FCC RF Test Report

APPLICANT	:	FCNT LLC.
EQUIPMENT	:	Mobile cellular phone
BRAND NAME	:	arrows We2
MODEL NAME	:	F-52E
FCC ID	:	2BEPUFMP195
STANDARD	:	47 CFR Part 2, 22(H), 27(H), 27(M)
CLASSIFICATION	:	PCS Licensed Transmitter Held to Ear (PCE)
TEST DATE(S)	:	Jan. 22, 2024 ~ Apr. 03, 2024

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

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

Jason Jia

Approved by: Jason Jia

ACCREDITED Cert #5145.02

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

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG3D0613-04B	Rev. 01	Initial issue of report	May 22, 2024

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)	ERP < 7 Watt	PASS	-
	§27.50(c)(10)	Effective Radiated Power (Band 12)	ERP < 3 Watt		-
	§27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 41)	EIRP < 2Watt		-
3.5	N/A	Peak-to-Average Ratio	<13 dB	PASS	-
3.6	§2.1049	Occupied Bandwidth	-	Report Only	-
3.7	§2.1051 §22.917(a) §27.53(g)	Conducted Band Edge Measurement (Band 5) (Band 12)	< 43+10log10(P[Watts])	PASS	-
	§27.53(m)(4)	Conducted Band Edge Measurement (Band 41)	§27.53(m)(4)		
3.8	§2.1051 §22.917(a) §27.53(g)	Conducted Spurious Emission Band 5) (Band 12)	< 43+10log10(P[Watts])	PASS	-
	§2.1051 §27.53(m)(4)	Conducted Spurious Emission (Band 41)	< 55+10log$_{10}$(P[Watts])		
3.9	§2.1055 §22.355	Frequency Stability Temperature & Voltage	< 2.5 ppm for Part 22	PASS	-
	§2.1055 §27.54		Within Authorized Band		
4.4	§2.1053 §22.917(a) §27.53(g)	Radiated Spurious Emission (Band 5) (Band 12)	< 43+10log$_{10}$(P[Watts])	PASS	Under limit 16.50 dB at 7752.000 MHz
	§2.1053 §27.53(m)(4)	Radiated Spurious Emission (Band 41)	< 55+10log$_{10}$(P[Watts])		

Conformity Assessment Condition:

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

Disclaimer:

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

1 General Description

1.1 Applicant

FCNT LLC.
Sanki Yamato Bldg. 3F, 7-10-1, Chuorinkan, Yamato-shi, Kanagawa, 242-0007, Japan

1.2 Manufacturer

FCNT LLC.
Sanki Yamato Bldg. 3F, 7-10-1, Chuorinkan, Yamato-shi, Kanagawa, 242-0007, Japan

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile cellular phone
Brand Name	arrows We2
Model Name	F-52E
FCC ID	2BEPUFMP195
IMEI Code	Conducted: 354214220026404/354214220026412 Radiation: 354214220043508/354214220043516
HW Version	V4
SW Version	FAC_V006
EUT Stage	Identical Prototype

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	LTE Band 5 : 824 MHz ~ 849 MHz LTE Band 12 : 699 MHz ~ 716 MHz LTE Band 41 : 2496 MHz ~ 2690 MHz
Rx Frequency	LTE Band 5 : 869 MHz ~ 894 MHz LTE Band 12 : 729 MHz ~ 746 MHz LTE Band 41 : 2496 MHz ~ 2690 MHz
Bandwidth	LTE Band 5 : 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 12 : 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 41 : 5MHz / 10MHz / 15MHz / 20MHz
Maximum Output Power to Antenna	LTE Band 5 : 23.26 dBm LTE Band 12 : 23.17 dBm LTE Band 41 : 18.30 dBm
Antenna Gain	LTE Band 5 : -2.58 dBi LTE Band 12 : -2.87 dBi LTE Band 41 : -2.67 dBi
Type of Modulation	QPSK / 16QAM / 64QAM / 256QAM(Downlink only)

1.5 Modification of EUT

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

1.6 Maximum ERP/EIRP and Emission Designator

LTE Band 5		QPSK		16QAM/64QAM	
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	0.0690	1M10G7D	0.0621	1M09W7D
3	825.5 ~ 847.5	0.0701	2M70G7D	0.0627	2M71W7D
5	826.5 ~ 846.5	0.0682	4M49G7D	0.0628	4M48W7D
10	829.0 ~ 844.0	0.0713	9M01G7D	0.0635	8M99W7D
LTE Band 12		QPSK		16QAM/64QAM	
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)
1.4	699.7 ~ 715.3	0.0649	1M09G7D	0.0552	1M09W7D
3	700.5 ~ 714.5	0.0634	2M72G7D	0.0568	2M72W7D
5	701.5 ~ 713.5	0.0638	4M51G7D	0.0558	4M50W7D
10	704.0 ~ 711.0	0.0653	9M05G7D	0.0568	8M97W7D
LTE Band 41		QPSK		16QAM/64QAM	
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)
5	2498.5 ~ 2687.5	0.0356	4M49G7D	0.0350	4M49W7D
10	2501.0 ~ 2685.0	0.0363	9M03G7D	0.0362	9M05W7D
15	2503.5 ~ 2682.5	0.0361	13M5G7D	0.0355	13M4W7D
20	2506.0 ~ 2680.0	0.0366	17M9G7D	0.0363	17M8W7D

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

1.7 Testing Location

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

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

1.8 Test Software

Item	Site	Manufacture	Name	Version
1.	TH01-KS	SPORTON	FCC LTE_Ver2.0 Auto_china_210503	2.0
2.	03CH04-KS	AUDIX	E3	210616

1.9 Applicable Standards

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

- 47 CFR Part 2, 22(H), 27(H), 27(M)
- 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

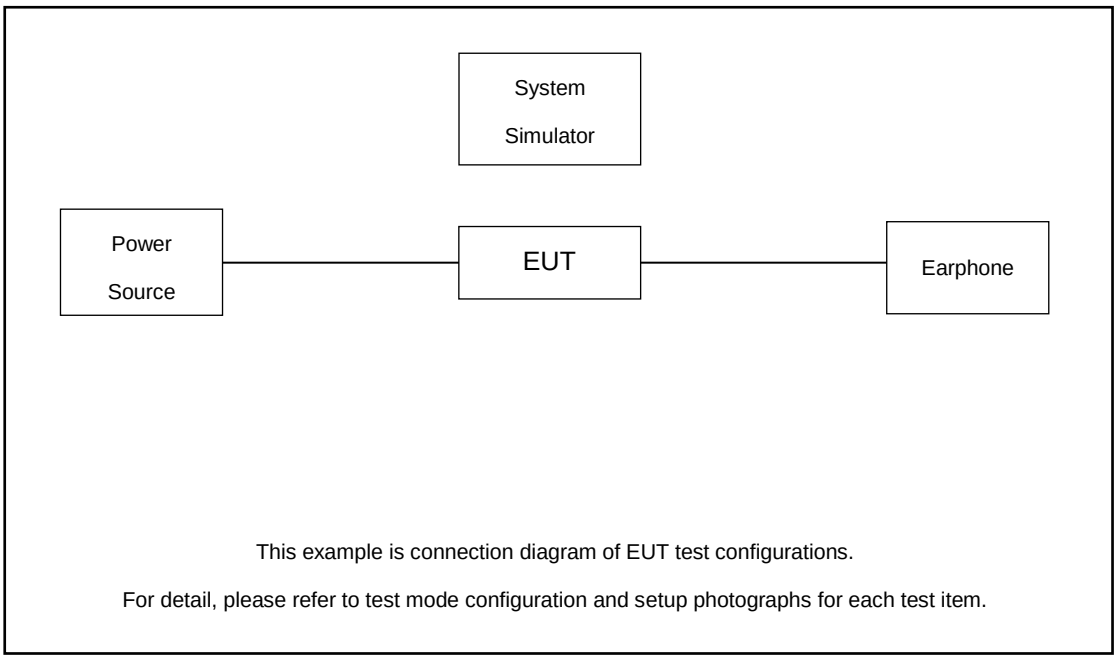
2.1 Test Mode

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(X/Y Plane).

Test Items	Band	Bandwidth (MHz)						Modulation			RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	M	H
Max. Output Power	5	v	v	v	v	-	-	v	v	v	v		v	v	v	v
	12	v	v	v	v	-	-	v	v	v	v		v	v	v	v
	41	-	-	v	v	v	v	v	v	v	v		v	v	v	v
Peak-to-Average Ratio	5				v	-	-	v	v	v			v		v	
	12				v	-	-	v	v	v			v		v	
	41	-	-				v	v	v	v			v		v	
26dB and 99% Bandwidth	5	v	v	v	v	-	-	v	v				v		v	
	12	v	v	v	v	-	-	v	v				v		v	
	41	-	-	v	v	v	v	v	v				v		v	
Conducted Band Edge	5	v	v	v	v	-	-	v	v	v	v		v	v		v
	12	v	v	v	v	-	-	v	v	v	v		v	v		v
	41	-	-	v	v	v	v	v	v	v	v		v	v		v
Conducted Spurious Emission	5	v	v	v	v	-	-	v			v			v	v	v
	12	v	v	v	v	-	-	v			v			v	v	v
	41	-	-	v	v	v	v	v			v			v	v	v
Frequency Stability	5				v	-	-	v					v		v	
	12				v	-	-	v					v		v	
	41	-	-		v			v					v		v	
E.R.P / E.I.R.P	5	v	v	v	v	-	-	v	v	v	v		v	v	v	v
	12	v	v	v	v	-	-	v	v	v	v		v	v	v	v
	41	-	-	v	v	v	v	v	v	v	v		v	v	v	v
Radiated Spurious Emission	5	Worst Case												-	v	-
	12	Worst Case												v	v	v
	41	Worst Case												-	v	-
Note	1. The mark "**v** " means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.															

2.2 Connection Diagram of Test System



This example is connection diagram of EUT test configurations.

For detail, please refer to test mode configuration and setup photographs for each test item.

2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	Fcc DoC	N/A	Unshielded, 1.8 m
2.	Power Supply	GWINSTEK	PSS-2002	N/A	N/A	Unshielded, 1.8 m
3.	Adapter	N/A	N/A	N/A	N/A	N/A
4.	USB Cable	N/A	N/A	N/A	N/A	N/A
5.	Earphone	N/A	N/A	N/A	N/A	N/A

2.4 Measurement Results Explanation Example

For all conducted test items:

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

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

Offset = RF cable loss

Following shows an offset computation example with cable loss 4.7 dB

Example :

Offset(dB) = RF cable loss(dB)

= 4.7 (dB)

2.5 Frequency List of Low/Middle/High Channels

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 12 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
10	Channel	23060	23095	23130
	Frequency	704	707.5	711
5	Channel	23035	23095	23155
	Frequency	701.5	707.5	713.5
3	Channel	23025	23095	23165
	Frequency	700.5	707.5	714.5
1.4	Channel	23017	23095	23173
	Frequency	699.7	707.5	715.3

LTE Band 41 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
20	Channel	39750	40620	41490
	Frequency	2506	2593	2680
15	Channel	39725	40620	41515
	Frequency	2503.5	2593	2682.5
10	Channel	39700	40620	41540
	Frequency	2501	2593	2685
5	Channel	39675	40620	41565
	Frequency	2498.5	2593	2687.5

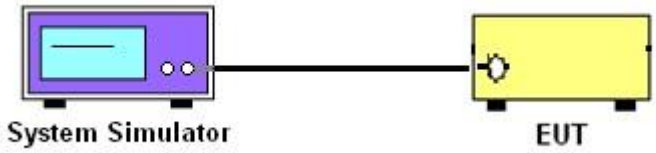
3 Conducted Test Items

3.1 Measuring Instruments

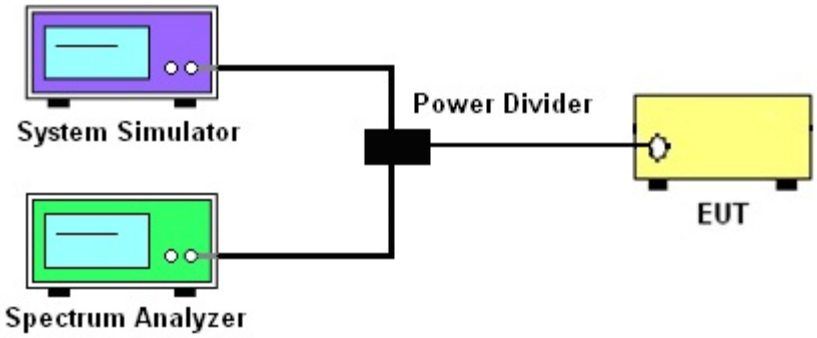
See list of measuring instruments of this test report.

3.2 Test Setup

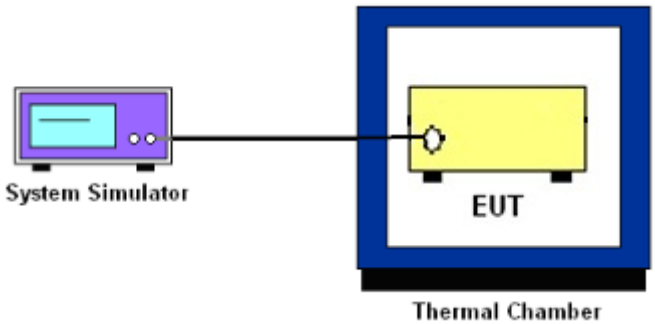
3.2.1 Conducted Output Power



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



3.2.3 Frequency Stability



3.3 Test Result of Conducted Test

Please refer to Appendix A.

3.4 Conducted Output Power and 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.

The ERP of mobile transmitters must not exceed 3 Watts for LTE Band 12.

The EIRP of mobile transmitters must not exceed 2 Watts for LTE Band 41.

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.

27.53 (g)

For operations in the 600MHz band and 698 -746 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 100 kHz bandwidth. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

27.53(m)(4)

For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

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% / 2% EBW in the 1MHz band immediately outside and adjacent to the band edge.
5. Beyond the 1 MHz band from the band edge, RBW=1MHz was used.
6. Set spectrum analyzer with RMS detector.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. Checked that all the results comply with the emission limit line.
   Example:
   The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB) = -13dBm.
9. For LTE Band 41, the other 40 dB, and 55 dB have additionally applied same calculation above.
10. When using the integration method, the starting frequency of the integration shall be centered at one-half of the RBW away from the band edge.

3.8 Conducted Spurious Emission

3.8.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

For Band 41:

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 55 + 10 log (P) dB.

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

3.8.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
7. Set spectrum analyzer with RMS detector.
8. Taking the record of maximum spurious emission.
9. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
10. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.
11. For Band 41
    The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [55+ 10log(P)] (dB)
    = [30+ 10log(P)] (dBm) - [55+ 10log(P)] (dB)
    = -25dBm.

3.9 Frequency Stability

3.9.1 Description of Frequency Stability Measurement

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

3.9.2 Test Procedures for Temperature Variation

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

3.9.3 Test Procedures for Voltage Variation

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

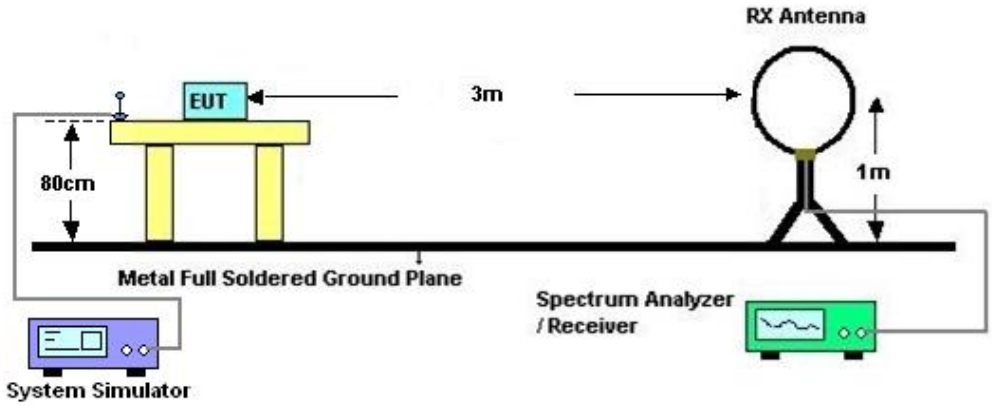
4 Radiated Test Items

4.1 Measuring Instruments

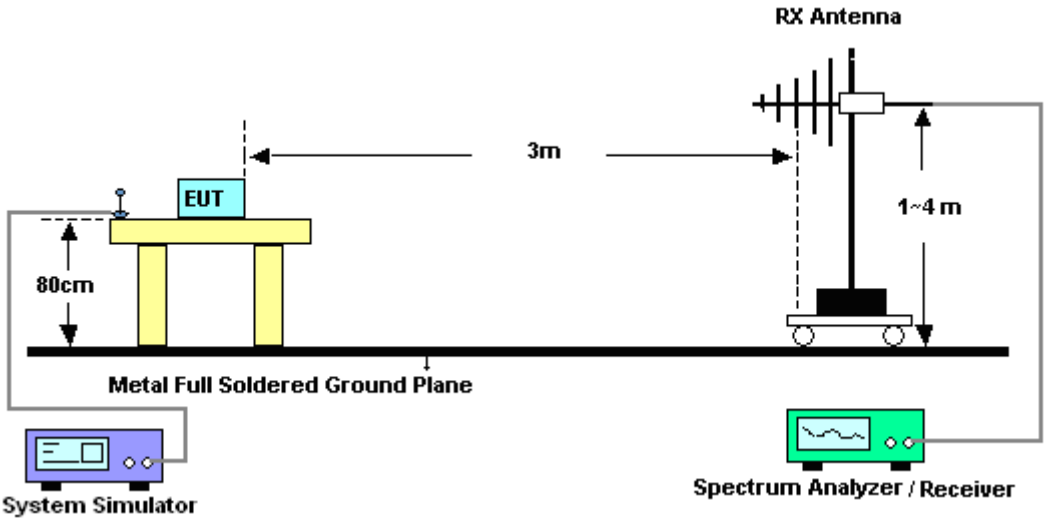
See list of measuring instruments of this test report.

4.2 Test Setup

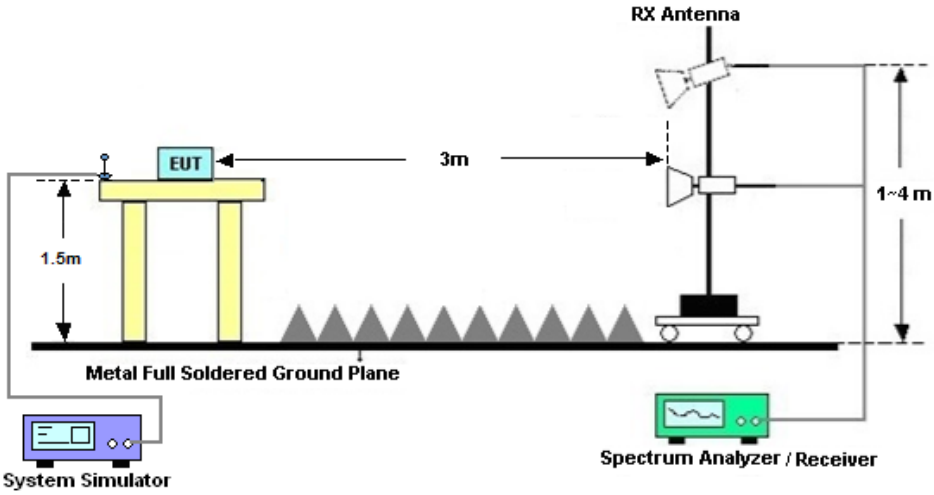
4.2.1 For radiated test below 30MHz



4.2.2 For radiated test from 30MHz to 1GHz



4.2.3 For radiated test above 1GHz



4.3 Test Result of Radiated Test

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

Please refer to Appendix B.

4.4 Radiated Spurious Emission

4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI C63.26. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

For Band 41

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 55 + 10 log (P) dB.

