FCC RF Test Report

FCC ID	:	UZ7WCMTA
EQUIPMENT	:	Touch Computer
BRAND NAME	:	Zebra
Model Name	:	WCMTA
APPLICANT	:	Zebra Technologies Corporation 1 Zebra Plaza, Holtsville, NY 11742
MANUFACTURER	:	Zebra Technologies Corporation 1 Zebra Plaza, Holtsville, NY 11742
STANDARD	:	47 CFR Part 2, 22(H), 24(E), 27(L)
CLASSIFICATION	:	PCS Licensed Transmitter Held to Ear (PCE)
Test Date(S)	:	Feb. 14, 2023 ~ Mar. 04, 2023

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

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

Jason Jia

Approved by: Jason Jia

ACCREDITED
Cert #5145.02

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

TABLE OF CONTENTS

REVISION HISTORY **3**

SUMMARY OF TEST RESULT **4**

1 GENERAL DESCRIPTION **5**

1.1 Product Feature of Equipment Under Test 5
1.2 Product Specification of Equipment Under Test 6
1.3 Modification of EUT 7
1.4 Maximum ERP/EIRP Power and Emission Designator 7
1.5 Testing Location 10
1.6 Test Software 10
1.7 Applicable Standards 10

2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST **11**

2.1 Test Mode 11
2.2 Connection Diagram of Test System 14
2.3 Support Unit used in test configuration and system 14
2.4 Measurement Results Explanation Example 14
2.5 Frequency List of Low/Middle/High Channels 15

3 CONDUCTED TEST ITEMS **22**

3.1 Measuring Instruments 22
3.2 Test Setup 22
3.3 Test Result of Conducted Test 22
3.4 Conducted Output Power and ERP/EIRP 23
3.5 Peak-to-Average Ratio 24
3.6 Occupied Bandwidth 25
3.7 Conducted Band Edge 26
3.8 Conducted Spurious Emission 28
3.9 Frequency Stability 29

4 RADIATED TEST ITEMS **30**

4.1 Measuring Instruments 30
4.2 Test Setup 30
4.3 Test Result of Radiated Test 31
4.4 Radiated Spurious Emission 32

5 LIST OF MEASURING EQUIPMENT **33**

6 UNCERTAINTY OF EVALUATION **34**

APPENDIX A. TEST RESULTS OF CONDUCTED TEST

APPENDIX B. TEST RESULTS OF RADIATED TEST

APPENDIX C. TEST SETUP PHOTOGRAPHS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG311602B	Rev. 01	Initial issue of report	Apr. 27, 2023

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 35.64 dB at 6990.00 MHz

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Touch Computer
Brand Name	Zebra
Model Name	WCMTA
FCC ID	UZ7WCMTA
Sample 1	Scanner(SE4710)
Sample 2	Scanner(SE5500)
HW Version	DV
SW Version	13-09-09.00-TG-U00-PRD-ATH-04
MFD	09MAR23
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. There are two types of EUT: the main differences between them are the scanner and memory. According to the difference, we choose sample 1 to perform full test and verify the worst mode for Sample 2.

Specification of Accessory				
Battery 1	**Brand Name**	Zebra	**Model Number**	BT-000473

Supported Unit used in test configuration and system				
Battery 2	**Brand Name**	Zebra	**Model Number**	BT-000473B
Battery 3	**Brand Name**	Zebra	**Model Number**	BT-000473E
AC Adapter	**Brand Name**	Zebra	**Part Number**	PWR-WUA5V12W0US
Earphone 1	**Brand Name**	Zebra	**Part Number**	HDST-35MM-PTT1-01
Earphone 2	**Brand Name**	Zebra	**Part Number**	HDST-USBC-PTT1-01
USB Cable (Type C to Type A)	**Brand Name**	Zebra	**Part Number**	CBL-TC5X-USBC2A-01
Type C-Audio Cable (Type C to 3.5mm)	**Brand Name**	Zebra	**Part Number**	ADP-USBC-35MM1-01
Trigger Handle	**Brand Name**	Zebra	**Part Number**	TRG-TC2L-SNP1-01
Hand Strap	**Brand Name**	Zebra	**Part Number**	SG-TC2L-HSTRP1-01
Soft Holster	**Brand Name**	Zebra	**Part Number**	SG-TC2L-HLSTR1-01

1.2 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	**<Ant. 0>:** LTE Band 5 : 23.76 dBm LTE Band 5B : 23.82 dBm LTE Band 26 : 23.79 dBm **<Ant. 1>:** LTE Band 2 : 23.81 dBm LTE Band 4 : 23.43 dBm LTE Band 25 : 23.83 dBm LTE Band 66 : 23.48 dBm **<Ant. 2>:** LTE Band 2 : 23.46 dBm LTE Band 4 : 23.52 dBm LTE Band 25 : 23.50 dBm LTE Band 66 : 23.60 dBm LTE Band 66B : 23.54 dBm LTE Band 66C : 23.55 dBm
Antenna Gain	**<Ant. 0>:** LTE Band 5 : -3.0 dBi LTE Band 26 : -3.0 dBi **<Ant. 1>:** LTE Band 2 : -0.6 dBi LTE Band 4 : -0.9 dBi LTE Band 25 : -0.6 dBi LTE Band 66 : -0.9 dBi **<Ant. 2>:** LTE Band 2 : -0.5 dBi LTE Band 4 : 0.06 dBi LTE Band 25 : -0.5 dBi LTE Band 66 : 0.06 dBi
Type of Modulation	QPSK / 16QAM / 64QAM / 256QAM

Note:

1. The device supports two PAs for LTE Band 2/4/25/66 (Ant.2_main PA for Single Carrier mode, and Ant.1_other PA for ENDC mode), the EIRP only show the maximum PA in the report, the conducted items full test both PA, and RSE verify ENDC mode for the other PA in the 5G NR RF report.

2. The maximum ERP/EIRP is calculated from max output power and max antenna gain, only the maximum ERP/EIRP of Ant.0 for Band 5/5B/26, Ant.1 for Band 2/25 and Ant.2 for Band 4/66/66B/66C are shown in the report.

1.3 Modification of EUT

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

1.4 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	0.2089	1M09G7D	0.1683	1M09W7D
3	1851.5 ~ 1908.5	0.2075	2M72G7D	0.1581	2M74W7D
5	1852.5 ~ 1907.5	0.2061	4M50G7D	0.1614	4M49W7D
10	1855.0 ~ 1905.0	0.2075	9M09G7D	0.1607	9M01W7D
15	1857.5 ~ 1902.5	0.2051	13M5G7D	0.1574	13M5W7D
20	1860.0 ~ 1900.0	0.2094	17M9G7D	0.1611	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	0.2094	1M09G7D	0.1656	1M09W7D
3	1851.5 ~ 1913.5	0.2089	2M72G7D	0.1592	2M74W7D
5	1852.5 ~ 1912.5	0.2094	4M50G7D	0.1611	4M49W7D
10	1855.0 ~ 1910.0	0.2084	9M09G7D	0.1585	9M01W7D
15	1857.5 ~ 1907.5	0.2094	13M5G7D	0.1618	13M5W7D
20	1860.0 ~ 1905.0	0.2104	17M9G7D	0.1622	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	0.2228	1M10G7D	0.1845	1M10W7D
3	1711.5 ~ 1753.5	0.2249	2M73G7D	0.1837	2M73W7D
5	1712.5 ~ 1752.5	0.2223	4M49G7D	0.1837	4M50W7D
10	1715.0 ~ 1750.0	0.2244	9M11G7D	0.1849	9M09W7D
15	1717.5 ~ 1747.5	0.2259	13M5G7D	0.1858	13M5W7D
20	1720.0 ~ 1745.0	0.2280	17M9G7D	0.1875	17M9W7D

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	0.2296	1M10G7D	0.1871	1M10W7D
3	1711.5 ~ 1778.5	0.2270	2M73G7D	0.1845	2M73W7D
5	1712.5 ~ 1777.5	0.2286	4M49G7D	0.1862	4M50W7D
10	1715.0 ~ 1775.0	0.2307	9M11G7D	0.1871	9M09W7D
15	1717.5 ~ 1772.5	0.2249	13M5G7D	0.1875	13M5W7D
20	1720.0 ~ 1770.0	0.2323	17M9G7D	0.1892	17M9W7D
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	0.0705	1M09G7D	0.0581	1M09W7D
3	825.5 ~ 847.5	0.0703	2M71G7D	0.0579	2M73W7D
5	826.5 ~ 846.5	0.0710	4M47G7D	0.0566	4M49W7D
10	829.0 ~ 844.0	0.0726	9M03G7D	0.0586	8M99W7D
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	0.0676	1M09G7D	0.0570	1M09W7D
3	825.5 ~ 847.5	0.0681	2M71G7D	0.0571	2M73W7D
5	826.5 ~ 846.5	0.0716	4M47G7D	0.0596	4M49W7D
10	829.0 ~ 844.0	0.0698	9M03G7D	0.0598	8M99W7D
15	831.5 ~ 841.5	0.0731	13M4G7D	0.0628	13M5W7D
CH26790	824.0	0.0700	13M4G7D	0.0598	13M4W7D

LTE Band CA_5B	QPSK		16QAM/64QAM/256QAM	
BW (MHz)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)
3MHz+5MHz	0.0706	7M54G7D	0.0536	7M51W7D
5MHz+3MHz	0.0716	7M58G7D	0.0545	7M51W7D
5MHz+10MHz	0.0706	13M9G7D	0.0542	13M8W7D
10MHz+5MHz	0.0714	13M9G7D	0.0553	13M9W7D
10MHz+10MHz	0.0723	18M7G7D	0.0570	18M7W7D

LTE Band CA_66B	QPSK		16QAM/64QAM/256QAM	
BW (MHz)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)
5MHz+5MHz	0.2223	9M37G7D	0.1750	9M39W7D
5MHz+10MHz	0.2203	13M9G7D	0.1714	13M8W7D
10MHz+5MHz	0.2218	14M0G7D	0.1722	14M0W7D
5MHz+15MHz	0.2173	18M0G7D	0.1714	18M1W7D
15MHz+5MHz	0.2228	18M2G7D	0.1758	18M3W7D
10MHz+10MHz	0.2291	18M7G7D	0.1807	18M7W7D
LTE Band CA_66C	**QPSK**		**16QAM/64QAM/256QAM**	
BW (MHz)	**Maximum EIRP(W)**	**Emission Designator (99%OBW)**	**Maximum EIRP(W)**	**Emissio Designator (99%OBW)**
5MHz+20MHz	0.2173	23M3G7D	0.1679	23M2W7D
20MHz+5MHz	0.2143	23M3G7D	0.1667	23M2W7D
10MHz+15MHz	0.2198	23M2G7D	0.1734	23M5W7D
15MHz+10MHz	0.2203	23M4G7D	0.1746	23M4W7D
10MHz+20MHz	0.2138	27M6G7D	0.1718	27M9W7D
20MHz+10MHz	0.2213	28M1G7D	0.1726	28M0W7D
15MHz+15MHz	0.2168	28M4G7D	0.1702	28M6W7D
15MHz+20MHz	0.2223	32M8G7D	0.1742	33M1W7D
20MHz+15MHz	0.2249	33M1G7D	0.1758	33M0W7D
20MHz+20MHz	0.2296	37M9G7D	0.1803	37M6W7D

Note:

1. All modulations have been tested, and only the worst test results of PSK & QAM are shown in the report.
2. 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.
3. 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.
4. 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.

1.5 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 03CH06-KS TH01-KS	CN1257	314309

1.6 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH04-KS	AUDIX	E3	6.2009-8-24a
2.	03CH06-KS	AUDIX	E3	6.2009-8-24al

1.7 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.

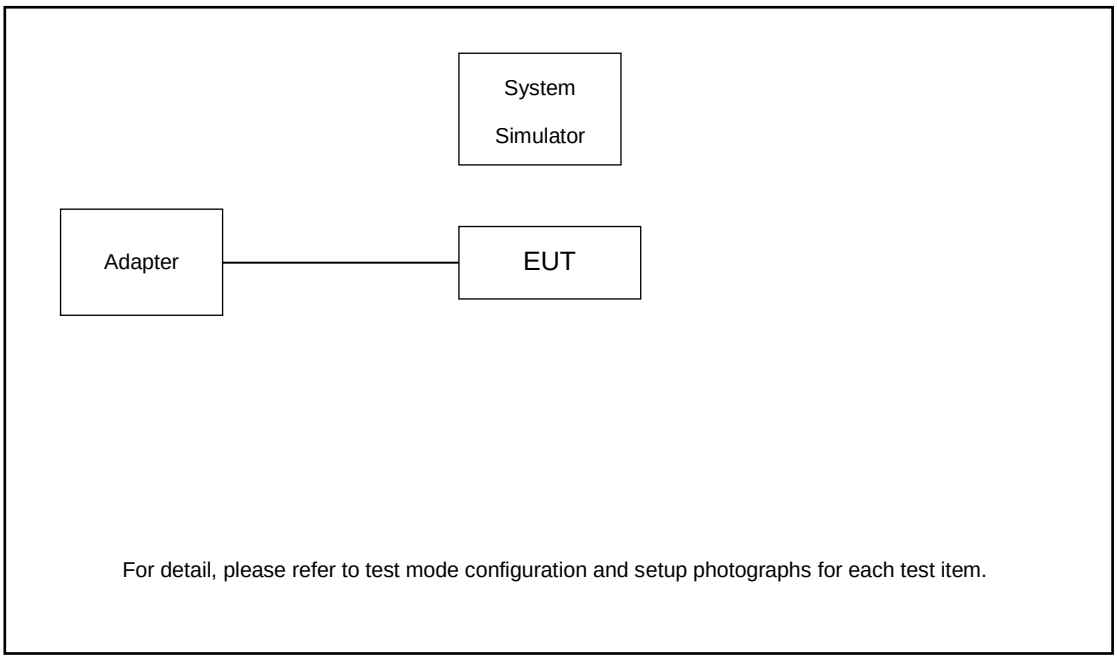
Test Items	Band	Bandwidth (MHz)						Modulation				RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16 QAM	64 QAM	256 QAM	1	Half	Full	L	M	H
Max. Output Power	2	v	v	v	v	v	v	v	v	v	v	v		v	v	v	v
	4	v	v	v	v	v	v	v	v	v	v	v		v	v	v	v
	5	v	v	v	v	-	-	v	v	v	v	v		v	v	v	v
	25	v	v	v	v	v	v	v	v	v	v	v		v	v	v	v
	26	v	v	v	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
Peak-to-Average Ratio	25						v	v	v	v	v			v		v	
	26					v	-	v	v	v	v			v		v	
	66						v	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	2	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
	26	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
Conducted Spurious Emission	25	v	v	v	v	v	v	v				v			v	v	v
	26	v	v	v	v	v	-	v				v			v	v	v
	66	v	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	

Test Items	Band	Bandwidth (MHz)						Modulation				RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16 QAM	64 QAM	256 QAM	1	Half	Full	L	M	H
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	v	v
	26	Worst Case													v	v	v
	66	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. All test items are based on engineering evaluation.																

Test Items	Band	Bandwidth (MHz)								Modulation				RB #			Test Channel		
		10+10	15+5	5+15	10+5	5+10	5+5	5+3	3+5	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
Max. Output Power	5B_CA	v	-	-	v	v	-	v	v	v	v	v	v	v			v	v	v
	66B_CA	v	v	v	v	v	v	-	-	v	v	v	v	v			v	v	v
26dB and 99% Bandwidth	5B_CA	v	-	-	v	v	-	v	v	v	v					v		v	
	66B_CA	v	v	v	v	v	v	-	-	v	v					v		v	
Conducted Band Edge	5B_CA	v	-	-	v	v	-	v	v	v	v	v	v	v		v	v		v
	66B_CA	v	v	v	v	v	v	-	-	v	v	v	v	v		v	v		v
Conducted Spurious Emission	5B_CA	v	-	-	v	v	-	v	v	v				v			v	v	v
	66B_CA	v	v	v	v	v	v	-	-	v				v			v	v	v
Frequency Stability	5B_CA	v	-	-			-			v				v				v	
	66B_CA	v						-	-	v				v				v	
E.R.P / E.I.R.P.	5B_CA	v	-	-	v	v	-	v	v	v	v	v	v	v			v	v	v
	66B_CA	v	v	v	v	v	v	-	-	v	v	v	v	v			v	v	v
Radiated Spurious Emission	5B_CA	Worst Case															v	v	v
	66B_CA	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. All test items are based on engineering evaluation.																		

Test Items	Band	Bandwidth (MHz)										Modulation				RB #			Test Channel		
		20+20	20+15	20+10	20+5	15+20	15+15	15+10	10+20	10+15	5+20	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
Max. Output Power	66C_CA	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v			v	v	v
26dB and 99% Bandwidth	66C_CA	v	v	v	v	v	v	v	v	v	v	v	v					v		v	
Conducted Band Edge	66C_CA	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v		v	v		v
Conducted Spurious Emission	66C_CA	v	v	v	v	v	v	v	v	v	v	v				v			v	v	v
Frequency Stability	66C_CA	v										v				v				v	
E.I.R.P.	66C_CA	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v			v	v	v
Radiated Spurious Emission	66C_CA	Worst Case																	v	v	v
Note	1. The mark "**v** " means that this configuration is chosen for testing 2. 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. 3. All test items are based on engineering evaluation.																				

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.	Base Station	Anritsu	MT8820/8821	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

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

The spectrum analyzer offset is derived from RF cable loss.

Offset = RF cable loss.

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

Example :

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

= 5.4 (dB)

2.5 Frequency List of Low/Middle/High Channels

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 26 Cross-rule Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	-	Middle	-
15	Channel	-	26790	-
	Frequency	-	824	-
10	Channel	-	26790	-
	Frequency	-	824	-
5	Channel	-	26790	-
	Frequency	-	824	-
3	Channel	-	26790	-
	Frequency	-	824	-
1.4	Channel	-	26790	-
	Frequency	-	824	-

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

LTE Band 5B_CA Channel and Frequency List					
BW [MHz]	Channel/Frequency(MHz)		Lowest	Middle	Highest
3 + 5	PCC	Channel	20416	20501	20586
		Frequency	825.6	834.1	842.6
	SCC	Channel	20455	20540	20625
		Frequency	829.5	838.0	846.5
5 + 3	PCC	Channel	20425	20510	20595
		Frequency	826.5	835.0	843.5
	SCC	Channel	20464	20549	20634
		Frequency	830.4	838.9	847.4
5 + 10	PCC	Channel	20428	20478	20528
		Frequency	826.8	831.8	836.8
	SCC	Channel	20500	20550	20600
		Frequency	834	839	844
10 + 5	PCC	Channel	20450	20500	20550
		Frequency	829	834	839
	SCC	Channel	20522	20572	20622
		Frequency	836.2	841.2	846.2
10 + 10	PCC	Channel	20450	20476	20501
		Frequency	829	831.6	834.1
	SCC	Channel	20549	20575	20600
		Frequency	838.9	841.5	844

LTE Band 66B_CA Channel and Frequency List					
BW [MHz]	Channel/Frequency(MHz)		Lowest	Middle	Highest
5 + 5	PCC	Channel	131997	132398	132599
		Frequency	1712.5	1752.6	1772.7
	SCC	Channel	132045	132446	132647
		Frequency	1717.3	1757.4	1777.5
5 + 10	PCC	Channel	132000	132375	132550
		Frequency	1712.8	1750.3	1767.8
	SCC	Channel	132072	132447	132622
		Frequency	1720	1757.5	1775
10 + 5	PCC	Channel	132022	132397	132572
		Frequency	1715	1752.5	1770
	SCC	Channel	132094	132469	132644
		Frequency	1722.2	1759.7	1777.2
5 + 15	PCC	Channel	132002	132353	132504
		Frequency	1713	1748.1	1763.2
	SCC	Channel	132095	132446	132597
		Frequency	1722.3	1757.4	1772.5
15 + 5	PCC	Channel	132047	132398	132549
		Frequency	1717.5	1752.6	1767.7
	SCC	Channel	132140	132491	132642
		Frequency	1726.8	1761.9	1777
10 + 10	PCC	Channel	132022	132373	132523
		Frequency	1715	1750.1	1765.1
	SCC	Channel	132121	132472	132622
		Frequency	1724.9	1760	1775

LTE Band 66C_CA Channel and Frequency List					
BW [MHz]	Channel/Frequency(MHz)		Lowest	Middle	Highest
10 + 15	PCC	Channel	132025	132351	132477
		Frequency	1715.3	1747.9	1760.5
	SCC	Channel	132145	132471	132597
		Frequency	1727.3	1759.9	1772.5
15 + 10	PCC	Channel	132047	132373	132499
		Frequency	1717.5	1750.1	1762.7
	SCC	Channel	132167	132493	132619

