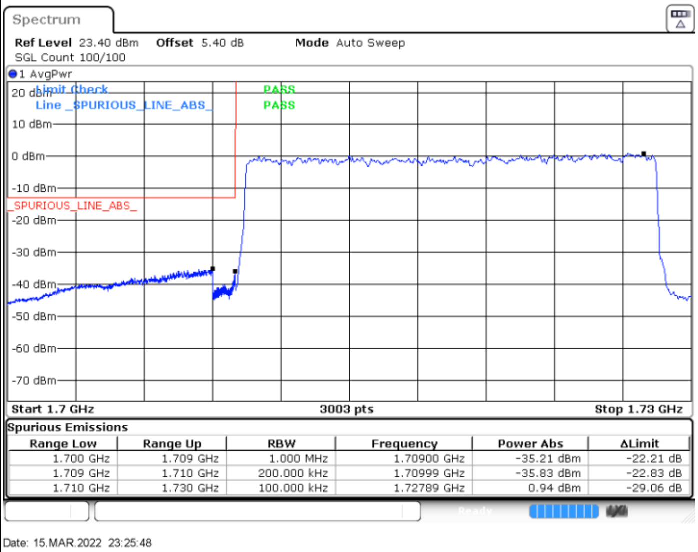
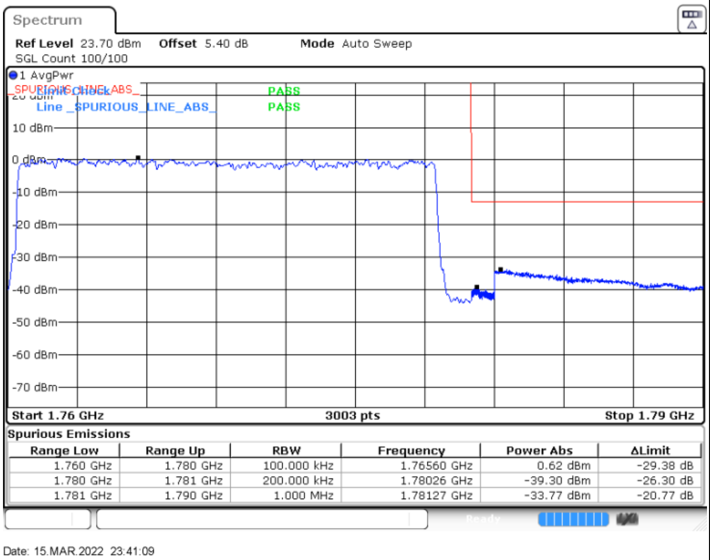
Date: 15.MAR.2022 23:23:26

Highest Band Edge / Full RB



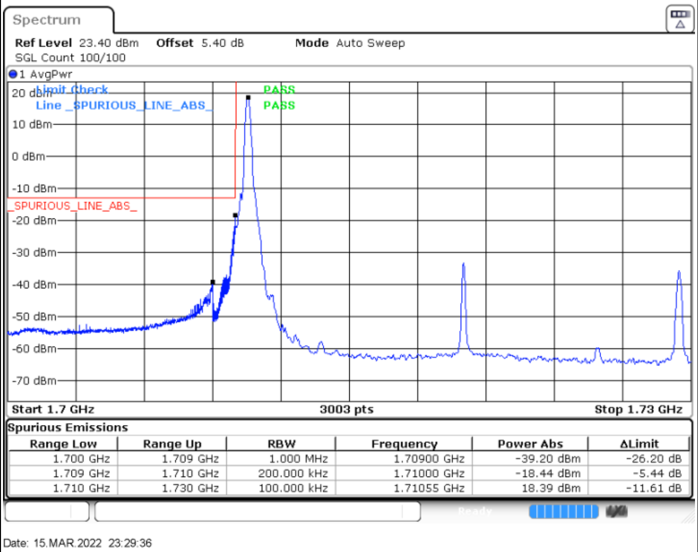
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.760 GHz	1.780 GHz	100.000 kHz	1.76497 GHz	1.19 dBm	-28.81 dB
1.780 GHz	1.781 GHz	200.000 kHz	1.78030 GHz	-37.60 dBm	-24.60 dB
1.781 GHz	1.790 GHz	1.000 MHz	1.78141 GHz	-32.58 dBm	-19.58 dB

