



FCC RF Test Report

APPLICANT : Nokia Shanghai Bell Co., Ltd.
EQUIPMENT : Nokia FastMile 5G Gateway 12
BRAND NAME : Nokia
MODEL NAME : 5G31-03W-B
FCC ID : 2ADZR5G3103WB
STANDARD : 47 CFR Part 2, 22(H), 24(E), 27(L)
CLASSIFICATION : PCS Licensed Transmitter (PCB)
TEST DATE(S) : Apr. 10, 2024 ~ May 08, 2024

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.

This report contains data that were produced under subcontract by Sporton International Inc. (Shenzhen)

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

Jason Jia

Approved by: Jason Jia



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SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	-	Report Only	-
	§22.913(a)(5)	Effective Radiated Power (Band 5) (Band 26)	ERP < 7 Watt	PASS	-
	§24.232(c)	Equivalent Isotropic Radiated Power (Band 2) (Band 25)	EIRP < 2Watt		-
	§27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4) (Band 66)	EIRP < 1Watt		-
3.5	§24.232(d)	Peak-to-Average Ratio	<13 dB	PASS	-
3.6	§2.1049	Occupied Bandwidth	-	Report Only	-
3.7	§2.1051 §22.917(a) §24.238(a) §27.53(h)	Conducted Band Edge Measurement (Band 2) (Band 4) (Band 5) (Band 25) (Band 26) (Band 66)	< 43+10log10(P[Watts])	PASS	-
3.8	§2.1051 §22.917(a) §24.238(a) §27.53(h)	Conducted Spurious Emission (Band 2) (Band 4) (Band 5) (Band 25) (Band 26) (Band 66)	< 43+10log10(P[Watts])	PASS	-
3.9	§2.1055 §22.355	Frequency Stability Temperature & Voltage	< 2.5 ppm for Part 22	PASS	-
	§2.1055 §24.235 §27.54		Within Authorized Band		
4.4	§2.1053 §22.917(a) §24.238(a) §27.53(h)	Radiated Spurious Emission (Band 2) (Band 4) (Band 5) (Band 25) (Band 26) (Band 66)	< 43+10log ₁₀ (P[Watts])	PASS	Under limit 40.65 dB at 7500.00 MHz

Conformity Assessment Condition:

- The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
- The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty"

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.



1 General Description

1.1 Applicant

Nokia Shanghai Bell Co., Ltd.

388#, Ningqiao Road, China (Shanghai) Pilot Free Trade Zone, Shanghai 201206, China

1.2 Manufacturer

Nokia Solutions and Networks Oy

Karakaari 7, 02610 Espoo, Finland

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Nokia FastMile 5G Gateway 12
Brand Name	Nokia
Model Name	5G31-03W-B
FCC ID	2ADZR5G3103WB
SN / IMEI Code	Conducted: KLT241102369(SN) Radiation: 355630740001412(IMEI)
HW Version	3TG03021Exxx (x may be from A to Z)
SW Version	5GGW-QCOM7X_D240200B31T0601E0496
EUT Stage	Identical Prototype

Remark: There are three samples under test, only different for the antenna manufacturers as below. According to the difference, we choose sample 1 to full test and the sample 2/3 are verified the RSE worse cases of LTE/NR in another report.

Ant Description	P/N	Vendor_1	Vendor_2	Vendor_3
Ant0&WiFi3_2.4G	3TG03393AAAA	GW12-A0W3	N42NKASA-PK1-D1X95BUD150U4LI	NKH049-15-000-R
Ant1&WiFi2_6G	3TG03394AAAA	GW12-A1W2	N40NKASB-PK1-E1X190BUE110U4LI	NKH050-15-000-R
Ant 2,Ant3,Ant5,Ant7	3TG03395AAAA	GW12-A2357	N40NKASC-PK1-R150U4LID115U4LI E165U4LIA105U4LI	NKH051-15-000-R
Ant4,Ant6&Ant9	3TG03396AAAA	GW12-A469	N40NKASD-PK1-A135U4LID170U4LI E200U4LI	NKH052-15-000-R
WiFi1_6G	3TG03397AAAA	GW12-W1	N06NKASF-PK1-A1X95BU	NKH053-15-000-R
WiFi4_2.4G	3TG03398AAAA	GW12-W4	N01NKASG-PK1-R1X160BU	NKH054-15-000-R
WiFi5_5G	3TG03399AAAA	GW12-W5	N02NKASH-PK1-D1X90BU	NKH055-15-000-R
Ant8&WiFi6_5G	3TG03400AAAA	GW12-A8W6	N43NKASE-PK1-E1X95BUA165U4LI	NKH056-15-000-R
WiFi7_5G	3TG03401AAAA	GW12-W7	N02NKASJ-PK1-A1X95BU	NKH057-15-000-R
WiFi8_5G	3TG03402AAAA	GW12-W8	N02NKASK-PK1-R1X115BU	NKH058-15-000-R



1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	LTE Band 2 : 1850 MHz ~ 1910 MHz LTE Band 4 : 1710 MHz ~ 1755 MHz LTE Band 5 : 824 MHz ~ 849 MHz LTE Band 25 : 1850 MHz ~ 1915 MHz LTE Band 26 : 824 MHz ~ 849 MHz LTE Band 66 : 1710 MHz ~ 1780 MHz
Rx Frequency	LTE Band 2 : 1930 MHz ~ 1990 MHz LTE Band 4 : 2110 MHz ~ 2155 MHz LTE Band 5 : 869 MHz ~ 894 MHz LTE Band 25 : 1930 MHz ~ 1995 MHz LTE Band 26 : 869 MHz ~ 894 MHz LTE Band 66 : 2110 MHz~ 2200 MHz
Bandwidth	LTE Band 2 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 4 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 5 : 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 25 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 26 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz LTE Band 66 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz
Maximum Output Power to Antenna	LTE Band 2 : 23.14 dBm LTE Band 4 : 23.37 dBm LTE Band 5 : 23.25 dBm LTE Band 25 : 23.23 dBm LTE Band 26 : 23.30 dBm LTE Band 66 : 23.47 dBm
Antenna Gain	<Ant.0> LTE Band 2 : 3.6 dBi LTE Band 4 : 2.1 dBi LTE Band 5 : 2.4 dBi LTE Band 25 : 3.6 dBi LTE Band 26 : 2.4 dBi LTE Band 66 : 2.1 dBi
Type of Modulation	QPSK / 16QAM / 64QAM / 256QAM

1.5 Modification of EUT

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



1.6 Maximum ERP/EIRP Power and Emission Designator

LTE Band 2		QPSK		16QAM/64QAM/256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)
1.4	1850.7 ~ 1909.3	0.4498	1M09G7D	0.3767	1M09W7D
3	1851.5 ~ 1908.5	0.4624	2M74G7D	0.3936	2M72W7D
5	1852.5 ~ 1907.5	0.4581	4M50G7D	0.3908	4M58W7D
10	1855.0 ~ 1905.0	0.4645	9M09G7D	0.3917	9M03W7D
15	1857.5 ~ 1902.5	0.4571	13M5G7D	0.3926	13M5W7D
20	1860.0 ~ 1900.0	0.4721	17M9G7D	0.3945	17M9W7D
LTE Band 25		QPSK		16QAM/64QAM/256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)
1.4	1850.7 ~ 1914.3	0.4508	1M09G7D	0.3776	1M09W7D
3	1851.5 ~ 1913.5	0.4819	2M74G7D	0.4102	2M72W7D
5	1852.5 ~ 1912.5	0.4819	4M50G7D	0.4159	4M58W7D
10	1855.0 ~ 1910.0	0.4721	9M09G7D	0.4093	9M03W7D
15	1857.5 ~ 1907.5	0.4742	13M5G7D	0.4140	13M5W7D
20	1860.0 ~ 1905.0	0.4819	17M9G7D	0.4178	17M9W7D
LTE Band 4		QPSK		16QAM/64QAM/256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)
1.4	1710.7 ~ 1754.3	0.3420	1M09G7D	0.2897	1M09W7D
3	1711.5 ~ 1753.5	0.3499	2M72G7D	0.2985	2M73W7D
5	1712.5 ~ 1752.5	0.3499	4M52G7D	0.2917	4M53W7D
10	1715.0 ~ 1750.0	0.3459	9M07G7D	0.2972	9M03W7D
15	1717.5 ~ 1747.5	0.3524	13M5G7D	0.2931	13M5W7D
20	1720.0 ~ 1745.0	0.3524	18M0G7D	0.2999	18M0W7D
LTE Band 5		QPSK		16QAM/64QAM/256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)
1.4	824.7 ~ 848.3	0.2183	1M10G7D	0.1892	1M09W7D
3	825.5 ~ 847.5	0.2198	2M75G7D	0.1945	2M76W7D
5	826.5 ~ 846.5	0.2193	4M49G7D	0.1959	4M49W7D
10	829.0 ~ 844.0	0.2239	9M09G7D	0.1963	9M01W7D



LTE Band 26		QPSK		16QAM/64QAM/256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)
1.4	824.7 ~ 848.3	0.2028	1M10G7D	0.2032	1M09W7D
3	825.5 ~ 847.5	0.2109	2M75G7D	0.2084	2M76W7D
5	826.5 ~ 846.5	0.2113	4M49G7D	0.2094	4M49W7D
10	829.0 ~ 844.0	0.2133	9M09G7D	0.2065	9M01W7D
15	831.5 ~ 841.5	0.2265	13M4G7D	0.2099	13M6W7D
CH26790	824.0	0.2143	13M4G7D	0.2089	13M5W7D
LTE Band 66		QPSK		16QAM/64QAM/256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)
1.4	1710.7 ~ 1779.3	0.3304	1M09G7D	0.3177	1M09W7D
3	1711.5 ~ 1778.5	0.3573	2M72G7D	0.2844	2M73W7D
5	1712.5 ~ 1777.5	0.3499	4M52G7D	0.2858	4M53W7D
10	1715.0 ~ 1775.0	0.3606	9M07G7D	0.2871	9M03W7D
15	1717.5 ~ 1772.5	0.3589	13M5G7D	0.2844	13M5W7D
20	1720.0 ~ 1770.0	0.3606	18M0G7D	0.3184	18M0W7D

Note:

1. LTE Band 26 overlaps the entire frequency range of LTE Band 5. Therefore, the test results provided in this report covers Band 5 and the portion of Band 26 subject to Part 22.
2. LTE Band 66 overlaps the entire frequency range of LTE Band 4. Therefore, the test results provided in this report covers Band 66 as well as Band 4.
3. LTE Band 25 overlaps the entire frequency range of LTE Band 2. Therefore, the test results provided in this report covers Band 25 as well as Band 2.
4. All modulations have been tested, and only the worst test results of PSK & QAM are shown in the report.



1.7 Testing Location

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

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

Sporton International Inc. (ShenZhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Test Firm	Sporton International Inc. (ShenZhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	TH01-SZ	CN1256	421272

Test data subcontracted: Conducted test cases in section 3 of this report.

1.8 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH04-KS	AUDIX	E3	210616



1.9 Applicable Standards

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

- ♦ 47 CFR Part 2, 22(H), 24(E), 27(L)
- ♦ ANSI C63.26-2015
- ♦ FCC KDB 971168 D01 Power Meas License Digital Systems v03r01
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



2 Test Configuration of Equipment Under Test

2.1 Test Mode

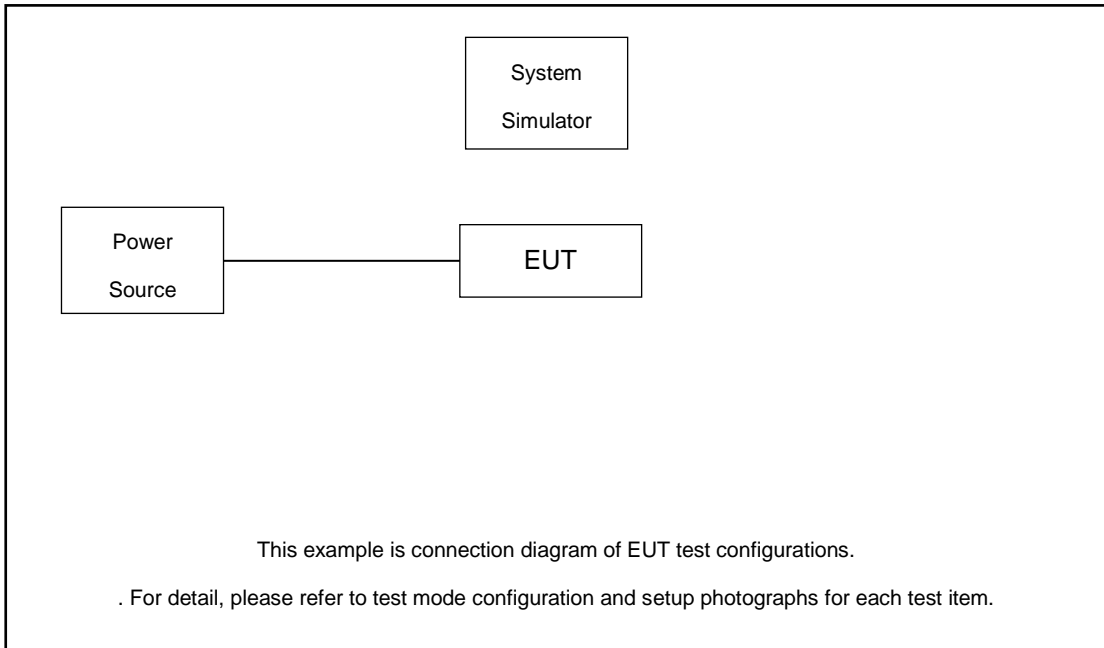
Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas License Digital Systems v03r01 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission. (Y Plane)

Test Items	Band	Bandwidth (MHz)						Modulation				RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
Max. Output Power	2	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	4	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	5	v	v	v	v	-	-	v	v	v	v	v	v	v	v	v	v
	25	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	26	v	v	v	v	v	-	v	v	v	v	v	v	v	v	v	v
	66	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
Peak-to-Average Ratio	25						v	v	v	v				v		v	
	26					v	-	v	v	v				v		v	
	66						v	v	v	v				v		v	
26dB and 99% Bandwidth	25	v	v	v	v	v	v	v	v					v		v	
	26	v	v	v	v	v	-	v	v					v		v	
	66	v	v	v	v	v	v	v	v					v		v	
Conducted Band Edge	25	v	v	v	v	v	v	v	v	v		v		v	v	v	
	26	v	v	v	v	v	-	v	v	v		v		v	v	v	
	66	v	v	v	v	v	v	v	v	v		v		v	v	v	
Conducted Spurious Emission	25	v	v	v	v	v	v	v				v			v	v	
	26	v	v	v	v	v	-	v				v			v	v	
	66	v	v	v	v	v	v	v				v			v	v	
Frequency Stability	25				v			v						v		v	
	26				v		-	v						v		v	
	66				v			v						v		v	
E.R.P / E.I.R.P	2	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	
	4	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	
	5	v	v	v	v	-	-	v	v	v	v	v	v	v	v	v	
	25	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	
	26	v	v	v	v	v	-	v	v	v	v	v	v	v	v	v	
	66	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	
Radiated Spurious Emission	25	Worst Case														v	
	26	Worst Case														v	
	66	Worst Case														v	

Note	<ol style="list-style-type: none"> 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 QAM modulation mode, the whole testing has assessed 16QAM&64QAM mode by referring to the higher conducted power.
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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.	Power Supply	GWINSTEK	PSS-2002	N/A	N/A	Unshielded, 1.8 m
2.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m



2.4 Measurement Results Explanation Example

For all conducted test items:

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

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

$$\text{Offset} = \text{RF cable loss} + \text{attenuator factor}.$$

Following shows an offset computation example with cable loss 4.5 dB and 10dB attenuator.

Example :

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\ &= 4.5 + 10 = 14.5 \text{ (dB)} \end{aligned}$$

2.5 Frequency List of Low/Middle/High Channels

LTE Band 2 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	18700	18900	19100
	Frequency	1860	1880	1900
15	Channel	18675	18900	19125
	Frequency	1857.5	1880	1902.5
10	Channel	18650	18900	19150
	Frequency	1855	1880	1905
5	Channel	18625	18900	19175
	Frequency	1852.5	1880	1907.5
3	Channel	18615	18900	19185
	Frequency	1851.5	1880	1908.5
1.4	Channel	18607	18900	19193
	Frequency	1850.7	1880	1909.3



LTE Band 4 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	20050	20175	20300
	Frequency	1720	1732.5	1745
15	Channel	20025	20175	20325
	Frequency	1717.5	1732.5	1747.5
10	Channel	20000	20175	20350
	Frequency	1715	1732.5	1750
5	Channel	19975	20175	20375
	Frequency	1712.5	1732.5	1752.5
3	Channel	19965	20175	20385
	Frequency	1711.5	1732.5	1753.5
1.4	Channel	19957	20175	20393
	Frequency	1710.7	1732.5	1754.3

LTE Band 5 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	20450	20525	20600
	Frequency	829	836.5	844
5	Channel	20425	20525	20625
	Frequency	826.5	836.5	846.5
3	Channel	20415	20525	20635
	Frequency	825.5	836.5	847.5
1.4	Channel	20407	20525	20643
	Frequency	824.7	836.5	848.3



LTE Band 25 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	26140	26340	26590
	Frequency	1860	1880	1905
15	Channel	26115	26340	26615
	Frequency	1857.5	1880	1907.5
10	Channel	26090	26340	26640
	Frequency	1855	1880	1910
5	Channel	26065	26340	26665
	Frequency	1852.5	1880	1912.5
3	Channel	26055	26340	26675
	Frequency	1851.5	1880	1913.5
1.4	Channel	26047	26340	26683
	Frequency	1850.7	1880	1914.3

LTE Band 26 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
15	Channel	26865	26915	26965
	Frequency	831.5	836.5	841.5
10	Channel	26840	26915	26990
	Frequency	829	836.5	844
5	Channel	26815	26915	27015
	Frequency	826.5	836.5	846.5
3	Channel	26805	26915	27025
	Frequency	825.5	836.5	847.5
1.4	Channel	26797	26915	27033
	Frequency	824.7	836.5	848.3



LTE Band 66 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	132072	132322	132572
	Frequency	1720	1745	1770
15	Channel	132047	132322	132597
	Frequency	1717.5	1745	1772.5
10	Channel	132022	132322	132622
	Frequency	1715	1745	1775
5	Channel	131997	132322	132647
	Frequency	1712.5	1745	1777.5
3	Channel	131987	132322	132657
	Frequency	1711.5	1745	1778.5
1.4	Channel	131979	132322	132665
	Frequency	1710.7	1745	1779.3

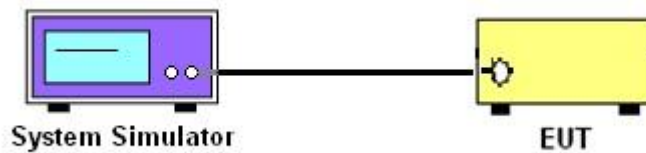
3 Conducted Test Items

3.1 Measuring Instruments

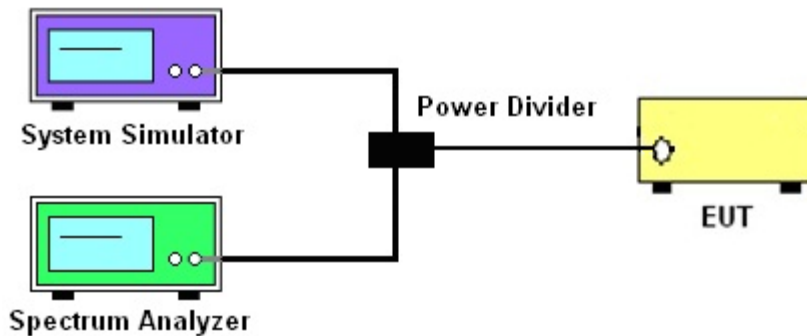
See list of measuring instruments of this test report.

