FCC RF Test Report

APPLICANT	:	Relay, Inc.
EQUIPMENT	:	Relay
BRAND NAME	:	RelayM
MODEL NAME	:	RY2267
FCC ID	:	2AMBHRY2267
STANDARD	:	47 CFR Part 27
CLASSIFICATION	:	PCS Licensed Transmitter held to face (PCF)
TEST DATE(S)	:	Oct. 04, 2024 ~ Feb. 08, 2025

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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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
FG250505E	Rev. 01	Initial issue of report	Feb. 24, 2025

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 16.01 dB at 9222.00 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.
2230 Bandmate Way, Suite 500, Raleigh, NC 27607, USA

1.2 Manufacturer

Relay, Inc.
2230 Bandmate Way, Suite 500, Raleigh, NC 27607, USA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Relay
Brand Name	RelayM
Model Name	RY2267
FCC ID	2AMBHRY2267
IMEI Code	Conducted: 004400152020000 Radiation: 990007540010789
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	<Ant.9> LTE Band 30 : -3.5 dBi
Antenna Type	PIFA Antenna
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	0.1138	4M49G7D	0.0912	4M51W7D
10	2310.0	0.1151	9M05G7D	0.0923	9M97W7D

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.**
	TH01-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	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City, Guangdong Province 518103 People's Republic of China TEL: +86-755-86066985		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	03CH02-SZ	CN1256	421272

Test data subcontracted: Radiated Spurious Emission test case in section 4.4 of this report.

1.8 Test Software

Item	Site	Manufacture	Name	Version
1.	TH01-KS	SPORTON	FCC LTE_Ver2.0 Auto_china_210503	2.0
2.	03CH02-SZ	AUDIX	E3	6.2009-8-24a

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 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

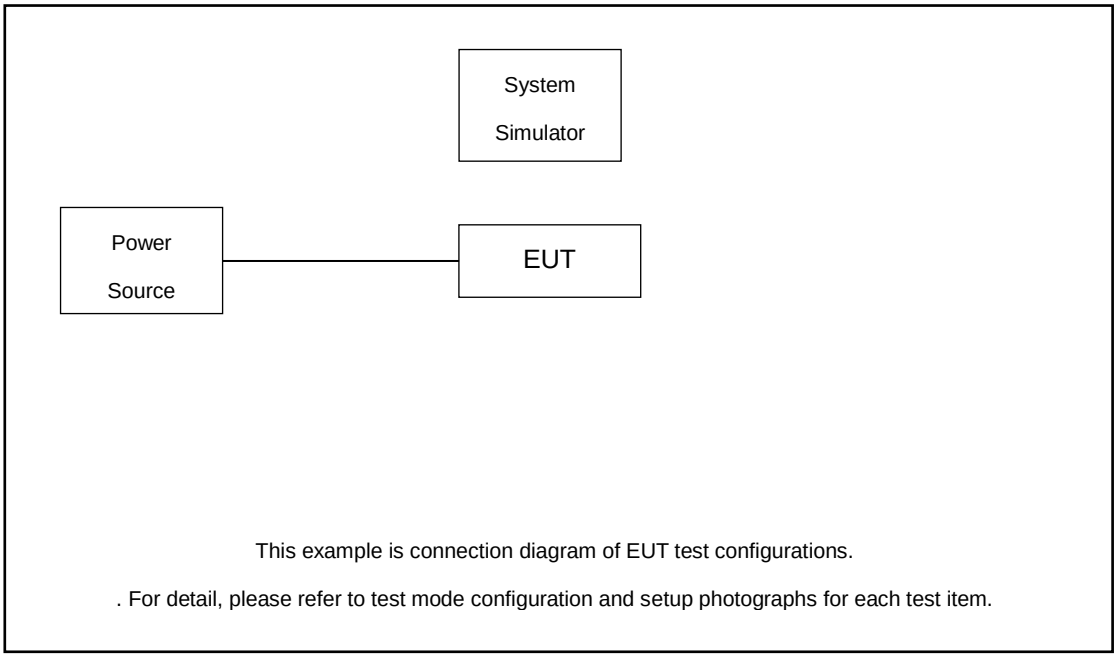
2.1 Test Mode

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		V	
E.I.R.P	30	-	-	V		-	-	V	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	
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 between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss.

Offset = RF cable loss.

Following shows an offset computation example with cable loss 5.8 dB.

Example :

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

= 5.8 (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

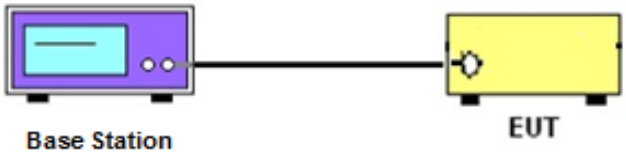
3 Conducted Test Items

3.1 Measuring Instruments

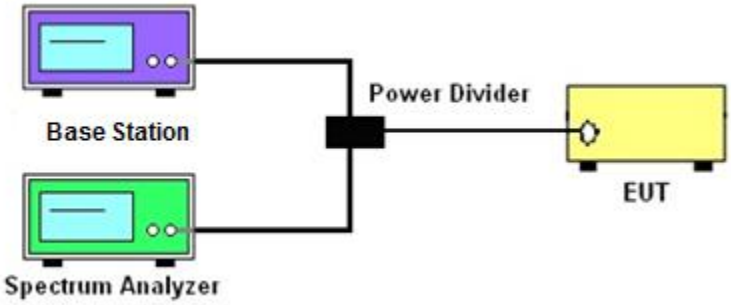
See list of measuring instruments of this test report.

3.2 Test Setup

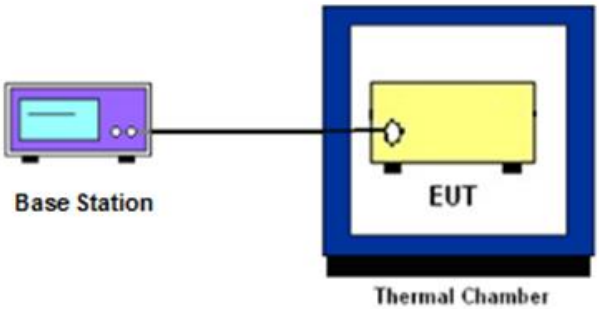
3.2.1 Conducted Output Power



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 9 kHz 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.

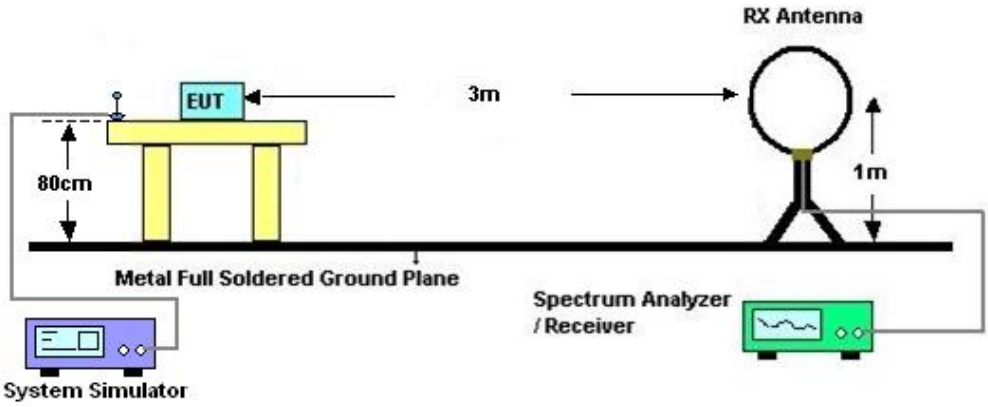
4 Radiated Test Items

4.1 Measuring Instruments

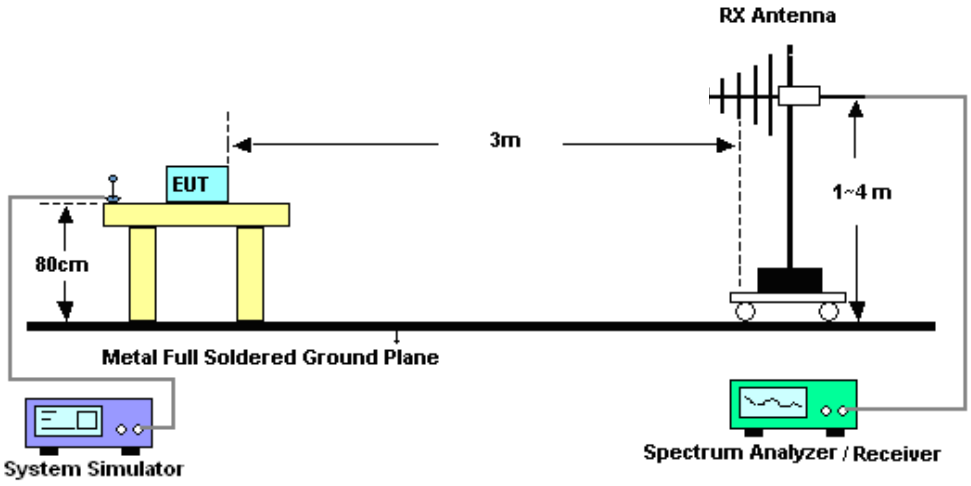
See list of measuring instruments of this test report.

4.2 Test Setup

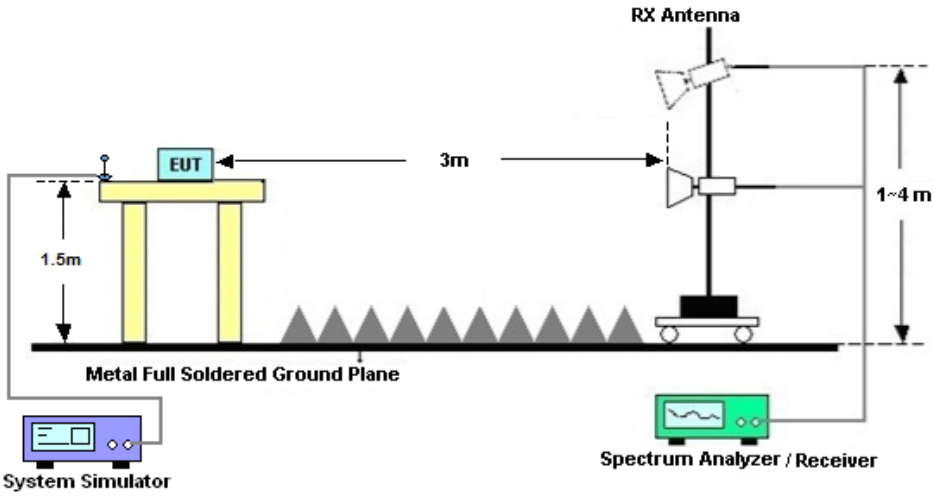
4.2.1 For radiated test below 30MHz



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 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 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	101040	10Hz~40GHz	Oct. 10, 2023	Oct. 04, 2024~ Oct. 11, 2024	Oct. 09, 2025	Conducted (TH01-KS)
Power divider	STI	STI08-0055	-	0.5~40GHz	NCR	Oct. 04, 2024~ Oct. 11, 2024	NCR	Conducted (TH01-KS)
Temperature & humidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 04, 2024	Oct. 04, 2024~ Oct. 11, 2024	Jul. 03, 2025	Conducted (TH01-KS)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Jul. 03, 2024	Feb. 08, 2025	Jul. 02, 2025	Radiation (03CH02-SZ)
Loop Antenna	R&S	HFH2-Z2E	101141	9kHz~30MHz	Dec. 28, 2024	Feb. 08, 2025	Dec. 27, 2025	Radiation (03CH02-SZ)
Bilog Antenna	TeseQ	CBL6112D	35407	30MHz-2GHz	Oct. 24, 2023	Feb. 08, 2025	Oct. 23, 2025	Radiation (03CH02-SZ)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00119436	1GHz~18GHz	Jul. 04, 2024	Feb. 08, 2025	Jul. 04, 2025	Radiation (03CH02-SZ)
HF Amplifier	MITEQ	TTA1840-35 -HG	1871923	18GHz~40GHz	Jul. 03, 2024	Feb. 08, 2025	Jul. 03, 2025	Radiation (03CH02-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz-40GHz	Apr. 09, 2024	Feb. 08, 2025	Apr. 08, 2025	Radiation (03CH02-SZ)
LF Amplifier	Burgeon	BPA-530	102211	0.01~3000Mhz	Oct. 18, 2024	Feb. 08, 2025	Oct. 17, 2025	Radiation (03CH02-SZ)
HF Amplifier	KEYSIGHT	83017A	MY53270105	0.5GHz~26.5Ghz	Oct. 14, 2024	Feb. 08, 2025	Oct. 13, 2025	Radiation (03CH02-SZ)
AC Power Source	Chroma	61601	616010003043	N/A	Oct. 18, 2024	Feb. 08, 2025	Oct. 17, 2025	Radiation (03CH02-SZ)
Turn Table	Chaintek	T-200	N/A	0~360 degree	NCR	Feb. 08, 2025	NCR	Radiation (03CH02-SZ)
Antenna Mast	Chaintek	MBS-400	N/A	1 m~4 m	NCR	Feb. 08, 2025	NCR	Radiation (03CH02-SZ)

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	±2.22 dB
Occupied Channel Bandwidth	±0.1%
Conducted Power	±0.50 dB
Peak to Average Ratio	±0.50 dB
Frequency Stability	±0.04 ppm

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.47 dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.31 dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.72 dB

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

Appendix A. Test Results of Conducted Test

Test Engineer :	Simle Wang	Temperature :	24~26℃
		Relative Humidity :	50~53%

Conducted Output Power(Average power) and EIRP

LTE Band 30_ANT9:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	EIRP	EIRP	EIRP
Channel					27710			27710	
Frequency (MHz)					2310			2310	
10	QPSK	1	0		24.11			0.1151	
10	QPSK	1	25		23.98			0.1117	
10	QPSK	1	49		23.91			0.1099	
10	QPSK	25	0		23.13			0.0918	
10	QPSK	25	12		23.01			0.0893	
10	QPSK	25	25		22.95			0.0881	
10	QPSK	50	0		23.01			0.0893	
10	16QAM	1	0		23.15			0.0923	
10	16QAM	1	25		23.12			0.0916	
10	16QAM	1	49		23.01			0.0893	
10	16QAM	25	0		22.12			0.0728	
10	16QAM	25	12		22.00			0.0708	
10	16QAM	25	25		22.08			0.0721	
10	16QAM	50	0		21.96			0.0701	
10	64QAM	1	0		22.07			0.0719	
10	64QAM	1	25		22.20			0.0741	
10	64QAM	1	49		22.09			0.0723	
10	64QAM	25	0		21.22			0.0592	
10	64QAM	25	12		21.23			0.0593	
10	64QAM	25	25		21.06			0.0570	
10	64QAM	50	0		21.21			0.0590	
Channel				27685	27710	27735	27685	27710	27735
Frequency (MHz)				2307.5	2310	2312.5	2307.5	2310	2312.5
5	QPSK	1	0	24.04	24.06	24.00	0.1132	0.1138	0.1122
5	QPSK	1	12	23.90	23.83	23.94	0.1096	0.1079	0.1107
5	QPSK	1	24	23.88	23.79	23.77	0.1091	0.1069	0.1064
5	QPSK	12	0	23.06	23.00	22.99	0.0904	0.0891	0.0889
5	QPSK	12	7	22.89	22.90	22.91	0.0869	0.0871	0.0873
5	QPSK	12	13	22.90	22.81	22.87	0.0871	0.0853	0.0865
5	QPSK	25	0	22.93	22.97	22.88	0.0877	0.0885	0.0867
5	16QAM	1	0	23.04	23.07	23.10	0.0899	0.0906	0.0912

5	16QAM	1	12	23.01	23.07	23.03	0.0893	0.0906	0.0897
5	16QAM	1	24	22.91	22.91	22.90	0.0873	0.0873	0.0871
5	16QAM	12	0	22.00	22.07	22.01	0.0708	0.0719	0.0710
5	16QAM	12	7	21.88	21.93	21.89	0.0689	0.0697	0.0690
5	16QAM	12	13	22.01	21.98	21.96	0.0710	0.0705	0.0701
5	16QAM	25	0	21.82	21.85	21.82	0.0679	0.0684	0.0679
5	64QAM	1	0	21.92	22.12	22.06	0.0695	0.0728	0.0718
5	64QAM	1	12	22.04	22.16	22.07	0.0714	0.0735	0.0719
5	64QAM	1	24	22.05	22.10	22.06	0.0716	0.0724	0.0718
5	64QAM	12	0	20.98	21.08	20.96	0.0560	0.0573	0.0557
5	64QAM	12	7	21.07	21.10	20.97	0.0571	0.0575	0.0558
5	64QAM	12	13	21.03	21.16	20.96	0.0566	0.0583	0.0557
5	64QAM	25	0	21.16	21.02	20.96	0.0583	0.0565	0.0557