Date: 15.MAR.2022 23:40:51

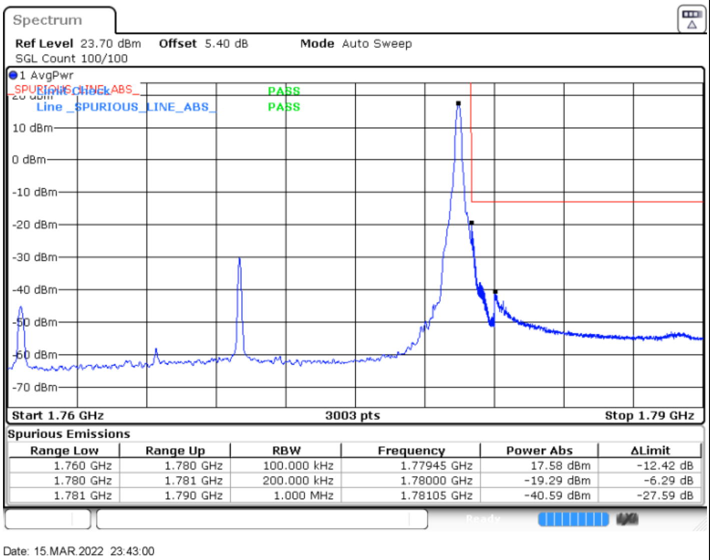
FR1 n66 / 20MHz / DFT-s-OFDM / QPSK	
Lowest Band Edge / 1RB0	Highest Band Edge / 1RBMAX
	
