FCC RF Test Report

APPLICANT	: ASUSTeK COMPUTER INC.
EQUIPMENT	: ASUS Phone(Mobile Phone)
BRAND NAME	: ASUS
MODEL NAME	: ASUS_I005D,ASUS_I005DC
FCC ID	: MSQI005D
STANDARD	: 47 CFR Part 2, 22, 24, 27
CLASSIFICATION	: PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Nov. 03, 2020 and completely tested on Jan. 26, 2021. We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown compliance with the applicable technical standards.

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

Jason Jia

Reviewed by: Jason Jia / Supervisor

James Huang

Approved by: James Huang / Manager

ACCREDITED Cert #5145.02

Sporton International (Kunshan) Inc.
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
FG0N0335H	Rev. 01	Initial issue of report	Feb. 02, 2021

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting Only	PASS	-
	§22.913(a)(5)	Effective Radiated Power (5G NR n5)	ERP < 7 Watt		
	§24.232(c)	Equivalent Isotropic Radiated Power (5G NR n2, n25)	EIRP < 2Watt		
	§27.50(d)(4)	Equivalent Isotropic Radiated Power (5G NR n66)	EIRP < 1Watt		
	§27.50(j)(3)	Equivalent Isotropic Radiated Power (5G NR n77, n78)	EIRP < 1Watt		
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 §22.917(a) §24.238(a) §27.53(h) §27.53(l)(2)	Conducted Band Edge Measurement (5G NR n5) (5G NR n2, n25) (5G NR n66) (5G NR n77, n78)	< 43+10log10(P[Watts])	PASS	-
3.8	§2.1051 §22.917(a) §24.238(a) §27.53(h) §27.53(l)(2)	Conducted Spurious Emission (5G NR n5) (5G NR n2, n25) (5G NR n66) (5G NR n77, n78)	< 43+10log10(P[Watts])	PASS	-
3.9	§2.1055 §22.355	Frequency Stability Temperature & Voltage	< 2.5 ppm for Part 22	PASS	-
	§24.235 §27.54		Within Authorized Band		
4.4	§2.1053 §22.917(a) §24.238(a) §27.53(h) §27.53(g) §27.53(l)(2)	Radiated Spurious Emission (5G NR n5) (5G NR n2, n25) (5G NR n66) (5G NR n77, n78)	< 43+10log$_{10}$(P[Watts])	PASS	Under limit 27.69 dB at 9480.000 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

ASUSTeK COMPUTER INC.
1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan

1.2 Manufacturer 1

Guangdong Enok Communication Co., Ltd.
No. 137, 139, Lixiang Road., Songmushan Village, Dalang Town, Dongguan City, Guangdong Province, China

1.3 Manufacturer 2

PT. SAT NUSAPERSADA TBK
JALAN PELITA VI. NO. 99, BATAM, 29443, INDONESIA

1.4 Product Feature of Equipment Under Test

Product Feature	
Equipment	ASUS Phone(Mobile Phone)
Brand Name	ASUS
Model Name	ASUS_I005D,ASUS_I005DC
FCC ID	MSQI005D
EUT supports Radios application	GSM/WCDMA/LTE/5G NR/NFC/GNSS WLAN 2.4GHz 802.11b/g/n/ax HT20/HT40/HE20/HE40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 WLAN 5GHz 802.11ax HE20/HE40/HE80 Bluetooth BR/EDR/LE
IMEI Code	Conducted : N/A Radiation : 352977280005417/352977280005425 352977280003313/352977280003321
HW Version	R2.0B
SW Version	Android R
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.

1.5 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	5G NR n2: 1850 MHz ~ 1910 MHz 5G NR n5: 824 MHz ~ 849 MHz 5G NR n25: 1850 MHz ~ 1915 MHz 5G NR n66: 1710 MHz ~ 1780 MHz 5G NR n77: 3700 MHz ~ 3980 MHz 5G NR n78: 3700 MHz ~ 3800 MHz
Rx Frequency	5G NR n2: 1930 MHz ~ 1990 MHz 5G NR n5: 869 MHz ~ 894 MHz 5G NR n25: 1930 MHz ~ 1995 MHz 5G NR n66: 2110 MHz ~ 2200 MHz 5G NR n77: 3700 MHz ~ 3980 MHz 5G NR n78: 3700 MHz ~ 3800 MHz
Bandwidth	n2, n5: 5MHz / 10MHz / 15MHz / 20MHz n25: 5MHz / 10MHz / 15MHz / 20MHz / 25MHz / 30MHz / 40MHz n66: 5MHz / 10MHz / 15MHz / 20MHz / 30MHz / 40MHz n77/n78: 20MHz / 30MHz / 40MHz / 50MHz / 60MHz / 80MHz / 90MHz / 100MHz
Antenna Gain	Ant0: n5: -3.0 dBi Ant1: n2: 0 dBi n25: 0dBi n66: -0.1dBi Ant11: 5G NR n77: 0.9 dBi 5G NR n78:0.9 dBi
Type of Modulation	CP-OFDM: QPSK / 16QAM / 64QAM / 256QAM DFT-s-OFDM: PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM

1. The Maximum ERP/EIRP is calculated from Max Output power and Max antenna gain, only the maximum ERP/EIRP is shown in the report.

2. The device supports Standalone and EN-DC mode, the whole testing has assessed SA mode by referring to the higher conducted power for conducted test items.

3. The EN-DC mode could be referred to the product spec.

4. The device supports EN-DC mode and SA mode, the different modes match with different antenna combination. Pre-scanned harmonic for RSE testing, we choice worse case of antenna combination to full test.

1.6 Modification of EUT

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

1.7 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

5G NR n2		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)
20	1860.0 ~ 1900.0	18M9G7D	0.2133	19M0W7D	0.1656
Frequency Tolerance (ppm)		0.0034			

5G NR n5		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)
20	834.0 ~ 839.0	18M9G7D	0.0676	18M8W7D	0.0551
Frequency Tolerance (ppm)		0.0092			

5G NR n25		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)
40	1870.0 ~ 1895.0	38M4G7D	0.2193	38M8W7D	0.1671
Frequency Tolerance (ppm)		0.0034			

5G NR n66		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)
40	1730.0 ~ 1760.0	38M6G7D	0.2198	38M7W7D	0.1742
Frequency Tolerance (ppm)		0.0046			

5G NR n77		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)
100	3750.0 ~ 3930.0	96M5G7D	0.2089	96M7W7D	0.2042
Frequency Tolerance (ppm)		0.0043			

5G NR n78		PI/2 BPSK		QPSK	
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)
100	3750.0 ~ 3750.0	96M5G7D	0.2089	96M7W7D	0.2042
Frequency Tolerance (ppm)		0.0043			

Note:

1. 5G NR Band n25 overlaps the entire frequency range of Band n2. Therefore, the conducted test results provided in this report covers Band n25 as well as Band n2.
2. 5G NR Band n77 overlaps the entire frequency range of Band n78. Therefore, the conducted test results provided in this report covers Band n77 as well as Band n78.
3. Based on engineering evaluation, only the maximum bandwidth and the worst modulation test results are shown in the report.

1.8 Testing Location

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

Test Firm	Sporton International (Kunshan) Inc.		
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

1.9 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, 22, 24, 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.

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			

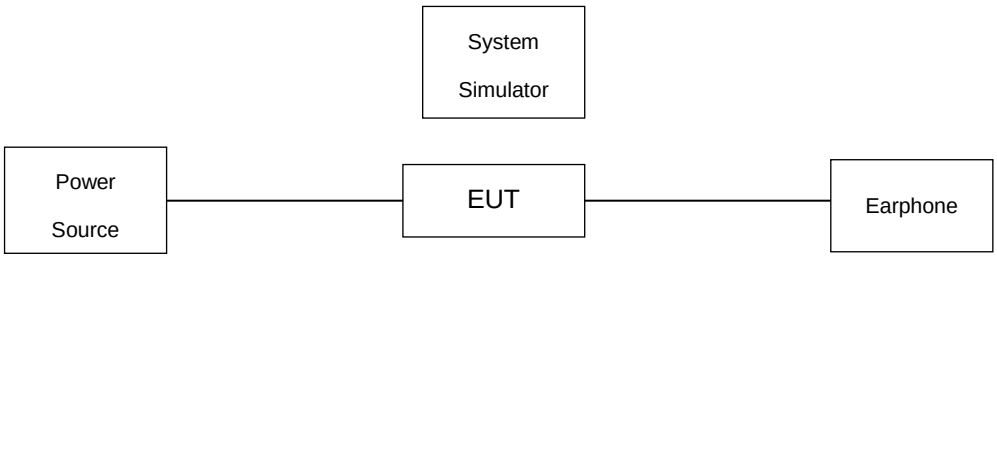
Test Items	5G NR	Bandwidth (MHz)										Modulation					RB #		Test Channel		
		5	10	15	20	25	30	40	50	60-90	100	PI/2 BPSK	QPSK	16QAM	64QAM	256 QAM	1	Full	L	M	H
Max. Output Power	n2	v	v	v	v	-	-	-	-	-	-	v	v	v	v	v	v	v	v	v	v
	n5	v	v	v	v	-	-	-	-	-	-	v	v	v	v	v	v	v	v	v	v
	n25	v	v	v	v	v	v	v	-	-	-	v	v	v	v	v	v	v	v	v	v
	n66	v	v	v	v	-	v	v	-	-	-	v	v	v	v	v	v	v	v	v	v
	n77	-	-	-	v	-	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	n78	-	-	-	v	-	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
Peak-to-Average Ratio	n5				v							v	v	v	v	v		v		v	
	n25							v				v	v	v	v	v		v		v	
	n66							v				v	v	v	v	v		v		v	
	n77										v	v	v	v	v	v		v		v	
26dB and 99% Bandwidth	n5				v						-		v	v				v		v	
	n25				-	-	-	v	-	-	-		v	v				v		v	
	n66	-	-	-		-		v					v	v				v		v	
	n77					-	-	-	-	-	v		v	v				v		v	

Test Items	5G NR	Bandwidth (MHz)										Modulation					RB #		Test Channel		
		5	10	15	20	25	30	40	50	60-90	100	PI/2 BPSK	QPSK	16QAM	64QAM	256 QAM	1	Full	L	M	H
Conducted Band Edge	n5	v	v	v	v	-	-	-	-	-	-	v	v	v	v	v	v	v	v		v
	n25	v	v	v	v	v	v	v	-	-	-	v	v	v	v	v	v	v	v		v
	n66	v	v	v	v	-	v	v	-	-	-	v	v	v	v	v	v	v	v		v
	n77	-	-	-	v	-	v	v	v	v	v	v	v	v	v	v	v	v	v		v
Conducted Spurious Emission	n5	v	v	v	v	-	-	-	-	-	-		v				v		v	v	v
	n25	v	v	v	v	v	v	v	-	-	-		v				v		v	v	v
	n66	v	v	v	v	-	v	v	-	-	-		v				v		v	v	v
	n77	-	-	-	v	-	v	v	v	v	v		v				v		v	v	v
Frequency Stability	n5				v					-	-		v					v		v	
	n25					-	-	v	-	-	-		v					v		v	
	n66	-	-	-		-		v					v					v		v	
	n77					-	-	-	-	-	v		v					v		v	
E.R.P / E.I.R.P	n5	v	v	v	v	-	-	-	-	-	-	v	v	v	v	v	v	v	v	v	v
	n25	v	v	v	v	v	v	v	-	-	-	v	v	v	v	v	v	v	v	v	v
	n66	v	v	v	v	-	v	v	-	-	-	v	v	v	v	v	v	v	v	v	v
	n77	-	-	-	v	-	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
Radiated Spurious Emission	n2	Worst Case																	v	v	v
	n5	Worst Case																	v	v	v
	n25	Worst Case																	v	v	v
	n66	Worst Case																	v	v	v
	n77	Worst Case																	v	v	v

Note

1. The mark "**v** " means that this configuration is chosen for testing
2. The mark "-" means that this bandwidth is not supported.
3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.
4. For modulation of CP-OFDM and DFT-s-OFDM , the maximum power of CP-OFDM is lower than DFT-s-OFDM modulation, therefore, we chose higher power (DFT-s-OFDM modulation) to perform all tests and show in the report.
5. All modulations (BPSK/QPSK/16QAM/64QAM/256QAM) have been tested, and only the worst test results are shown in the report .
6. All test items are based on engineering evaluation.

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.	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
4.	Earphone	N/A	N/A	N/A	Unshielded,1.2m	N/A

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss 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.

Following shows an offset computation example with cable loss 4.80 dB.