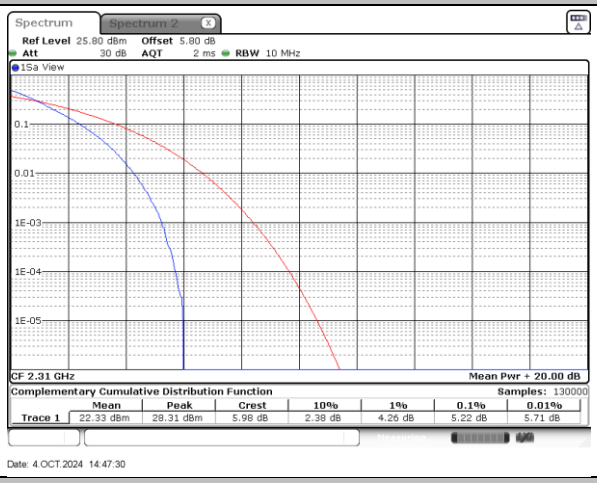
LTE Band 30

Peak-to-Average Ratio

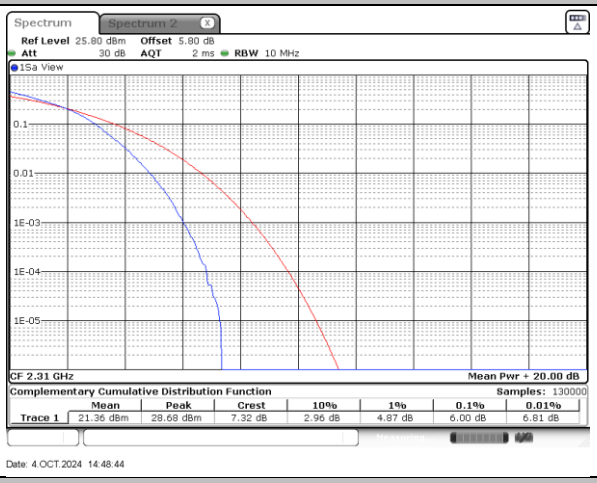
Mode	LTE Band 30 / 10MHz			
Mod.	QPSK	16QAM	64QAM	Limit: 13dB
RB Size	Full RB	Full RB	Full RB	Result
Middle CH	5.22	6.0	6.35	PASS

LTE Band 30 / 10MHz

Middle Channel / Full RB / QPSK

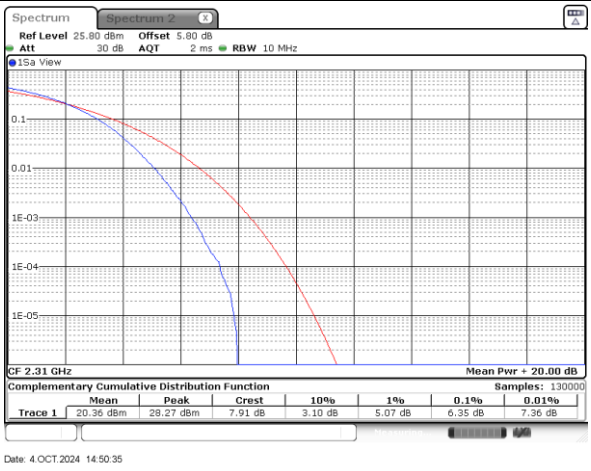


Middle Channel / Full RB / 16QAM



LTE Band 30 / 10MHz / 16QAM

Middle Channel / Full RB / 64QAM

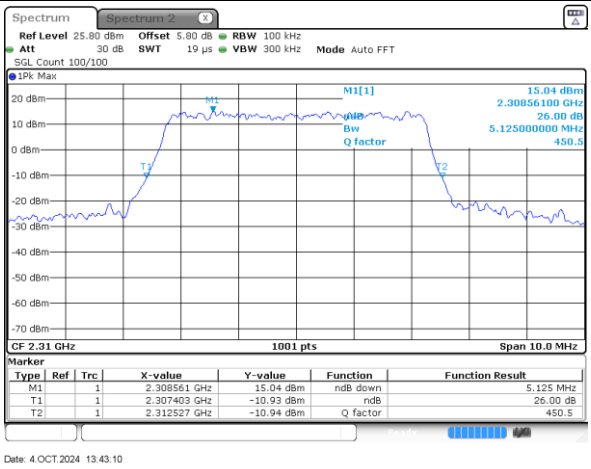


26dB Bandwidth

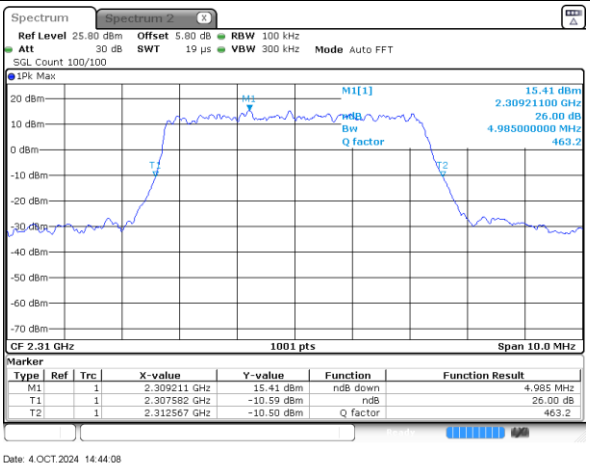
Mode	LTE Band 30 : 26dB BW(MHz)			
BW	5MHz		10MHz	
Mod.	QPSK	16QAM	QPSK	16QAM
Middle CH	5.13	4.99	10.05	9.69

LTE Band 30

Middle Channel / 5MHz / QPSK

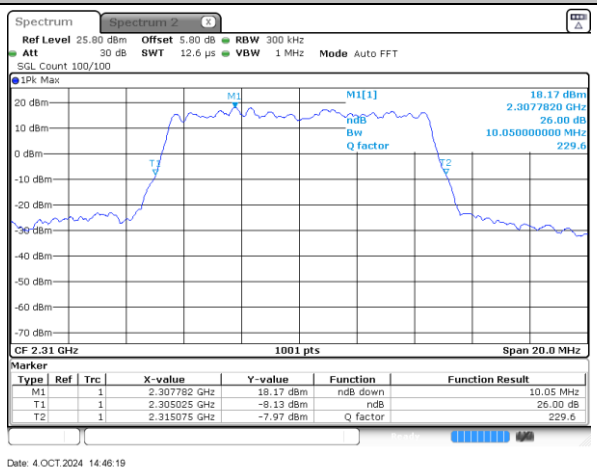


Middle Channel / 5MHz / 16QAM

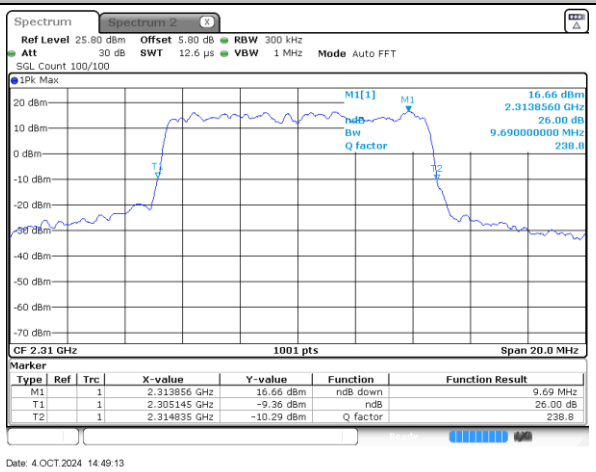


LTE Band 30

Middle Channel / 10MHz / QPSK



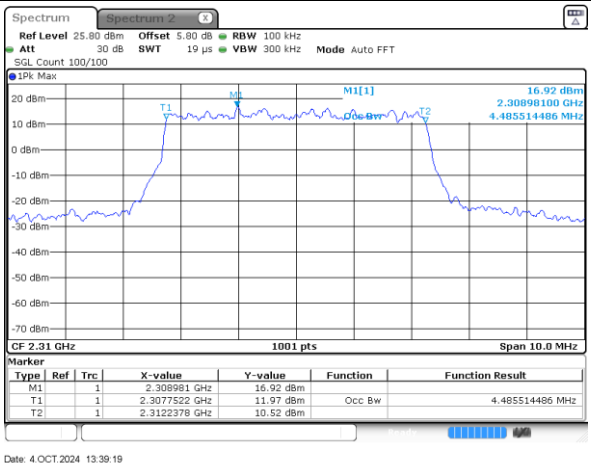
Middle Channel / 10MHz / 16QAM



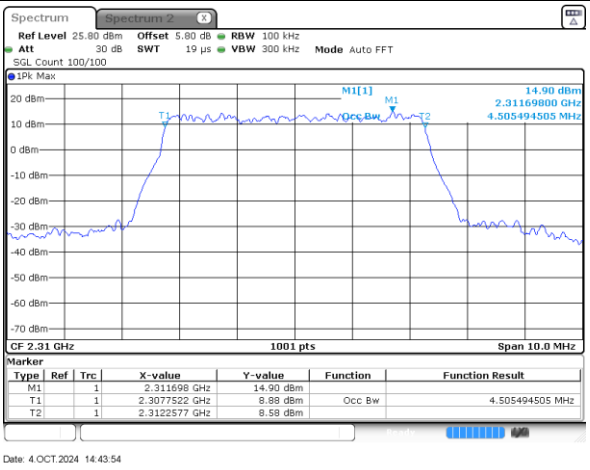
Occupied Bandwidth

Mode	LTE Band 30 : 99%OBW(MHz)			
BW	5MHz		10MHz	
Mod.	QPSK	16QAM	QPSK	16QAM
Middle CH	4.49	4.51	9.05	9.97

Middle Channel / 5MHz / QPSK

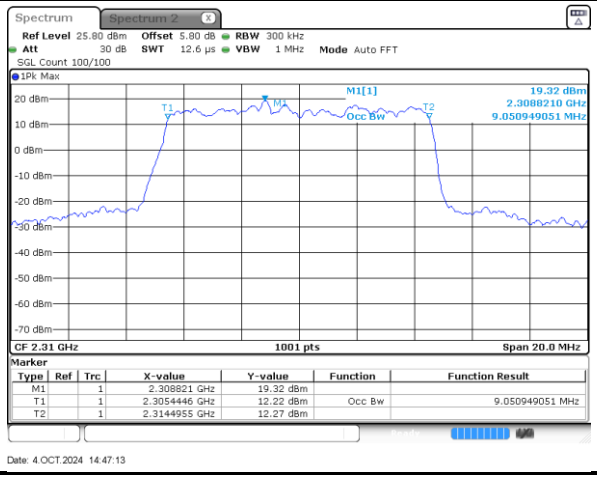


Middle Channel / 5MHz / 16QAM

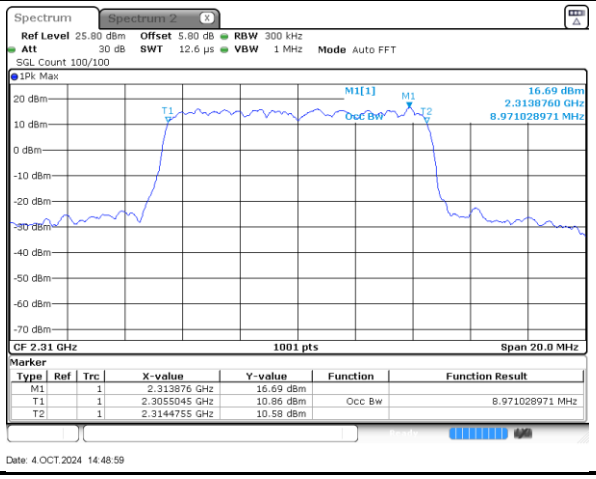


LTE Band 30

Middle Channel / 10MHz / QPSK



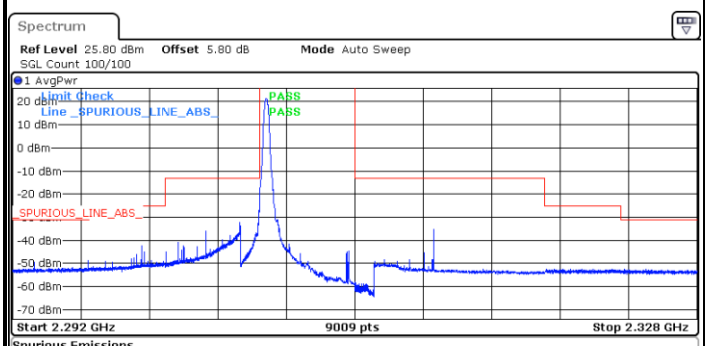
Middle Channel / 10MHz / 16QAM



Conducted Band Edge

LTE Band 30 / 5MHz / QPSK

Lowest Band Edge / 1 RB

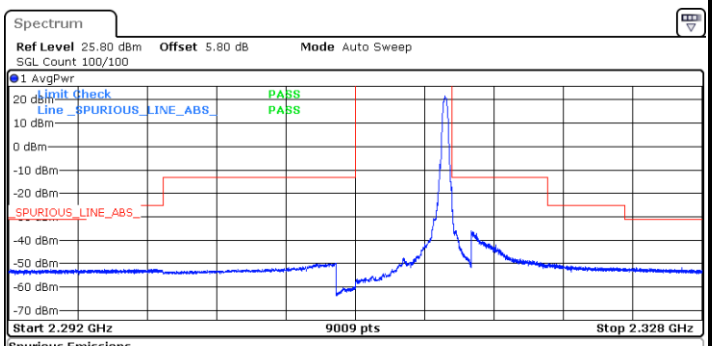


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29596 GHz	-48.73 dBm	-17.73 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29880 GHz	-42.48 dBm	-17.48 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30396 GHz	-32.36 dBm	-19.36 dB
2.304 GHz	2.305 GHz	50.000 kHz	2.30499 GHz	-23.34 dBm	-10.34 dB
2.305 GHz	2.310 GHz	100.000 kHz	2.30535 GHz	21.39 dBm	-8.61 dB
2.310 GHz	2.311 GHz	50.000 kHz	2.31000 GHz	-57.94 dBm	-44.94 dB
2.311 GHz	2.320 GHz	1.000 MHz	2.31412 GHz	-35.38 dBm	-22.38 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32093 GHz	-52.32 dBm	-27.32 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32417 GHz	-52.55 dBm	-21.55 dB

Date: 4.OCT.2024 12:35:00

Highest Band Edge / 1 RBMAX

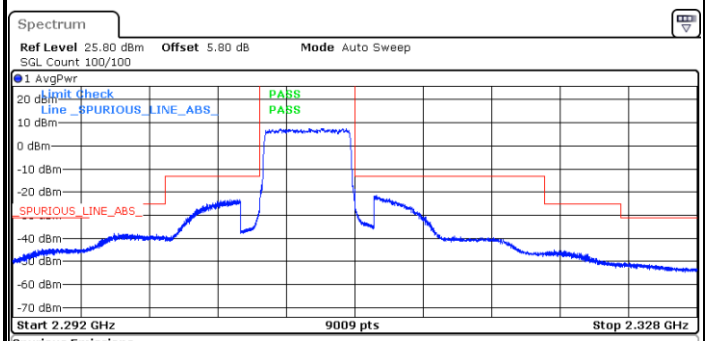


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29547 GHz	-52.61 dBm	-21.61 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29824 GHz	-52.33 dBm	-27.33 dB
2.300 GHz	2.309 GHz	1.000 MHz	2.30898 GHz	-49.94 dBm	-36.94 dB
2.309 GHz	2.310 GHz	50.000 kHz	2.30995 GHz	-60.01 dBm	-47.01 dB
2.310 GHz	2.315 GHz	100.000 kHz	2.31465 GHz	21.54 dBm	-8.46 dB
2.315 GHz	2.316 GHz	50.000 kHz	2.31500 GHz	-23.03 dBm	-10.03 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31601 GHz	-36.18 dBm	-23.18 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32003 GHz	-49.92 dBm	-24.92 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32456 GHz	-51.90 dBm	-20.90 dB

Date: 4.OCT.2024 13:15:17

Lowest Band Edge / Full RB

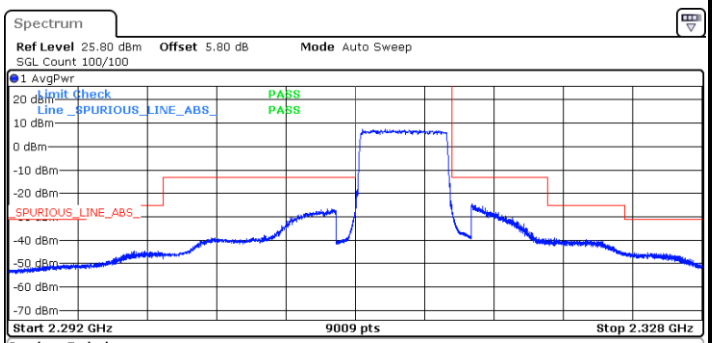


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29596 GHz	-44.20 dBm	-13.20 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29756 GHz	-37.97 dBm	-12.97 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30396 GHz	-23.25 dBm	-10.25 dB
2.304 GHz	2.305 GHz	50.000 kHz	2.30499 GHz	-26.95 dBm	-13.95 dB
2.305 GHz	2.310 GHz	100.000 kHz	2.30824 GHz	7.55 dBm	-22.45 dB
2.310 GHz	2.311 GHz	50.000 kHz	2.31000 GHz	-26.12 dBm	-13.12 dB
2.311 GHz	2.320 GHz	1.000 MHz	2.31113 GHz	-21.52 dBm	-8.52 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32050 GHz	-45.10 dBm	-20.10 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32417 GHz	-50.74 dBm	-19.74 dB

Date: 4.OCT.2024 12:37:39

Highest Band Edge / Full RB



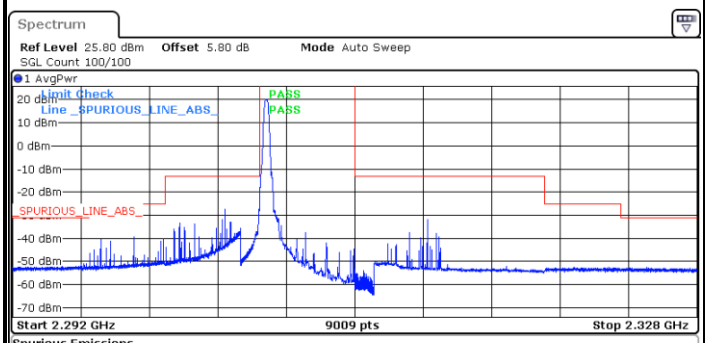
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29539 GHz	-50.36 dBm	-19.36 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29908 GHz	-44.43 dBm	-19.43 dB
2.300 GHz	2.309 GHz	1.000 MHz	2.30879 GHz	-26.69 dBm	-13.69 dB
2.309 GHz	2.310 GHz	50.000 kHz	2.31000 GHz	-27.28 dBm	-14.28 dB
2.310 GHz	2.315 GHz	100.000 kHz	2.31156 GHz	7.32 dBm	-22.68 dB
2.315 GHz	2.316 GHz	50.000 kHz	2.31500 GHz	-26.90 dBm	-13.90 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31606 GHz	-24.25 dBm	-11.25 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32034 GHz	-39.04 dBm	-14.04 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32421 GHz	-45.32 dBm	-14.32 dB