3.2 Test Setup

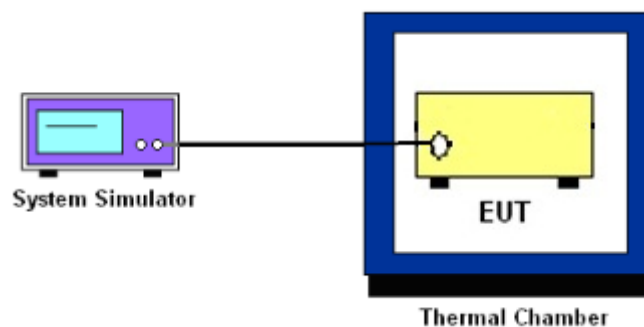
3.2.1 Conducted Output Power



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 LTE Band 5 and Band 26.

The EIRP of mobile transmitters must not exceed 2 Watts for LTE Band 2 and Band 25.

The EIRP of mobile transmitters must not exceed 1 Watts for LTE Band 4 and Band 66.

According to KDB 412172 D01 Power Approach,

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

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

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

3.4.2 Test Procedures

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



3.5 Peak-to-Average Ratio

3.5.1 Description of the PAR Measurement

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

3.5.2 Test Procedures

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



3.6 Occupied Bandwidth

3.6.1 Description of Occupied Bandwidth Measurement

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

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

3.6.2 Test Procedures

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



3.7 Conducted Band Edge

3.7.1 Description of Conducted Band Edge Measurement

22.917(a)

For operations in the 824 – 849 MHz band, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ 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 $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ 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 $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ 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
1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured.
3. Set RBW \geq 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
4. Beyond the 1 MHz band from the band edge, RBW=1MHz was used
5. Set spectrum analyzer with RMS detector.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. Checked that all the results comply with the emission limit line.

Example:

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

$$= P(W) - [43 + 10\log(P)] \text{ (dB)}$$

$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)} = -13\text{dBm}.$$

8. 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.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th 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 $43 + 10\log(P)$ dB below the transmitter power P(Watts)
= $P(W) - [43 + 10\log(P)]$ (dB)
= $[30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (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 $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) 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 $20\pm 5^{\circ}\text{C}$ 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.

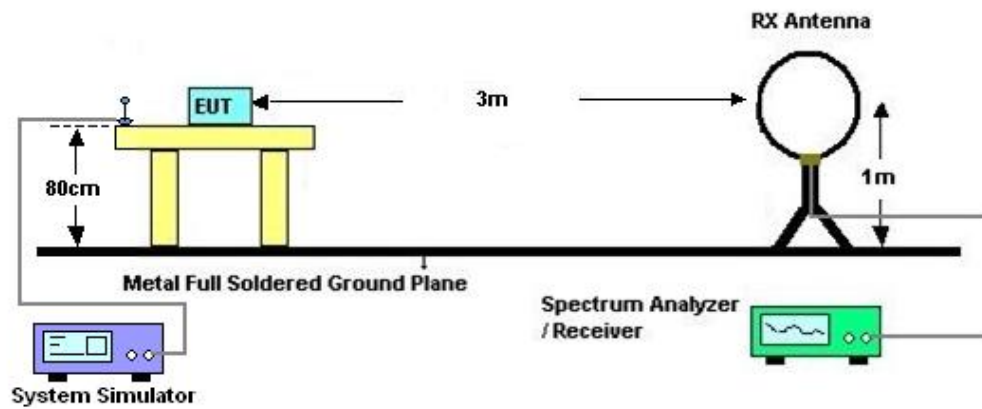
4 Radiated Test Items

4.1 Measuring Instruments

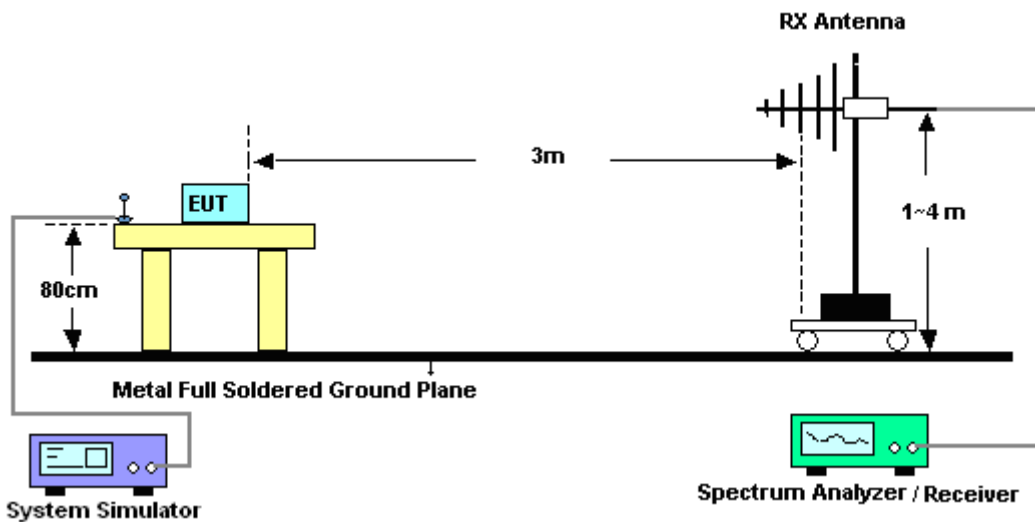
See list of measuring instruments of this test report.

4.2 Test Setup

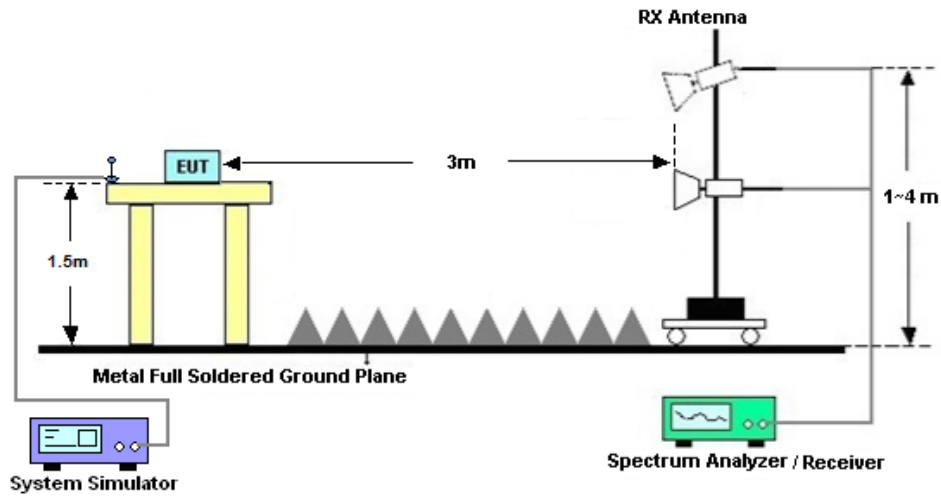
4.2.1 For radiated test below 30MHz



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.

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 $43 + 10\log(P)$ dB below the transmitter power P(Watts)
= $P(W) - [43 + 10\log(P)] (dB)$
= $[30 + 10\log(P)] (dBm) - [43 + 10\log(P)] (dB)$
= -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	101078	10Hz~40GHz	Apr. 09, 2024	Apr. 10, 2024~ Apr. 11, 2024	Apr. 08, 2025	Conducted (TH01-SZ)
DC Power Supply	TTI	PL330P	290070	Max 32V , 3A	Oct. 16, 2023	Apr. 10, 2024~ Apr. 11, 2024	Oct. 15, 2024	Conducted (TH01-SZ)
Power Divider	TOJOIN	PS-2SM-04 265	60.06.020.007 7	0.4GHz~26.5GHz	Dec. 25, 2023	Apr. 10, 2024~ Apr. 11, 2024	Dec. 24, 2024	Conducted (TH01-SZ)
Thermal Chamber	Ten Billion Hongzhangroup	LP-150U	H2014081803	-40~+150°C	Jul. 05, 2023	Apr. 10, 2024~ Apr. 11, 2024	Jul. 04, 2024	Conducted (TH01-SZ)
EXA Spectrum Analyzer	Keysight	N9010B	MY57471079	10Hz-44G,MAX 30dB	Oct. 10, 2023	May 08, 2024	Oct. 09, 2024	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 11, 2023	May 08, 2024	Sep. 10, 2024	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	59913	30MHz-1GHz	Aug. 19, 2023	May 08, 2024	Aug. 18, 2024	Radiation (03CH04-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00251694	1GHz~18GHz	Jul. 12, 2023	May 08, 2024	Jul. 11, 2024	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2024	May 08, 2024	Jan. 04, 2025	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	380827	9KHz-1GHz	Jul. 06, 2023	May 08, 2024	Jul. 05, 2024	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40G GA	060728	18~40GHz	Jan. 05, 2024	May 08, 2024	Jan. 04, 2025	Radiation (03CH04-KS)
high gain Amplifier	EM	EM01G18G A	060840	1Ghz-18Ghz	Oct. 10, 2023	May 08, 2024	Oct. 09, 2024	Radiation (03CH04-KS)
Amplifier	Agilent	8449B	3008A02370	1Ghz-18Ghz	Oct. 10, 2023	May 08, 2024	Oct. 09, 2024	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	May 08, 2024	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	May 08, 2024	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	May 08, 2024	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required



6 Measurement Uncertainty

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

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Spurious Emission & Bandedge	±1.34 dB
Occupied Channel Bandwidth	±0.012 MHz
Conducted Power	±1.34 dB
Peak to Average Ratio	±1.34 dB
Frequency Stability	±1.3 Hz

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.83 dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.83 dB
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.82 dB
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----- THE END -----



Appendix A. Test Results of Conducted Test

Test Engineer :	Lorenzo Liu	Temperature :	24~26°C
		Relative Humidity :	50~53%

A1. Conducted Output Power(Average power) and ERP/EIRP

LTE Band 2:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	EIRP(W)		
Channel				18700	18900	19100			
Frequency (MHz)				1860	1880	1900	L	M	H
20	QPSK	1	0	23.14	22.97	22.96	0.4721	0.4539	0.4529
20	QPSK	1	49	22.99	22.99	22.95	0.4560	0.4560	0.4519
20	QPSK	1	99	23.07	22.91	22.90	0.4645	0.4477	0.4467
20	QPSK	50	0	22.16	22.10	22.11	0.3767	0.3715	0.3724
20	QPSK	50	24	22.08	21.96	22.09	0.3698	0.3597	0.3707
20	QPSK	50	50	21.93	21.92	21.94	0.3573	0.3565	0.3581
20	QPSK	100	0	22.04	21.97	22.07	0.3664	0.3606	0.3690
20	16QAM	1	0	22.36	22.24	22.26	0.3945	0.3837	0.3855
20	64QAM	1	0	21.07	21.09	21.10	0.2931	0.2944	0.2951
20	256QAM	1	0	18.37	18.33	18.36	0.1574	0.1560	0.1570
Channel				18675	18900	19125	EIRP(W)		
Frequency (MHz)				1857.5	1880	1902.5	L	M	H
15	QPSK	1	0	23.00	23.00	22.92	0.4571	0.4571	0.4487
15	16QAM	1	0	22.34	22.32	22.22	0.3926	0.3908	0.3819
Channel				18650	18900	19150	EIRP(W)		
Frequency (MHz)				1855	1880	1905	L	M	H
10	QPSK	1	0	23.07	22.95	22.93	0.4645	0.4519	0.4498
10	16QAM	1	0	22.30	22.33	22.22	0.3890	0.3917	0.3819
Channel				18625	18900	19175	EIRP(W)		
Frequency (MHz)				1852.5	1880	1907.5	L	M	H
5	QPSK	1	0	23.01	22.95	22.93	0.4581	0.4519	0.4498
5	16QAM	1	0	22.30	22.26	22.32	0.3890	0.3855	0.3908
Channel				18615	18900	19185	EIRP(W)		
Frequency (MHz)				1851.5	1880	1908.5	L	M	H
3	QPSK	1	0	23.02	23.05	23.01	0.4592	0.4624	0.4581
3	16QAM	1	0	22.35	22.26	22.24	0.3936	0.3855	0.3837
Channel				18607	18900	19193	EIRP(W)		
Frequency (MHz)				1850.7	1880	1909.3	L	M	H
1.4	QPSK	1	0	22.88	22.93	22.92	0.4446	0.4498	0.4487
1.4	16QAM	1	0	22.16	22.11	22.11	0.3767	0.3724	0.3724



LTE Band 4:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	EIRP(W)		
Channel				20050	20175	20300			
Frequency (MHz)				1720	1732.5	1745	L	M	H
20	QPSK	1	0	23.37	23.31	23.15	0.3524	0.3475	0.3350
20	QPSK	1	49	22.95	22.91	22.88	0.3199	0.3170	0.3148
20	QPSK	1	99	22.78	22.72	22.68	0.3076	0.3034	0.3006
20	QPSK	50	0	22.09	22.14	22.15	0.2624	0.2655	0.2661
20	QPSK	50	24	22.09	22.07	21.97	0.2624	0.2612	0.2553
20	QPSK	50	50	21.80	21.86	21.80	0.2455	0.2489	0.2455
20	QPSK	100	0	22.08	22.04	21.98	0.2618	0.2594	0.2559
20	16QAM	1	0	22.58	22.67	22.00	0.2938	0.2999	0.2570
20	64QAM	1	0	21.35	21.16	21.69	0.2213	0.2118	0.2393
20	256QAM	1	0	18.37	18.40	18.35	0.1114	0.1122	0.1109
Channel				20025	20175	20325	EIRP(W)		
Frequency (MHz)				1717.5	1732.5	1747.5	L	M	H
15	QPSK	1	0	23.03	23.37	23.24	0.3258	0.3524	0.3420
15	16QAM	1	0	22.57	22.35	22.06	0.2931	0.2786	0.2606
Channel				20000	20175	20350	EIRP(W)		
Frequency (MHz)				1715	1732.5	1750	L	M	H
10	QPSK	1	0	23.08	23.29	23.16	0.3296	0.3459	0.3357
10	16QAM	1	0	22.63	22.35	22.07	0.2972	0.2786	0.2612
Channel				19975	20175	20375	EIRP(W)		
Frequency (MHz)				1712.5	1732.5	1752.5	L	M	H
5	QPSK	1	0	23.01	23.34	23.24	0.3243	0.3499	0.3420
5	16QAM	1	0	22.55	22.45	22.07	0.2917	0.2851	0.2612
Channel				19965	20175	20385	EIRP(W)		
Frequency (MHz)				1711.5	1732.5	1753.5	L	M	H
3	QPSK	1	0	23.04	23.34	23.23	0.3266	0.3499	0.3412
3	16QAM	1	0	22.65	22.47	22.04	0.2985	0.2864	0.2594
Channel				19950	20175	20393	EIRP(W)		
Frequency (MHz)				1710	1732.5	1754.3	L	M	H
1.4	QPSK	1	0	22.97	23.24	23.10	0.3214	0.3420	0.3311
1.4	16QAM	1	0	22.52	22.33	21.90	0.2897	0.2773	0.2512



LTE Band 5:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	ERP(W)		
Channel				20450	20525	20600			
Frequency (MHz)				829	836.5	844	L	M	H
10	QPSK	1	0	23.11	23.25	22.90	0.2168	0.2239	0.2065
10	QPSK	1	25	23.18	22.96	22.99	0.2203	0.2094	0.2109
10	QPSK	1	49	22.94	22.91	22.98	0.2084	0.2070	0.2104
10	QPSK	25	0	22.07	21.93	21.92	0.1706	0.1652	0.1648
10	QPSK	25	12	22.16	22.00	22.00	0.1742	0.1679	0.1679
10	QPSK	25	25	22.08	22.01	22.00	0.1710	0.1683	0.1679
10	QPSK	50	0	22.10	21.99	21.92	0.1718	0.1675	0.1648
10	16QAM	1	0	22.59	22.68	22.19	0.1923	0.1963	0.1754
10	64QAM	1	0	21.06	21.10	21.05	0.1352	0.1365	0.1349
10	256QAM	1	0	18.17	18.43	18.36	0.0695	0.0738	0.0726
Channel				20425	20525	20625	ERP(W)		
Frequency (MHz)				826.5	836.5	846.5	L	M	H
5	QPSK	1	0	23.09	23.16	22.86	0.2158	0.2193	0.2046
5	16QAM	1	0	22.67	22.31	22.24	0.1959	0.1803	0.1774
Channel				20415	20525	20635	ERP(W)		
Frequency (MHz)				825.5	836.5	847.5	L	M	H
3	QPSK	1	0	23.17	23.13	22.98	0.2198	0.2178	0.2104
3	16QAM	1	0	22.64	22.31	22.28	0.1945	0.1803	0.1791
Channel				20407	20525	20643	ERP(W)		
Frequency (MHz)				824.7	836.5	848.3	L	M	H
1.4	QPSK	1	0	23.03	23.14	22.85	0.2128	0.2183	0.2042
1.4	16QAM	1	0	22.52	22.17	22.05	0.1892	0.1746	0.1698



LTE Band 25:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	EIRP(W)		
Channel				26140	26340	26590			
Frequency (MHz)				1860	1880	1905	L	M	H
20	QPSK	1	0	23.23	22.85	23.16	0.4819	0.4416	0.4742
20	QPSK	1	49	22.95	23.05	23.14	0.4519	0.4624	0.4721
20	QPSK	1	99	22.86	22.77	22.74	0.4426	0.4335	0.4305
20	QPSK	50	0	22.05	22.07	22.06	0.3673	0.3690	0.3681
20	QPSK	50	24	21.99	21.97	22.00	0.3622	0.3606	0.3631
20	QPSK	50	50	21.98	21.88	21.97	0.3614	0.3532	0.3606
20	QPSK	100	0	21.97	22.01	22.05	0.3606	0.3639	0.3673
20	16QAM	1	0	22.47	22.61	21.95	0.4046	0.4178	0.3589
20	64QAM	1	0	21.30	20.67	21.31	0.3090	0.2673	0.3097
20	256QAM	1	0	18.31	18.36	18.32	0.1552	0.1570	0.1556
Channel				26115	26340	26615	EIRP(W)		
Frequency (MHz)				1857.5	1880	1907.5	L	M	H
15	QPSK	1	0	22.96	22.93	23.16	0.4529	0.4498	0.4742
15	16QAM	1	0	22.56	22.57	21.93	0.4130	0.4140	0.3573
Channel				26090	26340	26640	EIRP(W)		
Frequency (MHz)				1855	1880	1910	L	M	H
10	QPSK	1	0	22.98	22.86	23.14	0.4550	0.4426	0.4721
10	16QAM	1	0	22.48	22.52	22.00	0.4055	0.4093	0.3631
Channel				26065	26340	26665	EIRP(W)		
Frequency (MHz)				1852.5	1880	1912.5	L	M	H
5	QPSK	1	0	22.94	22.94	23.23	0.4508	0.4508	0.4819
5	16QAM	1	0	22.44	22.59	21.95	0.4018	0.4159	0.3589
Channel				26055	26340	26675	EIRP(W)		
Frequency (MHz)				1851.5	1880	1913.5	L	M	H
3	QPSK	1	0	22.94	22.88	23.23	0.4508	0.4446	0.4819
3	16QAM	1	0	22.48	22.53	22.03	0.4055	0.4102	0.3656
Channel				26047	26340	26683	EIRP(W)		
Frequency (MHz)				1850.7	1880	1914.3	L	M	H
1.4	QPSK	1	0	22.94	22.94	22.91	0.4508	0.4508	0.4477
1.4	16QAM	1	0	22.17	22.12	22.09	0.3776	0.3733	0.3707



