# FCC RADIO TEST REPORT

| | | |
|---|---|---|
| **FCC ID** | : | **RI7FN990A40** |
| **Equipment** | : | **5G NR Module** |
| **Brand Name** | : | **Telit** |
| **Model Name** | : | **FN990A40** |
| **Marketing Name** | : | **FN990A40** |
| **Applicant** | : | **Telit Communications S.p.A.**<br>**Viale Stazione di Prosecco 5/b, Trieste 34010, Italy** |
| **Manufacturer** | : | **Telit Communications S.p.A.**<br>**Viale Stazione di Prosecco 5/b, Trieste 34010, Italy** |
| **Standard** | : | **FCC 47 CFR Part 2, Part 27(D)** |

**The product was received on Jul. 19, 2022 and testing was performed from Jul. 29, 2022 to Nov. 23, 2022. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.**

**The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.**

Louis Wu

**Approved by: Louis Wu**

***Sporton International Inc. EMC & Wireless Communications Laboratory***
*No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)*

# Table of Contents

# History of this test report

| Report No. | Version | Description | Issue Date |
|---|---|---|---|
| FG270608E | 01 | Initial issue of report | Dec. 01, 2022 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

# Summary of Test Result

| Report Clause | Ref Std. Clause | Test Items | Result (PASS/FAIL) | Remark |
|---|---|---|---|---|
| 3.2 | §2.1046 | Conducted Output Power | Reporting only | - |
| 3.3 | - | Peak-to-Average Ratio | Reporting only | - |
| 3.4 | §27.50 (a)(3) | Effective Isotropic Radiated Power | Pass | - |
| 3.5 | §2.1049 | Occupied Bandwidth | Reporting only | - |
| 3.6 | §2.1051<br>§27.53 (a)(4) | Conducted Band Edge Measurement | Pass | - |
| 3.7 | §2.1051<br>§27.53 (a)(4) | Conducted Spurious Emission | Pass | - |
| 3.8 | §2.1055<br>§27.54 | Frequency Stability<br>Temperature & Voltage | Pass | - |
| 4.2 | §2.1053<br>§27.53 (a)(4) | Radiated Spurious Emission | Pass | 18.86 dB<br>under the limit at<br>9221.000 MHz |

**Declaration of Conformity:**

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
   It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results.
2. The measurement uncertainty please refer to this report "Uncertainty of Evaluation".

**Comments and Explanations:**

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

**Reviewed by: Avis Chuang**
**Report Producer: Clio Lo**

# 1 General Description

## 1.1 Product Feature of Equipment Under Test

WCDMA/LTE/5G NR, and GNSS

| Product Feature | |
|---|---|
| **Antenna Type** | WWAN: Monopole Antenna<br>GPS/Glonass/BDS/Galileo/SBAS: Monopole Antenna |
| **Test Antenna Gain** | LTE Band 30: 1.0 dBi |

**Remark:** The EUT's information above is declared by manufacturer. Please refer to Comments and Explanations in report summary.

## 1.2 Modification of EUT

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

## 1.3 Testing Site

| | |
|---|---|
| **Test Site** | Sporton International Inc. EMC & Wireless Communications Laboratory |
| **Test Site Location** | No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)<br>TEL: +886-3-327-3456<br>FAX: +886-3-328-4978 |
| **Test Site No.** | **Sporton Site No.** |
| | TH03-HY |
| **Test Engineer** | George Chen |
| **Temperature (℃)** | 22.8~24.5 |
| **Relative Humidity (%)** | 51~58 |

| | |
|---|---|
| **Test Site** | Sporton International Inc. Wensan Laboratory |
| **Test Site Location** | No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist.,<br>Taoyuan City 333010, Taiwan (R.O.C.)<br>TEL: +886-3-327-0868<br>FAX: +886-3-327-0855 |
| **Test Site No.** | **Sporton Site No.** |
| | 03CH13-HY (TAF Code: 3786) |
| **Test Engineer** | Rain Lee, Jacky Hong and Mancy Chou |
| **Temperature (℃)** | 20~25 |
| **Relative Humidity (%)** | 50~60 |
| **Remark** | The Radiated Spurious Emission test item subcontracted to Sporton International Inc. Wensan Laboratory. |

**Note:** The test site complies with ANSI C63.4 2014 requirement.

FCC Designation No.: TW1190 and TW3786

## 1.4 Applied Standards

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

- ANSI C63.26-2015
- FCC 47 CFR Part 2, Part 27(D)
- ANSI / TIA-603-E
- FCC KDB 971168 Power Meas License Digital Systems D01 v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01
- FCC KDB 414788 D01 Radiated Test Site 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.
3. The TAF code is not including all the FCC KDB listed without accreditation.