Date: 4.OCT.2024 13:17:56

LTE Band 30 / 5MHz / 16QAM

Lowest Band Edge / 1RB

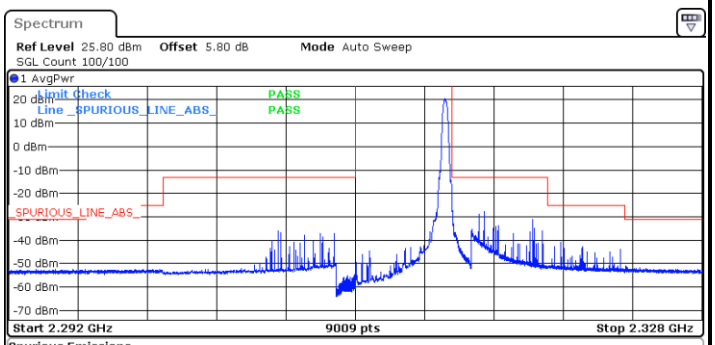


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29573 GHz	-50.88 dBm	-19.88 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29840 GHz	-39.34 dBm	-14.34 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30317 GHz	-27.23 dBm	-14.23 dB
2.304 GHz	2.305 GHz	50.000 kHz	2.30499 GHz	-23.94 dBm	-10.94 dB
2.305 GHz	2.310 GHz	100.000 kHz	2.30535 GHz	20.31 dBm	-9.69 dB
2.310 GHz	2.311 GHz	50.000 kHz	2.31000 GHz	-53.55 dBm	-40.55 dB
2.311 GHz	2.320 GHz	1.000 MHz	2.31384 GHz	-31.78 dBm	-18.78 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32334 GHz	-52.62 dBm	-27.62 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32537 GHz	-52.64 dBm	-21.64 dB

Date: 4.OCT.2024 12:35:53

Highest Band Edge / 1 RBMAX

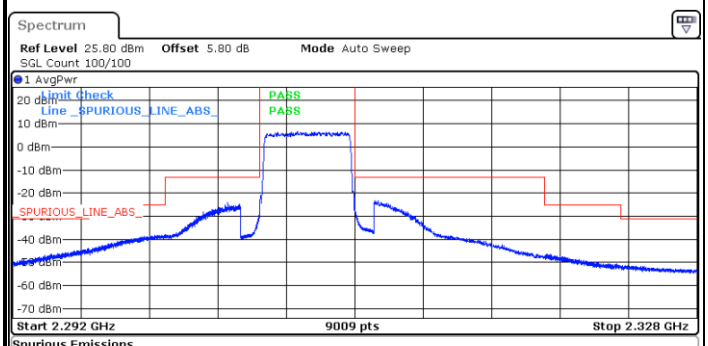


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29533 GHz	-52.58 dBm	-21.58 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29897 GHz	-52.50 dBm	-27.50 dB
2.300 GHz	2.309 GHz	1.000 MHz	2.30599 GHz	-35.87 dBm	-22.87 dB
2.309 GHz	2.310 GHz	50.000 kHz	2.30998 GHz	-54.68 dBm	-41.68 dB
2.310 GHz	2.315 GHz	100.000 kHz	2.31465 GHz	20.48 dBm	-9.52 dB
2.315 GHz	2.316 GHz	50.000 kHz	2.31500 GHz	-23.08 dBm	-10.08 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31668 GHz	-27.62 dBm	-14.62 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32065 GHz	-40.75 dBm	-15.75 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32403 GHz	-50.97 dBm	-19.97 dB

Date: 4.OCT.2024 13:16:10

Lowest Band Edge / Full RB

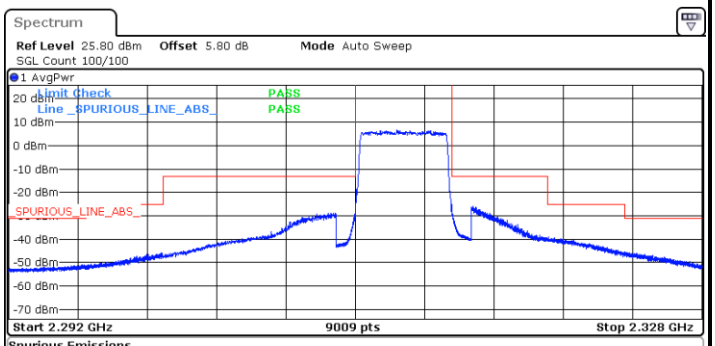


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29595 GHz	-44.01 dBm	-13.01 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29971 GHz	-38.09 dBm	-13.09 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30332 GHz	-24.18 dBm	-11.18 dB
2.304 GHz	2.305 GHz	50.000 kHz	2.30500 GHz	-28.24 dBm	-15.24 dB
2.305 GHz	2.310 GHz	100.000 kHz	2.30698 GHz	6.59 dBm	-23.41 dB
2.310 GHz	2.311 GHz	50.000 kHz	2.31001 GHz	-27.52 dBm	-14.52 dB
2.311 GHz	2.320 GHz	1.000 MHz	2.31103 GHz	-23.44 dBm	-10.44 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32008 GHz	-46.52 dBm	-21.52 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32407 GHz	-51.36 dBm	-20.36 dB

Date: 4.OCT.2024 12:38:32

Highest Band Edge / Full RB



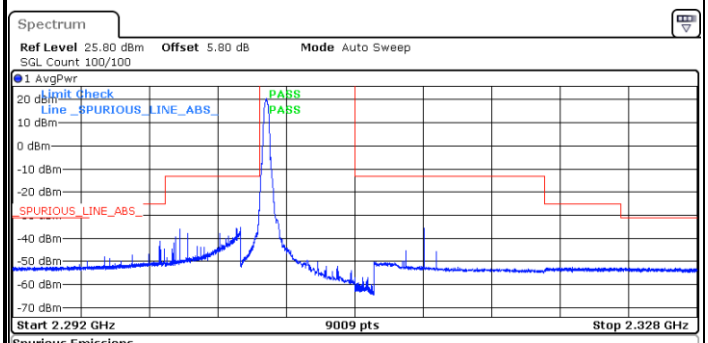
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29576 GHz	-50.93 dBm	-19.93 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29995 GHz	-45.84 dBm	-20.84 dB
2.300 GHz	2.309 GHz	1.000 MHz	2.30893 GHz	-28.78 dBm	-15.78 dB
2.309 GHz	2.310 GHz	50.000 kHz	2.30999 GHz	-28.10 dBm	-15.10 dB
2.310 GHz	2.315 GHz	100.000 kHz	2.31215 GHz	6.67 dBm	-23.33 dB
2.315 GHz	2.316 GHz	50.000 kHz	2.31501 GHz	-28.31 dBm	-15.31 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31610 GHz	-26.03 dBm	-13.03 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32001 GHz	-39.07 dBm	-14.07 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32401 GHz	-45.20 dBm	-14.20 dB

Date: 4.OCT.2024 13:18:49

LTE Band 30 / 5MHz / 64QAM

Lowest Band Edge / 1RB

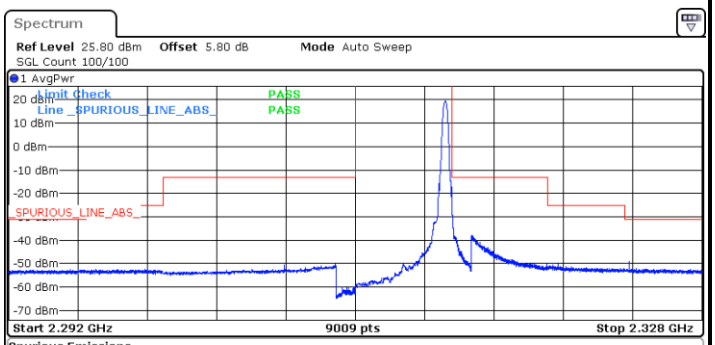


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29591 GHz	-50.04 dBm	-19.04 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29973 GHz	-41.29 dBm	-16.29 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30398 GHz	-35.33 dBm	-22.33 dB
2.304 GHz	2.305 GHz	50.000 kHz	2.30500 GHz	-24.35 dBm	-11.35 dB
2.305 GHz	2.310 GHz	100.000 kHz	2.30534 GHz	20.74 dBm	-9.26 dB
2.310 GHz	2.311 GHz	50.000 kHz	2.31042 GHz	-56.84 dBm	-43.84 dB
2.311 GHz	2.320 GHz	1.000 MHz	2.31364 GHz	-35.70 dBm	-22.70 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32146 GHz	-52.56 dBm	-27.56 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32551 GHz	-52.67 dBm	-21.67 dB

Date: 4.OCT.2024 12:36:46

Highest Band Edge / 1 RBMAX

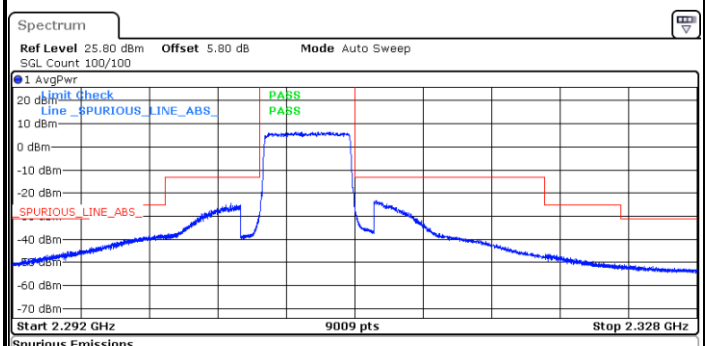


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29520 GHz	-52.48 dBm	-21.48 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29766 GHz	-52.57 dBm	-27.57 dB
2.300 GHz	2.309 GHz	1.000 MHz	2.30894 GHz	-50.29 dBm	-37.29 dB
2.309 GHz	2.310 GHz	50.000 kHz	2.30996 GHz	-59.97 dBm	-46.97 dB
2.310 GHz	2.315 GHz	100.000 kHz	2.31465 GHz	19.44 dBm	-10.56 dB
2.315 GHz	2.316 GHz	50.000 kHz	2.31500 GHz	-24.58 dBm	-11.58 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31606 GHz	-38.00 dBm	-25.00 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32053 GHz	-50.33 dBm	-25.33 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32421 GHz	-49.24 dBm	-18.24 dB

Date: 4.OCT.2024 13:17:03

Lowest Band Edge / Full RB

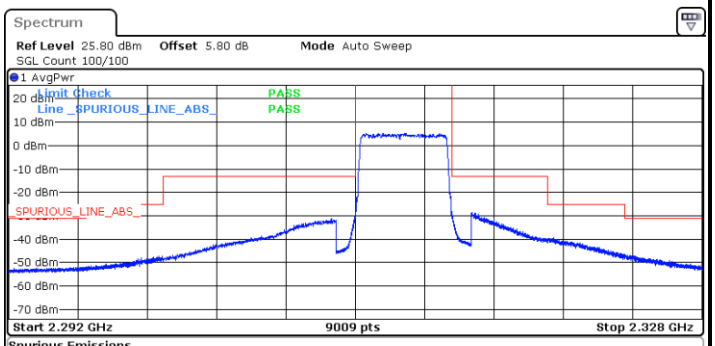


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29589 GHz	-44.47 dBm	-13.47 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29978 GHz	-37.99 dBm	-12.99 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30348 GHz	-24.54 dBm	-11.54 dB
2.304 GHz	2.305 GHz	50.000 kHz	2.30500 GHz	-28.25 dBm	-15.25 dB
2.305 GHz	2.310 GHz	100.000 kHz	2.30688 GHz	6.40 dBm	-23.60 dB
2.310 GHz	2.311 GHz	50.000 kHz	2.31001 GHz	-27.06 dBm	-14.06 dB
2.311 GHz	2.320 GHz	1.000 MHz	2.31112 GHz	-23.12 dBm	-10.12 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32002 GHz	-46.36 dBm	-21.36 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32419 GHz	-51.09 dBm	-20.09 dB

Date: 4.OCT.2024 12:39:25

Highest Band Edge / Full RB



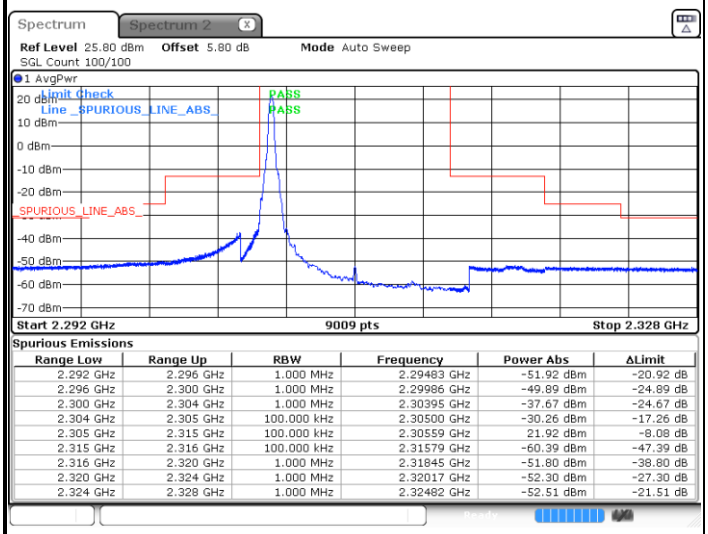
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29600 GHz	-51.88 dBm	-20.88 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29977 GHz	-47.20 dBm	-22.20 dB
2.300 GHz	2.309 GHz	1.000 MHz	2.30879 GHz	-31.19 dBm	-18.19 dB
2.309 GHz	2.310 GHz	50.000 kHz	2.30999 GHz	-29.65 dBm	-16.65 dB
2.310 GHz	2.315 GHz	100.000 kHz	2.31262 GHz	5.35 dBm	-24.65 dB
2.315 GHz	2.316 GHz	50.000 kHz	2.31501 GHz	-29.34 dBm	-16.34 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31608 GHz	-28.57 dBm	-15.57 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32031 GHz	-39.49 dBm	-14.49 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32426 GHz	-46.72 dBm	-15.72 dB

Date: 4.OCT.2024 13:19:42

LTE Band 30 / 10MHz / QPSK

1 RB

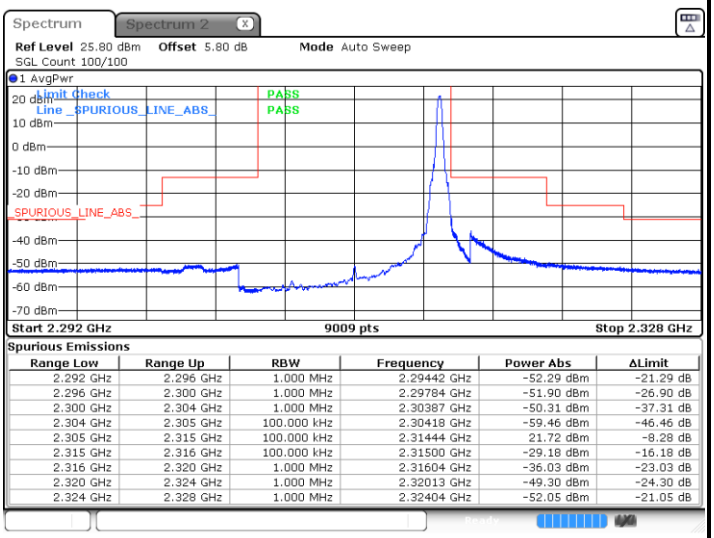


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29483 GHz	-51.92 dBm	-20.92 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29986 GHz	-49.89 dBm	-24.89 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30395 GHz	-37.67 dBm	-24.67 dB
2.304 GHz	2.305 GHz	100.000 kHz	2.30500 GHz	-30.26 dBm	-17.26 dB
2.305 GHz	2.315 GHz	100.000 kHz	2.30559 GHz	21.92 dBm	-8.08 dB
2.315 GHz	2.316 GHz	100.000 kHz	2.31579 GHz	-60.39 dBm	-47.39 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31845 GHz	-51.80 dBm	-38.80 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32017 GHz	-52.30 dBm	-27.30 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32482 GHz	-52.51 dBm	-21.51 dB

Date: 4.OCT.2024 14:58:48

1 RBMax

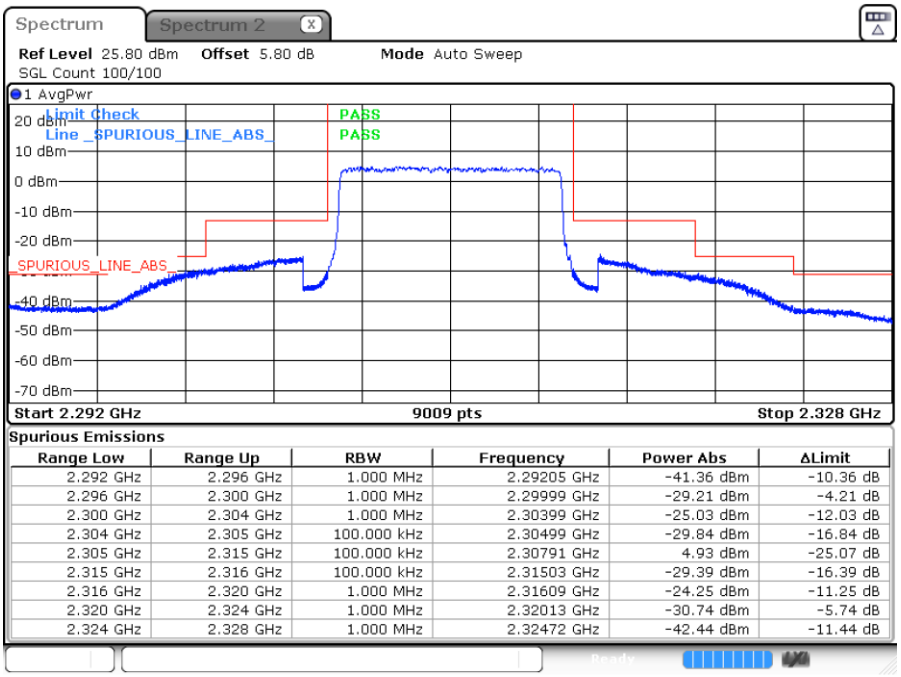


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29442 GHz	-52.29 dBm	-21.29 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29784 GHz	-51.90 dBm	-26.90 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30387 GHz	-50.31 dBm	-37.31 dB
2.304 GHz	2.305 GHz	100.000 kHz	2.30418 GHz	-59.46 dBm	-46.46 dB
2.305 GHz	2.315 GHz	100.000 kHz	2.31444 GHz	21.72 dBm	-8.28 dB
2.315 GHz	2.316 GHz	100.000 kHz	2.31500 GHz	-29.18 dBm	-16.18 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31604 GHz	-36.03 dBm	-23.03 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32013 GHz	-49.30 dBm	-24.30 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32404 GHz	-52.05 dBm	-21.05 dB

