FCC RF Test Report

APPLICANT	:	Relay, Inc.
EQUIPMENT	:	Relay
BRAND NAME	:	Relay
MODEL NAME	:	RY2268
FCC ID	:	2AMBHRY2268
STANDARD	:	47 CFR Part 2, 27(D)
CLASSIFICATION	:	PCS Licensed Transmitter Held to Ear (PCE)
TEST DATE(S)	:	Dec. 14, 2023 ~ Apr. 18, 2024

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

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

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

Jason Jia

Approved by: Jason Jia

ACCREDITED
Cert #5145.02

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG250507E	Rev. 01	Initial issue of report	May 30, 2024

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	—	Report Only	-
3.5	-	Peak-to-Average Ratio	—	Report Only	
3.6	§27.50 (a)(3)	EIRP	EIRP < 250mW/5MHz	PASS	-
3.7	§2.1049	Occupied Bandwidth	—	Report Only	-
3.8	§2.1051 §27.53 (a)(4)	Conducted Band Edge Measurement	Refer standard	PASS	-
3.9	§2.1051 §27.53 (a)(4)	Conducted Spurious Emission	< $70+10\log_{10}$(P[Watts])	PASS	-
3.10	§2.1055 §27.54	Frequency Stability Temperature & Voltage	Within the band	PASS	-
4.4	§2.1053 §27.53 (a)(4)	Radiated Spurious Emission	< $70+10\log_{10}$(P[Watts])	PASS	Under limit 15.90 dB at 9236.000/9222.000 MHz

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

Relay, Inc.
4200 Six Forks Rd, Suite 1800, Raleigh, NC 27609, USA

1.2 Manufacturer

Relay, Inc.
4200 Six Forks Rd, Suite 1800, Raleigh, NC 27609, USA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Relay
Brand Name	Relay
Model Name	RY2268
FCC ID	2AMBHRY2268
IMEI Code	Conducted: 004400152020000 Radiation: 990007570009388/990007570004066
HW Version	v01
EUT Stage	Identical Prototype

1.4 Product Specification of Equipment Under Test

Product Feature	
Tx Frequency	LTE Band 30 : 2305 MHz ~ 2315 MHz
Rx Frequency	LTE Band 30 : 2350 MHz ~ 2360 MHz
Bandwidth	5MHz / 10MHz
Maximum Output Power to Antenna	LTE Band 30 : 24.11 dBm
Antenna Gain	LTE Band 30 : -1.47 dBi
Type of Modulation	QPSK / 16QAM / 64QAM

1.5 Modification of EUT

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

1.6 Maximum EIRP Power and Emission Designator

LTE Band 30		QPSK		16QAM / 64QAM	
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)
5	2307.5 ~ 2312.5	0.1816	4M49G7D	0.1455	4M50W7D
10	2310.0	0.1837	9M15G7D	0.1472	8M95W7D

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

1.7 Testing Site

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

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

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

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

Test data subcontracted: Test cases in section 3.4~3.10 of this report.

1.8 Test Software

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

1.9 Applied Standards

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

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

Remark:

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

2 Test Configuration of Equipment Under Test

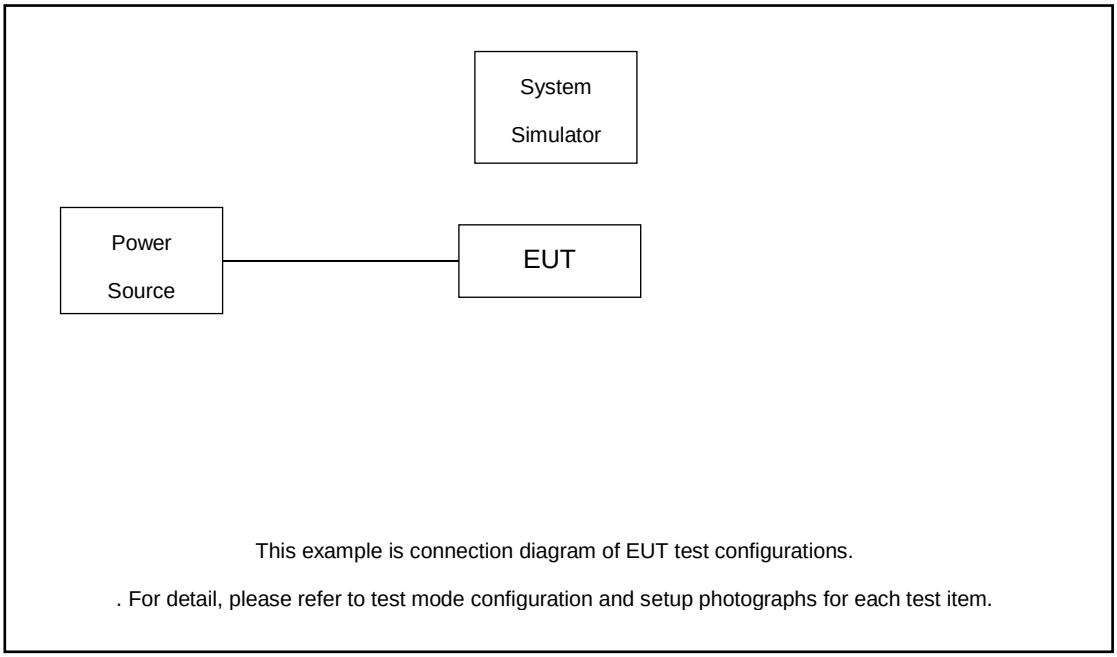
2.1 Test Mode

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

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

Conducted Test Cases	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	30	-	-	V		-	-	V	V	V	V	V	V	V	V	V
		-	-		V	-	-	V	V	V	V	V	V		V	
Peak-to-Average Ratio	30	-	-		V	-	-	V	V	V			V		V	
E.I.R.P	30	-	-	V		-	-	V	V	V	V		V	V	V	V
		-	-		V	-	-	V	V	V	V		V		V	
26dB and 99% Bandwidth	30	-	-	V		-	-	V	V				V	V	V	V
		-	-		V	-	-	V	V				V		V	
Conducted Band Edge	30	-	-	V		-	-	V	V	V	V		V	V		V
		-	-		V	-	-	V	V	V	V		V		V	
Conducted Spurious Emission	30	-	-	V		-	-	V			V			V	V	V
		-	-		V	-	-	V			V				V	
Frequency Stability	30	-	-		V	-	-	V					V		V	
Radiated Spurious Emission	30	-	-	V		-	-	V			V			V	V	V
					V			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.															

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	Power Supply	GWINSTEK	PSS-2002	N/A	N/A	Unshielded, 1.8 m
2.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

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

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

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 5.0 dB and 10dB attenuator.

Example :

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 5.0 + 10 = 15.0 (dB)

2.5 Frequency List of Low/Middle/High Channels

LTE Band 30 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
10	Channel	-	27710	-
	Frequency	-	2310	-
5	Channel	27685	27710	27735
	Frequency	2307.5	2310	2312.5

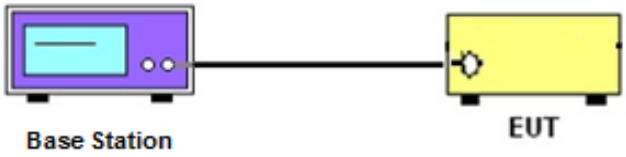
3 Conducted Test Items

3.1 Measuring Instruments

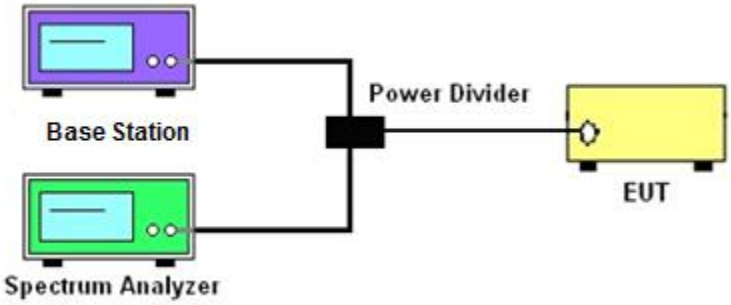
See list of measuring instruments of this test report.

3.2 Test Setup

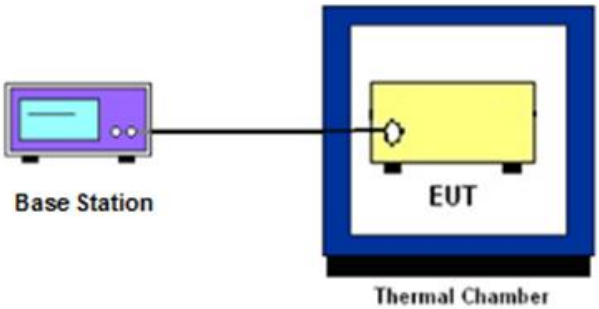
3.2.1 Conducted Output Power



3.2.2 Peak-to-Average Ratio, Occupied / 26dB Bandwidth ,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 Measurement

3.4.1 Description of the Conducted Output Power Measurement

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

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 EIRP

3.6.1 Description of EIRP

For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, *except that* for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth. For mobile and portable stations using time division duplexing (TDD) technology, the duty cycle must not exceed 38 percent in the 2305-2315 MHz and 2350-2360 MHz bands. Mobile and portable stations using FDD technology are restricted to transmitting in the 2305-2315 MHz band. Power averaging shall not include intervals in which the transmitter is off.

3.6.2 Test Procedures

1. According to KDB 412172 D01 Power Approach,
2. 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

3.7 Occupied Bandwidth

3.7.1 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.

3.7.2 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.

3.8 Conducted Band Edge Measurement

3.8.1 Description of Conducted Band Edge Measurement

27.53 (a)(4)

For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

(i) By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337 MHz;

(ii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300 MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296 MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292 MHz, and 70 + 10 log (P) dB below 2288 MHz;

(iii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

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 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 or a narrower RBW was used and the measured power was integrated over the full required measurement bandwidth of 1 MHz.
6. Set spectrum analyzer with RMS detector.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. Checked that all the results comply with the emission limit line.

   Example:

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

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

   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB) = -13dBm.

3.9 Conducted Spurious Emission Measurement

3.9.1 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 70 + 10 log (P) dB.

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

3.9.2 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 70 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [70 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [70 + 10log(P)] (dB)
    = -40dBm

3.10 Frequency Stability Measurement

3.10.1 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.

3.10.2 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.

3.10.3 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.

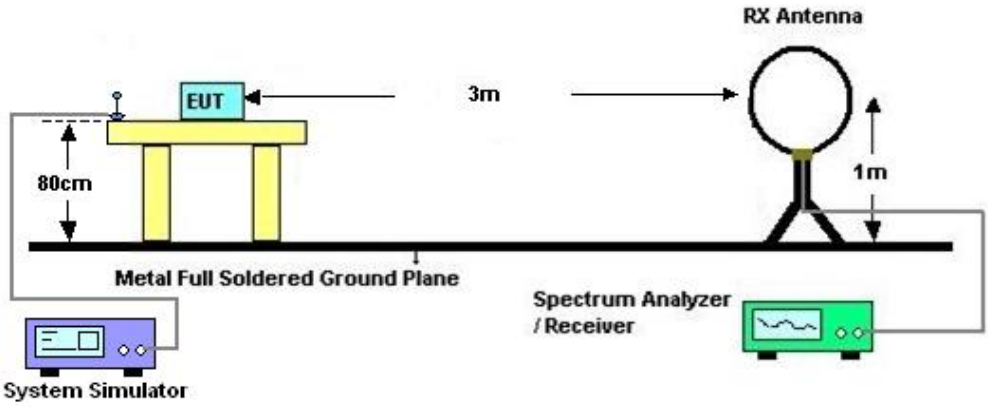
4 Radiated Test Items

4.1 Measuring Instruments

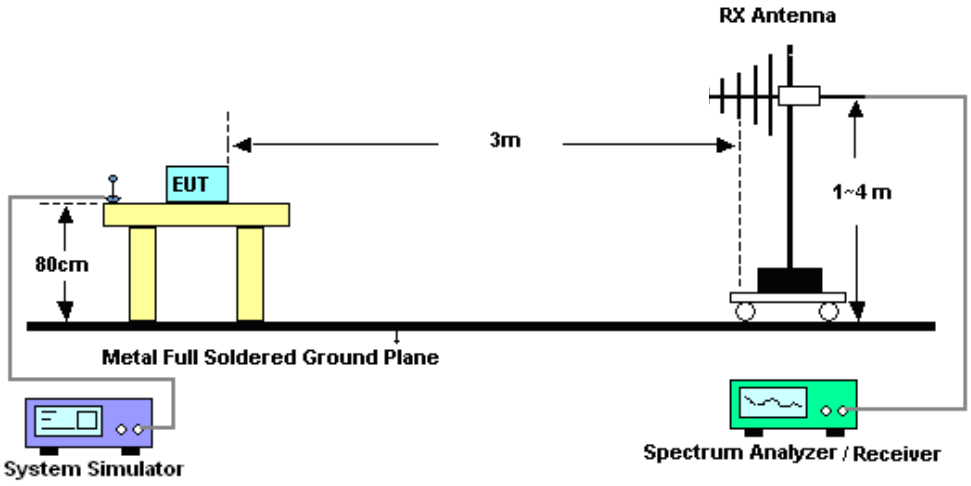
See list of measuring instruments of this test report.