# 2 Test Configuration of Equipment Under Test

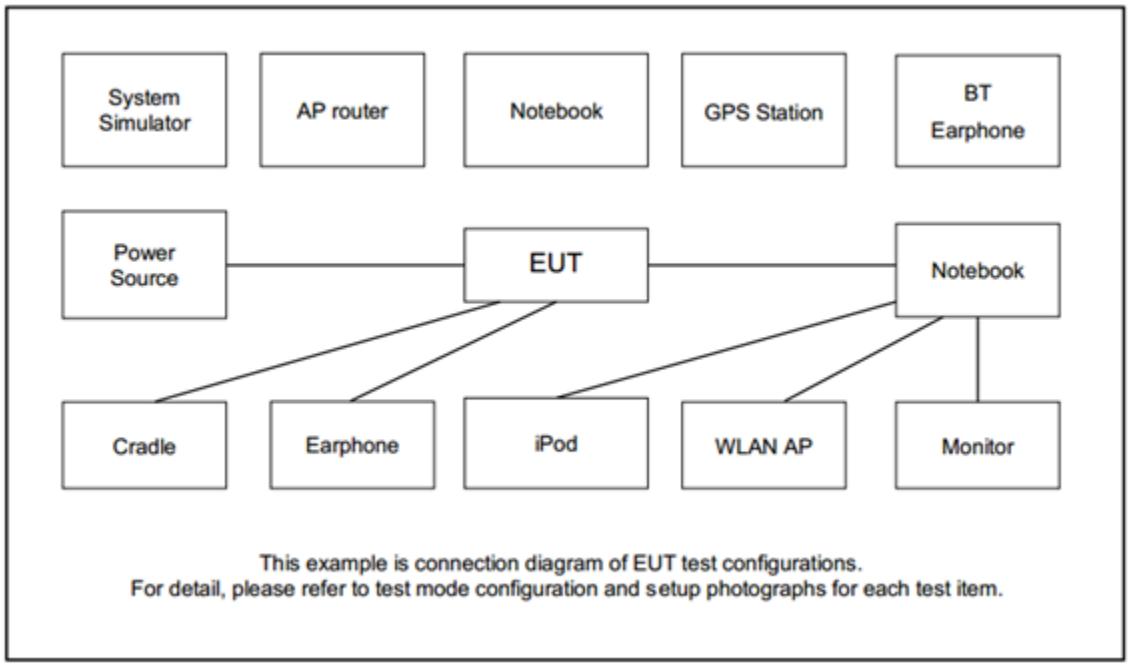
## 2.1 Test Mode

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.

For radiated measurement, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in two config (Ant. Horizontal and Ant. Vertical), and adjusting the measurement antenna orientation, following C63.26 exploratory test procedures and only the worst case emissions were reported in this report.

| Test Items | Band | Bandwidth (MHz) | | | | | | Modulation | | | | RB # | | | Test Channel | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.4 | 3 | 5 | 10 | 15 | 20 | QPSK | 16QAM | 64QAM | 256QAM | 1 | Half | Full | L | M | H |
| Max. Output Power | 30 | - | - | 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 | Max. Power | | | | | |
| 26dB and 99% Bandwidth | 30 | - | - | v | v | - | - | v | v | v | v | | | v | | v | |
| Conducted Band Edge | 30 | - | - | v | v | - | - | v | v | v | v | v | | v | v | | v |
| Conducted Spurious Emission | 30 | - | - | v | v | - | - | v | | | | v | | | v | v | v |
| Frequency Stability | 30 | - | - | | v | - | - | v | | | | | | v | | v | |
| Radiated Spurious Emission | 30 | Worst Case | | | | | | | | | | | | | v | v | v |
| Remark | 1. The mark "**v** " means that this configuration is chosen for testing<br>2. The mark "-" means that this bandwidth is not supported.<br>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.<br>4. One representative bandwidth is selected to perform PAR and frequency stability. | | | | | | | | | | | | | | | | |

## 2.2 Connection Diagram of Test System




## 2.3 Support Unit used in test configuration and system

| Item | Equipment | Brand Name | Model No. | FCC ID | Data Cable | Power Cord |
|---|---|---|---|---|---|---|
| 1. | System Simulator | Anritsu | MT8820C | N/A | N/A | Unshielded, 1.8 m |
| 2. | System Simulator | Anritsu | MT8821C | 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 4.2 dB and 10dB attenuator.