		Frequency	1729.5	1762.1	1774.7
10 + 20	PCC	Channel	132027	132328	132428
		Frequency	1715.5	1745.6	1755.6
	SCC	Channel	132171	132472	132572
		Frequency	1729.9	1760	1770
20 + 10	PCC	Channel	132072	132373	132473
		Frequency	1720	1750.1	1760.1
	SCC	Channel	132216	132517	132617
		Frequency	1734.4	1764.5	1774.5
15 + 15	PCC	Channel	132047	132347	132447
		Frequency	1717.5	1747.5	1757.5
	SCC	Channel	132197	132497	132597
		Frequency	1732.5	1762.5	1772.5
15 + 20	PCC	Channel	132050	132325	132401
		Frequency	1717.8	1745.3	1752.9
	SCC	Channel	132221	132496	132572
		Frequency	1734.9	1762.4	1770
20 + 15	PCC	Channel	132072	132348	132423
		Frequency	1720	1747.6	1755.1
	SCC	Channel	132243	132519	132594
		Frequency	1737.1	1764.7	1772.2
20 + 5	PCC	Channel	132072	132397	132522
		Frequency	1720	1752.5	1765
	SCC	Channel	132189	132514	132639
		Frequency	1731.7	1764.2	1776.7
5 + 20	PCC	Channel	132005	132330	132455
		Frequency	1713.3	1745.8	1758.3
	SCC	Channel	132122	132447	132572
		Frequency	1725	1757.5	1770
20 + 20	PCC	Channel	132072	132323	132374
		Frequency	1720	1745.1	1750.2
	SCC	Channel	132270	132521	132572
		Frequency	1739.8	1764.9	1770

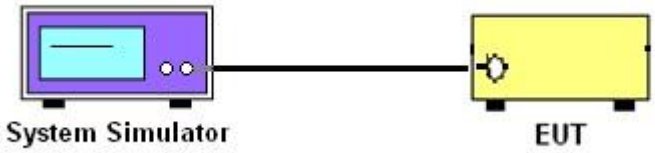
3 Conducted Test Items

3.1 Measuring Instruments

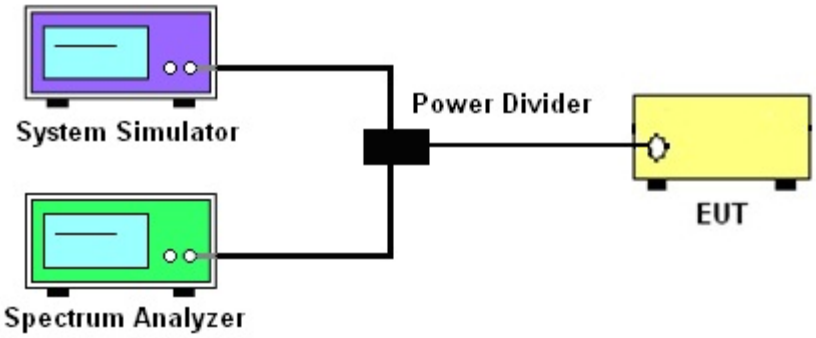
See list of measuring instruments of this test report.

3.2 Test Setup

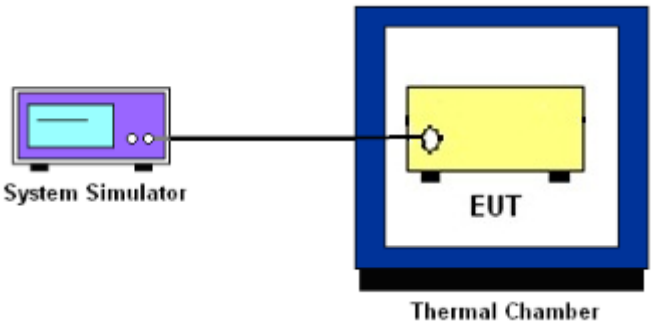
3.2.1 Conducted Output Power



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[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.

3.7.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured.
4. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
5. Beyond the 1 MHz band from the band edge, RBW=1MHz was used
6. Set spectrum analyzer with RMS detector.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. Checked that all the results comply with the emission limit line.

   Example:

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

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

   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB) = -13dBm.
9. 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 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.

3.9 Frequency Stability

3.9.1 Description of Frequency Stability Measurement

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

3.9.2 Test Procedures for Temperature Variation

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

3.9.3 Test Procedures for Voltage Variation

1. The testing follows ANSI C63.26 section 5.6.5
2. The EUT was placed in a temperature chamber at 20±5°C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value for other than hand carried battery equipment.
4. For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.
5. The variation in frequency was measured for the worst case.

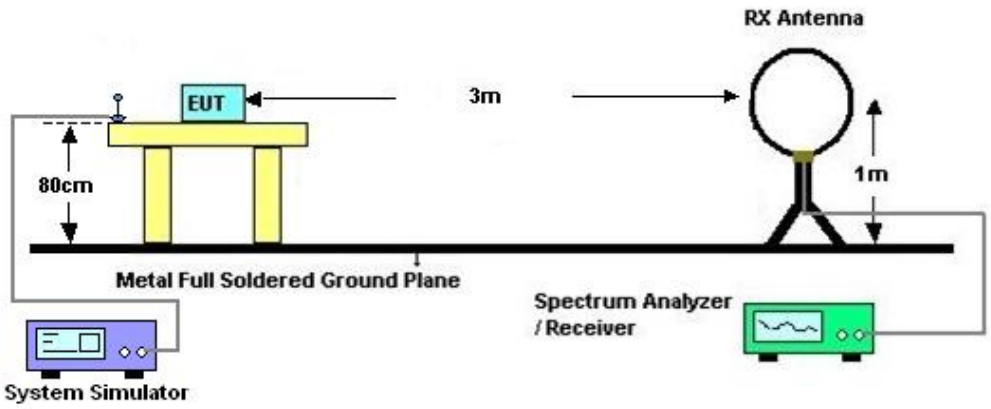
4 Radiated Test Items

4.1 Measuring Instruments

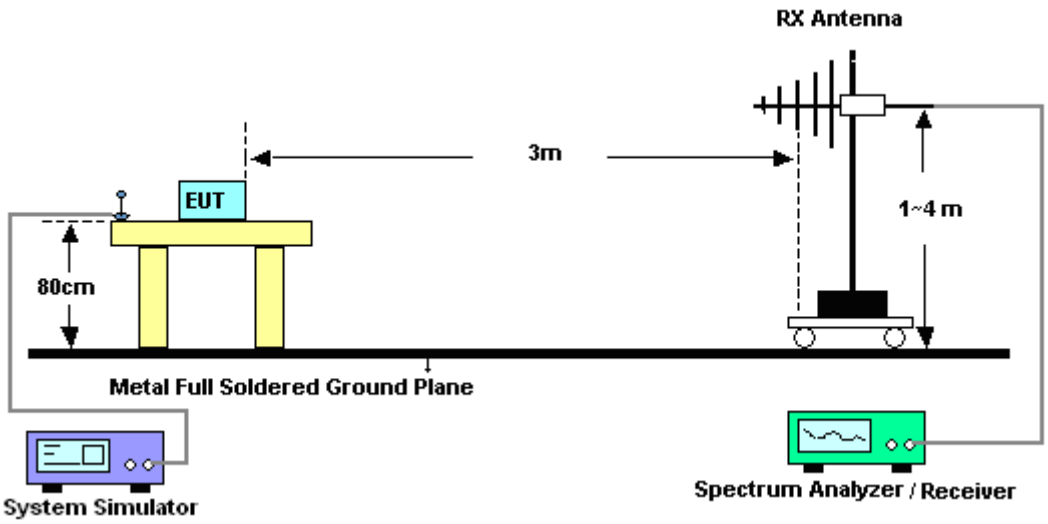
See list of measuring instruments of this test report.

4.2 Test Setup

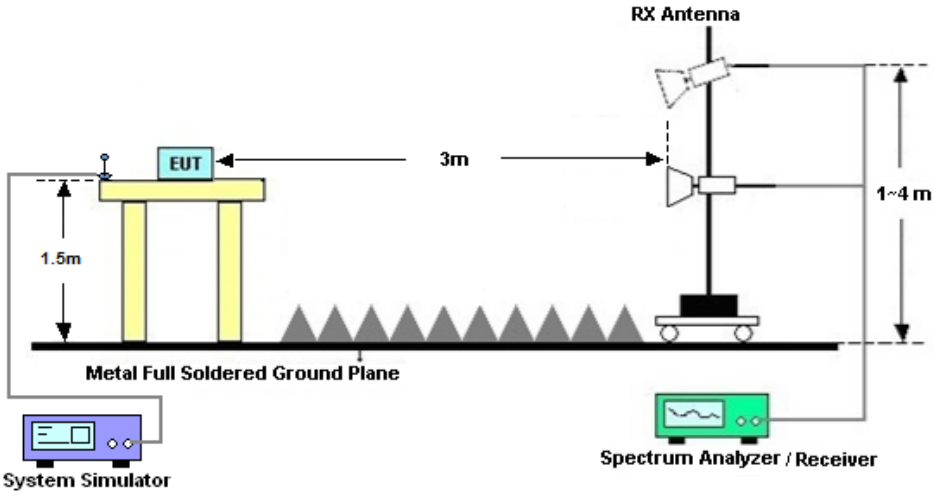
4.2.1 For radiated test below 30MHz



4.2.2 For radiated test from 30MHz to 1GHz



4.2.3 For radiated test above 1GHz



4.3 Test Result of Radiated Test

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

Please refer to Appendix B.

4.4 Radiated Spurious Emission

4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI C63.26. 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	Oct. 12, 2022	Feb. 14, 2023~ Mar. 04, 2023	Oct. 11, 2023	Conducted (TH01-KS)
Power divider	STI	STI08-0055	-	0.5~40GHz	NCR	Feb. 14, 2023~ Mar. 04, 2023	NCR	Conducted (TH01-KS)
Temperature &humidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 15, 2022	Feb. 14, 2023~ Mar. 04, 2023	Jul. 14, 2023	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY57471079	10Hz-44G,MAX 30dB	Oct. 12, 2022	Mar. 01, 2023	Oct. 11, 2023	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 16, 2022	Mar. 01, 2023	Oct. 15, 2023	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	May 24, 2022	Mar. 01, 2023	May 23, 2023	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1284	1GHz~18GHz	Oct. 16, 2022	Mar. 01, 2023	Oct. 15, 2023	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 08, 2023	Mar. 01, 2023	Jan. 07, 2024	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	May 24, 2022	Mar. 01, 2023	May 23, 2023	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40G GA	060728	18~40GHz	Jan. 05, 2023	Mar. 01, 2023	Jan. 04, 2024	Radiation (03CH04-KS)
high gain Amplifier	EM	EM01G18G A	060840	1Ghz-18Ghz	Oct. 12, 2022	Mar. 01, 2023	Oct. 11, 2023	Radiation (03CH04-KS)
Amplifier	Agilent	8449B	3008A02370	1Ghz-18Ghz	Oct. 12, 2022	Mar. 01, 2023	Oct. 11, 2023	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Mar. 01, 2023	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Mar. 01, 2023	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Mar. 01, 2023	NCR	Radiation (03CH04-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY60242126	10Hz-44GHz	Oct. 13, 2022	Mar. 01, 2023	Oct. 12, 2023	Radiation (03CH06-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 16, 2022	Mar. 01, 2023	Oct. 15, 2023	Radiation (03CH06-KS)
Bilog Antenna	TeseQ	CBL6111D	49921	30MHz-1GHz	May 24, 2022	Mar. 01, 2023	May 23, 2023	Radiation (03CH06-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00218642	1GHz~18GHz	Apr. 18, 2022	Mar. 01, 2023	Apr. 17, 2023	Radiation (03CH06-KS)
SHF-EHF Horn	Com-power	AH-840	101093	18GHz~40GHz	Jan. 08, 2023	Mar. 01, 2023	Jan. 07, 2024	Radiation (03CH06-KS)
Amplifier	SONOMA	310N	380827	9KHz ~1GHZ	Jul. 11, 2022	Mar. 01, 2023	Jul. 10, 2023	Radiation (03CH06-KS)
Amplifier	MITEQ	EM18G40G GA	060728	18~40GHz	Jan. 05, 2023	Mar. 01, 2023	Jan. 04, 2024	Radiation (03CH06-KS)
high gain Amplifier	MITEQ	AMF-7D-00 101800-30-1 0P	2082395	1Ghz-18Ghz	Jan. 05, 2023	Mar. 01, 2023	Jan. 04, 2024	Radiation (03CH06-KS)
Amplifier	Keysight	83017A	MY53270319	500MHz~26.5GHz	Oct. 12, 2022	Mar. 01, 2023	Oct. 12, 2023	Radiation (03CH06-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Mar. 01, 2023	NCR	Radiation (03CH06-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Mar. 01, 2023	NCR	Radiation (03CH06-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Mar. 01, 2023	NCR	Radiation (03CH06-KS)

NCR: No Calibration Required

6 Uncertainty of Evaluation

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

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Power	±0.46 dB
Conducted Emissions	±0.48 dB
Occupied Channel Bandwidth	±0.1 %

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz) for 03CH04-KS

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

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz) for 03CH04-KS

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

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz) for 03CH06-KS

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.5dB

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz) for 03CH06-KS

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.1dB

Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power) and ERP/EIRP

LTE Band 2-Ant 1									
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	23.79	23.81	23.79	0.2084	0.2094	0.2084
20	QPSK	1	99	23.73	23.79	23.66	0.2056	0.2084	0.2023
20	QPSK	100	0	22.72	22.89	22.72	0.1629	0.1694	0.1629
20	16QAM	1	0	22.62	22.67	22.51	0.1592	0.1611	0.1552
20	64QAM	1	0	22.29	22.43	22.33	0.1476	0.1524	0.1489
20	256QAM	1	0	18.78	18.98	18.77	0.0658	0.0689	0.0656
Channel				18675	18900	19125	EIRP(W)		
Frequency (MHz)				1857.5	1880	1902.5	L	M	H
15	QPSK	1	0	23.63	23.72	23.58	0.2009	0.2051	0.1986
15	16QAM	1	0	22.55	22.57	22.45	0.1567	0.1574	0.1531
Channel				18650	18900	19150	EIRP(W)		
Frequency (MHz)				1855	1880	1905	L	M	H
10	QPSK	1	0	23.69	23.77	23.63	0.2037	0.2075	0.2009
10	16QAM	1	0	22.43	22.66	22.51	0.1524	0.1607	0.1552
Channel				18625	18900	19175	EIRP(W)		
Frequency (MHz)				1852.5	1880	1907.5	L	M	H
5	QPSK	1	0	23.74	23.73	23.68	0.2061	0.2056	0.2032
5	16QAM	1	0	22.61	22.68	22.36	0.1589	0.1614	0.1500
Channel				18615	18900	19185	EIRP(W)		
Frequency (MHz)				1851.5	1880	1908.5	L	M	H
3	QPSK	1	0	23.60	23.77	23.68	0.1995	0.2075	0.2032
3	16QAM	1	0	22.42	22.59	22.47	0.1521	0.1581	0.1538
Channel				18607	18900	19193	EIRP(W)		
Frequency (MHz)				1850.7	1880	1909.3	L	M	H
1.4	QPSK	1	0	23.65	23.80	23.65	0.2018	0.2089	0.2018
1.4	16QAM	1	0	22.72	22.86	22.76	0.1629	0.1683	0.1644

LTE Band 4-Ant 2									
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	23.34	23.52	23.36	0.2188	0.2280	0.2198
20	QPSK	1	99	23.41	23.48	23.36	0.2223	0.2259	0.2198
20	QPSK	100	0	22.37	22.40	22.32	0.1750	0.1762	0.1730
20	16QAM	1	0	22.64	22.67	22.61	0.1862	0.1875	0.1849
20	64QAM	1	0	21.49	21.63	21.53	0.1429	0.1476	0.1442
20	256QAM	1	0	18.45	18.59	18.39	0.0710	0.0733	0.0700
Channel				20025	20175	20325	EIRP(W)		
Frequency (MHz)				1717.5	1732.5	1747.5	L	M	H
15	QPSK	1	0	23.20	23.48	23.33	0.2118	0.2259	0.2183
15	16QAM	1	0	22.57	22.63	22.54	0.1832	0.1858	0.1820
Channel				20000	20175	20350	EIRP(W)		
Frequency (MHz)				1715	1732.5	1750	L	M	H
10	QPSK	1	0	23.27	23.45	23.28	0.2153	0.2244	0.2158
10	16QAM	1	0	22.48	22.61	22.51	0.1795	0.1849	0.1807
Channel				19975	20175	20375	EIRP(W)		
Frequency (MHz)				1712.5	1732.5	1752.5	L	M	H
5	QPSK	1	0	23.20	23.41	23.28	0.2118	0.2223	0.2158
5	16QAM	1	0	22.58	22.50	22.47	0.1837	0.1803	0.1791
Channel				19965	20175	20385	EIRP(W)		
Frequency (MHz)				1711.5	1732.5	1753.5	L	M	H
3	QPSK	1	0	23.26	23.46	23.28	0.2148	0.2249	0.2158
3	16QAM	1	0	22.55	22.58	22.48	0.1824	0.1837	0.1795
Channel				19950	20175	20393	EIRP(W)		
Frequency (MHz)				1710	1732.5	1754.3	L	M	H
1.4	QPSK	1	0	23.22	23.42	23.21	0.2128	0.2228	0.2123
1.4	16QAM	1	0	22.39	22.60	22.42	0.1758	0.1845	0.1770

LTE Band 5-Ant 0									
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	23.68	23.76	23.60	0.0713	0.0726	0.0700
10	QPSK	1	49	23.61	23.63	23.52	0.0701	0.0705	0.0687
10	QPSK	50	0	22.49	22.71	22.60	0.0542	0.0570	0.0556
10	16QAM	1	0	22.67	22.83	22.75	0.0565	0.0586	0.0575
10	64QAM	1	0	21.75	21.78	21.72	0.0457	0.0460	0.0454
10	256QAM	1	0	18.77	18.84	18.72	0.0230	0.0234	0.0228
Channel				20425	20525	20625	ERP(W)		
Frequency (MHz)				826.5	836.5	846.5	L	M	H
5	QPSK	1	0	23.56	23.66	23.54	0.0693	0.0710	0.0690
5	16QAM	1	0	22.57	22.68	22.65	0.0552	0.0566	0.0562
Channel				20415	20525	20635	ERP(W)		
Frequency (MHz)				825.5	836.5	847.5	L	M	H
3	QPSK	1	0	23.62	23.61	23.55	0.0703	0.0701	0.0692
3	16QAM	1	0	22.59	22.78	22.64	0.0555	0.0579	0.0561
Channel				20407	20525	20643	ERP(W)		
Frequency (MHz)				824.7	836.5	848.3	L	M	H
1.4	QPSK	1	0	23.59	23.63	23.47	0.0698	0.0705	0.0679
1.4	16QAM	1	0	22.54	22.79	22.70	0.0548	0.0581	0.0569

LTE Band 25-Ant 1									
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	23.76	23.83	23.70	0.2070	0.2104	0.2042
20	QPSK	1	99	23.61	23.80	23.66	0.2000	0.2089	0.2023
20	QPSK	100	0	22.64	22.78	22.58	0.1600	0.1652	0.1578
20	16QAM	1	0	22.60	22.70	22.62	0.1585	0.1622	0.1592
20	64QAM	1	0	22.25	22.34	22.27	0.1462	0.1493	0.1469
20	256QAM	1	0	18.69	18.85	18.67	0.0644	0.0668	0.0641
Channel				26115	26340	26615	EIRP(W)		
Frequency (MHz)				1857.5	1880	1907.5	L	M	H
15	QPSK	1	0	23.42	23.81	23.59	0.1914	0.2094	0.1991
15	16QAM	1	0	22.60	22.69	22.45	0.1585	0.1618	0.1531
Channel				26090	26340	26640	EIRP(W)		
Frequency (MHz)				1855	1880	1910	L	M	H
10	QPSK	1	0	23.52	23.79	23.56	0.1959	0.2084	0.1977
10	16QAM	1	0	22.44	22.60	22.54	0.1528	0.1585	0.1563
Channel				26065	26340	26665	EIRP(W)		
Frequency (MHz)				1852.5	1880	1912.5	L	M	H
5	QPSK	1	0	23.60	23.81	23.44	0.1995	0.2094	0.1923
5	16QAM	1	0	22.50	22.67	22.48	0.1549	0.1611	0.1542
Channel				26055	26340	26675	EIRP(W)		
Frequency (MHz)				1851.5	1880	1913.5	L	M	H
3	QPSK	1	0	23.73	23.80	23.64	0.2056	0.2089	0.2014
3	16QAM	1	0	22.60	22.61	22.62	0.1585	0.1589	0.1592
Channel				26047	26340	26683	EIRP(W)		
Frequency (MHz)				1850.7	1880	1914.3	L	M	H
1.4	QPSK	1	0	23.71	23.81	23.66	0.2046	0.2094	0.2023
1.4	16QAM	1	0	22.59	22.61	22.79	0.1581	0.1589	0.1656