Example :

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

= 4.80 (dB)

2.5 Frequency List of Low/Middle/High Channels

5G NR n2 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
20	Channel	372000	376000	380000
	Frequency	1860	1880	1900
15	Channel	371500	376000	380500
	Frequency	1857.5	1880	1902.5
10	Channel	371000	376000	381000
	Frequency	1855	1880	1905
5	Channel	370500	376000	381500
	Frequency	1852.5	1880	1907.5

5G NR n5 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
20	Channel	166800	167300	167800
	Frequency	834	836.5	839
15	Channel	166300	167300	168300
	Frequency	831.5	836.5	841.5
10	Channel	165800	167300	168800
	Frequency	829	836.5	844
5	Channel	165300	167300	169300
	Frequency	826.5	836.5	846.5

5G NR n25 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
40	Channel	374000	376500	379000
	Frequency	1870	1882.5	1895
30	Channel	373000	376500	380000
	Frequency	1865	1882.5	1900
25	Channel	372500	376500	380500
	Frequency	1862.5	1882.5	1902.5
20	Channel	372000	376500	381000
	Frequency	1860	1882.5	1905
15	Channel	371500	376500	381500
	Frequency	1857.5	1882.5	1907.5
10	Channel	371000	376500	382000
	Frequency	1855	1882.5	1910
5	Channel	370500	376500	382500
	Frequency	1852.5	1882.5	1912.5

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

5G NR n77 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
100	Channel	650000	656000	662000
	Frequency	3750	3840	3930
90	Channel	649668	656000	662334
	Frequency	3745.02	3840	3935.01
80	Channel	649334	656000	662668
	Frequency	3740.01	3840	3940.02
60	Channel	648668	656000	663334
	Frequency	3730.02	3840	3950.01
50	Channel	648334	656000	663668
	Frequency	3725.01	3840	3955.02
40	Channel	648000	656000	664000
	Frequency	3720	3840	3960
30	Channel	647668	656000	664334
	Frequency	3715.02	3840	3965.01
20	Channel	647334	656000	664668
	Frequency	3710.01	3840	3970.02

5G NR n78 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
100	Channel		650000	
	Frequency		3750	
90	Channel	649668	650000	650334
	Frequency	3745.02	3750	3755.01
80	Channel	649334	650000	650668
	Frequency	3740.01	3750	3760.02
60	Channel	648668	650000	651334
	Frequency	3730.02	3750	3770.01
50	Channel	648334	650000	651668
	Frequency	3725.01	3750	3775.02
40	Channel	648000	650000	652000
	Frequency	3720	3750	3780
30	Channel	647668	650000	652334
	Frequency	3715.02	3750	3785.01
20	Channel	647334	650000	652668
	Frequency	3710.01	3750	3790.02

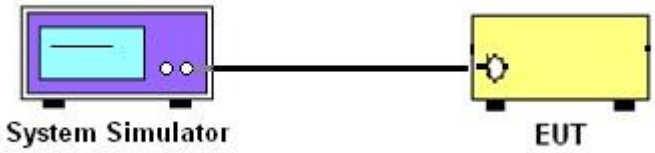
3 Conducted Test Items

3.1 Measuring Instruments

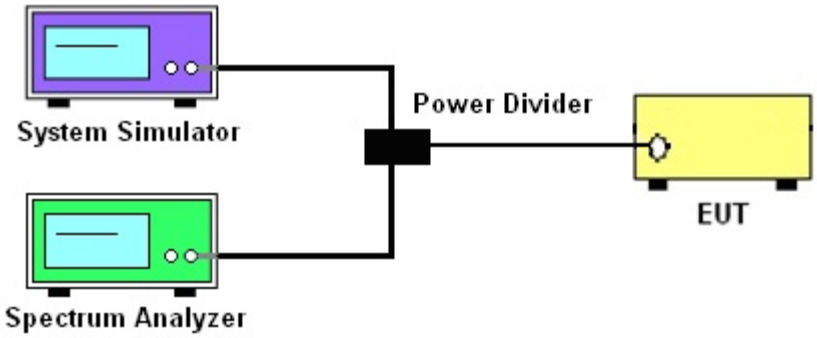
See list of measuring instruments of this test report.

3.2 Test Setup

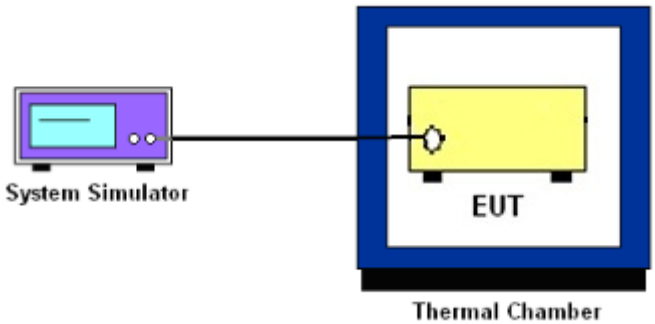
3.2.1 Conducted Output Power



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 ERP/EIRP

3.4.1 Description of the Conducted Output Power Measurement and ERP/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 ERP of mobile transmitters must not exceed 7 Watts for 5G NR n5.

The EIRP of mobile transmitters must not exceed 2 Watts for 5G NR n2 and n25.

The EIRP of mobile transmitters must not exceed 1 Watts for 5G NR n66, n77, n78.

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

For 5G NR Band n5:

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.

For 5G NR Band n25/n66:

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

22.917(a)

For operations in the 824 – 849 MHz band, the FCC limit is 43 + $10\log_{10}$(P[Watts]) dB below the transmitter power P(Watts) in a 100kHz 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.

24.238 (a)

For operations in the 1850-1910 and 1930-1990 MHz band, the FCC limit is 43 + $10\log_{10}$(P[Watts]) dB below the transmitter power P(Watts) in a 1MHz bandwidth. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

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.

27.53(l)(2)

For mobile 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 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, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz.

3.7.2 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.

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.

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.

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.

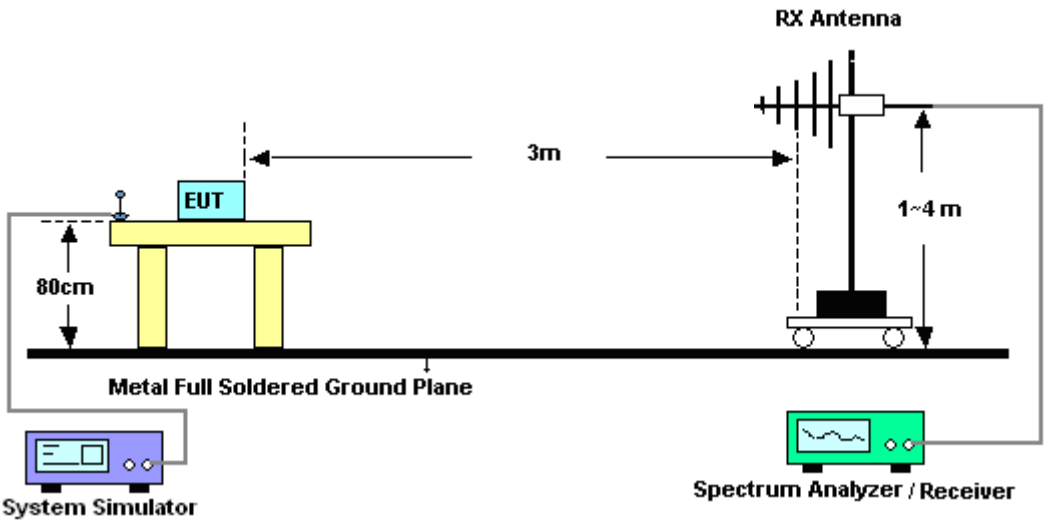
4 Radiated Test Items

4.1 Measuring Instruments

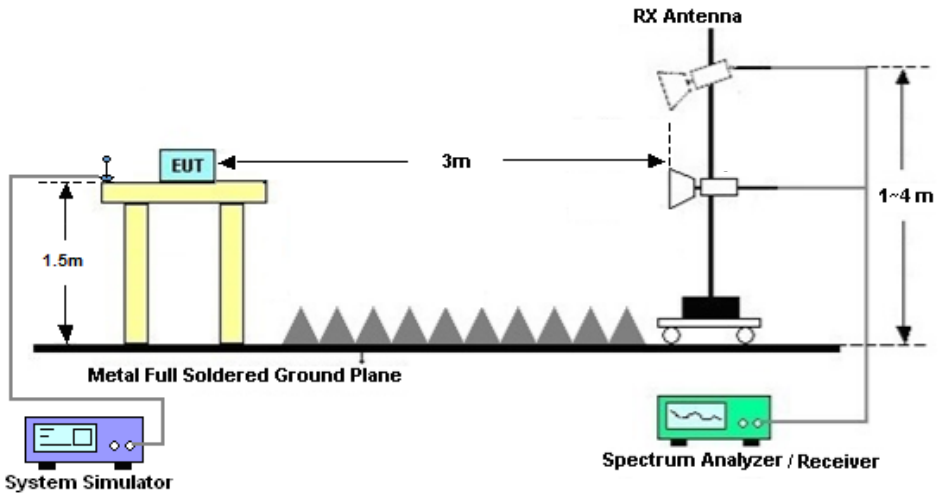
See list of measuring instruments of this test report.

4.2 Test Setup

4.2.1 For radiated test from 30MHz to 1GHz



4.2.2 For radiated test above 1GHz



4.3 Test Result of Radiated Test

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.

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	Nov. 02, 2020	Dec. 20, 2020~ Jan. 26, 2021	Nov. 01, 2021	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Oct. 27, 2020	Dec. 20, 2020~ Jan. 26, 2021	Oct. 26, 2021	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44G,MAX 30dB	Apr. 15, 2020	Jan. 15, 2021	Apr. 14, 2021	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	Jan. 02, 2021	Jan. 15, 2021	Jan. 01, 2022	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1356	1GHz~18GHz	Apr. 20, 2020	Jan. 15, 2021	Apr. 19, 2021	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101115	18GHz~40GHz	Nov. 09, 2020	Jan. 15, 2021	Nov. 08, 2021	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Jan. 02, 2021	Jan. 15, 2021	Jan. 01, 2022	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 07, 2021	Jan. 15, 2021	Jan. 06, 2022	Radiation (03CH04-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	2025788	1Ghz-18Ghz	Jan. 02, 2021	Jan. 15, 2021	Jan. 01, 2022	Radiation (03CH04-KS)
Amplifier	Keysight	83017A	MY57280106	500MHz~26.5GHz	Oct. 14, 2020	Jan. 15, 2021	Oct. 13, 2021	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Jan. 15, 2021	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Jan. 15, 2021	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Jan. 15, 2021	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required

6 Uncertainty of Evaluation

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

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

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

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**

Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power and EIRP)

5G NR n2:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Gain	EIRP	EIRP	EIRP
Channel				372000	376000	380000		L	M	H
Frequency (MHz)				1860	1880	1900				
20	PI/2 BPSK	1	1	23.21	23.24	23.21	0.0	0.2094	0.2109	0.2094
20	QPSK	1	1	23.29	23.03	23.12	0.0	0.2133	0.2009	0.2051
20	QPSK	1	53	23.11	23.06	23.04	0.0	0.2046	0.2023	0.2014
20	QPSK	1	104	23.02	22.97	23.00	0.0	0.2004	0.1982	0.1995
20	QPSK	50	0	22.39	22.25	22.26	0.0	0.1734	0.1679	0.1683
20	QPSK	50	28	23.26	23.19	23.21	0.0	0.2118	0.2084	0.2094
20	QPSK	50	56	22.25	22.31	22.30	0.0	0.1679	0.1702	0.1698
20	QPSK	100	0	22.33	22.27	22.37	0.0	0.1710	0.1687	0.1726
20	16QAM	1	1	22.19	21.85	21.95	0.0	0.1656	0.1531	0.1567
20	64QAM	1	1	20.91	20.97	20.95	0.0	0.1233	0.1250	0.1245
20	256QAM	1	1	19.01	18.88	18.96	0.0	0.0796	0.0773	0.0787
Channel				371500	376000	380500	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				1857.5	1880	1902.5				
15	QPSK	1	1	23.02	22.95	23.07	0.0	0.2004	0.1972	0.2028
15	16QAM	1	1	22.15	21.68	21.74	0.0	0.1641	0.1472	0.1493
Channel				371000	376000	381000	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				1855	1880	1905				
10	QPSK	1	1	23.11	22.98	23.19	0.0	0.2046	0.1986	0.2084
10	16QAM	1	1	22.16	21.80	21.69	0.0	0.1644	0.1514	0.1476
Channel				370500	376000	381500	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				1852.5	1880	1907.5				
5	QPSK	1	1	23.00	22.90	23.18	0.0	0.1995	0.1950	0.2080
5	16QAM	1	1	22.01	21.56	21.49	0.0	0.1589	0.1432	0.1409

5G NR n5:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Gain	ERP	ERP	ERP
Channel				166800	167300	167800		L	M	H
Frequency (MHz)				834	836.5	839				
20	PI/2 BPSK	1	1	23.31	23.33	23.22	-3.0	0.0655	0.0658	0.0641
20	QPSK	1	1	23.45	23.26	23.16	-3.0	0.0676	0.0647	0.0632
20	QPSK	1	53	23.03	22.94	23.06	-3.0	0.0614	0.0601	0.0618
20	QPSK	1	104	23.19	22.79	22.93	-3.0	0.0637	0.0581	0.0600
20	QPSK	50	0	22.21	22.02	22.01	-3.0	0.0508	0.0486	0.0485
20	QPSK	50	28	22.15	23.04	23.01	-3.0	0.0501	0.0615	0.0611
20	QPSK	50	56	22.11	22.03	21.95	-3.0	0.0497	0.0488	0.0479
20	QPSK	100	0	22.24	22.01	22.03	-3.0	0.0512	0.0485	0.0488
20	16QAM	1	1	22.56	22.23	22.46	-3.0	0.0551	0.0511	0.0538
20	64QAM	1	1	20.67	20.36	20.47	-3.0	0.0356	0.0332	0.0340
20	256QAM	1	1	18.54	18.66	18.37	-3.0	0.0218	0.0224	0.0210
Channel				166300	167300	168300	Gain	ERP	ERP	ERP
Frequency (MHz)				831.5	836.5	841.5				
15	QPSK	1	1	23.09	22.98	23.01	-3.0	0.0622	0.0607	0.0611
15	16QAM	1	1	22.25	22.06	22.12	-3.0	0.0513	0.0491	0.0498
Channel				165800	167300	168800	Gain	ERP	ERP	ERP
Frequency (MHz)				829	836.5	844				
10	QPSK	1	1	23.10	22.92	22.68	-3.0	0.0624	0.0598	0.0566
10	16QAM	1	1	22.06	21.86	22.77	-3.0	0.0491	0.0469	0.0578
Channel				165300	167300	169300	Gain	ERP	ERP	ERP
Frequency (MHz)				826.5	836.5	846.5				
5	QPSK	1	1	23.13	22.96	22.86	-3.0	0.0628	0.0604	0.0590
5	16QAM	1	1	22.15	22.15	21.85	-3.0	0.0501	0.0501	0.0468