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

4.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
2. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
6. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
7. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
8. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
9. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
10. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
11. ERP (dBm) = EIRP - 2.15
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
    The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.
13. For Band 41:
    The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 11, 2023	Jan. 22, 2024~ Jan. 23, 2024	Oct. 10, 2024	Conducted (TH01-KS)
Power divider	STI	STI08-0055	-	0.5~40GHz	NCR	Jan. 22, 2024~ Jan. 23, 2024	NCR	Conducted (TH01-KS)
Temperature & humidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 06, 2023	Jan. 22, 2024~ Jan. 23, 2024	Jul. 05, 2024	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY574710709	10Hz-44G,MAX 30dB	Oct. 10, 2023	Apr. 03, 2024	Oct. 09, 2024	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 11 2023	Apr. 03, 2024	Sep. 10, 2024	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	Apr. 09, 2023	Apr. 03, 2024	Apr. 08, 2024	Radiation (03CH04-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00251694	1GHz~18GHz	Jul. 12, 2023	Apr. 03, 2024	Jul. 11, 2024	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2024	Apr. 03, 2024	Jan. 04, 2025	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	380827	9KHz-1GHz	Jul. 06, 2023	Apr. 03, 2024	Jul. 05, 2024	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 05, 2024	Apr. 03, 2024	Jan. 04, 2025	Radiation (03CH04-KS)
high gain Amplifier	EM	EM01G18GA	060840	1Ghz-18Ghz	Oct. 10, 2023	Apr. 03, 2024	Oct. 09, 2024	Radiation (03CH04-KS)
Amplifier	Agilent	8449B	3008A02370	1Ghz-18Ghz	Oct. 10, 2023	Apr. 03, 2024	Oct. 09, 2024	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Apr. 03, 2024	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Apr. 03, 2024	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Apr. 03, 2024	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required

6 Measurement Uncertainty

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

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Spurious Emission & Bandedge	±2.26 dB
Occupied Channel Bandwidth	±0.1%
Conducted Power	±0.46 dB
Peak to Average Ratio	±0.46 dB
Frequency Stability	±0.4 Hz

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.82dB

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.56dB

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.54dB

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

Appendix A. Test Results of Conducted Test

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

Conducted Output Power(Average power)

LTE Band 5 :

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	ERP(W)		
Channel				20450	20525	20600			
Frequency (MHz)				829	836.5	844	L	M	H
10	QPSK	1	0	23.21	23.26	23.19	0.0705	0.0713	0.0701
10	QPSK	1	49	23.09	23.21	23.09	0.0685	0.0705	0.0685
10	QPSK	50	0	22.49	22.51	22.37	0.0597	0.0600	0.0581
10	16QAM	1	0	22.56	22.72	22.76	0.0607	0.0630	0.0635
10	64QAM	1	0	21.37	21.41	21.51	0.0461	0.0466	0.0476
Channel				20425	20525	20625	ERP(W)		
Frequency (MHz)				826.5	836.5	846.5	L	M	H
5	QPSK	1	0	23.00	23.07	23.02	0.0671	0.0682	0.0675
5	16QAM	1	0	22.57	22.55	22.71	0.0608	0.0605	0.0628
Channel				20415	20525	20635	ERP(W)		
Frequency (MHz)				825.5	836.5	847.5	L	M	H
3	QPSK	1	0	23.19	23.19	23.03	0.0701	0.0701	0.0676
3	16QAM	1	0	22.36	22.61	22.70	0.0579	0.0614	0.0627
Channel				20407	20525	20643	ERP(W)		
Frequency (MHz)				824.7	836.5	848.3	L	M	H
1.4	QPSK	1	0	23.11	23.12	23.09	0.0689	0.0690	0.0685
1.4	16QAM	1	0	22.34	22.63	22.66	0.0577	0.0617	0.0621

LTE Band 12 :

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	ERP(W)		
Channel				23060	23095	23130			
Frequency (MHz)				704	707.5	711	L	M	H
10	QPSK	1	0	23.10	23.17	23.15	0.0643	0.0653	0.0650
10	QPSK	1	49	23.11	23.13	23.04	0.0644	0.0647	0.0634
10	QPSK	50	0	22.35	22.38	22.36	0.0541	0.0545	0.0542
10	16QAM	1	0	22.48	22.56	22.55	0.0557	0.0568	0.0566
10	64QAM	1	0	21.23	21.11	21.14	0.0418	0.0406	0.0409
Channel				23035	23095	23155	ERP(W)		
Frequency (MHz)				701.5	707.5	713.5	L	M	H
5	QPSK	1	0	22.94	23.00	23.07	0.0619	0.0628	0.0638
5	16QAM	1	0	22.31	22.46	22.49	0.0536	0.0555	0.0558
Channel				23025	23095	23165	ERP(W)		
Frequency (MHz)				700.5	707.5	714.5	L	M	H
3	QPSK	1	0	22.98	23.04	22.97	0.0625	0.0634	0.0624
3	16QAM	1	0	22.31	22.38	22.56	0.0536	0.0545	0.0568
Channel				23017	23095	23173	ERP(W)		
Frequency (MHz)				699.7	707.5	715.3	L	M	H
1.4	QPSK	1	0	23.02	23.14	23.10	0.0631	0.0649	0.0643
1.4	16QAM	1	0	22.41	22.35	22.44	0.0548	0.0541	0.0552

LTE Band 41 :

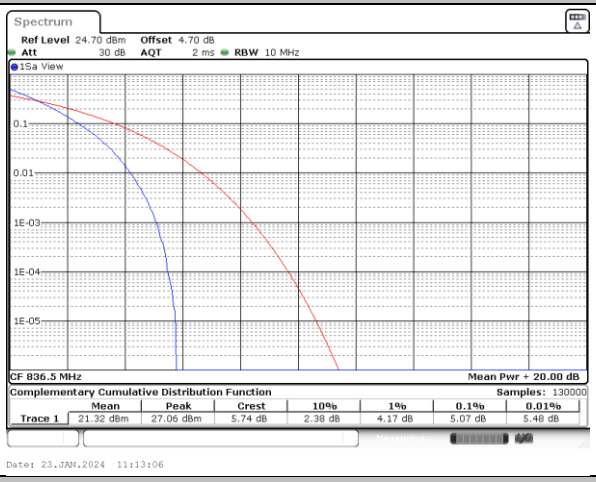
BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	EIRP(W)		
Channel				39750	40620	41490			
Frequency (MHz)				2506	2593	2680	L	M	H
20	QPSK	1	0	18.19	18.30	18.08	0.0356	0.0366	0.0348
20	QPSK	1	99	18.07	18.26	17.94	0.0347	0.0362	0.0337
20	QPSK	100	0	18.10	18.26	17.95	0.0349	0.0362	0.0337
20	16QAM	1	0	17.98	18.27	17.90	0.0340	0.0363	0.0333
20	64QAM	1	0	18.20	18.15	18.04	0.0357	0.0353	0.0344
Channel				39725	40620	41515	EIRP(W)		
Frequency (MHz)				2503.5	2593	2682.5	L	M	H
15	QPSK	1	0	18.12	18.24	18.02	0.0351	0.0361	0.0343
15	16QAM	1	0	17.79	18.17	17.73	0.0325	0.0355	0.0321
Channel				39700	40620	41540	EIRP(W)		
Frequency (MHz)				2501	2593	2685	L	M	H
10	QPSK	1	0	18.13	18.27	18.05	0.0352	0.0363	0.0345
10	16QAM	1	0	17.92	18.26	17.80	0.0335	0.0362	0.0326
Channel				39675	40620	41565	EIRP(W)		
Frequency (MHz)				2498.5	2593	2687.5	L	M	H
5	QPSK	1	0	18.19	18.13	17.99	0.0356	0.0352	0.0340
5	16QAM	1	0	17.83	18.11	17.88	0.0328	0.0350	0.0332

LTE Band 5

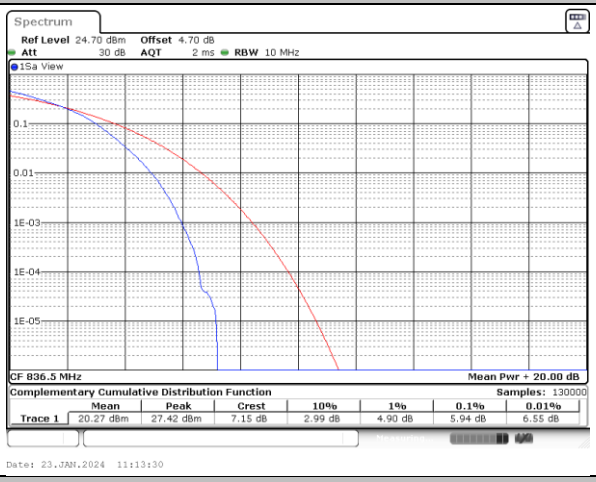
Peak-to-Average Ratio

Mode	LTE Band 5 / 10MHz			
Mod.	QPSK	16QAM	64QAM	Limit: 13dB
RB Size	Full RB	Full RB	Full RB	Result
Middle CH	5.07	5.94	6.17	PASS

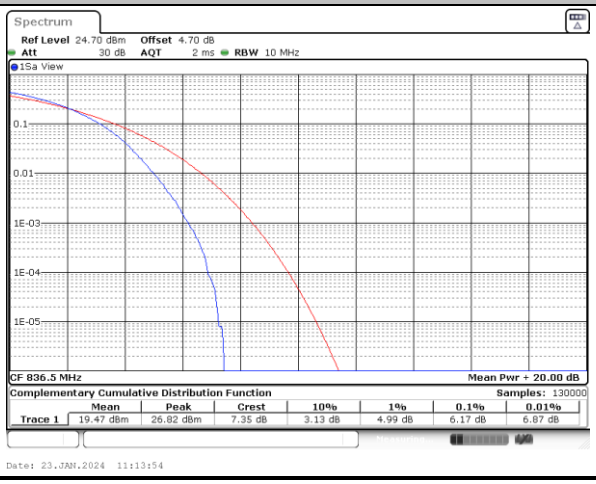
LTE Band 5 / 10MHz
Middle Channel / Full RB/ QPSK



Middle Channel / Full RB/ 16QAM



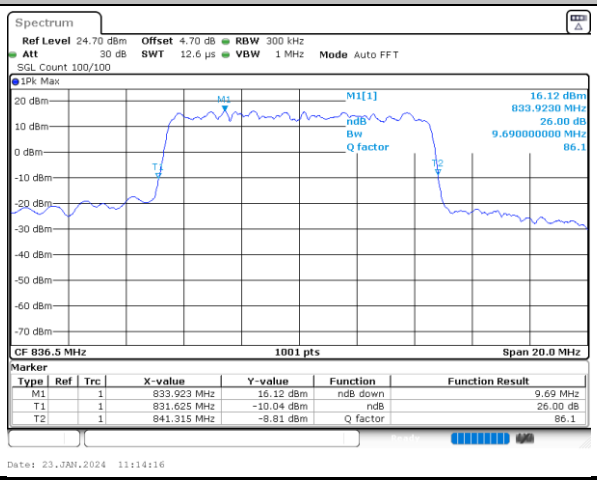
Middle Channel / Full RB/ 64QAM

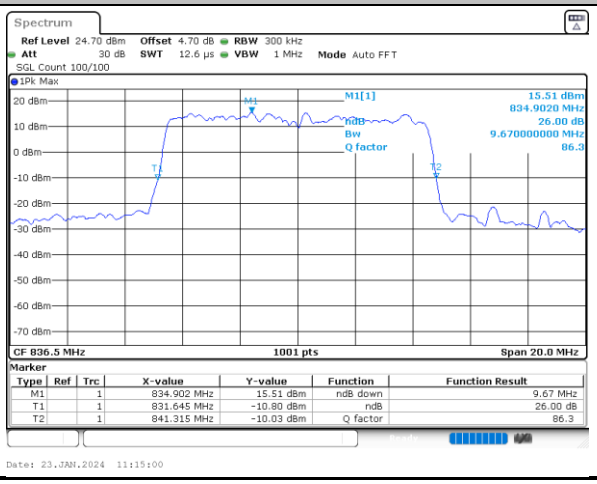


26dB Bandwidth

Mode	LTE Band 5 : 26dB BW(MHz)	
BW	10MHz	
Mod.	QPSK	16QAM
Middle CH	9.69	9.67
BW	5MHz	
Mod.	QPSK	16QAM
Middle CH	4.91	4.95
BW	3MHz	
Mod.	QPSK	16QAM
Middle CH	2.94	2.99
BW	1.4MHz	
Mod.	QPSK	16QAM
Middle CH	1.26	1.25

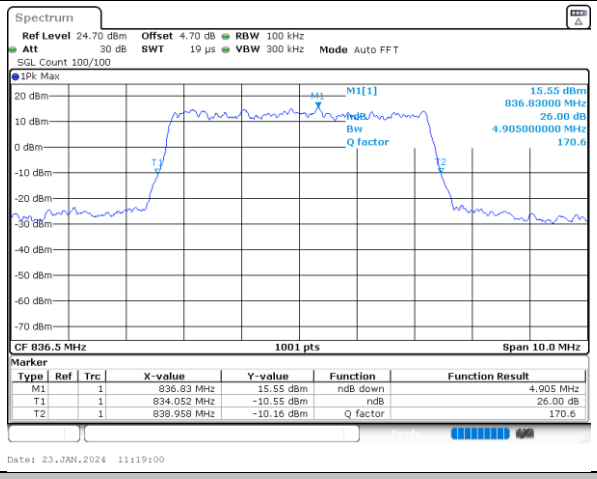
LTE Band 5	
Middle Channel / 10MHz / QPSK	Middle Channel / 10MHz / 16QAM