Date: 4.OCT.2024 14:55:41

Full RB



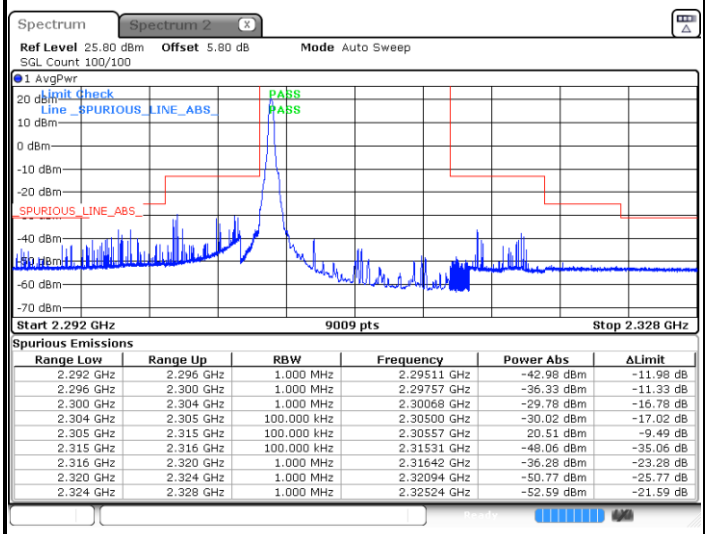
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29205 GHz	-41.36 dBm	-10.36 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29999 GHz	-29.21 dBm	-4.21 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30399 GHz	-25.03 dBm	-12.03 dB
2.304 GHz	2.305 GHz	100.000 kHz	2.30499 GHz	-29.84 dBm	-16.84 dB
2.305 GHz	2.315 GHz	100.000 kHz	2.30791 GHz	4.93 dBm	-25.07 dB
2.315 GHz	2.316 GHz	100.000 kHz	2.31503 GHz	-29.39 dBm	-16.39 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31609 GHz	-24.25 dBm	-11.25 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32013 GHz	-30.74 dBm	-5.74 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32472 GHz	-42.44 dBm	-11.44 dB

Date: 4.OCT.2024 14:48:13

LTE Band 30 / 10MHz / 16QAM

1 RB

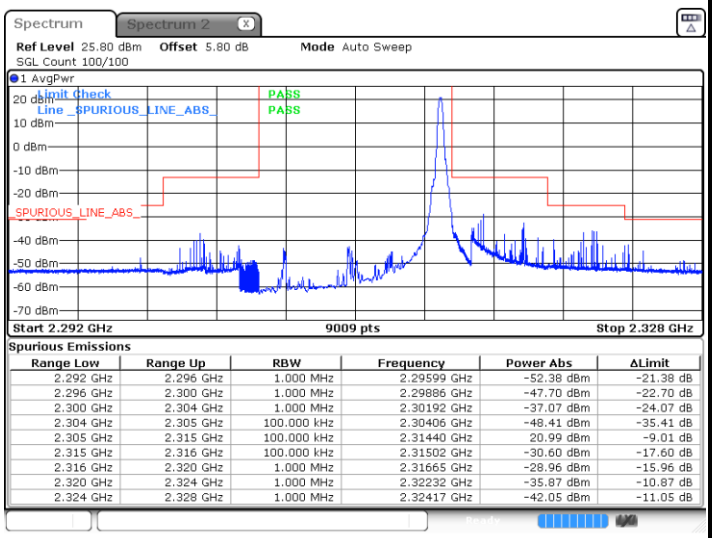


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29511 GHz	-42.98 dBm	-11.98 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29757 GHz	-36.33 dBm	-11.33 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30068 GHz	-29.78 dBm	-16.78 dB
2.304 GHz	2.305 GHz	100.000 kHz	2.30500 GHz	-30.02 dBm	-17.02 dB
2.305 GHz	2.315 GHz	100.000 kHz	2.30557 GHz	20.51 dBm	-9.49 dB
2.315 GHz	2.316 GHz	100.000 kHz	2.31531 GHz	-48.06 dBm	-35.06 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31642 GHz	-36.28 dBm	-23.28 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32094 GHz	-50.77 dBm	-25.77 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32524 GHz	-52.59 dBm	-21.59 dB

Date: 4.OCT.2024 14:57:42

1 RBMax

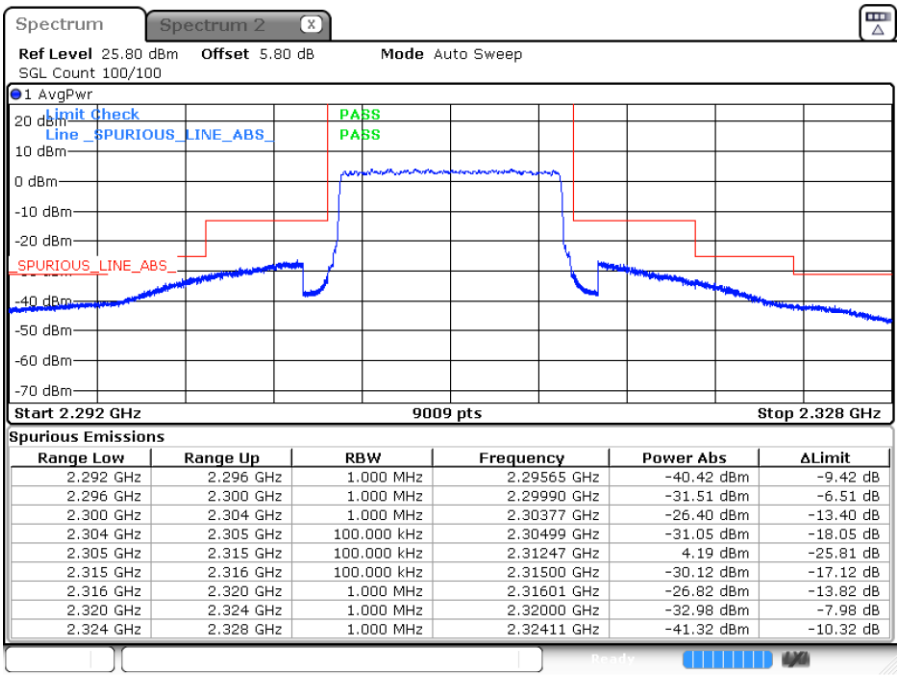


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29599 GHz	-52.38 dBm	-21.38 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29886 GHz	-47.70 dBm	-22.70 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30192 GHz	-37.07 dBm	-24.07 dB
2.304 GHz	2.305 GHz	100.000 kHz	2.30406 GHz	-48.41 dBm	-35.41 dB
2.305 GHz	2.315 GHz	100.000 kHz	2.31440 GHz	20.99 dBm	-9.01 dB
2.315 GHz	2.316 GHz	100.000 kHz	2.31502 GHz	-30.60 dBm	-17.60 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31665 GHz	-28.96 dBm	-15.96 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32232 GHz	-35.87 dBm	-10.87 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32417 GHz	-42.05 dBm	-11.05 dB

Date: 4.OCT.2024 14:54:41

Full RB



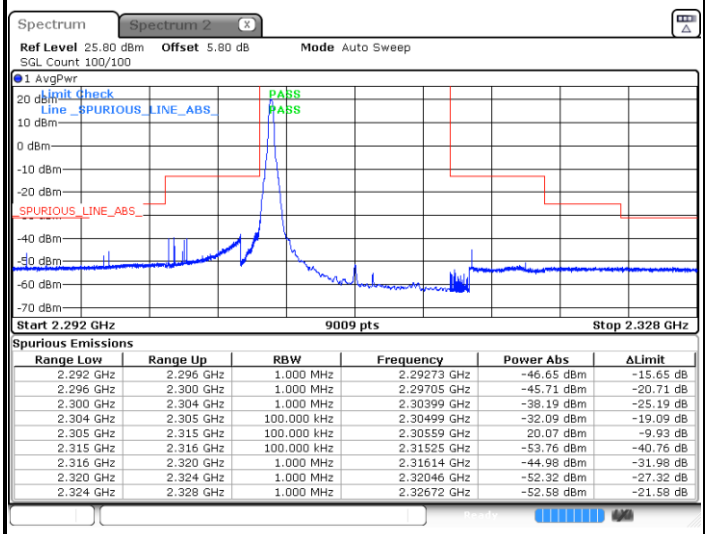
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29565 GHz	-40.42 dBm	-9.42 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29990 GHz	-31.51 dBm	-6.51 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30377 GHz	-26.40 dBm	-13.40 dB
2.304 GHz	2.305 GHz	100.000 kHz	2.30499 GHz	-31.05 dBm	-18.05 dB
2.305 GHz	2.315 GHz	100.000 kHz	2.31247 GHz	4.19 dBm	-25.81 dB
2.315 GHz	2.316 GHz	100.000 kHz	2.31500 GHz	-30.12 dBm	-17.12 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31601 GHz	-26.82 dBm	-13.82 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32000 GHz	-32.98 dBm	-7.98 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32411 GHz	-41.32 dBm	-10.32 dB

Date: 4.OCT.2024 14:49:55

LTE Band 30 / 10MHz / 64QAM

1 RB

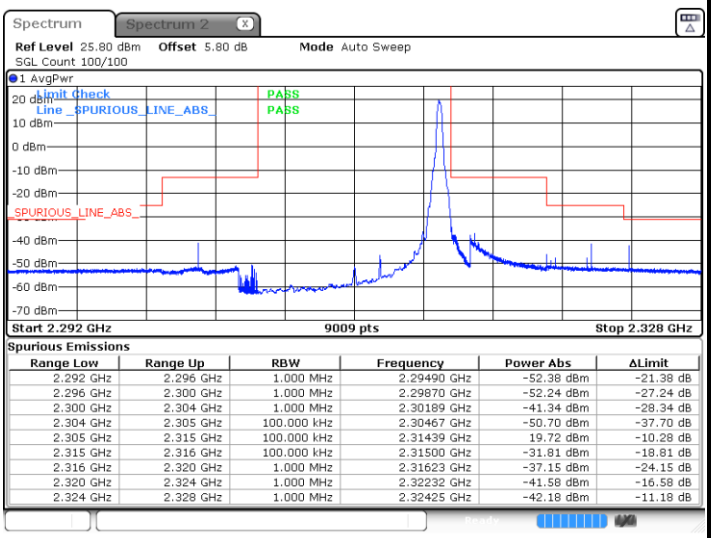


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29273 GHz	-46.65 dBm	-15.65 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29705 GHz	-45.71 dBm	-20.71 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30399 GHz	-38.19 dBm	-25.19 dB
2.304 GHz	2.305 GHz	100.000 kHz	2.30499 GHz	-32.09 dBm	-19.09 dB
2.305 GHz	2.315 GHz	100.000 kHz	2.30559 GHz	20.07 dBm	-9.93 dB
2.315 GHz	2.316 GHz	100.000 kHz	2.31525 GHz	-53.76 dBm	-40.76 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31614 GHz	-44.98 dBm	-31.98 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32046 GHz	-52.32 dBm	-27.32 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32672 GHz	-52.58 dBm	-21.58 dB

Date: 4.OCT.2024 14:56:47

1 RBMax

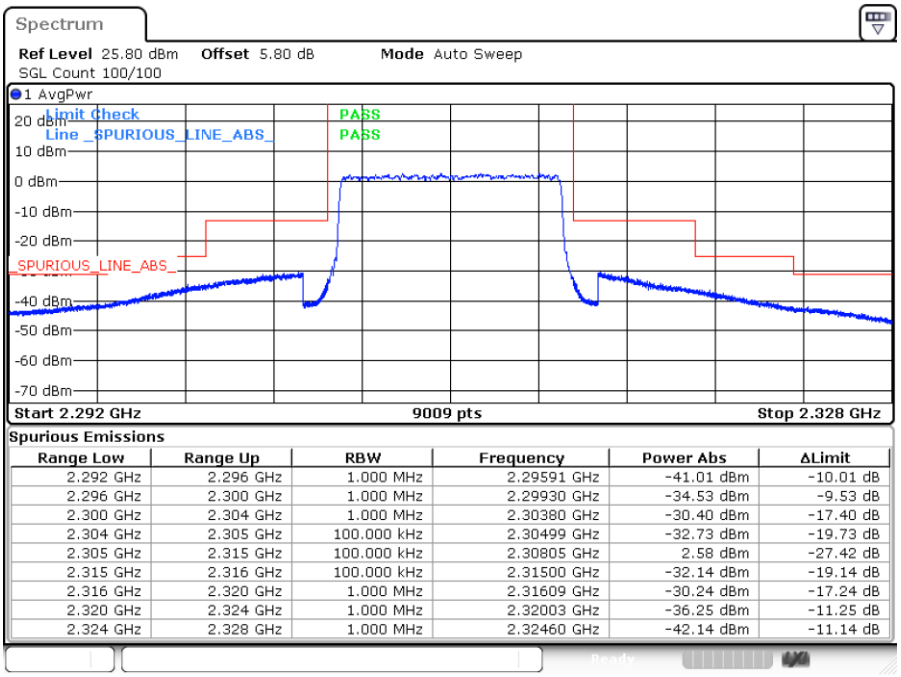


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29490 GHz	-52.38 dBm	-21.38 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29870 GHz	-52.24 dBm	-27.24 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30189 GHz	-41.34 dBm	-28.34 dB
2.304 GHz	2.305 GHz	100.000 kHz	2.30467 GHz	-50.70 dBm	-37.70 dB
2.305 GHz	2.315 GHz	100.000 kHz	2.31439 GHz	19.72 dBm	-10.28 dB
2.315 GHz	2.316 GHz	100.000 kHz	2.31500 GHz	-31.81 dBm	-18.81 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31623 GHz	-37.15 dBm	-24.15 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32232 GHz	-41.58 dBm	-16.58 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32425 GHz	-42.18 dBm	-11.18 dB

Date: 4.OCT.2024 14:51:42

Band Edge / Full RB



Spurious Emissions

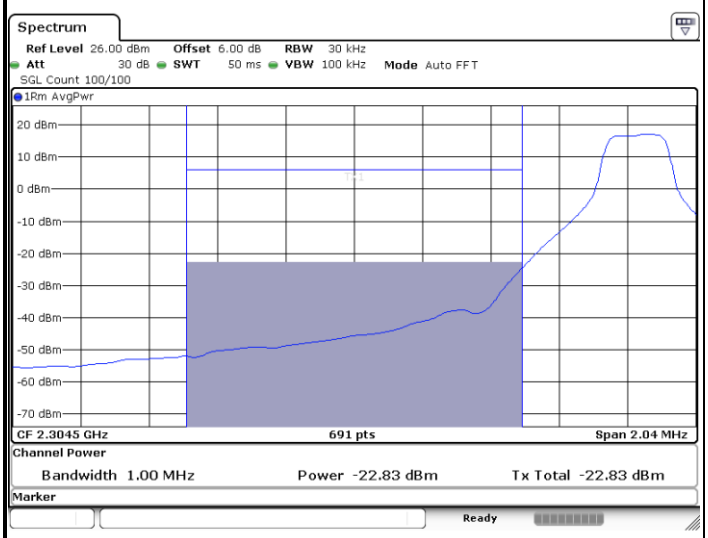
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.292 GHz	2.296 GHz	1.000 MHz	2.29591 GHz	-41.01 dBm	-10.01 dB
2.296 GHz	2.300 GHz	1.000 MHz	2.29930 GHz	-34.53 dBm	-9.53 dB
2.300 GHz	2.304 GHz	1.000 MHz	2.30380 GHz	-30.40 dBm	-17.40 dB
2.304 GHz	2.305 GHz	100.000 kHz	2.30499 GHz	-32.73 dBm	-19.73 dB
2.305 GHz	2.315 GHz	100.000 kHz	2.30805 GHz	2.58 dBm	-27.42 dB
2.315 GHz	2.316 GHz	100.000 kHz	2.31500 GHz	-32.14 dBm	-19.14 dB
2.316 GHz	2.320 GHz	1.000 MHz	2.31609 GHz	-30.24 dBm	-17.24 dB
2.320 GHz	2.324 GHz	1.000 MHz	2.32003 GHz	-36.25 dBm	-11.25 dB
2.324 GHz	2.328 GHz	1.000 MHz	2.32460 GHz	-42.14 dBm	-11.14 dB