LTE Band 26-Ant 0											
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	23.60	23.79	23.66	23.76	0.0700	0.0731	0.0710	0.0726
15	QPSK	1	74	23.52	23.64	23.49	23.72	0.0687	0.0706	0.0682	0.0719
15	QPSK	75	0	22.56	22.72	22.69	22.68	0.0551	0.0571	0.0568	0.0566
15	16QAM	1	0	22.92	22.97	23.13	23.03	0.0598	0.0605	0.0628	0.0614
15	64QAM	1	0	21.88	21.85	21.76	22.00	0.0471	0.0468	0.0458	0.0484
15	256QAM	1	0	18.64	18.74	18.59	18.90	0.0223	0.0229	0.0221	0.0237
Channel					26840	26915	26990	ERP(W)			
Frequency (MHz)					829	836.5	844		L	M	H
10	QPSK	1	0		23.59	23.39	23.50		0.0698	0.0667	0.0684
10	16QAM	1	0		22.78	22.90	22.92		0.0579	0.0596	0.0598
Channel					26815	26915	27015	ERP(W)			
Frequency (MHz)					826.5	836.5	846.5		L	M	H
5	QPSK	1	0		23.70	23.40	23.57		0.0716	0.0668	0.0695
5	16QAM	1	0		22.78	22.82	22.90		0.0579	0.0585	0.0596
Channel					26815	26915	27025	ERP(W)			
Frequency (MHz)					825.5	836.5	847.5		L	M	H
3	QPSK	1	0		23.48	23.10	23.36		0.0681	0.0624	0.0662
3	16QAM	1	0		22.62	22.72	22.61		0.0558	0.0571	0.0557
Channel					26797	26915	27033	ERP(W)			
Frequency (MHz)					824.7	836.5	848.3		L	M	H
1.4	QPSK	1	0		23.41	23.18	23.45		0.0670	0.0635	0.0676
1.4	16QAM	1	0		22.69	22.71	22.60		0.0568	0.0570	0.0556

LTE Band 66-Ant 2									
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	23.42	23.60	23.47	0.2228	0.2323	0.2254
20	QPSK	1	99	23.37	23.49	23.41	0.2203	0.2265	0.2223
20	QPSK	100	0	22.45	22.51	22.34	0.1782	0.1807	0.1738
20	16QAM	1	0	22.69	22.71	22.59	0.1884	0.1892	0.1841
20	64QAM	1	0	21.46	21.60	21.56	0.1419	0.1466	0.1452
20	256QAM	1	0	18.55	18.62	18.41	0.0726	0.0738	0.0703
Channel				132047	132322	132597	EIRP(W)		
Frequency (MHz)				1717.5	1745	1772.5	L	M	H
15	QPSK	1	0	23.27	23.46	23.31	0.2153	0.2249	0.2173
15	16QAM	1	0	22.67	22.55	22.50	0.1875	0.1824	0.1803
Channel				132022	132322	132622	EIRP(W)		
Frequency (MHz)				1715	1745	1775	L	M	H
10	QPSK	1	0	23.29	23.57	23.35	0.2163	0.2307	0.2193
10	16QAM	1	0	22.60	22.66	22.56	0.1845	0.1871	0.1828
Channel				131997	132322	132647	EIRP(W)		
Frequency (MHz)				1712.5	1745	1777.5	L	M	H
5	QPSK	1	0	23.27	23.53	23.34	0.2153	0.2286	0.2188
5	16QAM	1	0	22.64	22.59	22.54	0.1862	0.1841	0.1820
Channel				131987	132322	132657	EIRP(W)		
Frequency (MHz)				1711.5	1745	1778.5	L	M	H
3	QPSK	1	0	23.25	23.50	23.39	0.2143	0.2270	0.2213
3	16QAM	1	0	22.60	22.59	22.54	0.1845	0.1841	0.1820
Channel				131979	132322	132665	EIRP(W)		
Frequency (MHz)				1710.7	1745	1779.3	L	M	H
1.4	QPSK	1	0	23.55	23.49	23.42	0.2296	0.2265	0.2228
1.4	16QAM	1	0	22.66	22.55	22.53	0.1871	0.1824	0.1816

CA Power and ERP/EIRP

LTE Band 5B-Ant 0							
Combination 10MHz+10MHz (50RB+50RB)							
Channel	Modulation	PCC		SCC		Measured Power	ERP(W)
		RB Size	RB offset	RB Size	RB offset		
L	QPSK	1	Max	1	0	23.74	0.0723
M	QPSK	1	Max	1	0	23.82	0.0736
H	QPSK	1	Max	1	0	23.76	0.0726
L	16QAM	1	Max	1	0	22.70	0.0569
M	16QAM	1	Max	1	0	22.71	0.0570
H	16QAM	1	Max	1	0	22.63	0.0560
L	64QAM	1	Max	1	0	21.52	0.0434
M	64QAM	1	Max	1	0	21.58	0.0440
H	64QAM	1	Max	1	0	21.61	0.0443
L	256QAM	1	Max	1	0	18.71	0.0227
M	256QAM	1	Max	1	0	18.69	0.0226
H	256QAM	1	Max	1	0	18.70	0.0226
Combination 10MHz+5MHz (50RB+25RB)							
Channel	Modulation	PCC		SCC		Measured Power	ERP(W)
		RB Size	RB offset	RB Size	RB offset		
M	QPSK	1	Max	1	0	23.69	0.0714
M	16QAM	1	Max	1	0	22.58	0.0553
Combination 5MHz+10MHz (25RB+50RB)							
Channel	Modulation	PCC		SCC		Measured Power	ERP(W)
		RB Size	RB offset	RB Size	RB offset		
M	QPSK	1	Max	1	0	23.64	0.0706
M	16QAM	1	Max	1	0	22.49	0.0542
Combination 5MHz+3MHz (25RB+15RB)							
Channel	Modulation	PCC		SCC		Measured Power	ERP(W)
		RB Size	RB offset	RB Size	RB offset		
M	QPSK	1	Max	1	0	23.70	0.0716
M	16QAM	1	Max	1	0	22.51	0.0545
Combination 3MHz+5MHz (15RB+25RB)							
Channel	Modulation	PCC		SCC		Measured Power	ERP(W)
		RB Size	RB offset	RB Size	RB offset		
M	QPSK	1	Max	1	0	23.64	0.0706
M	16QAM	1	Max	1	0	22.44	0.0536

LTE Band 66B-Ant 2							
Combination 10MHz+10MHz (50RB+50RB)							
Channel	Modulation	PCC		SCC		Measured Power	EIRP(W)
		RB Size	RB offset	RB Size	RB offset		
L	QPSK	1	Max	1	0	23.41	0.2223
M	QPSK	1	Max	1	0	23.54	0.2291
H	QPSK	1	Max	1	0	23.44	0.2239
L	16QAM	1	Max	1	0	22.51	0.1807
M	16QAM	1	Max	1	0	22.43	0.1774
H	16QAM	1	Max	1	0	22.47	0.1791
L	64QAM	1	Max	1	0	21.39	0.1396
M	64QAM	1	Max	1	0	21.28	0.1361
H	64QAM	1	Max	1	0	21.35	0.1384
L	256QAM	1	Max	1	0	18.30	0.0685
M	256QAM	1	Max	1	0	18.35	0.0693
H	256QAM	1	Max	1	0	18.27	0.0681
Combination 15MHz+5MHz (75RB+25RB)							
Channel	Modulation	PCC		SCC		Measured Power	EIRP(W)
		RB Size	RB offset	RB Size	RB offset		
M	QPSK	1	Max	1	0	23.42	0.2228
L	16QAM	1	Max	1	0	22.39	0.1758
Combination 5MHz+15MHz (25RB+75RB)							
Channel	Modulation	PCC		SCC		Measured Power	EIRP(W)
		RB Size	RB offset	RB Size	RB offset		
M	QPSK	1	Max	1	0	23.31	0.2173
L	16QAM	1	Max	1	0	22.28	0.1714
Combination 10MHz+5MHz (50RB+25RB)							
Channel	Modulation	PCC		SCC		Measured Power	EIRP(W)
		RB Size	RB offset	RB Size	RB offset		
M	QPSK	1	Max	1	0	23.40	0.2218
L	16QAM	1	Max	1	0	22.30	0.1722
Combination 5MHz+10MHz (25RB+50RB)							
Channel	Modulation	PCC		SCC		Measured Power	EIRP(W)
		RB Size	RB offset	RB Size	RB offset		
M	QPSK	1	Max	1	0	23.37	0.2203
L	16QAM	1	Max	1	0	22.28	0.1714
Combination 5MHz+5MHz (25RB+25RB)							
Channel	Modulation	PCC		SCC		Measured Power	EIRP(W)
		RB Size	RB offset	RB Size	RB offset		
M	QPSK	1	Max	1	0	23.41	0.2223
L	16QAM	1	Max	1	0	22.37	0.1750

LTE Band 66C-Ant 2							
Combination 20MHz+20MHz (100RB+100RB)							
Channel	Modulation	PCC		SCC		Measured Power	EIRP(W)
		RB Size	RB offset	RB Size	RB offset		
L	QPSK	1	Max	1	0	23.43	0.2234
M	QPSK	1	Max	1	0	23.55	0.2296
H	QPSK	1	Max	1	0	23.46	0.2249
L	16QAM	1	Max	1	0	22.46	0.1786
M	16QAM	1	Max	1	0	22.39	0.1758
H	16QAM	1	Max	1	0	22.50	0.1803
L	64QAM	1	Max	1	0	21.46	0.1419
M	64QAM	1	Max	1	0	21.39	0.1396
H	64QAM	1	Max	1	0	21.41	0.1403
L	256QAM	1	Max	1	0	18.43	0.0706
M	256QAM	1	Max	1	0	18.28	0.0682
H	256QAM	1	Max	1	0	18.36	0.0695
Combination 20MHz+15MHz (100RB+75RB)							
Channel	Modulation	PCC		SCC		Measured Power	EIRP(W)
		RB Size	RB offset	RB Size	RB offset		
M	QPSK	1	Max	1	0	23.46	0.2249
H	16QAM	1	Max	1	0	22.39	0.1758
Combination 15MHz+20MHz (75RB+100RB)							
Channel	Modulation	PCC		SCC		Measured Power	EIRP(W)
		RB Size	RB offset	RB Size	RB offset		
M	QPSK	1	Max	1	0	23.41	0.2223
H	16QAM	1	Max	1	0	22.35	0.1742
Combination 15MHz+15MHz (75RB+75RB)							
Channel	Modulation	PCC		SCC		Measured Power	EIRP(W)
		RB Size	RB offset	RB Size	RB offset		
M	QPSK	1	Max	1	0	23.30	0.2168
H	16QAM	1	Max	1	0	22.25	0.1702
Combination 20MHz+10MHz (100RB+50RB)							
Channel	Modulation	PCC		SCC		Measured Power	EIRP(W)
		RB Size	RB offset	RB Size	RB offset		
M	QPSK	1	Max	1	0	23.39	0.2213
H	16QAM	1	Max	1	0	22.31	0.1726
Combination 10MHz+20MHz (50RB+100RB)							
Channel	Modulation	PCC		SCC		Measured Power	EIRP(W)
		RB Size	RB offset	RB Size	RB offset		
M	QPSK	1	Max	1	0	23.24	0.2138
H	16QAM	1	Max	1	0	22.29	0.1718
Combination 15MHz+10MHz (75RB+50RB)							
Channel	Modulation	PCC		SCC		Measured Power	EIRP(W)
		RB Size	RB offset	RB Size	RB offset		
M	QPSK	1	Max	1	0	23.37	0.2203

H	16QAM	1	Max	1	0	22.36	0.1746
Combination 10MHz+15MHz (50RB+75RB)							
Channel	Modulation	PCC		SCC		Measured Power	EIRP(W)
		RB Size	RB offset	RB Size	RB offset		
M	QPSK	1	Max	1	0	23.36	0.2198
H	16QAM	1	Max	1	0	22.33	0.1734
Combination 20MHz+5MHz (100RB+25RB)							
Channel	Modulation	PCC		SCC		Measured Power	EIRP(W)
		RB Size	RB offset	RB Size	RB offset		
M	QPSK	1	Max	1	0	23.25	0.2143
H	16QAM	1	Max	1	0	22.16	0.1667
Combination 5MHz+20MHz (25RB+100RB)							
Channel	Modulation	PCC		SCC		Measured Power	EIRP(W)
		RB Size	RB offset	RB Size	RB offset		
M	QPSK	1	Max	1	0	23.31	0.2173
H	16QAM	1	Max	1	0	22.19	0.1679

LTE Band 5B

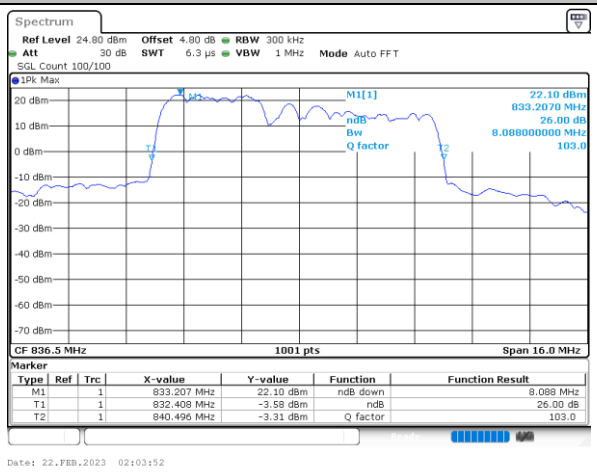
26dB Bandwidth

Mode	LTE Band 5B : 26dB BW(MHz)	
Mod.	QPSK	16QAM
BW	3MHz+5MHz	
Middle CH	8.09	8.10
Mod.	QPSK	16QAM
BW	5MHz+3MHz	
Middle CH	8.17	8.17
Mod.	QPSK	16QAM
BW	5MHz+10MHz	
Middle CH	14.54	14.54
Mod.	QPSK	16QAM
BW	10MHz+5MHz	
Middle CH	14.63	14.75
Mod.	QPSK	16QAM
BW	10MHz+10MHz	
Middle CH	19.62	19.58