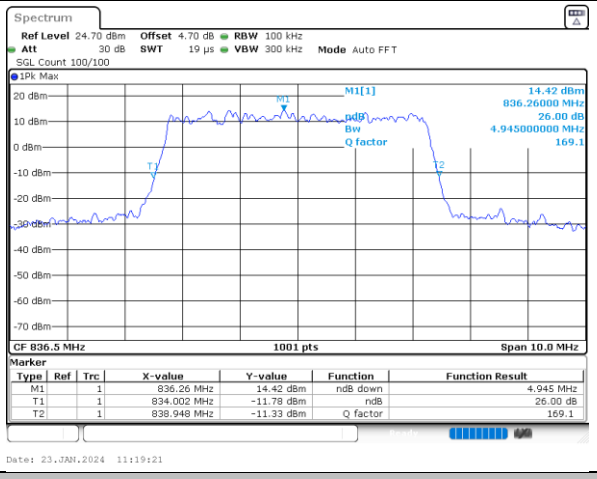


LTE Band 5

Middle Channel / 5MHz / QPSK

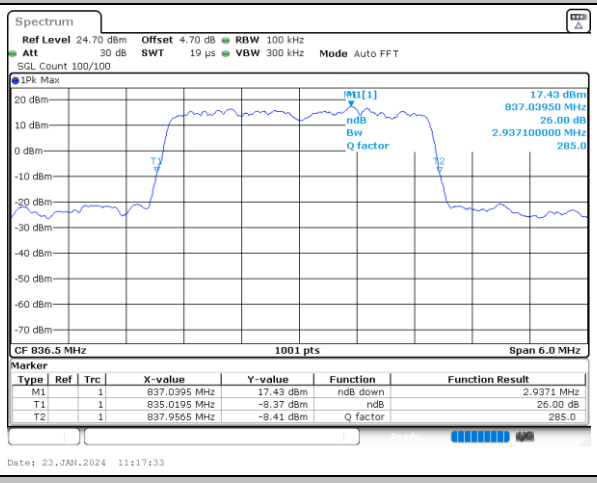


Middle Channel / 5MHz / 16QAM

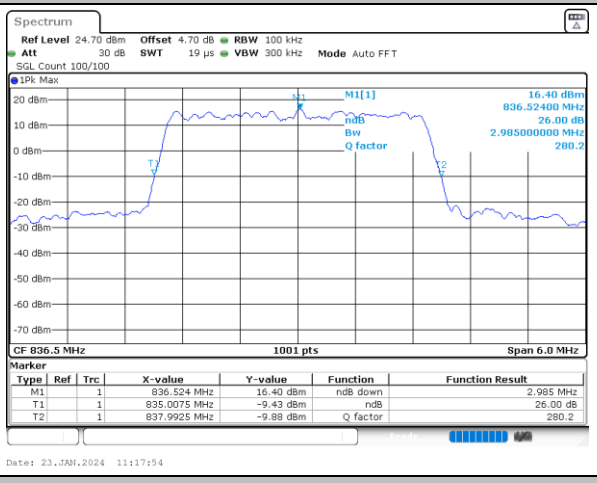


LTE Band 5

Middle Channel / 3MHz / QPSK

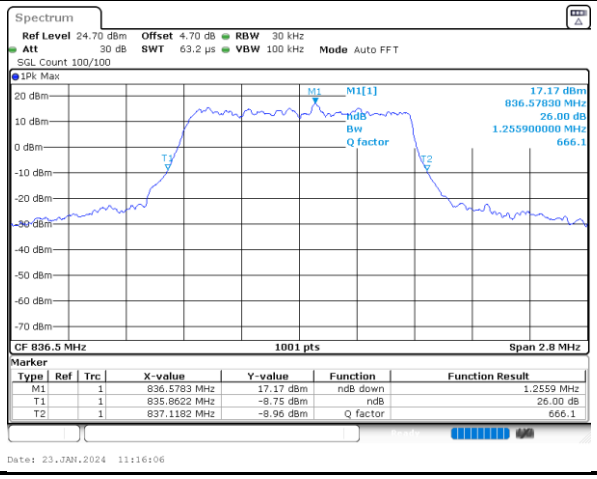


Middle Channel / 3MHz / 16QAM

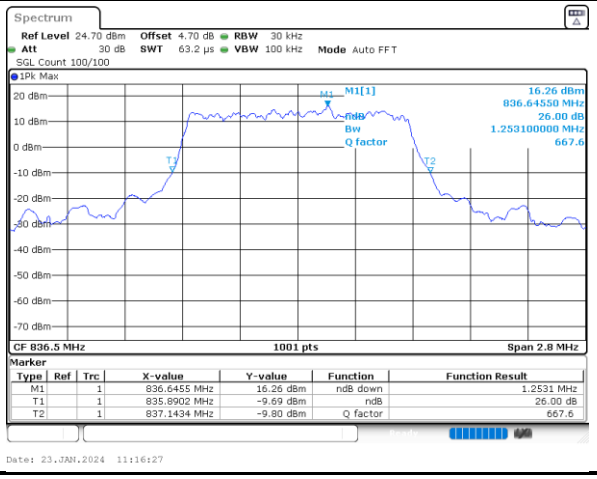


LTE Band 5

Middle Channel / 1.4MHz / QPSK



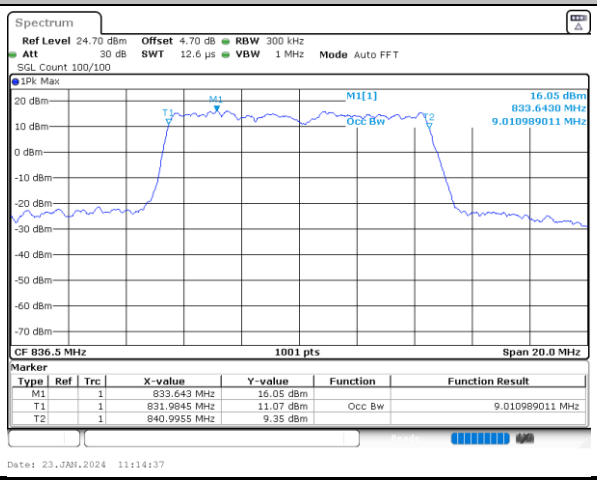
Middle Channel / 1.4MHz / 16QAM

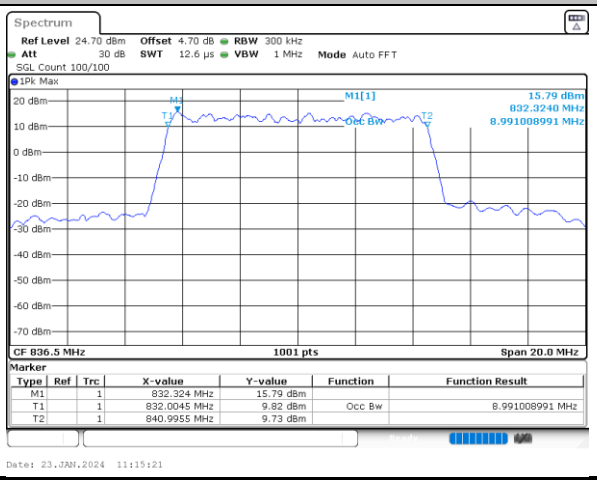


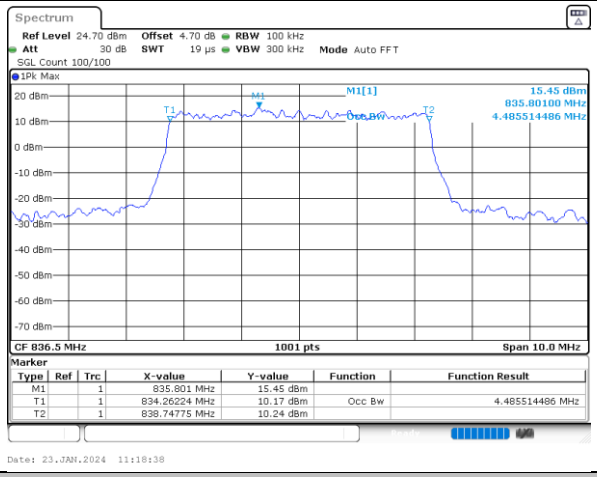
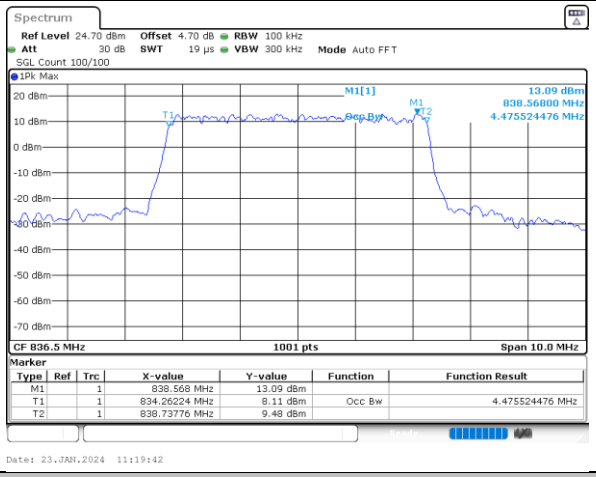
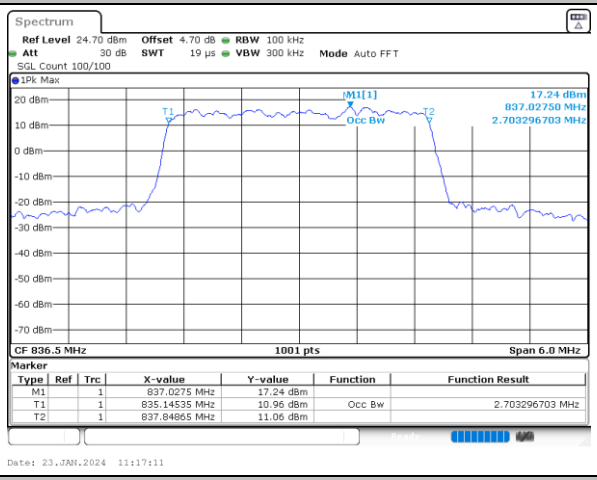
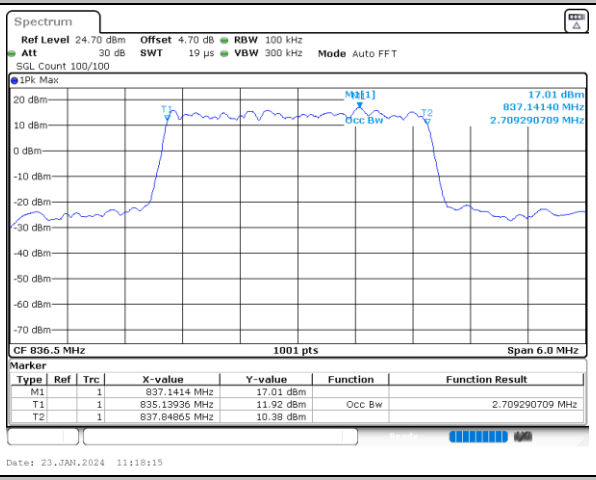
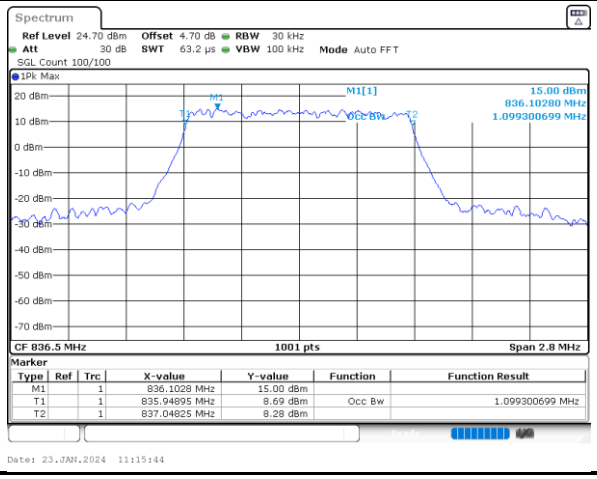
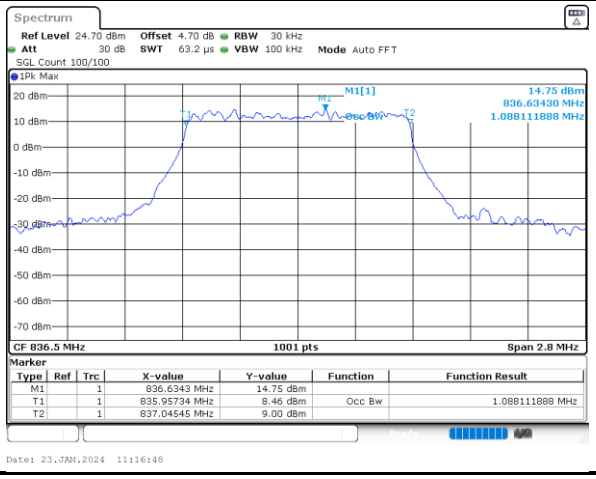
Occupied Bandwidth

Mode	LTE Band 5 : 99%OBW(MHz)	
BW	10MHz	
Mod.	QPSK	16QAM
Middle CH	9.01	8.99
BW	5MHz	
Mod.	QPSK	16QAM
Middle CH	4.49	4.48
BW	3MHz	
Mod.	QPSK	16QAM
Middle CH	2.70	2.71
BW	1.4MHz	
Mod.	QPSK	16QAM
Middle CH	1.10	1.09

LTE Band 5	
Middle Channel / 10MHz / QPSK	Middle Channel / 10MHz / 16QAM



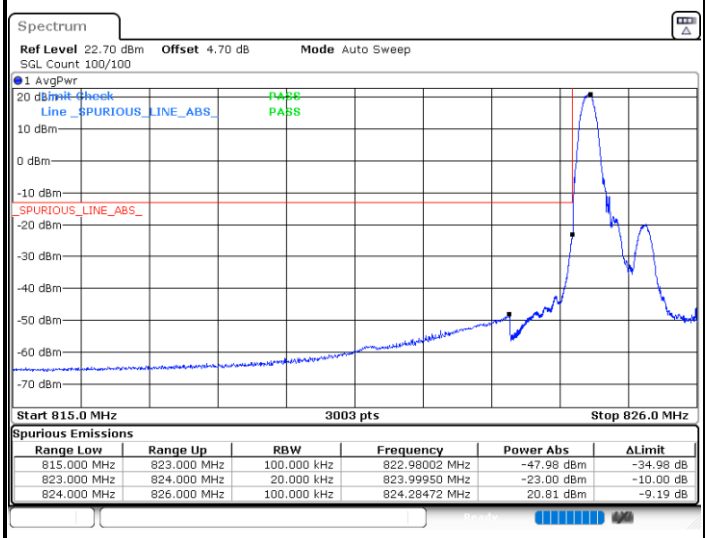


LTE Band 5	
Middle Channel / 10MHz / QPSK	**Middle Channel / 10MHz / 16QAM**
	
LTE Band 5	
Middle Channel / 3MHz / QPSK	**Middle Channel / 3MHz / 16QAM**
	
LTE Band 5	
Middle Channel / 1.4MHz / QPSK	**Middle Channel / 1.4MHz / 16QAM**
	

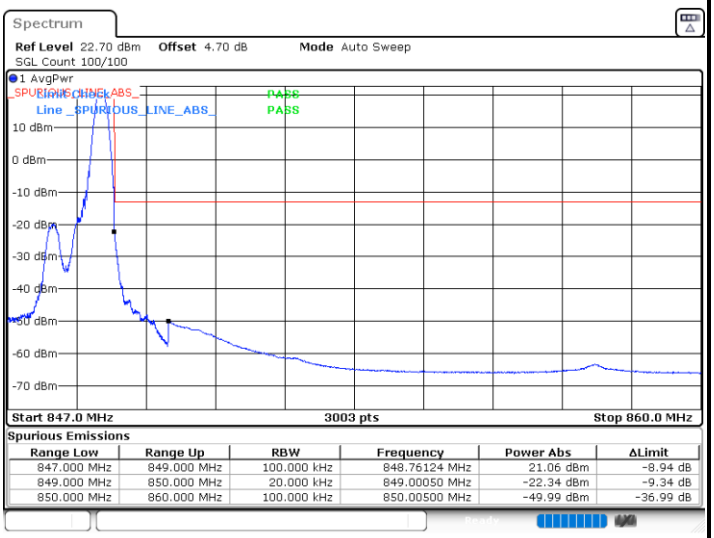
Conducted Band Edge

LTE Band 5 / 1.4MHz / QPSK

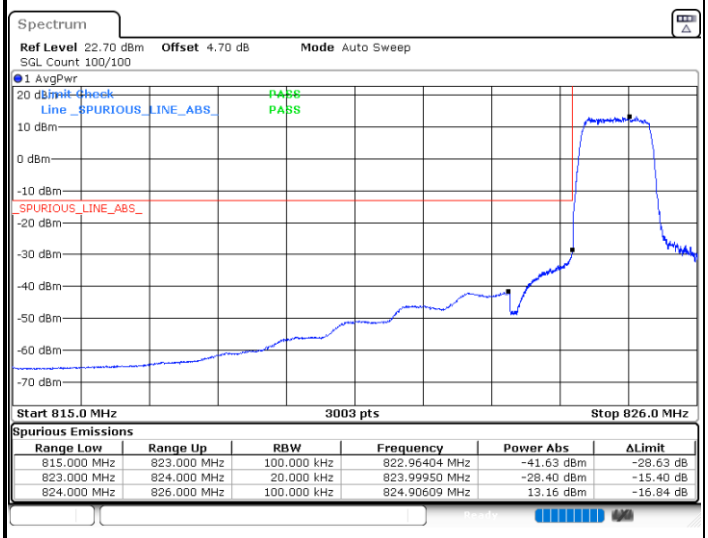
Lowest Band Edge / 1RB



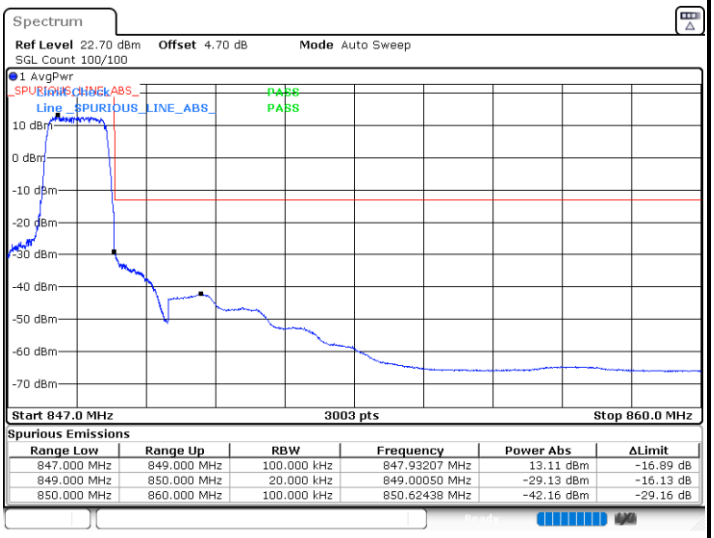
Highest Band Edge / 1RB



Lowest Band Edge / Full RB

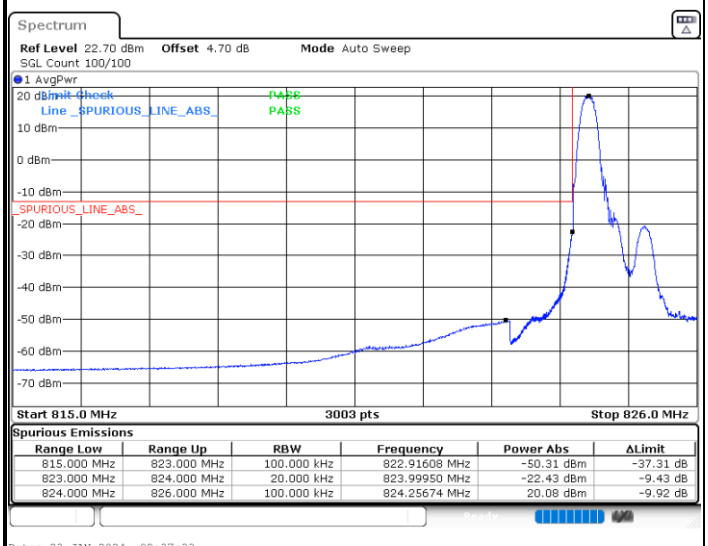


Highest Band Edge / Full RB



LTE Band 5 / 1.4MHz / 16QAM

Lowest Band Edge / 1 RB

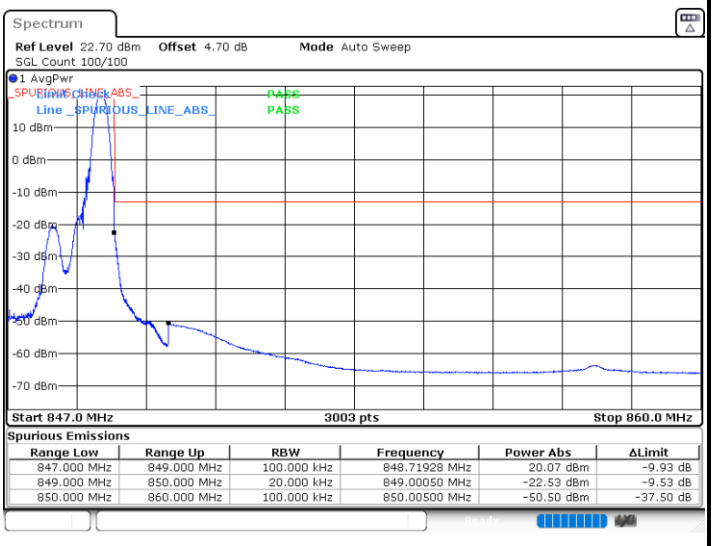


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.91608 MHz	-50.31 dBm	-37.31 dB
823.000 MHz	824.000 MHz	20.000 kHz	823.99950 MHz	-22.43 dBm	-9.43 dB
824.000 MHz	826.000 MHz	100.000 kHz	824.25674 MHz	20.08 dBm	-9.92 dB

Date: 23.JAN.2024 09:37:33

Highest Band Edge / 1 RB

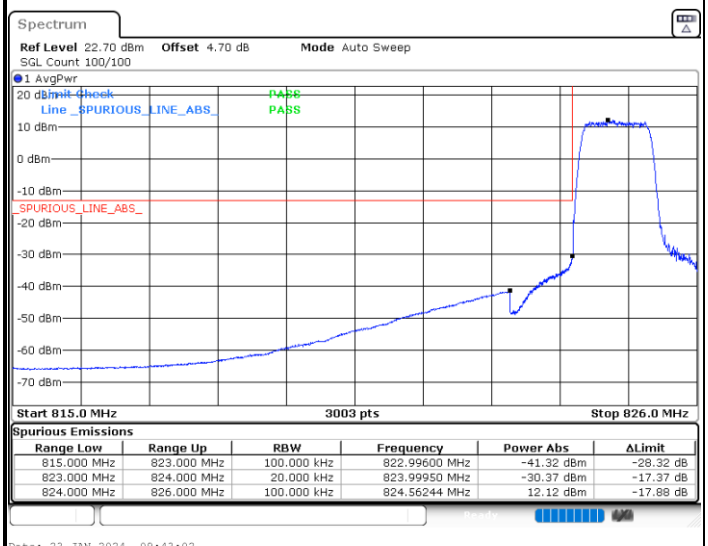


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
847.000 MHz	849.000 MHz	100.000 kHz	848.71928 MHz	20.07 dBm	-9.93 dB
849.000 MHz	850.000 MHz	20.000 kHz	849.00050 MHz	-22.53 dBm	-9.53 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.00500 MHz	-50.50 dBm	-37.50 dB

Date: 23.JAN.2024 09:51:10

Lowest Band Edge / Full RB

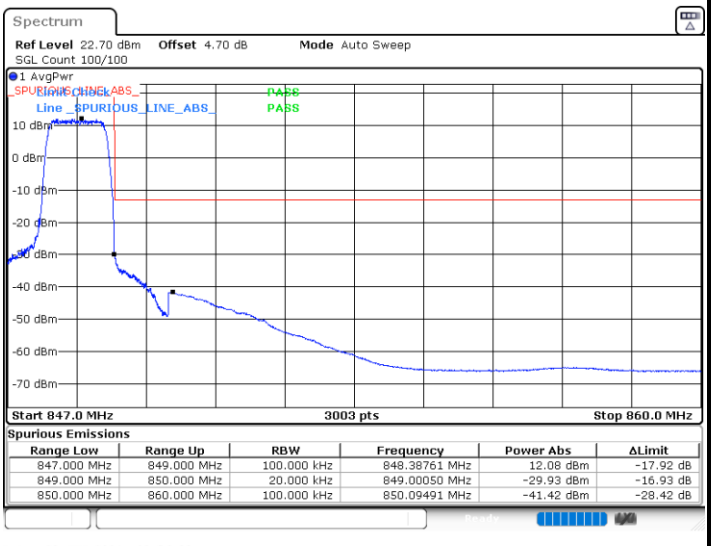


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.99600 MHz	-41.32 dBm	-28.32 dB
823.000 MHz	824.000 MHz	20.000 kHz	823.99950 MHz	-30.37 dBm	-17.37 dB
824.000 MHz	826.000 MHz	100.000 kHz	824.56244 MHz	12.12 dBm	-17.88 dB

Date: 23.JAN.2024 09:43:02

Highest Band Edge / Full RB



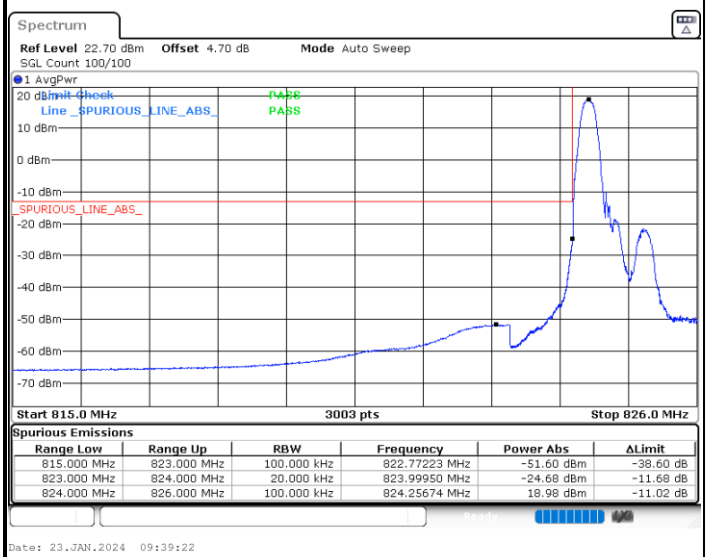
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
847.000 MHz	849.000 MHz	100.000 kHz	848.38761 MHz	12.08 dBm	-17.92 dB
849.000 MHz	850.000 MHz	20.000 kHz	849.00050 MHz	-29.93 dBm	-16.93 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.09491 MHz	-41.42 dBm	-28.42 dB