LTE Band 26:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	ERP(W)			
Channel				26790	26865	26915	26965				
Frequency (MHz)				824	831.5	836.5	841.5	Straddle Ch	L	M	H
15	QPSK	1	0	22.75	23.30	22.86	22.88	0.1995	0.2265	0.2046	0.2056
15	QPSK	1	37	23.06	23.19	22.92	23.02	0.2143	0.2208	0.2075	0.2123
15	QPSK	1	74	22.70	22.89	22.88	22.92	0.1972	0.2061	0.2056	0.2075
15	QPSK	36	0	21.81	21.94	21.97	21.92	0.1607	0.1656	0.1667	0.1648
15	QPSK	36	20	21.69	21.91	21.96	21.89	0.1563	0.1644	0.1663	0.1637
15	QPSK	36	39	21.71	21.93	21.91	21.98	0.1570	0.1652	0.1644	0.1671
15	QPSK	75	0	21.82	21.95	21.90	21.88	0.1611	0.1660	0.1641	0.1633
15	16QAM	1	0	22.95	22.49	22.21	22.97	0.2089	0.1879	0.1762	0.2099
15	64QAM	1	0	21.38	21.51	20.82	21.15	0.1455	0.1500	0.1279	0.1380
15	256QAM	1	0	18.23	18.43	18.43	18.44	0.0705	0.0738	0.0738	0.0740
Channel				-	26840	26915	26990	ERP(W)			
Frequency (MHz)				-	829	836.5	844	-	L	M	H
10	QPSK	1	0	-	22.99	23.04	22.89	-	0.2109	0.2133	0.2061
10	16QAM	1	0	-	22.41	22.54	22.90	-	0.1845	0.1901	0.2065
Channel				-	26815	26915	27015	ERP(W)			
Frequency (MHz)				-	826.5	836.5	846.5	-	L	M	H
5	QPSK	1	0	-	22.98	23.00	22.95	-	0.2104	0.2113	0.2089
5	16QAM	1	0	-	22.38	22.55	22.96	-	0.1832	0.1905	0.2094
Channel				-	26815	26915	27025	ERP(W)			
Frequency (MHz)				-	825.5	836.5	847.5	-	L	M	H
3	QPSK	1	0	-	22.99	22.94	22.91	-	0.2109	0.2084	0.2070
3	16QAM	1	0	-	22.36	22.54	22.94	-	0.1824	0.1901	0.2084
Channel				-	26797	26915	27033	ERP(W)			
Frequency (MHz)				-	824.7	836.5	848.3	-	L	M	H
1.4	QPSK	1	0	-	22.77	22.81	22.82	-	0.2004	0.2023	0.2028
1.4	16QAM	1	0	-	22.08	22.36	22.83	-	0.1710	0.1824	0.2032



LTE Band 66:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	EIRP(W)		
Channel				132072	132322	132572			
Frequency (MHz)				1720	1745	1770	L	M	H
20	QPSK	1	0	23.08	23.47	23.02	0.3296	0.3606	0.3251
20	QPSK	1	49	22.93	23.07	22.92	0.3184	0.3289	0.3177
20	QPSK	1	99	22.79	22.59	22.68	0.3083	0.2944	0.3006
20	QPSK	50	0	22.04	22.13	22.04	0.2594	0.2649	0.2594
20	QPSK	50	24	22.01	21.94	21.97	0.2576	0.2535	0.2553
20	QPSK	50	50	21.86	21.85	21.80	0.2489	0.2483	0.2455
20	QPSK	100	0	22.03	21.95	21.93	0.2588	0.2541	0.2529
20	16QAM	1	0	22.17	22.93	22.14	0.2673	0.3184	0.2655
20	64QAM	1	0	20.84	21.19	21.49	0.1968	0.2133	0.2286
20	256QAM	1	0	18.29	18.37	18.24	0.1094	0.1114	0.1081
Channel				132047	132322	132597	EIRP(W)		
Frequency (MHz)				1717.5	1745	1772.5	L	M	H
15	QPSK	1	0	23.16	23.45	23.09	0.3357	0.3589	0.3304
15	16QAM	1	0	22.19	22.44	22.12	0.2685	0.2844	0.2642
Channel				132022	132322	132622	EIRP(W)		
Frequency (MHz)				1715	1745	1775	L	M	H
10	QPSK	1	0	23.17	23.47	23.02	0.3365	0.3606	0.3251
10	16QAM	1	0	22.19	22.48	22.10	0.2685	0.2871	0.2630
Channel				131997	132322	132647	EIRP(W)		
Frequency (MHz)				1712.5	1745	1777.5	L	M	H
5	QPSK	1	0	23.11	23.34	23.08	0.3319	0.3499	0.3296
5	16QAM	1	0	22.13	22.46	22.19	0.2649	0.2858	0.2685
Channel				131987	132322	132657	EIRP(W)		
Frequency (MHz)				1711.5	1745	1778.5	L	M	H
3	QPSK	1	0	23.15	23.43	23.01	0.3350	0.3573	0.3243
3	16QAM	1	0	22.14	22.44	22.16	0.2655	0.2844	0.2667
Channel				131979	132322	132665	EIRP(W)		
Frequency (MHz)				1710.7	1745	1779.3	L	M	H
1.4	QPSK	1	0	23.01	23.09	23.08	0.3243	0.3304	0.3296
1.4	16QAM	1	0	22.66	22.72	22.92	0.2992	0.3034	0.3177



A2.LTE Band 25

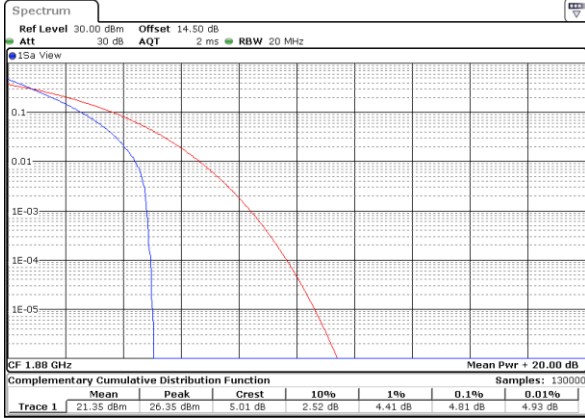
A2.1 Peak-to-Average Ratio

Mode	LTE Band 25 / 20MHz			
Mod.	QPSK	16QAM	64QAM	Limit: 13dB
RB Size	Full RB	Full RB	Full RB	Result
Middle CH	4.81	6.06	6.72	PASS



LTE Band 25 / 20MHz / QPSK

Middle Channel / Full RB



Date: 10.APR.2024 21:36:00

LTE Band 25 / 20MHz / 16QAM

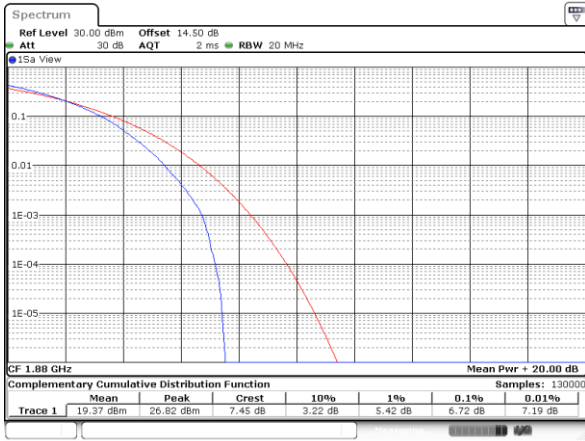
Middle Channel / Full RB



Date: 10.APR.2024 21:36:30

LTE Band 25 / 20MHz / 64QAM

Middle Channel / Full RB



Date: 10.APR.2024 21:37:01



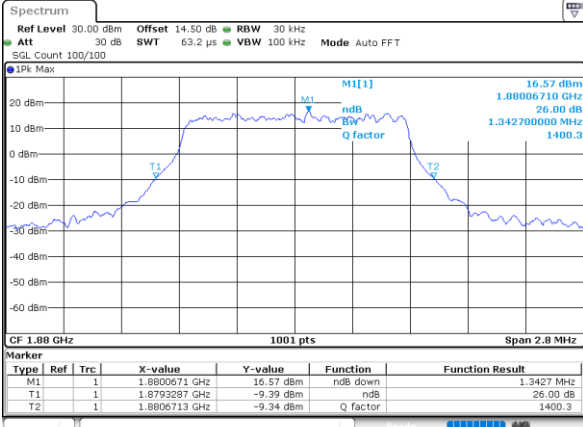
A2.2 26dB Bandwidth

Mode	LTE Band 25 : 26dB BW(MHz)											
	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
BW	1.4MHz	1.4MHz	3MHz	3MHz	5MHz	5MHz	10MHz	10MHz	15MHz	15MHz	20MHz	20MHz
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Middle CH	1.34	1.33	3.09	3.00	5.12	5.04	10.07	9.87	14.87	14.51	18.94	19.22



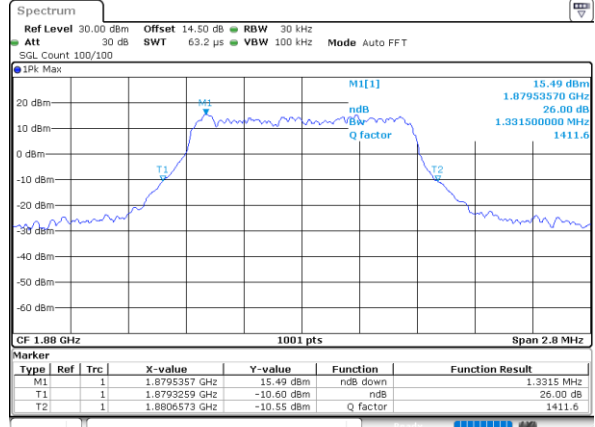
LTE Band 25

Middle Channel / 1.4MHz / QPSK



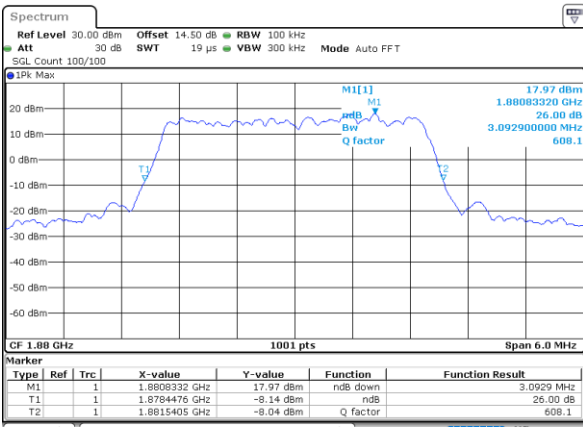
Date: 10.APR.2024 20:02:10

Middle Channel / 1.4MHz / 16QAM



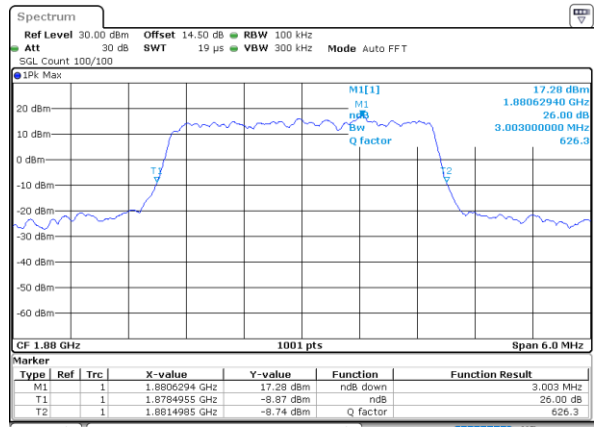
Date: 10.APR.2024 20:02:57

Middle Channel / 3MHz / QPSK



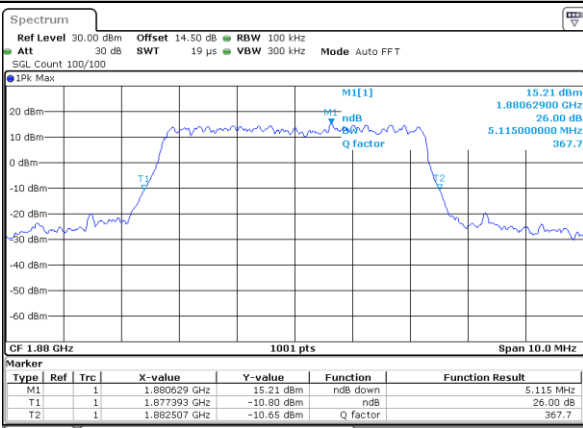
Date: 10.APR.2024 20:22:54

Middle Channel / 3MHz / 16QAM



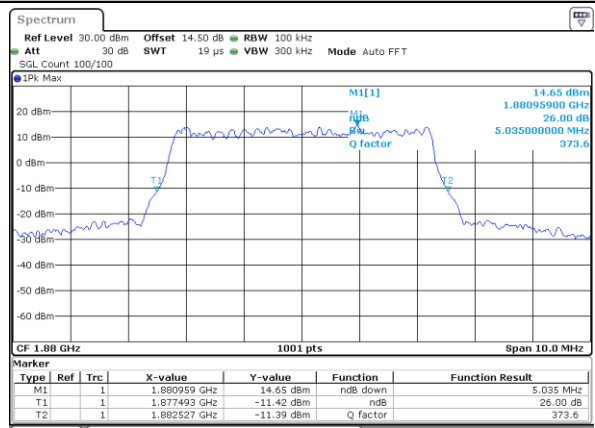
Date: 10.APR.2024 20:23:57

Middle Channel / 5MHz / QPSK



Date: 10.APR.2024 20:40:52

Middle Channel / 5MHz / 16QAM

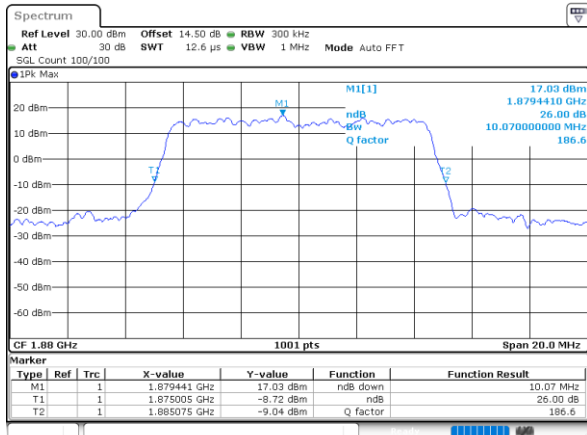


Date: 10.APR.2024 20:41:35



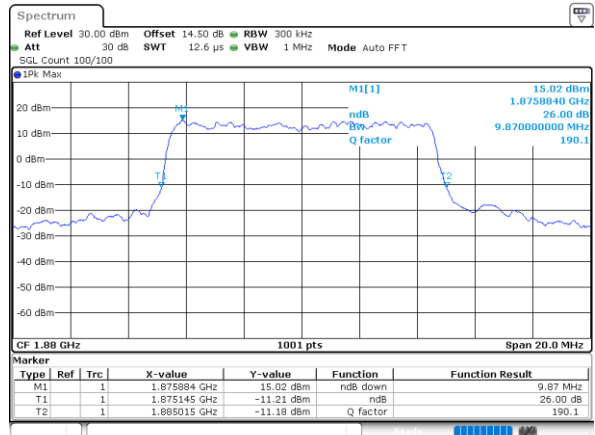
LTE Band 25

Middle Channel / 10MHz / QPSK



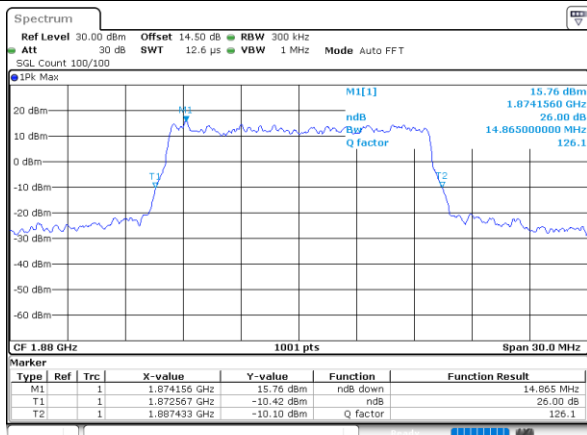
Date: 10.APR.2024 20:58:50

Middle Channel / 10MHz / 16QAM



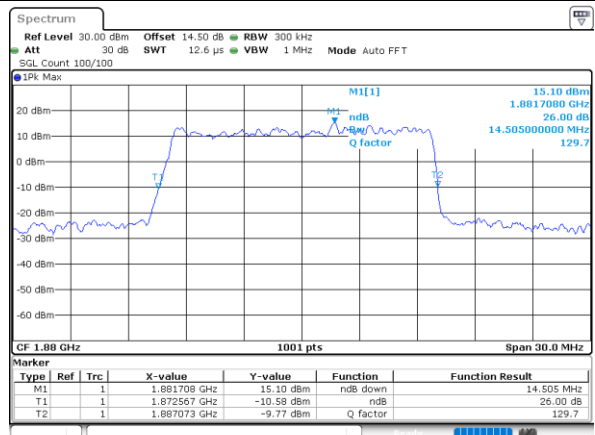
Date: 10.APR.2024 20:59:33

Middle Channel / 15MHz / QPSK



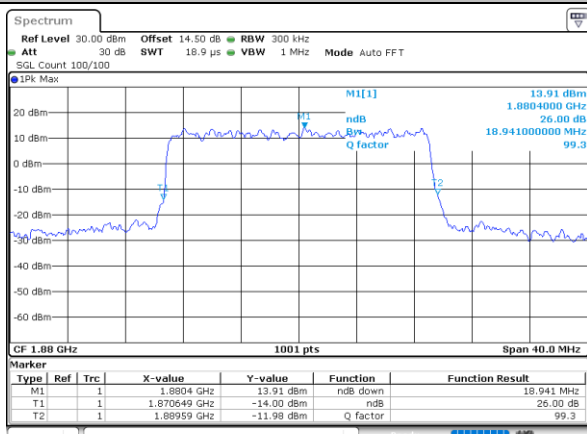
Date: 10.APR.2024 21:16:48

Middle Channel / 15MHz / 16QAM



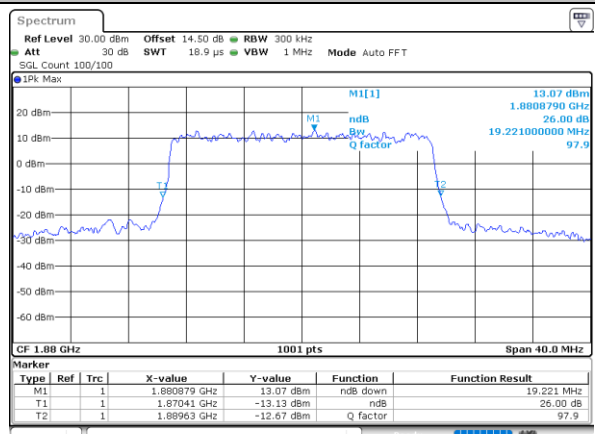
Date: 10.APR.2024 21:17:32

Middle Channel / 20MHz / QPSK



Date: 10.APR.2024 21:34:46

Middle Channel / 20MHz / 16QAM



Date: 10.APR.2024 21:35:29



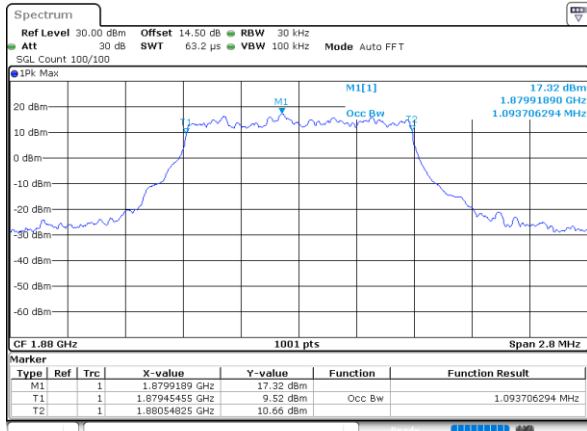
A2.3 Occupied Bandwidth

Mode	LTE Band 25 : 99%OBW(MHz)											
	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Middle CH	1.09	1.09	2.74	2.72	4.50	4.58	9.09	9.03	13.49	13.46	17.94	17.94