Example :

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

= 4.2 + 10 = 14.2 (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 |

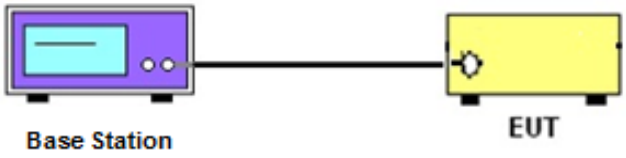
# 3 Conducted Test Items

## 3.1 Measuring Instruments

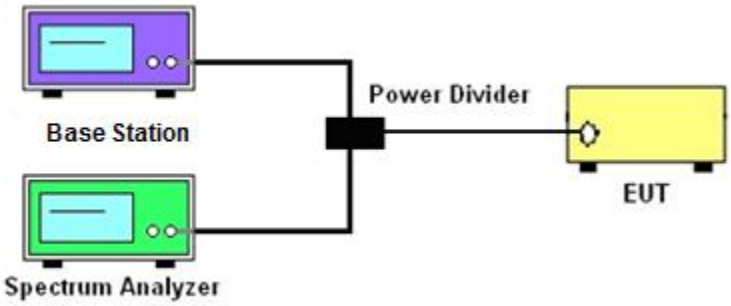
See list of measuring instruments of this test report.

### 3.1.1 Test Setup

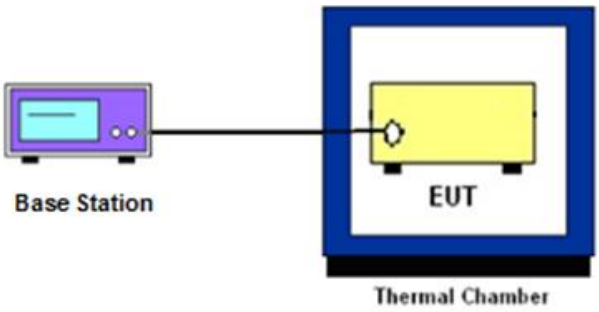
### 3.1.2 Conducted Output Power




### 3.1.3 Peak-to-Average Ratio, Occupied Bandwidth, 26dB Bandwidth ,Band-Edge and Conducted Spurious Emission




### 3.1.4 Frequency Stability




### 3.1.5 Test Result of Conducted Test

Please refer to Appendix A.

## 3.2 Conducted Output Power Measurement

### 3.2.1 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.

### 3.2.2 Test Procedures

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

# 3.3 Peak-to-Average Ratio

## 3.3.1 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.

## 3.3.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.2.6

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

# 3.4 Effective Isotropic Radiated Power

## 3.4.1 Description of EIRP Power

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.

**Remark:** EIRP use worst case measure the total power to cover per 5MHz Power.
According to KDB 412172 D01 Power Approach,
EIRP = $P_T + G_T – L_C$, where
$P_T$ = transmitter output power in dBm
$G_T$ = gain of the transmitting antenna in dBi
$L_C$ = signal attenuation in the connecting cable between the transmitter and antenna in dB

## 3.4.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.2.4.5

1. Determine the EIRP by adding the effective antenna gain to the adjusted power level.

# 3.5 Occupied Bandwidth

## 3.5.1 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.

## 3.5.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.4.3 (26dB) and Section 5.4.4 (99OB)

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. 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.
3. 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.
4. Set the detection mode to peak, and the trace mode to max hold.
5. 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)
6. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
7. 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.
8. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

# 3.6 Conducted Band Edge

## 3.6.1 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.

## 3.6.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

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

# 3.7 Conducted Spurious Emission

## 3.7.1 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 $10^{th}$ harmonic.

## 3.7.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. 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.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
6. Set spectrum analyzer with RMS detector.
7. Taking the record of maximum spurious emission.
8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
9. 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.

# 3.8 Frequency Stability

## 3.8.1 Description of Frequency Stability Measurement

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

## 3.8.2 Test Procedures for Temperature Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

1. The EUT was set up in the thermal chamber and connected with the system simulator.
2. 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.
3. 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.