Date: 23.JAN.2024 09:56:39

LTE Band 5 / 1.4MHz / 64QAM

Lowest Band Edge / 1 RB

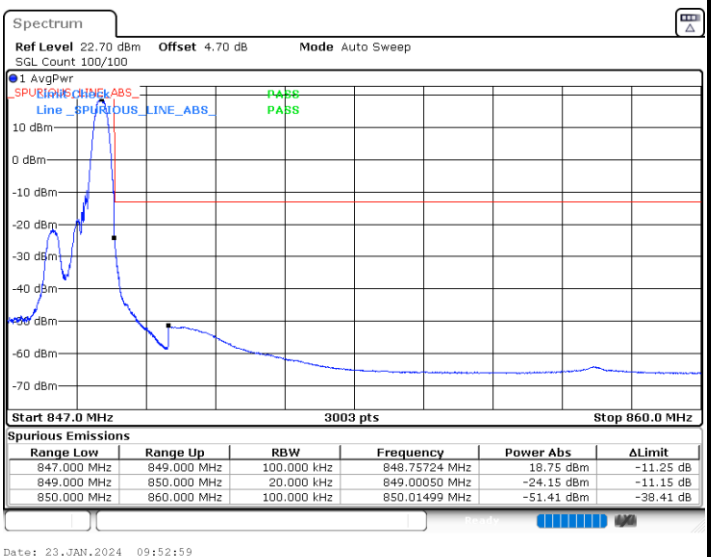


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.77223 MHz	-51.60 dBm	-38.60 dB
823.000 MHz	824.000 MHz	20.000 kHz	823.99950 MHz	-24.68 dBm	-11.68 dB
824.000 MHz	826.000 MHz	100.000 kHz	824.25674 MHz	18.98 dBm	-11.02 dB

Date: 23.JAN.2024 09:39:22

Highest Band Edge / 1 RB

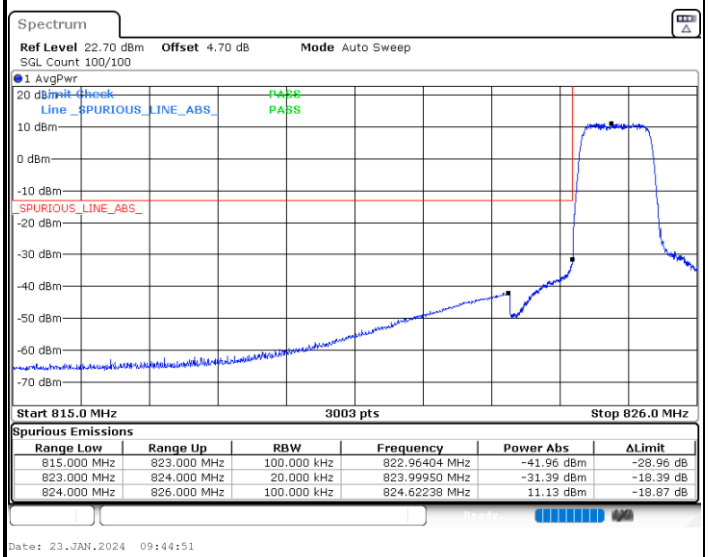


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
847.000 MHz	849.000 MHz	100.000 kHz	848.75724 MHz	18.75 dBm	-11.25 dB
849.000 MHz	850.000 MHz	20.000 kHz	849.00050 MHz	-24.15 dBm	-11.15 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.01499 MHz	-51.41 dBm	-38.41 dB

Date: 23.JAN.2024 09:52:59

Lowest Band Edge / Full RB

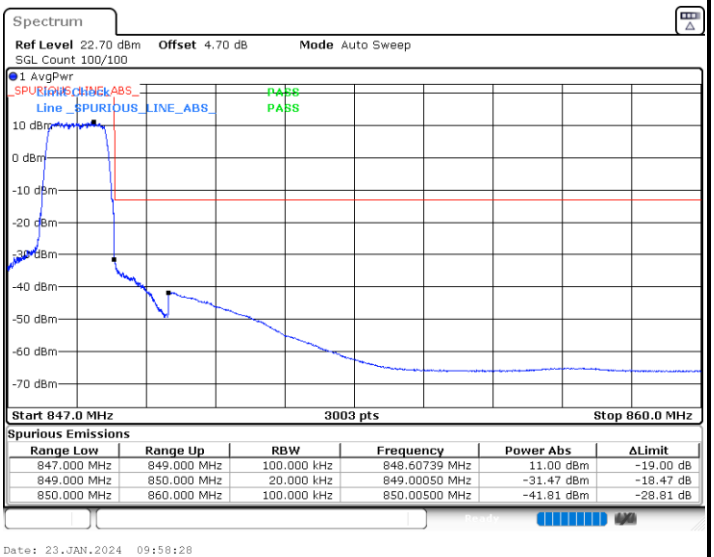


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.96404 MHz	-41.96 dBm	-28.96 dB
823.000 MHz	824.000 MHz	20.000 kHz	823.99950 MHz	-31.39 dBm	-18.39 dB
824.000 MHz	826.000 MHz	100.000 kHz	824.62238 MHz	11.13 dBm	-18.87 dB

Date: 23.JAN.2024 09:44:51

Highest Band Edge / Full RB



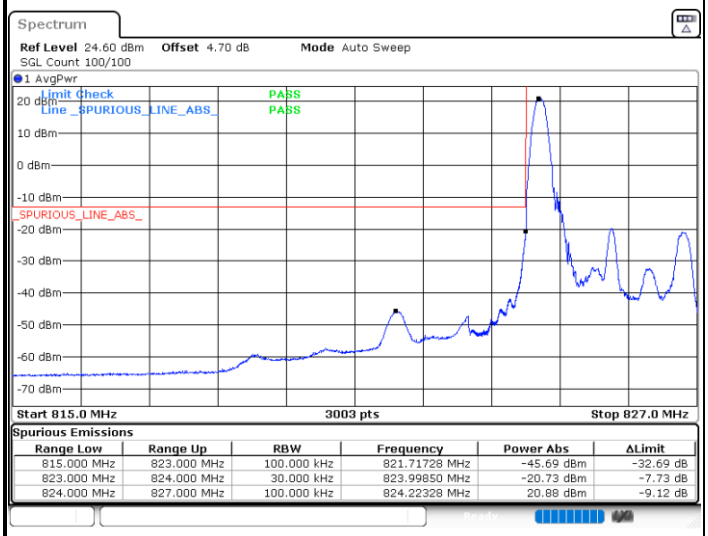
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
847.000 MHz	849.000 MHz	100.000 kHz	848.60739 MHz	11.00 dBm	-19.00 dB
849.000 MHz	850.000 MHz	20.000 kHz	849.00050 MHz	-31.47 dBm	-18.47 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.00500 MHz	-41.81 dBm	-28.81 dB

Date: 23.JAN.2024 09:58:28

LTE Band 5 / 3MHz / QPSK	
Lowest Band Edge / 1RB	**Highest Band Edge / 1 RB**
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**

Lowest Band Edge / 1RB

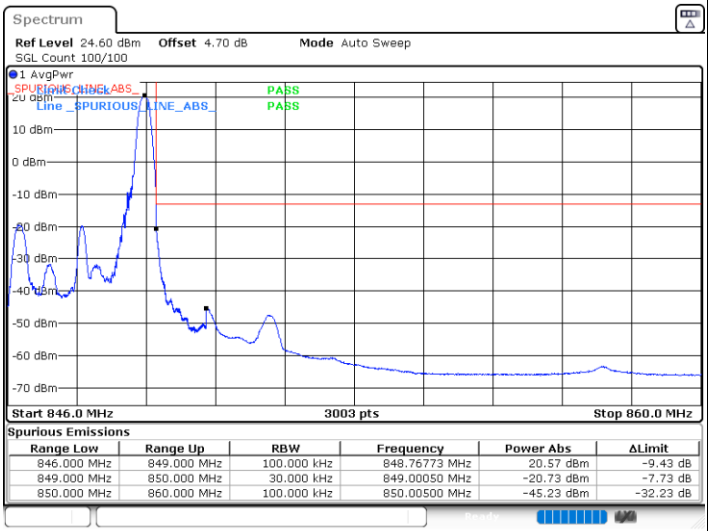


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	821.71728 MHz	-45.69 dBm	-32.69 dB
823.000 MHz	824.000 MHz	30.000 kHz	823.99850 MHz	-20.73 dBm	-7.73 dB
824.000 MHz	827.000 MHz	100.000 kHz	824.22328 MHz	20.88 dBm	-9.12 dB

Date: 23.JAN.2024 10:01:38

Highest Band Edge / 1 RB

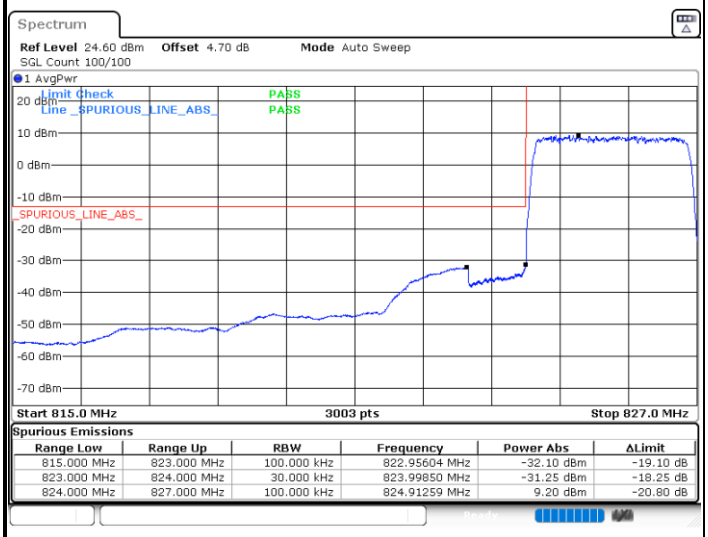


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
846.000 MHz	849.000 MHz	100.000 kHz	848.76773 MHz	20.57 dBm	-9.43 dB
849.000 MHz	850.000 MHz	30.000 kHz	849.00050 MHz	-20.73 dBm	-7.73 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.00500 MHz	-45.23 dBm	-32.23 dB

Date: 23.JAN.2024 10:14:45

Lowest Band Edge / Full RB

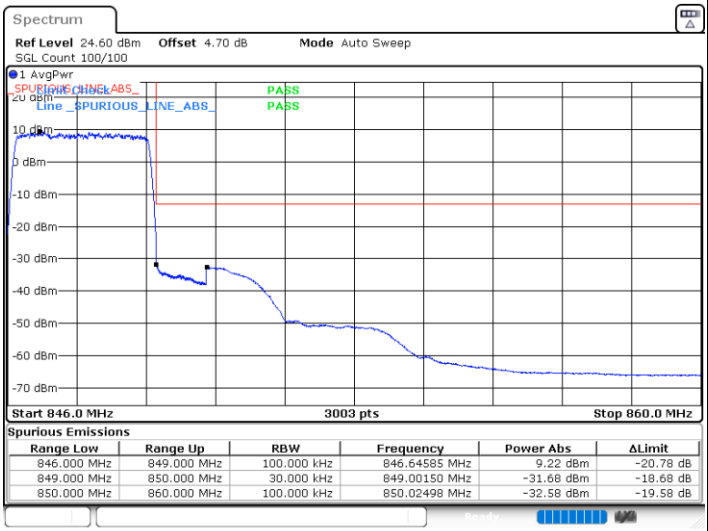


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.95604 MHz	-32.10 dBm	-19.10 dB
823.000 MHz	824.000 MHz	30.000 kHz	823.99850 MHz	-31.25 dBm	-18.25 dB
824.000 MHz	827.000 MHz	100.000 kHz	824.91259 MHz	9.20 dBm	-20.80 dB

Date: 23.JAN.2024 10:07:07

Highest Band Edge / Full RB



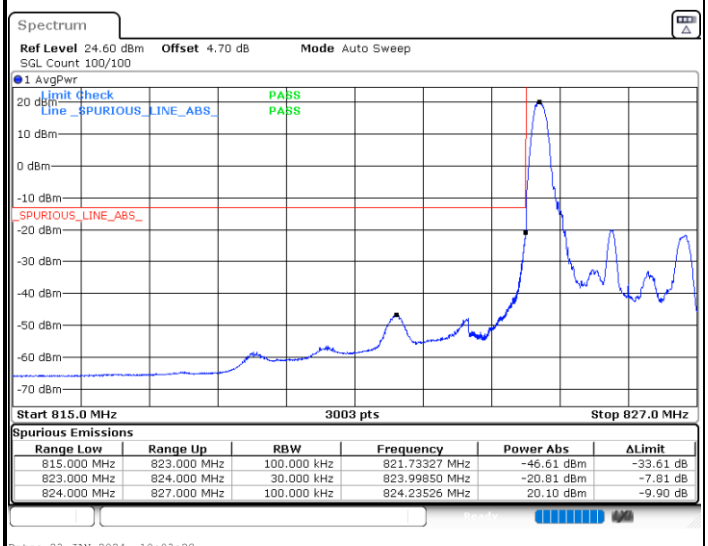
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
846.000 MHz	849.000 MHz	100.000 kHz	846.64585 MHz	9.22 dBm	-20.78 dB
849.000 MHz	850.000 MHz	30.000 kHz	849.00150 MHz	-31.68 dBm	-18.68 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.02498 MHz	-32.58 dBm	-19.58 dB