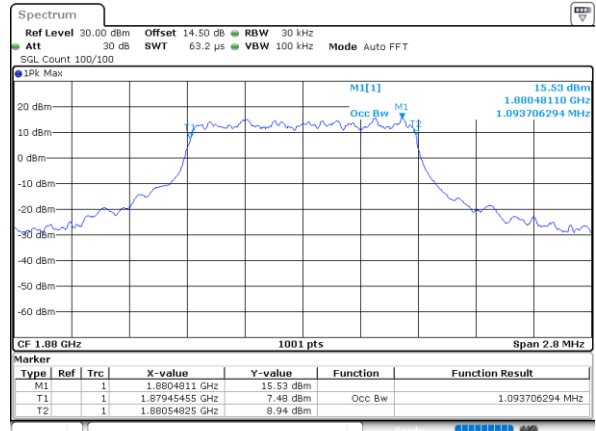
LTE Band 25

Middle Channel / 1.4MHz / QPSK



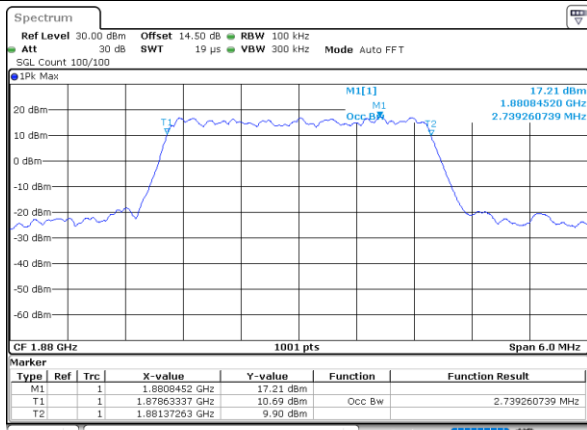
Date: 10.APR.2024 20:01:55

Middle Channel / 1.4MHz / 16QAM



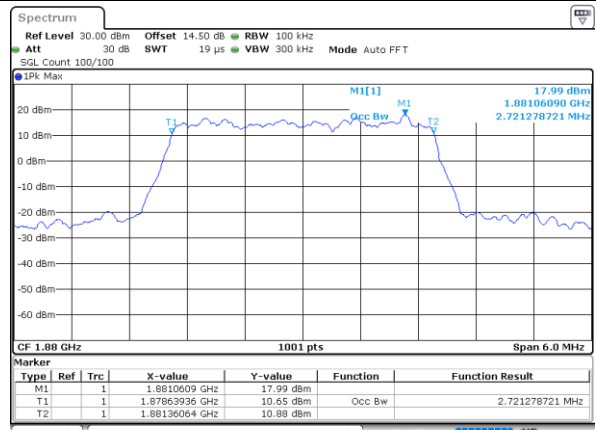
Date: 10.APR.2024 20:02:39

Middle Channel / 3MHz / QPSK



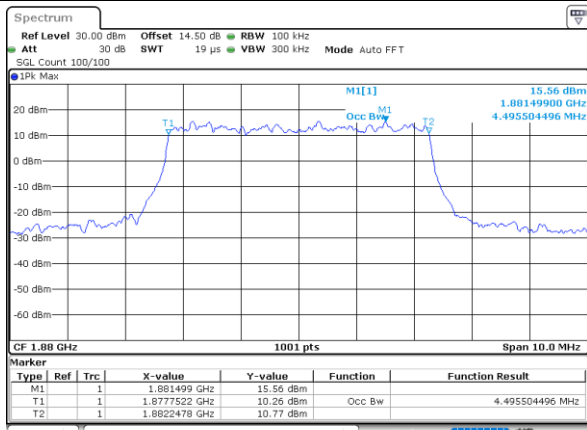
Date: 10.APR.2024 20:22:40

Middle Channel / 3MHz / 16QAM



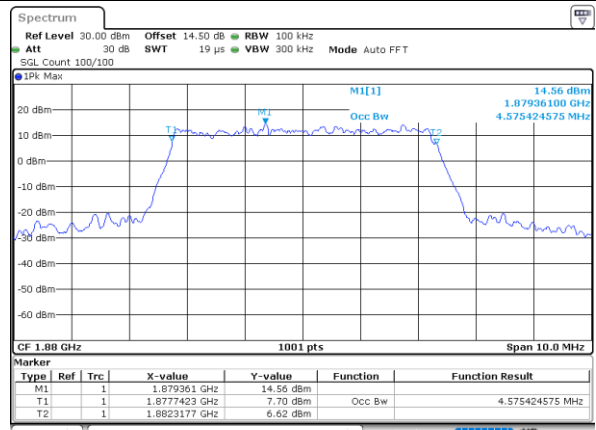
Date: 10.APR.2024 20:23:23

Middle Channel / 5MHz / QPSK



Date: 10.APR.2024 20:40:38

Middle Channel / 5MHz / 16QAM

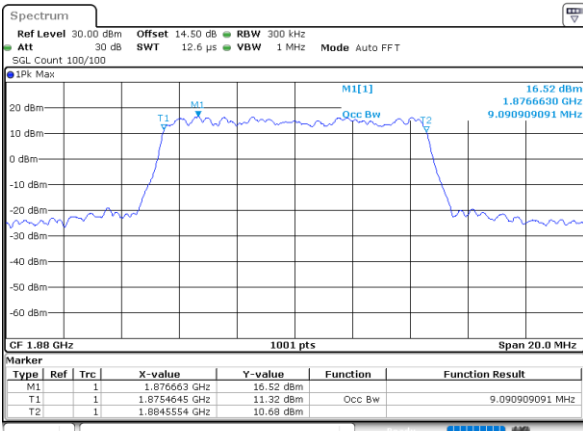


Date: 10.APR.2024 20:41:21



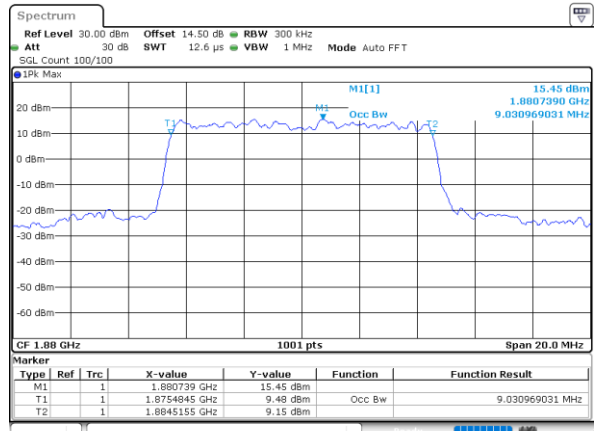
LTE Band 25

Middle Channel / 10MHz / QPSK



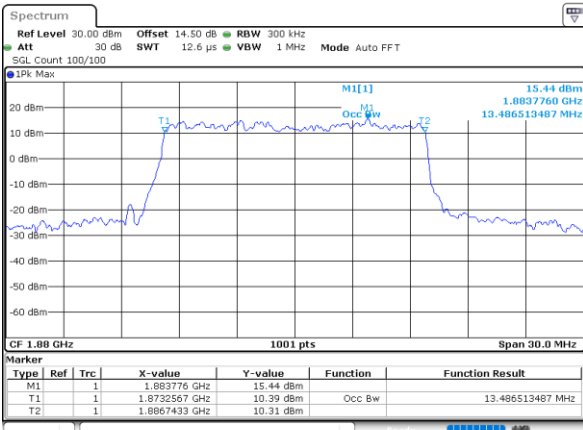
Date: 10.APR.2024 20:58:36

Middle Channel / 10MHz / 16QAM



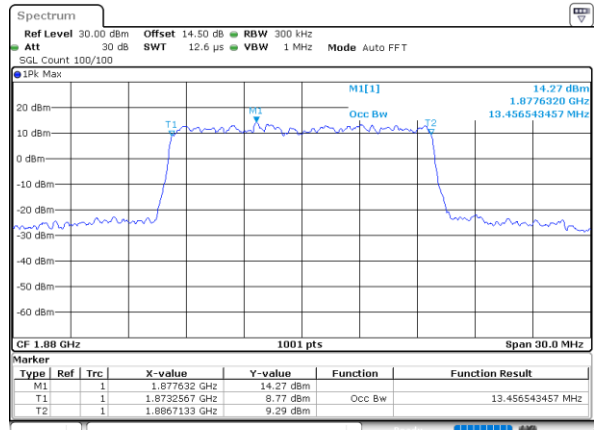
Date: 10.APR.2024 20:59:19

Middle Channel / 15MHz / QPSK



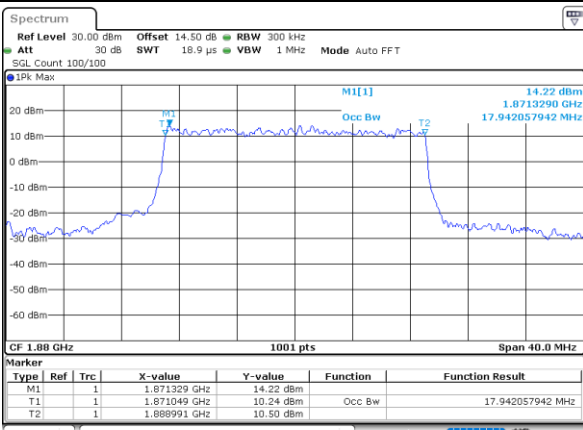
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Middle Channel / 15MHz / 16QAM



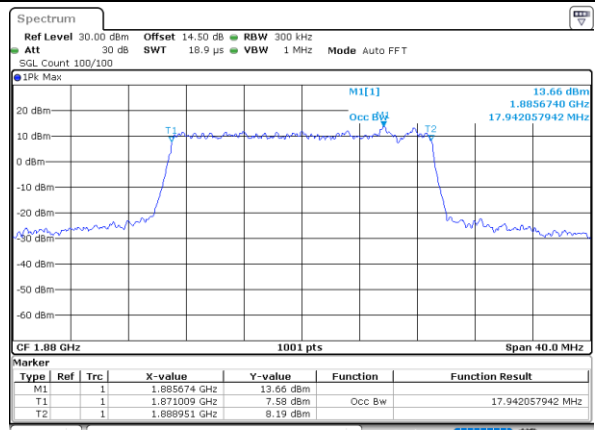
Date: 10.APR.2024 21:17:18

Middle Channel / 20MHz / QPSK



Date: 10.APR.2024 21:34:32

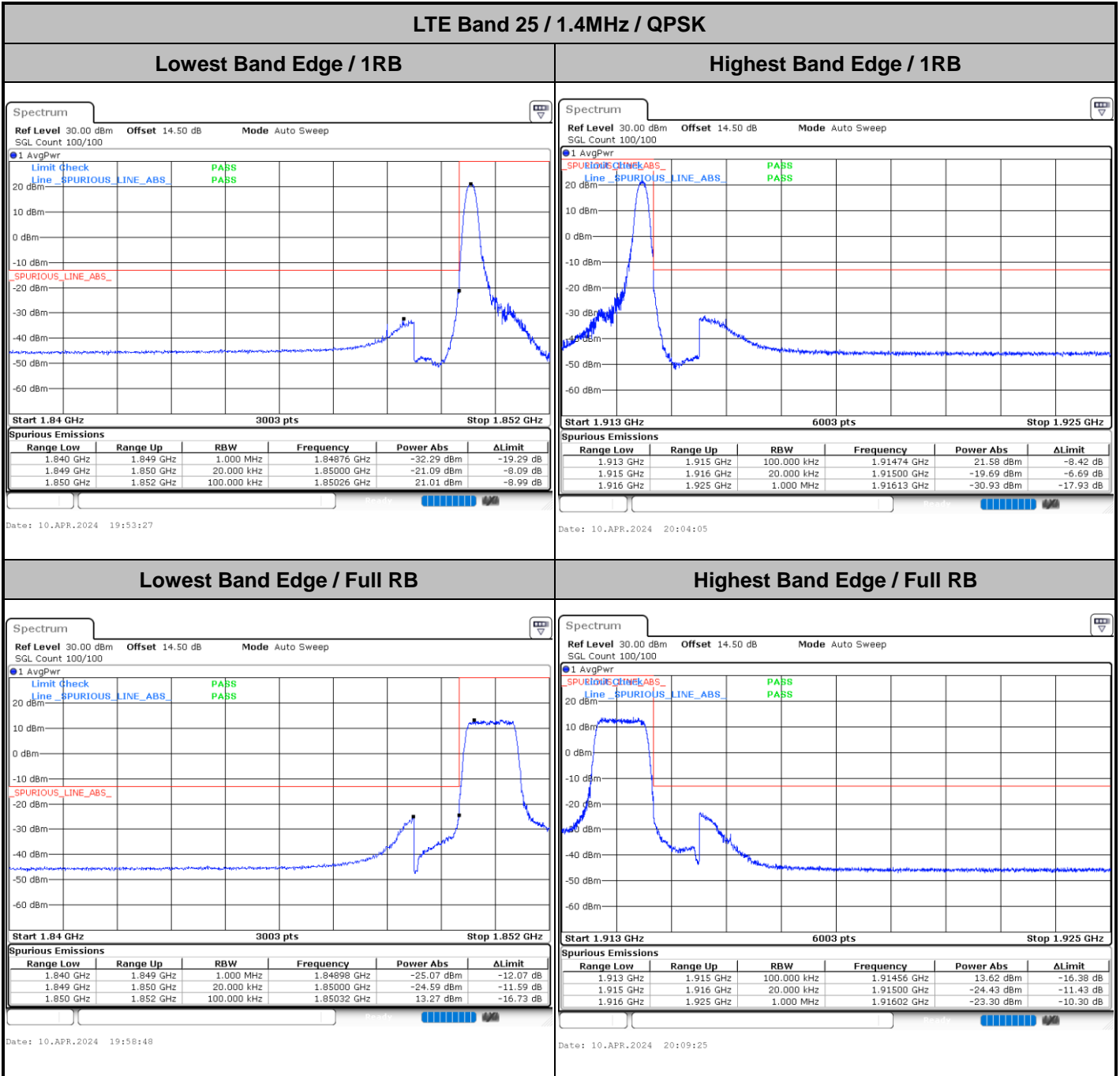
Middle Channel / 20MHz / 16QAM



Date: 10.APR.2024 21:35:15



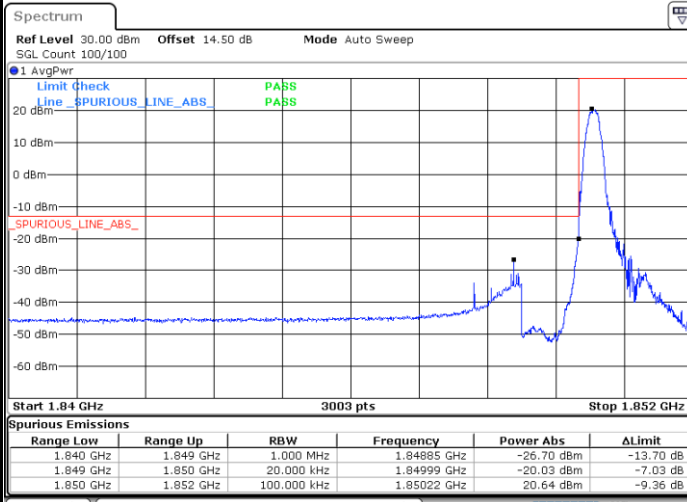
A2.4 Conducted Band Edge



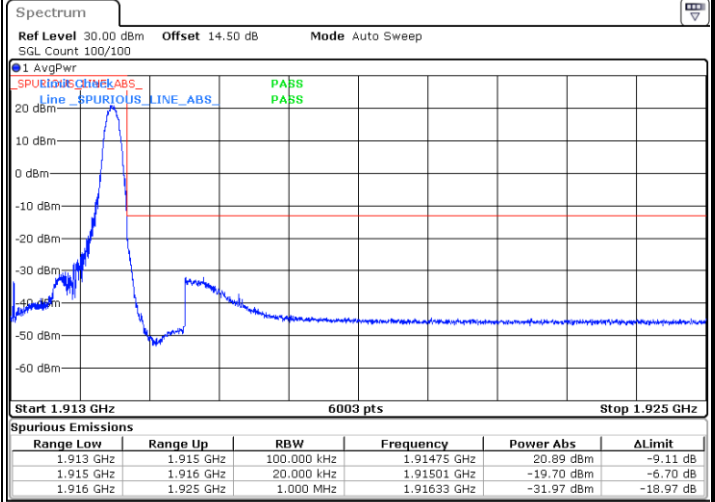


LTE Band 25 / 1.4MHz / 16QAM

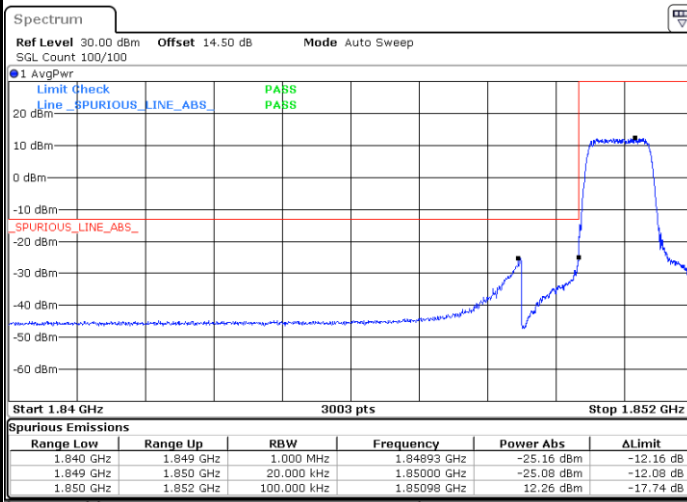
Lowest Band Edge / 1 RB



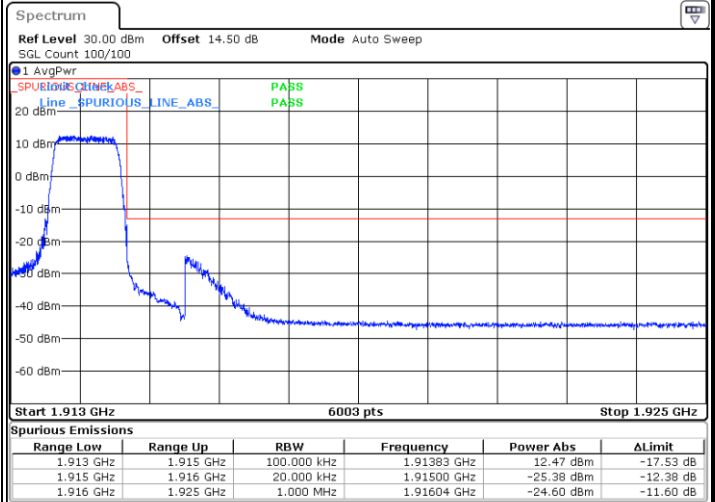
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