4.2 Test Setup

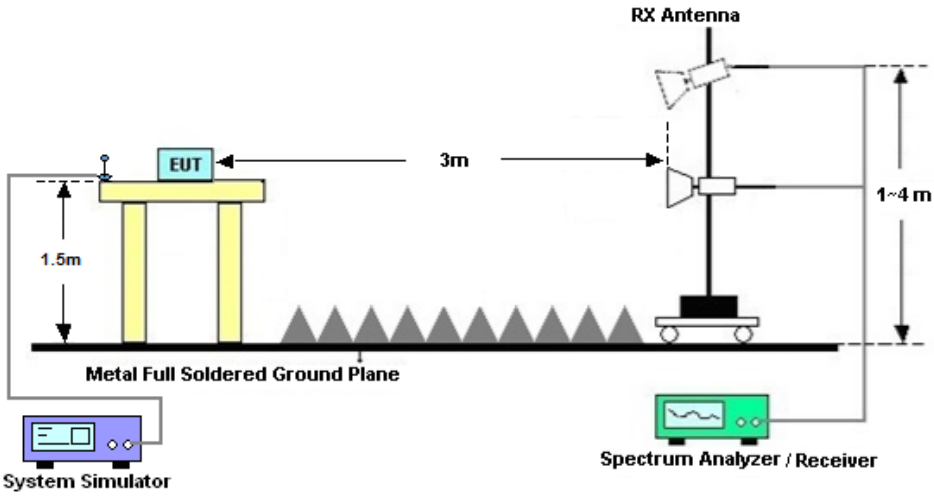
4.2.1 For radiated test below 30MHz



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 Measurement

4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI/TIA-603-E. 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 70 + 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.
   EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
   ERP (dBm) = EIRP - 2.15
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
    The limit line is derived from 70 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [70 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [70 + 10log(P)] (dB)
    = -40dBm.

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 06, 2023	Dec. 14, 2023	Apr. 05, 2024	Conducted (TH01-SZ)
Power Divider	TOJOIN	PS-2SM-04265	60.06.020.0077	0.4GHz~26.5GHz	Dec. 25, 2022	Dec. 14, 2023	Dec. 24, 2023	Conducted (TH01-SZ)
Thermal Chamber	Ten Billion Hongzhangroup	LP-150U	H2014081803	-40~+150°C	Jul. 05, 2023	Dec. 14, 2023	Jul. 04, 2024	Conducted (TH01-SZ)
EXA Spectrum Analyzer	Keysight	N9010B	MY57471079	10Hz-44G,MAX 30dB	Oct. 10, 2023	Apr. 18, 2024	Oct. 09, 2024	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	59913	30MHz-1GHz	Aug. 19, 2023	Apr. 18, 2024	Aug. 18, 2024	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 10, 2023	Apr. 18, 2024	Oct. 09, 2024	Radiation (03CH05-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00251694	1GHz~18GHz	Jul. 12, 2023	Apr. 18, 2024	Jul. 11, 2024	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 05, 2024	Apr. 18, 2024	Jan. 04, 2025	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	380827	9KHz-1GHz	Jul. 06, 2023	Apr. 18, 2024	Jul. 05, 2024	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 05, 2024	Apr. 18, 2024	Jan. 04, 2025	Radiation (03CH04-KS)
high gain Amplifier	EM	EM01G18GA	060840	1Ghz-18Ghz	Oct. 10, 2023	Apr. 18, 2024	Oct. 09, 2024	Radiation (03CH04-KS)
Amplifier	Agilent	8449B	3008A02370	1Ghz-18Ghz	Oct. 10, 2023	Apr. 18, 2024	Oct. 09, 2024	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Apr. 18, 2024	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Apr. 18, 2024	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Apr. 18, 2024	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required

6 Measurement Uncertainty

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

Uncertainty of Conducted Measurement

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

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

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

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

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

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

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

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

Appendix A. Test Results of Conducted Test

Test Engineer :	Hank Lin	Temperature :	24~26℃
		Relative Humidity :	50~53%

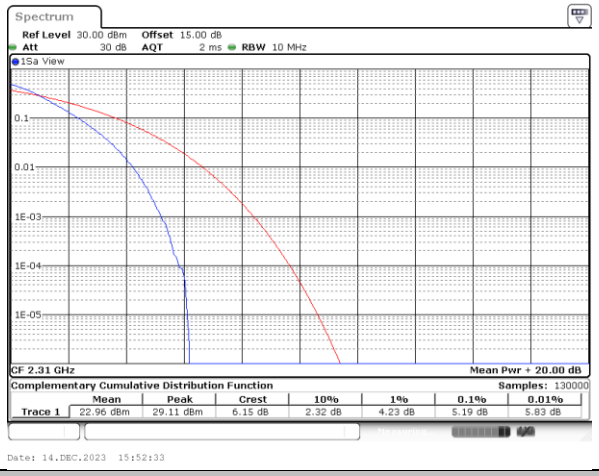
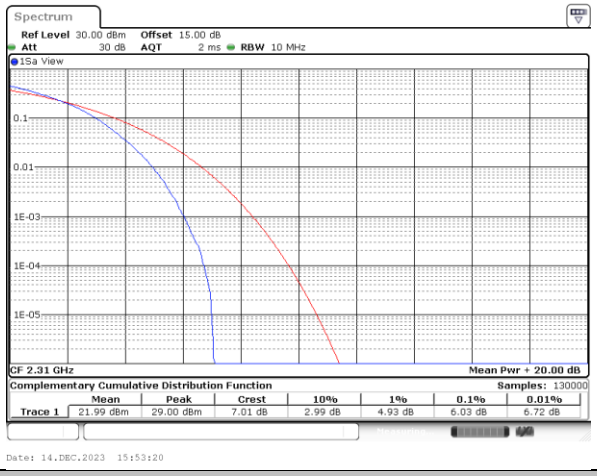
Conducted Output Power(Average power) and EIRP

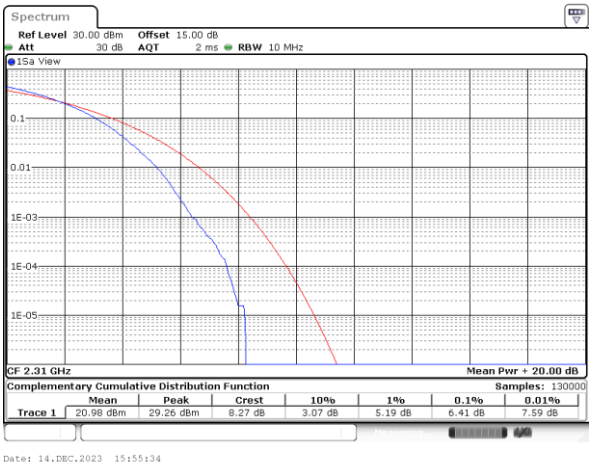
BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	EIRP(W)		
Channel				27710					
Frequency (MHz)				2310				M	
10	QPSK	1	0		24.11			0.1837	
10	QPSK	1	49		23.91			0.1754	
10	QPSK	50	0		23.01			0.1426	
10	16QAM	1	0		23.15			0.1472	
10	64QAM	1	0		22.07			0.1148	
Channel				27685	27710	27735	EIRP(W)		
Frequency (MHz)				2307.5	2310	2312.5	L	M	H
5	QPSK	1	0	24.04	24.06	24.00	0.1807	0.1816	0.1791
5	16QAM	1	0	23.04	23.07	23.10	0.1435	0.1445	0.1455

LTE Band 30

Peak-to-Average Ratio

Mode	LTE Band 30 / 10MHz			
Mod.	QPSK	16QAM	64QAM	Limit: 13dB
RB Size	Full RB	Full RB	Full RB	Result
Middle CH	5.19	6.03	6.41	PASS

LTE Band 30 / 10MHz / QPSK	LTE Band 30 / 10MHz / 16QAM
Middle Channel / Full RB	Middle Channel / Full RB
	

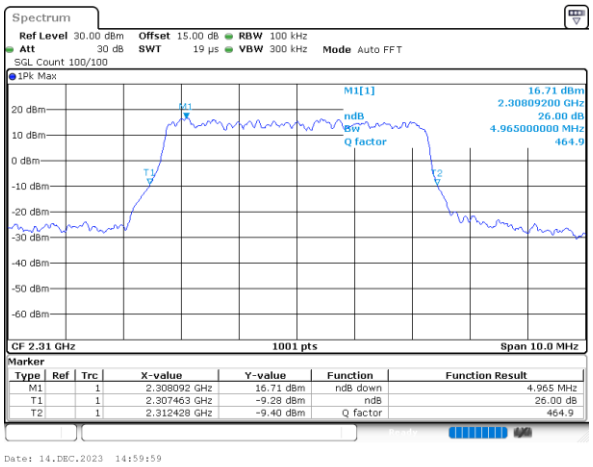
LTE Band 30 / 10MHz / 64QAM
Middle Channel / Full RB


26dB Bandwidth

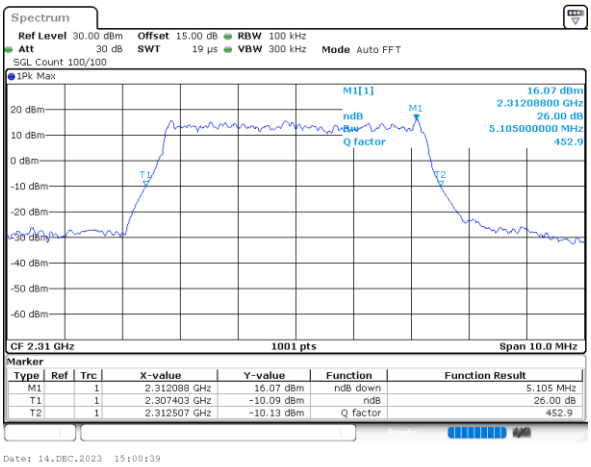
Mode	LTE Band 30 : 26dB BW(MHz)			
BW	5MHz		10MHz	
Mod.	QPSK	16QAM	QPSK	16QAM
Middle CH	4.97	5.11	9.65	9.75

LTE Band 30

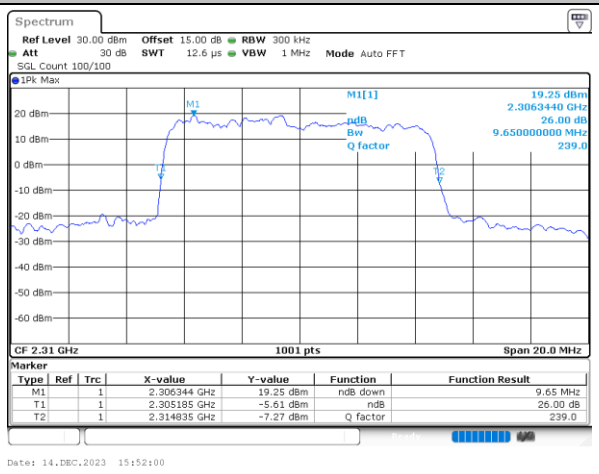
Middle Channel / 5MHz / QPSK



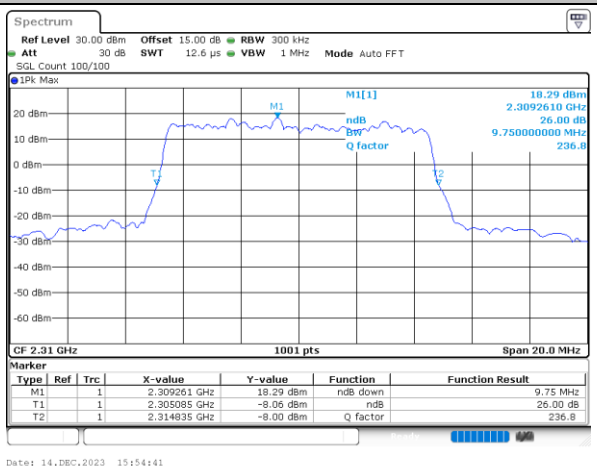
Middle Channel / 5MHz / 16QAM



Middle Channel / 10MHz / QPSK



Middle Channel / 10MHz / 16QAM

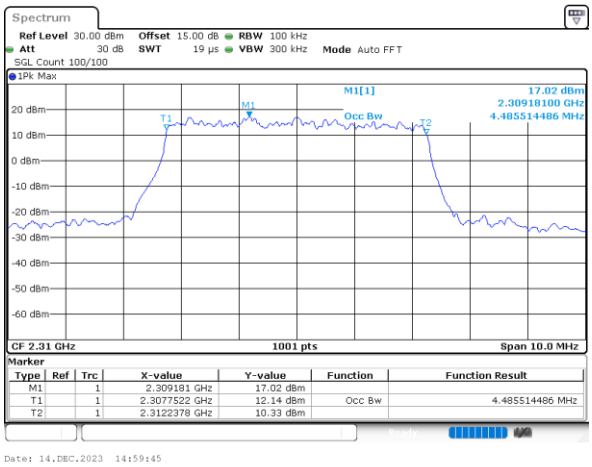


Occupied Bandwidth

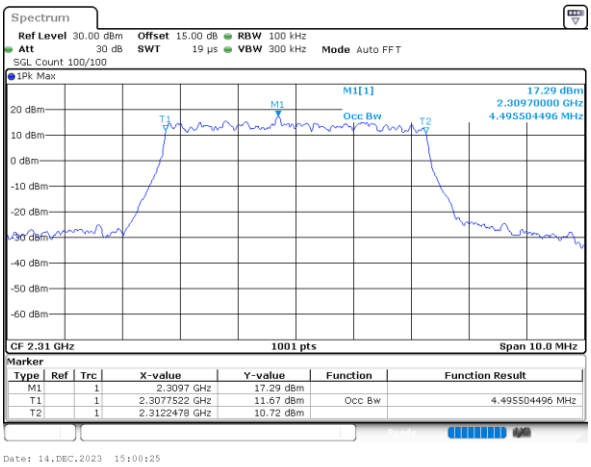
Mode	LTE Band 30 : 99%OBW(MHz)			
BW	5MHz		10MHz	
Mod.	QPSK	16QAM	QPSK	16QAM
Middle CH	4.49	4.50	9.15	8.95