5G NR n25:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Gain	EIRP	EIRP	EIRP
Channel				374000	376500	379000		L	M	H
Frequency (MHz)				1870	1882.5	1895				
40	PI/2 BPSK	1	1	23.25	23.12	23.23	0.00	0.2113	0.2051	0.2104
40	QPSK	1	1	23.41	23.12	23.06	0.00	0.2193	0.2051	0.2023
40	QPSK	1	108	23.06	22.86	22.85	0.00	0.2023	0.1932	0.1928
40	QPSK	1	214	23.13	22.78	22.19	0.00	0.2056	0.1897	0.1656
40	QPSK	108	0	21.75	21.32	21.82	0.00	0.1496	0.1355	0.1521
40	QPSK	108	54	22.72	22.44	22.75	0.00	0.1871	0.1754	0.1884
40	QPSK	108	108	21.59	21.16	21.22	0.00	0.1442	0.1306	0.1324
40	QPSK	216	0	21.63	20.96	21.69	0.00	0.1455	0.1247	0.1476
40	16QAM	1	1	22.23	21.63	22.06	0.00	0.1671	0.1455	0.1607
40	64QAM	1	1	19.78	21.22	21.12	0.00	0.0951	0.1324	0.1294
40	256QAM	1	1	18.96	18.59	19.21	0.00	0.0787	0.0723	0.0834
Channel				373000	376500	380000	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				1865	1882.5	1900				
30	QPSK	1	1	23.32	22.36	21.78	0.00	0.2148	0.1722	0.1507
30	16QAM	1	1	22.21	21.63	20.65	0.00	0.1663	0.1455	0.1161
Channel				372500	376500	380500	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				1862.5	1882.5	1902.5				
25	QPSK	1	1	23.13	22.98	23.15	0.00	0.2056	0.1986	0.2065
25	16QAM	1	1	22.11	22.13	22.11	0.00	0.1626	0.1633	0.1626
Channel				372000	376500	381000	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				1860	1882.5	1905				
20	QPSK	1	1	23.33	23.31	23.26	0.00	0.2153	0.2143	0.2118
20	16QAM	1	1	22.21	21.93	22.03	0.00	0.1663	0.1560	0.1596
Channel				371500	376500	381500	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				1857.5	1882.5	1907.5				
15	QPSK	1	1	23.27	23.01	23.16	0.00	0.2123	0.2000	0.2070
15	16QAM	1	1	22.15	22.01	22.11	0.00	0.1641	0.1589	0.1626
Channel				371000	376500	382000	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				1855	1882.5	1910				
10	QPSK	1	1	23.18	23.04	23.28	0.00	0.2080	0.2014	0.2128
10	16QAM	1	1	22.16	22.19	22.21	0.00	0.1644	0.1656	0.1663
Channel				370500	376500	382500	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				1852.5	1882.5	1912.5				
5	QPSK	1	1	23.01	22.96	23.26	0.00	0.2000	0.1977	0.2118
5	16QAM	1	1	22.07	21.84	22.21	0.00	0.1611	0.1528	0.1663

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	22.51	23.25	23.26	-0.10	0.1742	0.2065	0.2070
40	QPSK	1	1	23.52	23.16	23.16	-0.10	0.2198	0.2021	0.2023
40	QPSK	1	108	23.06	23.12	22.86	-0.10	0.1977	0.2004	0.1888
40	QPSK	1	214	23.13	22.52	23.06	-0.10	0.2009	0.1746	0.1977
40	QPSK	108	0	22.18	22.25	22.17	-0.10	0.1614	0.1641	0.1611
40	QPSK	108	54	23.15	23.13	23.06	-0.10	0.2018	0.2009	0.1977
40	QPSK	108	108	22.22	22.17	21.96	-0.10	0.1629	0.1611	0.1535
40	QPSK	216	0	22.25	22.17	21.99	-0.10	0.1641	0.1611	0.1545
40	16QAM	1	1	22.51	22.21	22.32	-0.10	0.1742	0.1626	0.1667
40	64QAM	1	1	20.85	20.32	20.65	-0.10	0.1189	0.1052	0.1135
40	256QAM	1	1	19.25	18.44	18.32	-0.10	0.0822	0.0682	0.0664
Channel				345000	349000	353000	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				1725	1745	1765				
30	QPSK	1	1	23.52	23.31	23.50	-0.10	0.2198	0.2094	0.2188
30	16QAM	1	1	22.31	22.06	22.44	-0.10	0.1663	0.1570	0.1714
Channel				344000	349000	354000	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				1720	1745	1770				
20	QPSK	1	1	23.05	23.07	22.95	-0.10	0.1972	0.1982	0.1928
20	16QAM	1	1	22.06	22.11	21.87	-0.10	0.1570	0.1589	0.1503
Channel				343500	349000	354500	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				1717.5	1745	1772.5				
15	QPSK	1	1	22.93	22.89	22.75	-0.10	0.1919	0.1901	0.1841
15	16QAM	1	1	21.85	21.86	21.74	-0.10	0.1496	0.1500	0.1459
Channel				343000	349000	355000	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				1715	1745	1775				
10	QPSK	1	1	23.01	22.93	22.69	-0.10	0.1954	0.1919	0.1816
10	16QAM	1	1	22.03	21.94	21.26	-0.10	0.1560	0.1528	0.1306
Channel				342500	349000	355500	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				1712.5	1745	1777.5				
5	QPSK	1	1	23.02	22.99	22.67	-0.10	0.1959	0.1945	0.1807
5	16QAM	1	1	21.98	22.08	21.58	-0.10	0.1542	0.1578	0.1406

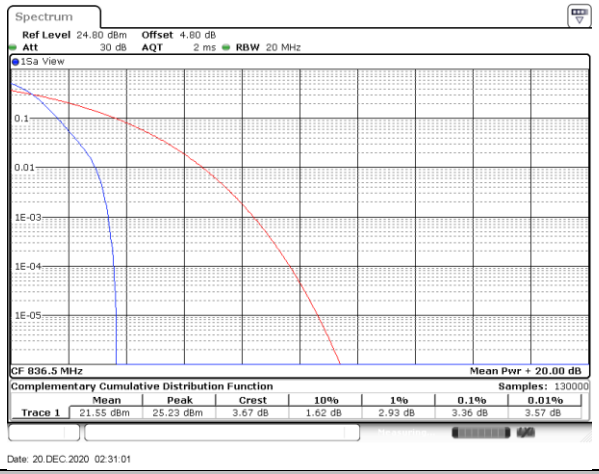
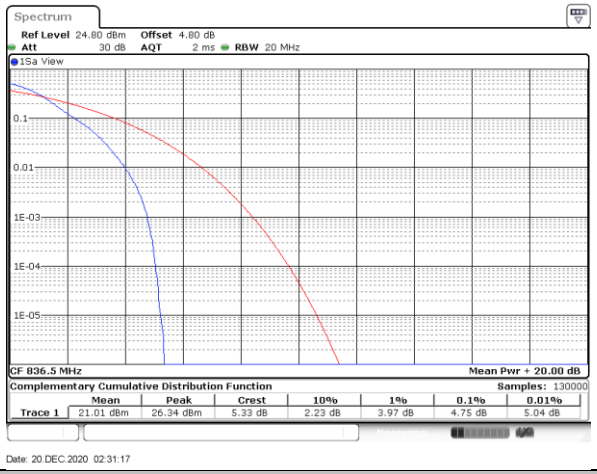
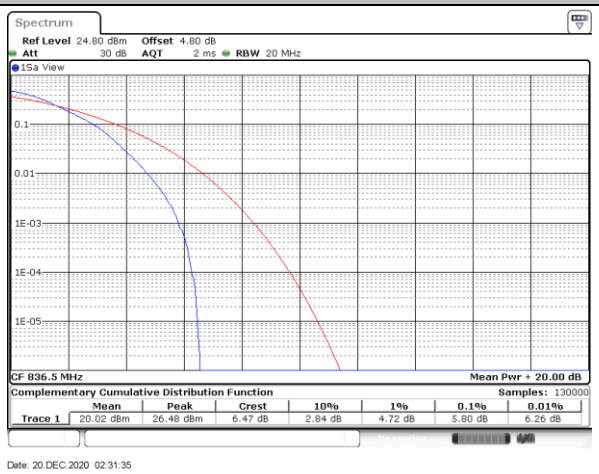
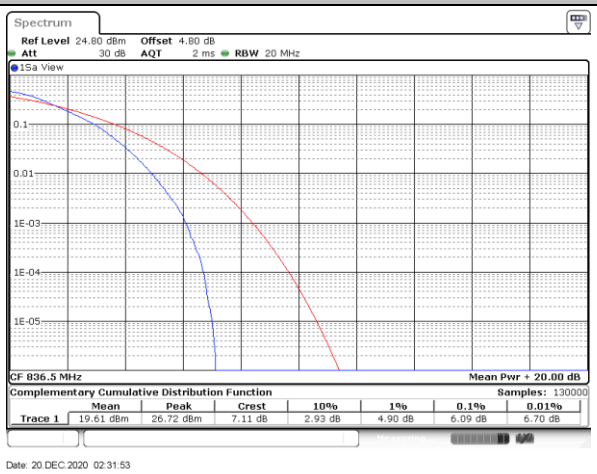
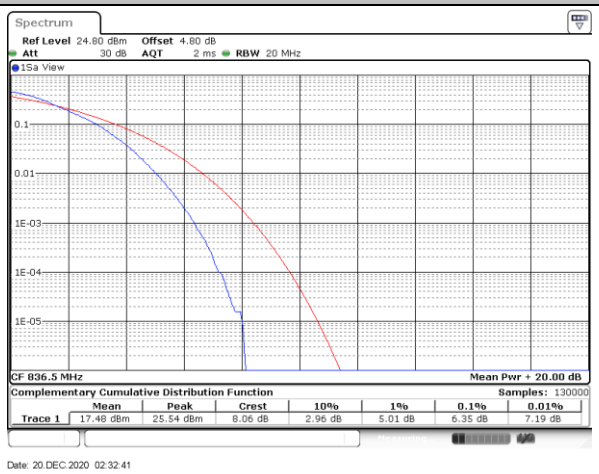
5G NR n77:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Gain	EIRP	EIRP	EIRP
Channel				650000	656000	662000		L	M	H
Frequency (MHz)				3750	3840	3930				
100	PI/2 BPSK	1	1	21.75	21.76	21.91	0.9	0.1841	0.1845	0.1910
100	QPSK	1	1	21.68	21.76	22.30	0.9	0.1811	0.1843	0.2089
100	QPSK	1	137	21.85	22.06	21.91	0.9	0.1884	0.1977	0.1910
100	QPSK	1	271	21.73	22.02	21.82	0.9	0.1832	0.1959	0.1871
100	QPSK	135	0	21.88	21.92	21.95	0.9	0.1897	0.1914	0.1928
100	QPSK	135	69	21.83	21.99	21.78	0.9	0.1875	0.1945	0.1854
100	QPSK	135	138	21.48	22.14	22.29	0.9	0.1730	0.2014	0.2084
100	QPSK	270	0	21.68	21.96	21.86	0.9	0.1811	0.1932	0.1888
100	16QAM	1	1	21.87	22.20	21.83	0.9	0.1892	0.2042	0.1875
100	64QAM	1	1	21.82	22.02	21.75	0.9	0.1871	0.1959	0.1841
100	256QAM	1	1	20.02	20.46	20.48	0.9	0.1236	0.1368	0.1374
Channel				649668	656000	662334	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3745.02	3840	3935.01				
90	QPSK	1	1	21.91	22.06	22.03	0.9	0.1910	0.1977	0.1963
90	16QAM	1	1	21.28	21.41	21.39	0.9	0.1652	0.1702	0.1694
Channel				649334	656000	662668	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3740.01	3840	3940.02				
80	QPSK	1	1	21.88	21.63	21.81	0.9	0.1897	0.1791	0.1866
80	16QAM	1	1	21.76	21.72	21.73	0.9	0.1845	0.1828	0.1832
Channel				648668	656000	663334	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3730.02	3840	3950.01				
60	QPSK	1	1	21.59	21.76	22.06	0.9	0.1774	0.1845	0.1977
60	16QAM	1	1	21.55	21.56	21.47	0.9	0.1758	0.1762	0.1726
Channel				648334	656000	663668	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3725.01	3840	3955.02				
50	QPSK	1	1	21.79	22.04	21.91	0.9	0.1858	0.1968	0.1910
50	16QAM	1	1	21.49	21.51	21.56	0.9	0.1734	0.1742	0.1762
Channel				648000	656000	664000	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3720	3840	3960				
40	QPSK	1	1	21.93	22.22	22.02	0.9	0.1919	0.2051	0.1959
40	16QAM	1	1	21.78	21.95	21.86	0.9	0.1854	0.1928	0.1888
Channel				647668	656000	664334	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3715.02	3840	3965.01				
30	QPSK	1	1	21.79	22.06	22.05	0.9	0.1858	0.1977	0.1972
30	16QAM	1	1	21.81	22.03	21.95	0.9	0.1866	0.1963	0.1928
Channel				647334	656000	664668	Gain	EIRP	EIRP	EIRP
Frequency (MHz)				3710.01	3840	3970.02				
20	QPSK	1	1	21.95	22.09	22.14	0.9	0.1928	0.1991	0.2014
20	16QAM	1	1	22.06	22.05	22.18	0.9	0.1977	0.1972	0.2032