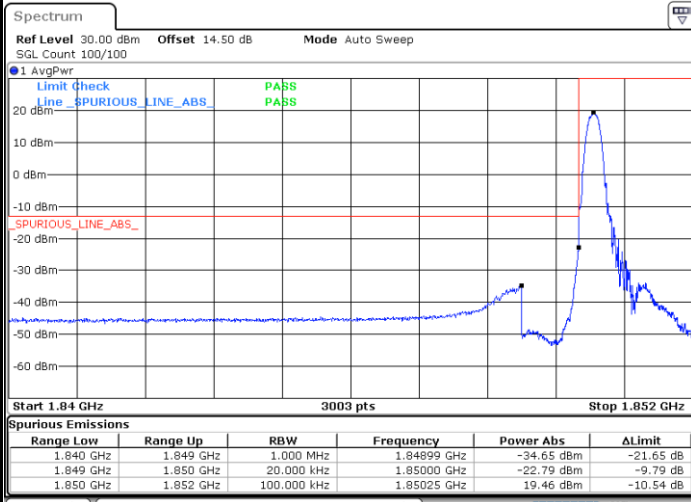
Highest Band Edge / Full RB





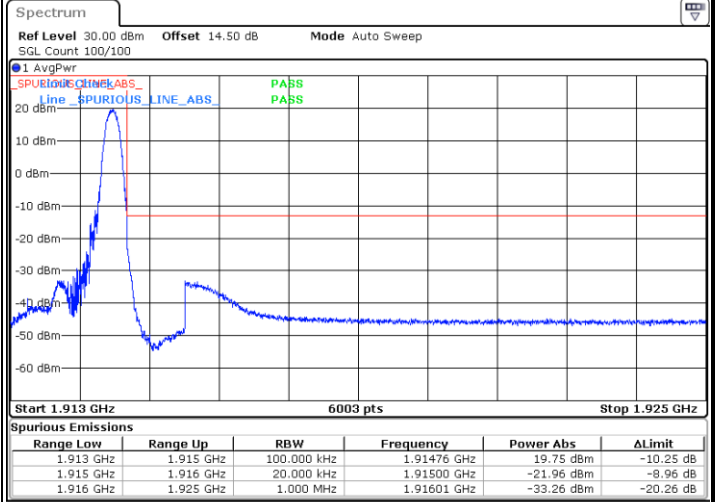
LTE Band 25 / 1.4MHz / 64QAM

Lowest Band Edge / 1 RB



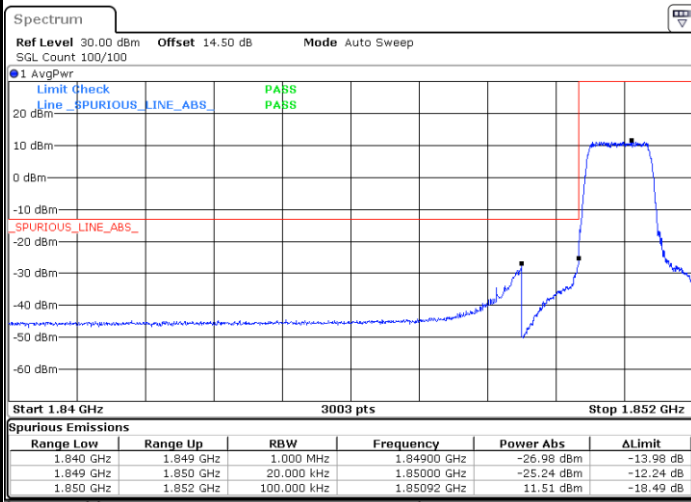
Date: 10.APR.2024 19:55:35

Highest Band Edge / 1 RB



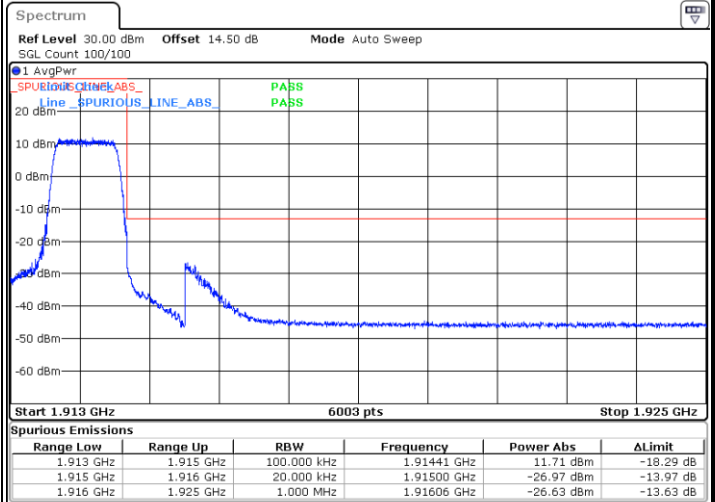
Date: 10.APR.2024 20:06:13

Lowest Band Edge / Full RB



Date: 10.APR.2024 19:56:40

Highest Band Edge / Full RB



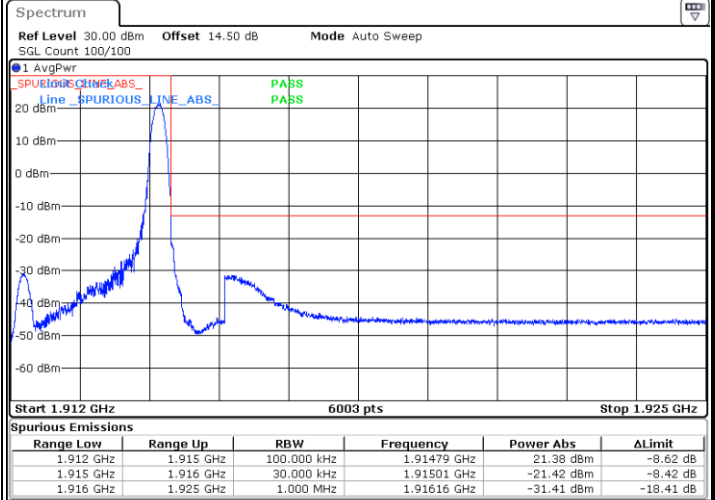
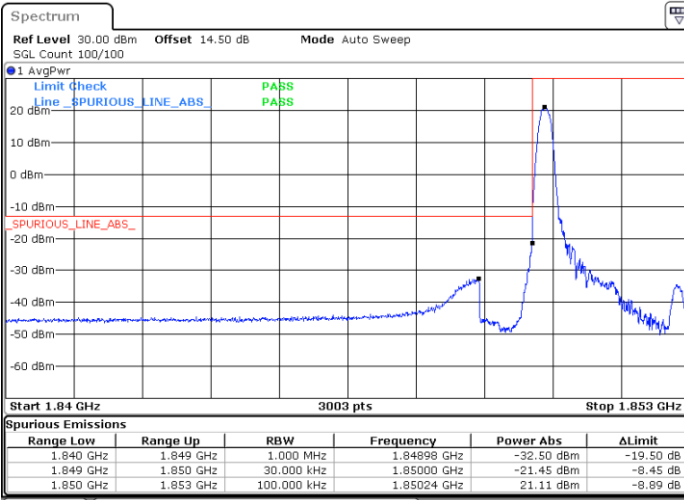
Date: 10.APR.2024 20:07:17



LTE Band 25 / 3MHz / QPSK

Lowest Band Edge / 1RB

Highest Band Edge / 1RB

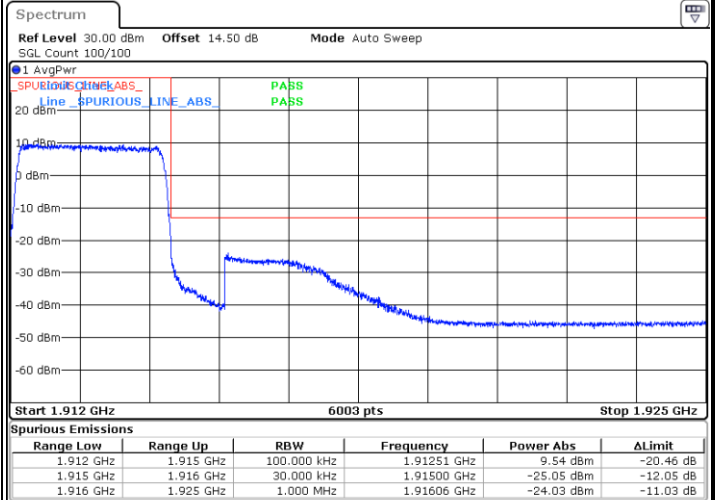
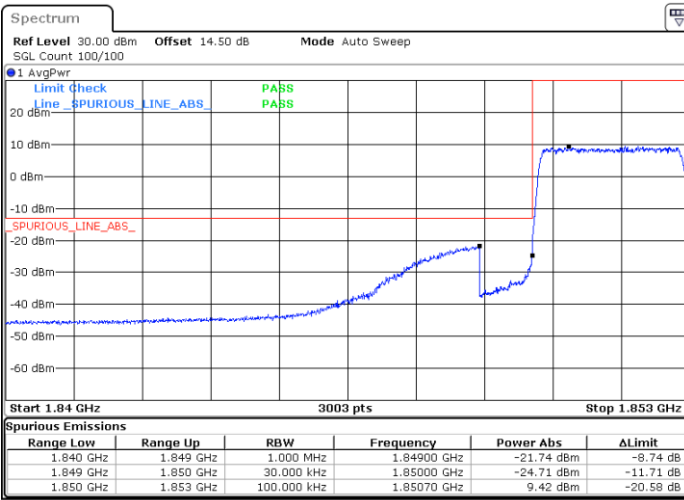


Date: 10.APR.2024 20:14:25

Date: 10.APR.2024 20:24:41

Lowest Band Edge / Full RB

Highest Band Edge / Full RB



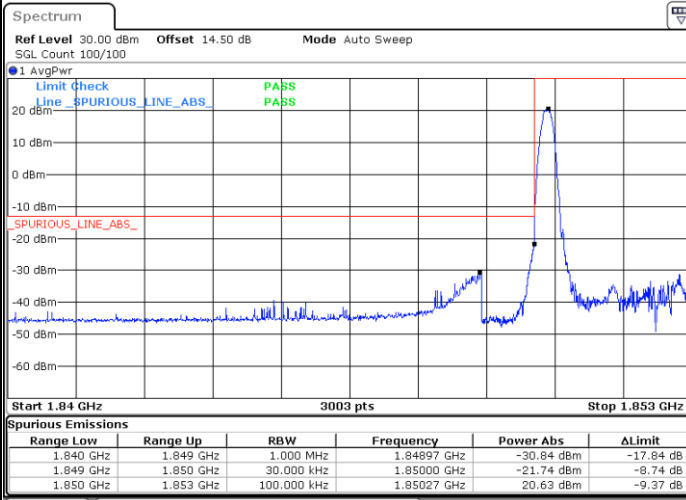
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Date: 10.APR.2024 20:30:00