LTE Band 30

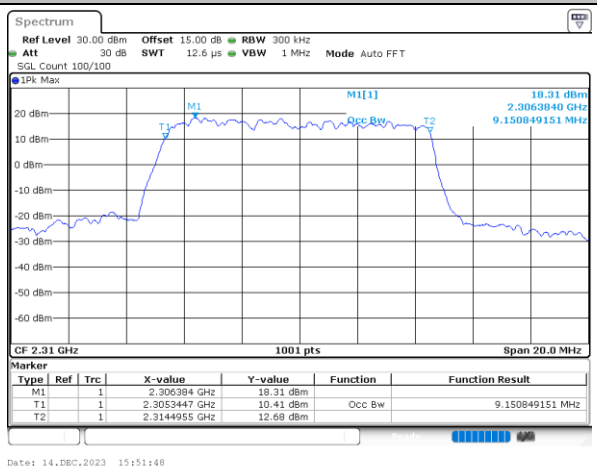
Middle Channel / 5MHz / QPSK



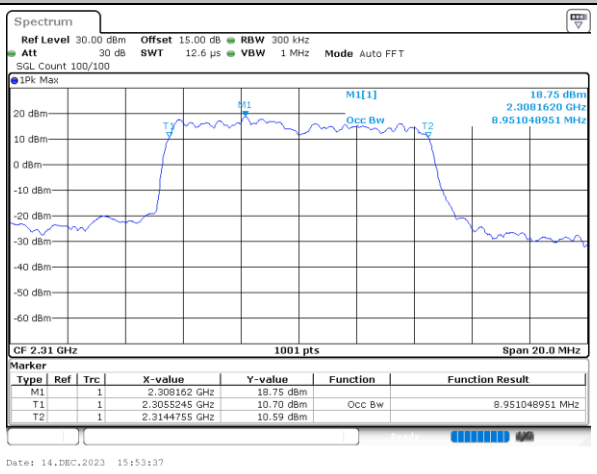
Middle Channel / 5MHz / 16QAM



Middle Channel / 10MHz / QPSK



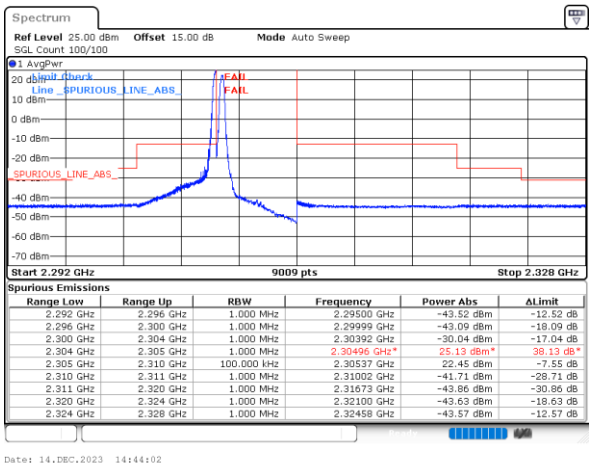
Middle Channel / 10MHz / 16QAM



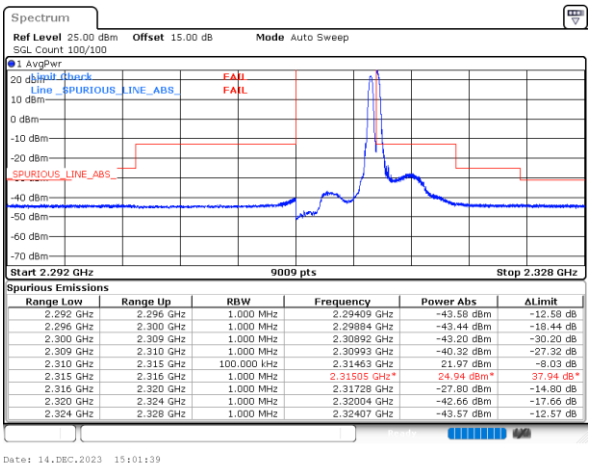
Conducted Band Edge

LTE Band 30 / 5MHz / QPSK

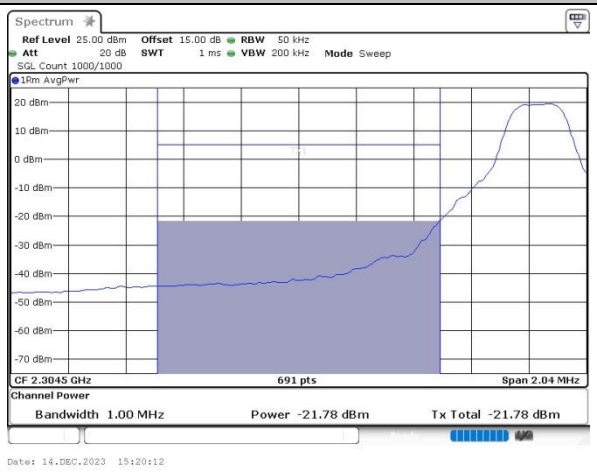
Lowest Band Edge / 1 RB



Highest Band Edge / 1 RB



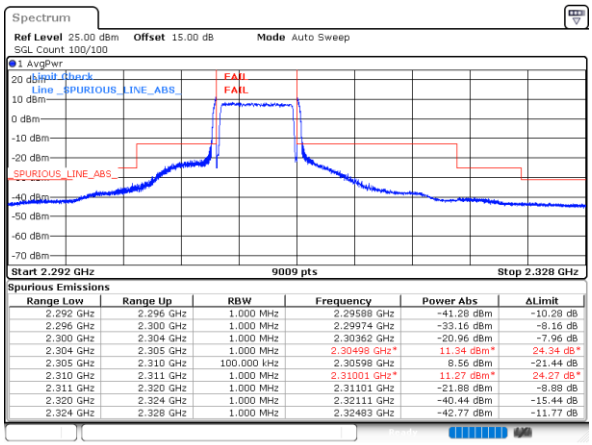
Lowest Band Edge / 1 RB / Lower zoom in



Highest Band Edge / 1 RB / Lower zoom in

LTE Band 30 / 5MHz / QPSK

Lowest Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29588 GHz	-41.28 dBm	-10.28 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29974 GHz	-33.16 dBm	-8.16 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30362 GHz	-20.96 dBm	-7.96 dB
2.304 GHz	2.305 GHz	1.000 MHz	2.30498 GHz*	11.34 dBm*	24.34 dB*
2.305 GHz	2.310 GHz	100.000 kHz	2.30598 GHz	8.56 dBm	-21.44 dB
2.310 GHz	2.311 GHz	1.000 MHz	2.31001 GHz*	11.27 dBm*	24.27 dB*
2.311 GHz	2.320 GHz	1.000 MHz	2.31101 GHz	-21.88 dBm	-8.88 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32111 GHz	-40.44 dBm	-15.44 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32483 GHz	-42.77 dBm	-11.77 dB

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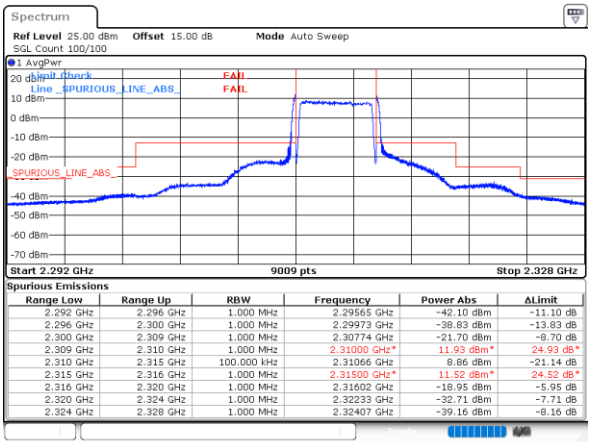
Highest Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29565 GHz	-42.10 dBm	-11.10 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29973 GHz	-38.83 dBm	-13.83 dB
2.300 GHz	2.309 GHz	1.000 MHz	2.30774 GHz	-21.70 dBm	-8.70 dB
2.309 GHz	2.310 GHz	1.000 MHz	2.31000 GHz*	11.93 dBm*	24.93 dB*
2.310 GHz	2.315 GHz	100.000 kHz	2.31066 GHz	8.86 dBm	-21.14 dB
2.315 GHz	2.316 GHz	1.000 MHz	2.31500 GHz*	11.52 dBm*	24.52 dB*
2.316 GHz	2.320 GHz	1.000 MHz	2.31602 GHz	-18.95 dBm	-5.95 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32233 GHz	-32.71 dBm	-7.71 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32407 GHz	-39.16 dBm	-8.16 dB

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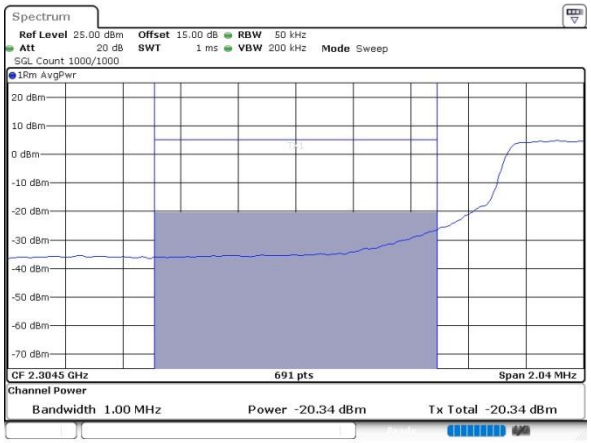
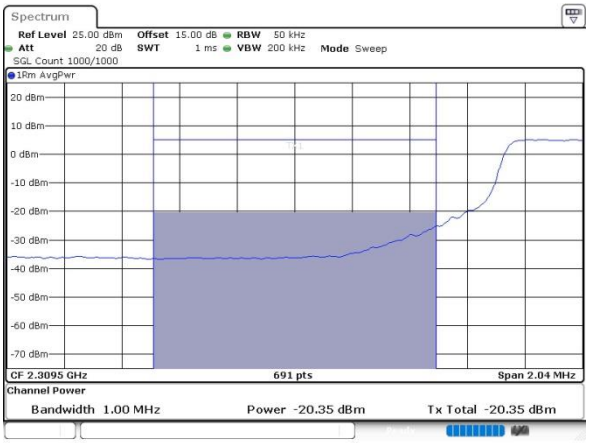
Lowest Band Edge / Full RB / Lower zoom in