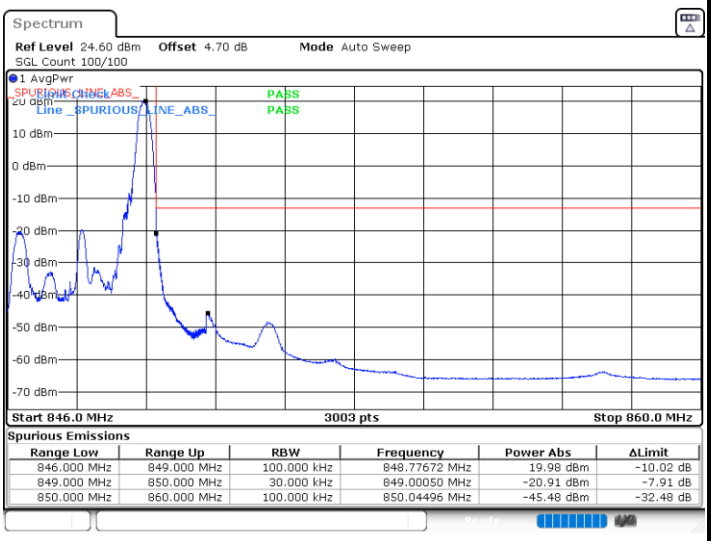
Date: 23.JAN.2024 10:20:14

LTE Band 5 / 3MHz / 16QAM

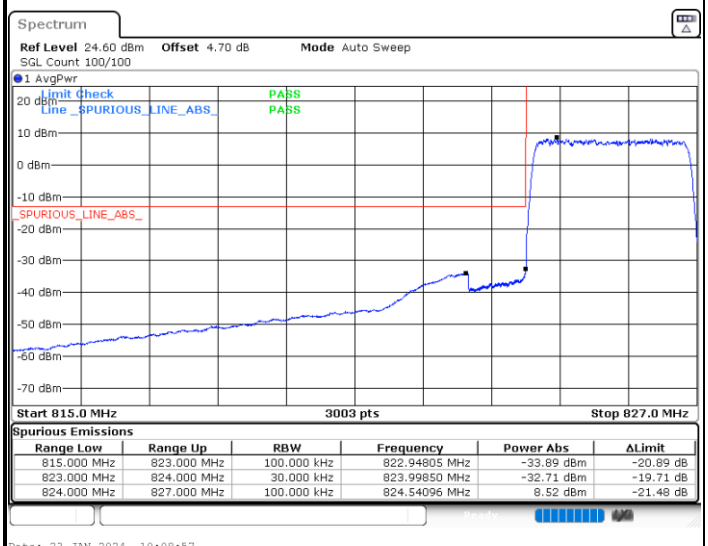
Lowest Band Edge / 1 RB



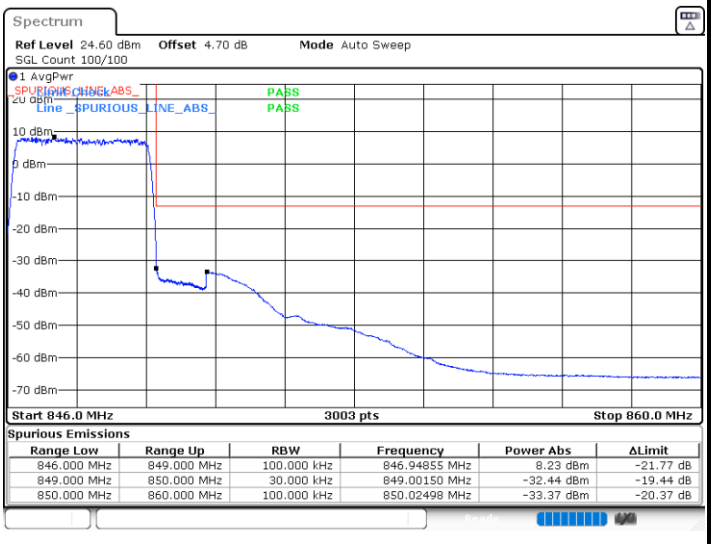
Highest Band Edge /1 RB



Lowest Band Edge / Full RB

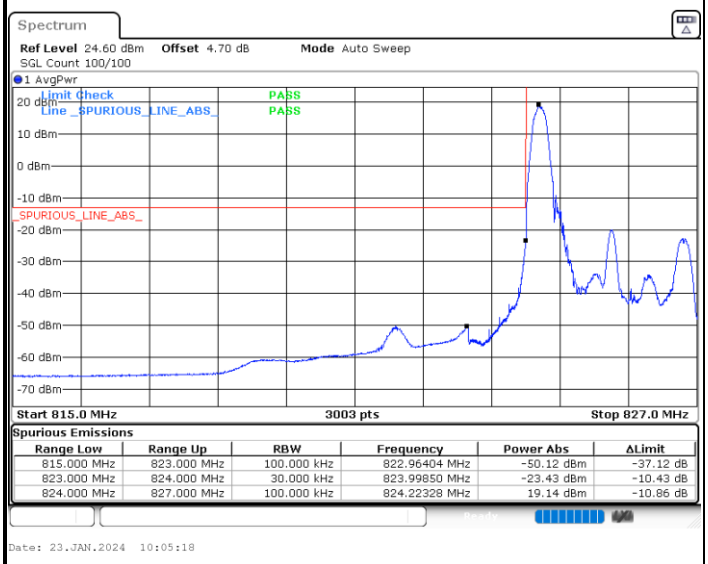


Highest Band Edge / Full RB

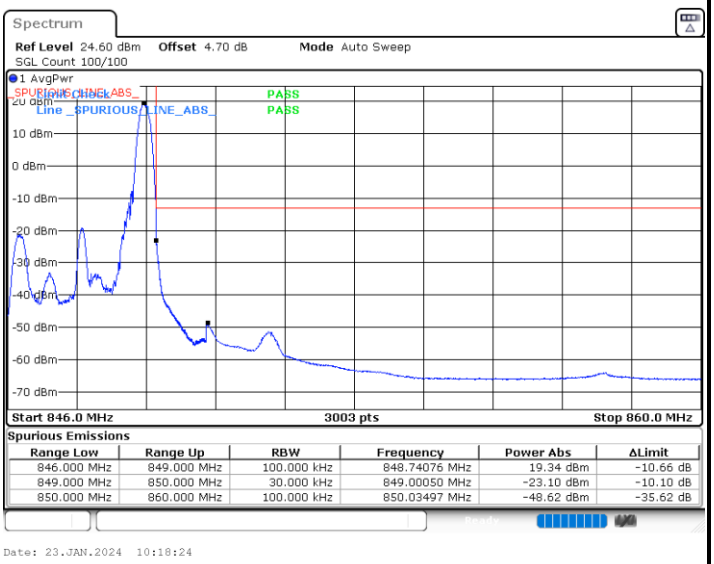


LTE Band 5 / 3MHz / 64QAM

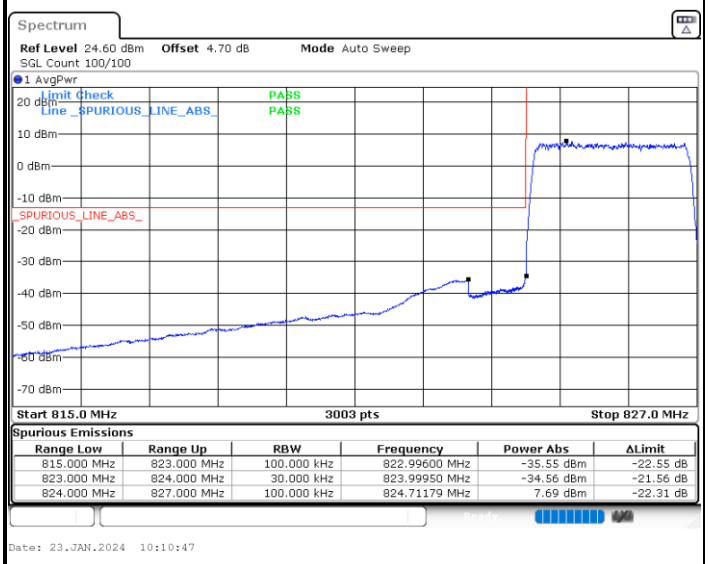
Lowest Band Edge / 1 RB



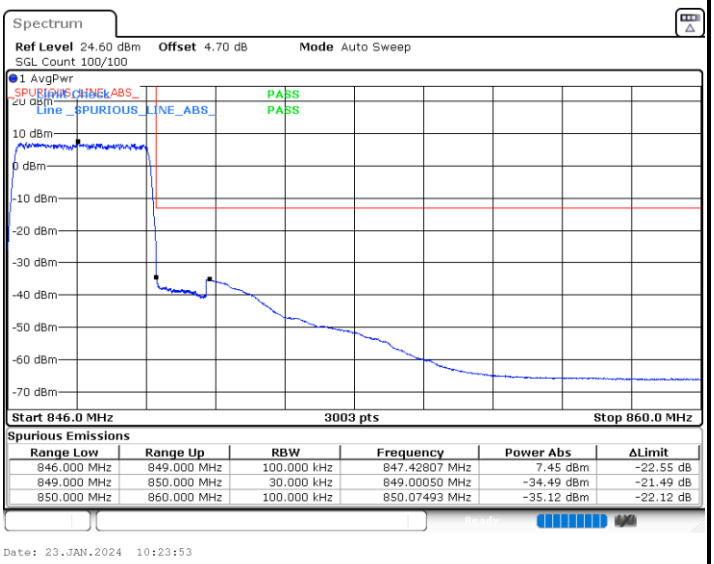
Highest Band Edge /1 RB

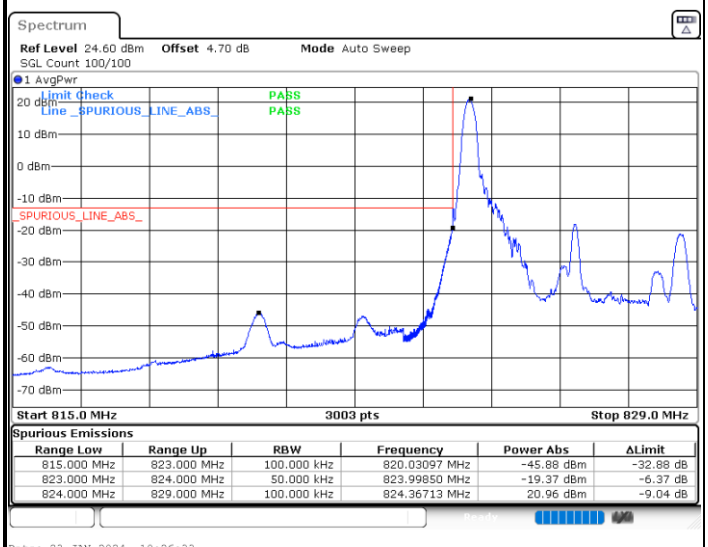
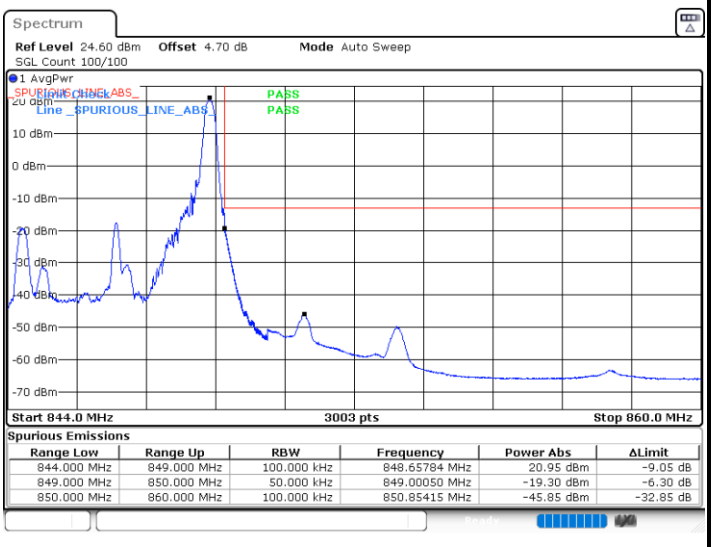
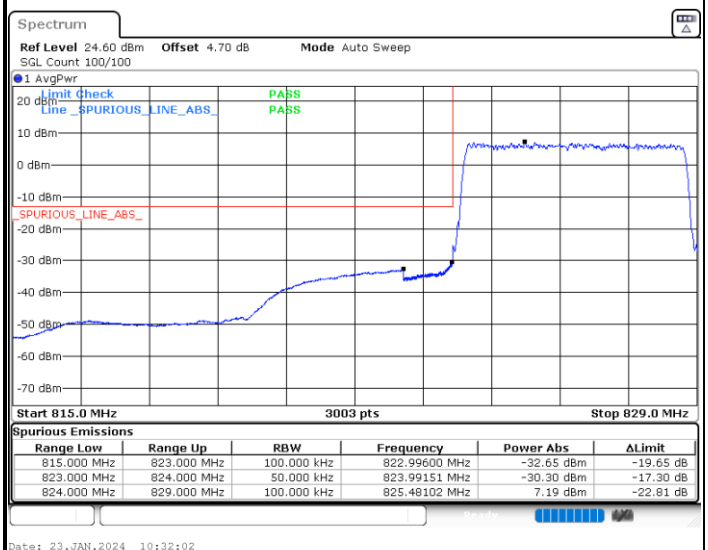
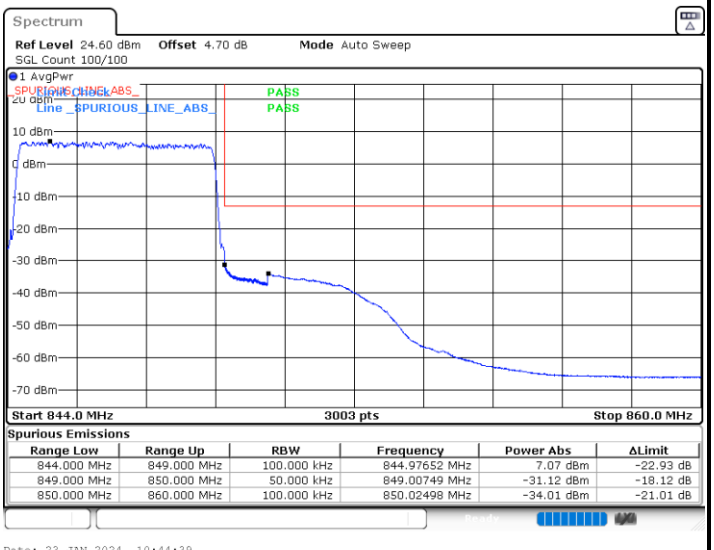


Lowest Band Edge / Full RB



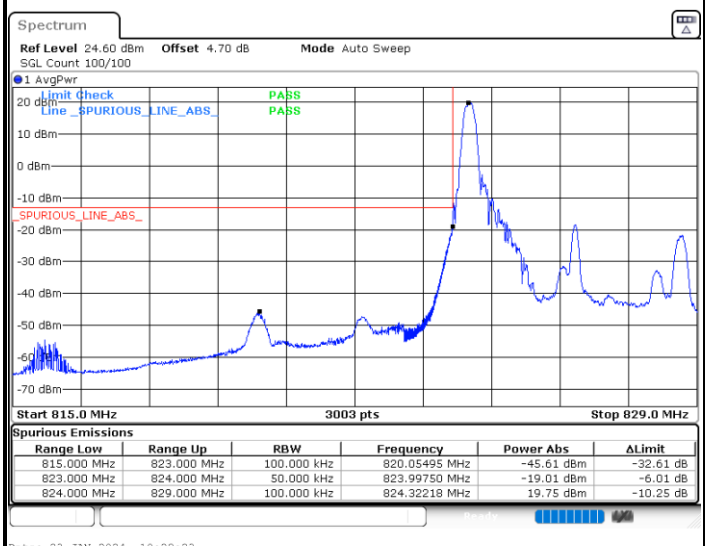
Highest Band Edge / Full RB



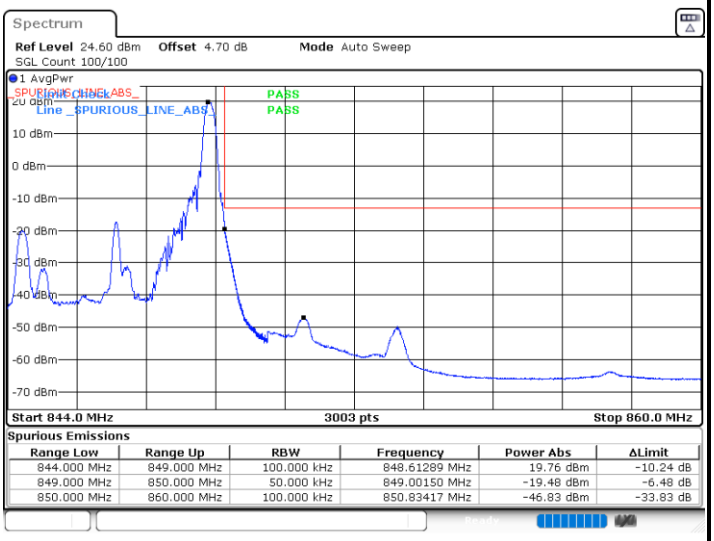
LTE Band 5 / 5MHz / QPSK	
Lowest Band Edge / 1 RB	**Highest Band Edge / 1 RB**
	
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	

LTE Band 5 / 5MHz / 16QAM

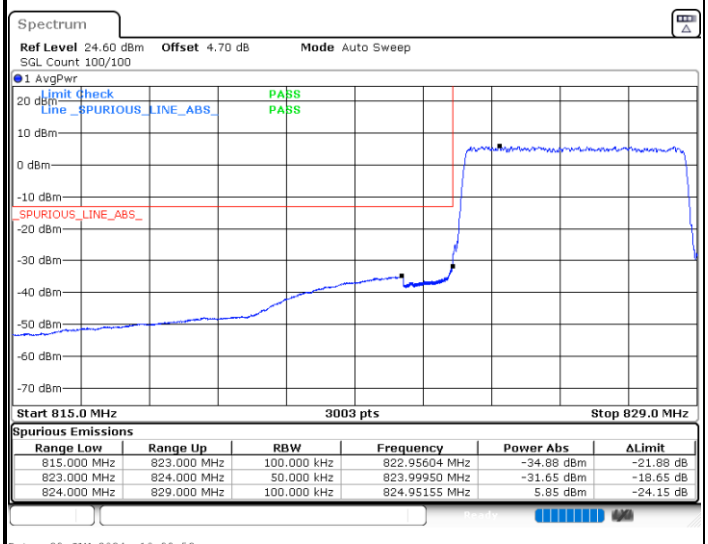
Lowest Band Edge / 1RB



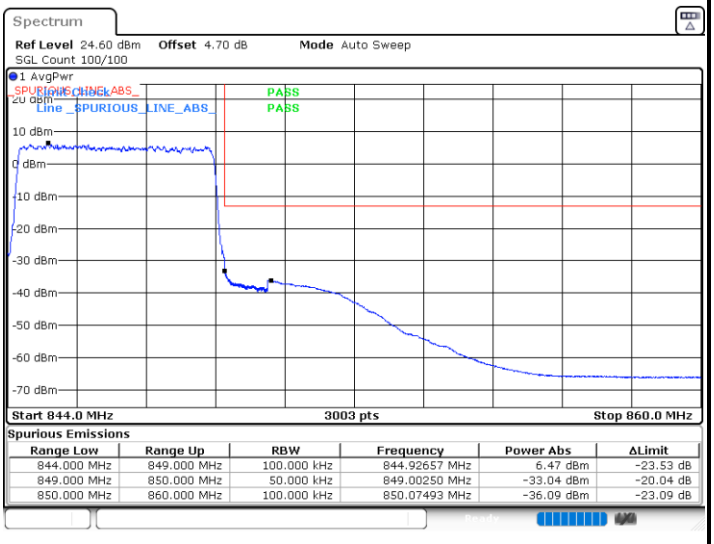
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB

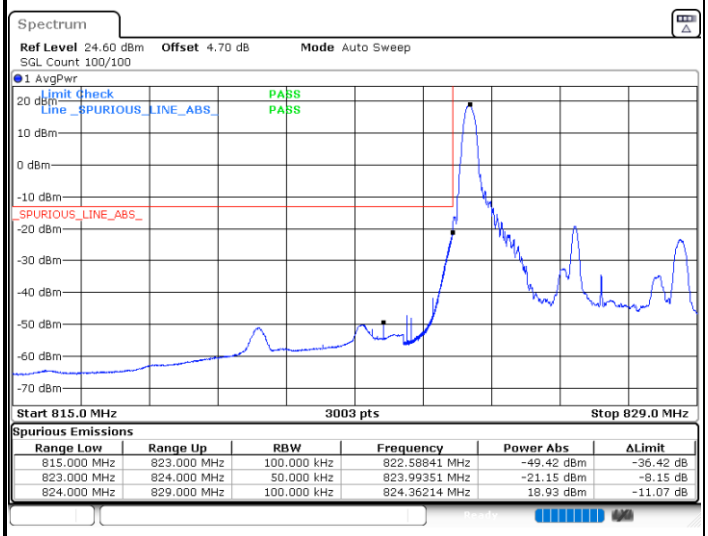


Highest Band Edge / Full RB



LTE Band 5 / 5MHz / 64QAM

Lowest Band Edge / 1RB

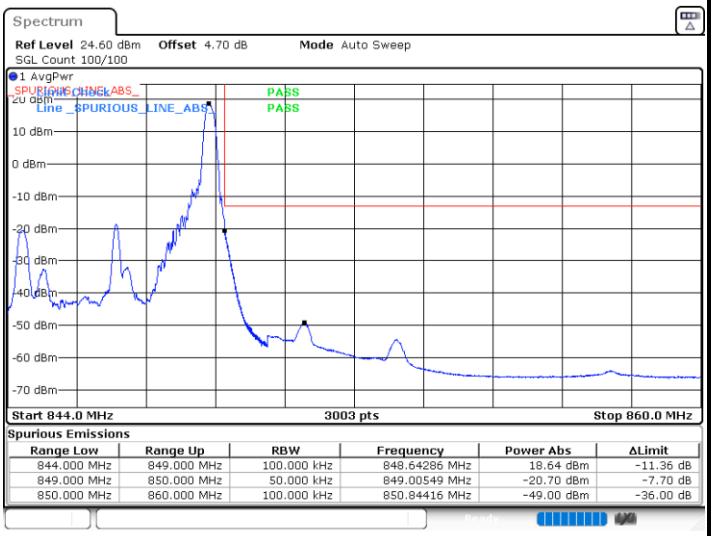


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.58841 MHz	-49.42 dBm	-36.42 dB
823.000 MHz	824.000 MHz	50.000 kHz	823.99351 MHz	-21.15 dBm	-8.15 dB
824.000 MHz	829.000 MHz	100.000 kHz	824.36214 MHz	18.93 dBm	-11.07 dB

Date: 23.JAN.2024 10:30:12

Highest Band Edge / 1 RB

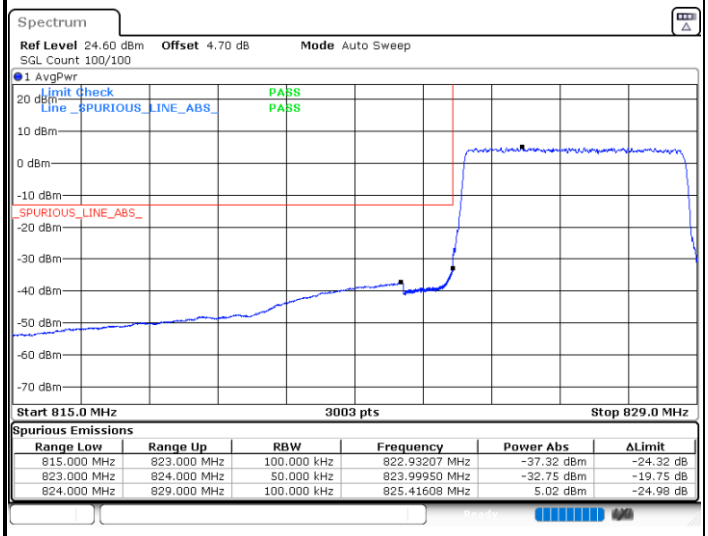


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
844.000 MHz	849.000 MHz	100.000 kHz	848.64286 MHz	18.64 dBm	-11.36 dB
849.000 MHz	850.000 MHz	50.000 kHz	849.00549 MHz	-20.70 dBm	-7.70 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.84416 MHz	-49.00 dBm	-36.00 dB

Date: 23.JAN.2024 10:42:50

Lowest Band Edge / Full RB

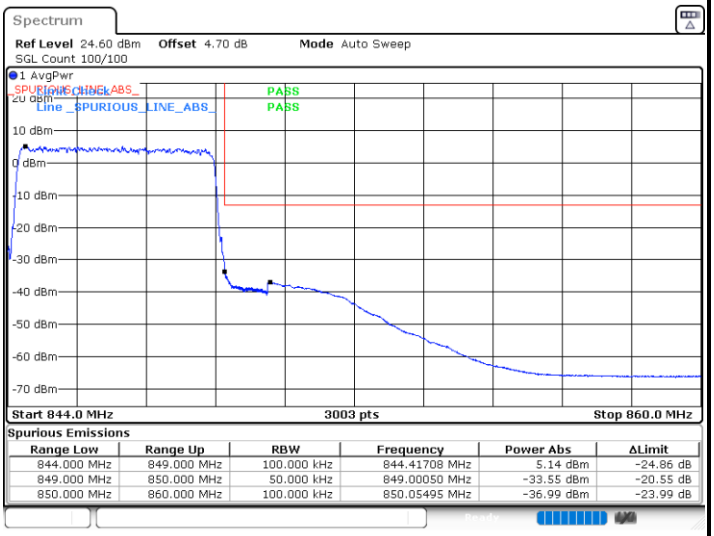


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.93207 MHz	-37.32 dBm	-24.32 dB
823.000 MHz	824.000 MHz	50.000 kHz	823.99950 MHz	-32.75 dBm	-19.75 dB
824.000 MHz	829.000 MHz	100.000 kHz	825.41608 MHz	5.02 dBm	-24.98 dB