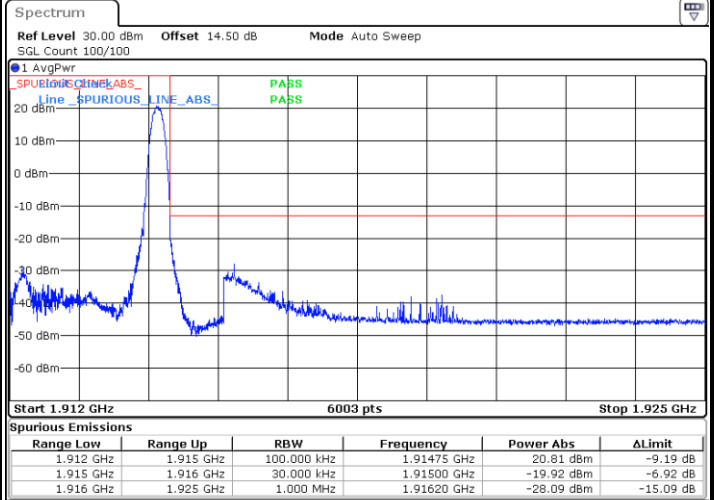
LTE Band 25 / 3MHz / 16QAM

Lowest Band Edge / 1 RB



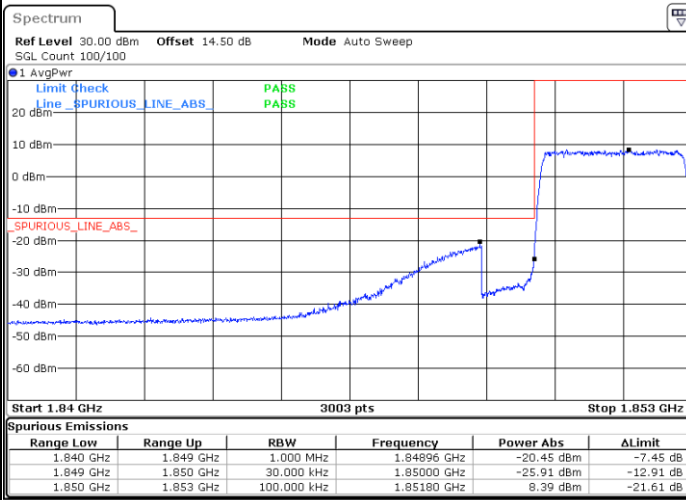
Date: 10.APR.2024 20:15:29

Highest Band Edge / 1 RB



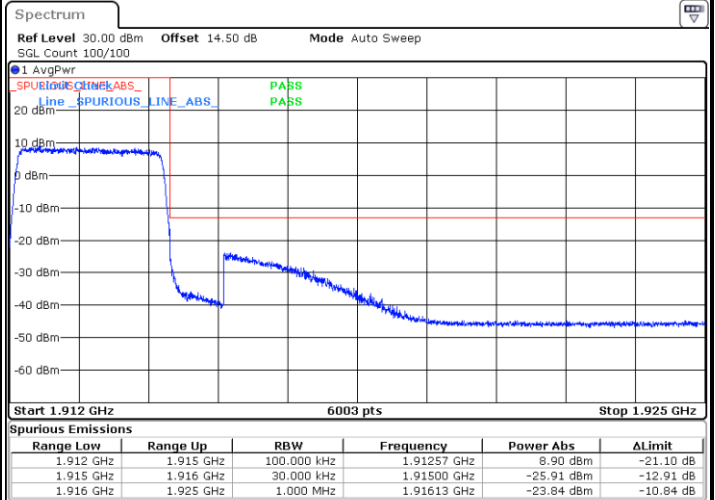
Date: 10.APR.2024 20:25:45

Lowest Band Edge / Full RB



Date: 10.APR.2024 20:18:40

Highest Band Edge / Full RB

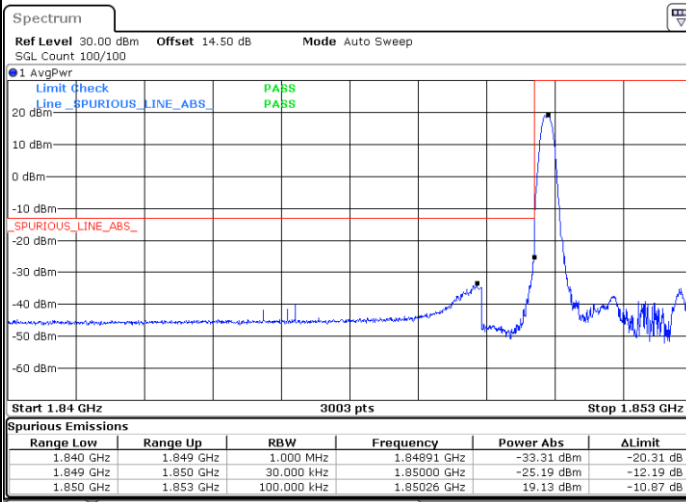


Date: 10.APR.2024 20:28:56



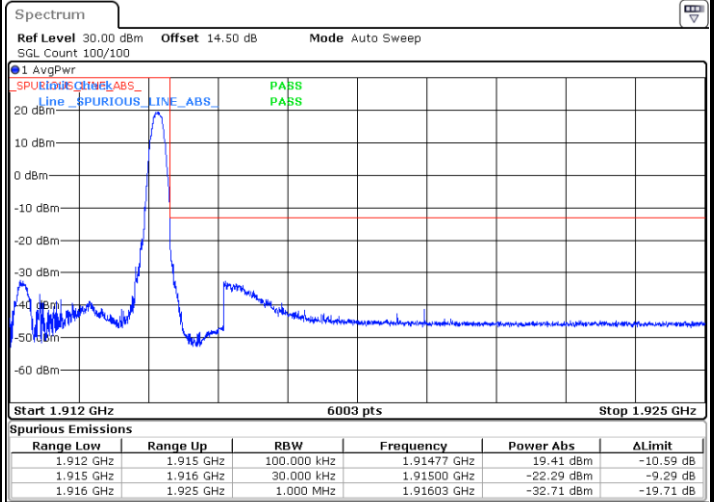
LTE Band 25 / 3MHz / 64QAM

Lowest Band Edge / 1 RB



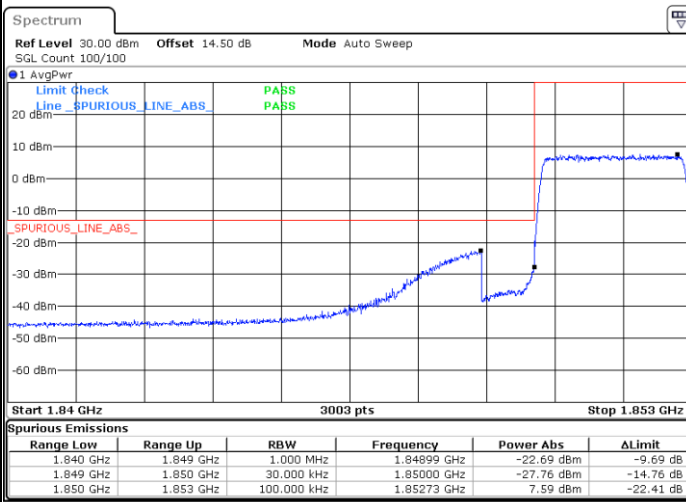
Date: 10.APR.2024 20:16:33

Highest Band Edge / 1 RB



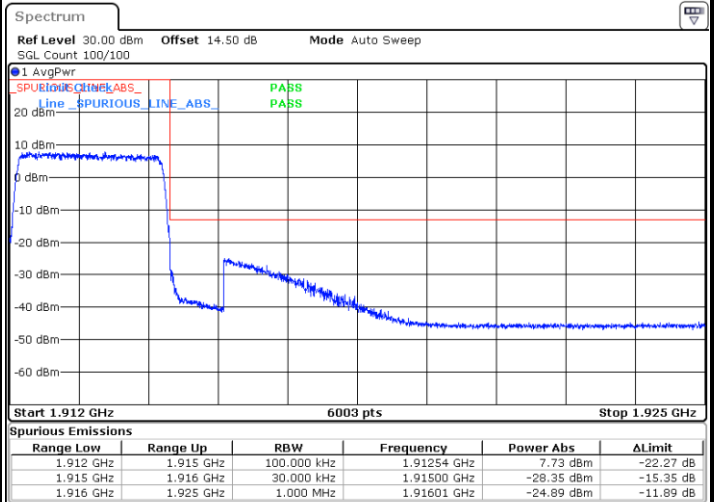
Date: 10.APR.2024 20:26:48

Lowest Band Edge / Full RB



Date: 10.APR.2024 20:17:37

Highest Band Edge / Full RB

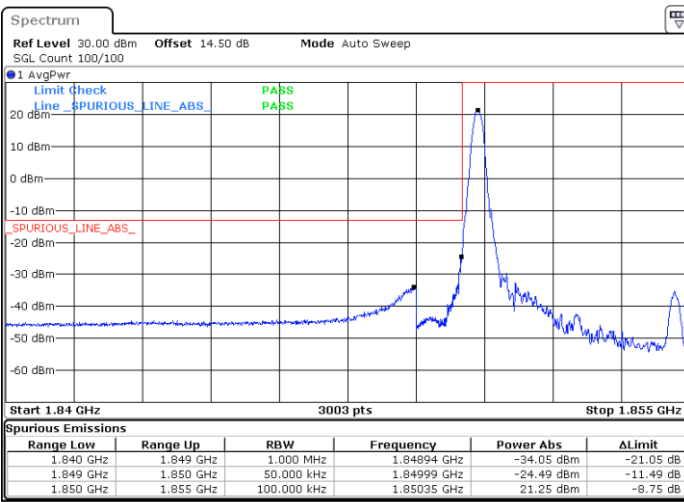


Date: 10.APR.2024 20:27:52



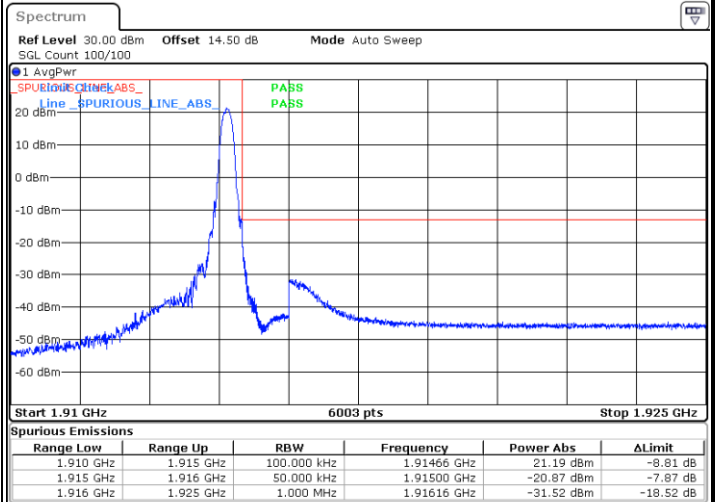
LTE Band 25 / 5MHz / QPSK

Lowest Band Edge / 1RB



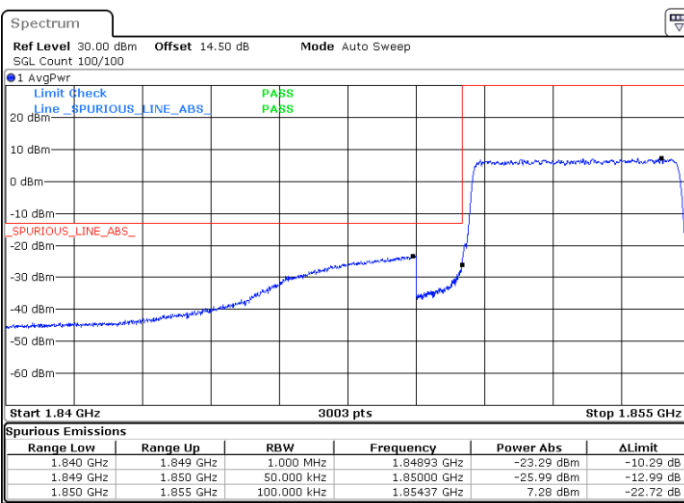
Date: 10.APR.2024 20:32:22

Highest Band Edge / 1RB



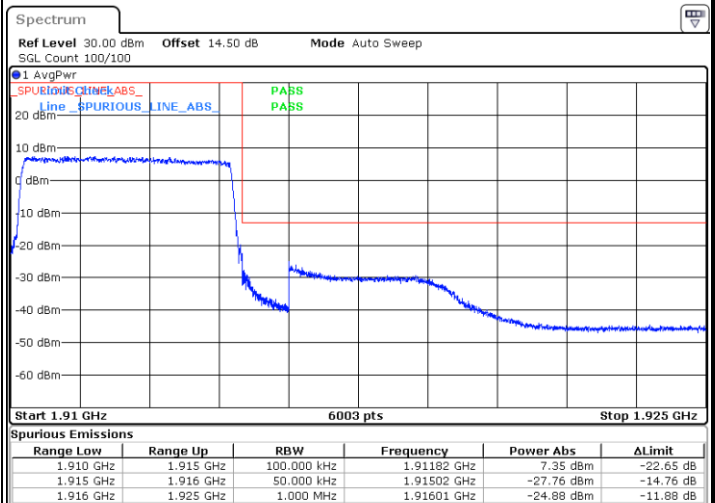
Date: 10.APR.2024 20:42:39

Lowest Band Edge / Full RB



Date: 10.APR.2024 20:37:42

Highest Band Edge / Full RB

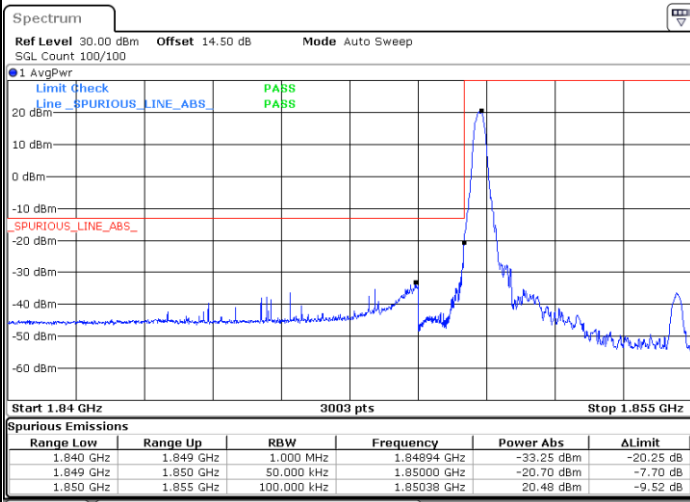


Date: 10.APR.2024 20:47:58



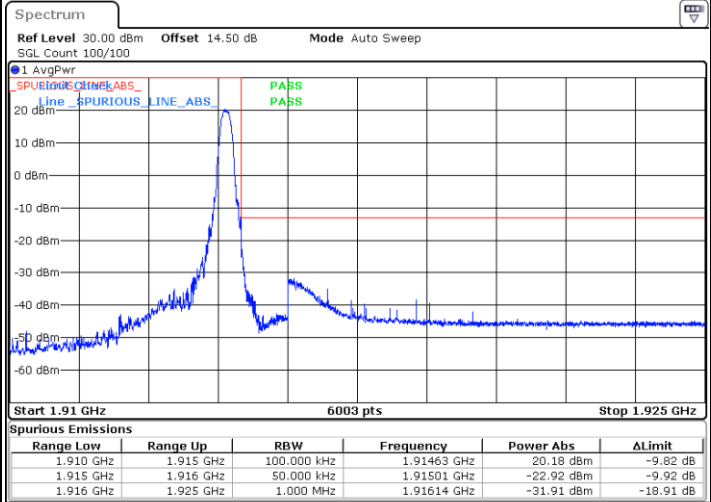
LTE Band 25 / 5MHz / 16QAM

Lowest Band Edge / 1 RB



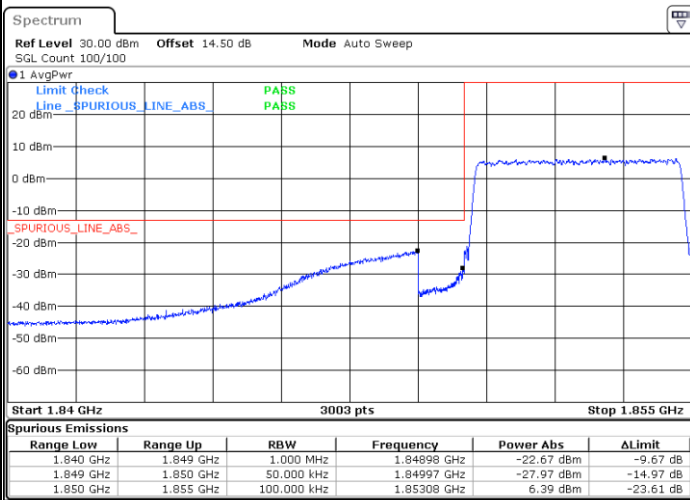
Date: 10.APR.2024 20:33:26

Highest Band Edge / 1 RB



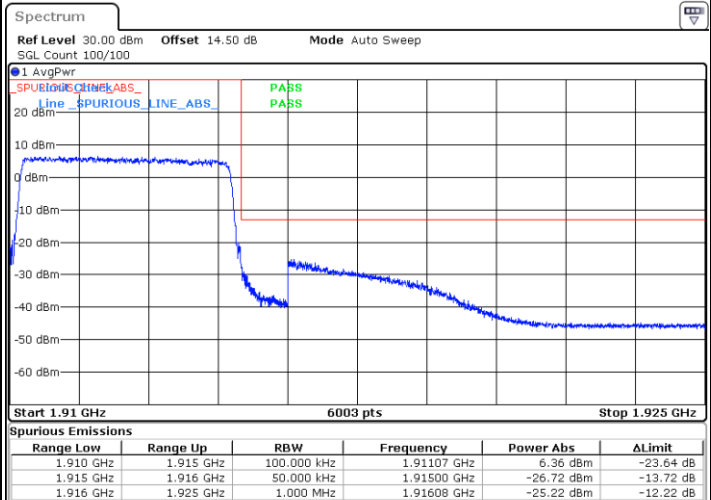
Date: 10.APR.2024 20:43:43

Lowest Band Edge / Full RB



Date: 10.APR.2024 20:36:38

Highest Band Edge / Full RB

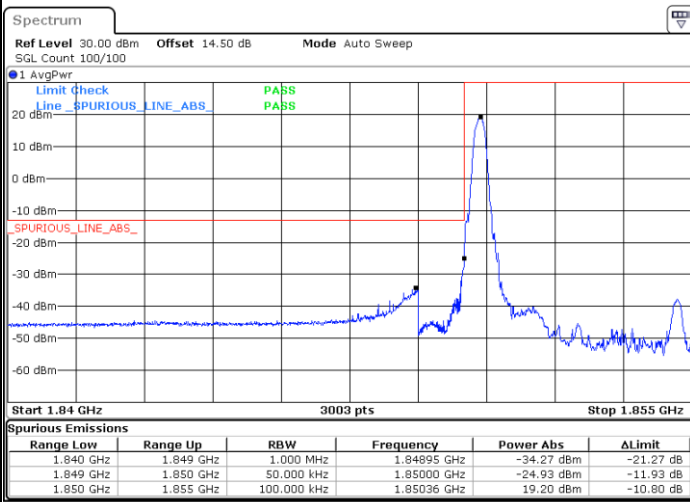


Date: 10.APR.2024 20:46:54



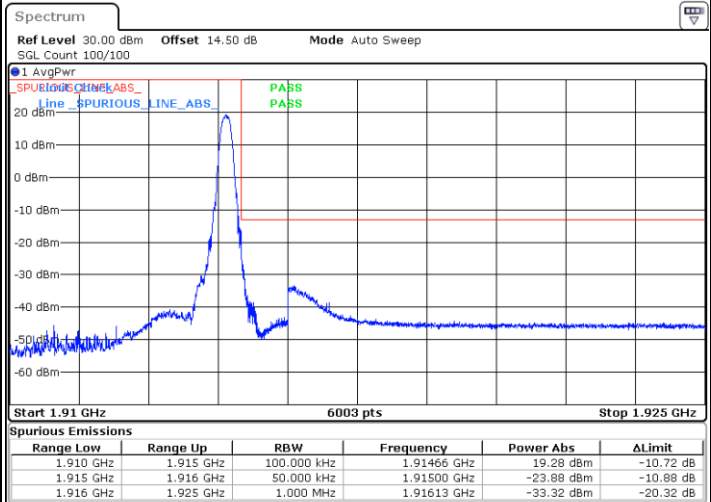
LTE Band 25 / 5MHz / 64QAM

Lowest Band Edge / 1 RB



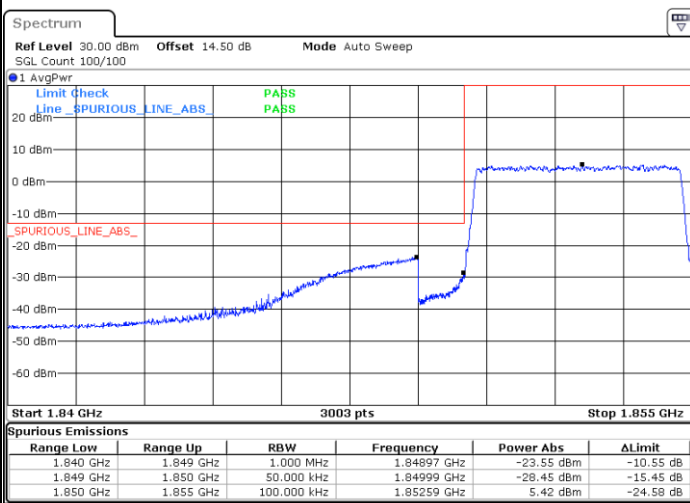
Date: 10.APR.2024 20:34:30

Highest Band Edge / 1 RB



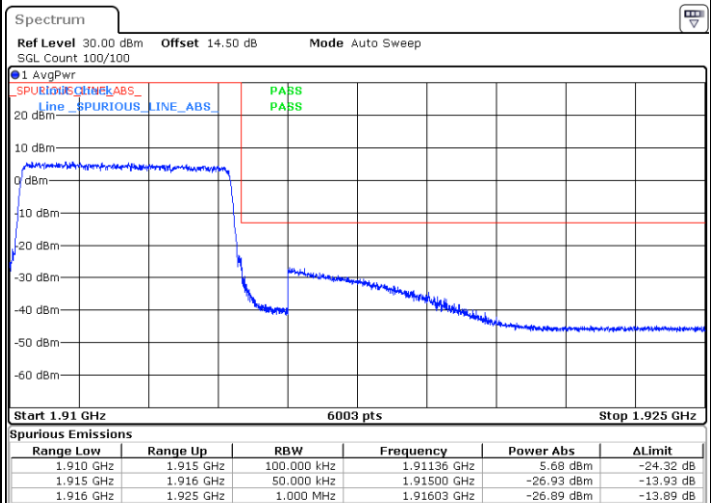
Date: 10.APR.2024 20:44:46