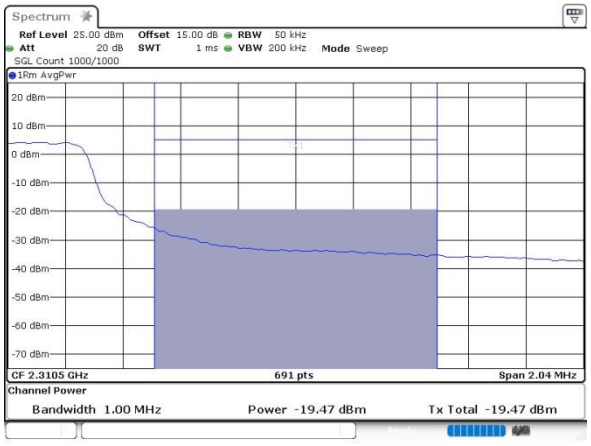
Date: 14.DEC.2023 15:30:36

Highest Band Edge / Full RB / Lower zoom in



Date: 14.DEC.2023 15:40:18

Lowest Band Edge / Full RB / Upper zoom in



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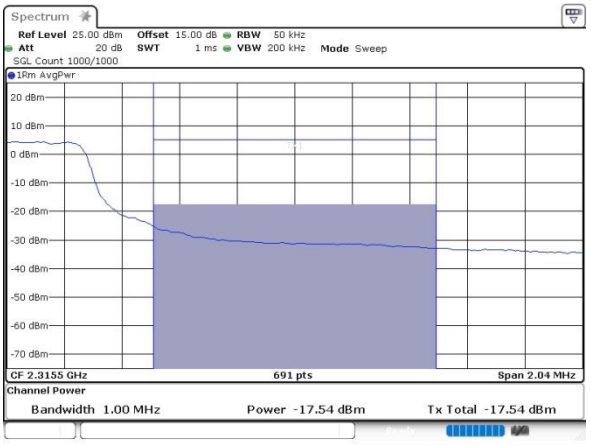
Highest Band Edge / Full RB / Upper zoom in



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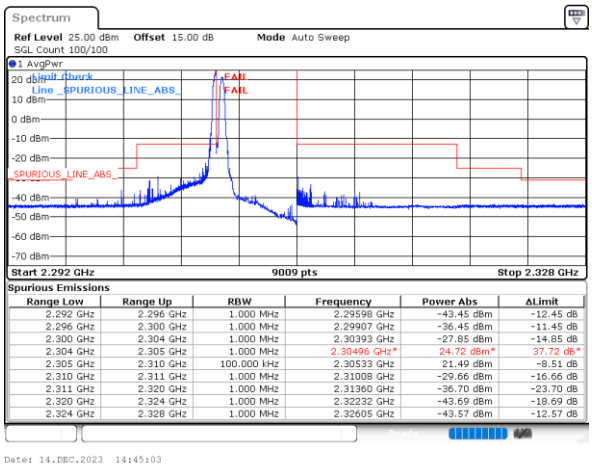
LTE Band 30 / 5MHz / 16QAM

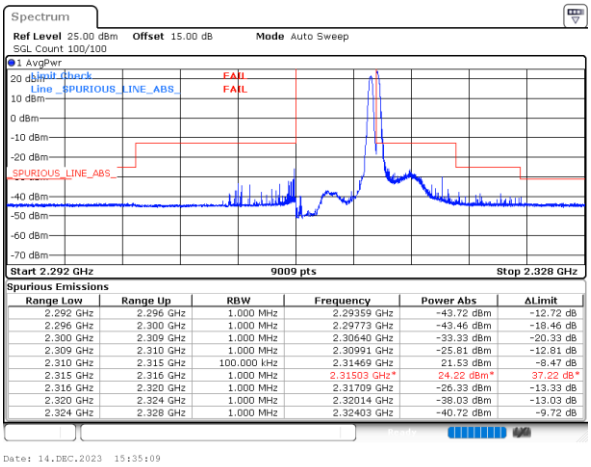
Lowest Band Edge / 1 RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29598 GHz	-43.45 dBm	-12.45 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29907 GHz	-36.45 dBm	-11.45 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30393 GHz	-27.85 dBm	-14.85 dB
2.304 GHz	2.305 GHz	1.000 MHz	2.30496 GHz*	24.72 dBm*	37.72 dB*
2.305 GHz	2.310 GHz	100.000 kHz	2.30533 GHz	21.49 dBm	-8.51 dB
2.310 GHz	2.311 GHz	1.000 MHz	2.31008 GHz	-29.66 dBm	-16.66 dB
2.311 GHz	2.320 GHz	1.000 MHz	2.31360 GHz	-36.70 dBm	-23.70 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32232 GHz	-43.69 dBm	-18.69 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32605 GHz	-43.57 dBm	-12.57 dB

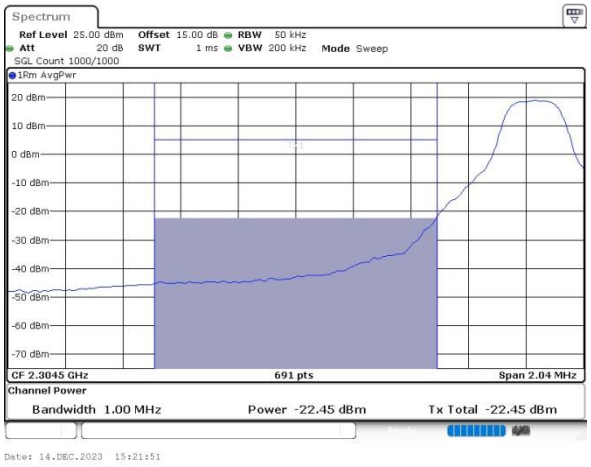
Highest Band Edge / 1 RB



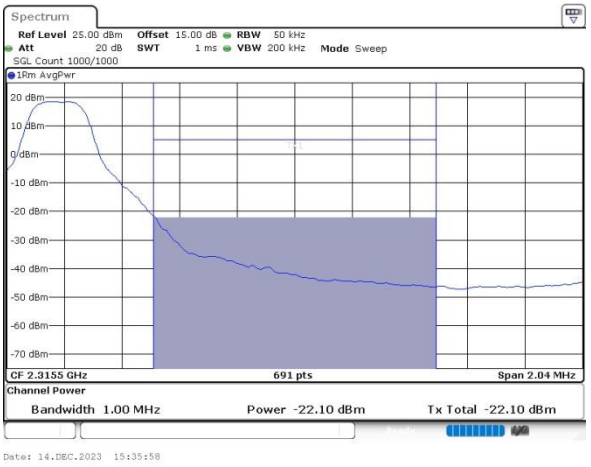
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29359 GHz	-43.72 dBm	-12.72 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29773 GHz	-43.46 dBm	-18.46 dB
2.300 GHz	2.309 GHz	1.000 MHz	2.30640 GHz	-33.33 dBm	-20.33 dB
2.309 GHz	2.310 GHz	1.000 MHz	2.30991 GHz	-25.81 dBm	-12.81 dB
2.310 GHz	2.315 GHz	100.000 kHz	2.31469 GHz	21.53 dBm	-8.47 dB
2.315 GHz	2.316 GHz	1.000 MHz	2.31503 GHz*	24.22 dBm*	37.22 dB*
2.316 GHz	2.320 GHz	1.000 MHz	2.31709 GHz	-26.33 dBm	-13.33 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32014 GHz	-38.03 dBm	-13.03 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32403 GHz	-40.72 dBm	-9.72 dB

Lowest Band Edge / 1 RB / Lower zoom in

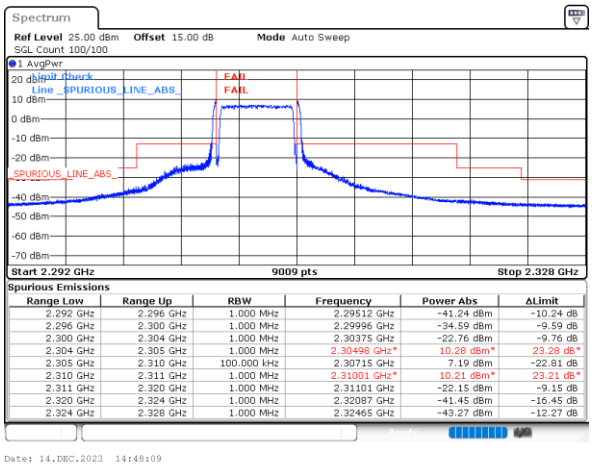


Highest Band Edge / 1 RB / Lower zoom in



LTE Band 30 / 5MHz / 16QAM

Lowest Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29512 GHz	-41.24 dBm	-10.24 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29996 GHz	-34.59 dBm	-9.59 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30375 GHz	-22.76 dBm	-9.76 dB
2.304 GHz	2.305 GHz	1.000 MHz	2.30498 GHz*	10.28 dBm*	23.28 dB*
2.305 GHz	2.310 GHz	100.000 kHz	2.30715 GHz	7.19 dBm	-22.81 dB
2.310 GHz	2.311 GHz	1.000 MHz	2.31001 GHz*	10.21 dBm*	23.21 dB*
2.311 GHz	2.320 GHz	1.000 MHz	2.31101 GHz	-22.15 dBm	-9.15 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32087 GHz	-41.45 dBm	-16.45 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32465 GHz	-43.27 dBm	-12.27 dB

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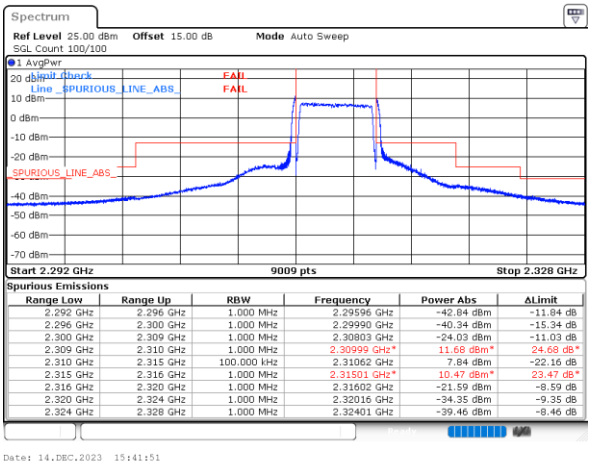
Highest Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29596 GHz	-42.84 dBm	-11.84 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29990 GHz	-40.34 dBm	-15.34 dB
2.300 GHz	2.309 GHz	1.000 MHz	2.30803 GHz	-24.03 dBm	-11.03 dB
2.309 GHz	2.310 GHz	1.000 MHz	2.30999 GHz*	11.68 dBm*	24.68 dB*
2.310 GHz	2.315 GHz	100.000 kHz	2.31062 GHz	7.84 dBm	-22.16 dB
2.315 GHz	2.316 GHz	1.000 MHz	2.31501 GHz*	10.47 dBm*	23.47 dB*
2.316 GHz	2.320 GHz	1.000 MHz	2.31602 GHz	-21.59 dBm	-8.59 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32016 GHz	-34.35 dBm	-9.35 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32401 GHz	-39.46 dBm	-8.46 dB

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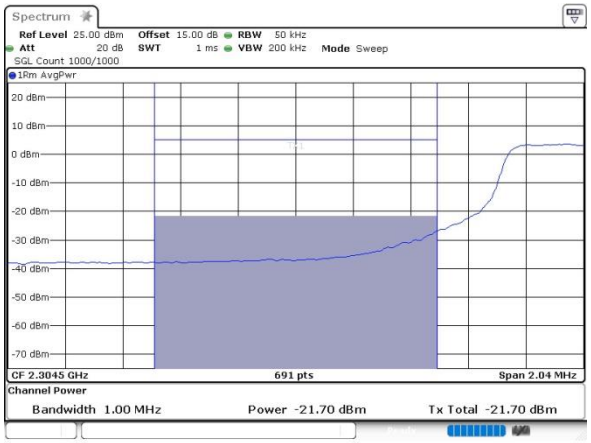
Lowest Band Edge / Full RB / Lower zoom in



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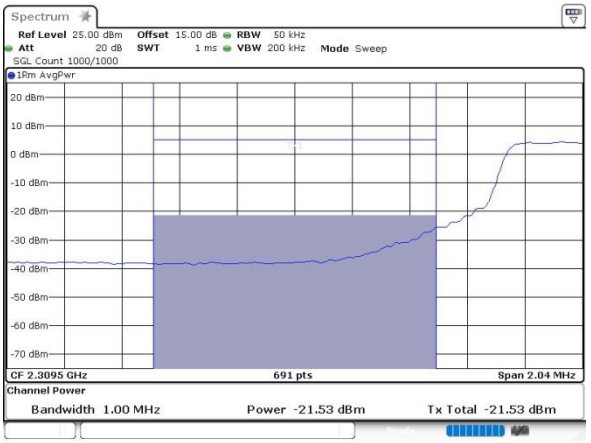
Highest Band Edge / Full RB / Lower zoom in



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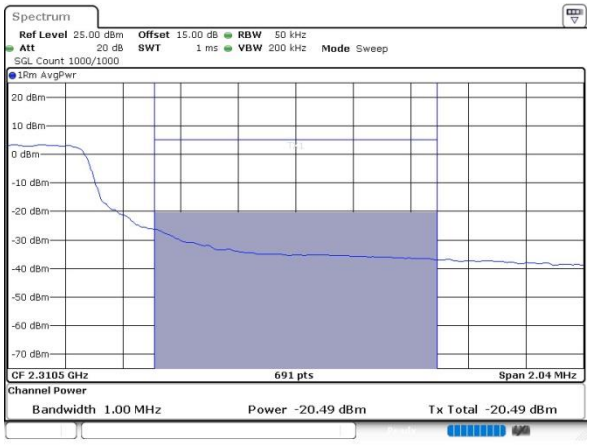
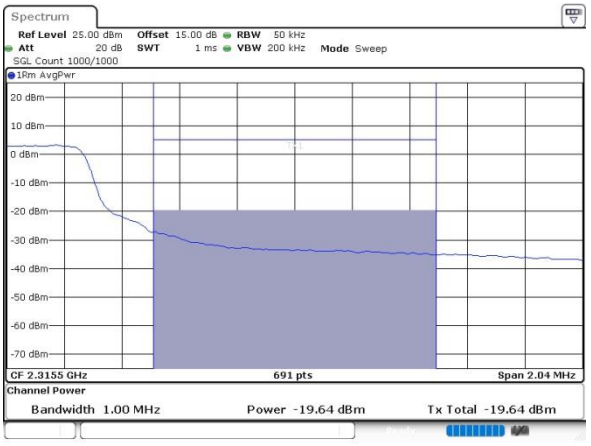
Lowest Band Edge / Full RB / Upper zoom in