## 3.8.3 Test Procedures for Voltage Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

1. The EUT was placed in a temperature chamber at 20±5° C and connected with the system simulator.
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

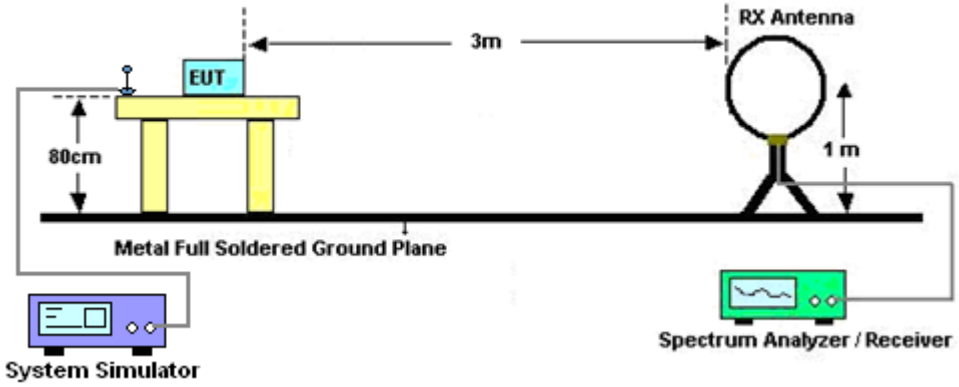
# 4 Radiated Test Items

## 4.1 Measuring Instruments

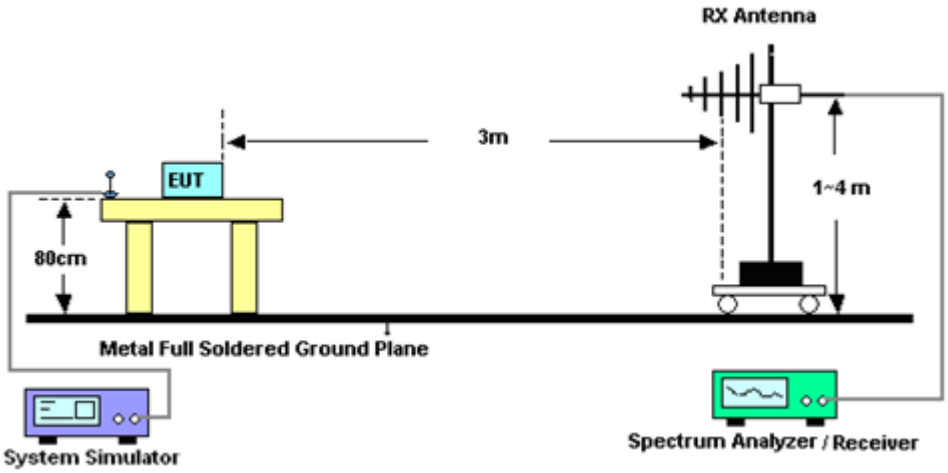
See list of measuring instruments of this test report.