Date: 23.JAN.2024 10:35:41

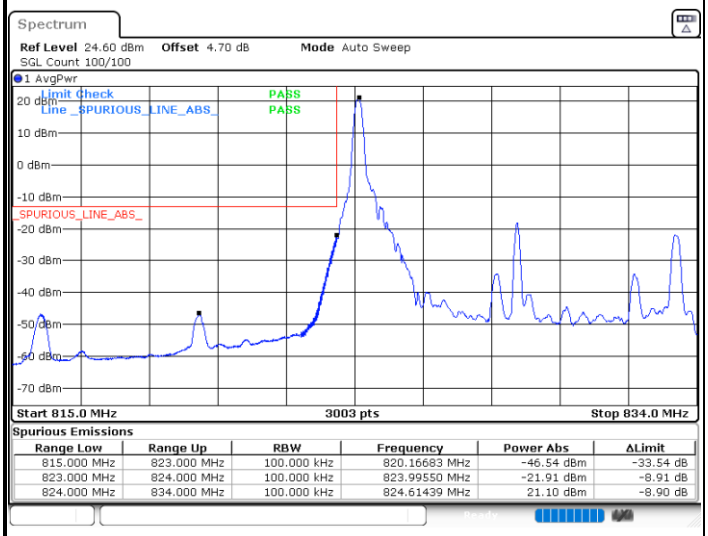
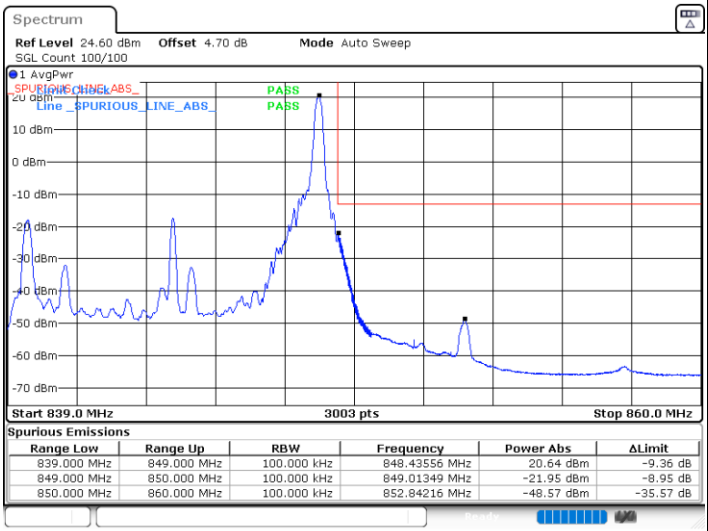
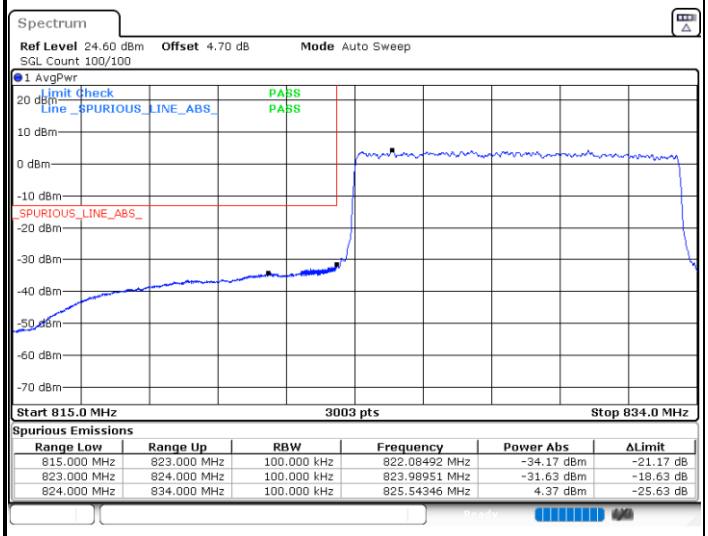
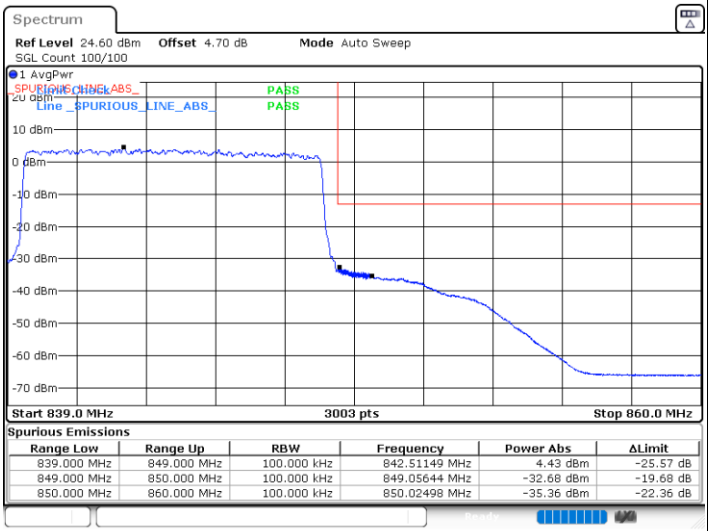
Highest Band Edge / Full RB



Spurious Emissions

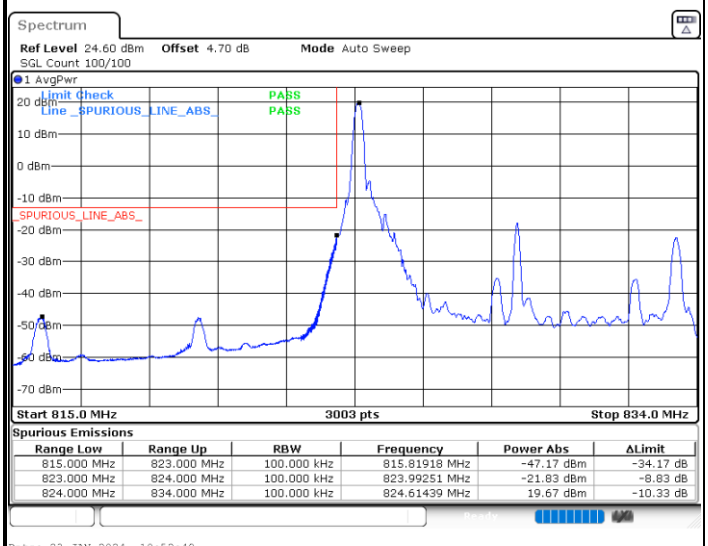
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
844.000 MHz	849.000 MHz	100.000 kHz	844.41708 MHz	5.14 dBm	-24.86 dB
849.000 MHz	850.000 MHz	50.000 kHz	849.00050 MHz	-33.55 dBm	-20.55 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.05495 MHz	-36.99 dBm	-23.99 dB

Date: 23.JAN.2024 10:48:19

LTE Band 5 / 10MHz / QPSK	
Lowest Band Edge / 1 RB	**Highest Band Edge / 1 RB**
	
Lowest Band Edge / Full RB	**Highest Band Edge / Full RB**
	

LTE Band 5 / 10MHz / 16QAM

Lowest Band Edge / 1 RB

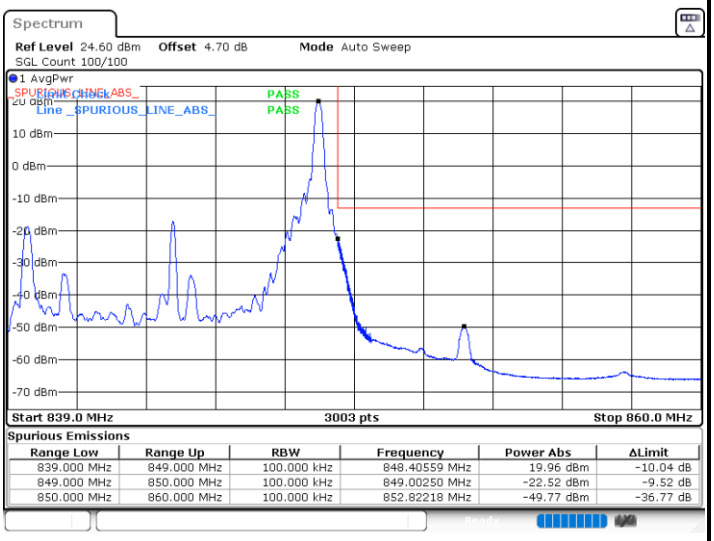


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	815.81918 MHz	-47.17 dBm	-34.17 dB
823.000 MHz	824.000 MHz	100.000 kHz	823.99251 MHz	-21.83 dBm	-8.83 dB
824.000 MHz	834.000 MHz	100.000 kHz	824.61439 MHz	19.67 dBm	-10.33 dB

Date: 23.JAN.2024 10:52:49

Highest Band Edge / 1 RB

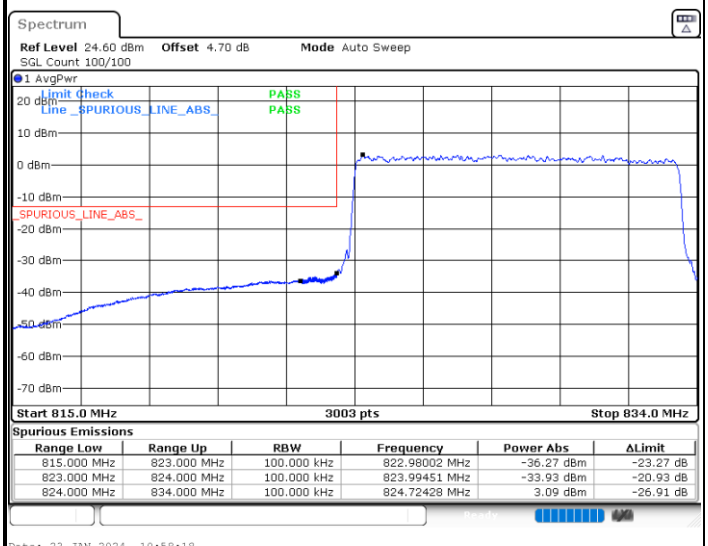


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
839.000 MHz	849.000 MHz	100.000 kHz	848.40559 MHz	19.96 dBm	-10.04 dB
849.000 MHz	850.000 MHz	100.000 kHz	849.00250 MHz	-22.52 dBm	-9.52 dB
850.000 MHz	860.000 MHz	100.000 kHz	852.82218 MHz	-49.77 dBm	-36.77 dB

Date: 23.JAN.2024 11:05:25

Lowest Band Edge / Full RB

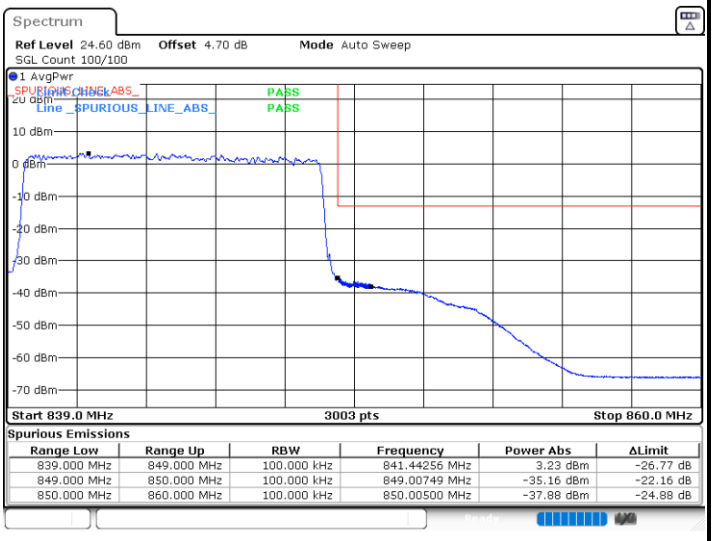


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.98002 MHz	-36.27 dBm	-23.27 dB
823.000 MHz	824.000 MHz	100.000 kHz	823.99451 MHz	-33.93 dBm	-20.93 dB
824.000 MHz	834.000 MHz	100.000 kHz	824.72428 MHz	3.09 dBm	-26.91 dB

Date: 23.JAN.2024 10:58:18

Highest Band Edge / Full RB



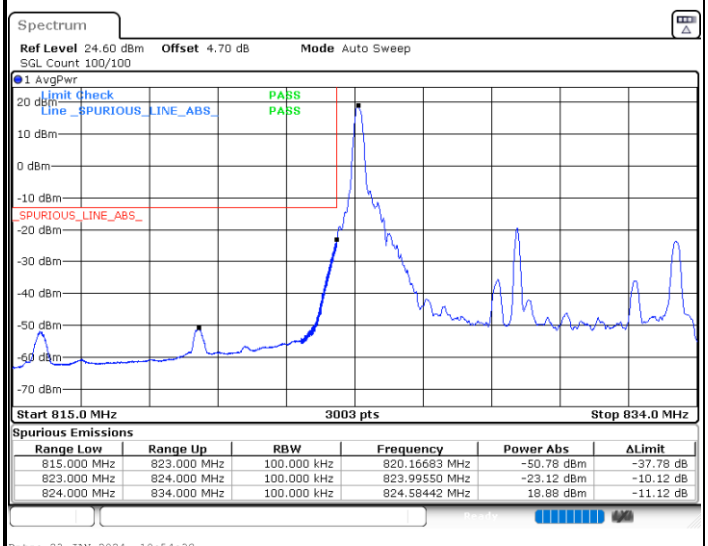
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
839.000 MHz	849.000 MHz	100.000 kHz	841.44256 MHz	3.23 dBm	-26.77 dB
849.000 MHz	850.000 MHz	100.000 kHz	849.00749 MHz	-35.16 dBm	-22.16 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.00500 MHz	-37.88 dBm	-24.88 dB

Date: 23.JAN.2024 11:10:55

LTE Band 5 / 10MHz / 64QAM

Lowest Band Edge / 1 RB

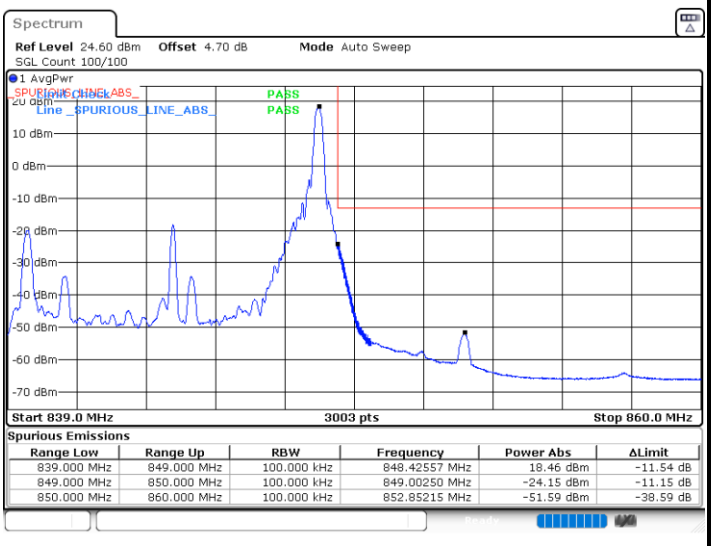


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	820.16683 MHz	-50.78 dBm	-37.78 dB
823.000 MHz	824.000 MHz	100.000 kHz	823.99550 MHz	-23.12 dBm	-10.12 dB
824.000 MHz	834.000 MHz	100.000 kHz	824.58442 MHz	18.88 dBm	-11.12 dB

Date: 23.JAN.2024 10:54:38

Highest Band Edge / 1 RB

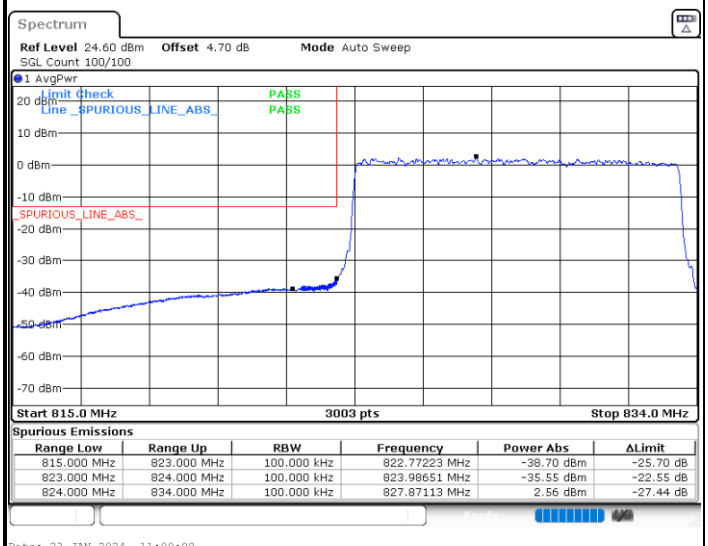


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
839.000 MHz	849.000 MHz	100.000 kHz	848.42557 MHz	18.46 dBm	-11.54 dB
849.000 MHz	850.000 MHz	100.000 kHz	849.00250 MHz	-24.15 dBm	-11.15 dB
850.000 MHz	860.000 MHz	100.000 kHz	852.85215 MHz	-51.59 dBm	-38.59 dB

Date: 23.JAN.2024 11:07:15

Lowest Band Edge / Full RB

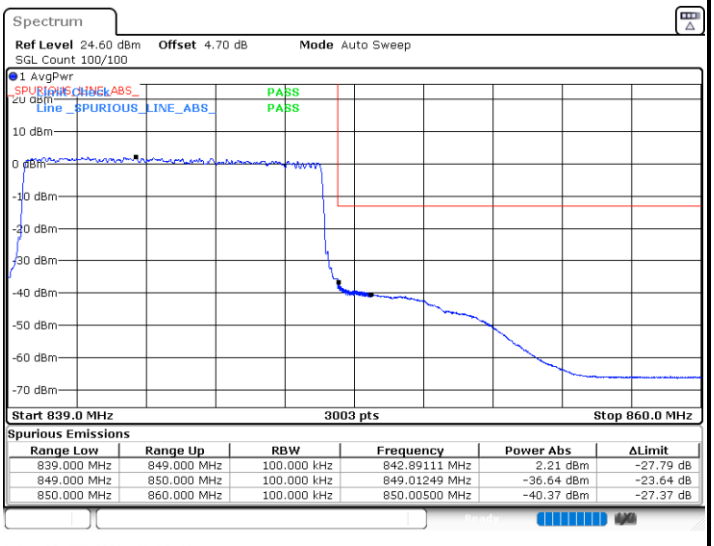


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.77223 MHz	-38.70 dBm	-25.70 dB
823.000 MHz	824.000 MHz	100.000 kHz	823.98651 MHz	-35.55 dBm	-22.55 dB
824.000 MHz	834.000 MHz	100.000 kHz	827.87113 MHz	2.56 dBm	-27.44 dB

Date: 23.JAN.2024 11:00:08

Highest Band Edge / Full RB



Spurious Emissions

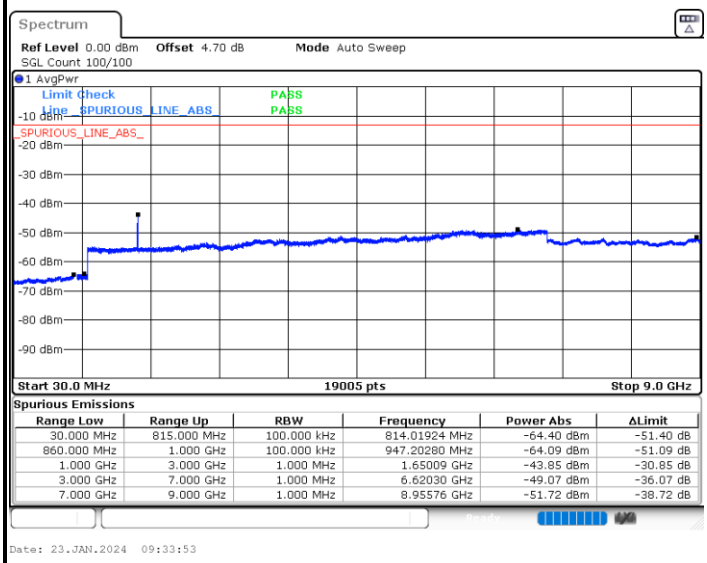
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
839.000 MHz	849.000 MHz	100.000 kHz	842.89111 MHz	2.21 dBm	-27.79 dB
849.000 MHz	850.000 MHz	100.000 kHz	849.01249 MHz	-36.64 dBm	-23.64 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.00500 MHz	-40.37 dBm	-27.37 dB