Lowest Band Edge / Full RB	Highest Band Edge / Full RB
	

FR1 n66 / 20MHz / DFT-s-OFDM / 16QAM

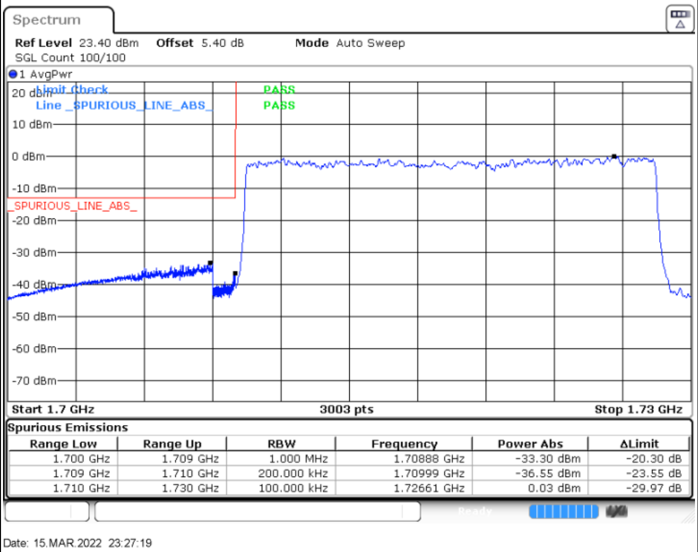
Lowest Band Edge / 1RB0



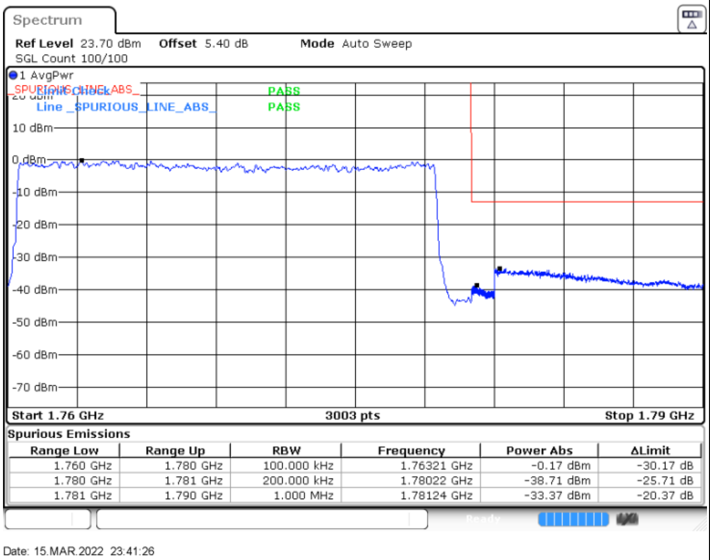
Highest Band Edge / 1RBMAX



Lowest Band Edge / Full RB



Highest Band Edge / Full RB



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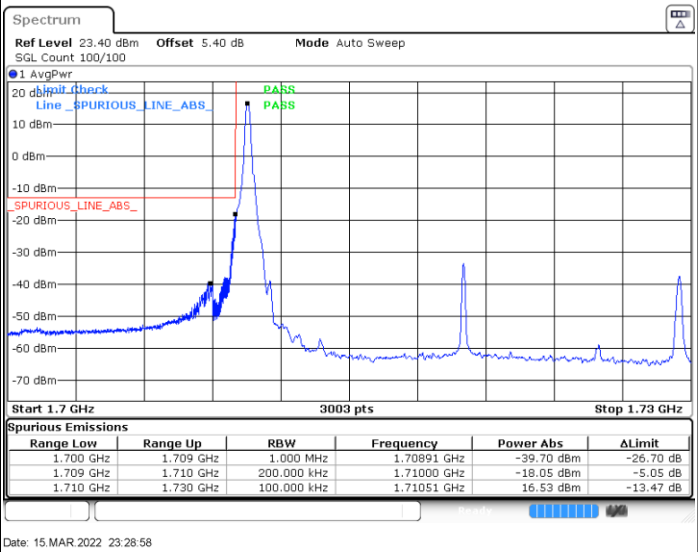
<tr><td>
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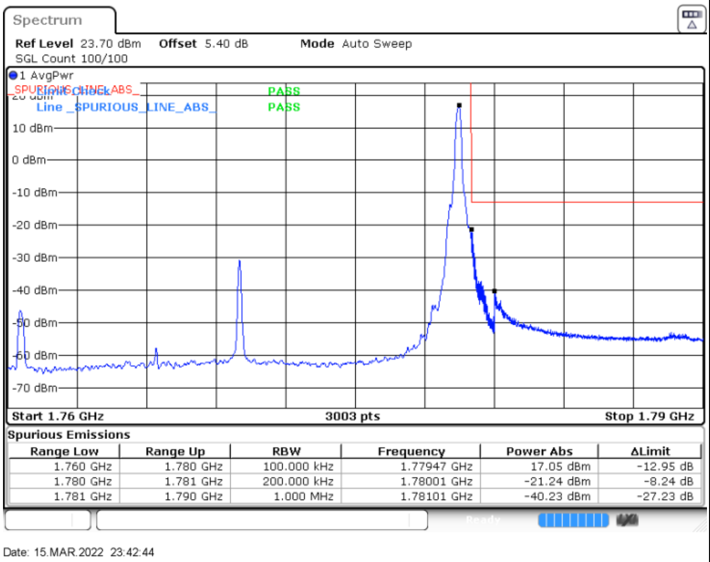