### 4.1.1 Test Setup

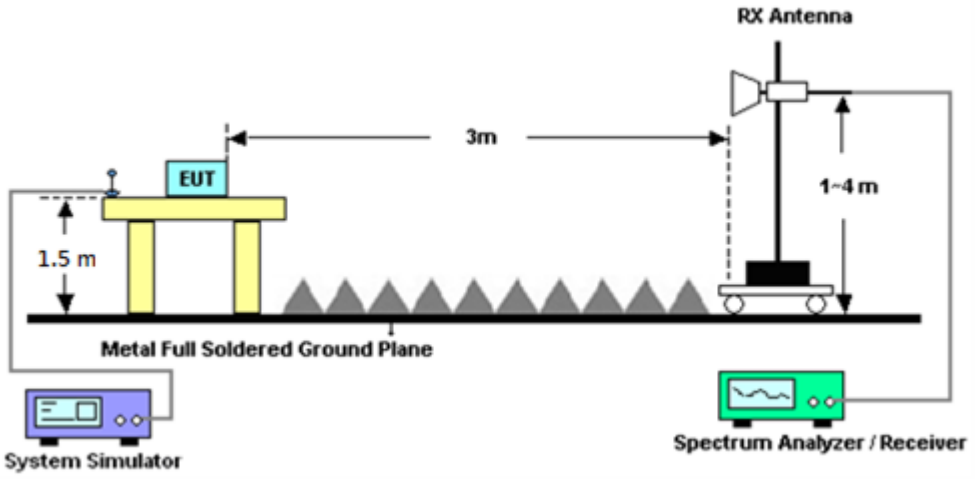
**For radiated test below 30MHz**



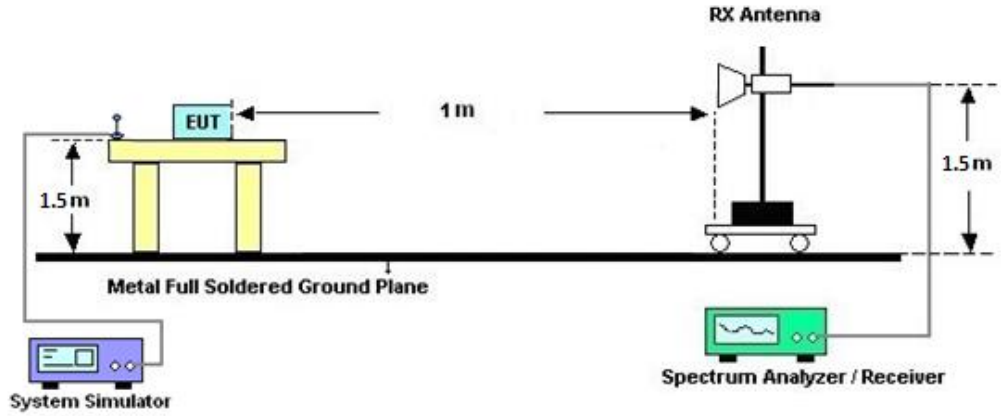

**For radiated test from 30MHz to 1GHz**



**For radiated test from 1GHz to 18GHz**




**For radiated test above 18GHz**




## 4.1.2 Test Result of Radiated Test

Please refer to Appendix B.

**Note:**

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.

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

# 4.2 Radiated Spurious Emission Measurement

## 4.2.1 Description of Radiated Spurious Emission Measurement

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.