Date: 23.JAN.2024 11:12:44

Conducted Spurious Emission

LTE Band 5 / 1.4MHz

Lowest Channel / QPSK

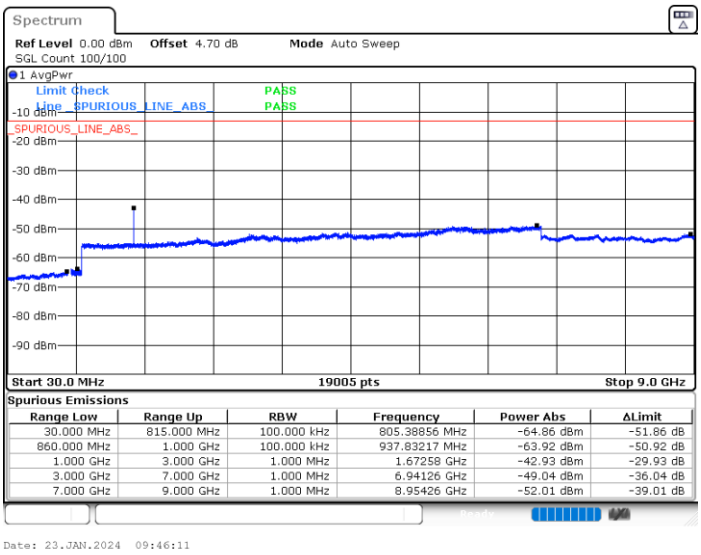


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	814.01924 MHz	-64.40 dBm	-51.40 dB
860.000 MHz	1.000 GHz	100.000 kHz	947.20280 MHz	-64.09 dBm	-51.09 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.65009 GHz	-43.85 dBm	-30.85 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.62030 GHz	-49.07 dBm	-36.07 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.95576 GHz	-51.72 dBm	-38.72 dB

Date: 23.JAN.2024 09:33:53

Middle Channel / QPSK

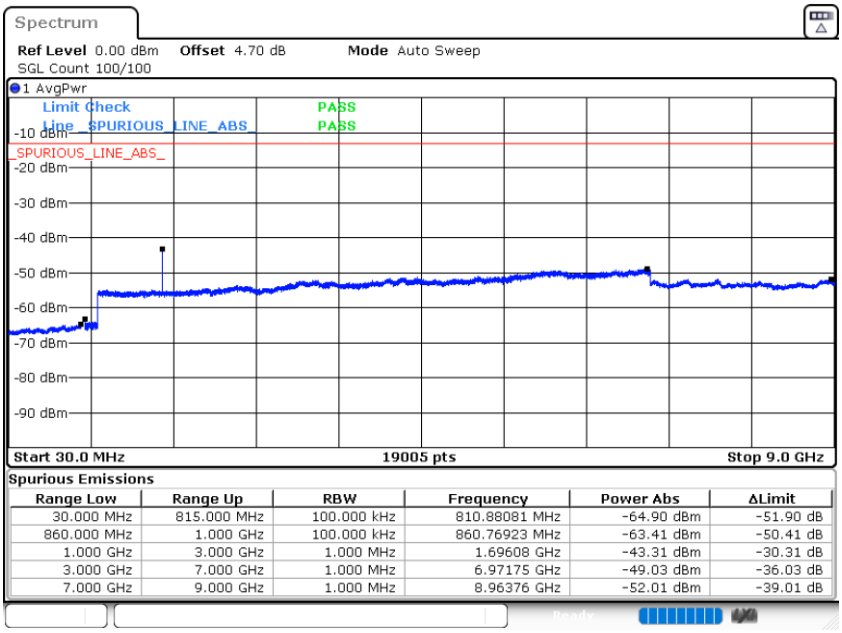


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	805.38856 MHz	-64.86 dBm	-51.86 dB
860.000 MHz	1.000 GHz	100.000 kHz	937.83217 MHz	-63.92 dBm	-50.92 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.67258 GHz	-42.93 dBm	-29.93 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.94126 GHz	-49.04 dBm	-36.04 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.95426 GHz	-52.01 dBm	-39.01 dB

Date: 23.JAN.2024 09:46:11

Highest Channel / QPSK



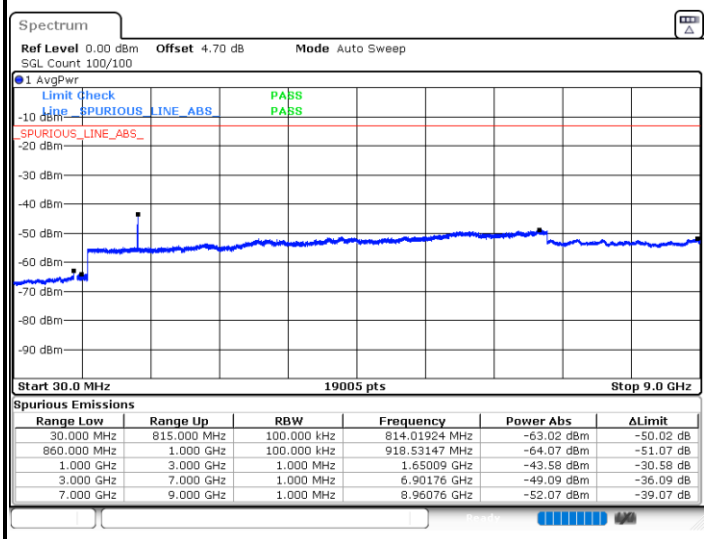
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	810.88081 MHz	-64.90 dBm	-51.90 dB
860.000 MHz	1.000 GHz	100.000 kHz	860.76923 MHz	-63.41 dBm	-50.41 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.69608 GHz	-43.31 dBm	-30.31 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.97175 GHz	-49.03 dBm	-36.03 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.96376 GHz	-52.01 dBm	-39.01 dB

Date: 23.JAN.2024 09:47:30

LTE Band 5 / 3MHz

Lowest Channel / QPSK

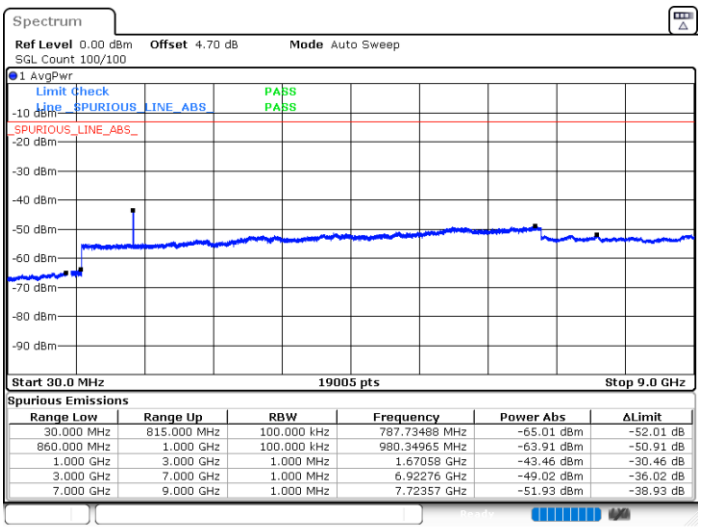


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	814.01924 MHz	-63.02 dBm	-50.02 dB
860.000 MHz	1.000 GHz	100.000 kHz	918.53147 MHz	-64.07 dBm	-51.07 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.65009 GHz	-43.58 dBm	-30.58 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.90176 GHz	-49.09 dBm	-36.09 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.96076 GHz	-52.07 dBm	-39.07 dB

Date: 23.JAN.2024 09:59:49

Middle Channel / QPSK

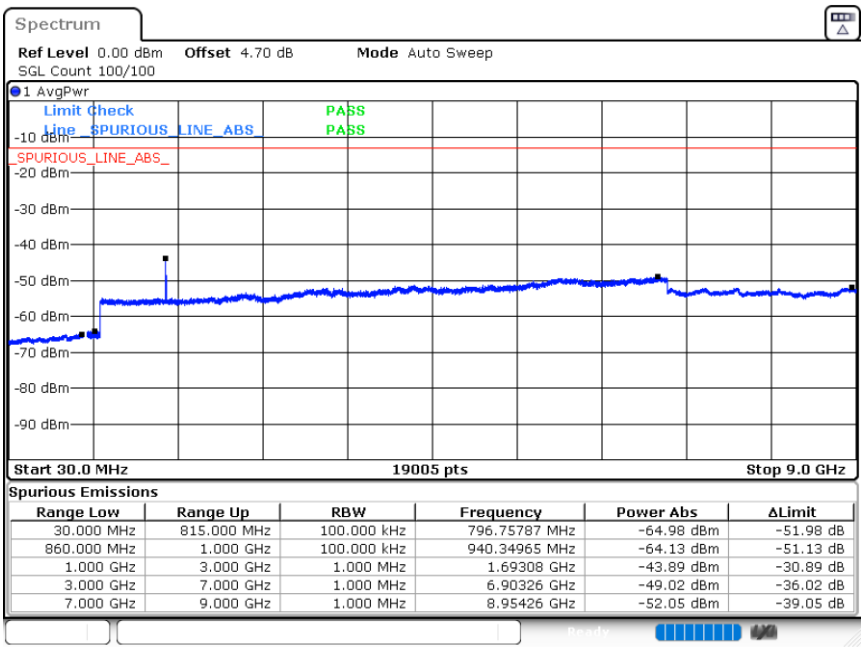


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	787.73488 MHz	-65.01 dBm	-52.01 dB
860.000 MHz	1.000 GHz	100.000 kHz	980.34965 MHz	-63.91 dBm	-50.91 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.67058 GHz	-43.46 dBm	-30.46 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.92276 GHz	-49.02 dBm	-36.02 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.72357 GHz	-51.93 dBm	-38.93 dB

Date: 23.JAN.2024 10:12:06

Highest Channel / QPSK



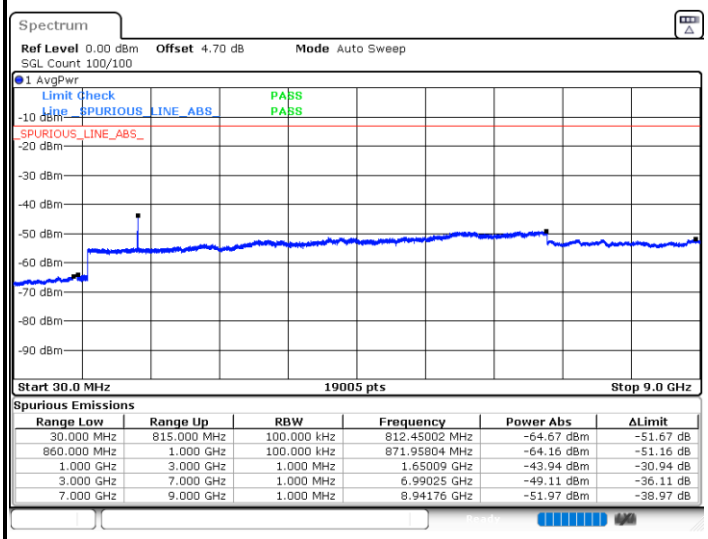
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	796.75787 MHz	-64.98 dBm	-51.98 dB
860.000 MHz	1.000 GHz	100.000 kHz	940.34965 MHz	-64.13 dBm	-51.13 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.69308 GHz	-43.89 dBm	-30.89 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.90326 GHz	-49.02 dBm	-36.02 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.95426 GHz	-52.05 dBm	-39.05 dB

Date: 23.JAN.2024 10:12:55

LTE Band 5 / 5MHz

Lowest Channel / QPSK

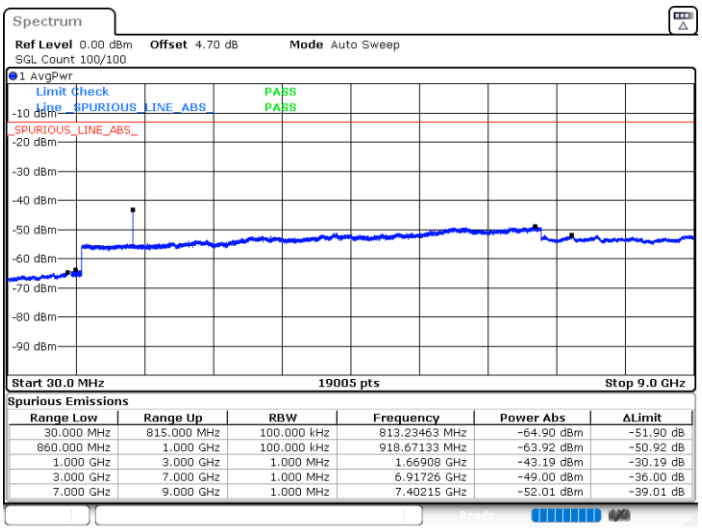


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	812.45002 MHz	-64.67 dBm	-51.67 dB
860.000 MHz	1.000 GHz	100.000 kHz	871.95804 MHz	-64.16 dBm	-51.16 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.65009 GHz	-43.94 dBm	-30.94 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99025 GHz	-49.11 dBm	-36.11 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.94176 GHz	-51.97 dBm	-38.97 dB

Date: 23.JAN.2024 10:24:43

Middle Channel / QPSK

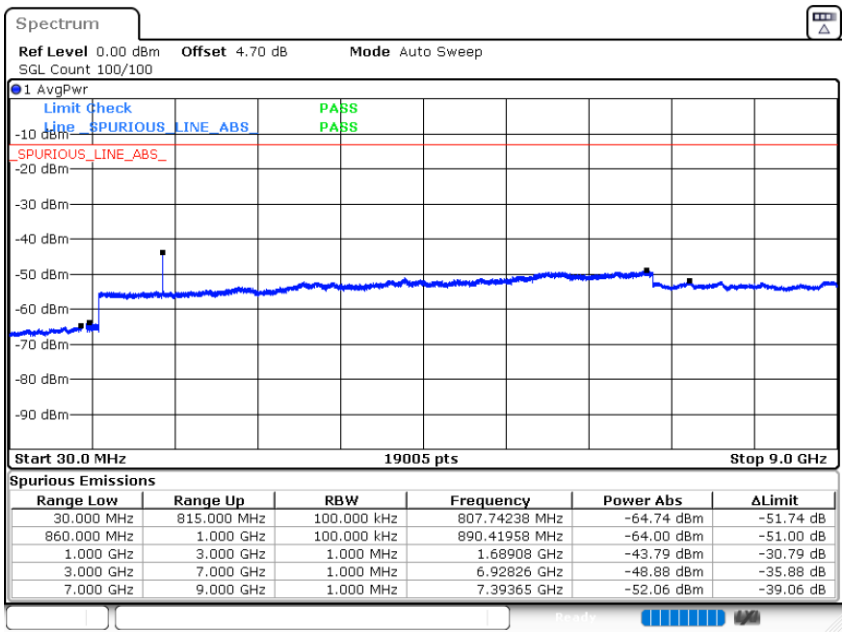


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	813.23463 MHz	-64.90 dBm	-51.90 dB
860.000 MHz	1.000 GHz	100.000 kHz	918.67133 MHz	-63.92 dBm	-50.92 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.66908 GHz	-43.19 dBm	-30.19 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.91726 GHz	-49.00 dBm	-36.00 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.40215 GHz	-52.01 dBm	-39.01 dB

Date: 23.JAN.2024 10:36:31

Highest Channel / QPSK



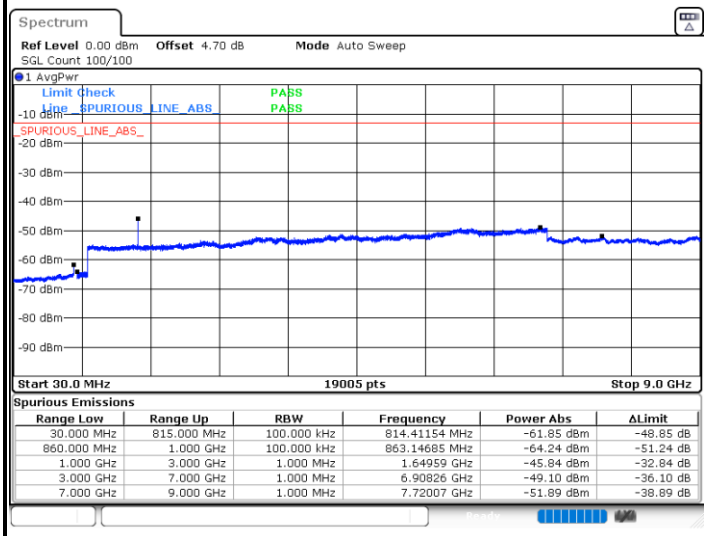
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	807.74238 MHz	-64.74 dBm	-51.74 dB
860.000 MHz	1.000 GHz	100.000 kHz	890.41958 MHz	-64.00 dBm	-51.00 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.68908 GHz	-43.79 dBm	-30.79 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.92826 GHz	-48.88 dBm	-35.88 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.39365 GHz	-52.06 dBm	-39.06 dB

Date: 23.JAN.2024 10:37:20

LTE Band 5 / 10MHz

Lowest Channel / QPSK

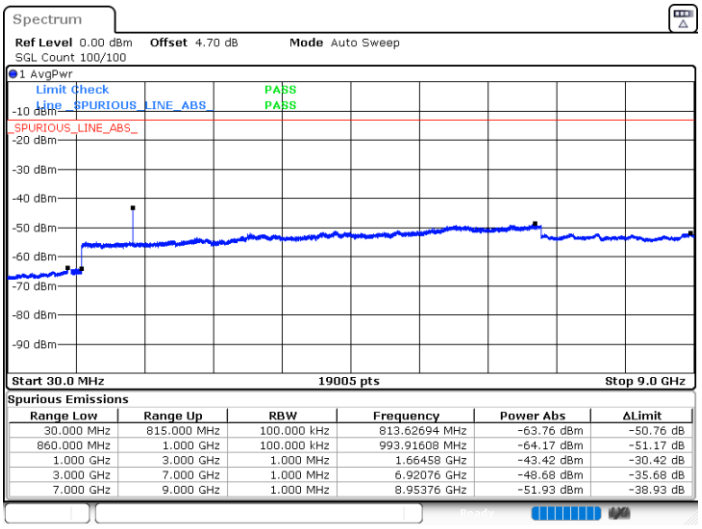


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	814.41154 MHz	-61.85 dBm	-48.85 dB
860.000 MHz	1.000 GHz	100.000 kHz	863.14685 MHz	-64.24 dBm	-51.24 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.64959 GHz	-45.84 dBm	-32.84 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.90826 GHz	-49.10 dBm	-36.10 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.72007 GHz	-51.89 dBm	-38.89 dB

Date: 23.JAN.2024 10:49:09

Middle Channel / QPSK

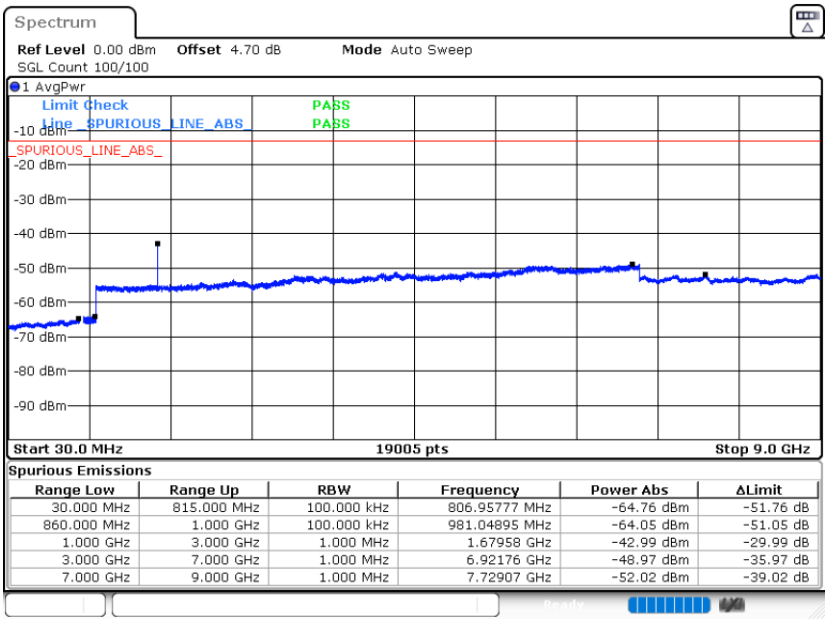


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	813.62694 MHz	-63.76 dBm	-50.76 dB
860.000 MHz	1.000 GHz	100.000 kHz	993.91608 MHz	-64.17 dBm	-51.17 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.66458 GHz	-43.42 dBm	-30.42 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.92076 GHz	-48.68 dBm	-35.68 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.95376 GHz	-51.93 dBm	-38.93 dB