<td>
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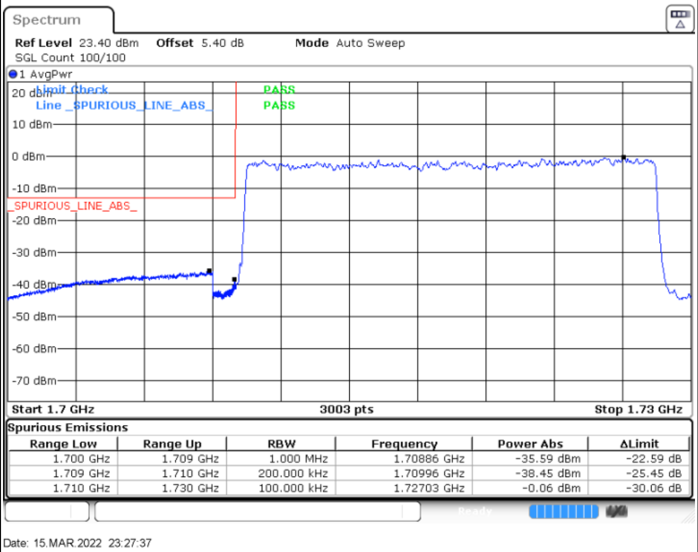
<tr><th>Lowest Band Edge / Full RB</th><th>Highest Band Edge / Full RB</th></tr>
<tr><td>
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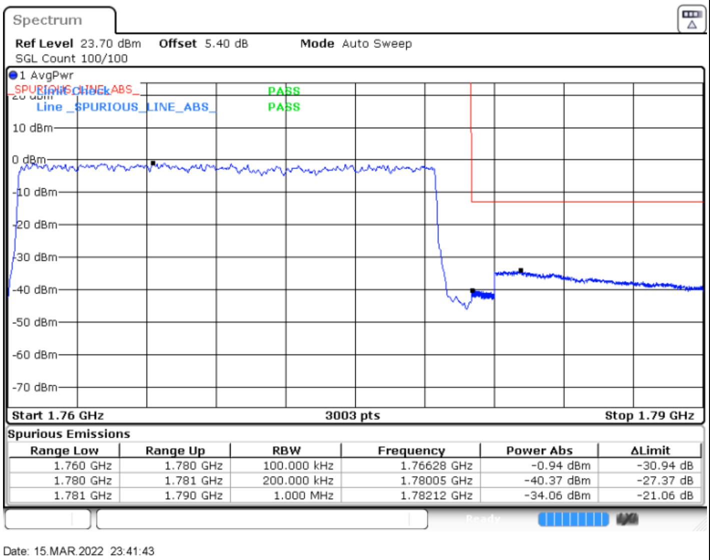
<td>
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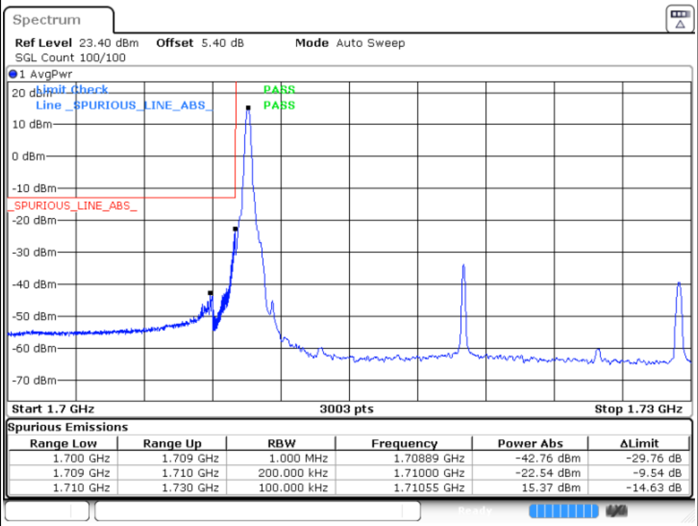
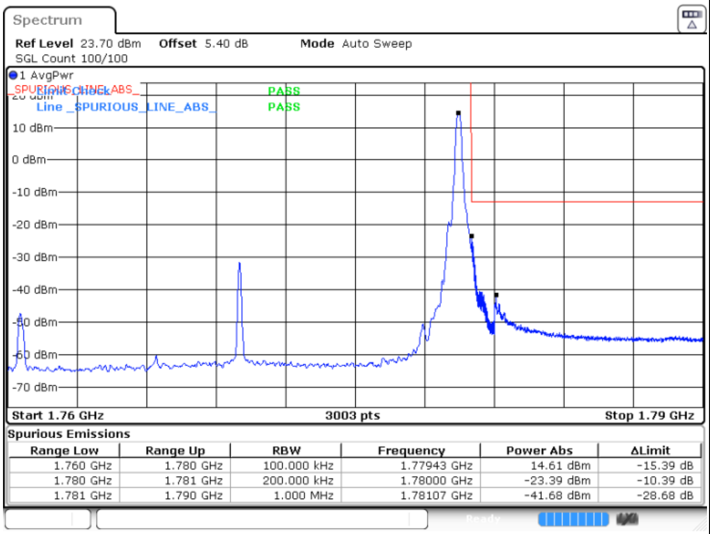
FR1 n66 / 20MHz / DFT-s-OFDM / 256QAM