Date: 14.DEC.2023 15:29:15

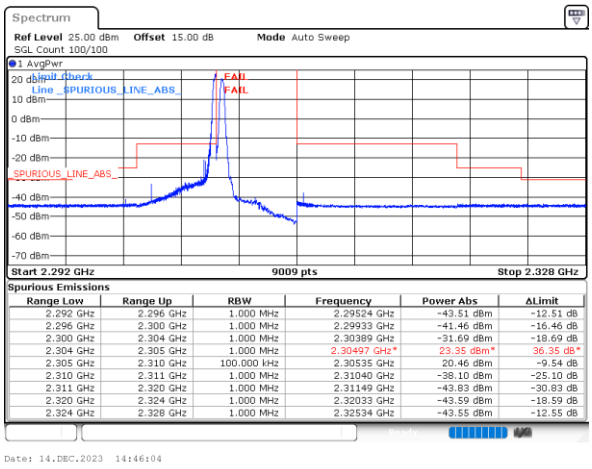
Highest Band Edge / Full RB / Upper zoom in



Date: 14.DEC.2023 15:39:54

LTE Band 30 / 5MHz / 64QAM

Lowest Band Edge / 1 RB

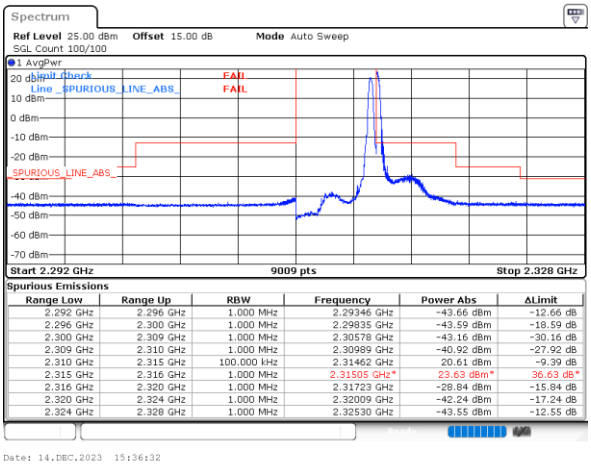


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29524 GHz	-43.51 dBm	-12.51 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29933 GHz	-41.46 dBm	-16.46 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30389 GHz	-31.69 dBm	-18.69 dB
2.304 GHz	2.305 GHz	1.000 MHz	2.30497 GHz*	23.35 dBm*	36.35 dB*
2.305 GHz	2.310 GHz	100.000 kHz	2.30535 GHz	20.46 dBm	-9.54 dB
2.310 GHz	2.311 GHz	1.000 MHz	2.31040 GHz	-38.10 dBm	-25.10 dB
2.311 GHz	2.320 GHz	1.000 MHz	2.31149 GHz	-43.83 dBm	-30.83 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32033 GHz	-43.59 dBm	-18.59 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32534 GHz	-43.55 dBm	-12.55 dB

Date: 14.DEC.2023 14:46:04

Highest Band Edge / 1 RB

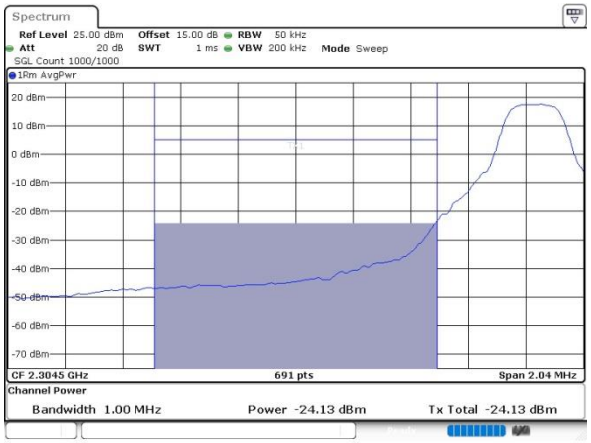


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29346 GHz	-43.66 dBm	-12.66 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29835 GHz	-43.59 dBm	-18.59 dB
2.300 GHz	2.309 GHz	1.000 MHz	2.30578 GHz	-43.16 dBm	-30.16 dB
2.309 GHz	2.310 GHz	1.000 MHz	2.30989 GHz	-40.92 dBm	-27.92 dB
2.310 GHz	2.315 GHz	100.000 kHz	2.31462 GHz	20.61 dBm	-9.39 dB
2.315 GHz	2.316 GHz	1.000 MHz	2.31505 GHz*	23.63 dBm*	36.63 dB*
2.316 GHz	2.320 GHz	1.000 MHz	2.31723 GHz	-28.84 dBm	-15.84 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32009 GHz	-42.24 dBm	-17.24 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32530 GHz	-43.55 dBm	-12.55 dB

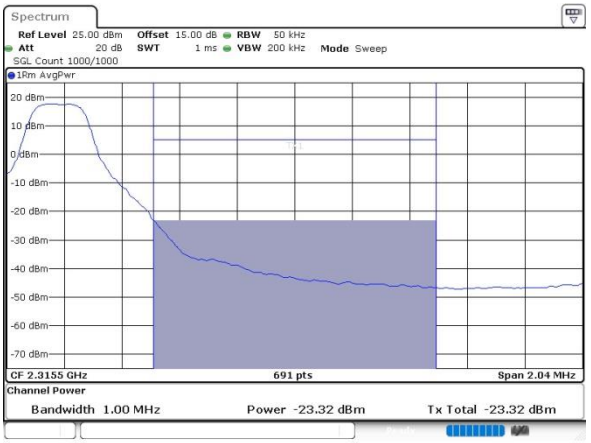
Date: 14.DEC.2023 15:36:32

Lowest Band Edge / 1 RB / Lower zoom in



Date: 14.DEC.2023 15:22:25

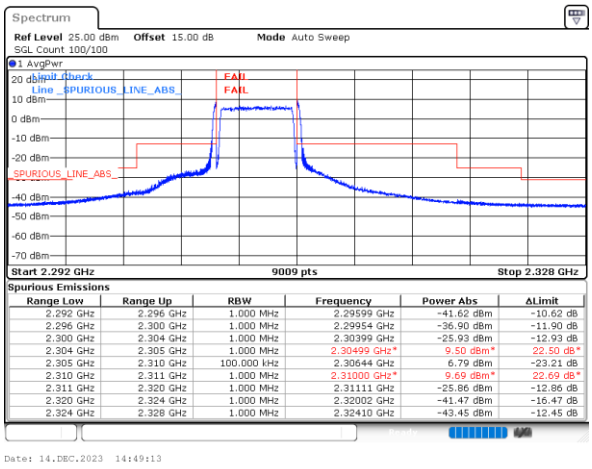
Highest Band Edge / 1 RB / Lower zoom in



Date: 14.DEC.2023 15:36:13

LTE Band 30 / 5MHz / 64QAM

Lowest Band Edge / Full RB

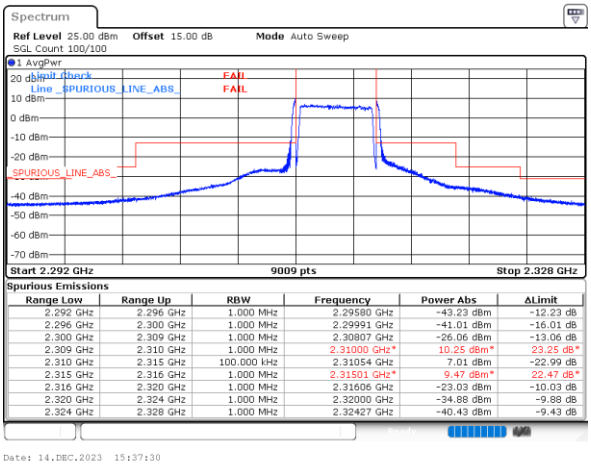


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29599 GHz	-41.62 dBm	-10.62 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29954 GHz	-36.90 dBm	-11.90 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30399 GHz	-25.93 dBm	-12.93 dB
2.304 GHz	2.305 GHz	1.000 MHz	2.30499 GHz*	9.50 dBm*	22.50 dB*
2.305 GHz	2.310 GHz	100.000 kHz	2.30644 GHz	6.79 dBm	-23.21 dB
2.310 GHz	2.311 GHz	1.000 MHz	2.31000 GHz*	9.69 dBm*	22.69 dB*
2.311 GHz	2.320 GHz	1.000 MHz	2.31111 GHz	-25.86 dBm	-12.86 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32002 GHz	-41.47 dBm	-16.47 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32410 GHz	-43.45 dBm	-12.45 dB

Date: 14.DEC.2023 14:49:13

Highest Band Edge / Full RB

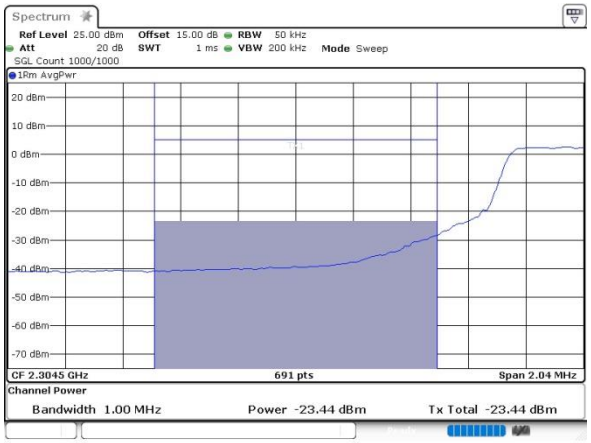


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29580 GHz	-43.23 dBm	-12.23 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29991 GHz	-41.01 dBm	-16.01 dB
2.300 GHz	2.309 GHz	1.000 MHz	2.30807 GHz	-26.06 dBm	-13.06 dB
2.309 GHz	2.310 GHz	1.000 MHz	2.31000 GHz*	10.25 dBm*	23.25 dB*
2.310 GHz	2.315 GHz	100.000 kHz	2.31054 GHz	7.01 dBm	-22.99 dB
2.315 GHz	2.316 GHz	1.000 MHz	2.31501 GHz*	9.47 dBm*	22.47 dB*
2.316 GHz	2.320 GHz	1.000 MHz	2.31606 GHz	-23.03 dBm	-10.03 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32000 GHz	-34.88 dBm	-9.88 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32427 GHz	-40.43 dBm	-9.43 dB