FR1 n5

Peak-to-Average Ratio

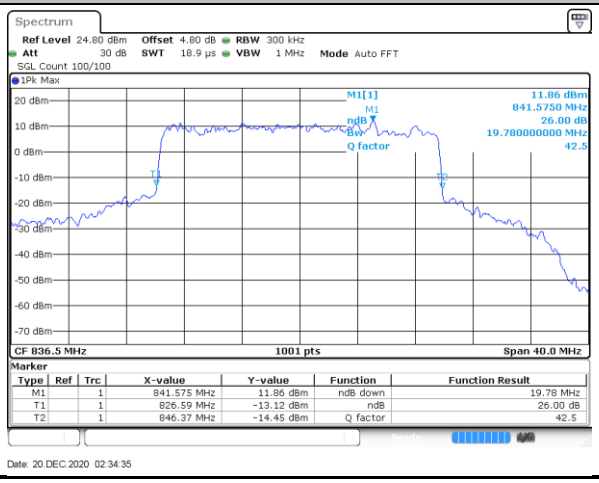
Mode	FR1 n5 / 20MHz / DFT-S OFDM				
Mod.	PI/2 BPSK	QPSK	16QAM	64QAM	Limit: 13dB
RB Size	Full RB	Full RB	Full RB	Full RB	Result
Middle CH	3.36	4.75	5.80	6.09	PASS
Mode	FR1 n5 / 20MHz / DFT-S OFDM				
Mod.	256QAM				Limit: 13dB
RB Size	Full RB				Result
Middle CH	6.35				PASS

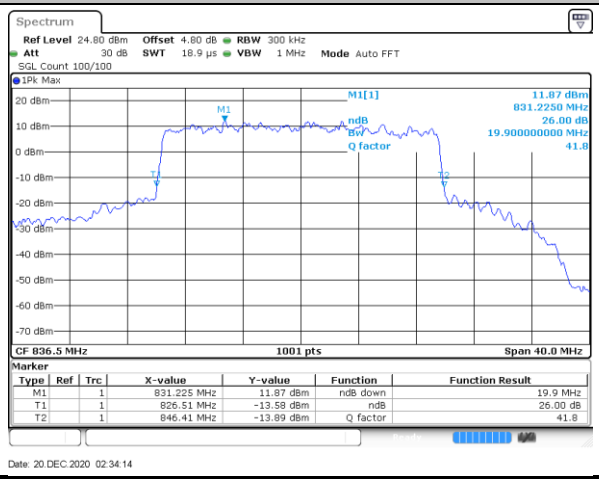
FR1 n5 / 20MHz / DFT-S OFDM	
Middle Channel / Full RB	**Middle Channel / Full RB**
PI/2 BPSK	**QPSK**
	
16QAM	**64QAM**
	
256QAM	
	

26dB Bandwidth

Mode	FR1 n5: 26dB BW(MHz) / DFT-S OFDM							
BW	20MHz							
Mod.	QPSK	16QAM						
Middle CH	19.78	19.90						

FR1 n5 / 20MHz / DFT-S OFDM	
Middle Channel	
QPSK	16QAM

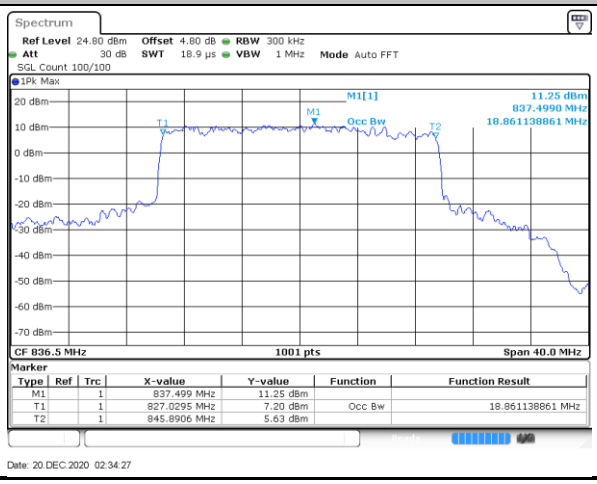


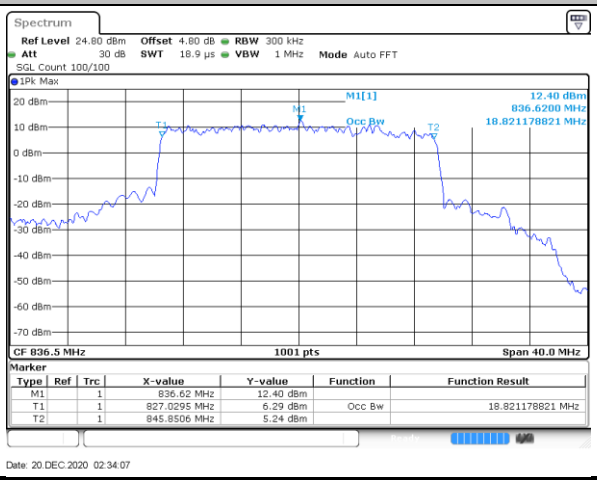


Occupied Bandwidth

Mode	FR1 n5 : 99%OBW(MHz) / DFT-S OFDM							
BW	20MHz							
Mod.	QPSK	16QAM						
Middle CH	18.86	18.82						

FR1 n5 / 20MHz / DFT-S OFDM	
Middle Channel	
QPSK	16QAM

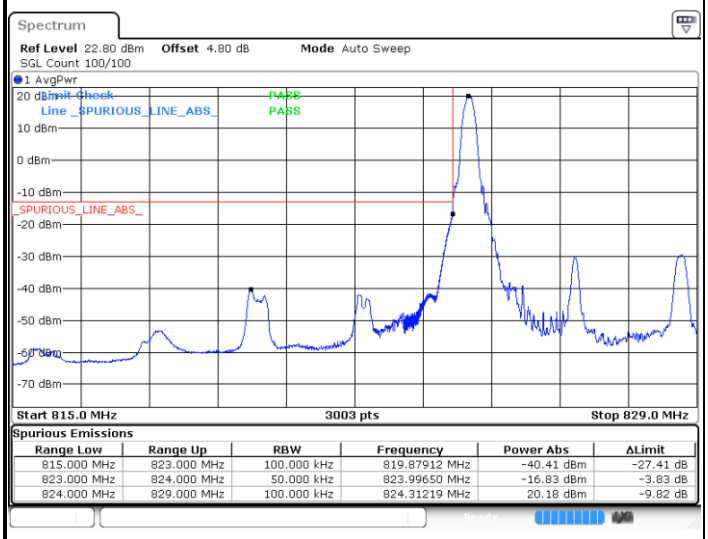




Conducted Band Edge

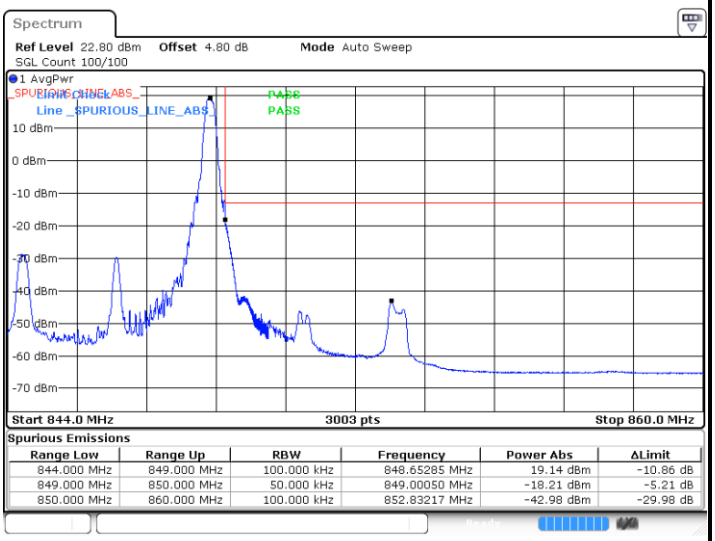
FR1 n5 / 5MHz / DFT-S OFDM / PI/2 BPSK

Lowest Band Edge / 1RB0



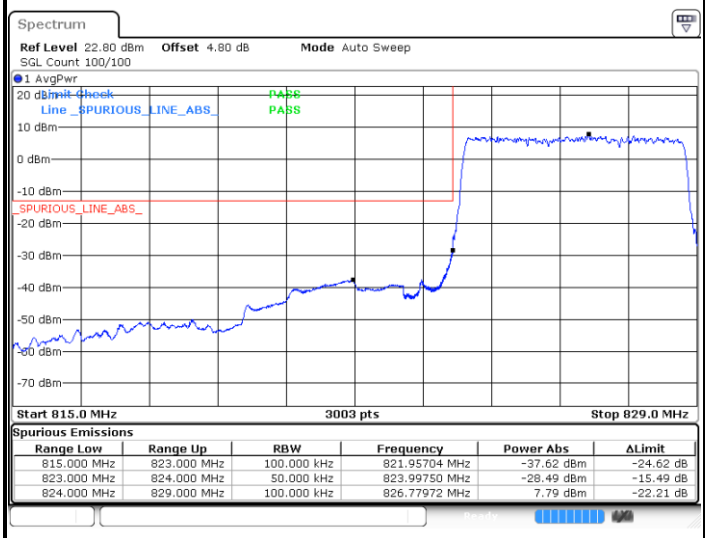
Date: 20.DEC.2020 00:46:19

Highest Band Edge / 1RBMAX



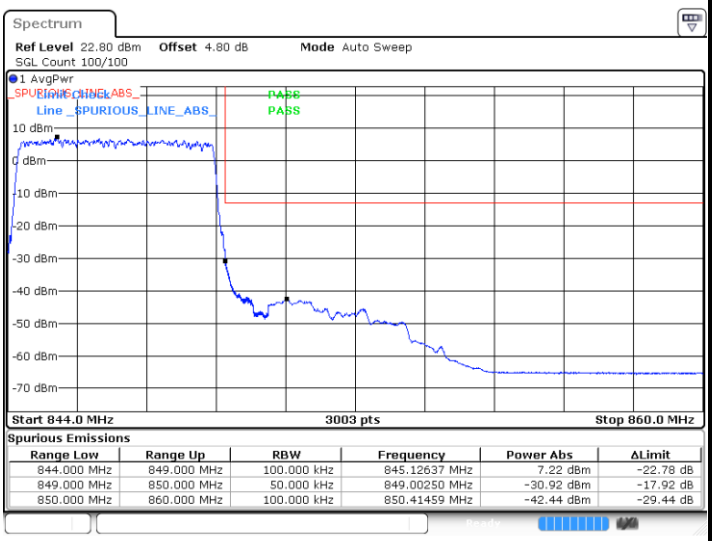
Date: 20.DEC.2020 00:52:39

Lowest Band Edge / Full RB

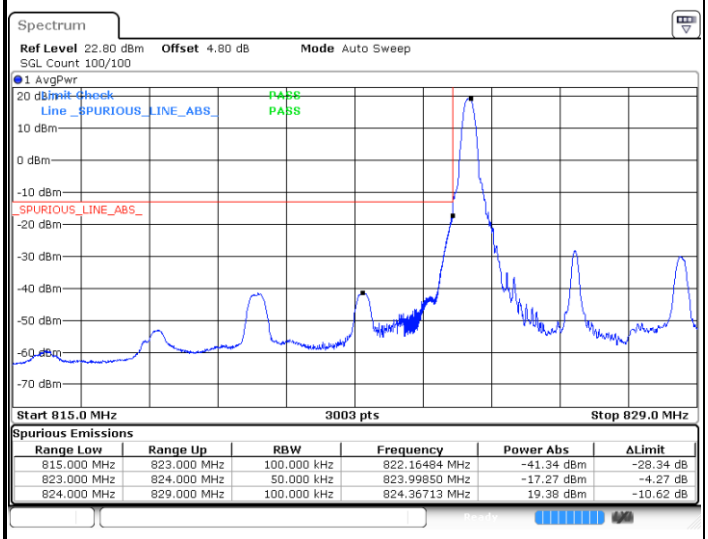
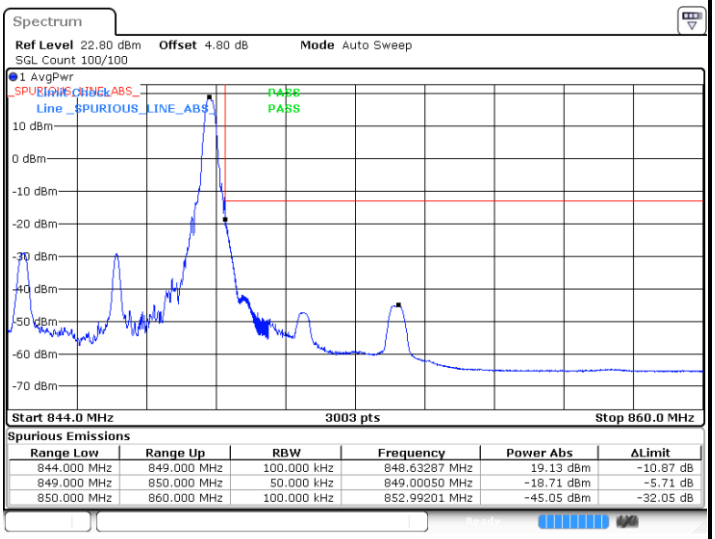
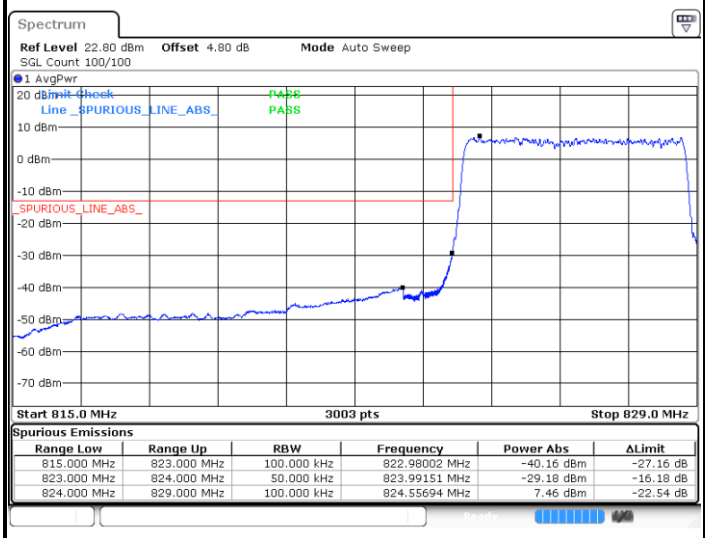
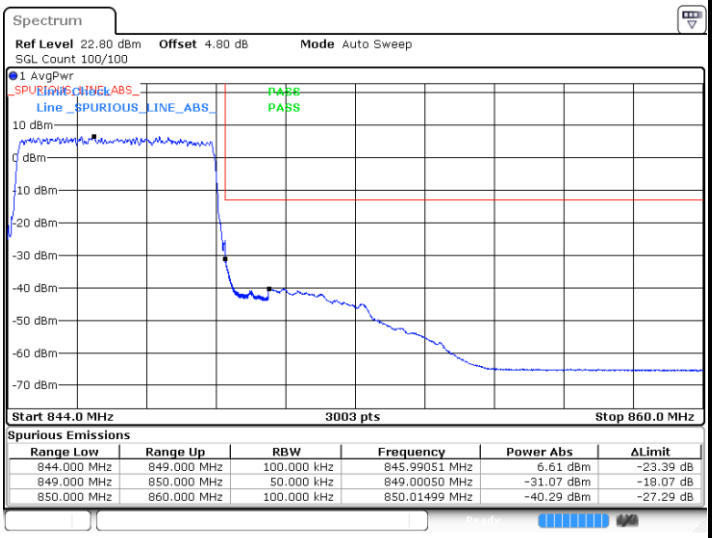