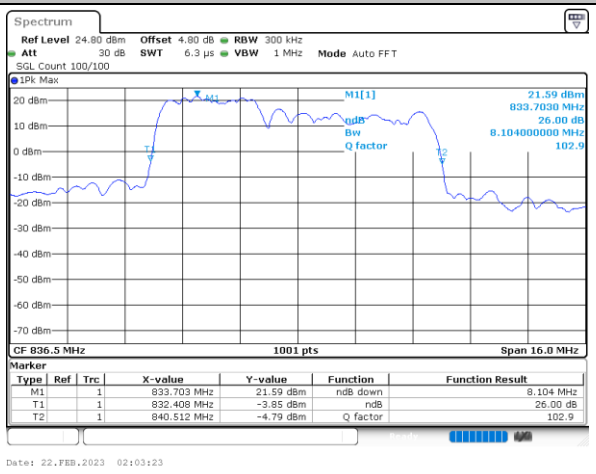
LTE Band 5B

QPSK

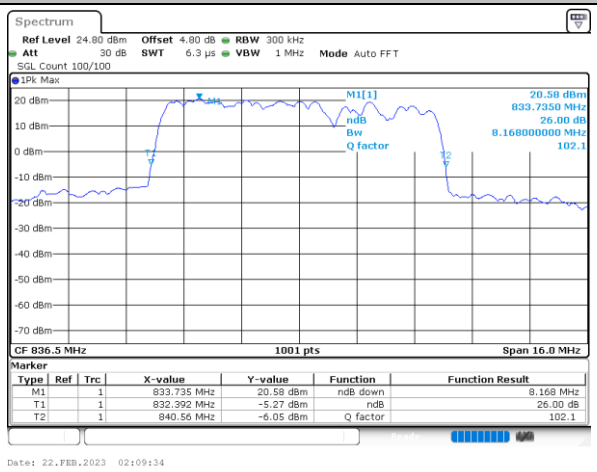
Middle Channel / 3MHz+5MHz / QPSK



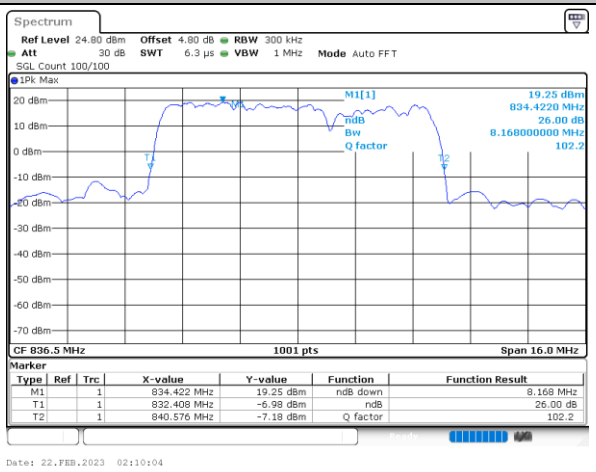
Middle Channel / 3MHz+5MHz /16QAM



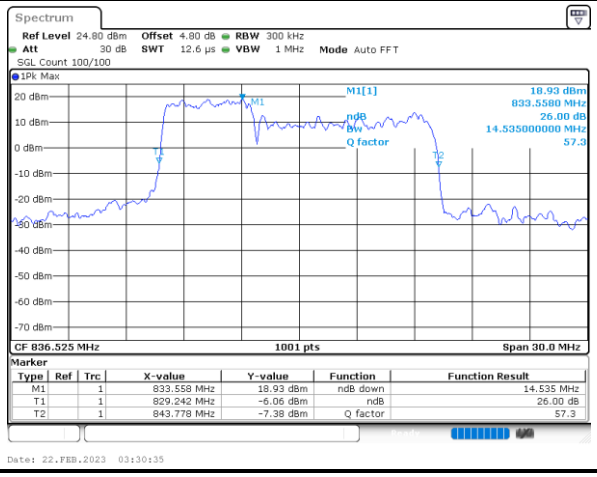
Middle Channel / 5MHz+3MHz / QPSK



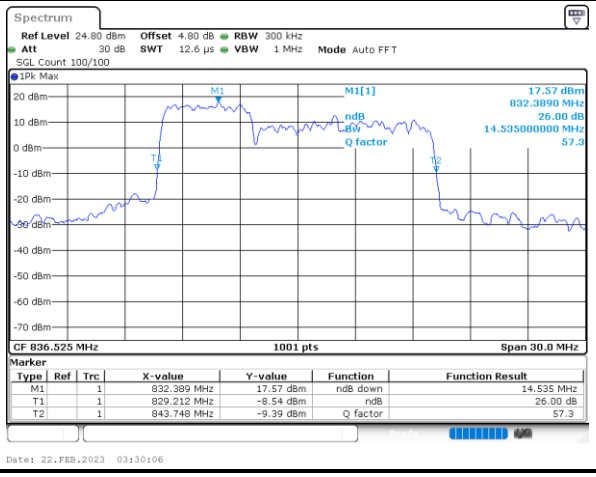
Middle Channel / 5MHz+3MHz /16QAM



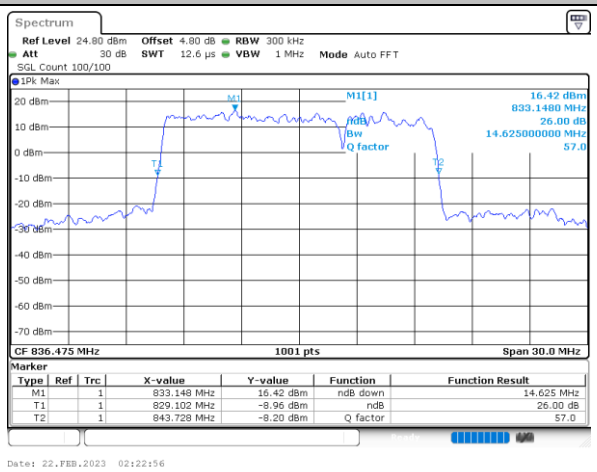
Middle Channel / 5MHz+10MHz / QPSK



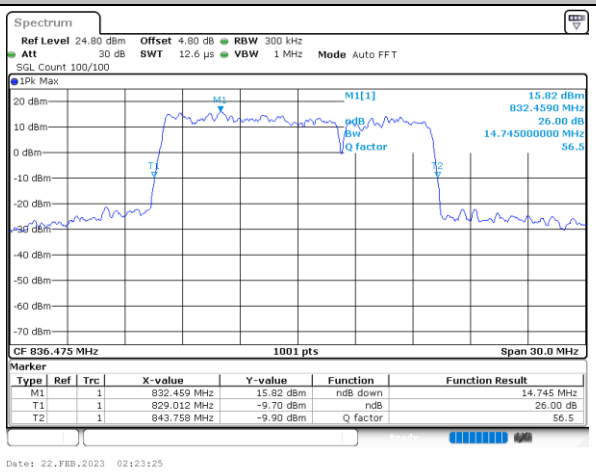
Middle Channel / 5MHz+10MHz /16QAM



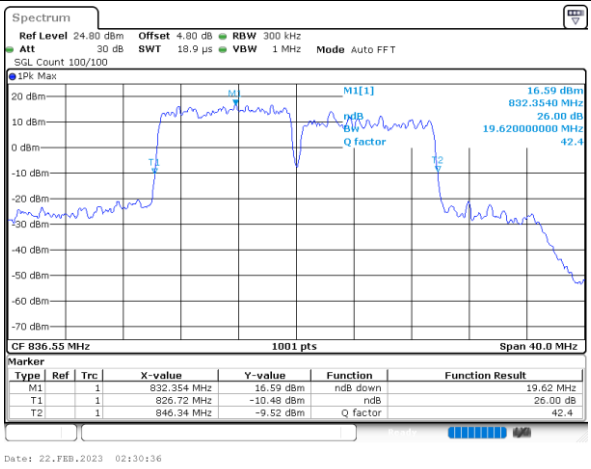
Middle Channel / 10MHz+5MHz / QPSK



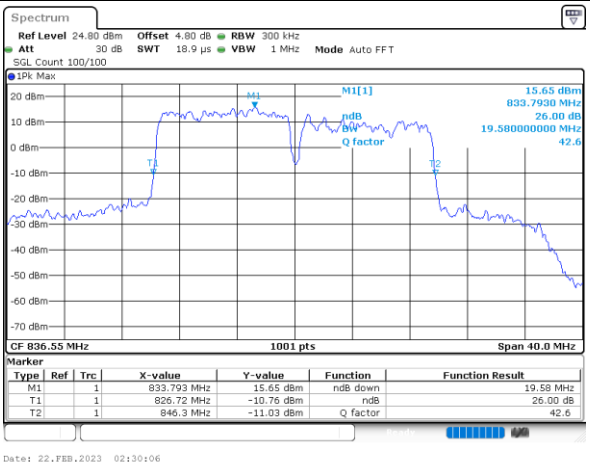
Middle Channel / 10MHz+5MHz /16QAM



Middle Channel / 10MHz+10MHz / QPSK



Middle Channel / 10MHz+10MHz /16QAM



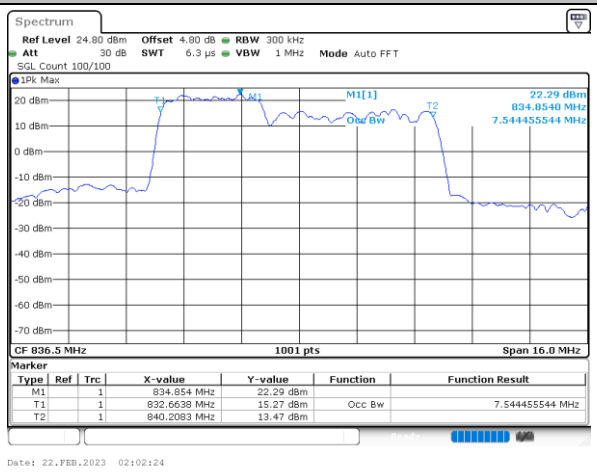
Occupied Bandwidth

Mode	LTE Band 5B : 99%OBW(MHz)	
Mod.	QPSK	16QAM
BW	3MHz+5MHz	
Middle CH	7.54	7.51
Mod.	QPSK	16QAM
BW	5MHz+3MHz	
Middle CH	7.58	7.51
Mod.	QPSK	16QAM
BW	5MHz+10MHz	
Middle CH	13.85	13.79
Mod.	QPSK	16QAM
BW	10MHz+5MHz	
Middle CH	13.88	13.91
Mod.	QPSK	16QAM
BW	10MHz+10MHz	
Middle CH	18.66	18.66

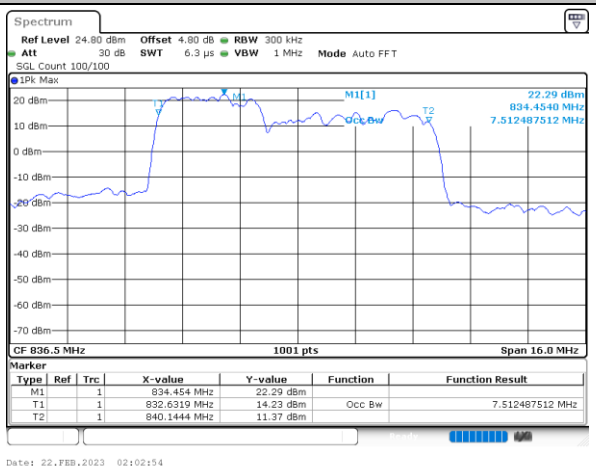
LTE Band 5B

QPSK

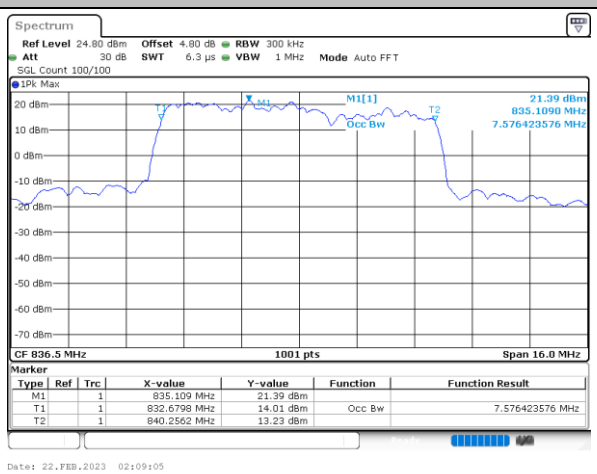
Middle Channel / 3MHz+5MHz / QPSK



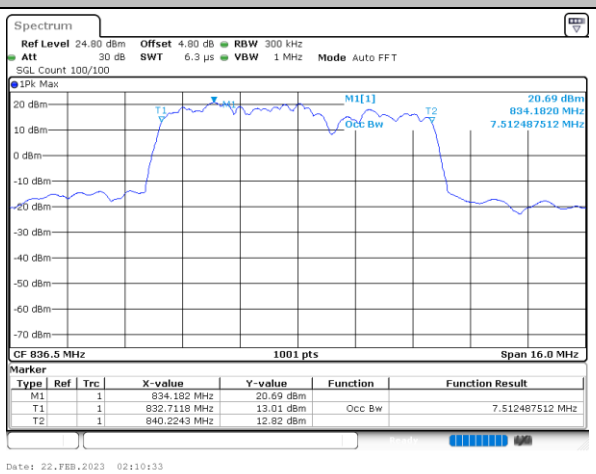
Middle Channel / 3MHz+5MHz /16QAM



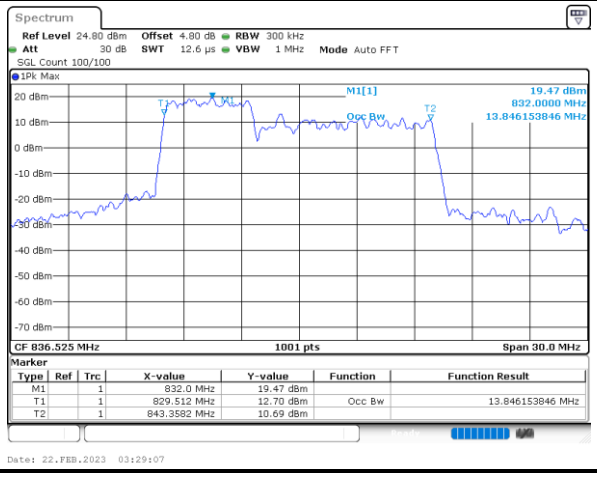
Middle Channel / 5MHz+3MHz / QPSK



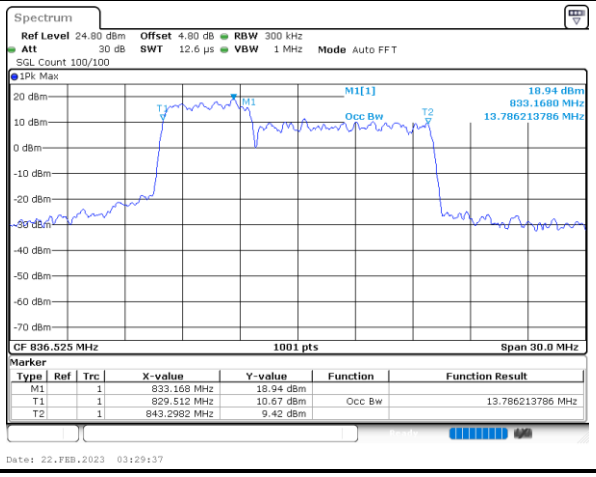
Middle Channel / 5MHz+3MHz /16QAM



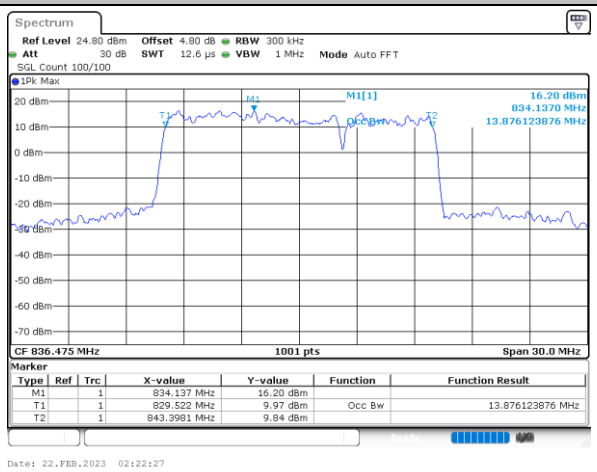
Middle Channel / 5MHz+10MHz / QPSK



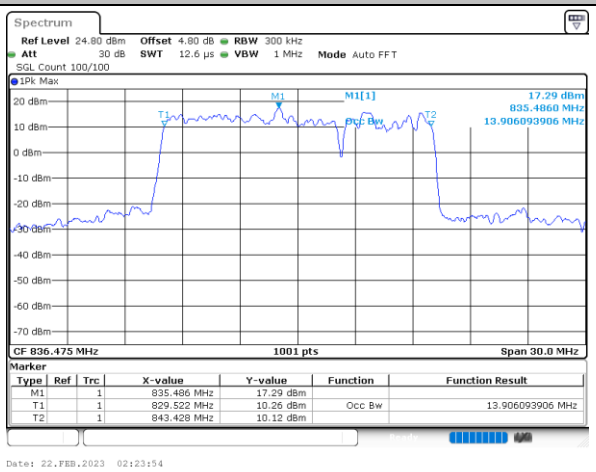
Middle Channel / 5MHz+10MHz /16QAM



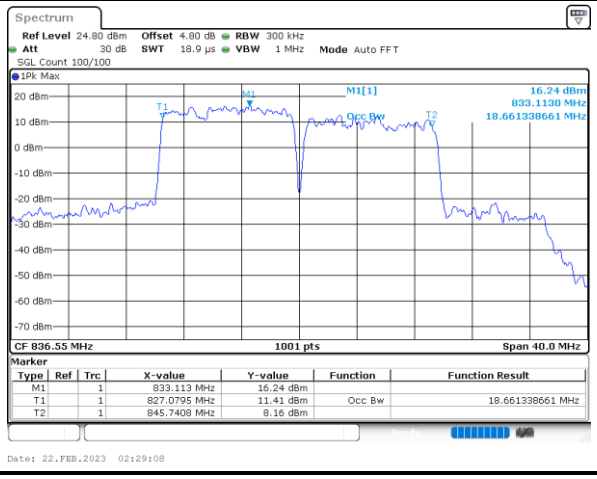
Middle Channel / 10MHz+5MHz / QPSK



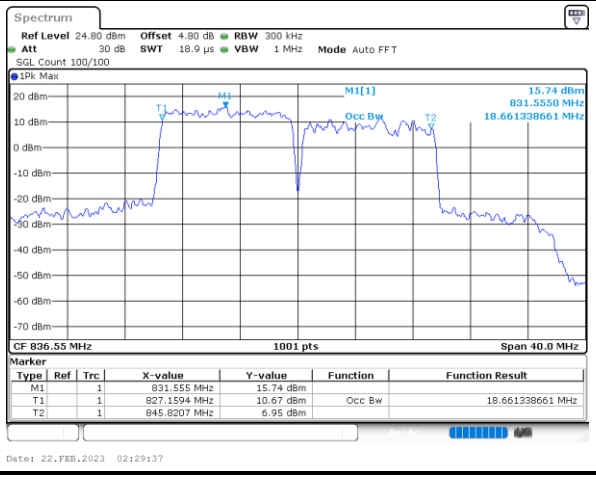
Middle Channel / 10MHz+5MHz /16QAM



Middle Channel / 10MHz+10MHz / QPSK



Middle Channel / 10MHz+10MHz /16QAM

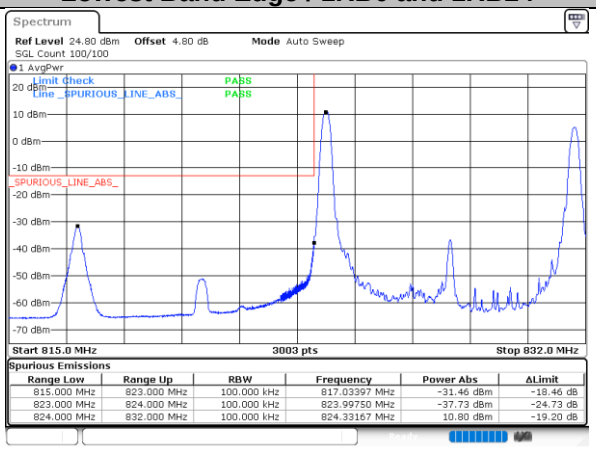


Conducted Band Edge

LTE Band 5B / 3MHz+5MHz

QPSK

Lowest Band Edge / 1RB0 and 1RB24

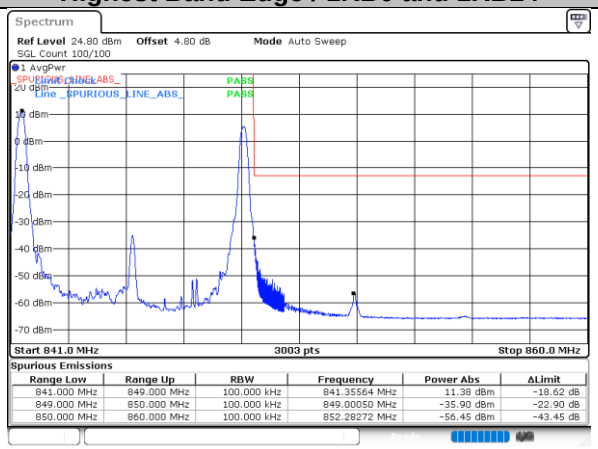


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	817.03397 MHz	-31.46 dBm	-18.46 dB
823.000 MHz	824.000 MHz	100.000 kHz	823.99750 MHz	-37.73 dBm	-24.73 dB
824.000 MHz	832.000 MHz	100.000 kHz	824.33167 MHz	10.80 dBm	-19.20 dB

Date: 21.FEB.2023 21:49:31

Highest Band Edge / 1RB0 and 1RB24

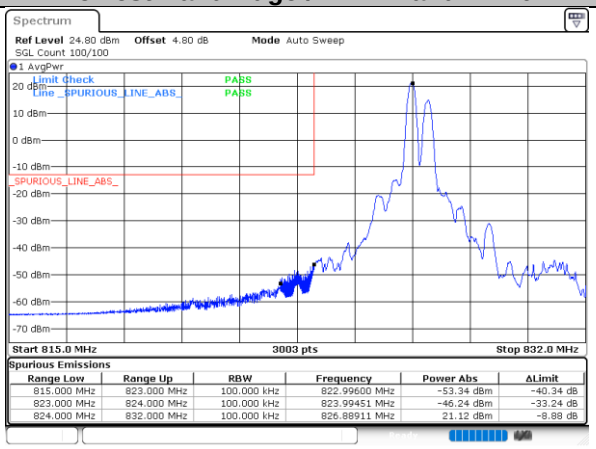


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
841.000 MHz	849.000 MHz	100.000 kHz	841.35564 MHz	11.38 dBm	-18.62 dB
849.000 MHz	850.000 MHz	100.000 kHz	849.00050 MHz	-35.90 dBm	-22.90 dB
850.000 MHz	860.000 MHz	100.000 kHz	852.28272 MHz	-56.45 dBm	-43.45 dB

Date: 21.FEB.2023 22:13:39

Lowest Band Edge / 1RB14 and 1RB0



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.99600 MHz	-53.34 dBm	-40.34 dB
823.000 MHz	824.000 MHz	100.000 kHz	823.99451 MHz	-46.24 dBm	-33.24 dB
824.000 MHz	832.000 MHz	100.000 kHz	826.88911 MHz	21.12 dBm	-8.88 dB

Date: 21.FEB.2023 21:57:40

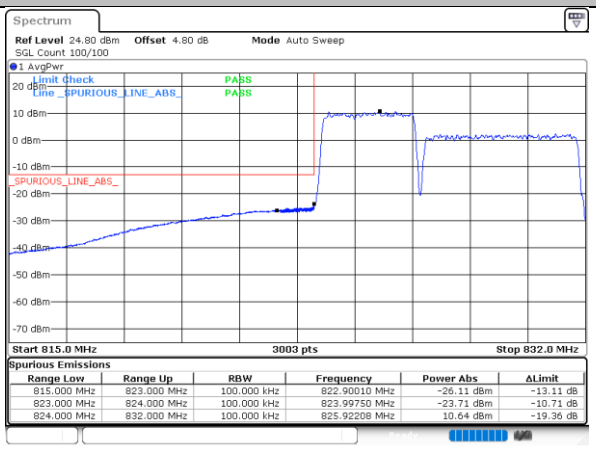
Highest Band Edge / 1RB14 and 1RB0

Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
841.000 MHz	849.000 MHz	100.000 kHz	843.85714 MHz	20.24 dBm	-9.76 dB
849.000 MHz	850.000 MHz	100.000 kHz	849.56494 MHz	-53.45 dBm	-40.45 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.15485 MHz	-59.79 dBm	-46.79 dB

Date: 21.FEB.2023 22:21:35

Lowest Band Edge / Full RB

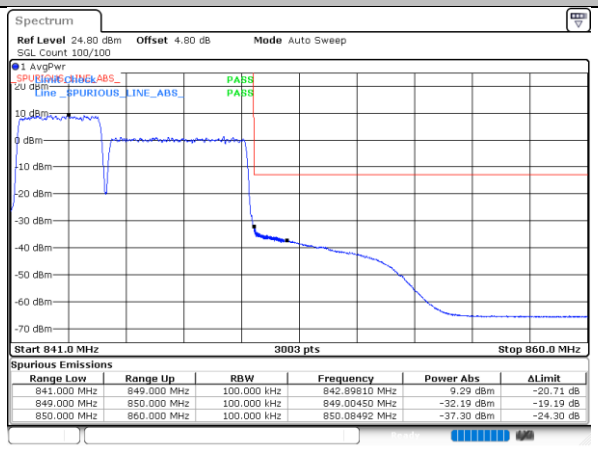


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.90010 MHz	-26.11 dBm	-13.11 dB
823.000 MHz	824.000 MHz	100.000 kHz	823.99750 MHz	-23.71 dBm	-10.71 dB
824.000 MHz	832.000 MHz	100.000 kHz	825.92208 MHz	10.64 dBm	-19.36 dB