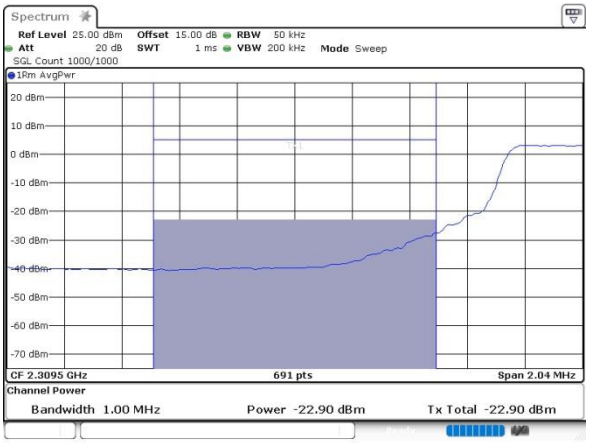
Date: 14.DEC.2023 15:37:30

Lowest Band Edge / Full RB / Lower zoom in



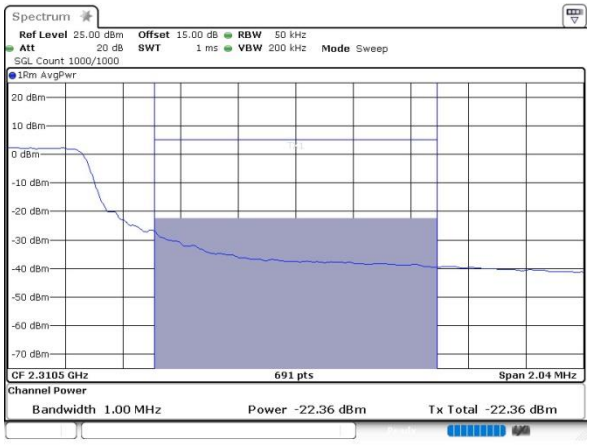
Date: 14.DEC.2023 15:27:45

Highest Band Edge / Full RB / Lower zoom in



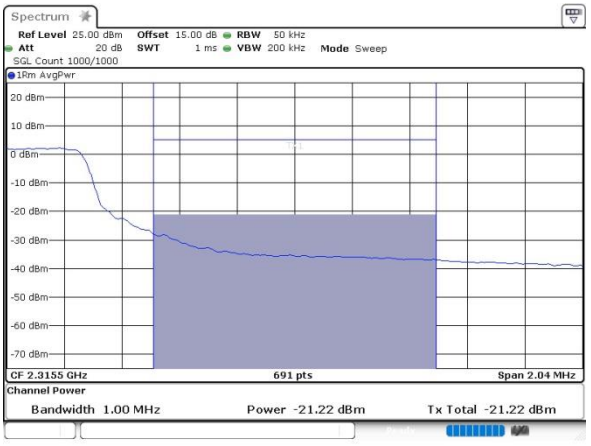
Date: 14.DEC.2023 15:38:42

Lowest Band Edge / Full RB / Upper zoom in



Date: 14.DEC.2023 15:28:20

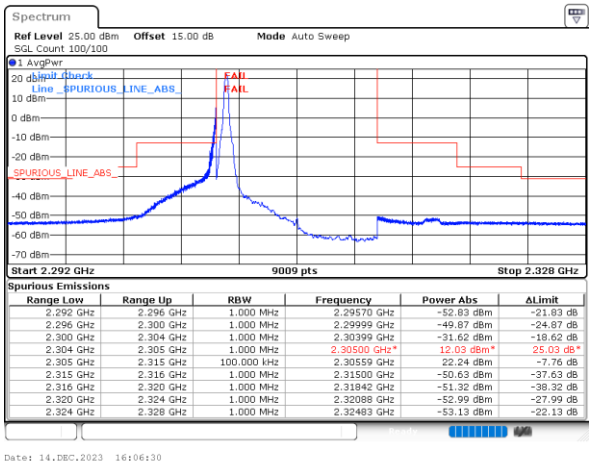
Highest Band Edge / Full RB / Upper zoom in



Date: 14.DEC.2023 15:39:04

LTE Band 30 / 10MHz / QPSK

Lowest Band Edge / 1 RB

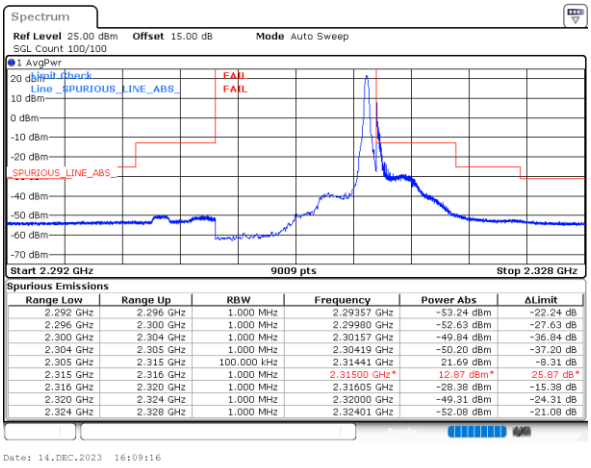


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29570 GHz	-52.83 dBm	-21.83 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29999 GHz	-49.87 dBm	-24.87 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30399 GHz	-31.62 dBm	-18.62 dB
2.304 GHz	2.305 GHz	1.000 MHz	2.30500 GHz*	12.03 dBm*	25.03 dB*
2.305 GHz	2.315 GHz	100.000 kHz	2.30559 GHz	22.24 dBm	-7.76 dB
2.315 GHz	2.316 GHz	1.000 MHz	2.31500 GHz	-50.63 dBm	-37.63 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31842 GHz	-51.32 dBm	-38.32 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32088 GHz	-52.99 dBm	-27.99 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32483 GHz	-53.13 dBm	-22.13 dB

Date: 14.DEC.2023 16:06:30

Highest Band Edge / 1 RB

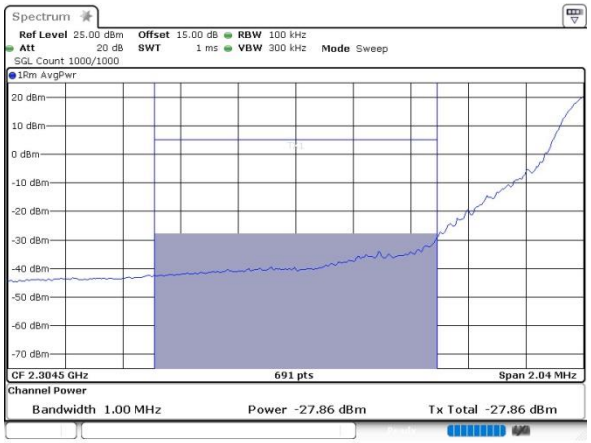


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29357 GHz	-53.24 dBm	-22.24 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29980 GHz	-52.63 dBm	-27.63 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30157 GHz	-49.84 dBm	-36.84 dB
2.304 GHz	2.305 GHz	1.000 MHz	2.30419 GHz	-50.20 dBm	-37.20 dB
2.305 GHz	2.315 GHz	100.000 kHz	2.31441 GHz	21.69 dBm	-8.31 dB
2.315 GHz	2.316 GHz	1.000 MHz	2.31500 GHz*	12.87 dBm*	25.87 dB*
2.316 GHz	2.320 GHz	1.000 MHz	2.31605 GHz	-28.38 dBm	-15.38 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32000 GHz	-49.31 dBm	-24.31 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32401 GHz	-52.08 dBm	-21.08 dB

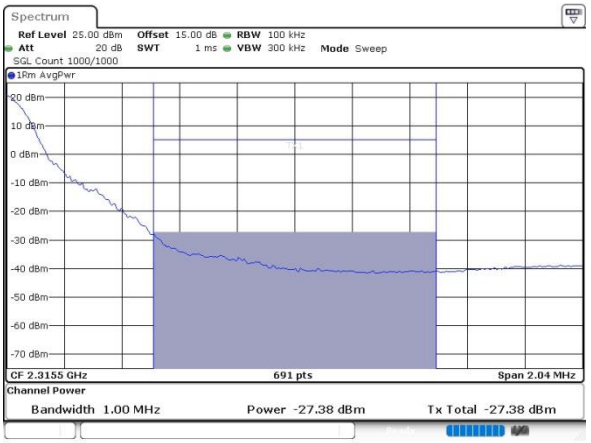
Date: 14.DEC.2023 16:09:16

Lowest Band Edge / 1 RB / Lower zoom in



Date: 14.DEC.2023 16:00:03

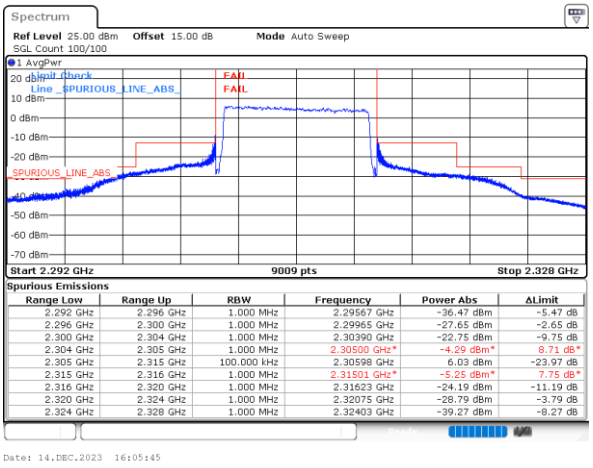
Highest Band Edge / 1 RB / Lower zoom in



Date: 14.DEC.2023 16:01:19

LTE Band 30 / 10MHz / QPSK

Lowest Band Edge / Full RB

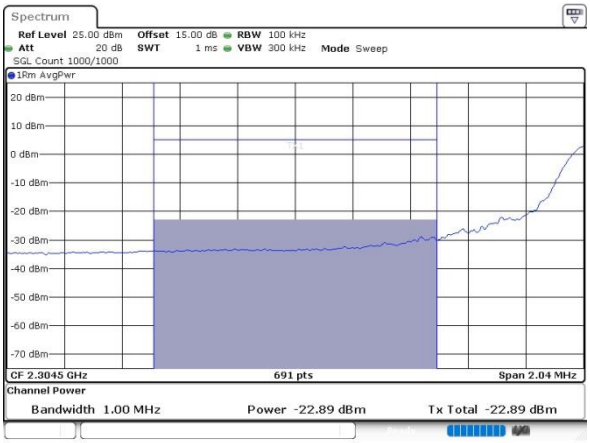


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29567 GHz	-36.47 dBm	-5.47 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29965 GHz	-27.65 dBm	-2.65 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30390 GHz	-22.75 dBm	-9.75 dB
2.304 GHz	2.305 GHz	1.000 MHz	2.30500 GHz*	-4.29 dBm*	8.71 dB*
2.305 GHz	2.315 GHz	100.000 kHz	2.30598 GHz	6.03 dBm	-23.97 dB
2.315 GHz	2.316 GHz	1.000 MHz	2.31501 GHz*	-5.25 dBm*	7.75 dB*
2.316 GHz	2.320 GHz	1.000 MHz	2.31623 GHz	-24.19 dBm	-11.19 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32075 GHz	-28.79 dBm	-3.79 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32403 GHz	-39.27 dBm	-8.27 dB

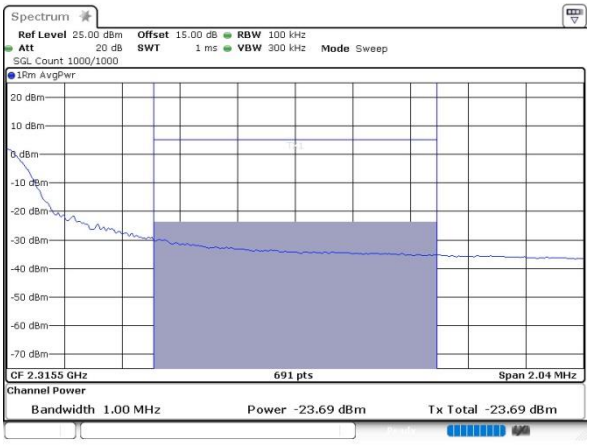
Date: 14.DEC.2023 16:05:45

Lowest Band Edge / Full RB / Lower zoom in



Date: 14.DEC.2023 15:59:04

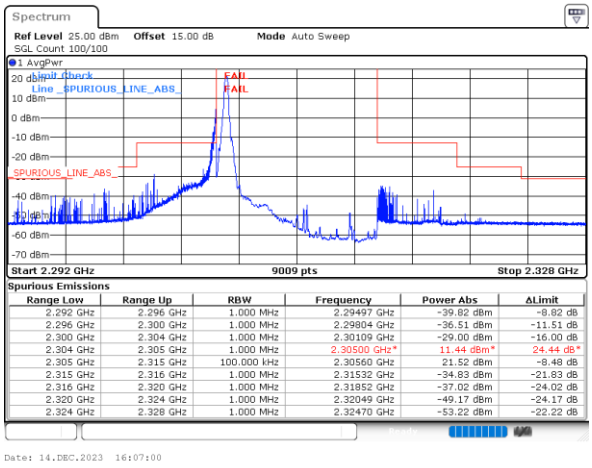
Lowest Band Edge / Full RB / Upper zoom in



Date: 14.DEC.2023 15:59:19

LTE Band 30 / 10MHz / 16QAM

Lowest Band Edge / 1 RB

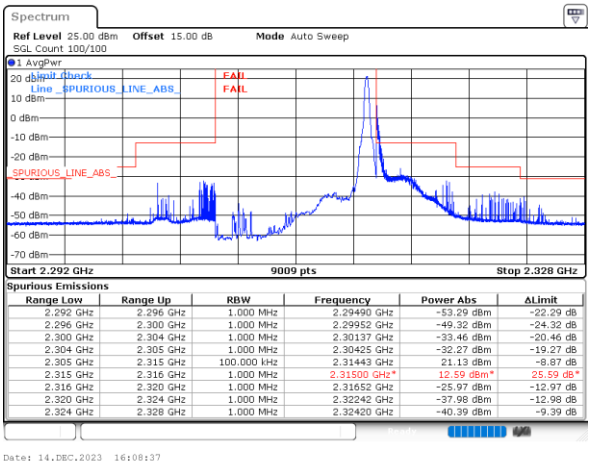


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29497 GHz	-39.82 dBm	-8.82 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29804 GHz	-36.51 dBm	-11.51 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30109 GHz	-29.00 dBm	-16.00 dB
2.304 GHz	2.305 GHz	1.000 MHz	2.30500 GHz*	11.44 dBm*	24.44 dB*
2.305 GHz	2.315 GHz	100.000 kHz	2.30560 GHz	21.52 dBm	-8.48 dB
2.315 GHz	2.316 GHz	1.000 MHz	2.31532 GHz	-34.83 dBm	-21.83 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31852 GHz	-37.02 dBm	-24.02 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32049 GHz	-49.17 dBm	-24.17 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32470 GHz	-53.22 dBm	-22.22 dB