Date: 4.OCT.2024 13:56:22

Conducted Band Edge Channel Power Left

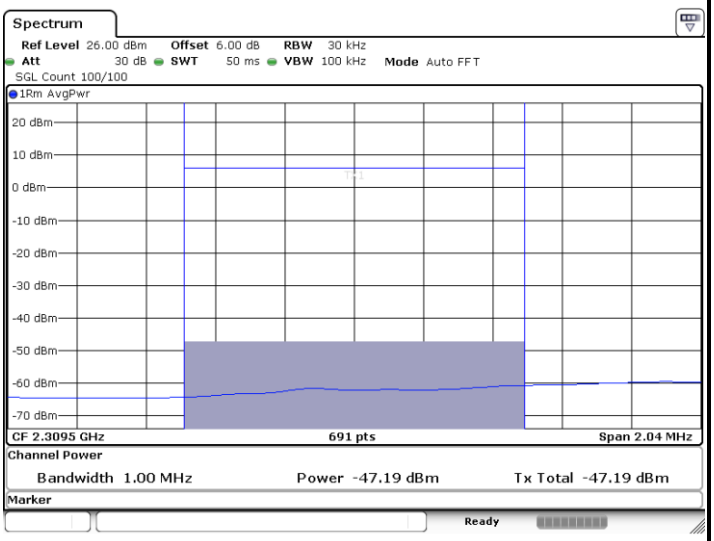
LTE Band 30 / 5MHz / QPSK

Lowest Band Edge / 1 RB



Date: 11.OCT.2024 03:21:26

Highest Band Edge / 1 RBMAX



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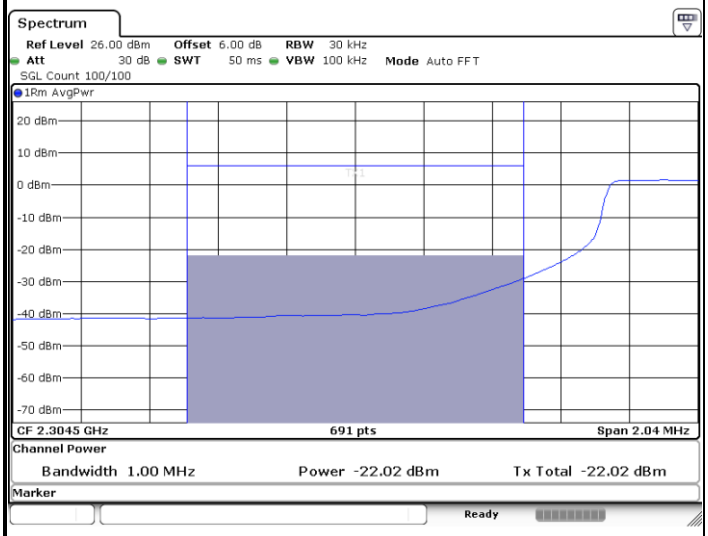
Lowest Band Edge / Full RB



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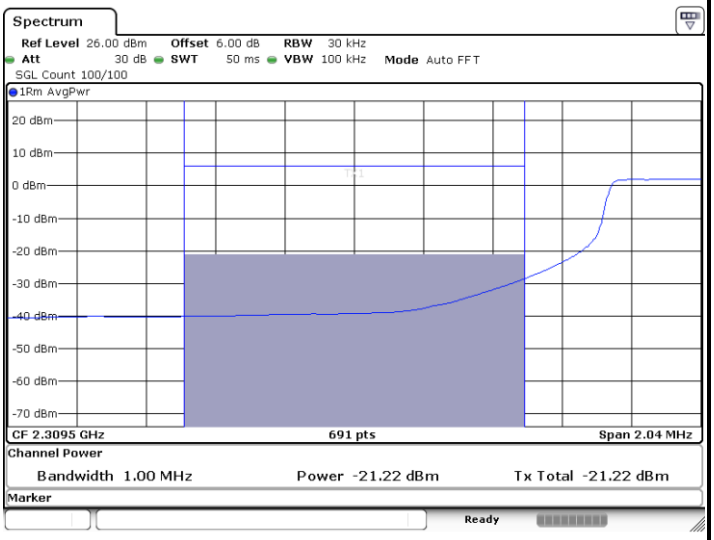
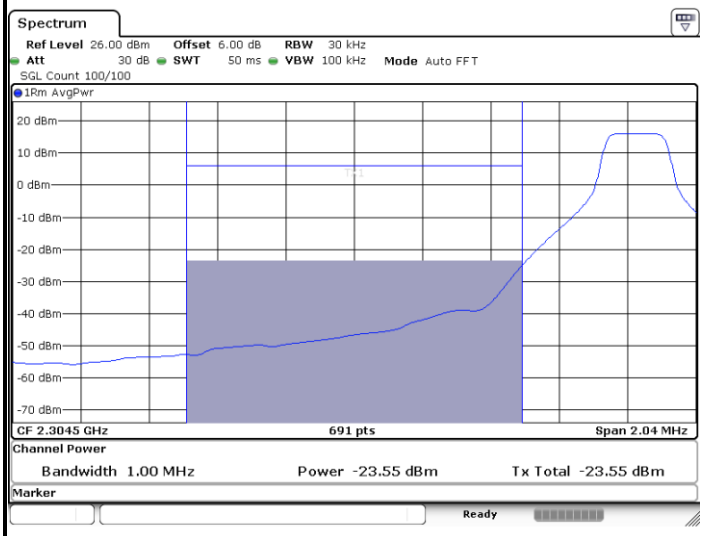
Highest Band Edge / Full RB



Date: 11.OCT.2024 03:12:13

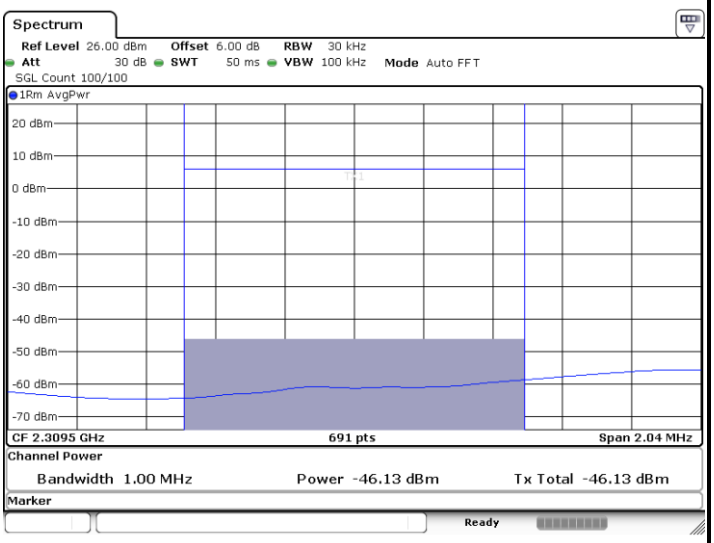
LTE Band 30 / 5MHz / 16QAM

Lowest Band Edge / 1RB



Date: 11.OCT.2024 03:21:51

Highest Band Edge / 1 RBMAX



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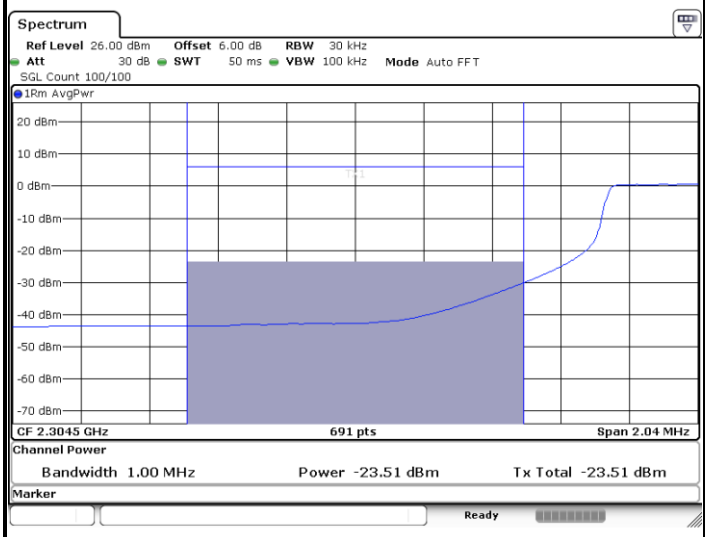
Lowest Band Edge / Full RB



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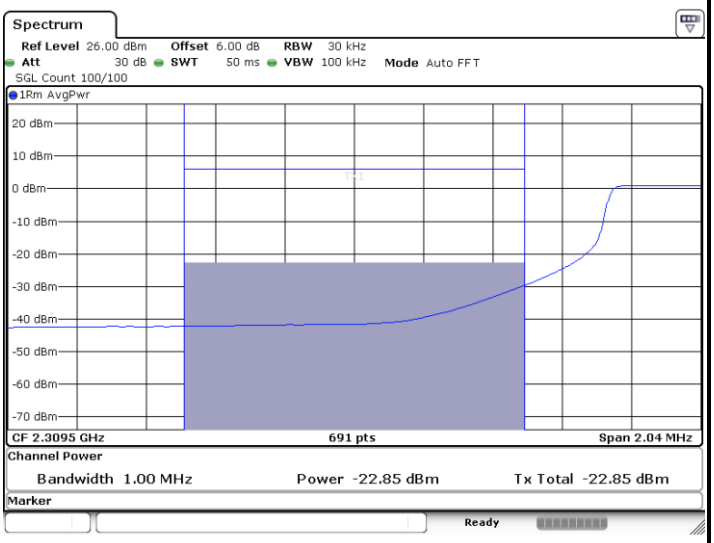
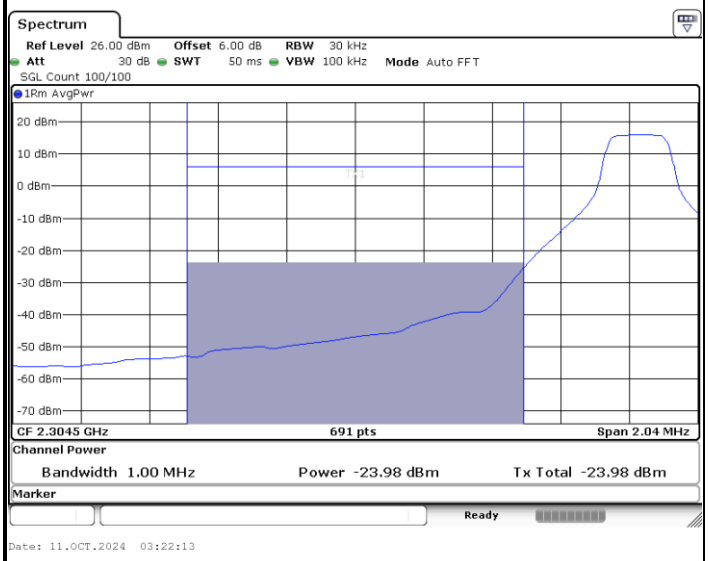
Highest Band Edge / Full RB



Date: 11.OCT.2024 03:11:51

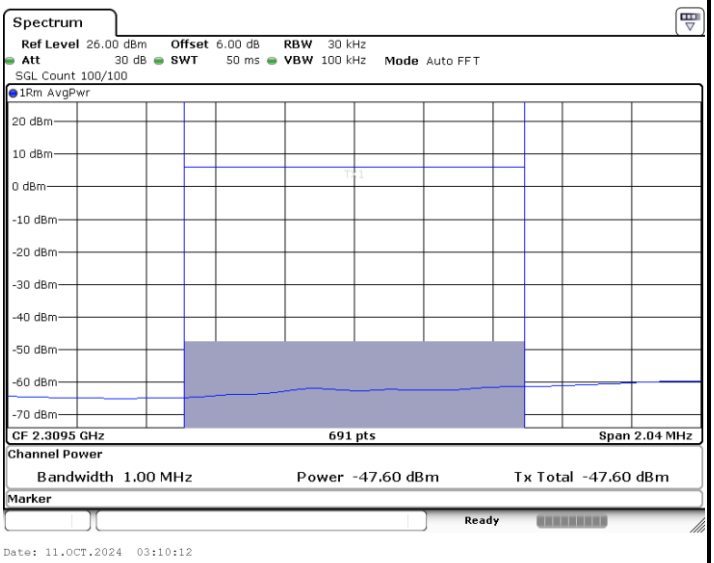
LTE Band 30 / 5MHz / 64QAM

Lowest Band Edge / 1RB



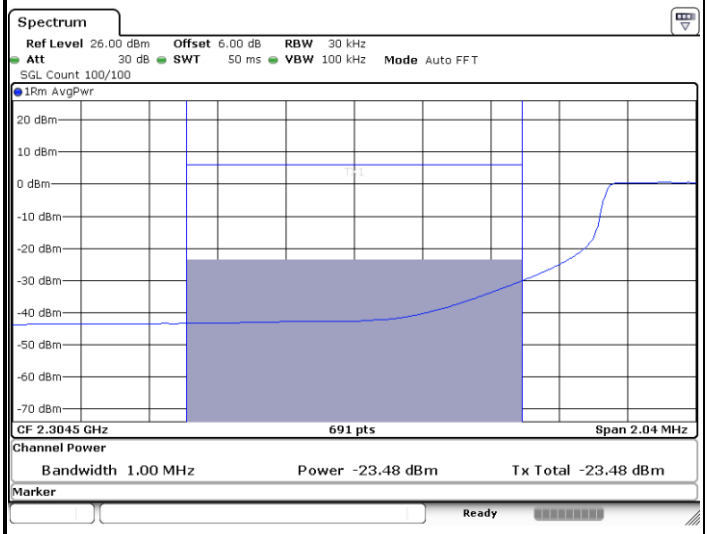
Date: 11.OCT.2024 03:22:13

Highest Band Edge / 1 RBMAX



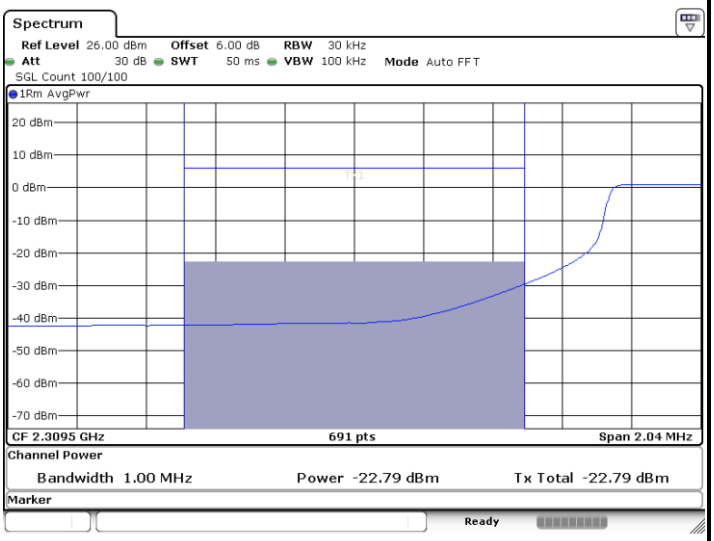
Date: 11.OCT.2024 03:10:12

Lowest Band Edge / Full RB



Date: 11.OCT.2024 03:22:41

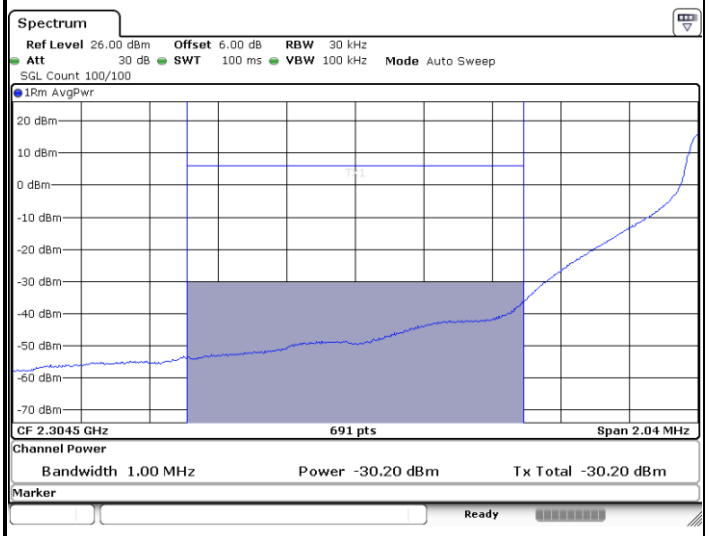
Highest Band Edge / Full RB



Date: 11.OCT.2024 03:10:48

LTE Band 30 / 10MHz / QPSK

1 RB



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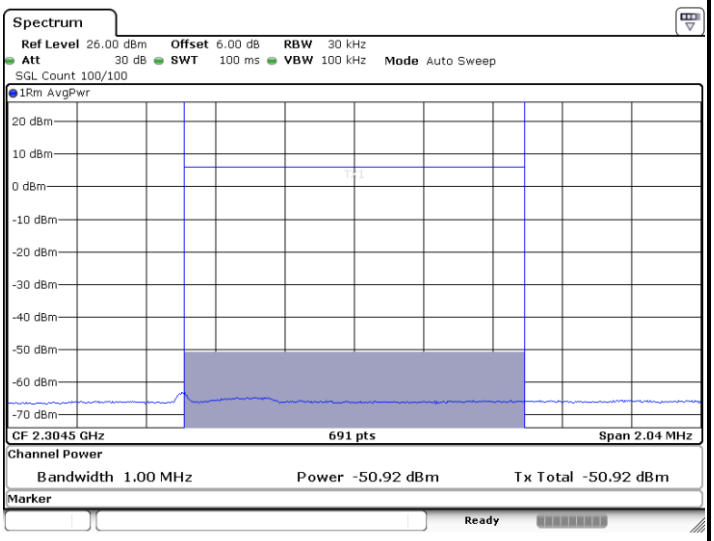
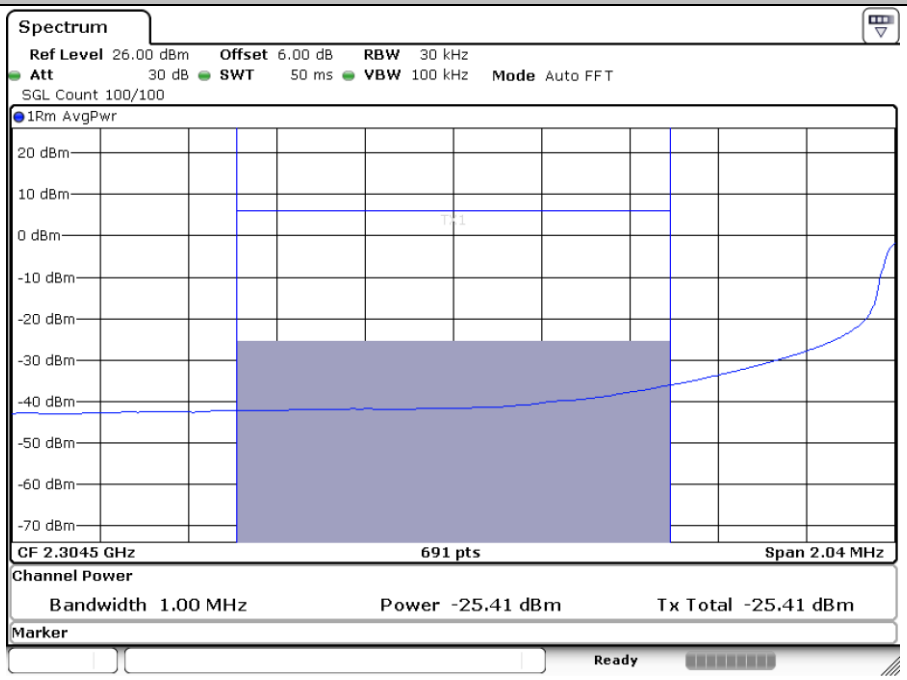
1 RBMax