Lowest Band Edge / Full RB



Date: 10.APR.2024 20:35:34

Highest Band Edge / Full RB

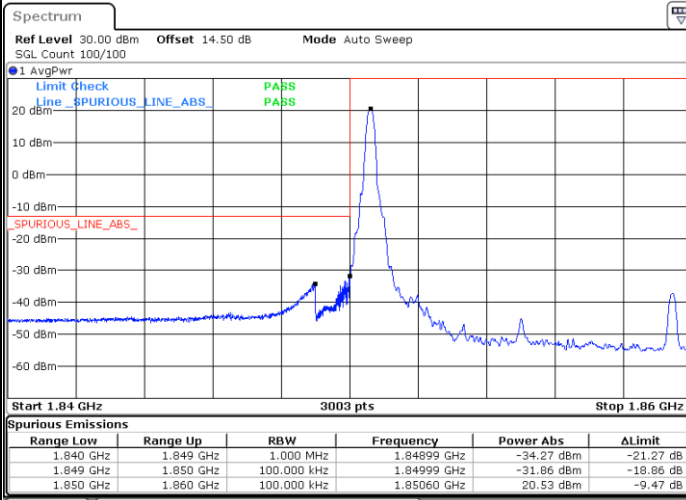


Date: 10.APR.2024 20:45:50



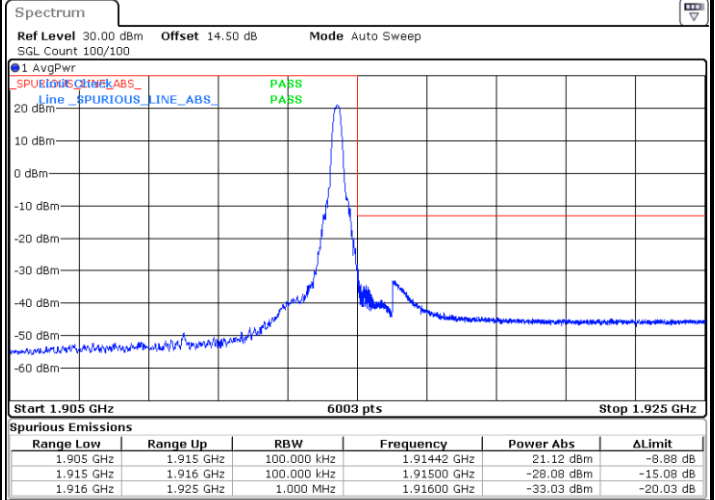
LTE Band 25 / 10MHz / QPSK

Lowest Band Edge / 1RB



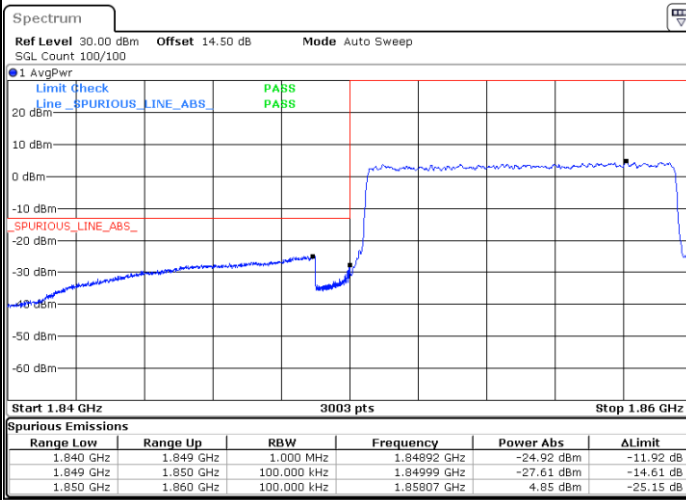
Date: 10.APR.2024 20:50:20

Highest Band Edge / 1RB



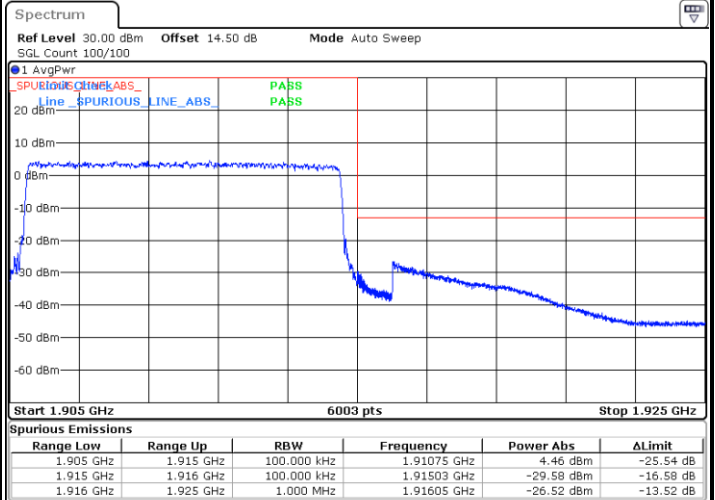
Date: 10.APR.2024 21:00:37

Lowest Band Edge / Full RB



Date: 10.APR.2024 20:55:40

Highest Band Edge / Full RB

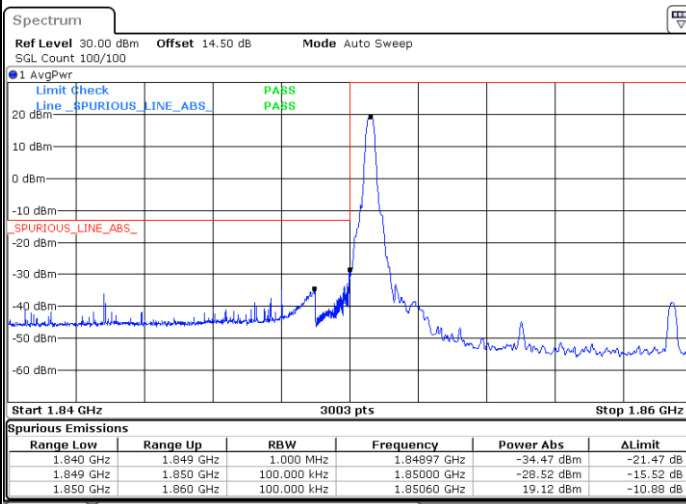


Date: 10.APR.2024 21:05:56



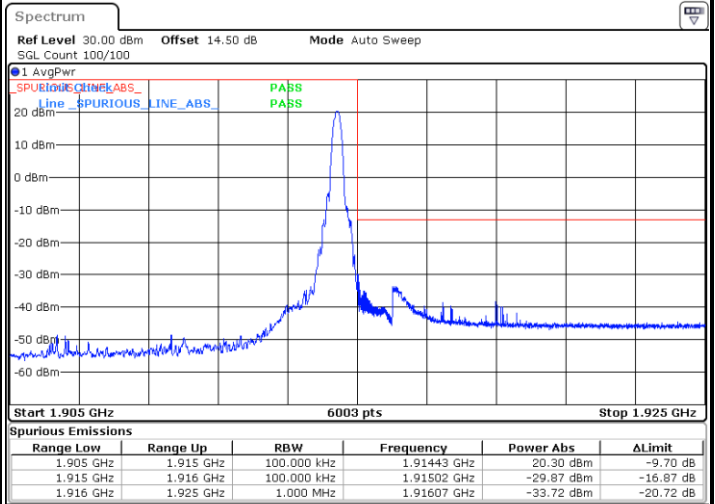
LTE Band 25 / 10MHz / 16QAM

Lowest Band Edge / 1 RB



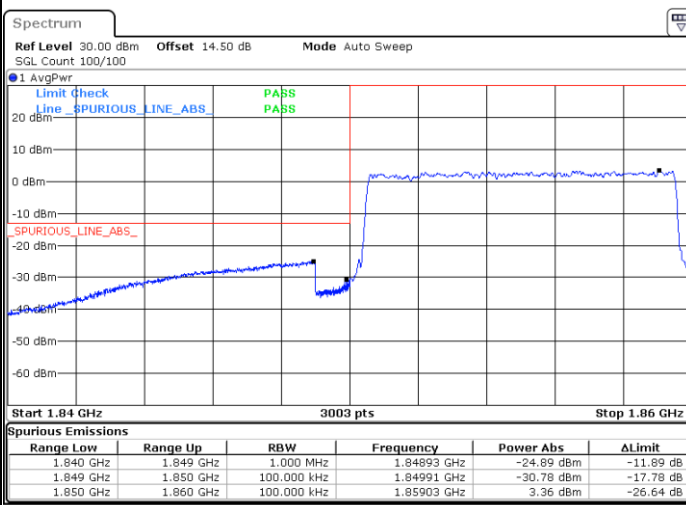
Date: 10.APR.2024 20:51:24

Highest Band Edge / 1 RB



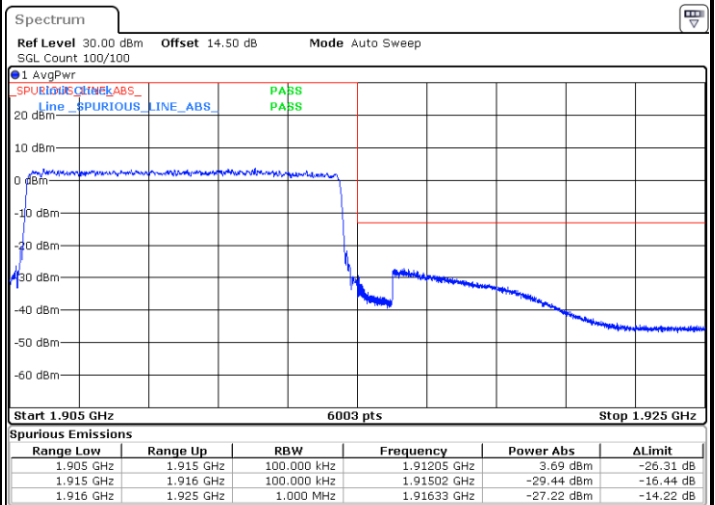
Date: 10.APR.2024 21:01:41

Lowest Band Edge / Full RB



Date: 10.APR.2024 20:54:36

Highest Band Edge / Full RB

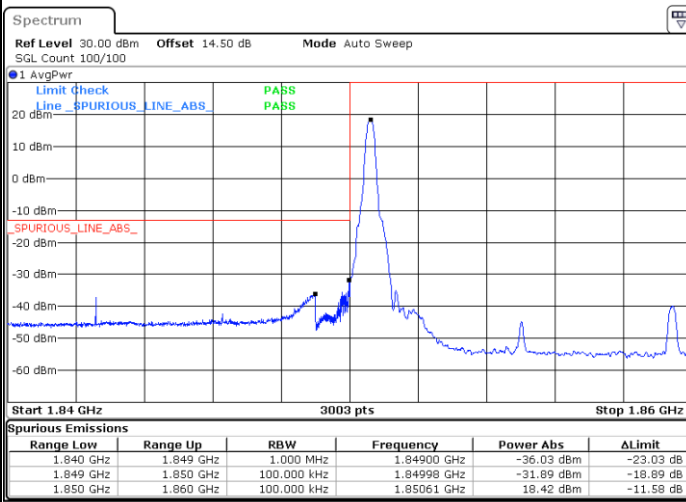


Date: 10.APR.2024 21:04:52



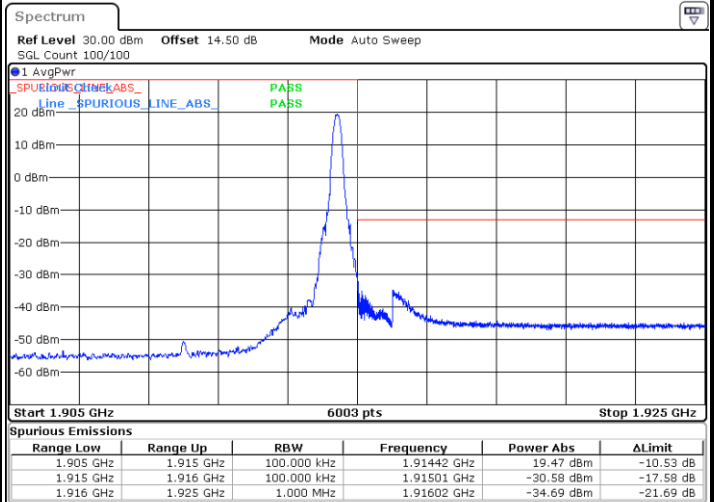
LTE Band 25 / 10MHz / 64QAM

Lowest Band Edge / 1 RB



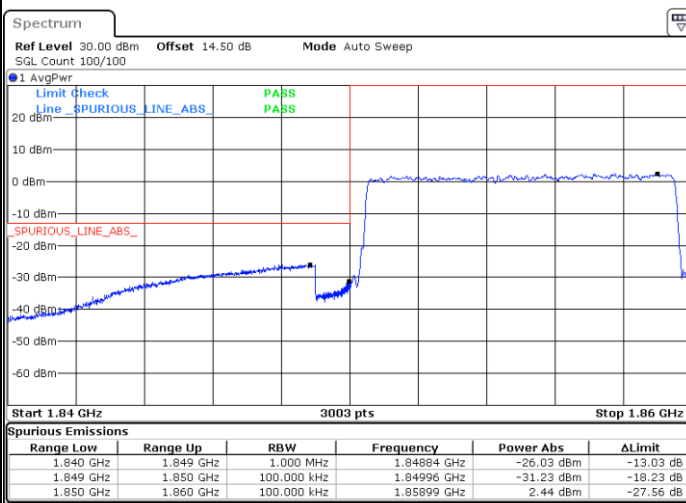
Date: 10.APR.2024 20:52:28

Highest Band Edge / 1 RB



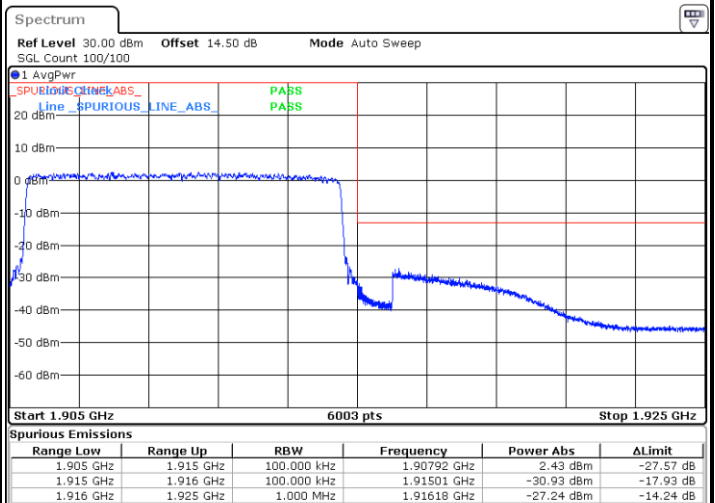
Date: 10.APR.2024 21:02:44

Lowest Band Edge / Full RB



Date: 10.APR.2024 20:53:32

Highest Band Edge / Full RB

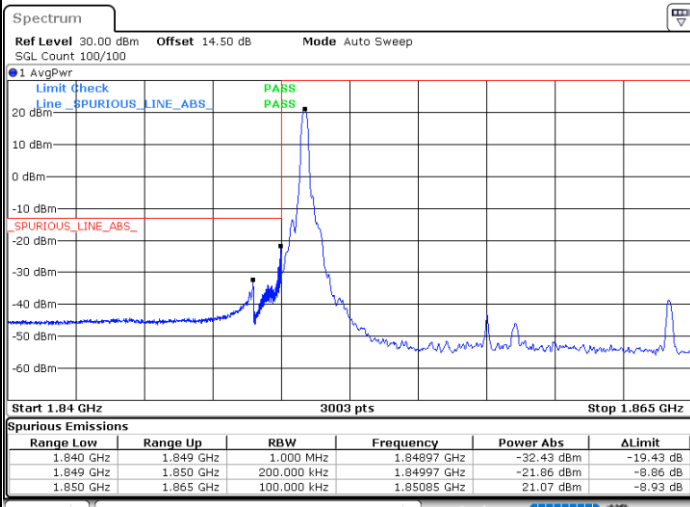


Date: 10.APR.2024 21:03:48



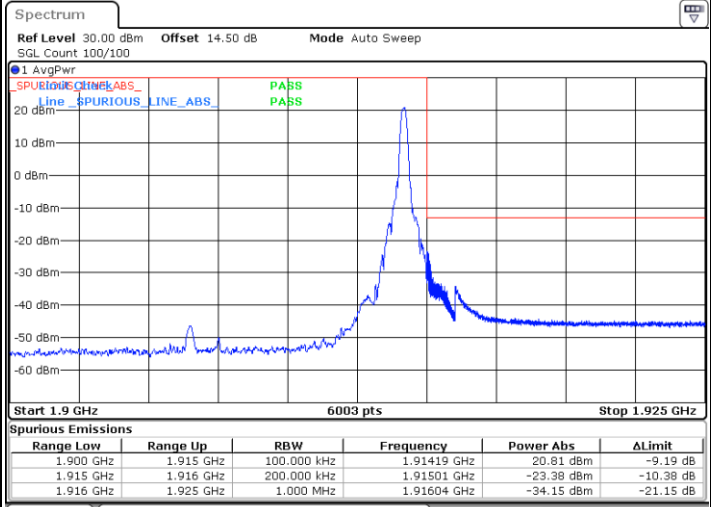
LTE Band 25 / 15MHz / QPSK

Lowest Band Edge / 1RB



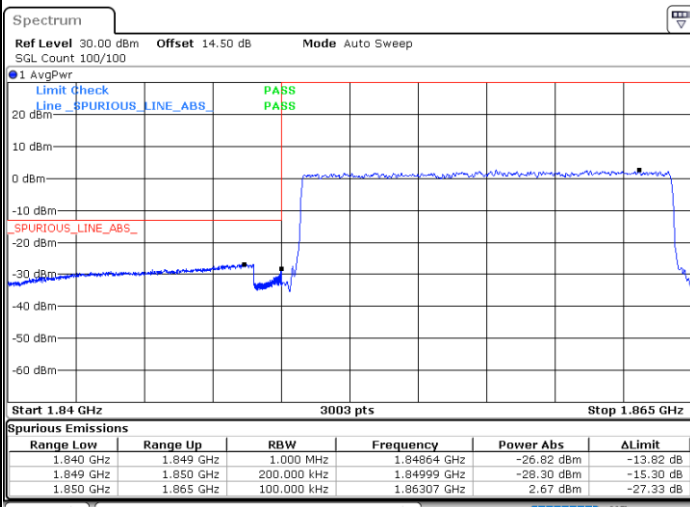
Date: 10.APR.2024 21:08:19

Highest Band Edge / 1RB



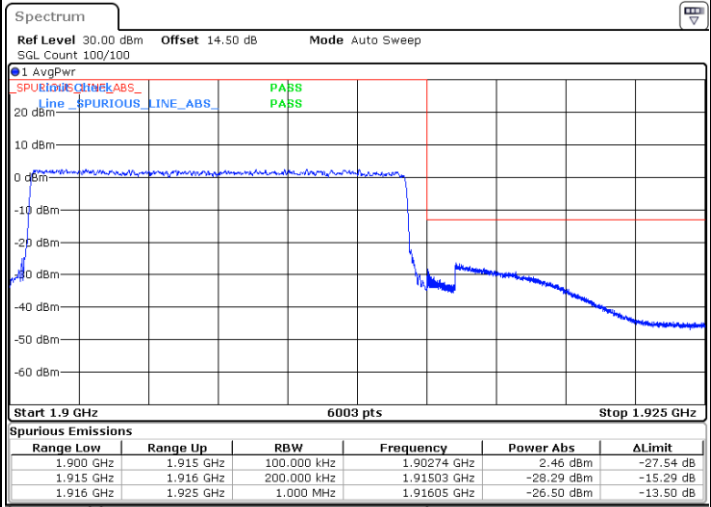
Date: 10.APR.2024 21:18:35

Lowest Band Edge / Full RB



Date: 10.APR.2024 21:13:38

Highest Band Edge / Full RB

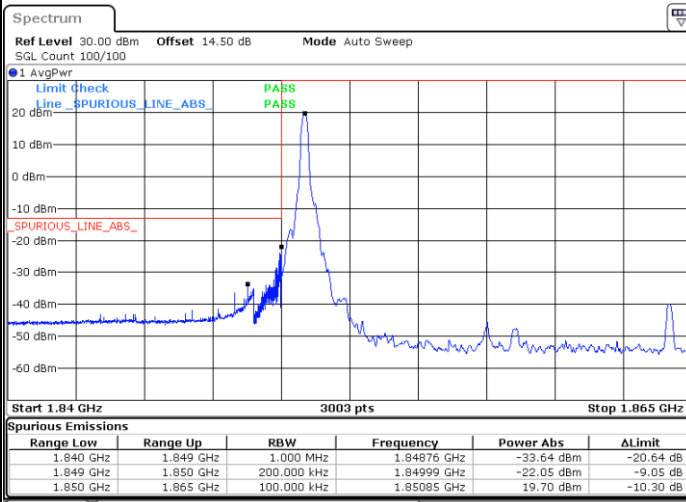


Date: 10.APR.2024 21:23:55



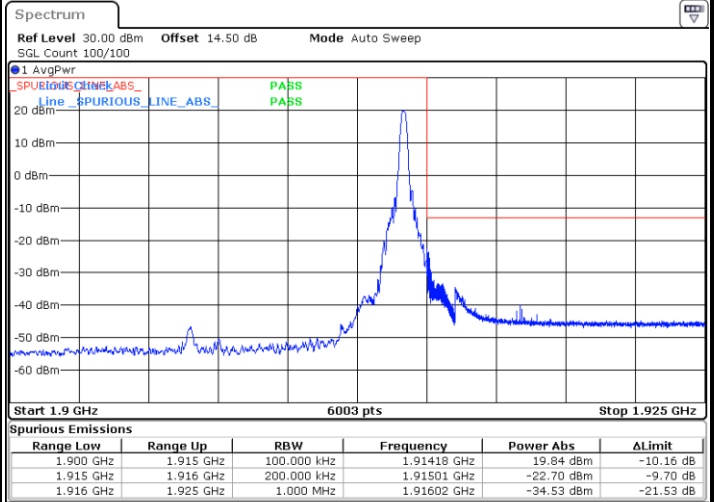
LTE Band 25 / 15MHz / 16QAM

Lowest Band Edge / 1 RB