Date: 14.DEC.2023 16:07:00

Highest Band Edge / 1 RB

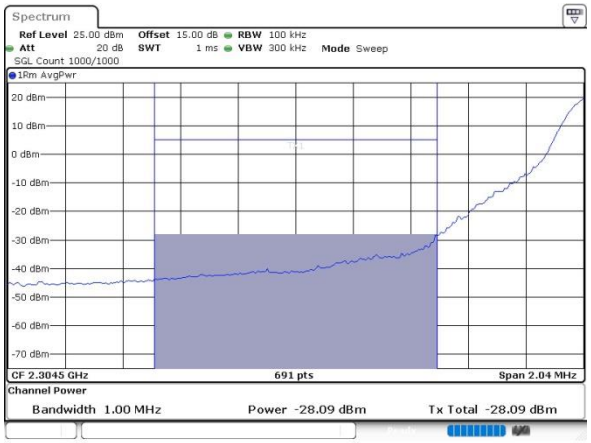


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29490 GHz	-53.29 dBm	-22.29 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29952 GHz	-49.32 dBm	-24.32 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30137 GHz	-33.46 dBm	-20.46 dB
2.304 GHz	2.305 GHz	1.000 MHz	2.30425 GHz	-32.27 dBm	-19.27 dB
2.305 GHz	2.315 GHz	100.000 kHz	2.31443 GHz	21.13 dBm	-8.87 dB
2.315 GHz	2.316 GHz	1.000 MHz	2.31500 GHz*	12.59 dBm*	25.59 dB*
2.316 GHz	2.320 GHz	1.000 MHz	2.31652 GHz	-25.97 dBm	-12.97 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32242 GHz	-37.98 dBm	-12.98 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32420 GHz	-40.39 dBm	-9.39 dB

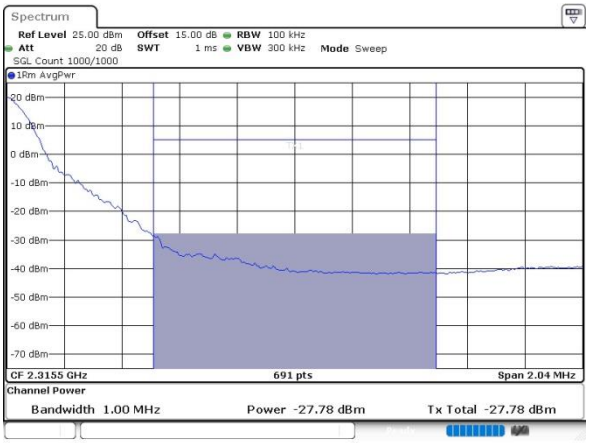
Date: 14.DEC.2023 16:08:37

Lowest Band Edge / 1 RB / Lower zoom in



Date: 14.DEC.2023 16:00:16

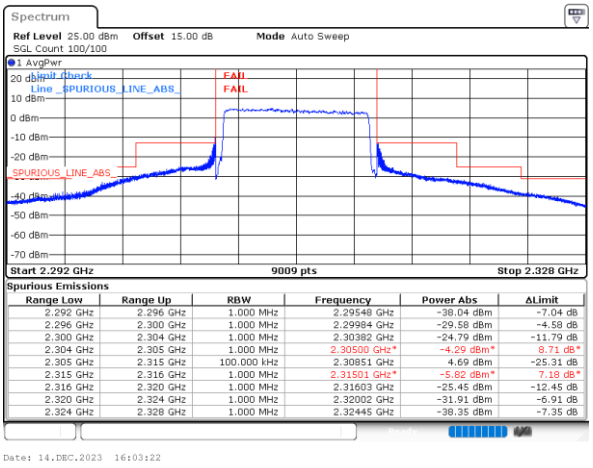
Highest Band Edge / 1 RB / Lower zoom in



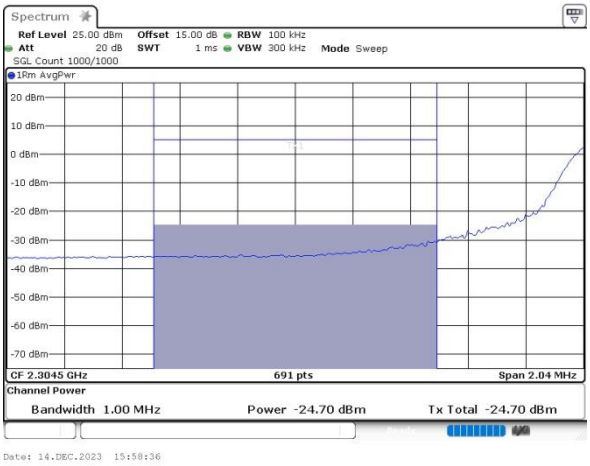
Date: 14.DEC.2023 16:01:08

LTE Band 30 / 10MHz / 16QAM

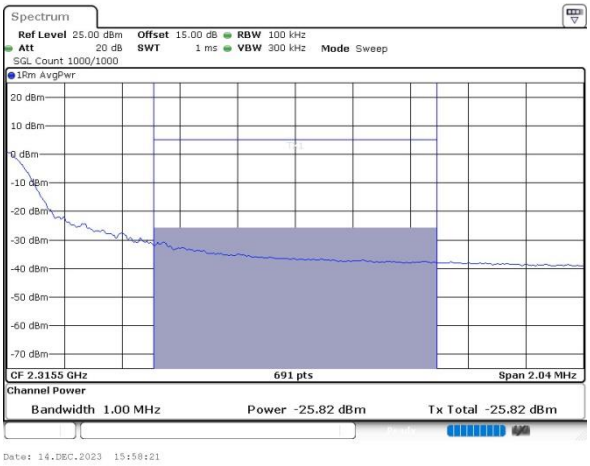
Lowest Band Edge / Full RB



Lowest Band Edge / Full RB / Lower zoom in

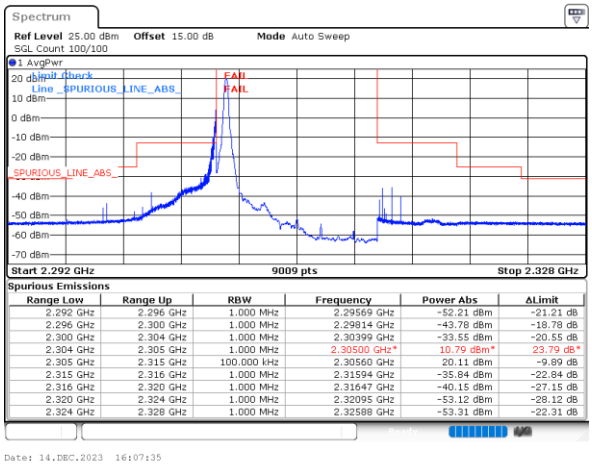


Lowest Band Edge / Full RB / Upper zoom in

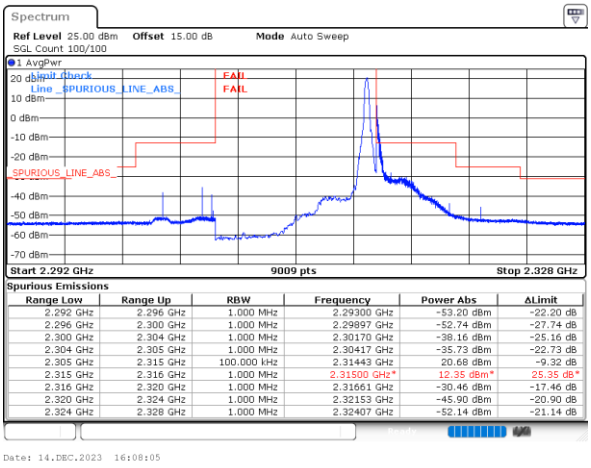


LTE Band 30 / 10MHz / 64QAM

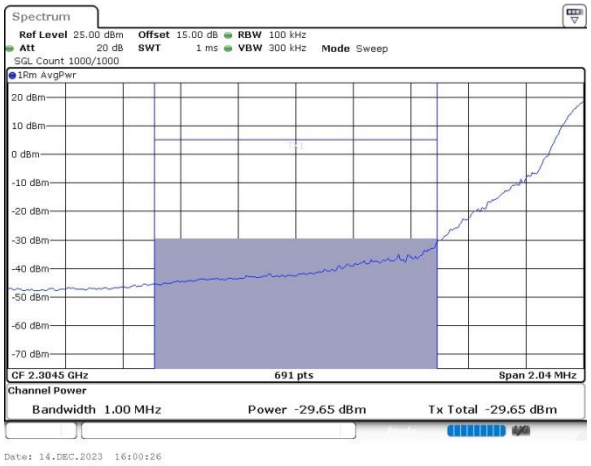
Lowest Band Edge / 1 RB



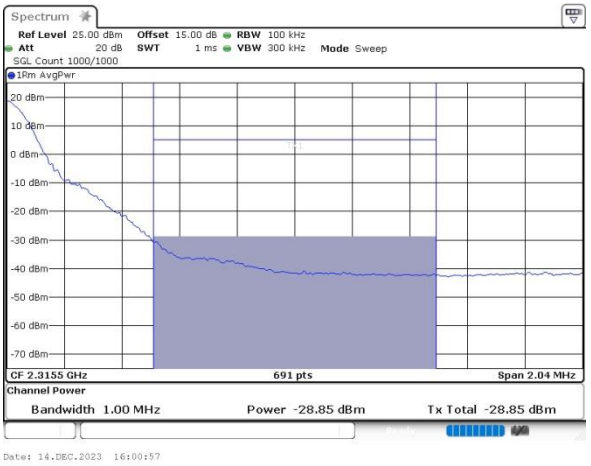
Highest Band Edge / 1 RB



Lowest Band Edge / 1 RB / Lower zoom in

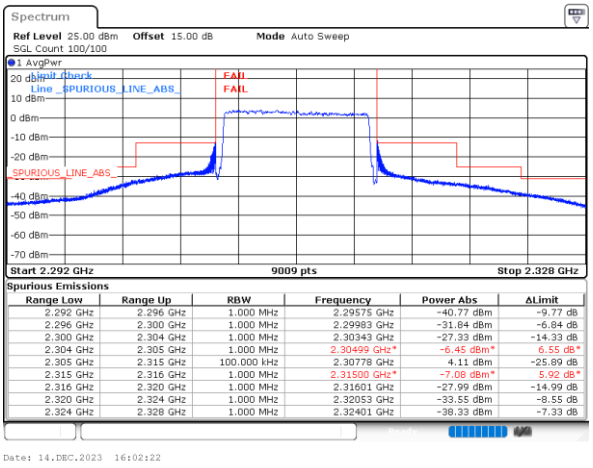


Highest Band Edge / 1 RB / Lower zoom in



LTE Band 30 / 10MHz / 64QAM

Lowest Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29575 GHz	-40.77 dBm	-9.77 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29983 GHz	-31.84 dBm	-6.84 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30343 GHz	-27.33 dBm	-14.33 dB
2.304 GHz	2.305 GHz	1.000 MHz	2.30499 GHz*	-6.45 dBm*	6.55 dB*
2.305 GHz	2.315 GHz	100.000 kHz	2.30778 GHz	4.11 dBm	-25.89 dB
2.315 GHz	2.316 GHz	1.000 MHz	2.31500 GHz*	-7.08 dBm*	5.92 dB*
2.316 GHz	2.320 GHz	1.000 MHz	2.31601 GHz	-27.99 dBm	-14.99 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32053 GHz	-33.55 dBm	-8.55 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32401 GHz	-38.33 dBm	-7.33 dB

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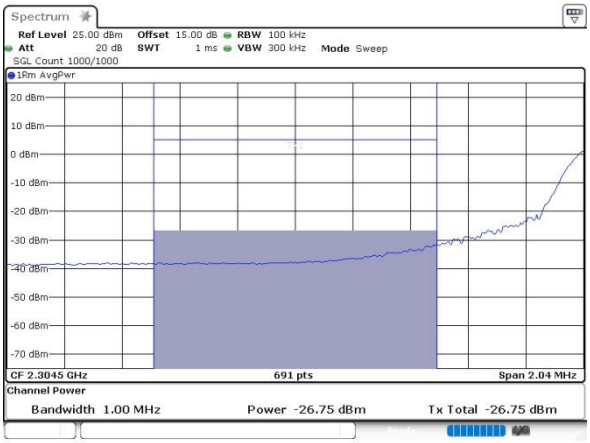
Lowest Band Edge / Full RB / Lower zoom in