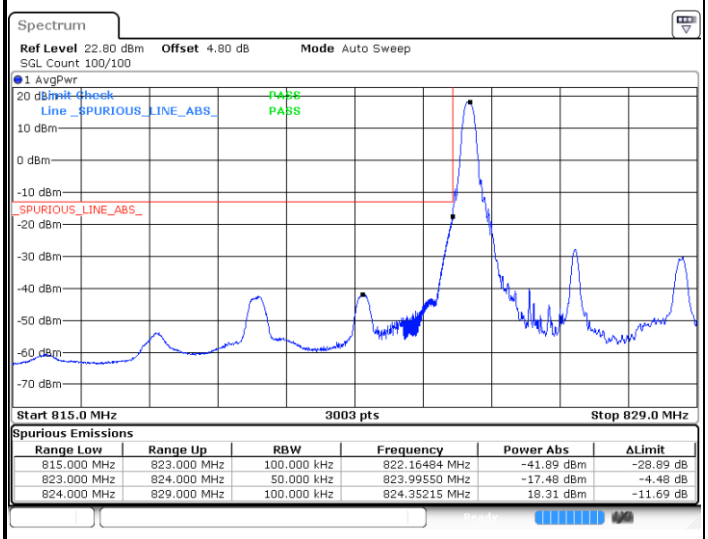
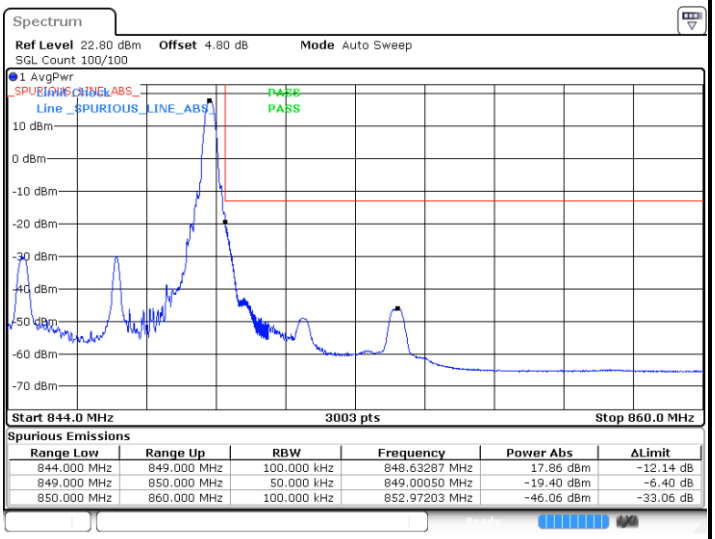
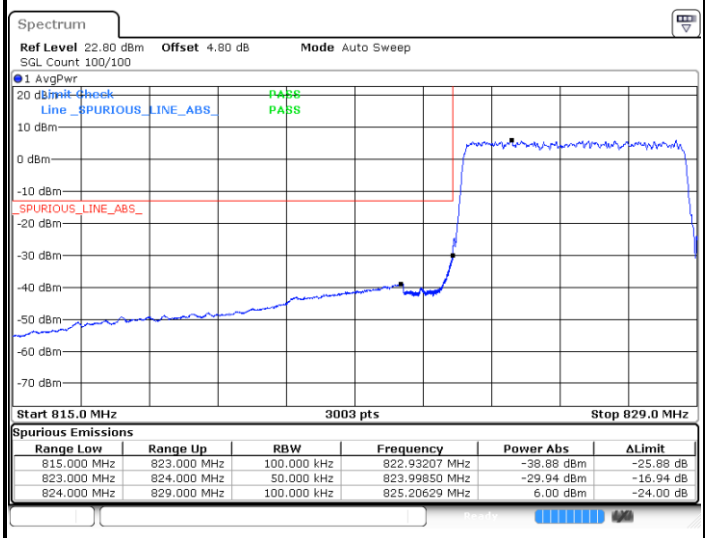
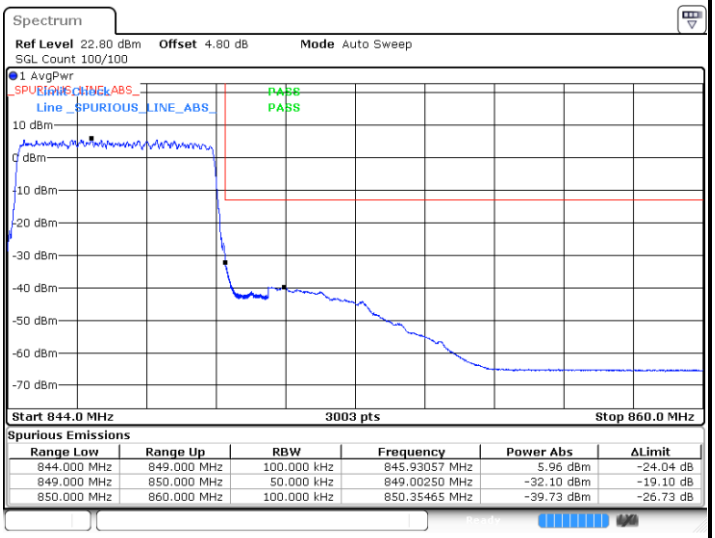
Date: 20.DEC.2020 00:28:39

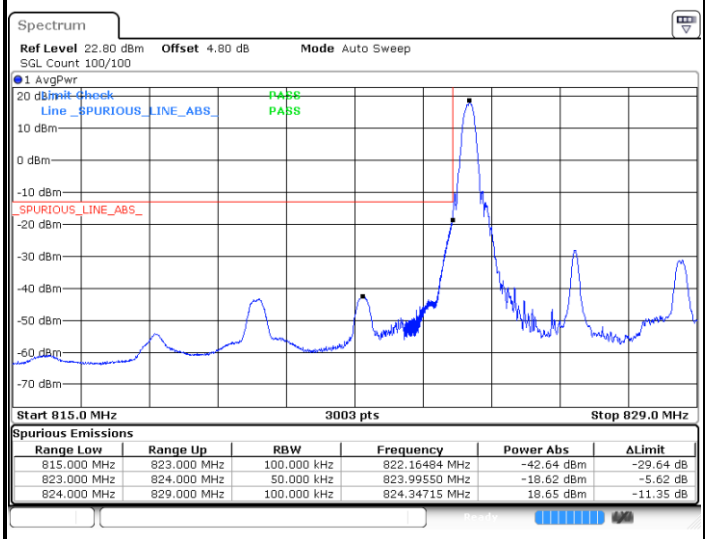
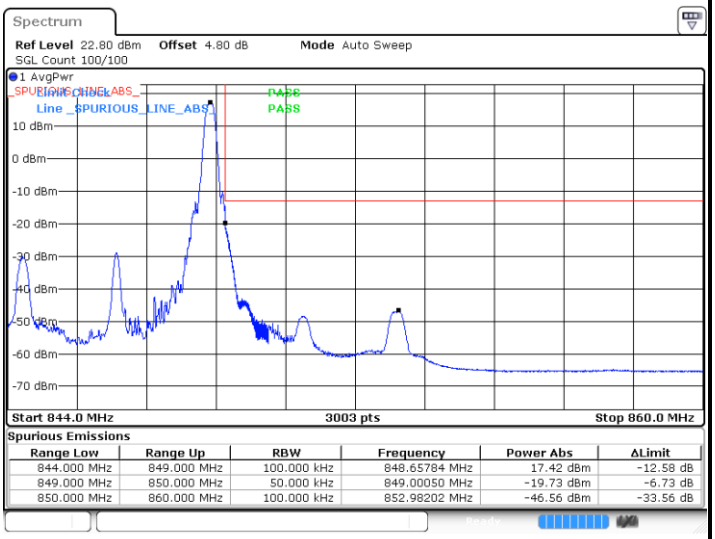
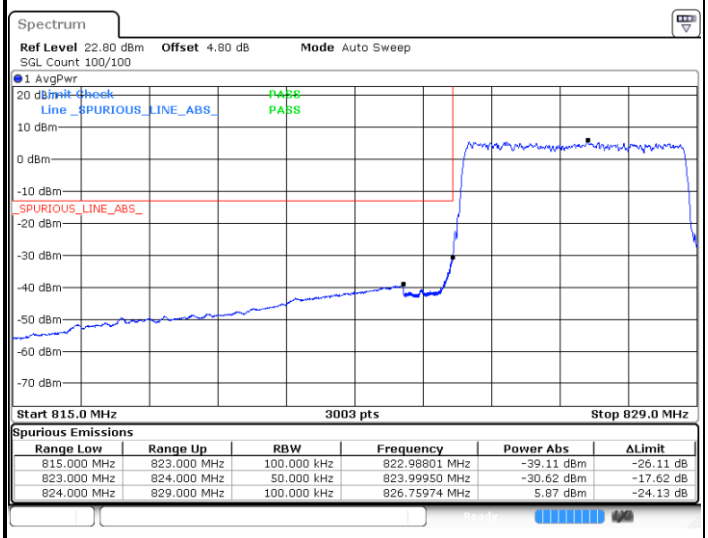
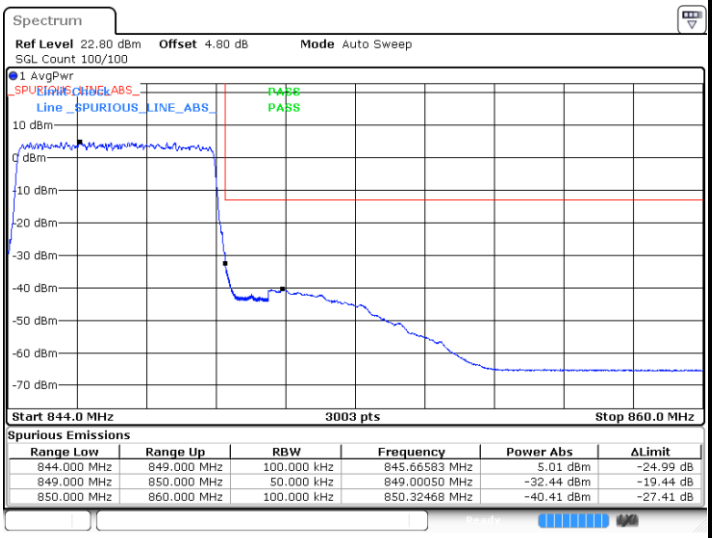
Highest Band Edge / Full RB