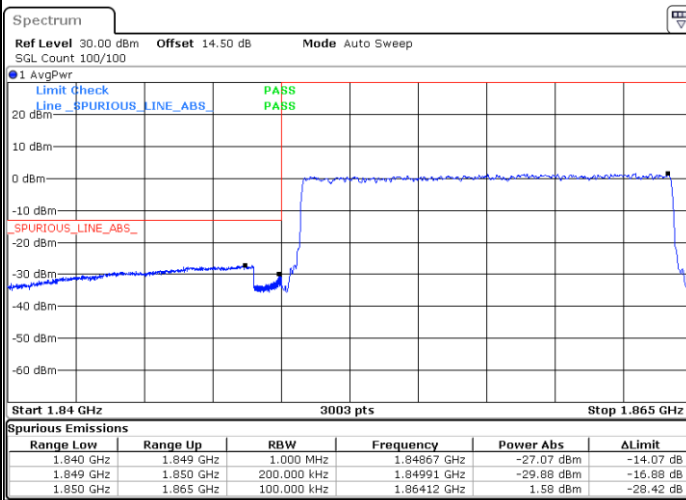
Date: 10.APR.2024 21:09:22

Highest Band Edge / 1 RB



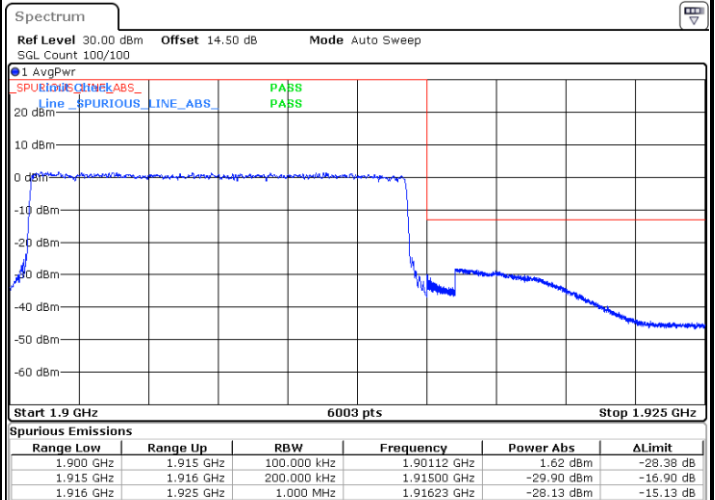
Date: 10.APR.2024 21:19:39

Lowest Band Edge / Full RB



Date: 10.APR.2024 21:12:34

Highest Band Edge / Full RB

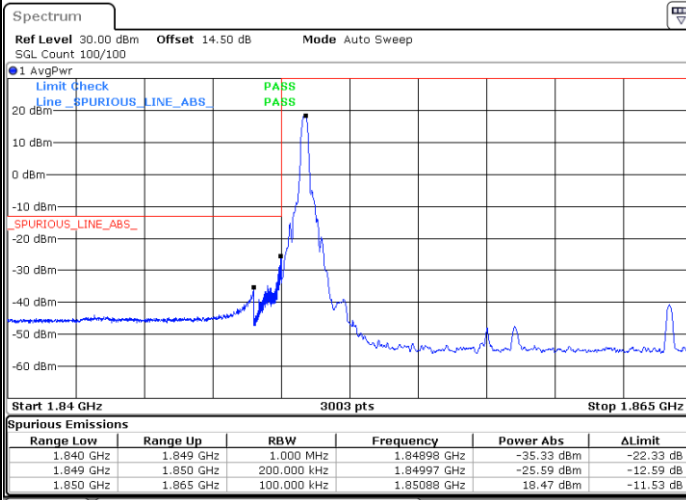


Date: 10.APR.2024 21:22:51



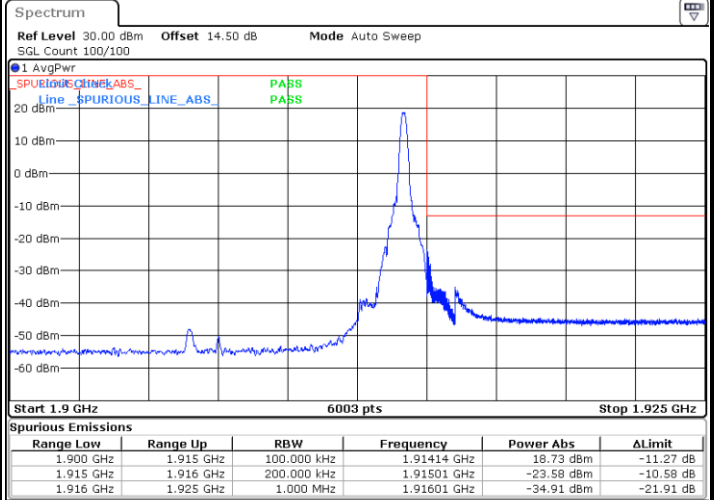
LTE Band 25 / 15MHz / 64QAM

Lowest Band Edge / 1 RB



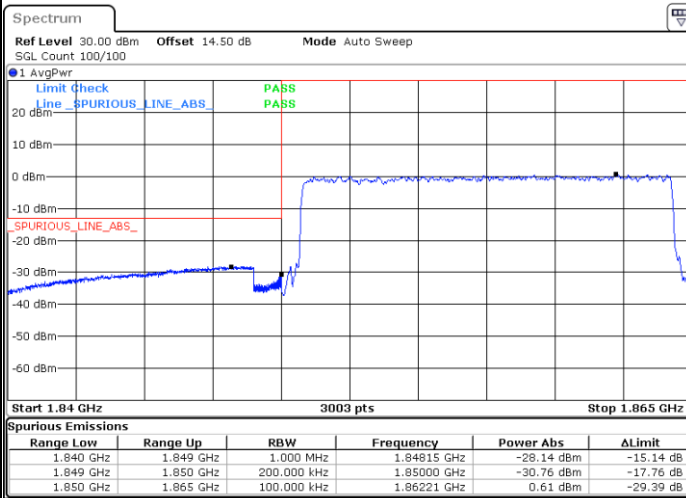
Date: 10.APR.2024 21:10:26

Highest Band Edge / 1 RB



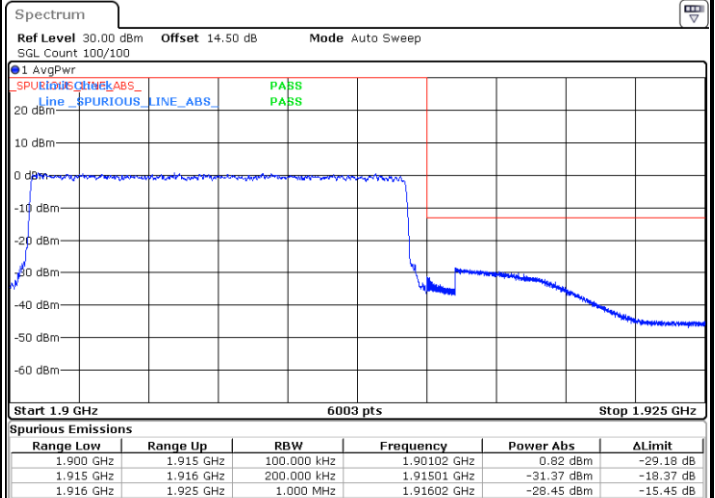
Date: 10.APR.2024 21:20:43

Lowest Band Edge / Full RB



Date: 10.APR.2024 21:11:30

Highest Band Edge / Full RB

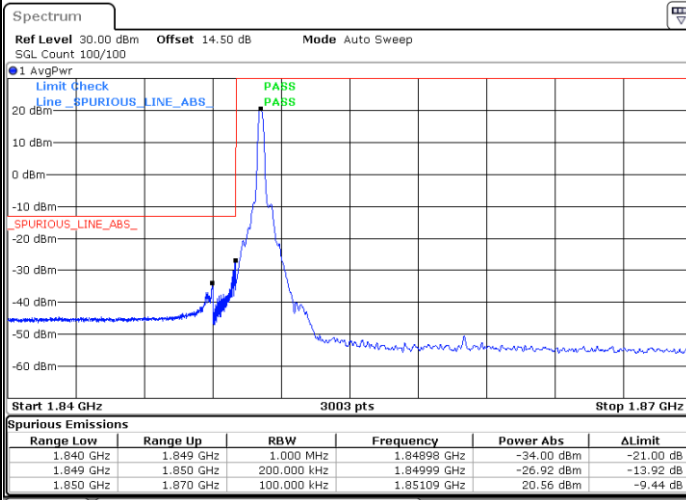


Date: 10.APR.2024 21:21:47



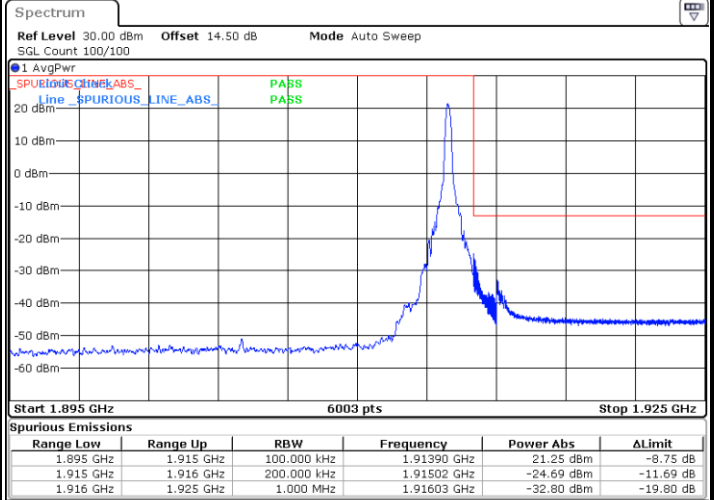
LTE Band 25 / 20MHz / QPSK

Lowest Band Edge / 1RB



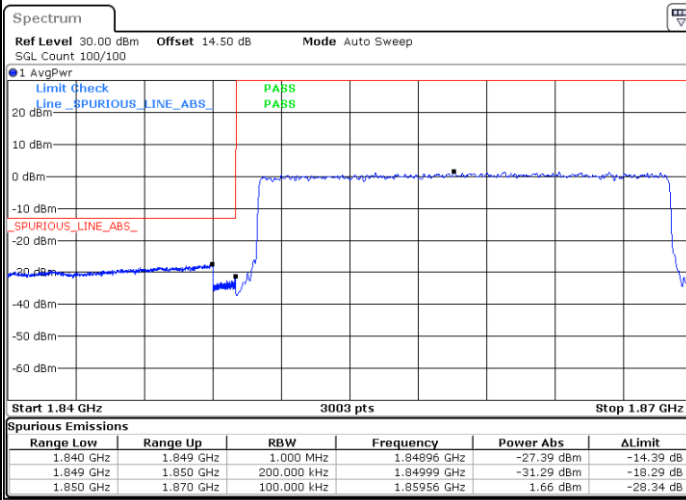
Date: 10.APR.2024 21:26:17

Highest Band Edge / 1RB



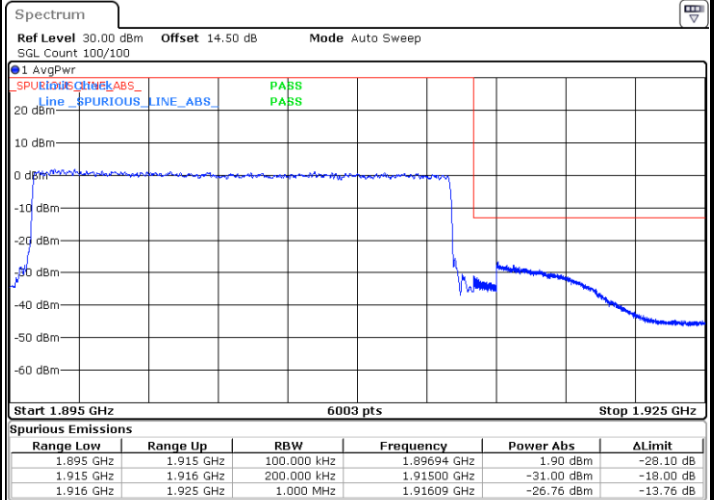
Date: 10.APR.2024 21:38:04

Lowest Band Edge / Full RB



Date: 10.APR.2024 21:31:36

Highest Band Edge / Full RB

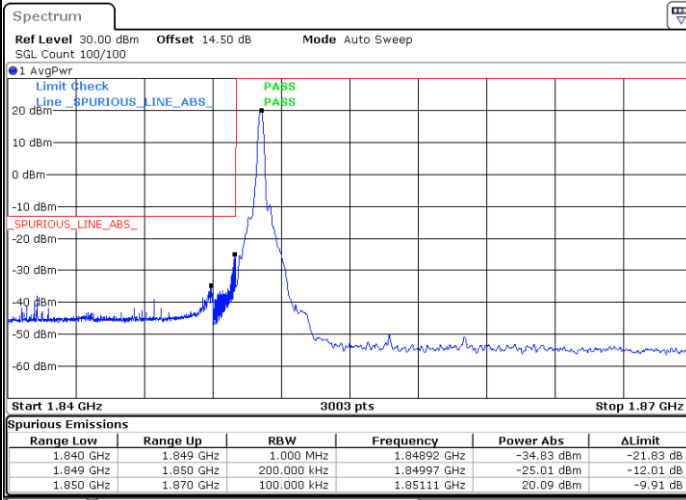


Date: 10.APR.2024 21:43:24



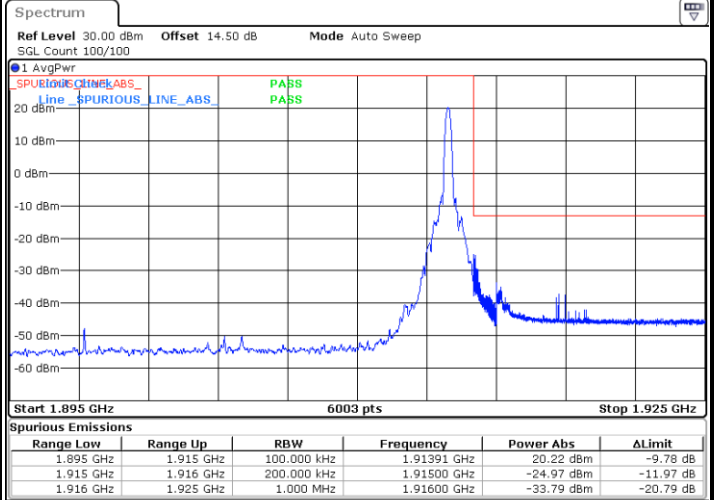
LTE Band 25 / 20MHz / 16QAM

Lowest Band Edge / 1 RB



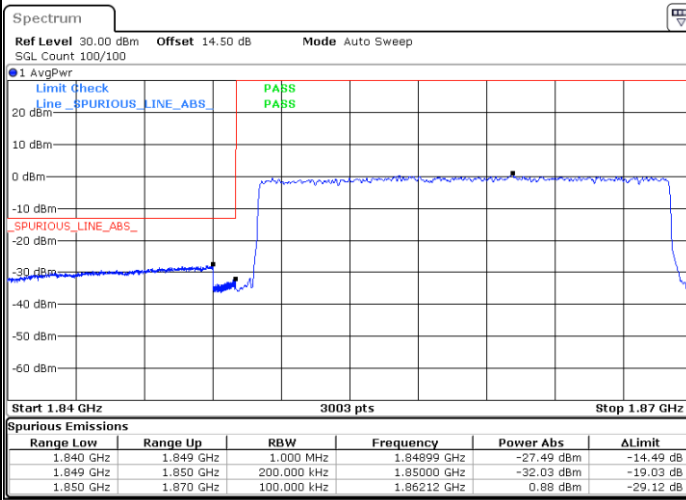
Date: 10.APR.2024 21:27:21

Highest Band Edge / 1 RB



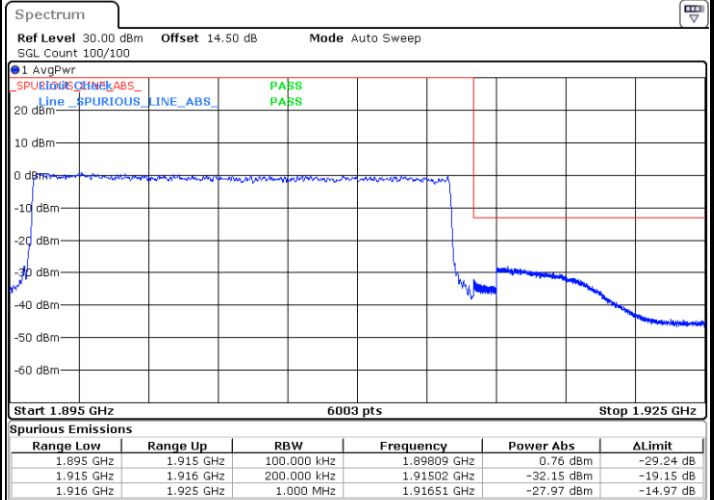
Date: 10.APR.2024 21:39:08

Lowest Band Edge / Full RB



Date: 10.APR.2024 21:30:32

Highest Band Edge / Full RB

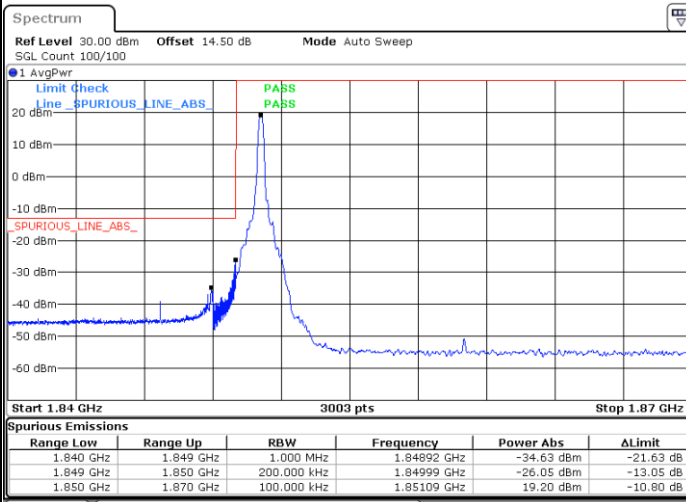


Date: 10.APR.2024 21:42:20



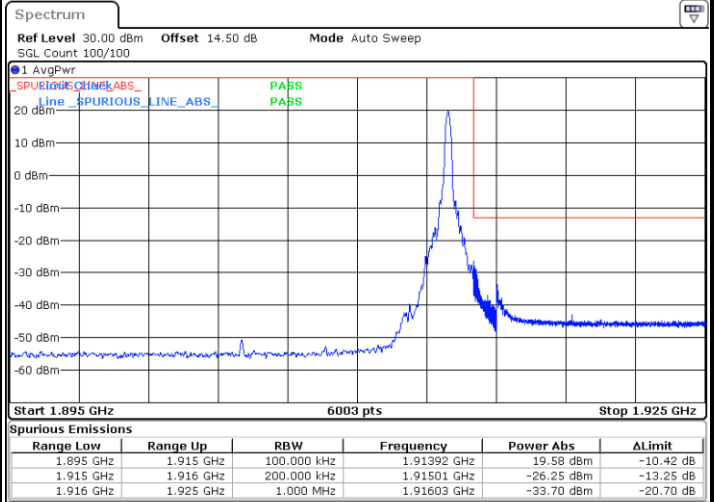
LTE Band 25 / 20MHz / 64QAM

Lowest Band Edge / 1 RB



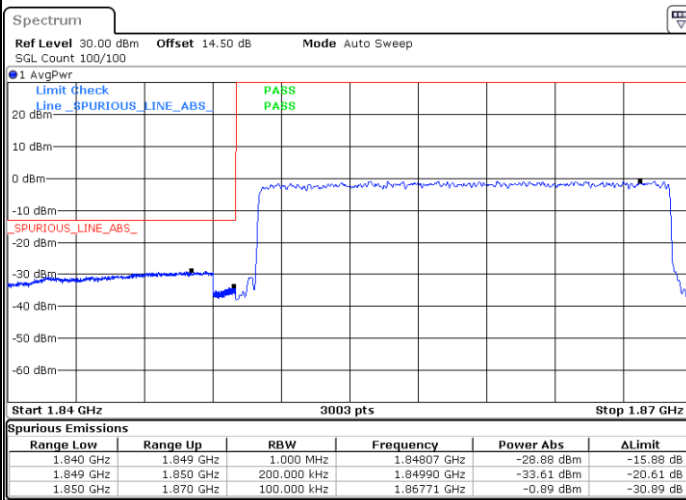
Date: 10.APR.2024 21:28:25

Highest Band Edge / 1 RB



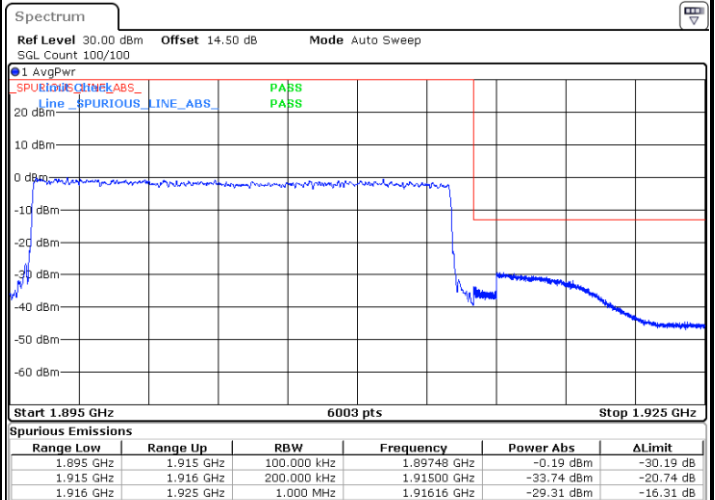
Date: 10.APR.2024 21:40:12

Lowest Band Edge / Full RB



Date: 10.APR.2024 21:29:29

Highest Band Edge / Full RB



Date: 10.APR.2024 21:41:16