Date: 21.FEB.2023 21:41:29

Highest Band Edge / Full RB



Spurious Emissions

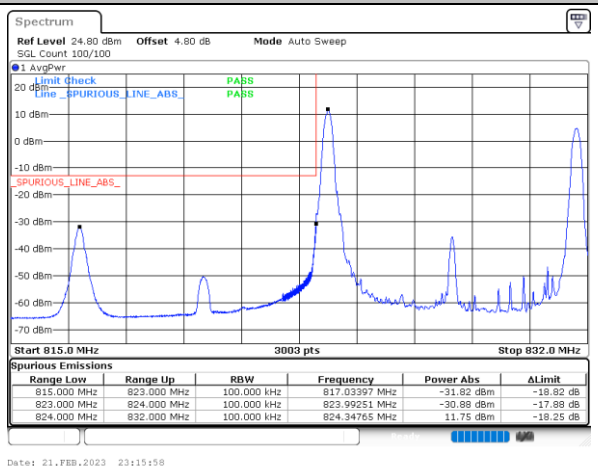
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
841.000 MHz	849.000 MHz	100.000 kHz	842.89810 MHz	9.29 dBm	-20.71 dB
849.000 MHz	850.000 MHz	100.000 kHz	849.00450 MHz	-32.19 dBm	-19.19 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.08492 MHz	-37.30 dBm	-24.30 dB

Date: 21.FEB.2023 22:05:43

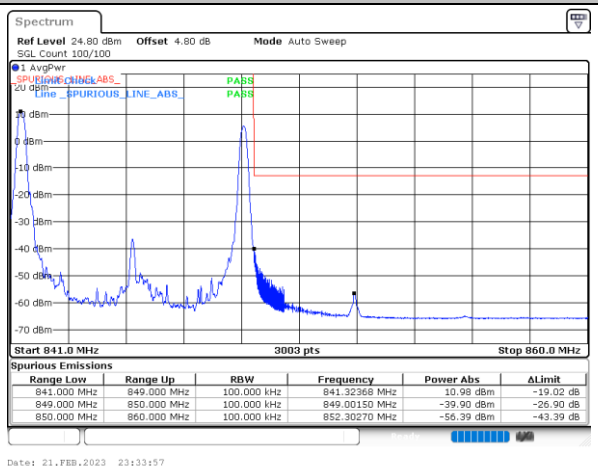
LTE Band 5B / 5MHz+3MHz

QPSK

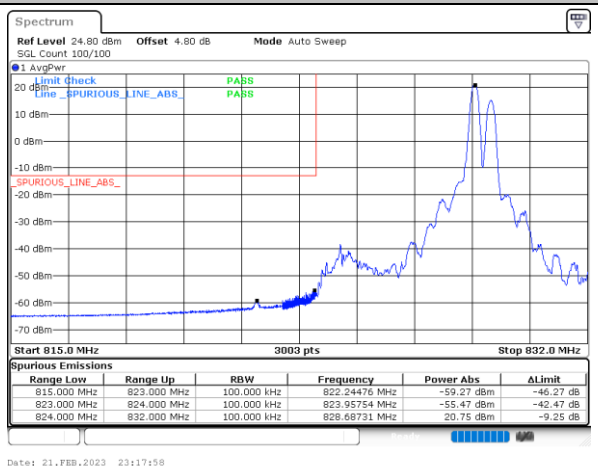
Lowest Band Edge / 1RB0 and 1RB14



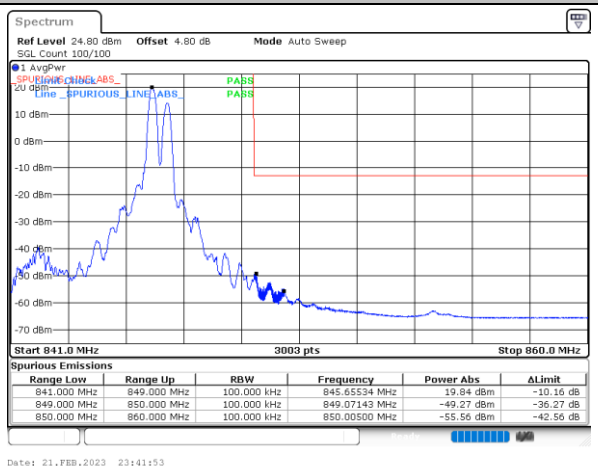
Highest Band Edge / 1RB0 and 1RB14



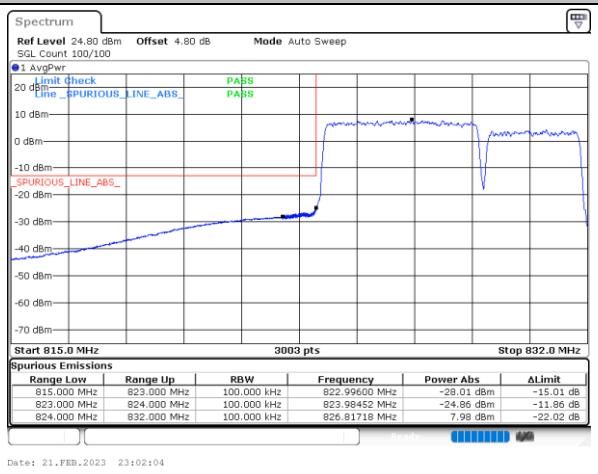
Lowest Band Edge / 1RB24 and 1RB0



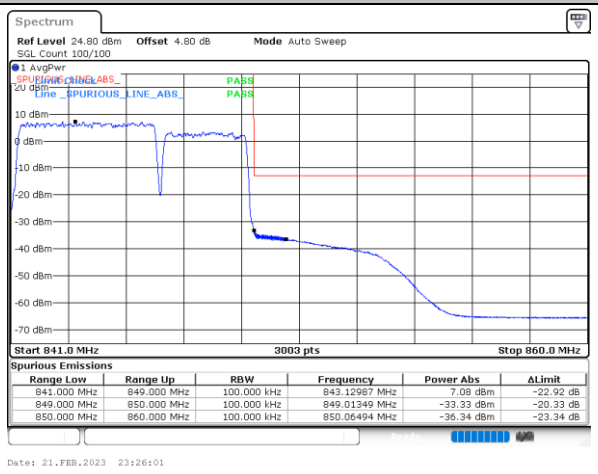
Highest Band Edge / 1RB24 and 1RB0



Lowest Band Edge / Full RB



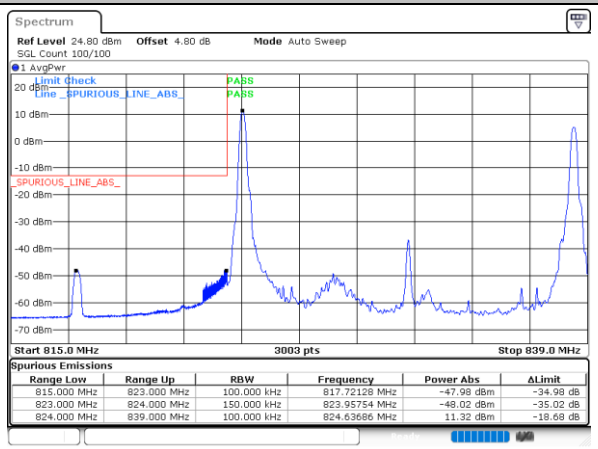
Highest Band Edge / Full RB



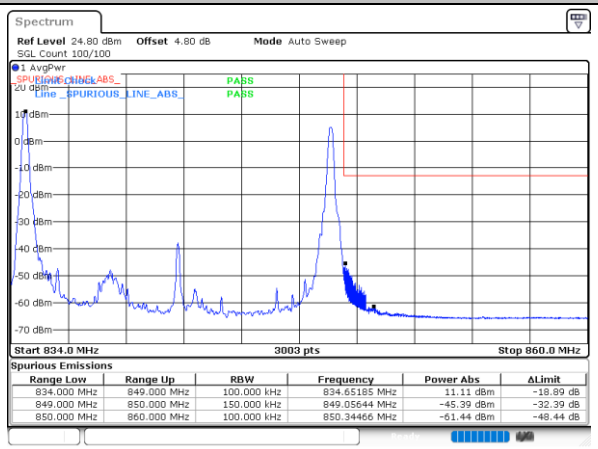
LTE Band 5B / 5MHz+10MHz

QPSK

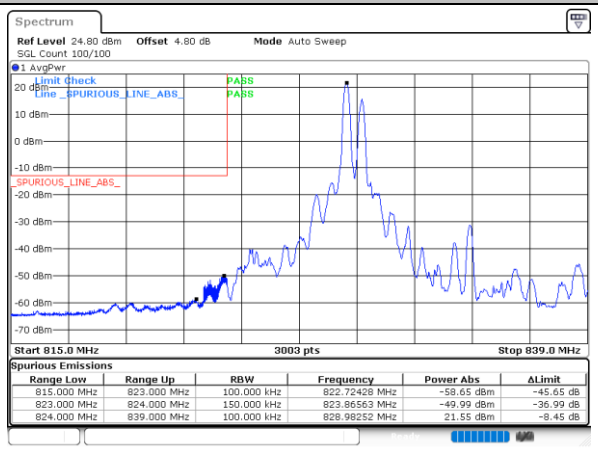
Lowest Band Edge / 1RB0 and 1RB49



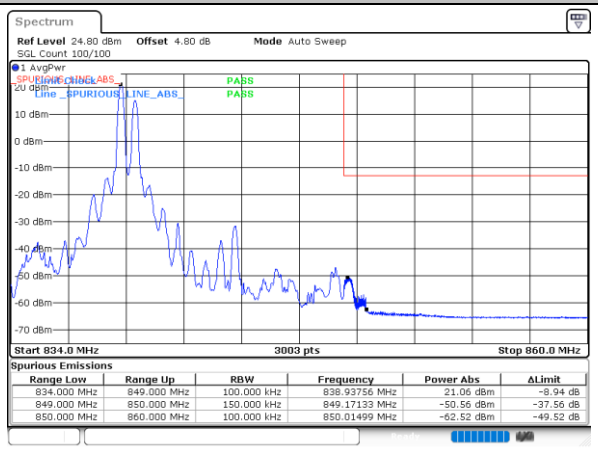
Highest Band Edge / 1RB0 and 1RB49



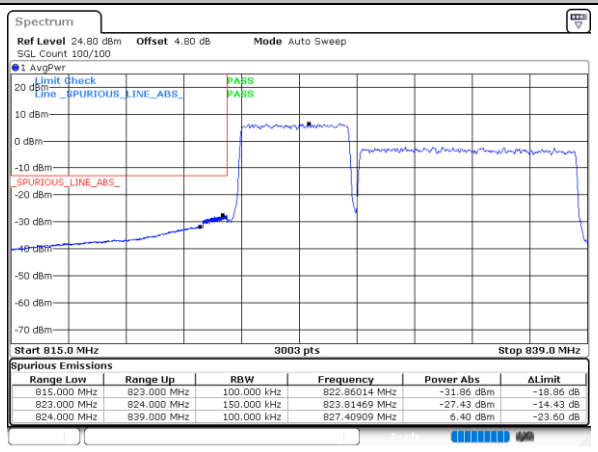
Lowest Band Edge / 1RB24 and 1RB0



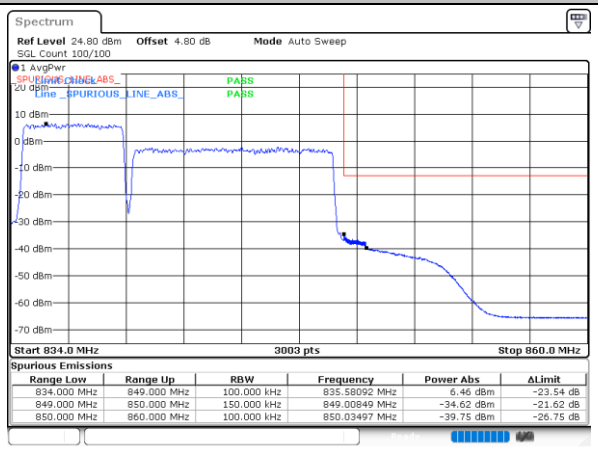
Highest Band Edge / 1RB24 and 1RB0



Lowest Band Edge / Full RB



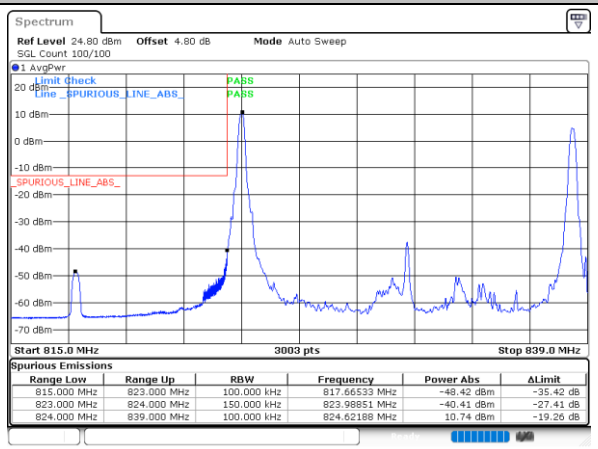
Highest Band Edge / Full RB



LTE Band 5B / 10MHz+5MHz

QPSK

Lowest Band Edge / 1RB0 and 1RB24

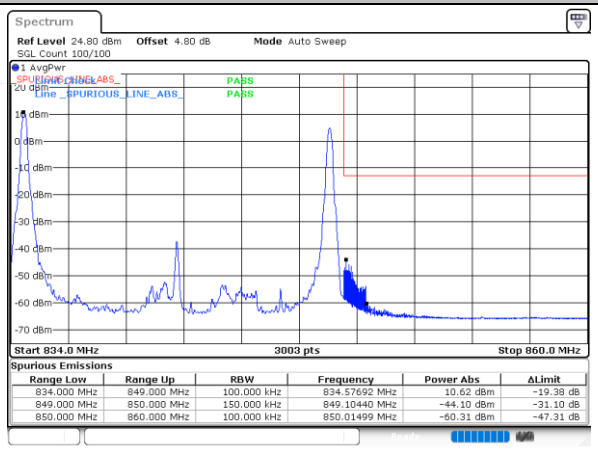


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	817.66533 MHz	-48.42 dBm	-35.42 dB
823.000 MHz	824.000 MHz	150.000 kHz	823.98851 MHz	-40.41 dBm	-27.41 dB
824.000 MHz	839.000 MHz	100.000 kHz	824.62188 MHz	10.74 dBm	-19.26 dB

Date: 22.FEB.2023 00:33:12

Highest Band Edge / 1RB0 and 1RB24

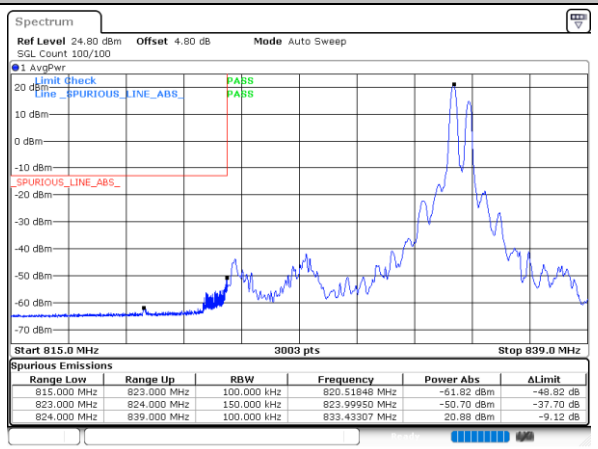


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
834.000 MHz	849.000 MHz	100.000 kHz	834.57692 MHz	10.62 dBm	-19.38 dB
849.000 MHz	850.000 MHz	150.000 kHz	849.10440 MHz	-44.10 dBm	-31.10 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.01499 MHz	-60.31 dBm	-47.31 dB

Date: 22.FEB.2023 00:57:05

Lowest Band Edge / 1RB49 and 1RB0

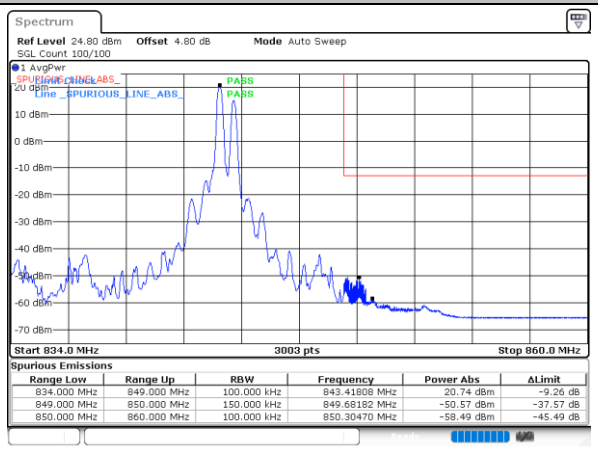


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	820.51848 MHz	-61.82 dBm	-48.82 dB
823.000 MHz	824.000 MHz	150.000 kHz	823.99950 MHz	-50.70 dBm	-37.70 dB
824.000 MHz	839.000 MHz	100.000 kHz	833.43307 MHz	20.88 dBm	-9.12 dB

Date: 22.FEB.2023 00:41:08

Highest Band Edge / 1RB49 and 1RB0

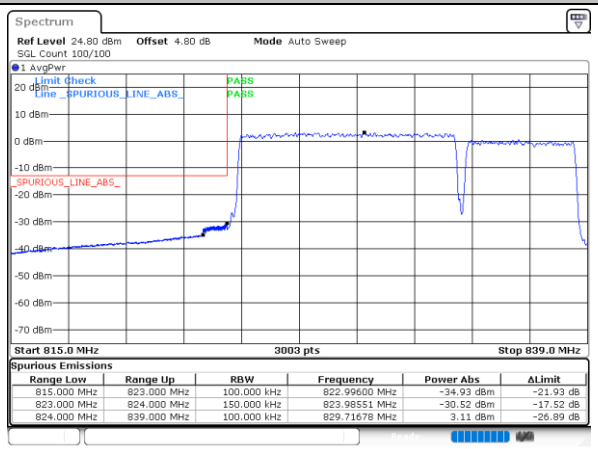


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
834.000 MHz	849.000 MHz	100.000 kHz	843.41808 MHz	20.74 dBm	-9.26 dB
849.000 MHz	850.000 MHz	150.000 kHz	849.68182 MHz	-50.57 dBm	-37.57 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.30470 MHz	-58.49 dBm	-45.49 dB

Date: 22.FEB.2023 01:05:01

Lowest Band Edge / Full RB

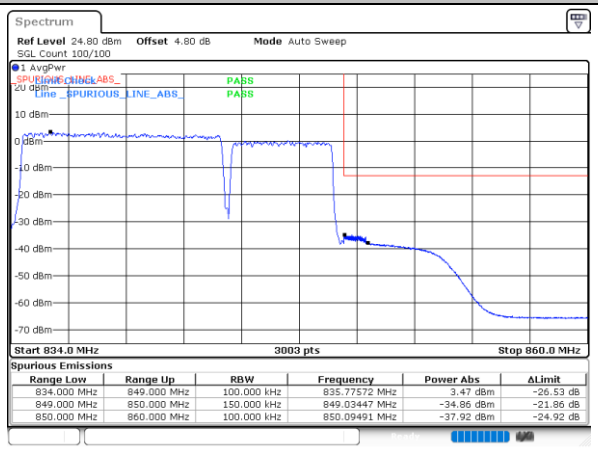


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.99600 MHz	-34.93 dBm	-21.93 dB
823.000 MHz	824.000 MHz	150.000 kHz	823.98551 MHz	-30.52 dBm	-17.52 dB
824.000 MHz	839.000 MHz	100.000 kHz	829.71678 MHz	3.11 dBm	-26.89 dB

Date: 21.FEB.2023 23:50:47

Highest Band Edge / Full RB



Spurious Emissions

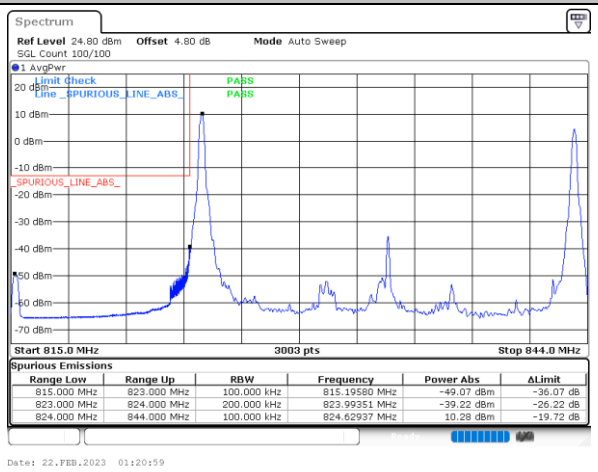
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
834.000 MHz	849.000 MHz	100.000 kHz	835.77572 MHz	3.47 dBm	-26.53 dB
849.000 MHz	850.000 MHz	150.000 kHz	849.03447 MHz	-34.86 dBm	-21.86 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.09491 MHz	-37.92 dBm	-24.92 dB