Date: 11.OCT.2024 03:36:37

Full RB



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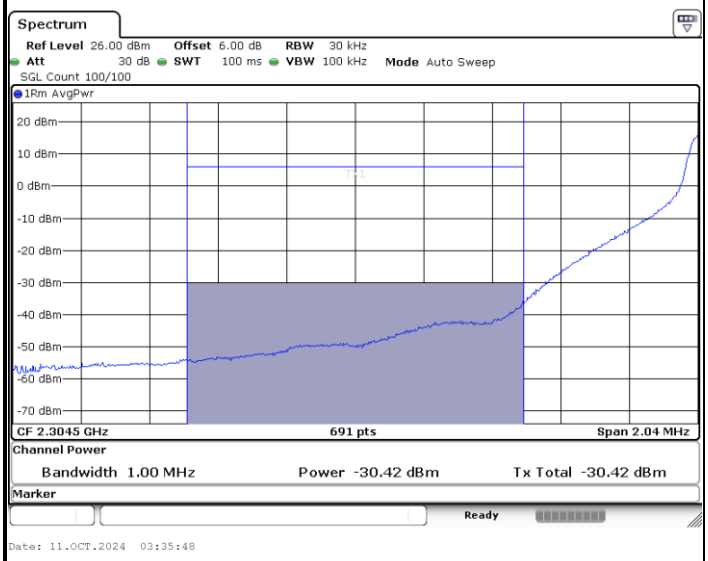
LTE Band 30 / 10MHz / 16QAM

1 RB



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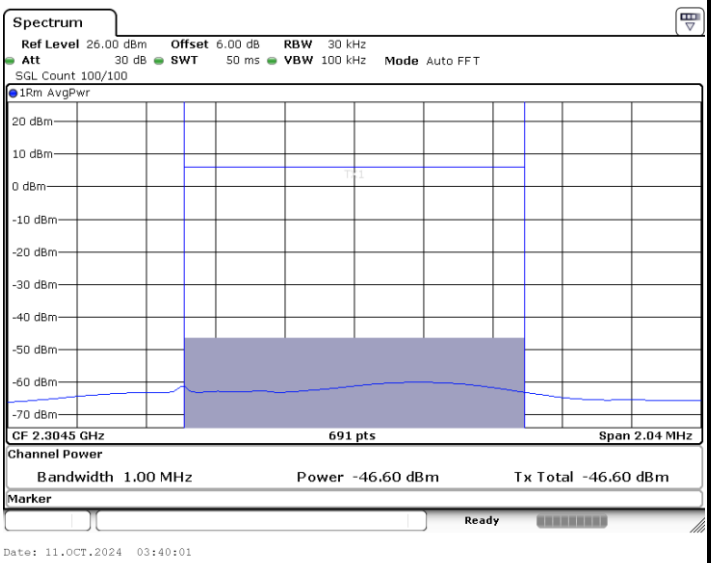
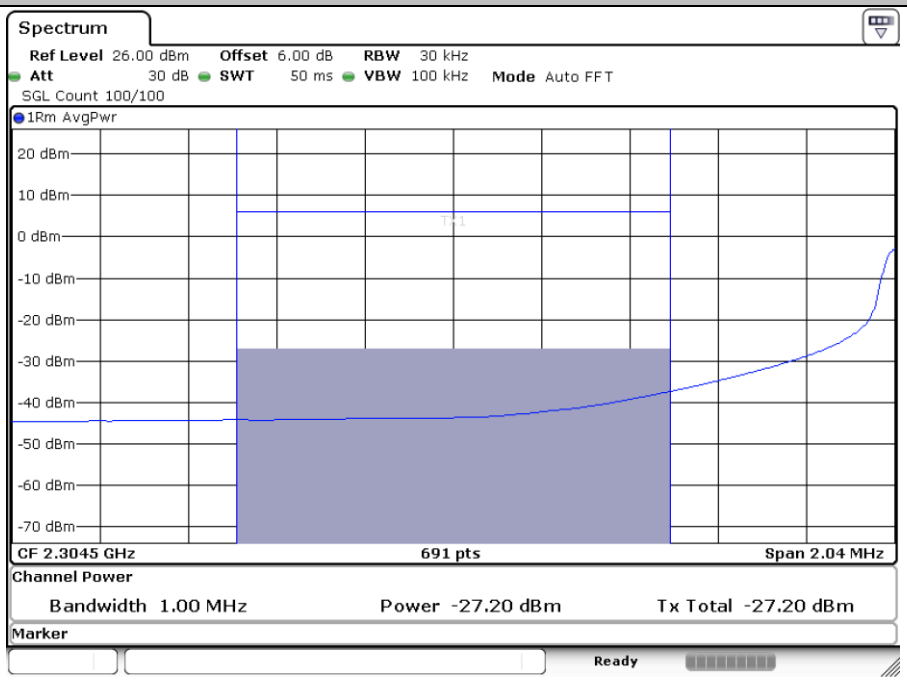
1 RBMax



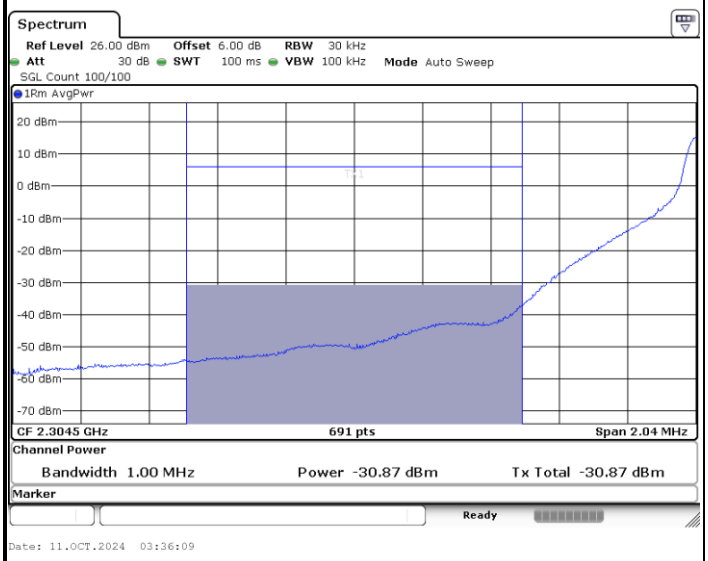
Date: 11.OCT.2024 03:40:01

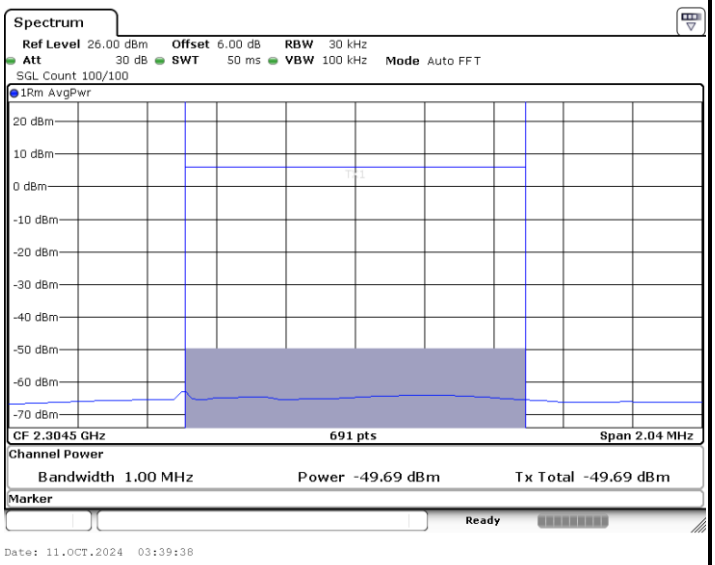
Full RB



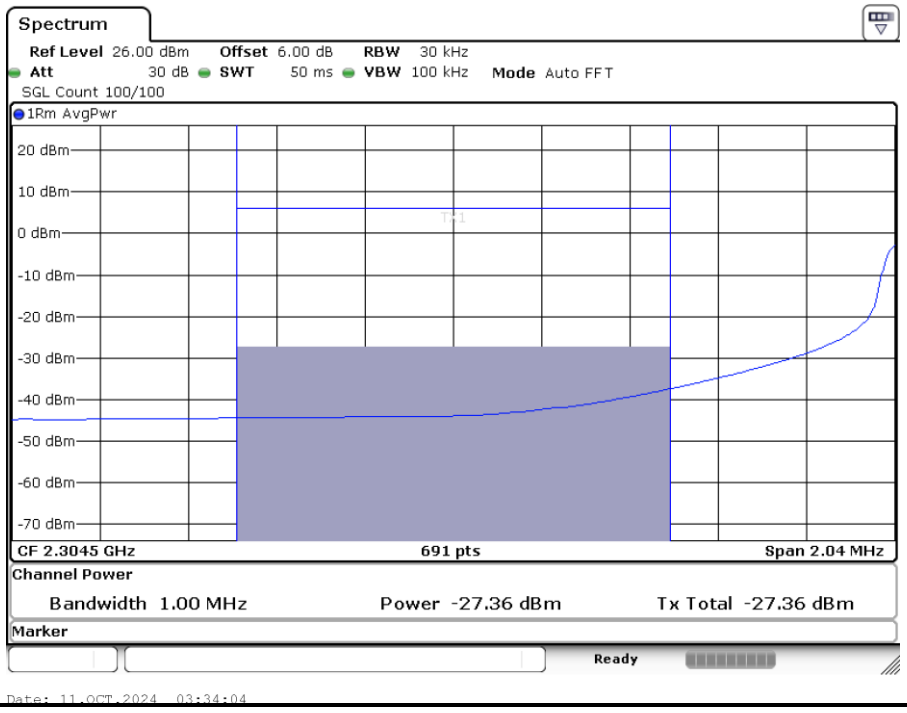
Date: 11.OCT.2024 03:33:11

LTE Band 30 / 10MHz / 64QAM	
1 RB	1 RBMax





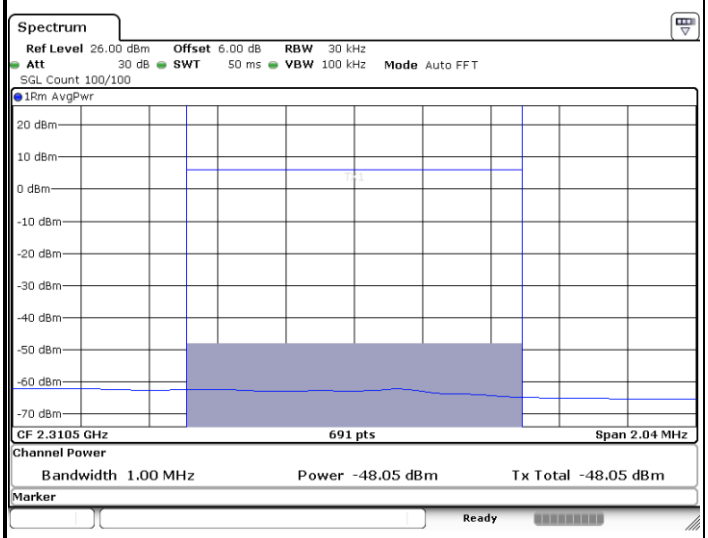
Band Edge / Full RB



Conducted Band Edge Channel Power Right

LTE Band 30 / 5MHz / QPSK

Lowest Band Edge / 1 RB



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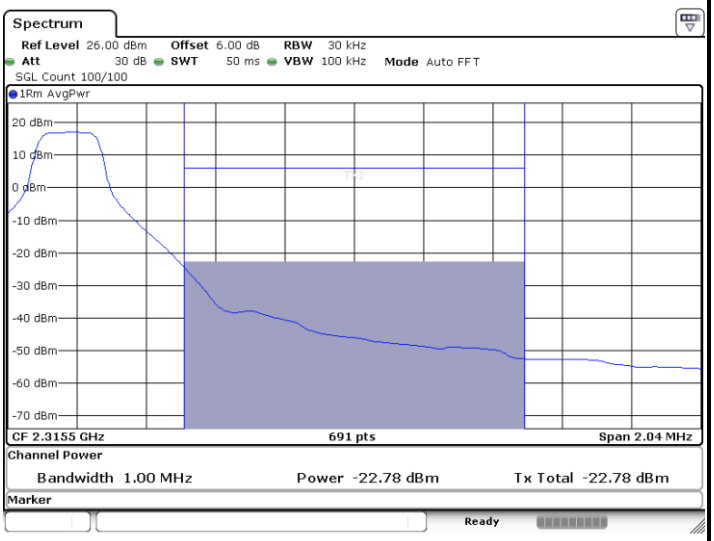
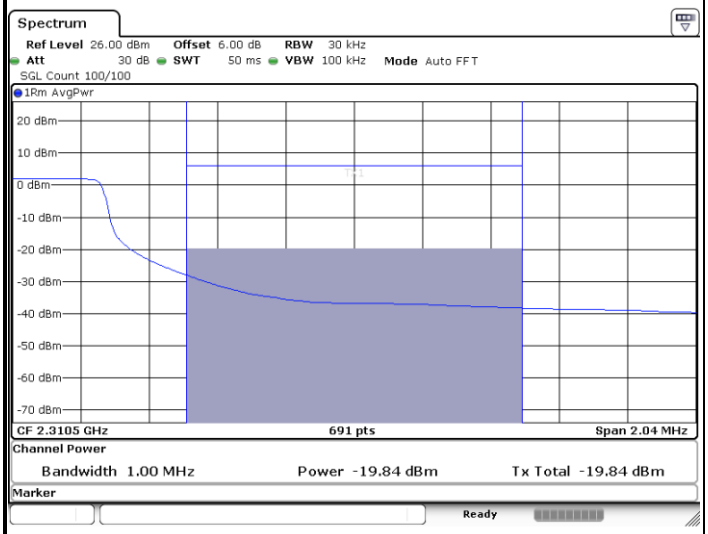
Highest Band Edge / 1 RBMAX