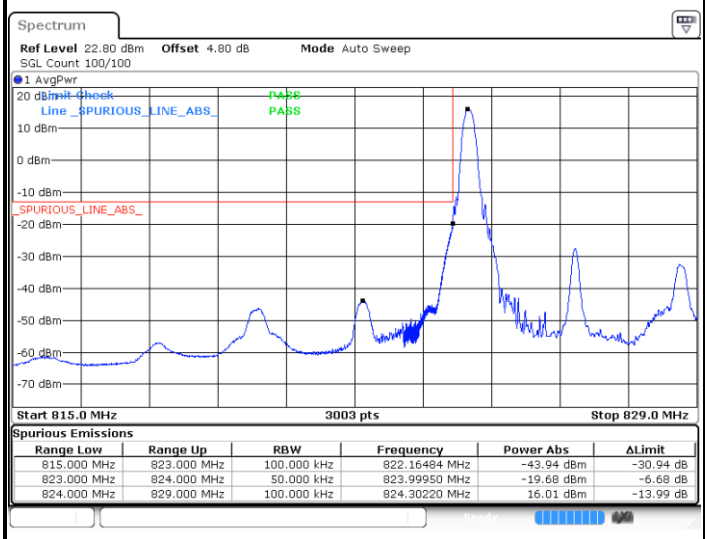
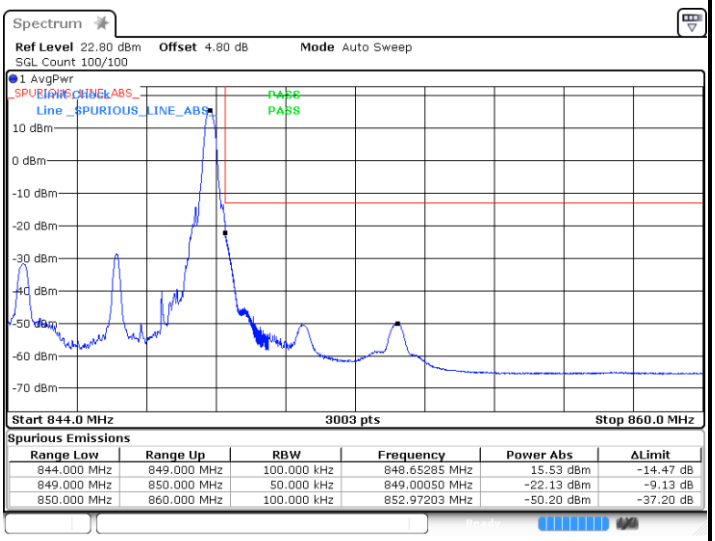
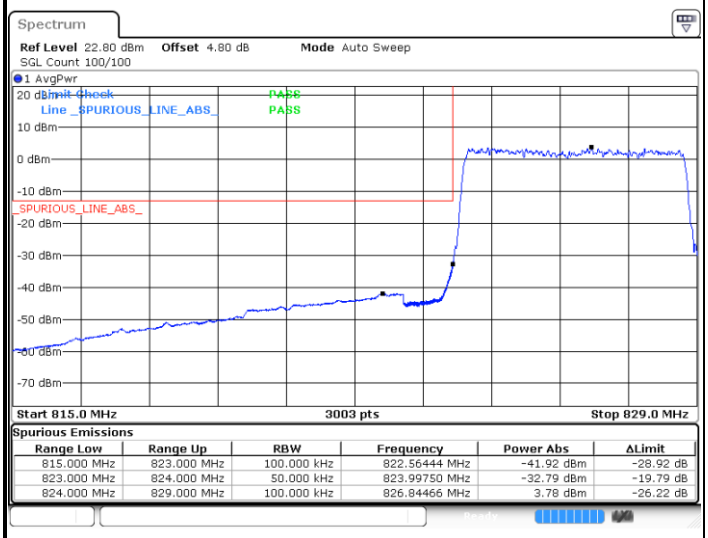
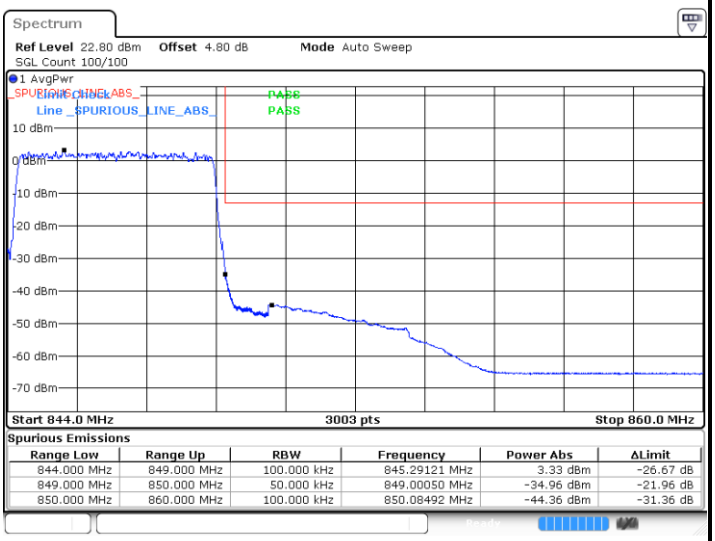


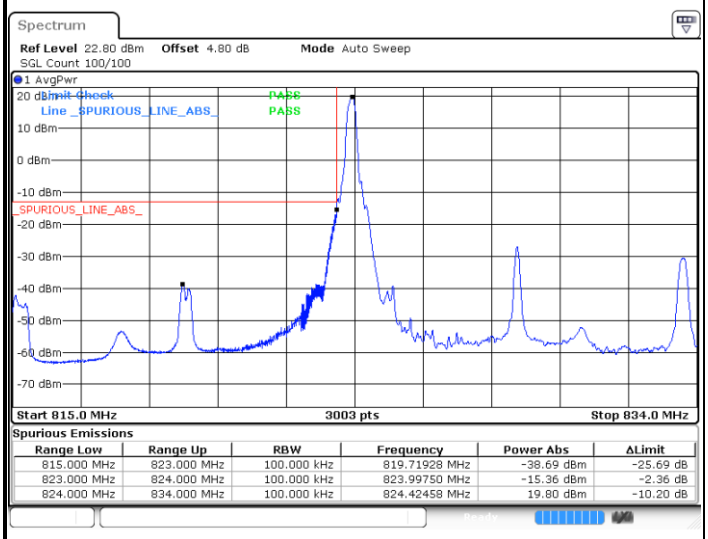
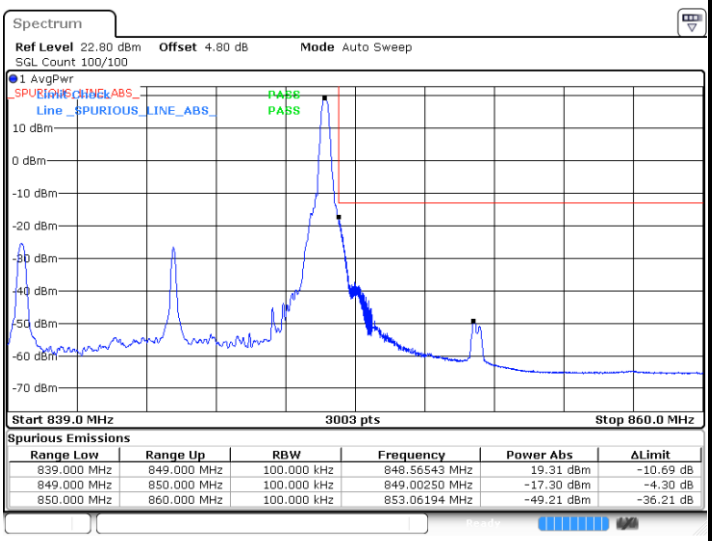
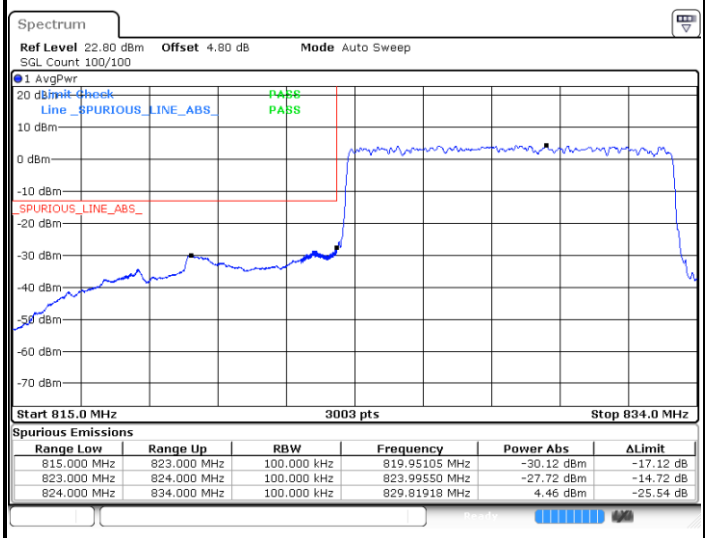
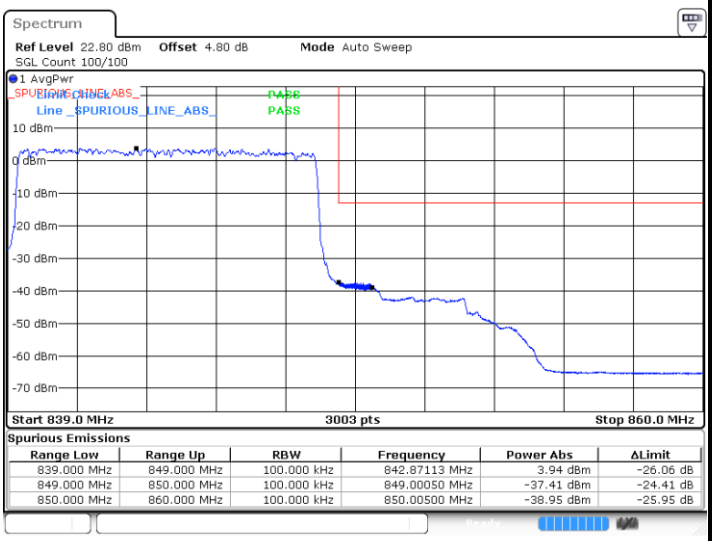
Date: 20.DEC.2020 00:58:43

FR1 n5 / 5MHz / DFT-S OFDM / QPSK	
Lowest Band Edge / 1RB0	**Highest Band Edge / 1RBMAX**
	
Date: 20.DEC.2020 00:43:33	Date: 20.DEC.2020 00:53:29
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	
Date: 20.DEC.2020 00:37:47	Date: 20.DEC.2020 00:57:57

FR1 n5 / 5MHz / DFT-S OFDM / 16Q	
Lowest Band Edge / 1RB0	**Highest Band Edge / 1RBMAX**
	
Date: 20.DEC.2020 00:42:51	Date: 20.DEC.2020 00:54:28
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	
Date: 20.DEC.2020 00:38:49	Date: 20.DEC.2020 00:57:10

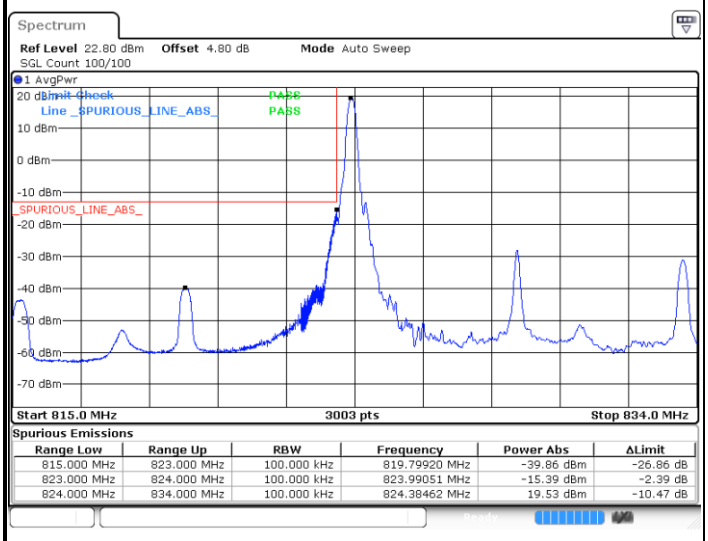
FR1 n5/ 5MHz / DFT-S OFDM / 64Q	
Lowest Band Edge / 1RB0	**Highest Band Edge / 1RBMAX**
	
Date: 20.DEC.2020 00:42:08	Date: 20.DEC.2020 00:55:25
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	
Date: 20.DEC.2020 00:39:33	Date: 20.DEC.2020 00:56:21

FR1 n5 / 5MHz / DFT-S OFDM / 256Q	
Lowest Band Edge / 1RB0	**Highest Band Edge / 1RBMAX**
	
Date: 20.DEC.2020 00:41:24	Date: 20.DEC.2020 02:50:41
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	
Date: 20.DEC.2020 00:40:26	Date: 20.DEC.2020 01:09:49

FR1 n5 / 10MHz / DFT-s-OFDM / PI/2 BPSK	
Lowest Band Edge / 1RB0	**Highest Band Edge / 1RBMAX**
	
Date: 20.DEC.2020 01:18:45	Date: 20.DEC.2020 01:24:16
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	
Date: 20.DEC.2020 01:19:26	Date: 20.DEC.2020 01:30:05

FR1 n5 / 10MHz / DFT-s-OFDM / QPSK

Lowest Band Edge / 1RB0

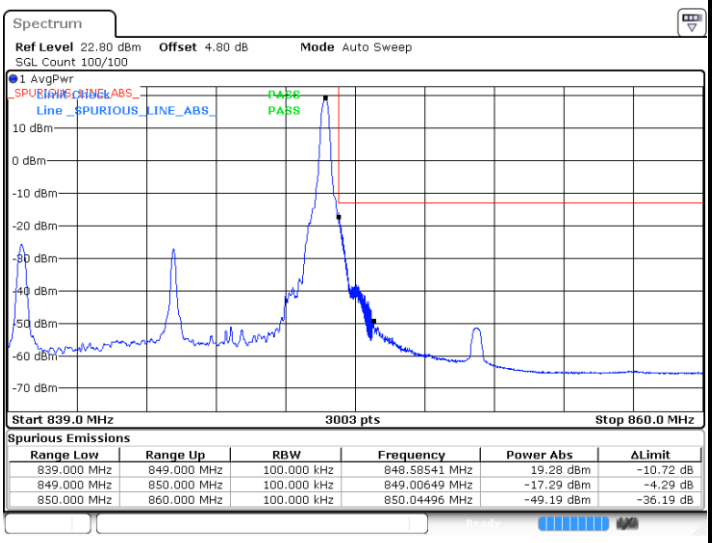


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	819.79920 MHz	-39.86 dBm	-26.86 dB
823.000 MHz	824.000 MHz	100.000 kHz	823.99051 MHz	-15.39 dBm	-2.39 dB
824.000 MHz	834.000 MHz	100.000 kHz	824.38462 MHz	19.53 dBm	-10.47 dB