Date: 22.FEB.2023 00:49:10

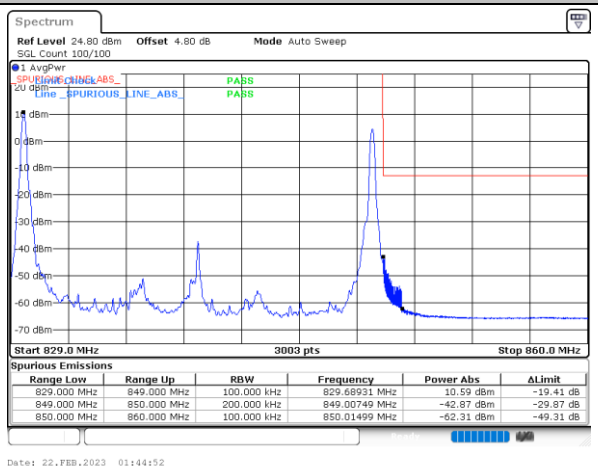
LTE Band 5B / 10MHz+10MHz

QPSK

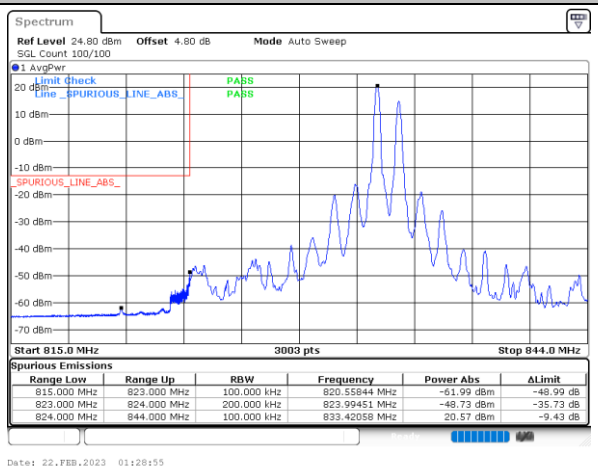
Lowest Band Edge / 1RB0 and 1RB49



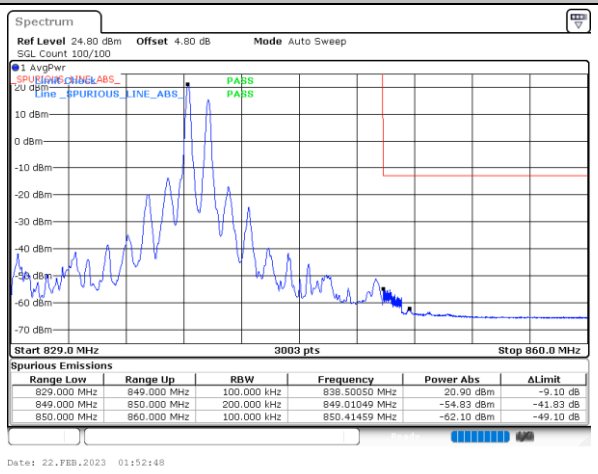
Highest Band Edge / 1RB0 and 1RB49



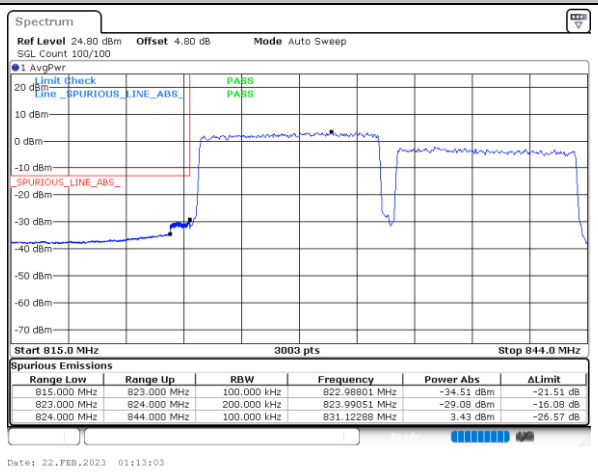
Lowest Band Edge / 1RB49 and 1RB0



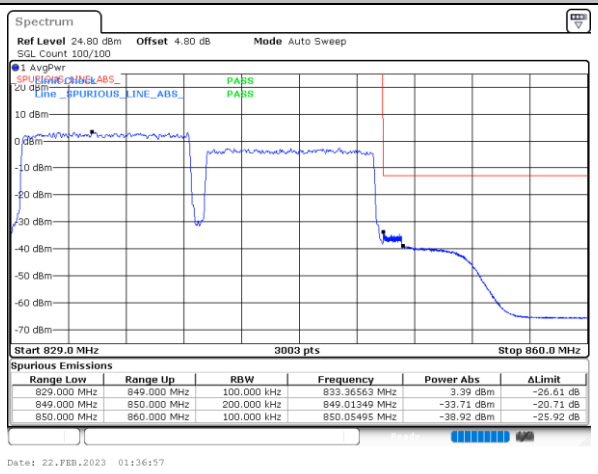
Highest Band Edge / 1RB49 and 1RB0



Lowest Band Edge / Full RB



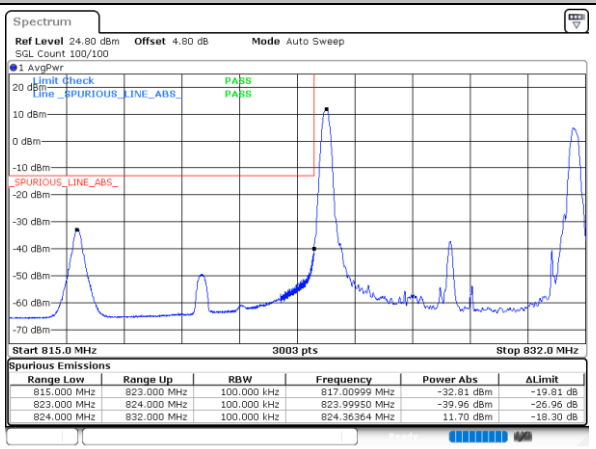
Highest Band Edge / Full RB



LTE Band 5B / 3MHz+5MHz

16QAM

Lowest Band Edge / 1RB0 and 1RB24

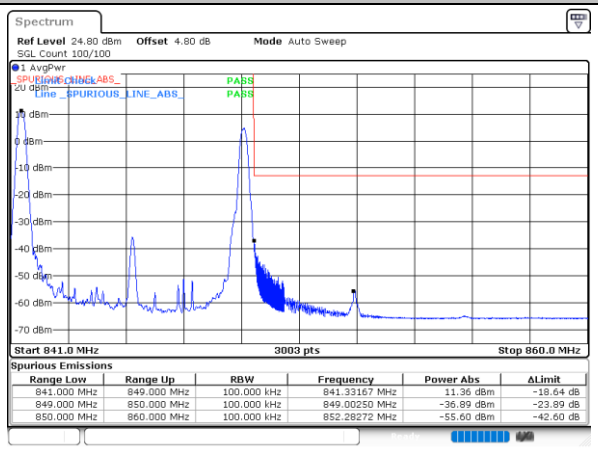


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	817.00999 MHz	-32.81 dBm	-19.81 dB
823.000 MHz	824.000 MHz	100.000 kHz	823.99950 MHz	-39.96 dBm	-26.96 dB
824.000 MHz	832.000 MHz	100.000 kHz	824.36364 MHz	11.70 dBm	-18.30 dB

Date: 21.FEB.2023 21:51:43

Highest Band Edge / 1RB0 and 1RB24

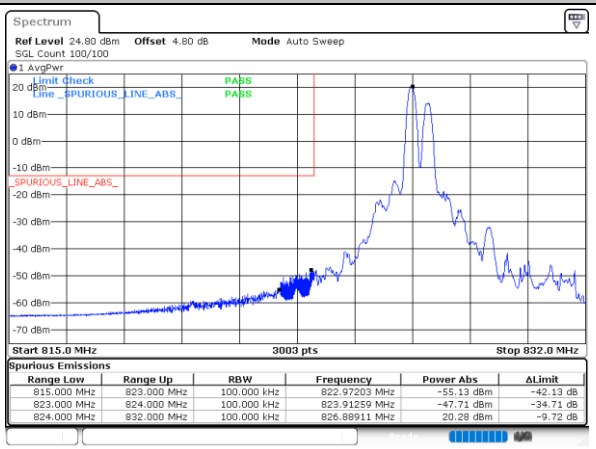


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
841.000 MHz	849.000 MHz	100.000 kHz	841.33167 MHz	11.36 dBm	-18.64 dB
849.000 MHz	850.000 MHz	100.000 kHz	849.00250 MHz	-36.89 dBm	-23.89 dB
850.000 MHz	860.000 MHz	100.000 kHz	852.28272 MHz	-55.60 dBm	-42.60 dB

Date: 21.FEB.2023 22:15:38

Lowest Band Edge / 1RB14 and 1RB0

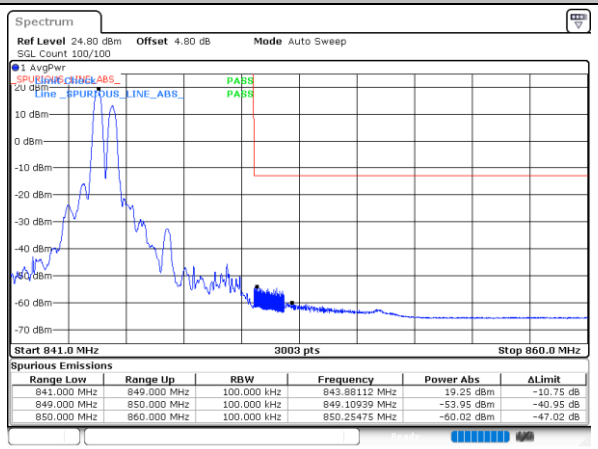


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.97203 MHz	-55.13 dBm	-42.13 dB
823.000 MHz	824.000 MHz	100.000 kHz	823.91259 MHz	-47.71 dBm	-34.71 dB
824.000 MHz	832.000 MHz	100.000 kHz	826.88911 MHz	20.28 dBm	-9.72 dB

Date: 21.FEB.2023 21:59:39

Highest Band Edge / 1RB14 and 1RB0

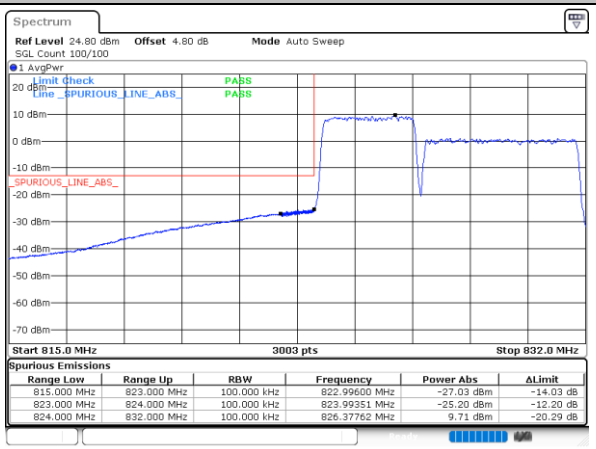


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
841.000 MHz	849.000 MHz	100.000 kHz	843.88112 MHz	19.25 dBm	-10.75 dB
849.000 MHz	850.000 MHz	100.000 kHz	849.10939 MHz	-53.95 dBm	-40.95 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.25475 MHz	-60.02 dBm	-47.02 dB

Date: 21.FEB.2023 22:23:34

Lowest Band Edge / Full RB

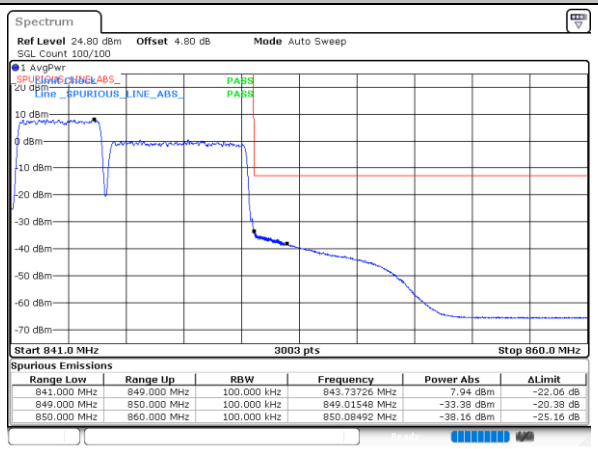


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.99600 MHz	-27.03 dBm	-14.03 dB
823.000 MHz	824.000 MHz	100.000 kHz	823.99351 MHz	-25.20 dBm	-12.20 dB
824.000 MHz	832.000 MHz	100.000 kHz	826.37762 MHz	9.71 dBm	-20.29 dB

Date: 21.FEB.2023 21:43:33

Highest Band Edge / Full RB



Spurious Emissions

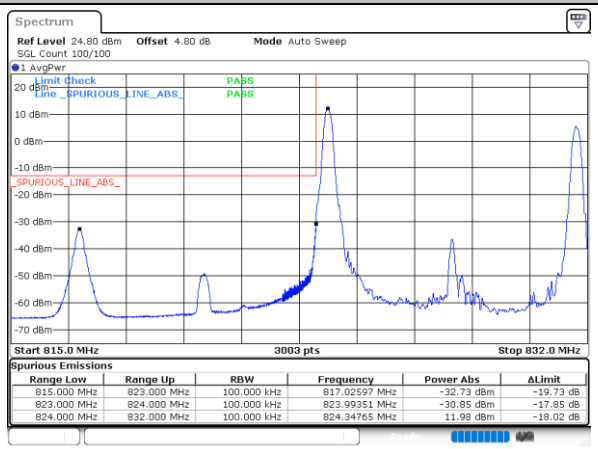
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
841.000 MHz	849.000 MHz	100.000 kHz	843.73726 MHz	7.94 dBm	-22.06 dB
849.000 MHz	850.000 MHz	100.000 kHz	849.01548 MHz	-33.38 dBm	-20.38 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.08492 MHz	-38.16 dBm	-25.16 dB

Date: 21.FEB.2023 22:07:42

LTE Band 5B / 5MHz+3MHz

16QAM

Lowest Band Edge / 1RB0 and 1RB14

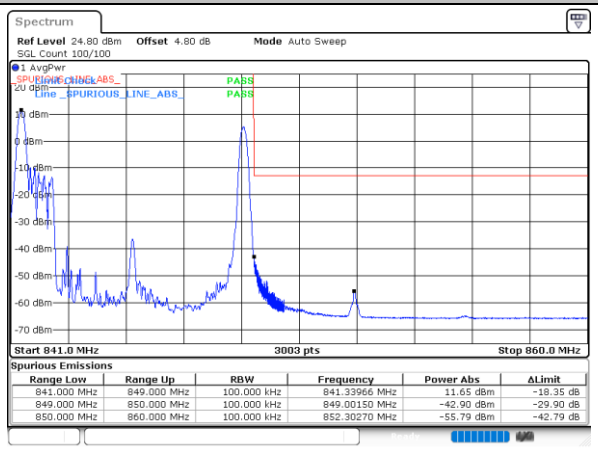


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	817.02597 MHz	-32.73 dBm	-19.73 dB
823.000 MHz	824.000 MHz	100.000 kHz	823.99351 MHz	-30.85 dBm	-17.85 dB
824.000 MHz	832.000 MHz	100.000 kHz	824.34765 MHz	11.98 dBm	-18.02 dB

Date: 21.FEB.2023 23:12:00

Highest Band Edge / 1RB0 and 1RB14

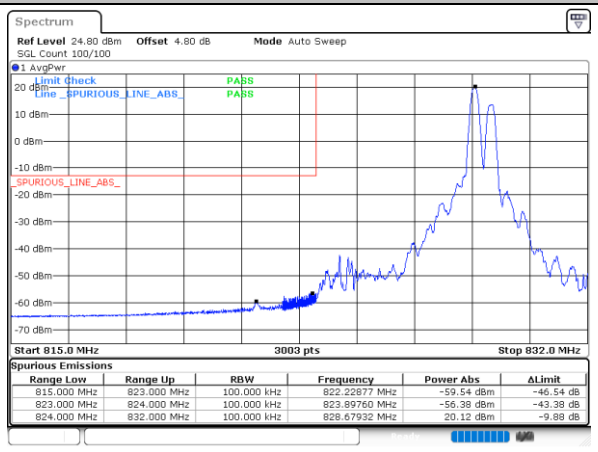


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
841.000 MHz	849.000 MHz	100.000 kHz	841.33966 MHz	11.65 dBm	-18.35 dB
849.000 MHz	850.000 MHz	100.000 kHz	849.00150 MHz	-42.90 dBm	-29.90 dB
850.000 MHz	860.000 MHz	100.000 kHz	852.30270 MHz	-55.79 dBm	-42.79 dB

Date: 21.FEB.2023 23:35:56

Lowest Band Edge / 1RB24 and 1RB0

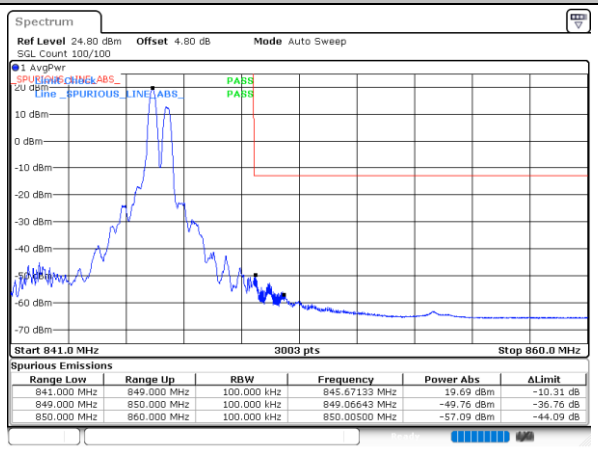


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.22877 MHz	-59.54 dBm	-46.54 dB
823.000 MHz	824.000 MHz	100.000 kHz	823.89760 MHz	-56.38 dBm	-43.38 dB
824.000 MHz	832.000 MHz	100.000 kHz	828.67932 MHz	20.12 dBm	-9.88 dB

Date: 21.FEB.2023 23:19:57

Highest Band Edge / 1RB24 and 1RB0

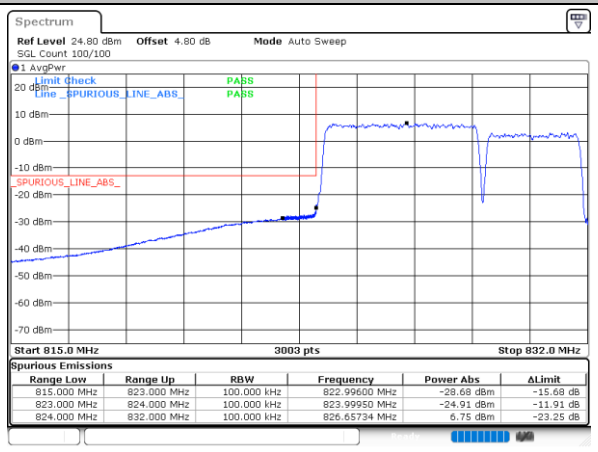


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
841.000 MHz	849.000 MHz	100.000 kHz	845.67133 MHz	19.69 dBm	-10.31 dB
849.000 MHz	850.000 MHz	100.000 kHz	849.06643 MHz	-49.76 dBm	-36.76 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.00500 MHz	-57.09 dBm	-44.09 dB

Date: 21.FEB.2023 23:43:52

Lowest Band Edge / Full RB

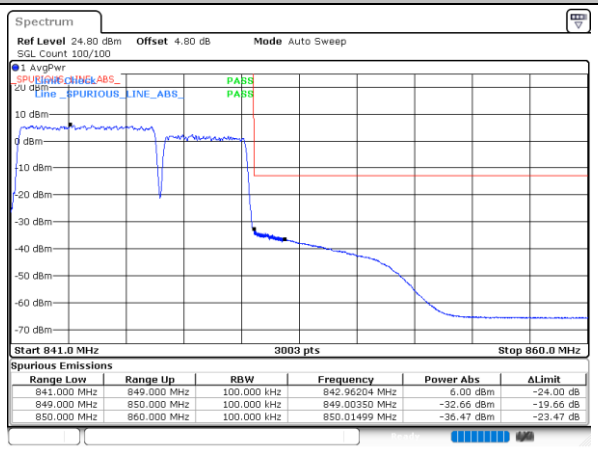


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.99600 MHz	-28.68 dBm	-15.68 dB
823.000 MHz	824.000 MHz	100.000 kHz	823.99950 MHz	-24.91 dBm	-11.91 dB
824.000 MHz	832.000 MHz	100.000 kHz	826.65734 MHz	6.75 dBm	-23.25 dB