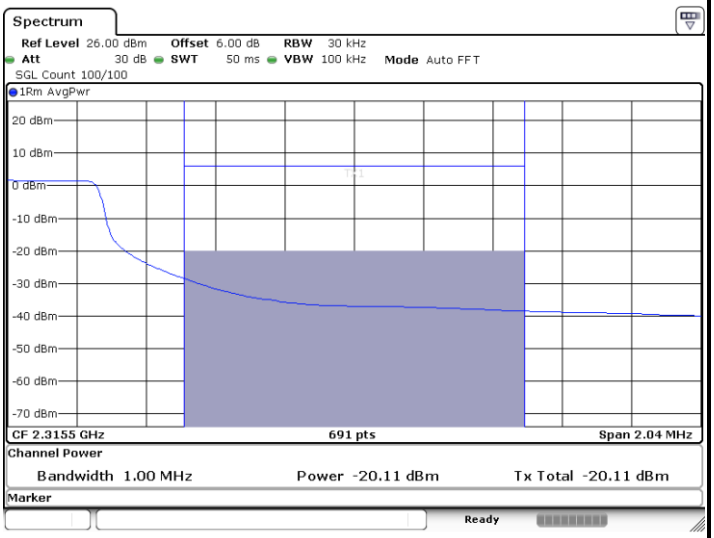
Date: 11.OCT.2024 03:15:48

Lowest Band Edge / Full RB



Date: 11.OCT.2024 03:24:11

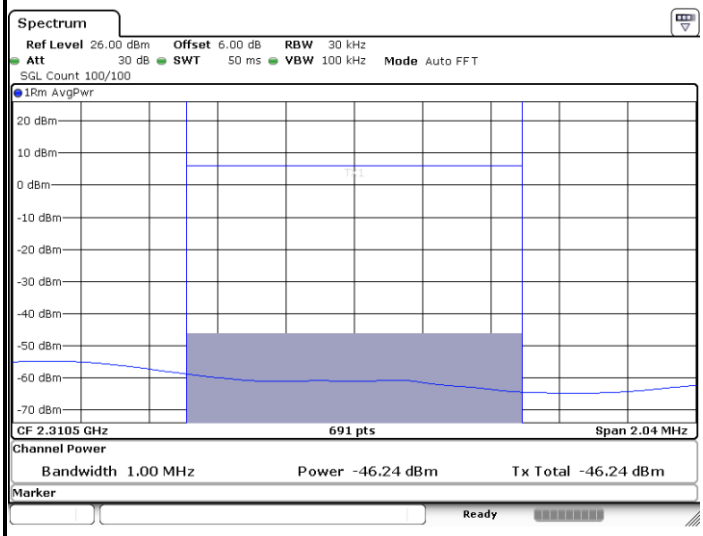
Highest Band Edge / Full RB



Date: 11.OCT.2024 03:13:14

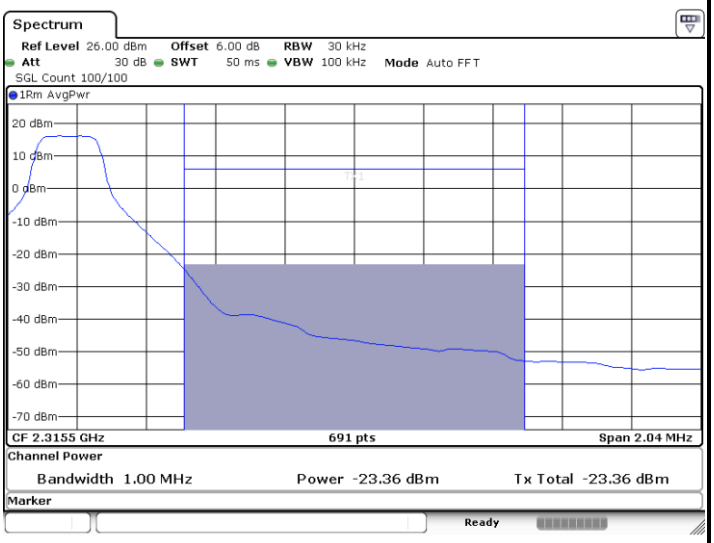
LTE Band 30 / 5MHz / 16QAM

Lowest Band Edge / 1RB



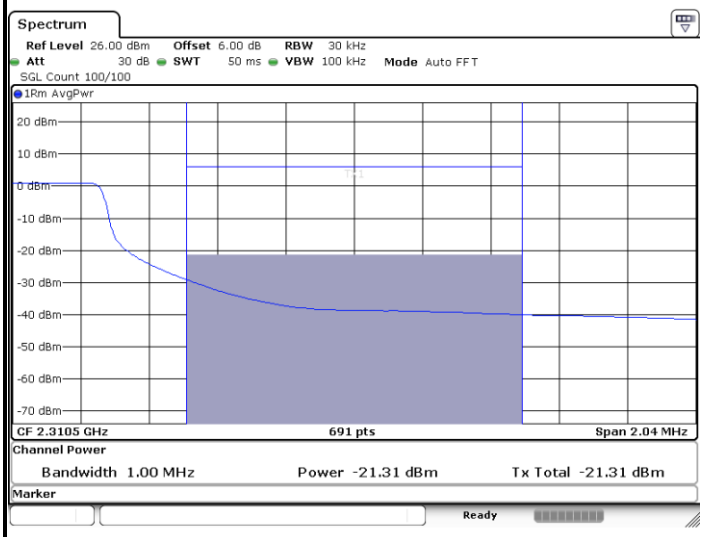
Date: 11.OCT.2024 03:26:01

Highest Band Edge / 1 RBMAX



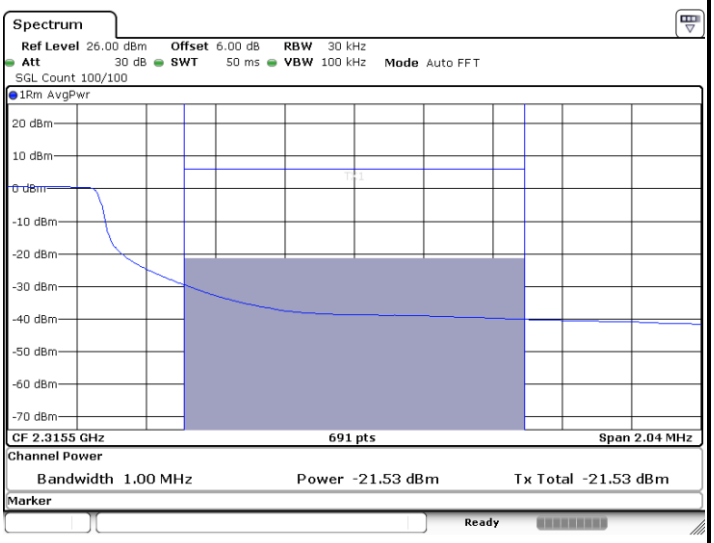
Date: 11.OCT.2024 03:15:26

Lowest Band Edge / Full RB



Date: 11.OCT.2024 03:24:45

Highest Band Edge / Full RB



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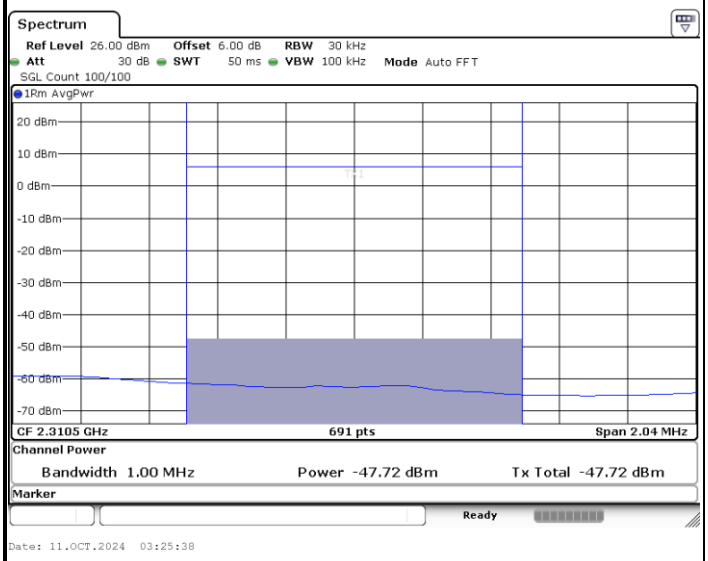
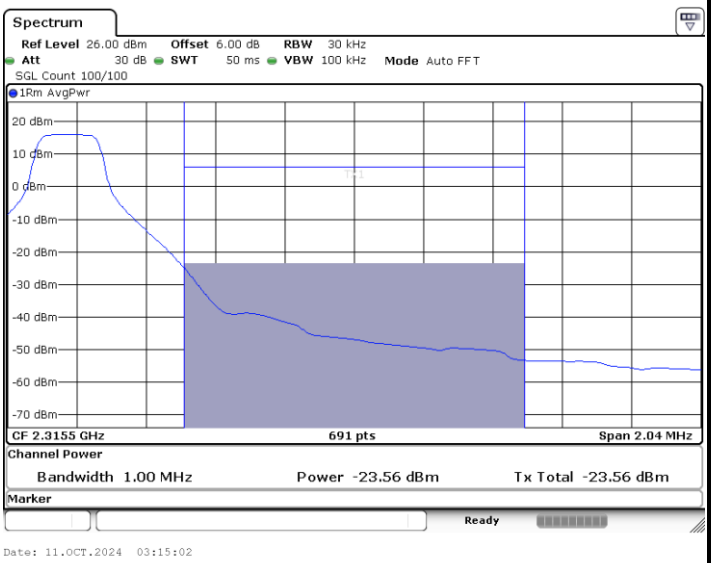
LTE Band 30 / 5MHz / 64QAM