Lowest Band Edge / 1RB0



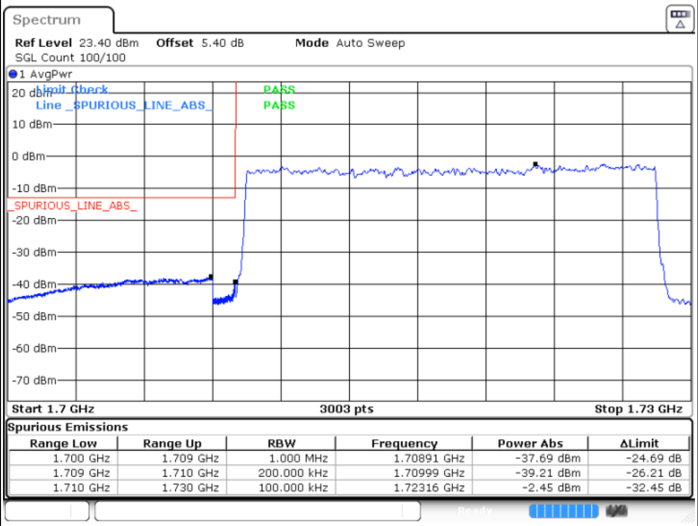
Date: 15.MAR.2022 23:28:28

Highest Band Edge / 1RBMAX



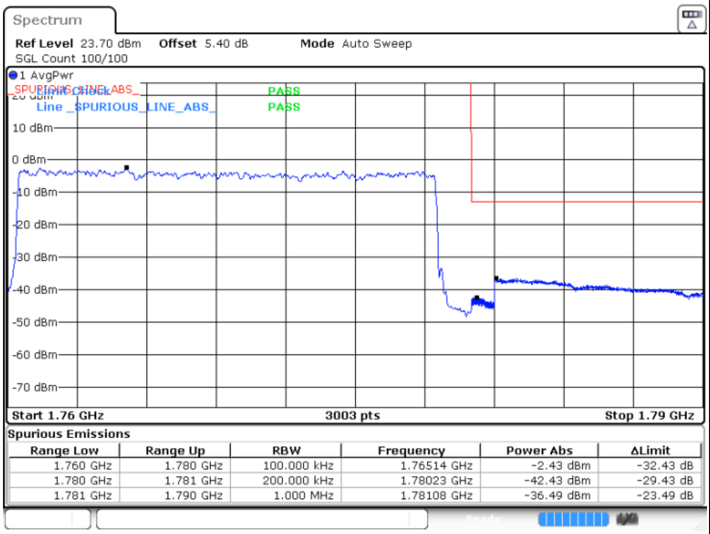
Date: 15.MAR.2022 23:42:28

Lowest Band Edge / Full RB



Date: 15.MAR.2022 23:27:56

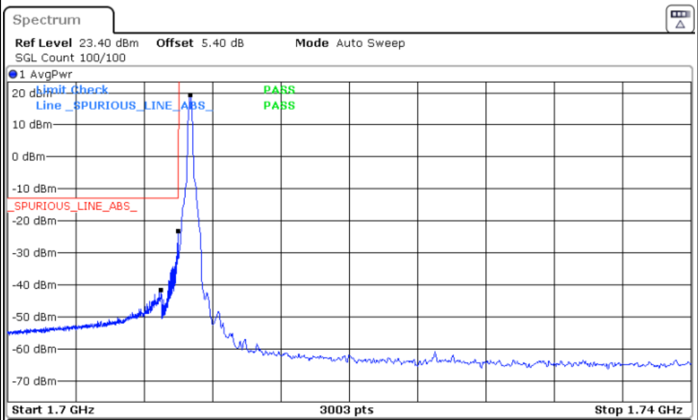
Highest Band Edge / Full RB



Date: 15.MAR.2022 23:42:02

FR1 n66 / 30MHz / DFT-s-OFDM / PI/2 BPSK

Lowest Band Edge / 1RB0

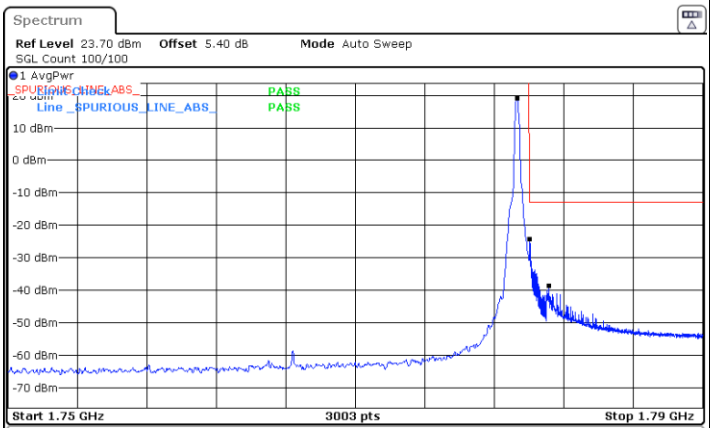


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.700 GHz	1.709 GHz	1.000 MHz	1.70897 GHz	-41.61 dBm	-28.61 dB
1.709 GHz	1.710 GHz	300.000 kHz	1.71000 GHz	-23.34 dBm	-10.34 dB
1.710 GHz	1.740 GHz	100.000 kHz	1.71067 GHz	19.26 dBm	-10.74 dB

Date: 16.MAR.2022 01:26:46

Highest Band Edge / 1RBMAX

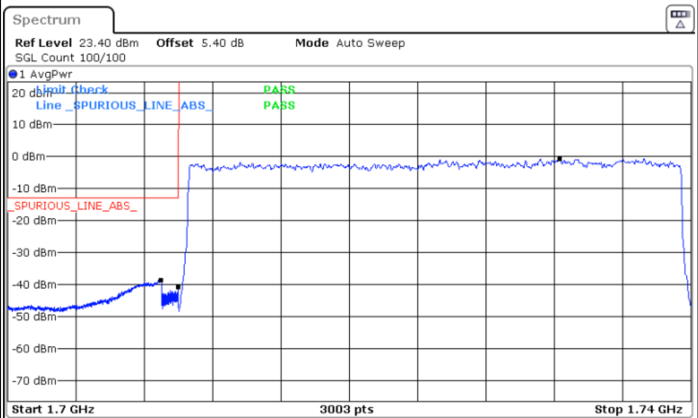