Date: 21.FEB.2023 23:04:03

Highest Band Edge / Full RB



Spurious Emissions

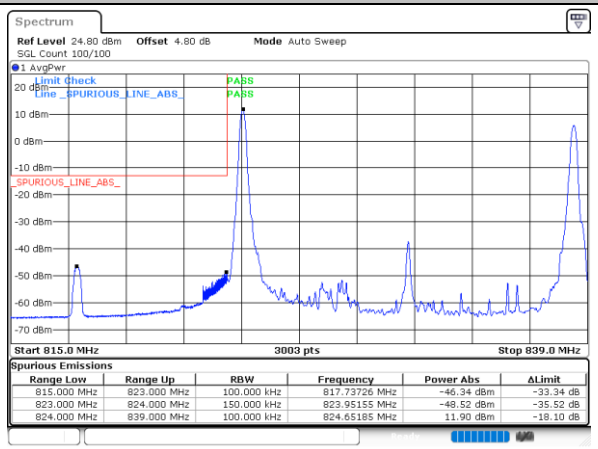
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
841.000 MHz	849.000 MHz	100.000 kHz	842.96204 MHz	6.00 dBm	-24.00 dB
849.000 MHz	850.000 MHz	100.000 kHz	849.00350 MHz	-32.66 dBm	-19.66 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.01499 MHz	-36.47 dBm	-23.47 dB