Lowest Band Edge / 1RB



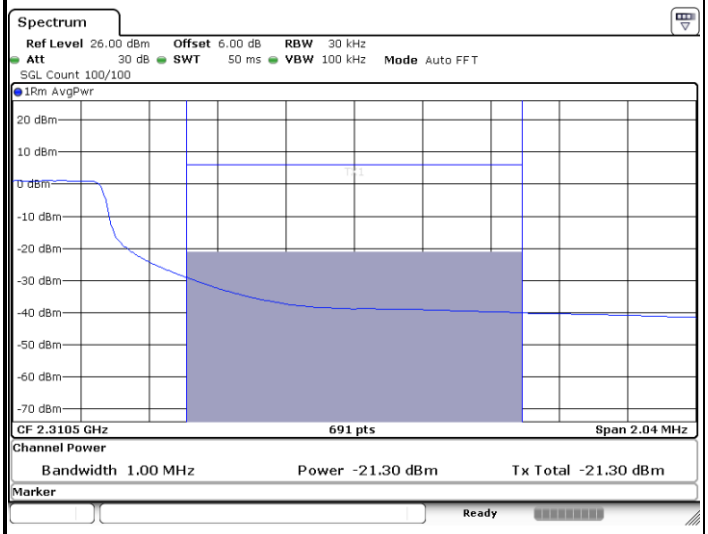
Date: 11.OCT.2024 03:25:38

Highest Band Edge / 1 RBMAX



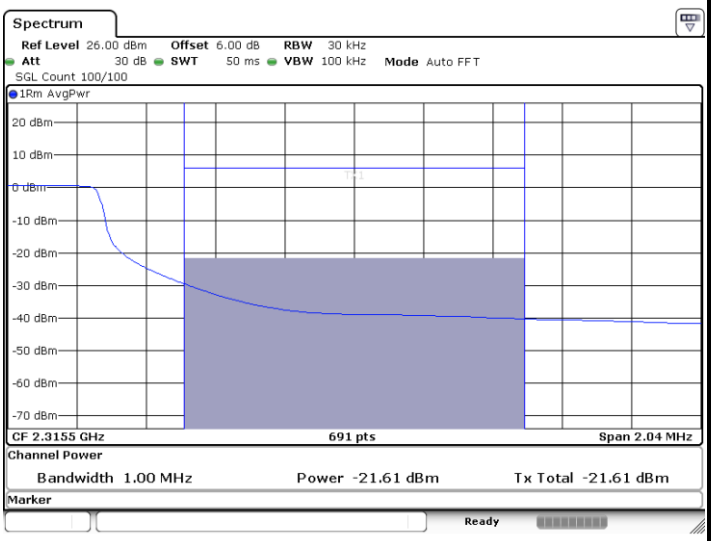
Date: 11.OCT.2024 03:15:02

Lowest Band Edge / Full RB



Date: 11.OCT.2024 03:25:11

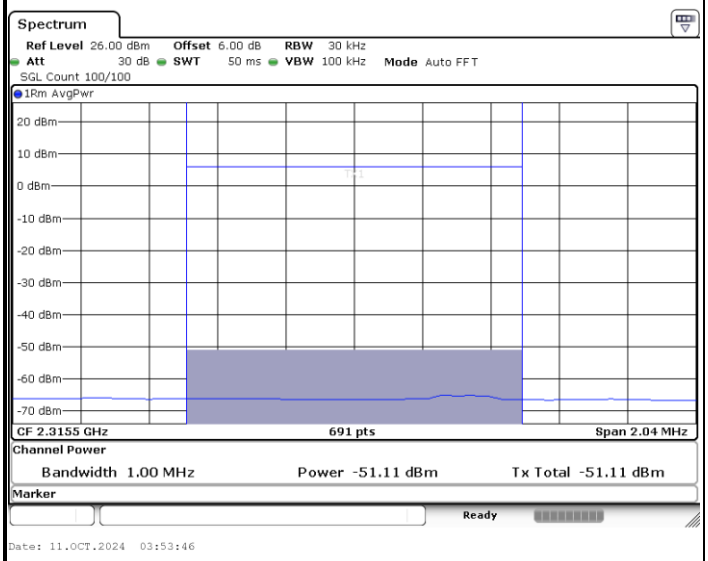
Highest Band Edge / Full RB



Date: 11.OCT.2024 03:14:24

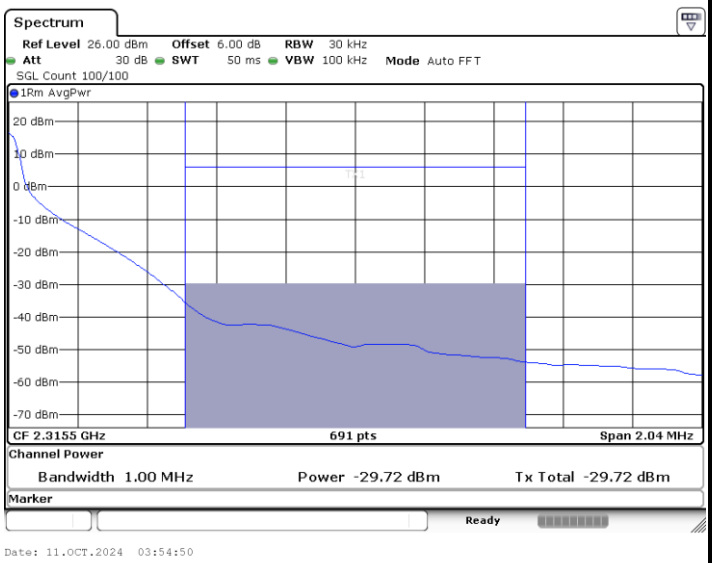
LTE Band 30 / 10MHz / QPSK

1 RB



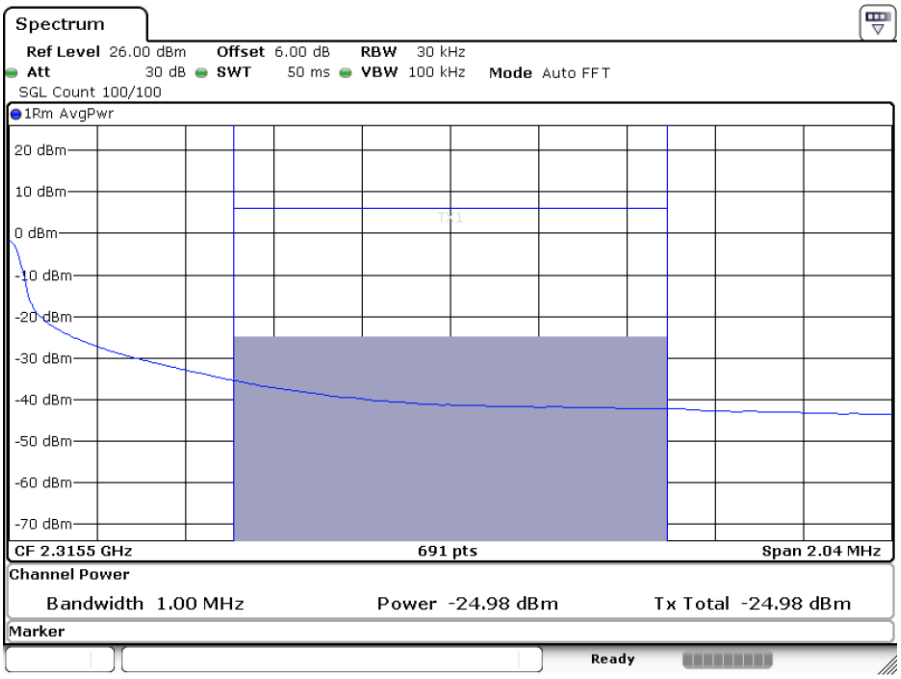
Date: 11.OCT.2024 03:53:46

1 RBMax



Date: 11.OCT.2024 03:54:50

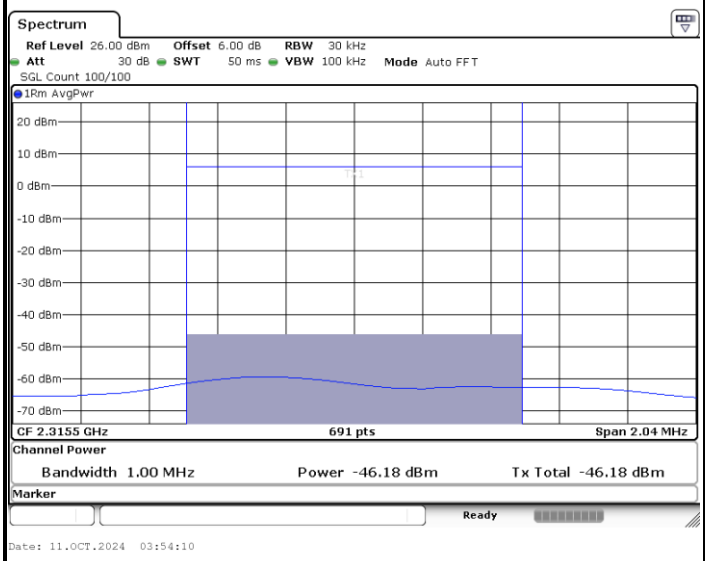
Full RB



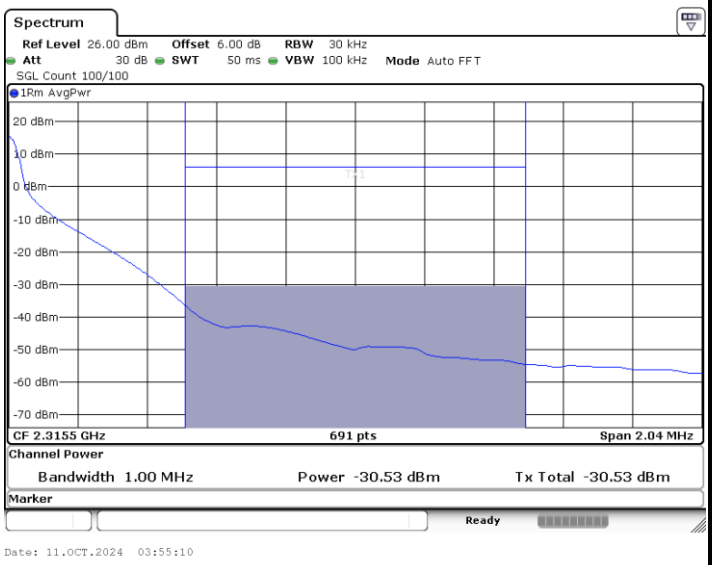
Date: 11.OCT.2024 03:53:26

LTE Band 30 / 10MHz / 16QAM

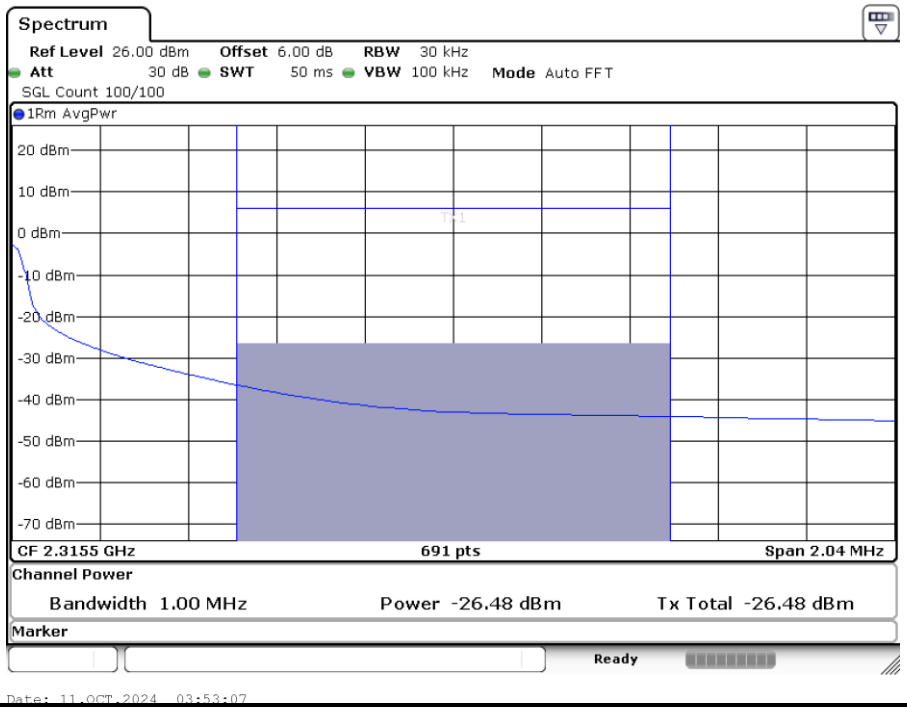
1 RB



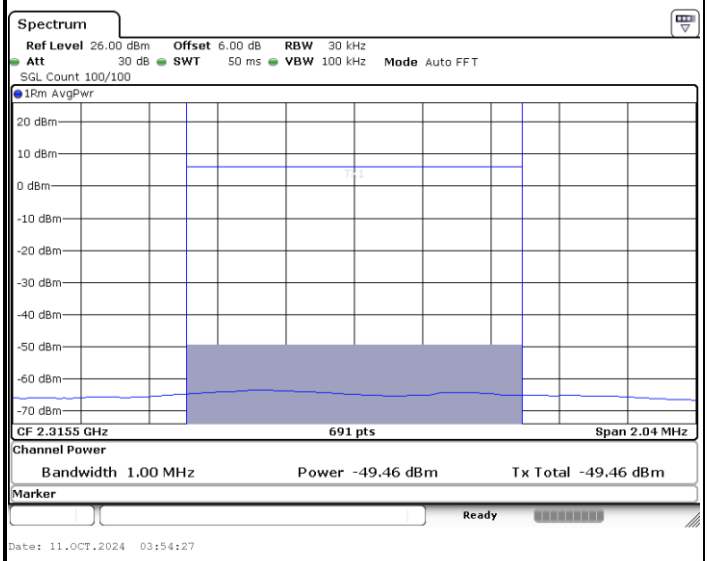
1 RBMax

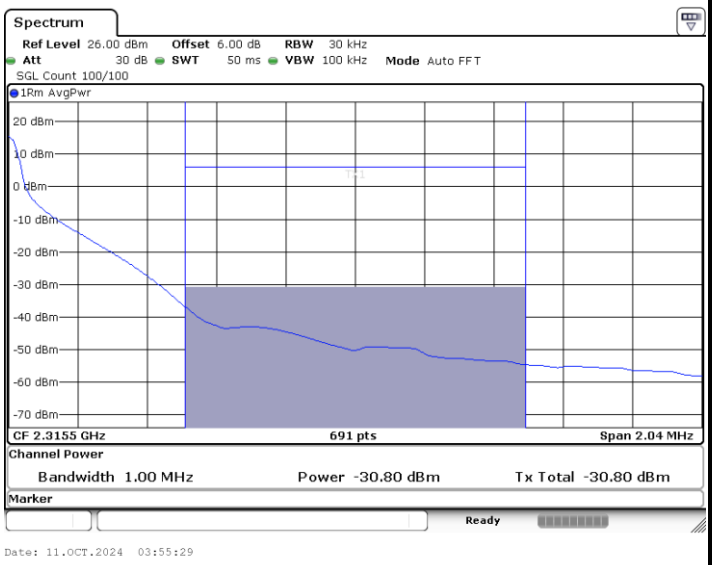


Full RB



LTE Band 30 / 10MHz / 64QAM	
1 RB	1 RBMax



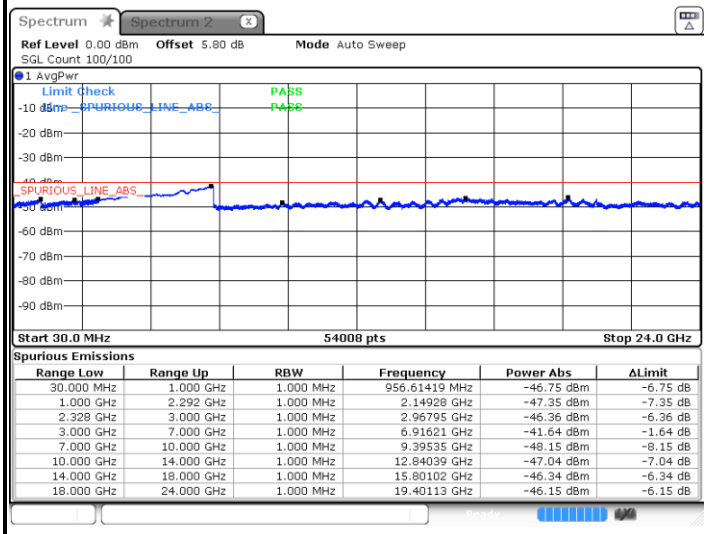


Band Edge / Full RB

Conducted Spurious Emission

LTE Band 30 / 5MHz

Lowest Channel / QPSK

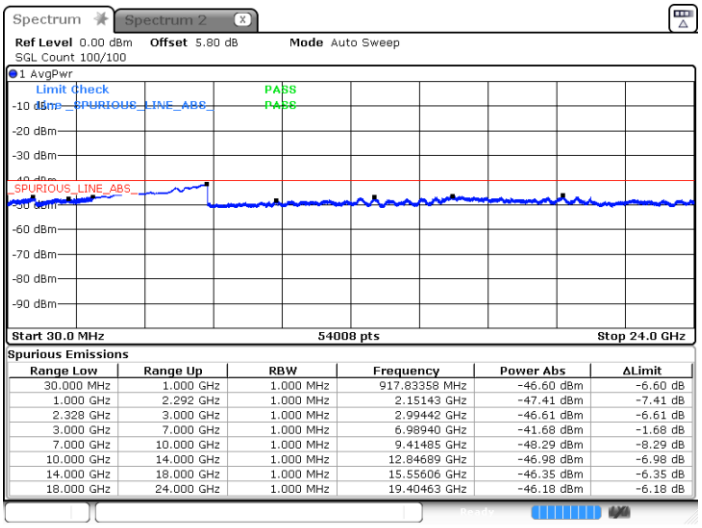


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	956.61419 MHz	-46.75 dBm	-6.75 dB
1.000 GHz	2.292 GHz	1.000 MHz	2.14928 GHz	-47.35 dBm	-7.35 dB
2.328 GHz	3.000 GHz	1.000 MHz	2.96795 GHz	-46.36 dBm	-6.36 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.91621 GHz	-41.64 dBm	-1.64 dB
7.000 GHz	10.000 GHz	1.000 MHz	9.39535 GHz	-48.15 dBm	-8.15 dB
10.000 GHz	14.000 GHz	1.000 MHz	12.84039 GHz	-47.04 dBm	-7.04 dB
14.000 GHz	18.000 GHz	1.000 MHz	15.80102 GHz	-46.34 dBm	-6.34 dB
18.000 GHz	24.000 GHz	1.000 MHz	19.40113 GHz	-46.15 dBm	-6.15 dB

Date: 4.OCT.2024 13:34:19

Middle Channel / QPSK

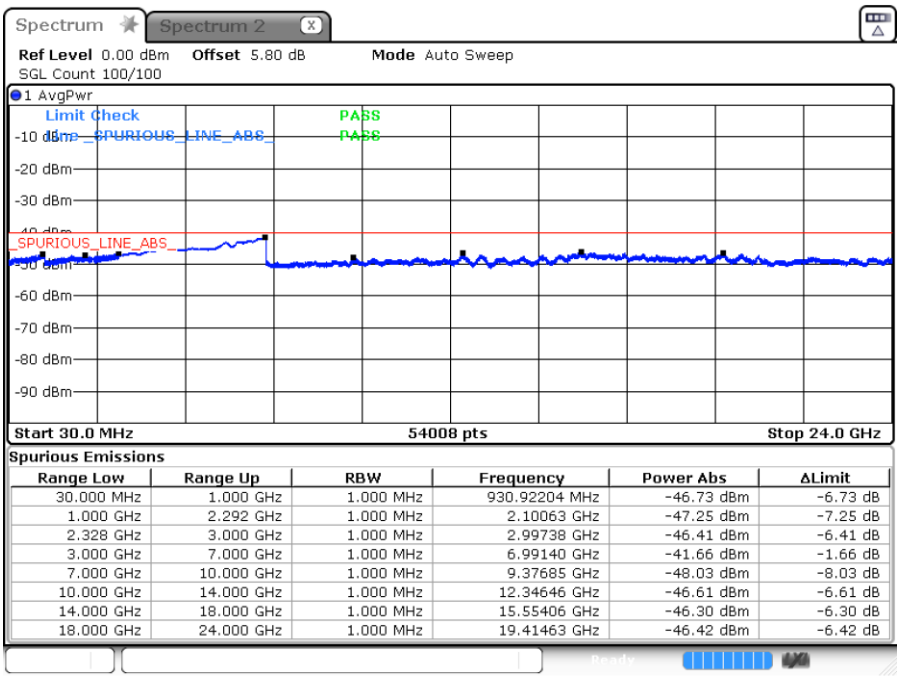


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	917.83358 MHz	-46.60 dBm	-6.60 dB
1.000 GHz	2.292 GHz	1.000 MHz	2.15143 GHz	-47.41 dBm	-7.41 dB
2.328 GHz	3.000 GHz	1.000 MHz	2.99442 GHz	-46.61 dBm	-6.61 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.98940 GHz	-41.68 dBm	-1.68 dB
7.000 GHz	10.000 GHz	1.000 MHz	9.41485 GHz	-48.29 dBm	-8.29 dB
10.000 GHz	14.000 GHz	1.000 MHz	12.84689 GHz	-46.98 dBm	-6.98 dB
14.000 GHz	18.000 GHz	1.000 MHz	15.55606 GHz	-46.35 dBm	-6.35 dB
18.000 GHz	24.000 GHz	1.000 MHz	19.40463 GHz	-46.18 dBm	-6.18 dB

Date: 4.OCT.2024 13:36:12

Highest Channel / QPSK



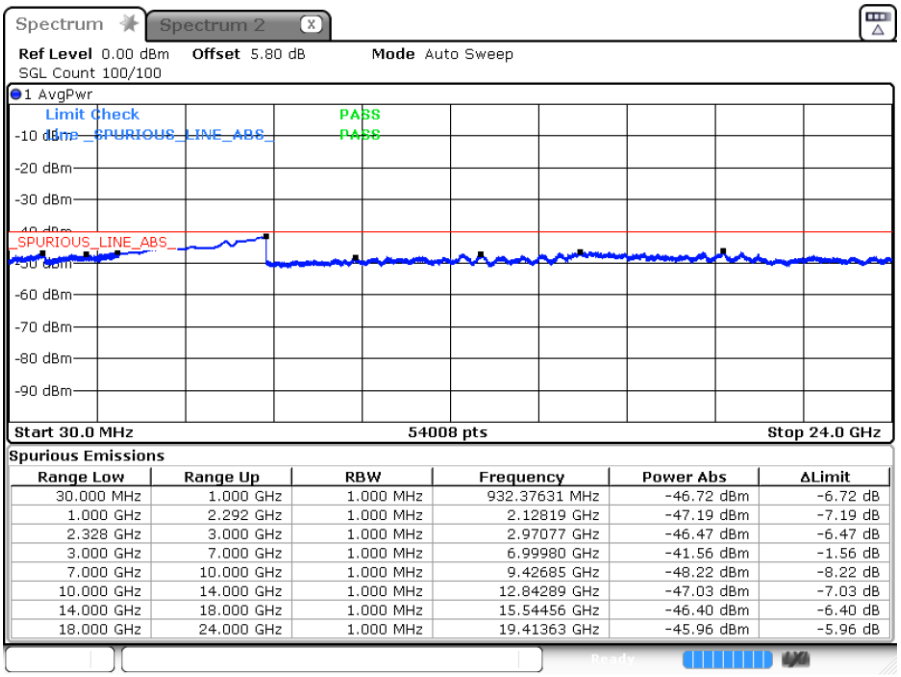
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	930.92204 MHz	-46.73 dBm	-6.73 dB
1.000 GHz	2.292 GHz	1.000 MHz	2.10063 GHz	-47.25 dBm	-7.25 dB
2.328 GHz	3.000 GHz	1.000 MHz	2.99738 GHz	-46.41 dBm	-6.41 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99140 GHz	-41.66 dBm	-1.66 dB
7.000 GHz	10.000 GHz	1.000 MHz	9.37685 GHz	-48.03 dBm	-8.03 dB
10.000 GHz	14.000 GHz	1.000 MHz	12.34646 GHz	-46.61 dBm	-6.61 dB
14.000 GHz	18.000 GHz	1.000 MHz	15.55406 GHz	-46.30 dBm	-6.30 dB
18.000 GHz	24.000 GHz	1.000 MHz	19.41463 GHz	-46.42 dBm	-6.42 dB

Date: 4.OCT.2024 13:38:33

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	932.37631 MHz	-46.72 dBm	-6.72 dB
1.000 GHz	2.292 GHz	1.000 MHz	2.12819 GHz	-47.19 dBm	-7.19 dB
2.328 GHz	3.000 GHz	1.000 MHz	2.97077 GHz	-46.47 dBm	-6.47 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99980 GHz	-41.56 dBm	-1.56 dB
7.000 GHz	10.000 GHz	1.000 MHz	9.42685 GHz	-48.22 dBm	-8.22 dB
10.000 GHz	14.000 GHz	1.000 MHz	12.84289 GHz	-47.03 dBm	-7.03 dB
14.000 GHz	18.000 GHz	1.000 MHz	15.54456 GHz	-46.40 dBm	-6.40 dB
18.000 GHz	24.000 GHz	1.000 MHz	19.41363 GHz	-45.96 dBm	-5.96 dB

Date: 4 OCT 2024 15:01:11

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	0.0011	PASS
40	Normal Voltage	0.0016	
30	Normal Voltage	0.0012	
20(Ref.)	Normal Voltage	0.0002	
10	Normal Voltage	0.0018	
0	Normal Voltage	0.0025	
-10	Normal Voltage	0.0016	
-20	Normal Voltage	0.0024	
-30	Normal Voltage	0.0021	
20	Maximum Voltage	0.0012	
20	Normal Voltage	0.0011	
20	Battery End Point	0.0005	

Note:

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

Appendix B. Test Results of Radiated Test

Radiated Spurious Emission

Test Engineer :	PingZhou Liang	Temperature :	22~25℃
		Relative Humidity :	48~52%

LTE Band 30 / 5MHz / QPSK / Ant.9									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	4610.50	-62.57	-40	-22.57	-57.55	-68.82	6.30	12.55	H
	6915.75	-59.82	-40	-19.82	-58.14	-63.22	8.25	11.65	H
	9221.00	-56.20	-40	-16.20	-59.69	-58.55	9.50	11.85	H
	4610.50	-61.93	-40	-21.93	-57.29	-68.18	6.30	12.55	V
	6915.75	-59.56	-40	-19.56	-58.36	-62.96	8.25	11.65	V
	9221.00	-56.94	-40	-16.94	-59.61	-59.29	9.50	11.85	V
Middle	4615.50	-62.29	-40	-22.29	-57.28	-68.54	6.45	12.70	H
	6923.25	-59.40	-40	-19.40	-57.72	-62.80	8.40	11.80	H
	9231.00	-56.14	-40	-16.14	-59.60	-58.49	9.65	12.00	H
	4615.50	-61.80	-40	-21.80	-57.17	-68.05	6.45	12.70	V
	6923.25	-58.94	-40	-18.94	-57.74	-62.34	8.40	11.80	V
	9231.00	-56.91	-40	-16.91	-59.55	-59.26	9.65	12.00	V
Highest	4620.50	-62.20	-40	-22.20	-57.19	-68.45	6.61	12.86	H
	6930.75	-59.53	-40	-19.53	-57.99	-62.91	8.56	11.94	H
	9241.00	-56.03	-40	-16.03	-59.51	-58.38	9.81	12.16	H
	4620.50	-61.48	-40	-21.48	-56.85	-67.73	6.61	12.86	V
	6930.75	-59.20	-40	-19.20	-58.13	-62.58	8.56	11.94	V
	9241.00	-56.89	-40	-16.89	-59.53	-59.24	9.81	12.16	V

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

LTE Band 30 / 10MHz / QPSK / Ant.9									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	4611.00	-62.27	-40	-22.27	-57.25	-68.52	6.45	12.70	H
	6916.50	-58.81	-40	-18.81	-57.13	-62.21	8.40	11.80	H
	9222.00	-56.01	-40	-16.01	-59.49	-58.36	9.65	12.00	H
	4611.00	-61.85	-40	-21.85	-57.21	-68.10	6.45	12.70	V
	6916.50	-59.04	-40	-19.04	-57.84	-62.44	8.40	11.80	V
	9222.00	-56.72	-40	-16.72	-59.38	-59.07	9.65	12.00	V

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