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.750 GHz	1.780 GHz	100.000 kHz	1.77930 GHz	19.13 dBm	-10.87 dB
1.780 GHz	1.781 GHz	300.000 kHz	1.78003 GHz	-24.14 dBm	-11.14 dB
1.781 GHz	1.790 GHz	1.000 MHz	1.78112 GHz	-38.73 dBm	-25.73 dB

Date: 16.MAR.2022 01:32:55

Lowest Band Edge / Full RB

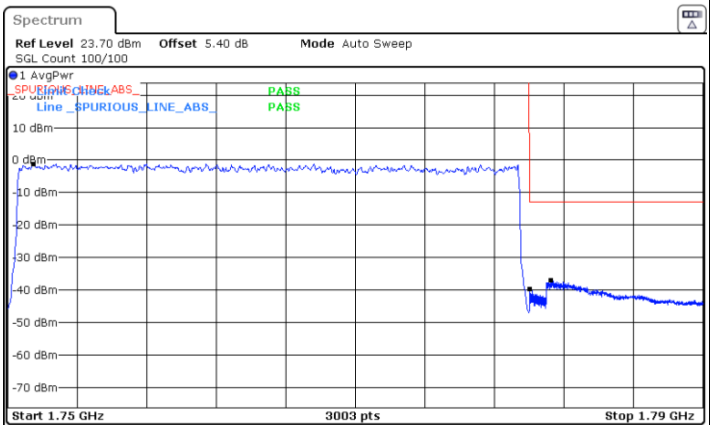


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.700 GHz	1.709 GHz	1.000 MHz	1.70894 GHz	-38.59 dBm	-25.59 dB
1.709 GHz	1.710 GHz	300.000 kHz	1.70998 GHz	-40.79 dBm	-27.79 dB
1.710 GHz	1.740 GHz	100.000 kHz	1.73228 GHz	-0.75 dBm	-30.75 dB

Date: 16.MAR.2022 01:23:32

Highest Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.750 GHz	1.780 GHz	100.000 kHz	1.75145 GHz	-1.14 dBm	-31.14 dB
1.780 GHz	1.781 GHz	300.000 kHz	1.78002 GHz	-39.83 dBm	-26.83 dB
1.781 GHz	1.790 GHz	1.000 MHz	1.78122 GHz	-36.94 dBm	-23.94 dB

Date: 16.MAR.2022 01:30:16