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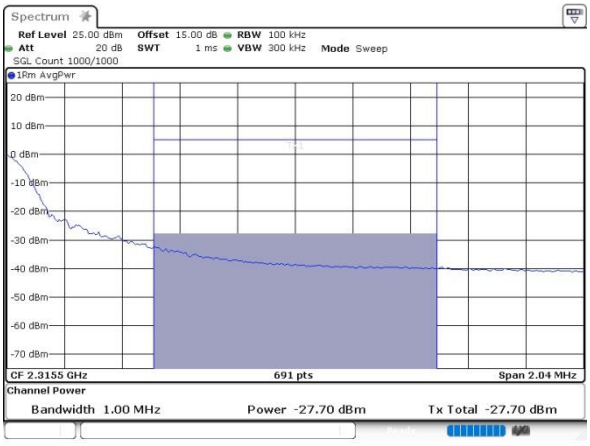
Lowest Band Edge / Full RB / Upper zoom in



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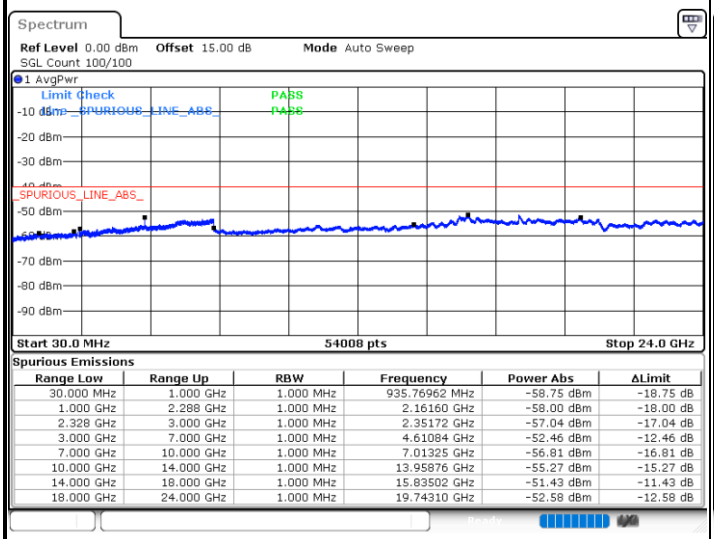
Conducted Spurious Emission

LTE Band 30 / 5MHz

Lowest Channel / QPSK



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	935.76962 MHz	-58.75 dBm	-18.75 dB
1.000 GHz	2.288 GHz	1.000 MHz	2.16160 GHz	-58.00 dBm	-18.00 dB
2.328 GHz	3.000 GHz	1.000 MHz	2.35172 GHz	-57.04 dBm	-17.04 dB
3.000 GHz	7.000 GHz	1.000 MHz	4.61084 GHz	-52.46 dBm	-12.46 dB
7.000 GHz	10.000 GHz	1.000 MHz	7.01325 GHz	-56.81 dBm	-16.81 dB
10.000 GHz	14.000 GHz	1.000 MHz	13.95876 GHz	-55.27 dBm	-15.27 dB
14.000 GHz	18.000 GHz	1.000 MHz	15.83502 GHz	-51.43 dBm	-11.43 dB
18.000 GHz	24.000 GHz	1.000 MHz	19.74310 GHz	-52.58 dBm	-12.58 dB

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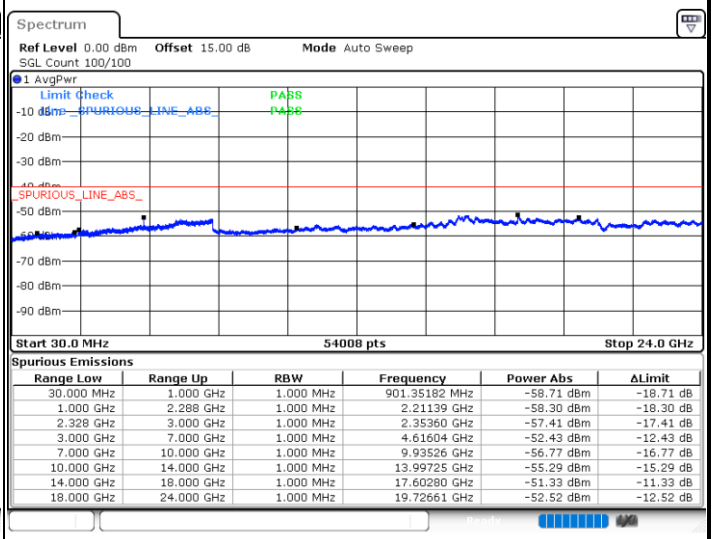
Middle Channel / QPSK



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	901.35182 MHz	-58.71 dBm	-18.71 dB
1.000 GHz	2.288 GHz	1.000 MHz	2.21139 GHz	-58.30 dBm	-18.30 dB
2.328 GHz	3.000 GHz	1.000 MHz	2.35360 GHz	-57.41 dBm	-17.41 dB
3.000 GHz	7.000 GHz	1.000 MHz	4.61604 GHz	-52.43 dBm	-12.43 dB
7.000 GHz	10.000 GHz	1.000 MHz	9.93526 GHz	-56.77 dBm	-16.77 dB
10.000 GHz	14.000 GHz	1.000 MHz	13.99725 GHz	-55.29 dBm	-15.29 dB
14.000 GHz	18.000 GHz	1.000 MHz	17.60280 GHz	-51.33 dBm	-11.33 dB
18.000 GHz	24.000 GHz	1.000 MHz	19.72661 GHz	-52.52 dBm	-12.52 dB

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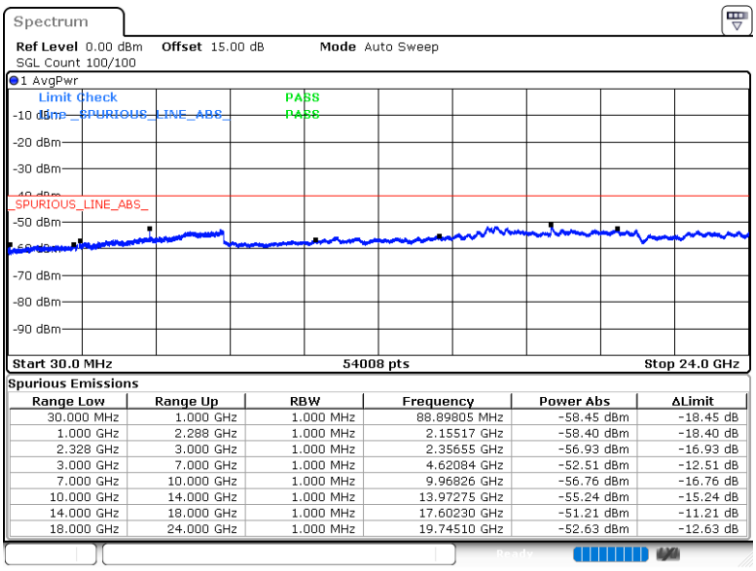
Highest Channel / QPSK



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	88.89805 MHz	-58.45 dBm	-18.45 dB
1.000 GHz	2.288 GHz	1.000 MHz	2.15517 GHz	-58.40 dBm	-18.40 dB
2.328 GHz	3.000 GHz	1.000 MHz	2.35655 GHz	-56.93 dBm	-16.93 dB
3.000 GHz	7.000 GHz	1.000 MHz	4.62084 GHz	-52.51 dBm	-12.51 dB
7.000 GHz	10.000 GHz	1.000 MHz	9.96826 GHz	-56.76 dBm	-16.76 dB
10.000 GHz	14.000 GHz	1.000 MHz	13.97275 GHz	-55.24 dBm	-15.24 dB
14.000 GHz	18.000 GHz	1.000 MHz	17.60230 GHz	-51.21 dBm	-11.21 dB
18.000 GHz	24.000 GHz	1.000 MHz	19.74510 GHz	-52.63 dBm	-12.63 dB

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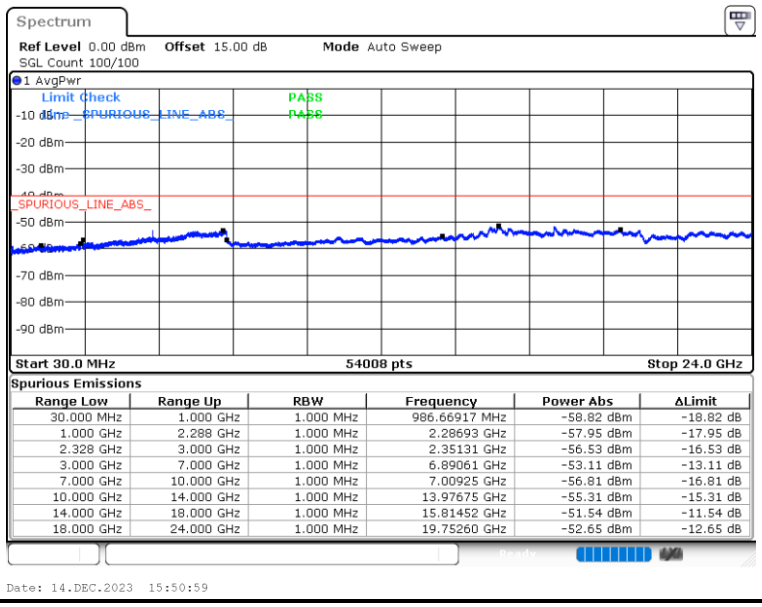
LTE Band 30 / 10MHz

Middle Channel / QPSK



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	986.66917 MHz	-58.82 dBm	-18.82 dB
1.000 GHz	2.288 GHz	1.000 MHz	2.28693 GHz	-57.95 dBm	-17.95 dB
2.328 GHz	3.000 GHz	1.000 MHz	2.35131 GHz	-56.53 dBm	-16.53 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.89061 GHz	-53.11 dBm	-13.11 dB
7.000 GHz	10.000 GHz	1.000 MHz	7.00925 GHz	-56.81 dBm	-16.81 dB
10.000 GHz	14.000 GHz	1.000 MHz	13.97675 GHz	-55.31 dBm	-15.31 dB
14.000 GHz	18.000 GHz	1.000 MHz	15.81452 GHz	-51.54 dBm	-11.54 dB
18.000 GHz	24.000 GHz	1.000 MHz	19.75260 GHz	-52.65 dBm	-12.65 dB

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Frequency Stability

Test Conditions		LTE Band 30 (QPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 10MHz	Note 2.
		Deviation (ppm)	Result
50	Normal Voltage	0.0003	PASS
40	Normal Voltage	0.0001	
30	Normal Voltage	0.0001	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0002	
0	Normal Voltage	0.0001	
-10	Normal Voltage	0.0004	
-20	Normal Voltage	0.0001	
-30	Normal Voltage	0.0005	
20	Maximum Voltage	0.0001	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0003	

Note:

1. Normal Voltage = 3.85 V. ; Battery End Point (BEP) = 3.6 V. ; Maximum Voltage = 4.4 V.
2. The frequency fundamental emissions stay within the authorized frequency block.

Appendix B. Test Results of Radiated Test

Radiated Spurious Emission

Test Engineer :	Chris	Temperature :	23~25℃
		Relative Humidity :	41~42%

LTE Band 30 / 5MHz / QPSK / RB Size 1 Offset 0								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	4616	-63.62	-40	-23.62	-75.08	2.84	14.30	H
	6912	-64.30	-40	-24.30	-74.24	3.49	13.43	H
	9222	-56.09	-40	-16.09	-66.33	3.85	14.09	H
	4616	-63.83	-40	-23.83	-75.29	2.84	14.30	V
	6912	-65.22	-40	-25.22	-75.16	3.49	13.43	V
	9222	-60.04	-40	-20.04	-70.28	3.85	14.09	V
Middle	4616	-63.78	-40	-23.78	-75.24	2.84	14.30	H
	6926	-62.25	-40	-22.25	-72.19	3.49	13.43	H
	9236	-55.90	-40	-15.90	-66.14	3.85	14.09	H
	4616	-63.70	-40	-23.70	-75.16	2.84	14.30	V
	6926	-64.85	-40	-24.85	-74.79	3.49	13.43	V
	9236	-59.69	-40	-19.69	-69.93	3.85	14.09	V
Highest	4616	-61.69	-40	-21.69	-73.15	2.84	14.30	H
	6926	-64.03	-40	-24.03	-73.97	3.49	13.43	H
	9236	-56.31	-40	-16.31	-66.55	3.85	14.09	H
	4616	-62.61	-40	-22.61	-74.07	2.84	14.30	V
	6926	-64.69	-40	-24.69	-74.63	3.49	13.43	V
	9236	-59.56	-40	-19.56	-69.80	3.85	14.09	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 30 / 10MHz / QPSK / RB Size 1 Offset 0								
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	4616	-64.58	-40	-24.58	-76.04	2.84	14.30	H
	6912	-64.96	-40	-24.96	-74.90	3.49	13.43	H
	9222	-55.90	-40	-15.90	-66.14	3.85	14.09	H
	4616	-63.54	-40	-23.54	-75.00	2.84	14.30	V
	6912	-65.01	-40	-25.01	-74.95	3.49	13.43	V
	9222	-58.08	-40	-18.08	-68.32	3.85	14.09	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.