Date: 23.JAN.2024 11:00:57

Highest Channel / QPSK



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	806.95777 MHz	-64.76 dBm	-51.76 dB
860.000 MHz	1.000 GHz	100.000 kHz	981.04895 MHz	-64.05 dBm	-51.05 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.67958 GHz	-42.99 dBm	-29.99 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.92176 GHz	-48.97 dBm	-35.97 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.72907 GHz	-52.02 dBm	-39.02 dB

Date: 23.JAN.2024 11:01:46

Frequency Stability

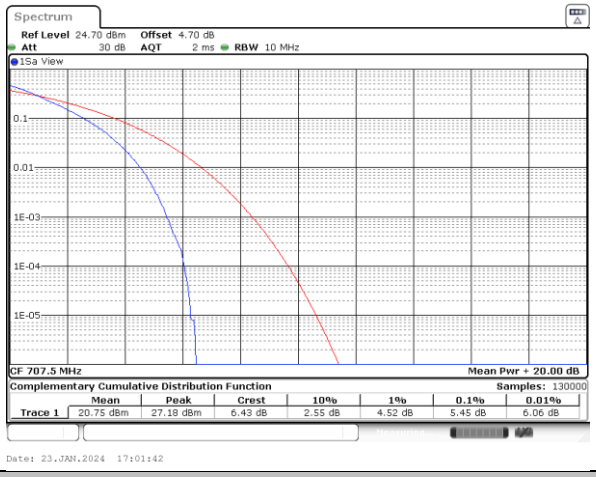
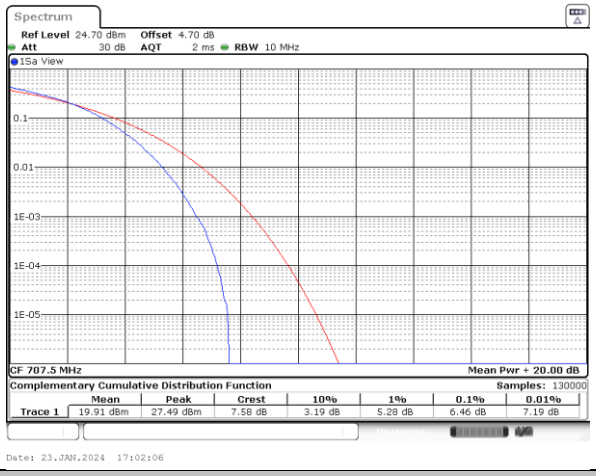
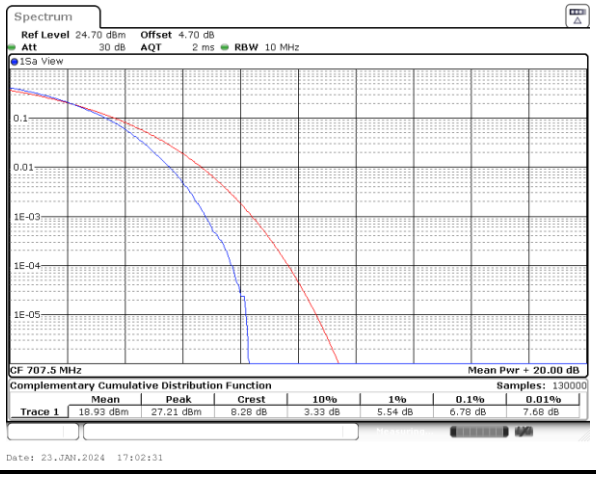
Test Conditions		LTE Band 5 (QPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 10MHz	2.5ppm
		Deviation (ppm)	Result
50	Normal Voltage	0.0024	PASS
40	Normal Voltage	0.0013	
30	Normal Voltage	0.0018	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0011	
0	Normal Voltage	0.0033	
-10	Normal Voltage	0.0027	
-20	Normal Voltage	0.0016	
-30	Normal Voltage	0.0028	
20	Maximum Voltage	0.0024	
20	Normal Voltage	0.0013	
20	Battery End Point	0.0016	

Note: Normal Voltage =3.91V. ; Battery End Point (BEP) =3.40 V ; Maximum Voltage =4.48 V.

LTE Band 12

Peak-to-Average Ratio

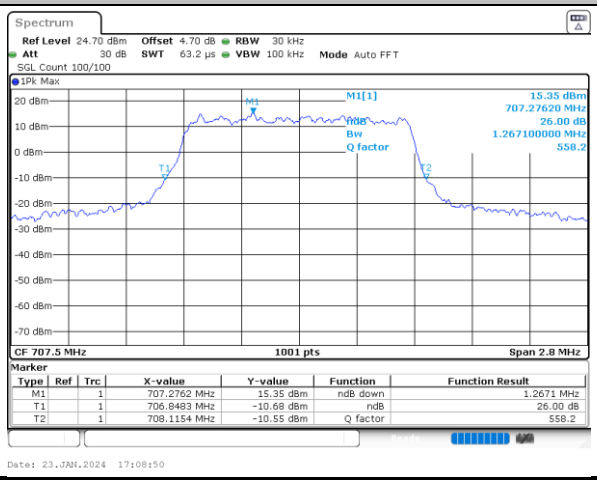
Mode	LTE Band 12 / 10MHz			
Mod.	QPSK	16QAM	64QAM	Limit: 13dB
RB Size	Full RB	Full RB	Full RB	Result
Middle CH	5.45	6.46	6.78	PASS

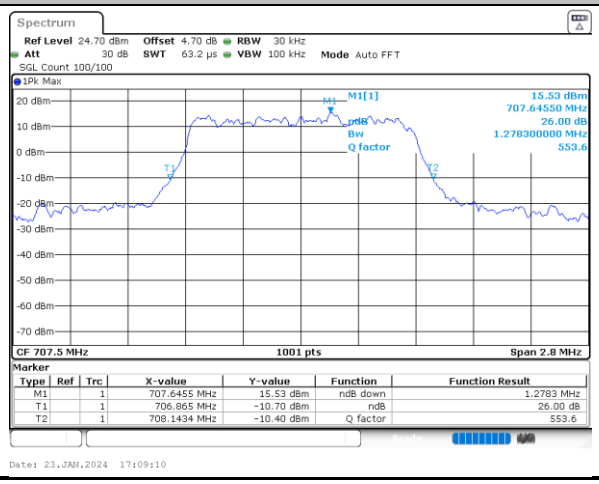
LTE Band 12 / 10MHz
Middle Channel / Full RB/ QPSK

Middle Channel / Full RB/ 16QAM

Middle Channel / Full RB/ 64QAM


26dB Bandwidth

Mode	LTE Band 12 : 26dB BW(MHz)	
BW	1.4MHz	
Mod.	QPSK	16QAM
Middle CH	1.27	1.28
BW	3MHz	
Mod.	QPSK	16QAM
Middle CH	3.00	2.95
BW	5MHz	
Mod.	QPSK	16QAM
Middle CH	4.92	4.80
BW	10MHz	
Mod.	QPSK	16QAM
Middle CH	9.69	9.81

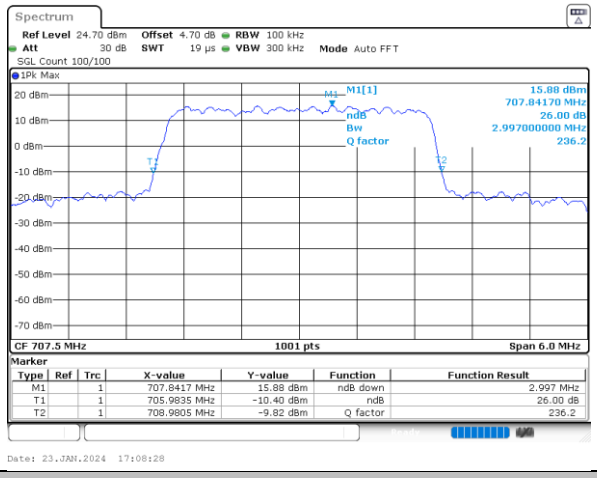
LTE Band 12	
Middle Channel / 1.4MHz / QPSK	Middle Channel / 1.4MHz / 16QAM



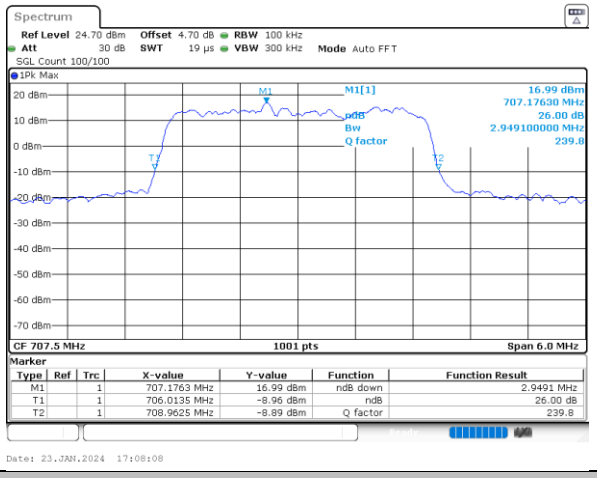


LTE Band 12

Middle Channel / 3MHz / QPSK

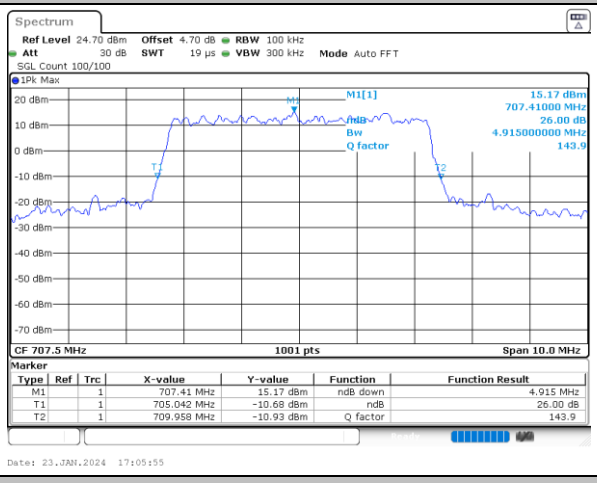


Middle Channel / 3MHz / 16QAM

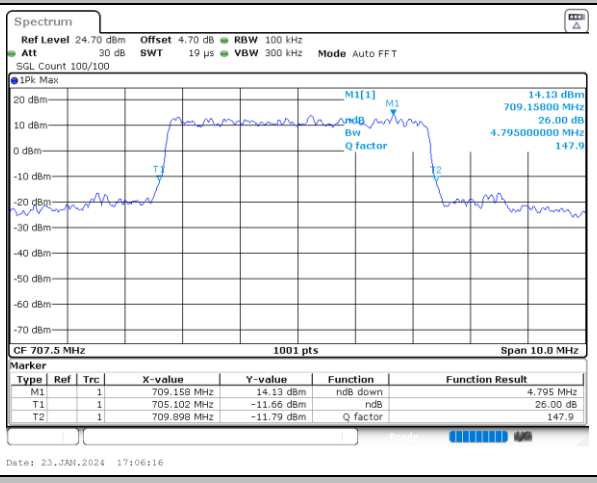


LTE Band 12

Middle Channel / 5MHz / QPSK

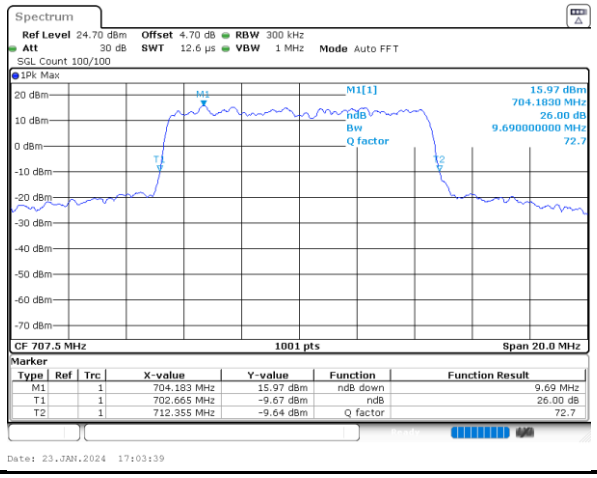


Middle Channel / 5MHz / 16QAM

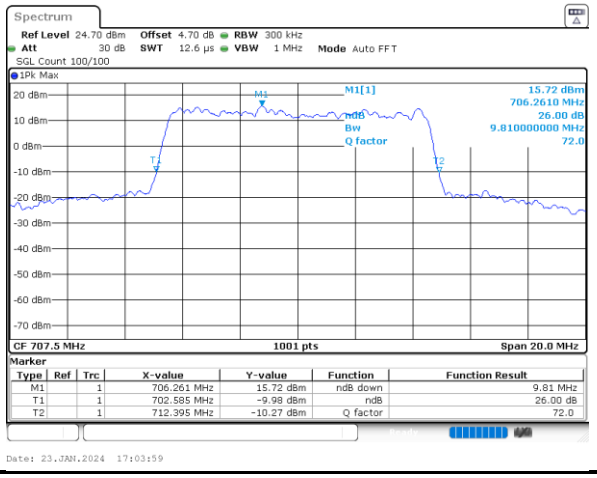


LTE Band 12

Middle Channel / 10MHz / QPSK



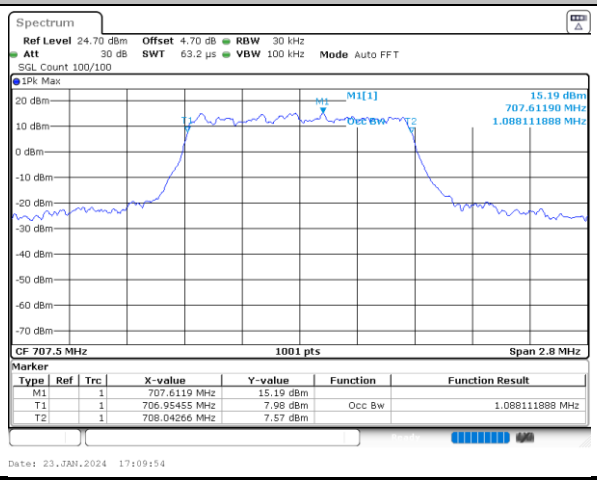
Middle Channel / 10MHz / 16QAM

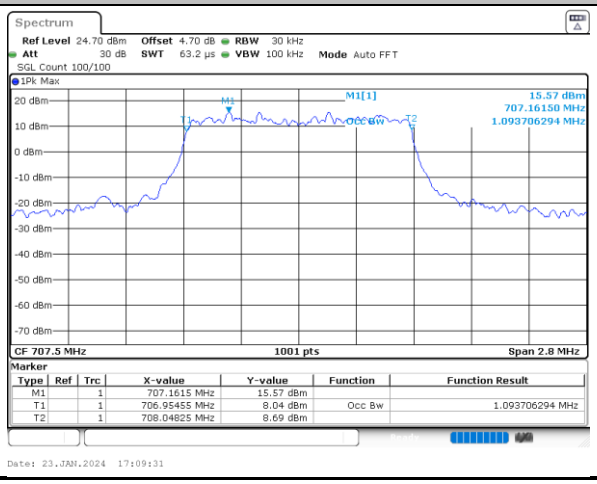


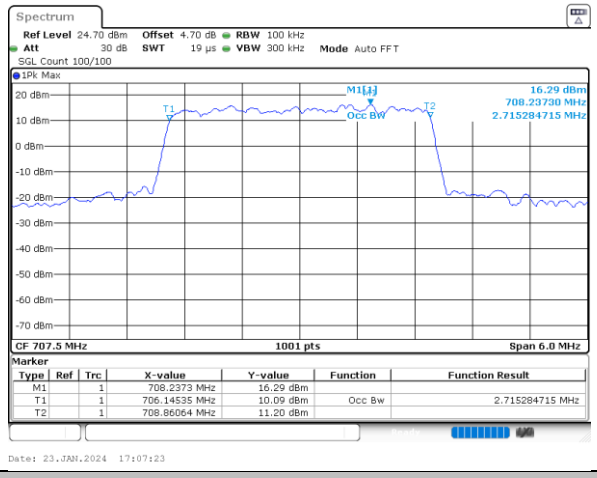
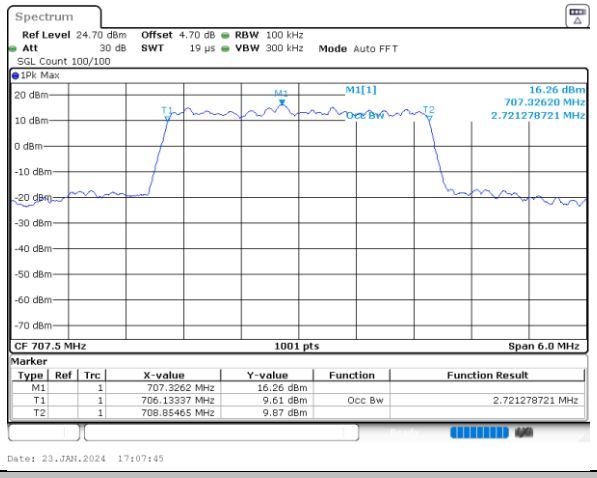
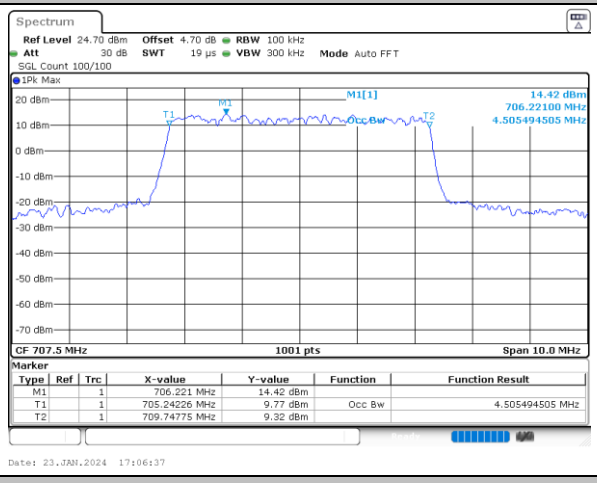
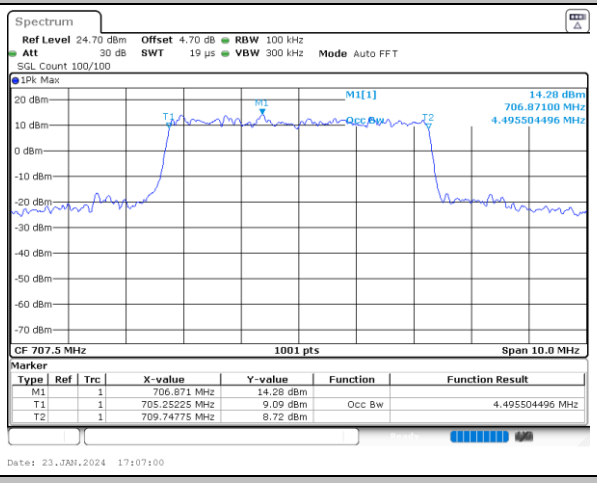
Occupied Bandwidth

Mode	LTE Band 12 : 99%OBW(MHz)	
BW	1.4MHz	
Mod.	QPSK	16QAM
Middle CH	1.09	1.09
BW	3MHz	
Mod.	QPSK	16QAM
Middle CH	2.72	2.72
BW	5MHz	
Mod.	QPSK	16QAM
Middle CH	4.51	4.50
BW	10MHz	
Mod.	QPSK	16QAM
Middle CH	9.05	8.97

LTE Band 12	
Middle Channel / 1.4MHz / QPSK	Middle Channel / 1.4MHz / 16QAM





LTE Band 12	
Middle Channel / 3MHz / QPSK	**Middle Channel / 3MHz / 16QAM**
	
LTE Band 12	
Middle Channel / 5MHz / QPSK	**Middle Channel / 5MHz / 16QAM**
	
LTE Band 12	
Middle Channel / 10MHz / QPSK	**Middle Channel / 10MHz / 16QAM**