Date: 20.DEC.2020 01:15:19

Highest Band Edge / 1RBMAX

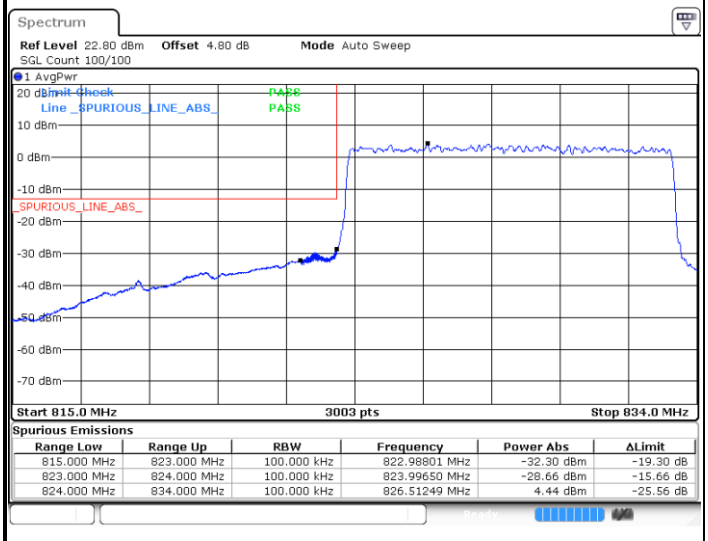


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
839.000 MHz	849.000 MHz	100.000 kHz	848.58541 MHz	19.28 dBm	-10.72 dB
849.000 MHz	850.000 MHz	100.000 kHz	849.00649 MHz	-17.29 dBm	-4.29 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.04496 MHz	-49.19 dBm	-36.19 dB

Date: 20.DEC.2020 01:25:01

Lowest Band Edge / Full RB

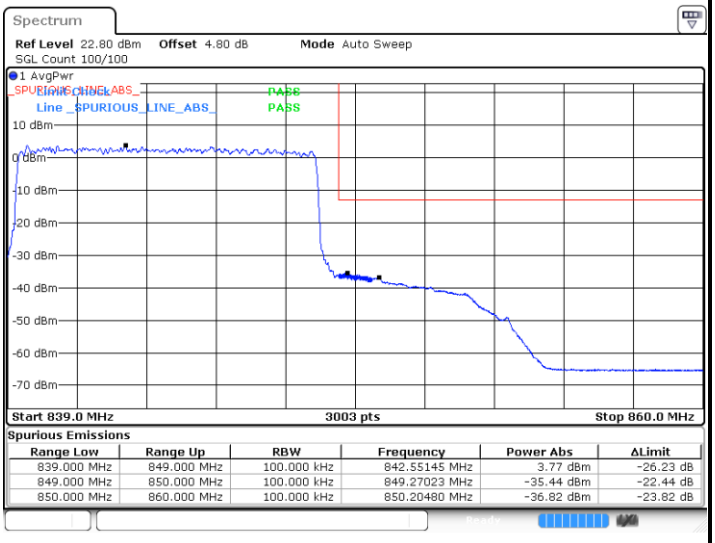


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.98801 MHz	-32.30 dBm	-19.30 dB
823.000 MHz	824.000 MHz	100.000 kHz	823.99650 MHz	-28.66 dBm	-15.66 dB
824.000 MHz	834.000 MHz	100.000 kHz	826.51249 MHz	4.44 dBm	-25.56 dB

Date: 20.DEC.2020 01:14:35

Highest Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
839.000 MHz	849.000 MHz	100.000 kHz	842.55145 MHz	3.77 dBm	-26.23 dB
849.000 MHz	850.000 MHz	100.000 kHz	849.27023 MHz	-35.44 dBm	-22.44 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.20480 MHz	-36.82 dBm	-23.82 dB

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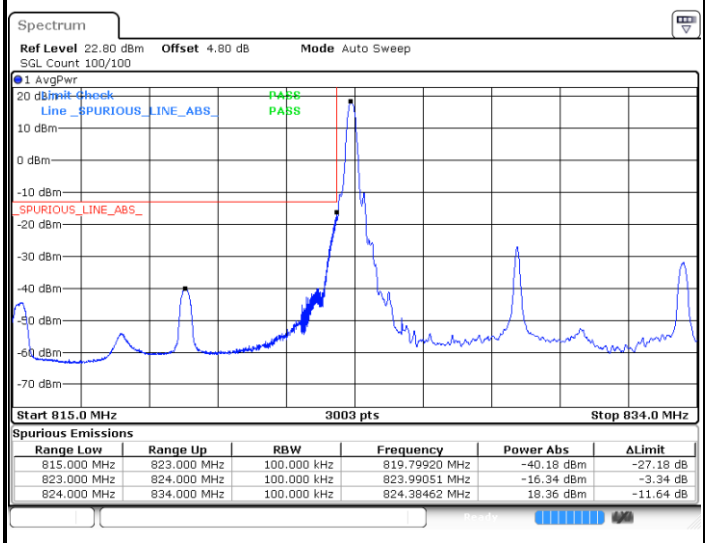
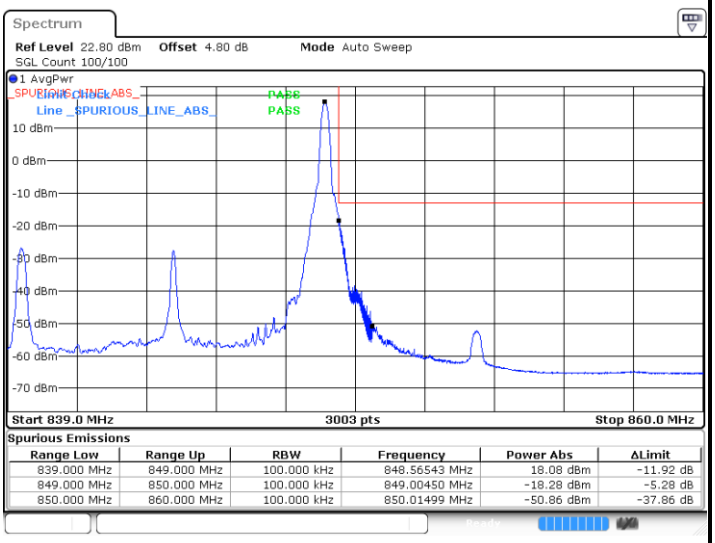
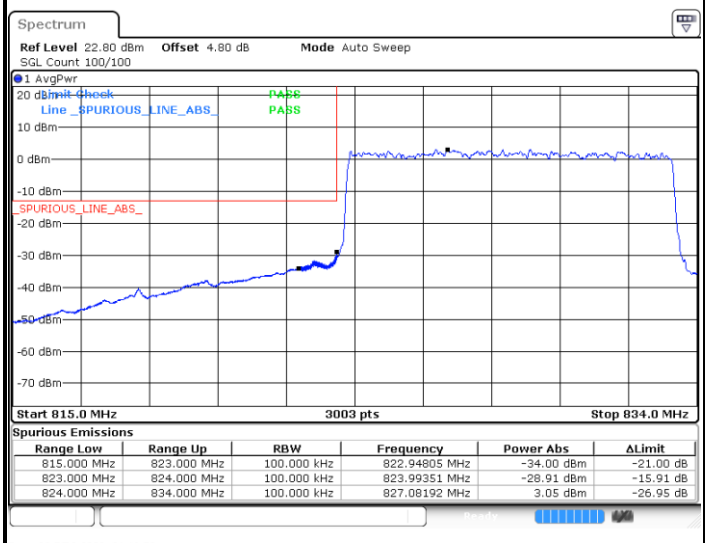
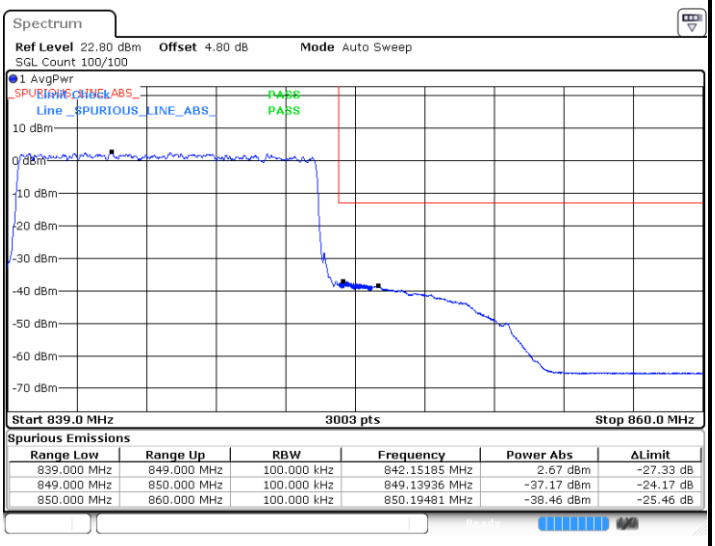
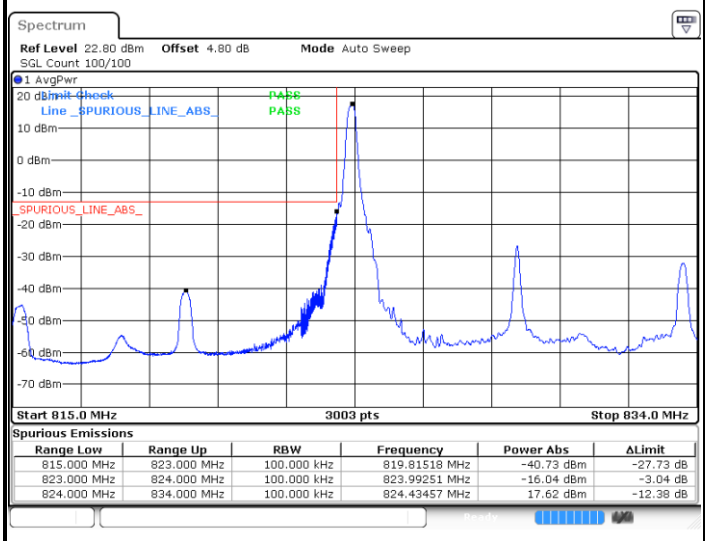
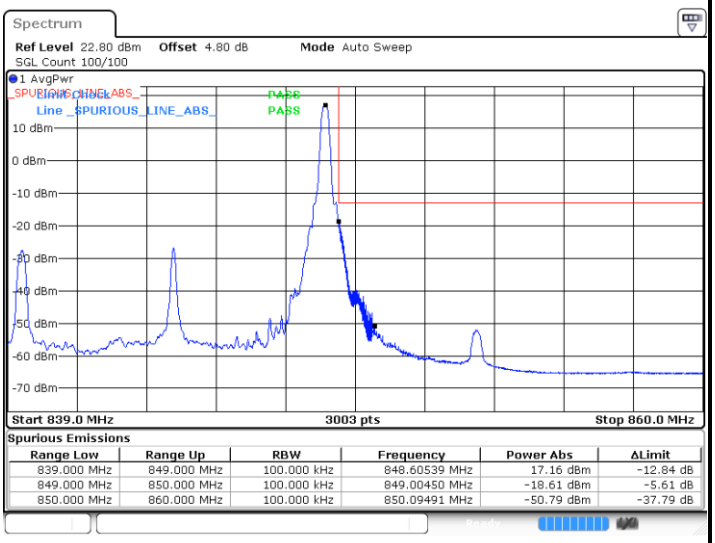
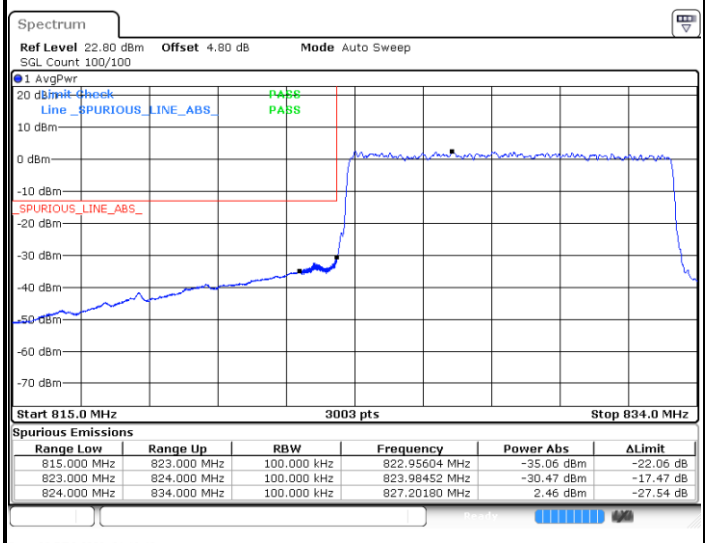
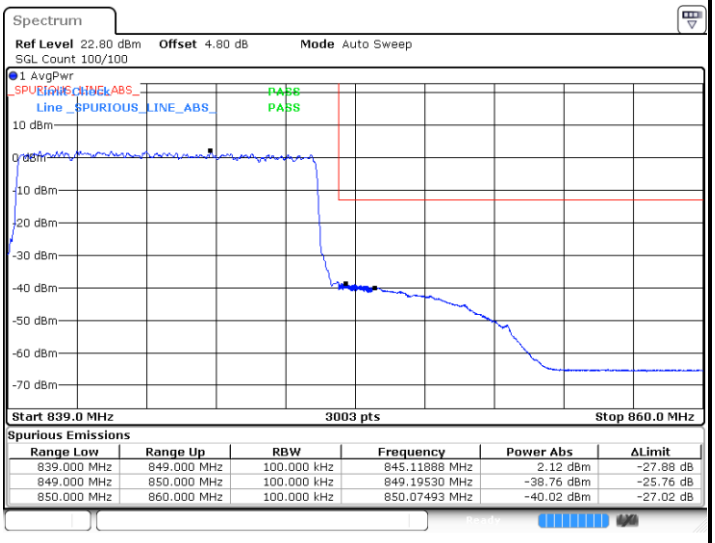
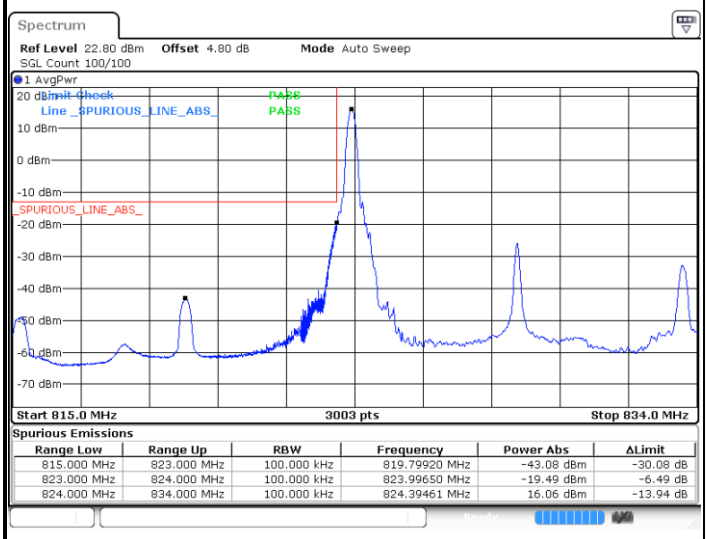
FR1 n5/ 10MHz / DFT-s-OFDM / 16QAM	
Lowest Band Edge / 1RB0	**Highest Band Edge / 1RBMAX**
	