Date: 21.FEB.2023 23:28:00

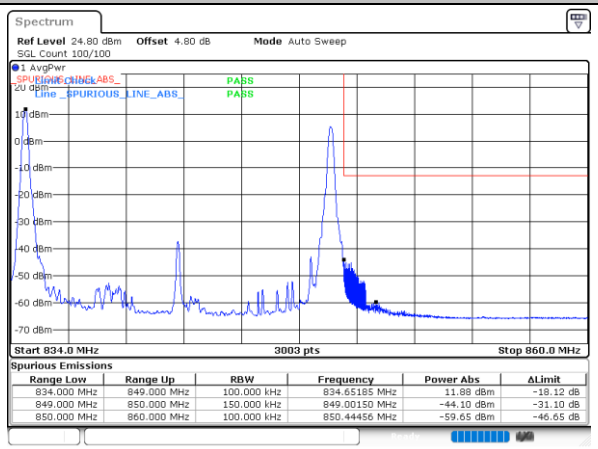
LTE Band 5B / 5MHz+10MHz

16QAM

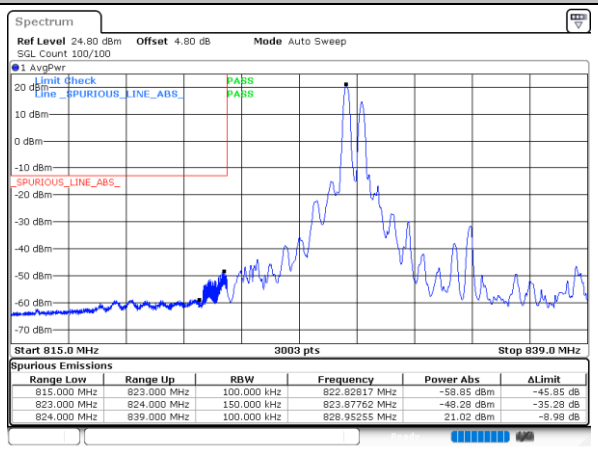
Lowest Band Edge / 1RB0 and 1RB49



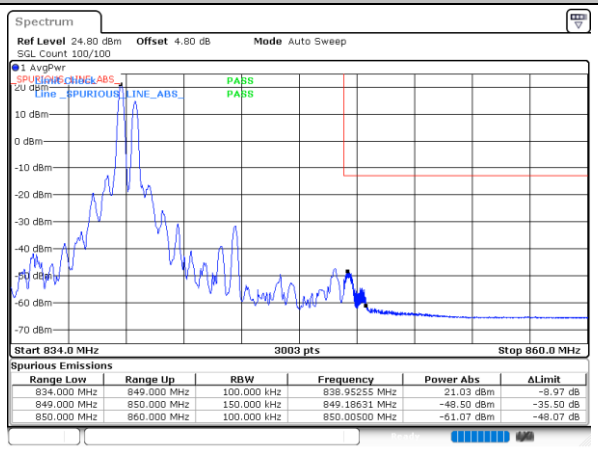
Highest Band Edge / 1RB0 and 1RB49



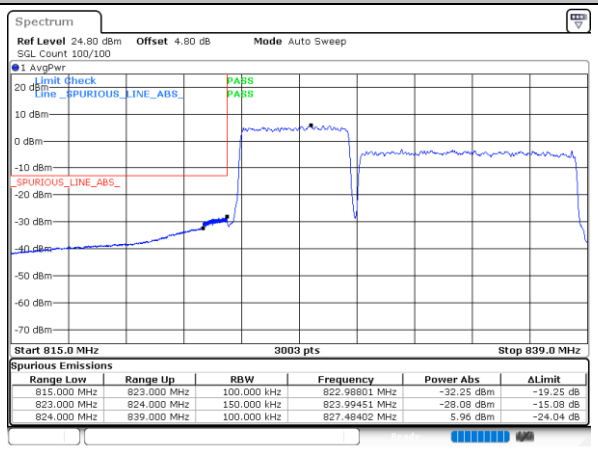
Lowest Band Edge / 1RB24 and 1RB0



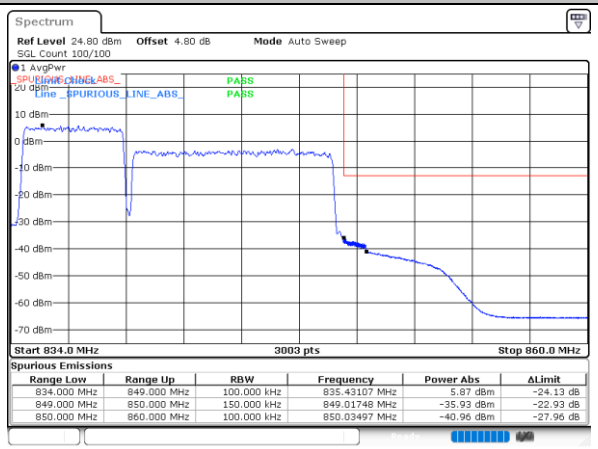
Highest Band Edge / 1RB24 and 1RB0



Lowest Band Edge / Full RB



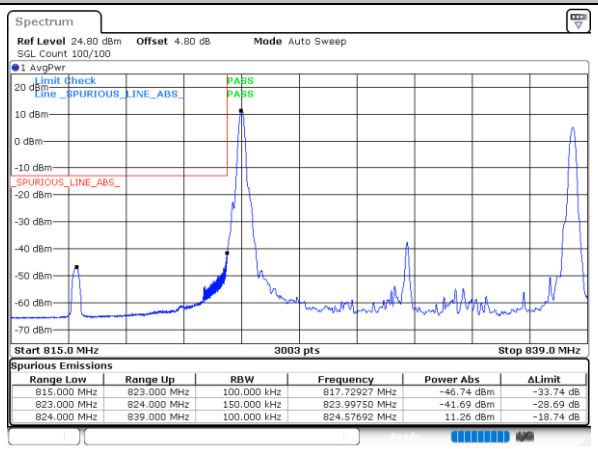
Highest Band Edge / Full RB



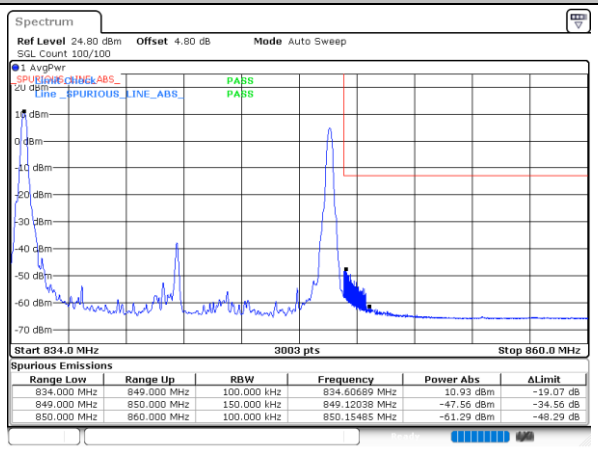
LTE Band 5B / 10MHz+5MHz

16QAM

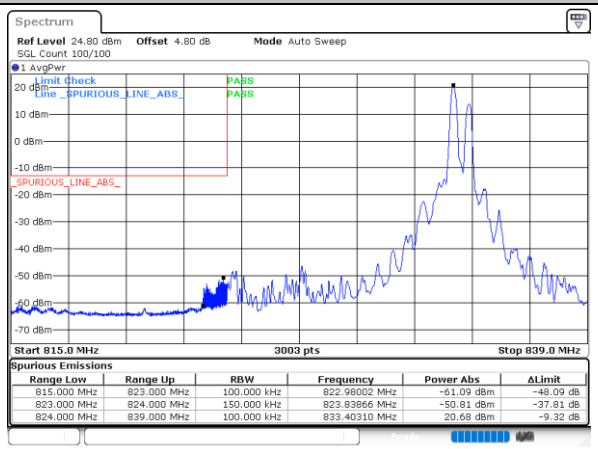
Lowest Band Edge / 1RB0 and 1RB24



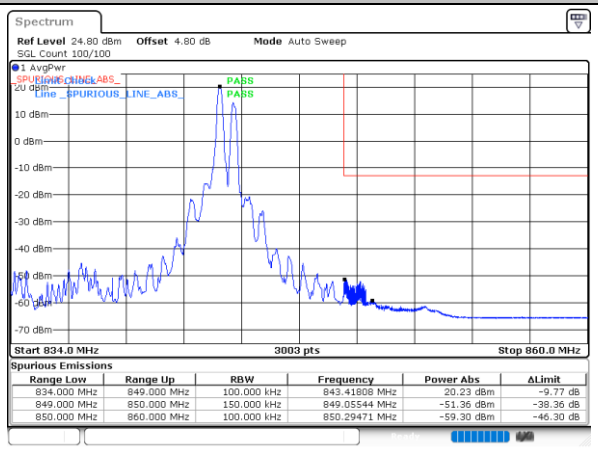
Highest Band Edge / 1RB0 and 1RB24



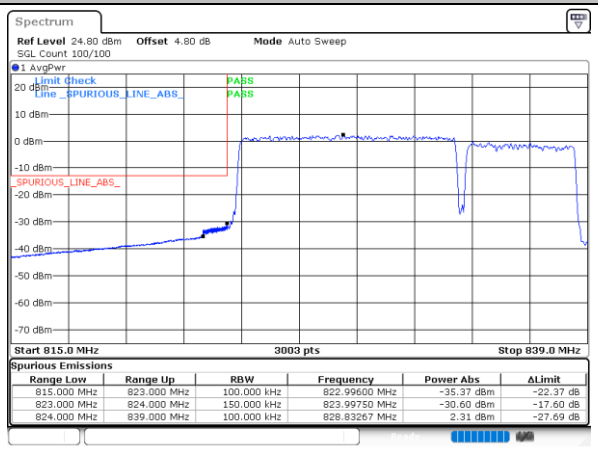
Lowest Band Edge / 1RB49 and 1RB0



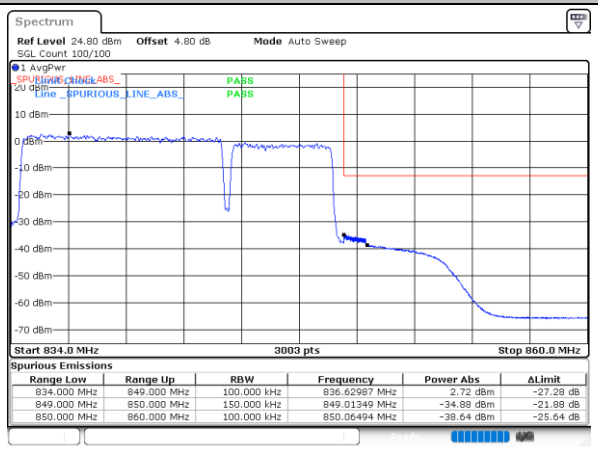
Highest Band Edge / 1RB49 and 1RB0



Lowest Band Edge / Full RB



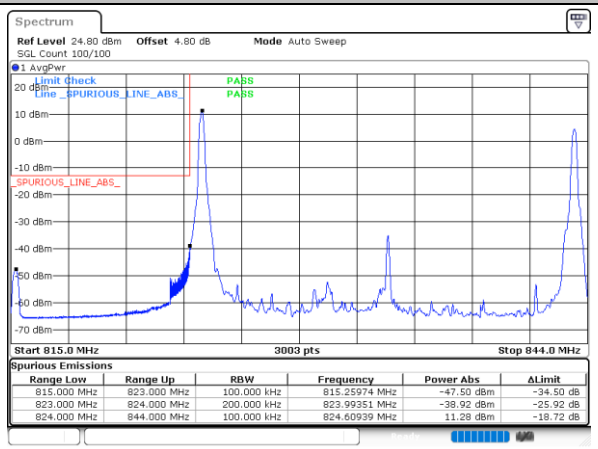
Highest Band Edge / Full RB



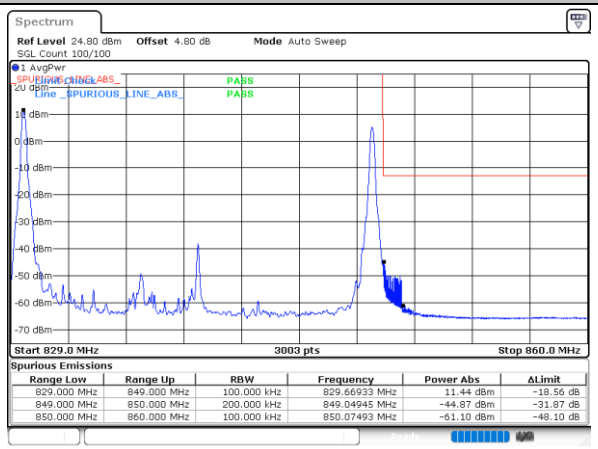
LTE Band 5B / 10MHz+10MHz

16QAM

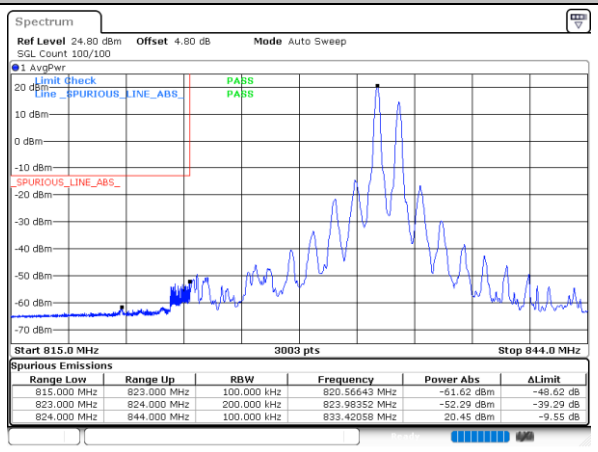
Lowest Band Edge / 1RB0 and 1RB49



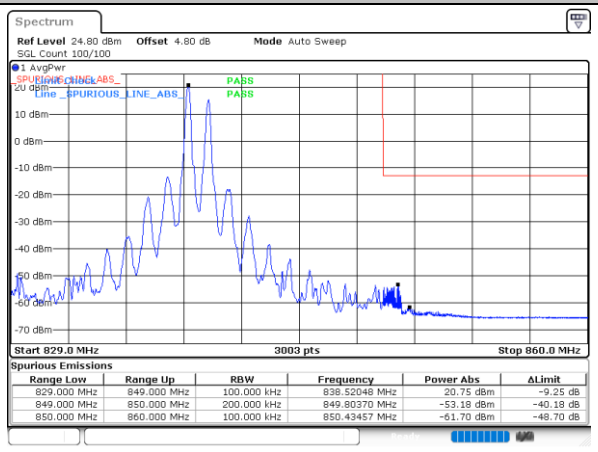
Highest Band Edge / 1RB0 and 1RB49



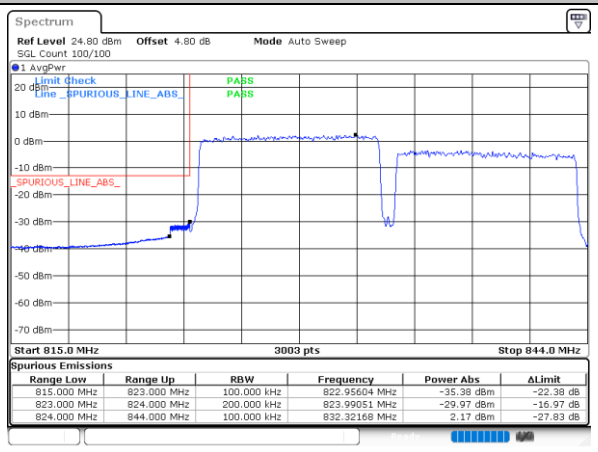
Lowest Band Edge / 1RB49 and 1RB0



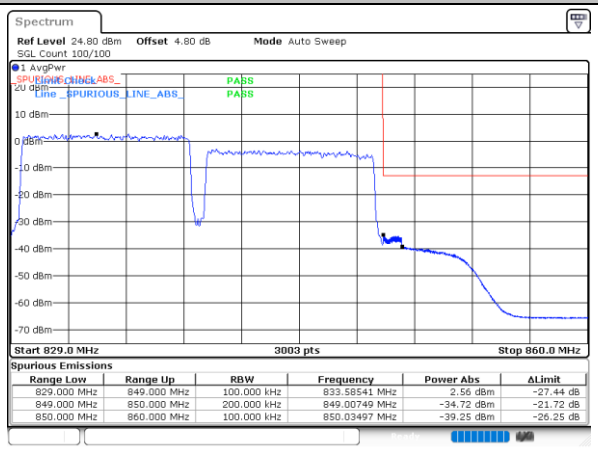
Highest Band Edge / 1RB49 and 1RB0



Lowest Band Edge / Full RB



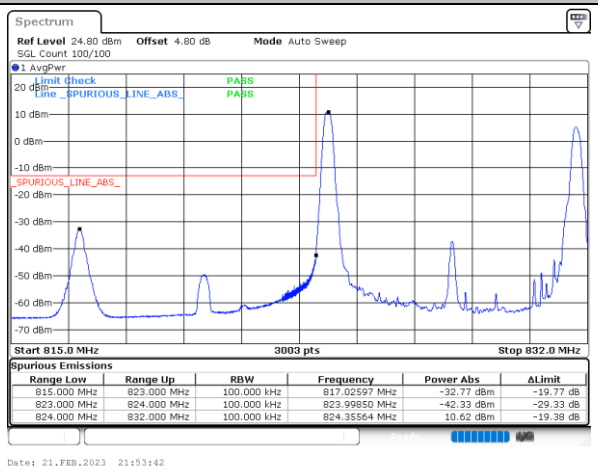
Highest Band Edge / Full RB



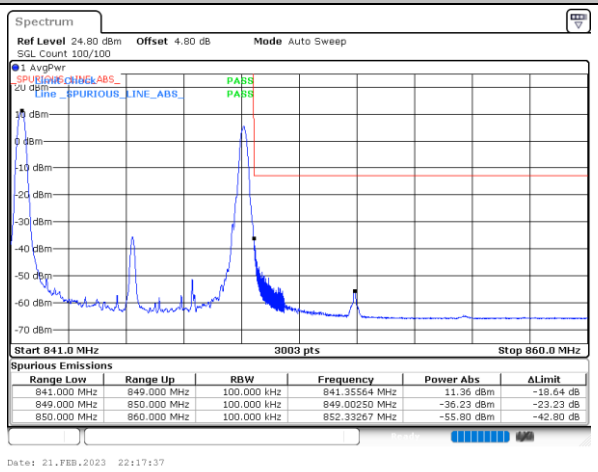
LTE Band 5B / 3MHz+5MHz

64QAM

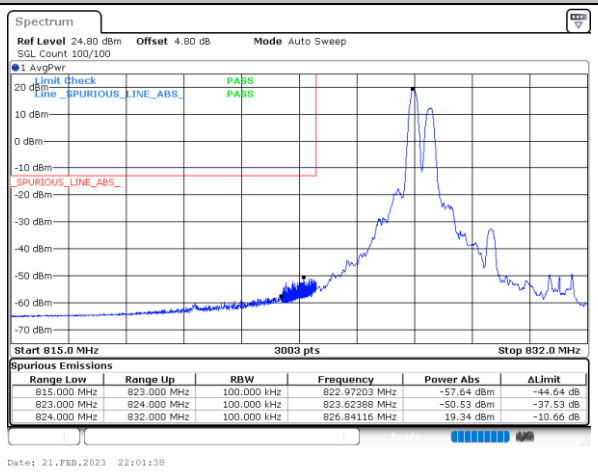
Lowest Band Edge / 1RB0 and 1RB24



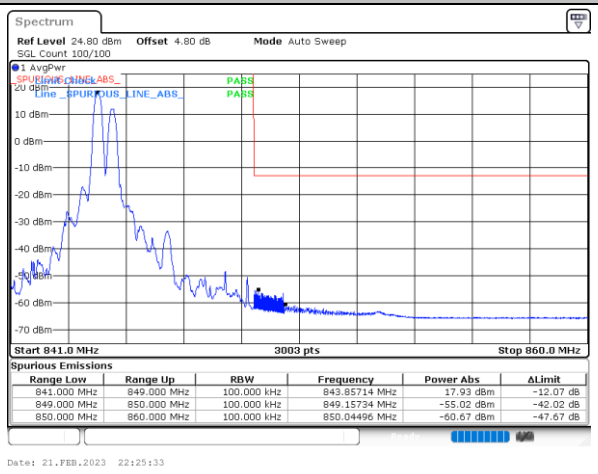
Highest Band Edge / 1RB0 and 1RB24



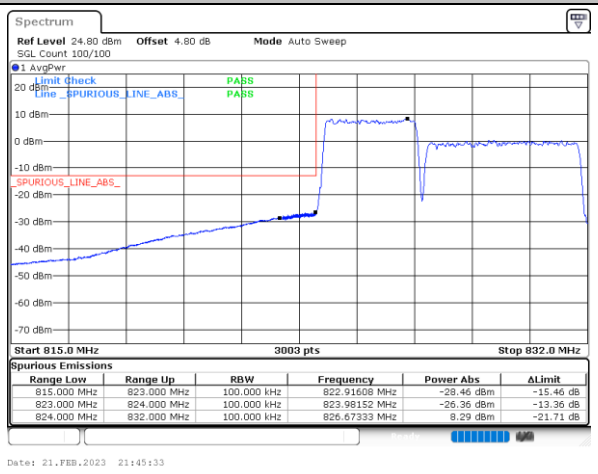
Lowest Band Edge / 1RB14 and 1RB0



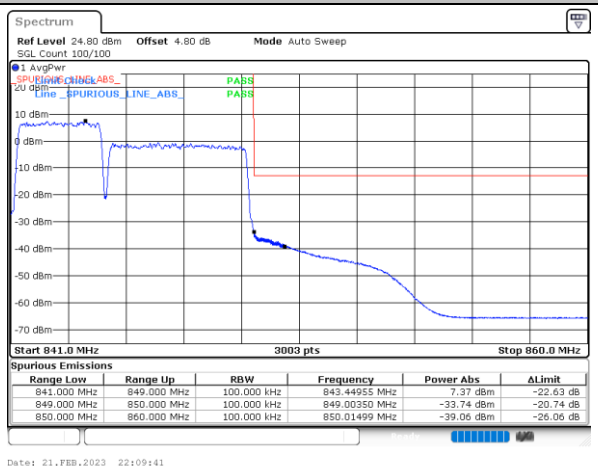
Highest Band Edge / 1RB14 and 1RB0



Lowest Band Edge / Full RB



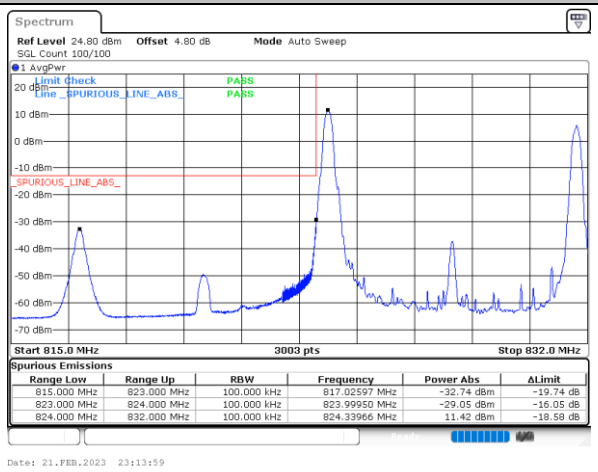
Highest Band Edge / Full RB



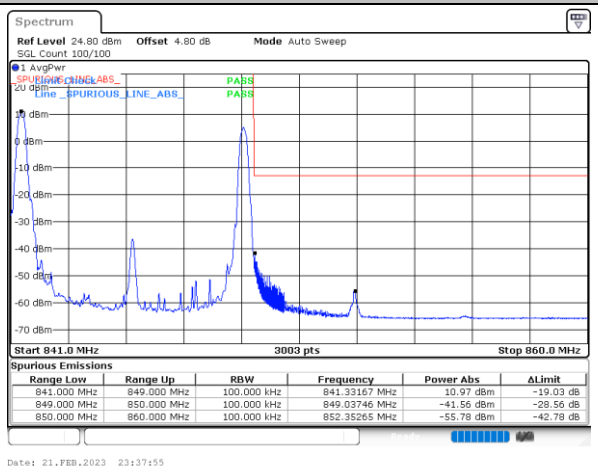
LTE Band 5B / 5MHz+3MHz

64QAM

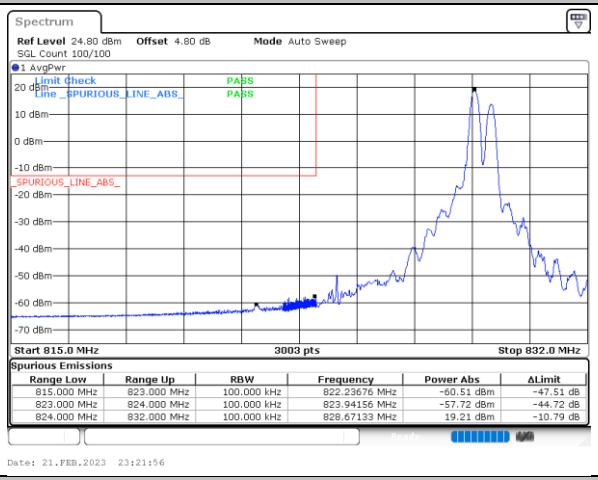
Lowest Band Edge / 1RB0 and 1RB14



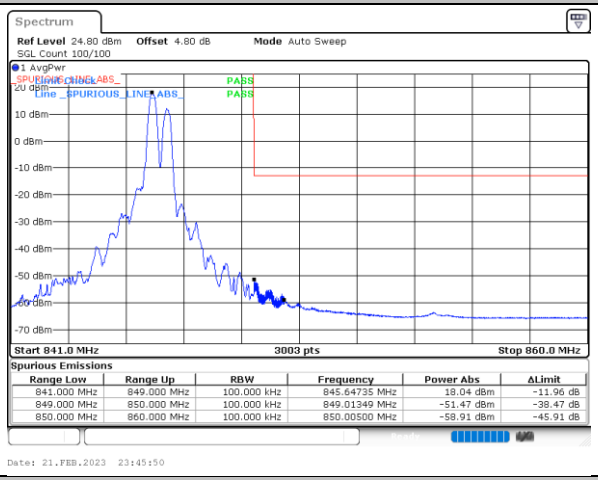
Highest Band Edge / 1RB0 and 1RB14



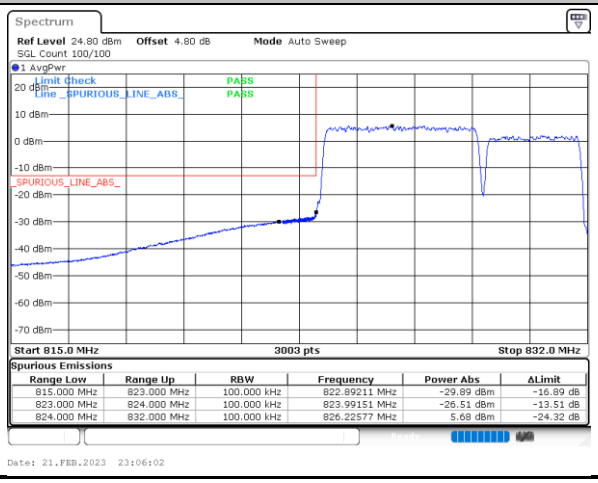
Lowest Band Edge / 1RB24 and 1RB0



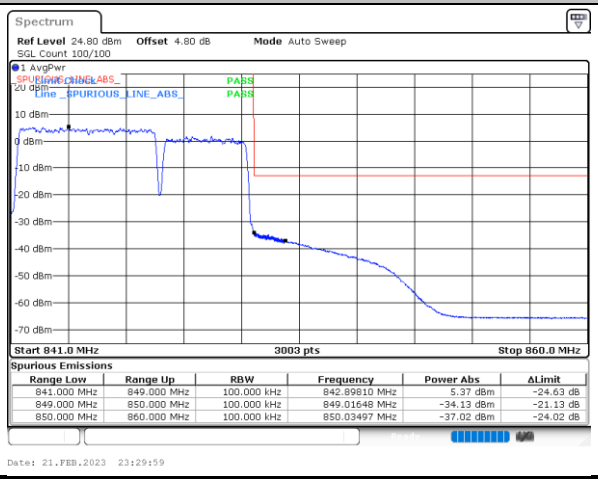
Highest Band Edge / 1RB24 and 1RB0



Lowest Band Edge / Full RB



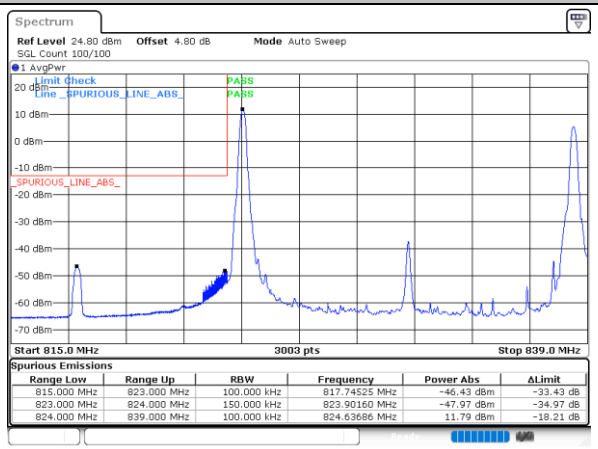
Highest Band Edge / Full RB



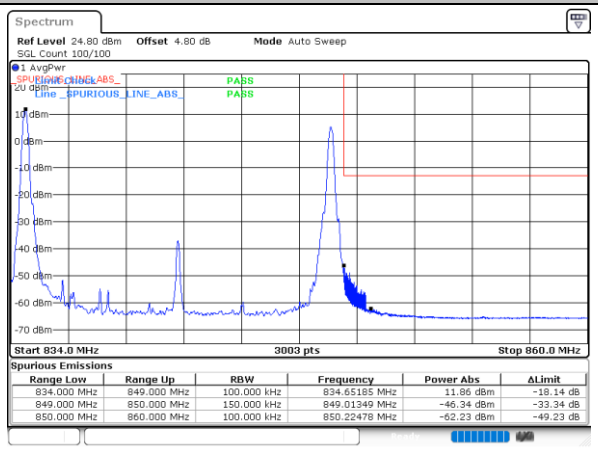
LTE Band 5B / 5MHz+10MHz

64QAM

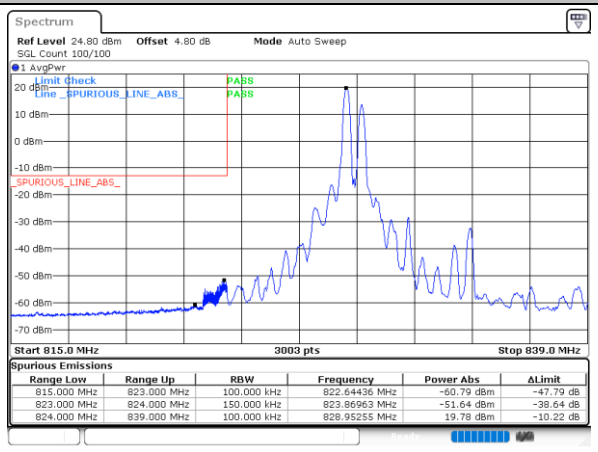
Lowest Band Edge / 1RB0 and 1RB49



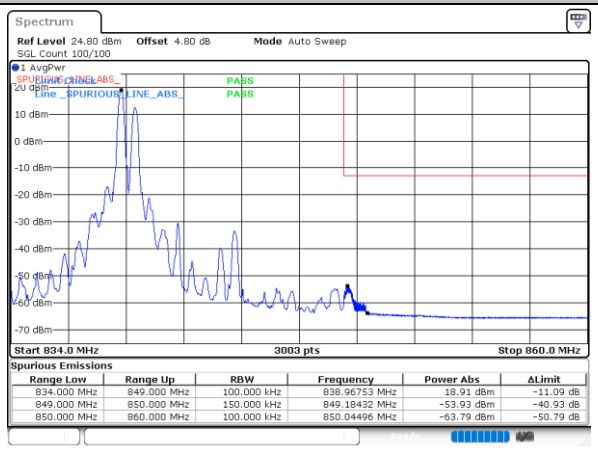
Highest Band Edge / 1RB0 and 1RB49



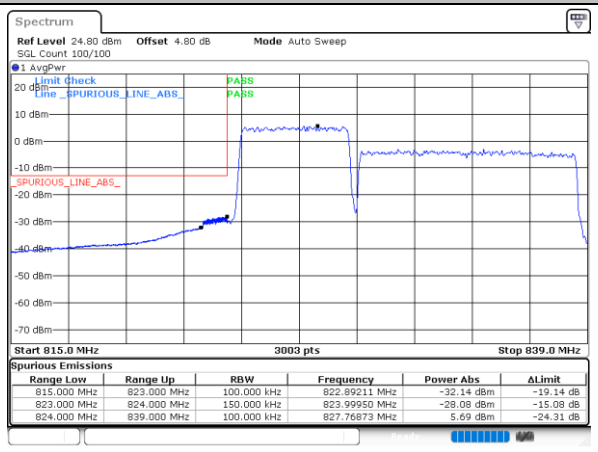
Lowest Band Edge / 1RB24 and 1RB0



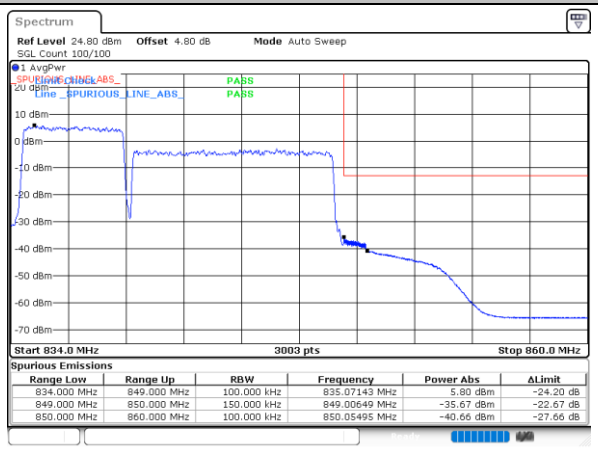
Highest Band Edge / 1RB24 and 1RB0



Lowest Band Edge / Full RB



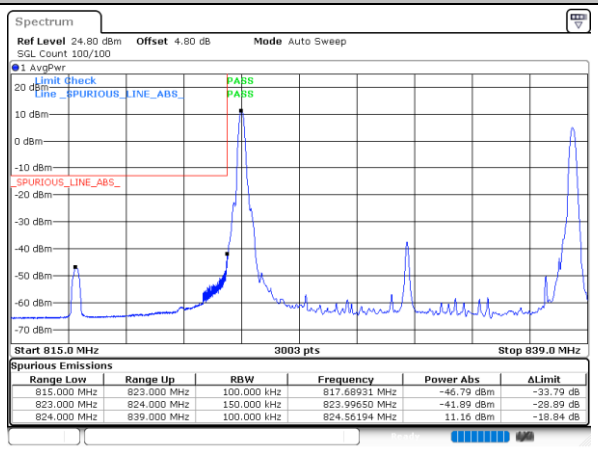
Highest Band Edge / Full RB



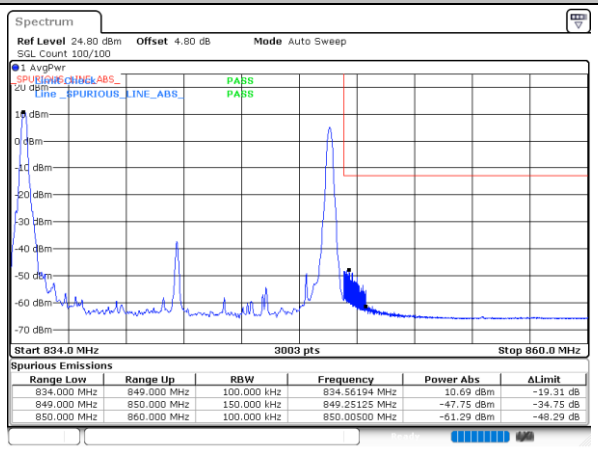
LTE Band 5B / 10MHz+5MHz

64QAM

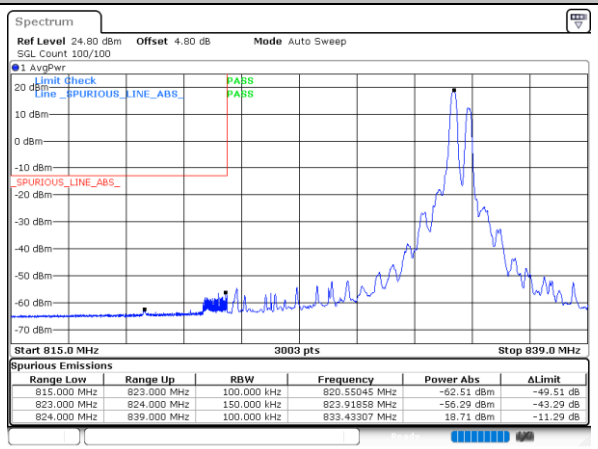
Lowest Band Edge / 1RB0 and 1RB24



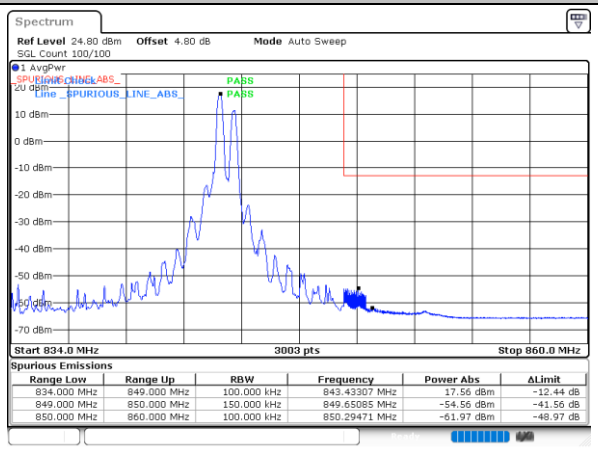
Highest Band Edge / 1RB0 and 1RB24



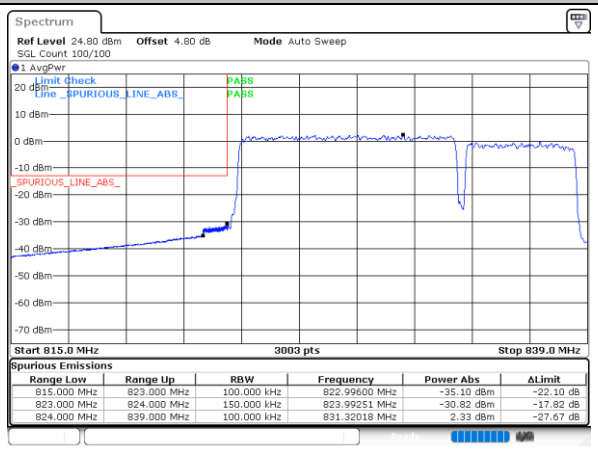
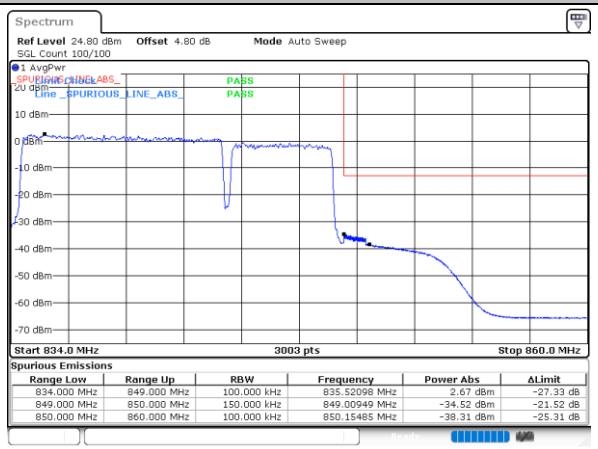
Lowest Band Edge / 1RB49 and 1RB0



Highest Band Edge / 1RB49 and 1RB0



Lowest Band Edge / Full RB



Highest Band Edge / Full RB