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	

FR1 n5 / 10MHz / DFT-s-OFDM / 64QAM	
Lowest Band Edge / 1RB0	**Highest Band Edge / 1RBMAX**
	
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	

FR1 n5 / 10MHz / DFT-s-OFDM / 256QAM

Lowest Band Edge / 1RB0



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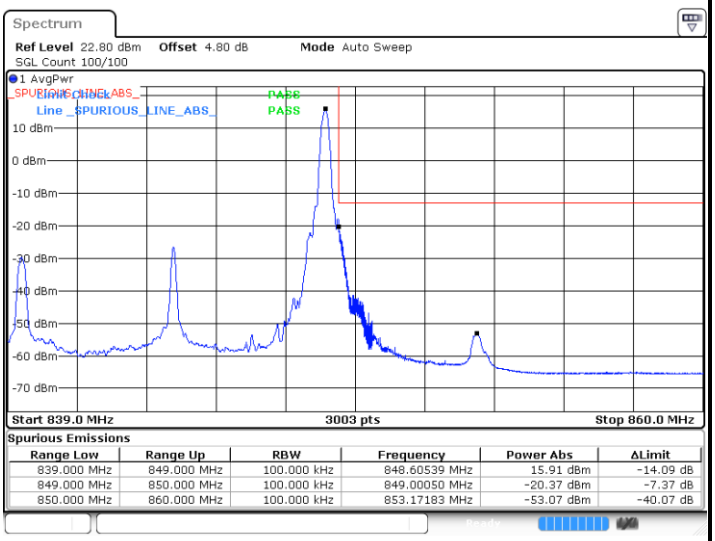
Highest Band Edge / 1RBMAX



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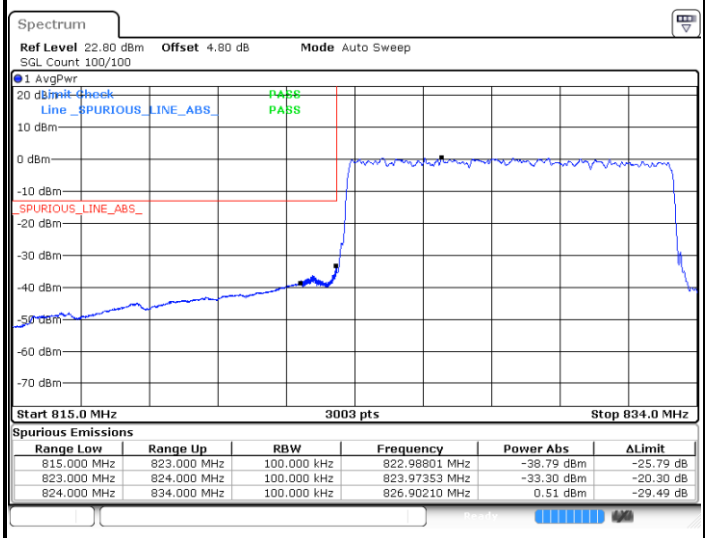
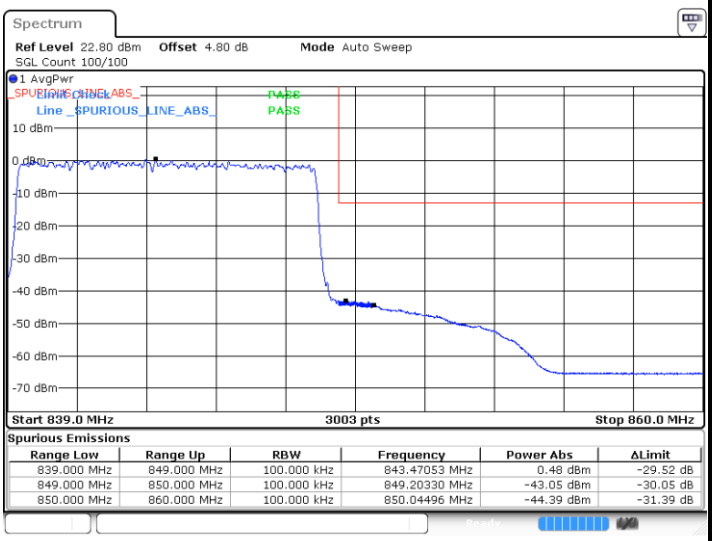
Lowest Band Edge / Full RB



Date: 20.DEC.2020 01:11:52

Highest Band Edge / Full RB



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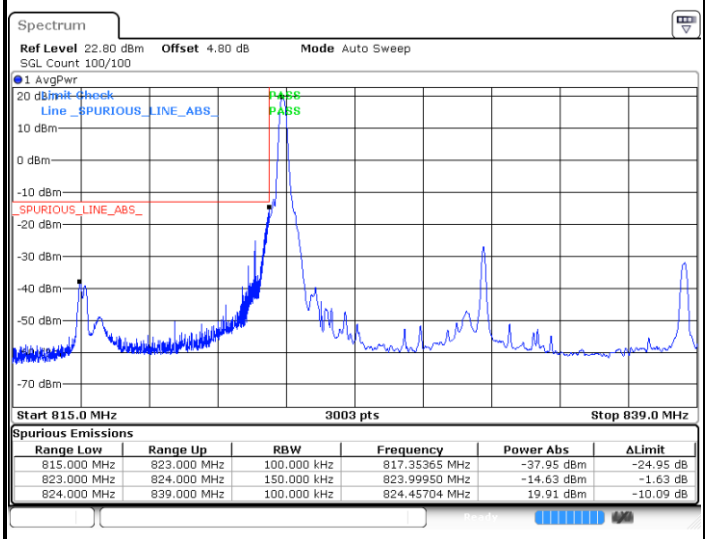
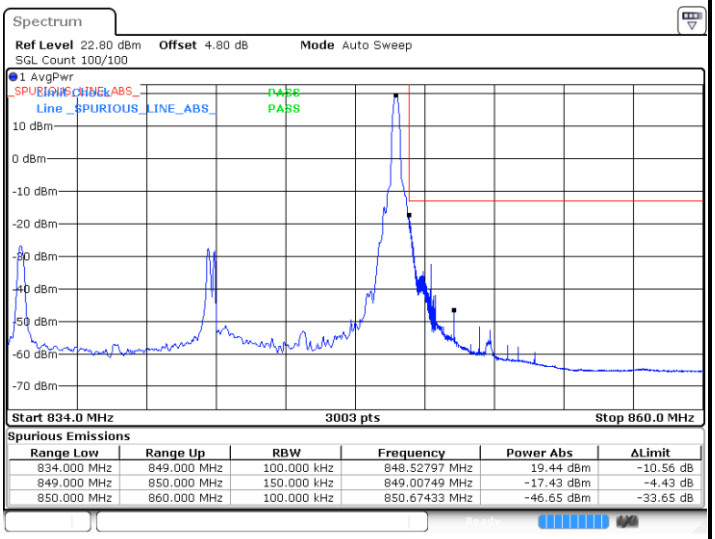
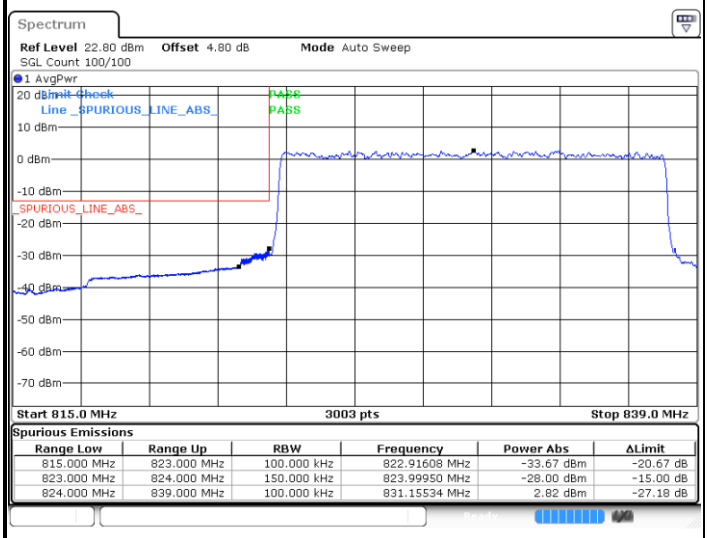
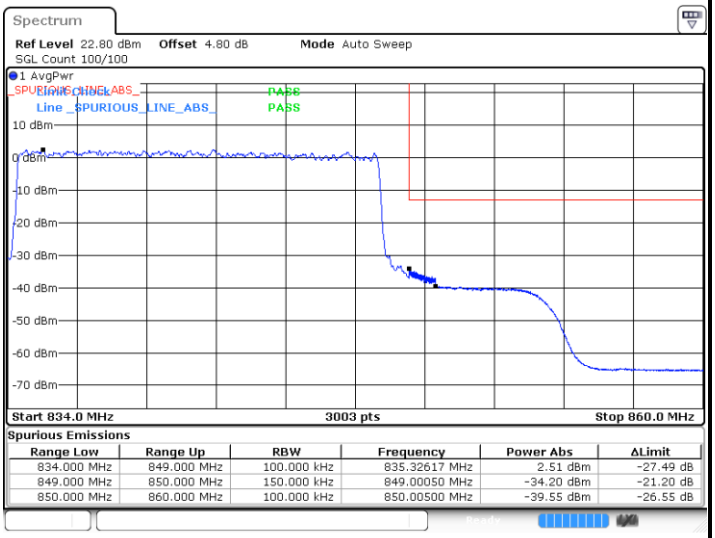
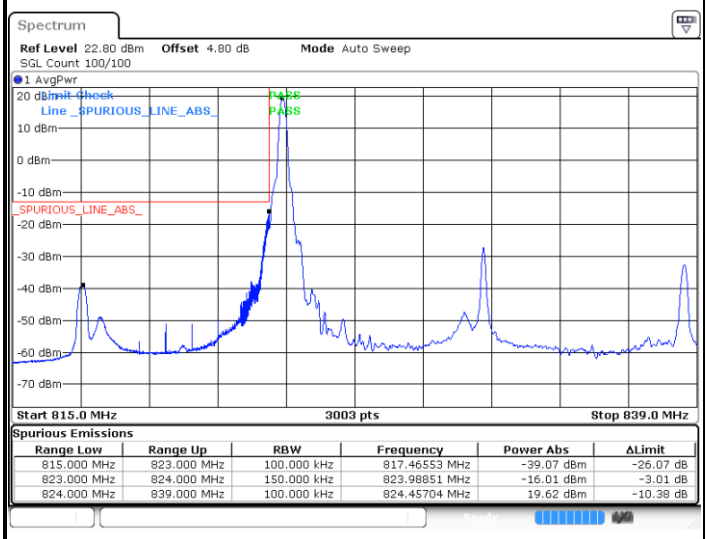
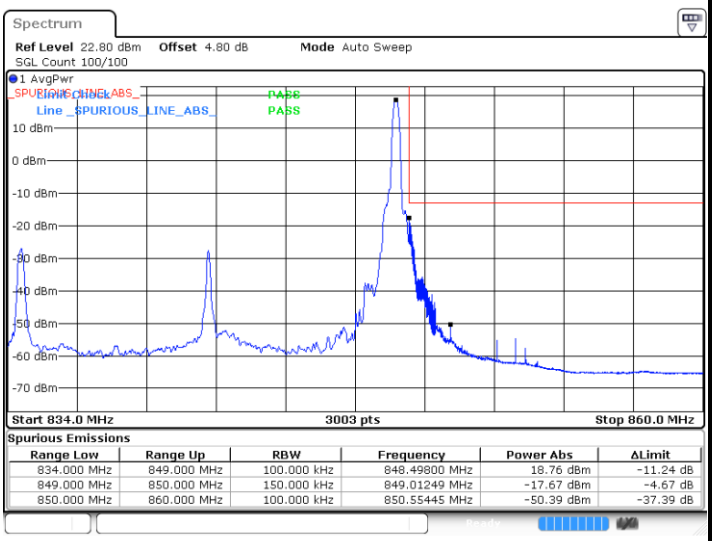
FR1 n5 / 15MHz / DFT-s-OFDM / PI/2 BPSK	
Lowest Band Edge / 1RB0	**Highest Band Edge / 1RBMAX**
	
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	

FR1 n5/ 15MHz / DFT-s-OFDM / QPSK	
Lowest Band Edge / 1RB0	**Highest Band Edge / 1RBMAX**
	
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**