## 4.2.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI / TIA-603-E Section 2.2.12.

1. 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.
2. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
5. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
7. Measure the burst average result by setting trace = max hold or trace = average with duty cycle factor when margin is not enough.
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 | Brand Name | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---|---|---|---|---|---|---|---|---|
| Loop Antenna | Rohde & Schwarz | HFH2-Z2 | 100488 | 9 kHz~30 MHz | May 13, 2022 | Jul. 29, 2022~ Aug. 02, 2022 | May 12, 2023 | Radiation (03CH13-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 104 | MY9837/4PE | 9kHz~30MHz | Mar. 10, 2022 | Jul. 29, 2022 ~ Aug. 02, 2022 | Mar. 09, 2023 | Radiation (03CH13-HY) |
| Preamplifier | EMEC | EM18G40G | 060715 | 18GHz~40GHz | Dec. 24, 2021 | Jul. 29, 2022~ Aug. 02, 2022 | Dec. 23, 2022 | Radiation (03CH13-HY) |
| SHF-EHF Horn Antenna | SCHWARZBECK | BBHA9170 | 00993 | 18GHz-40GHz | Nov. 30, 2021 | Jul. 29, 2022~ Aug. 02, 2022 | Nov. 29, 2022 | Radiation (03CH13-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 102 | 505134/2 | 30MHz~40GHz | Feb. 21, 2022 | Jul. 29, 2022~ Aug. 02, 2022 | Feb. 20, 2023 | Radiation (03CH13-HY) |
| SHF-EHF Horn Antenna | SCHWARZBECK | BBHA 9170 | BBHA9170576 | 18GHz~40GHz | May 14, 2022 | Jul. 29, 2022~ Aug. 02, 2022 | May 13, 2023 | Radiation (03CH13-HY) |
| Amplifier | SONOMA | 310N | 187282 | 9kHz~1GHz | Dec. 15, 2021 | Jul. 29, 2022~ Aug. 02, 2022 | Dec. 14, 2022 | Radiation (03CH13-HY) |
| Bilog Antenna | TESEQ | CBL 6111D & 00800N1D01 N-06 | 40103 & 07 | 30MHz~1GHz | Apr. 24, 2022 | Jul. 29, 2022~ Aug. 02, 2022 | Apr. 23, 2023 | Radiation (03CH13-HY) |
| Bilog Antenna | TESEQ | CBL 6111D & 00800N1D01 N-06 | 41912 & 05 | 30MHz~1GHz | Feb. 06, 2022 | Jul. 29, 2022~ Aug. 02, 2022 | Feb. 05, 2023 | Radiation (03CH13-HY) |
| Hygrometer | TECPEL | DTM-303B | TP200889 | N/A | Sep. 30, 2021 | Jul. 29, 2022~ Aug. 02, 2022 | Sep. 29, 2022 | Radiation (03CH13-HY) |
| Preamplifier | MITEQ | AMF-7D-0010 1800-30-10P | 1590074 | 1GHz~18GHz | May 17, 2022 | Jul. 29, 2022~ Aug. 02, 2022 | May 16, 2023 | Radiation (03CH13-HY) |
| Preamplifier | Keysight | 83017A | MY53270147 | 1GHz~26.5GHz | Oct. 26, 2021 | Jul. 29, 2022~ Aug. 02, 2022 | Oct. 25, 2022 | Radiation (03CH13-HY) |
| Spectrum Analyzer | Keysight | N9010A | MY55370526 | 10Hz~44GHz | Mar. 18, 2022 | Jul. 29, 2022~ Aug. 02, 2022 | Mar. 17, 2023 | Radiation (03CH13-HY) |
| Filter | Wainwright | WLK4-1000-1530-8000-40SS | SN12 | 1.53GHz Low Pass Filter | Sep. 14, 2021 | Jul. 29, 2022~ Aug. 02, 2022 | Sep. 13, 2022 | Radiation (03CH13-HY) |
| Filter | Wainwright | WHKX12-1080-1200-15000-60SS | SN3 | 1.2GHz High Pass Filter | Jun. 30, 2022 | Jul. 29, 2022~ Aug. 02, 2022 | Jun. 29, 2023 | Radiation (03CH13-HY) |
| Filter | Wainwright | WHKX12-2700-3000-18000-60SS | SN2 | 3GHz High Pass Filter | Jul. 12, 2022 | Jul. 29, 2022~ Aug. 02, 2022 | Jul. 11, 2023 | Radiation (03CH13-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 126E | 0030/126E | 30MHz~18GHz | Feb. 09, 2022 | Jul. 29, 2022~ Aug. 02, 2022 | Feb. 08, 2023 | Radiation (03CH13-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 104 | 804793/4 | 30MHz~18GHz | Feb. 09, 2022 | Jul. 29, 2022~ Aug. 02, 2022 | Feb. 08, 2023 | Radiation (03CH13-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 104 | MY24961/4 | 30MHz~18GHz | Feb. 09, 2022 | Jul. 29, 2022~ Aug. 02, 2022 | Feb. 08, 2023 | Radiation (03CH13-HY) |
| Controller | EMEC | EM1000 | N/A | Control Turn table & Ant Mast | N/A | Jul. 29, 2022~ Aug. 02, 2022 | N/A | Radiation (03CH13-HY) |
| Antenna Mast | EMEC | AM-BS-4500-B | N/A | 1m~4m | N/A | Jul. 29, 2022~ Aug. 02, 2022 | N/A | Radiation (03CH13-HY) |
| Turn Table | EMEC | TT2000 | N/A | 0~360 Degree | N/A | Jul. 29, 2022~ Aug. 02, 2022 | N/A | Radiation (03CH13-HY) |
| Horn Antenna | SCHWARZBECK | BBHA 9120 D | 9120D-02114 | 1-18GHz | Aug. 04, 2021 | Jul. 29, 2022~ Aug. 02, 2022 | Aug. 03, 2022 | Radiation (03CH13-HY) |
| Horn Antenna | SCHWARZBECK | BBHA 9120 D | 9120D-1212 | 1GHz~18GHz | Mar. 10, 2022 | Jul. 29, 2022~ Aug. 02, 2022 | Mar. 09, 2023 | Radiation (03CH13-HY) |

| Instrument | Brand Name | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---|---|---|---|---|---|---|---|---|
| Radio Communication Analyzer | Anritsu | MT8821C | 6262025280 | LTE FDD/TDD LTE-2CC DLCA/ULCA | Oct. 29, 2021 | Aug. 13, 2022~ Oct. 27, 2022 | Oct. 28, 2022 | Conducted (TH03-HY) |
| Radio Communication Analyzer | Anritsu | MT8821C | 6262025353 | LTE FDD/TDD LTE-2CC DLCA/ULCA | Oct. 13, 2022 | Oct. 28, 2022~ Nov. 23, 2022 | Oct. 12, 2023 | Conducted (TH03-HY) |
| Spectrum Analyzer | Rohde & Schwarz | FSV40 | 101908 | 10Hz~40GHz | Oct. 01, 2021 | Aug. 13, 2022~ Sep. 26, 2022 | Sep. 30, 2022 | Conducted (TH03-HY) |
| Spectrum Analyzer | Rohde & Schwarz | FSV40 | 101908 | 10Hz~40GHz | Sep. 27, 2022 | Sep. 27, 2022~ Nov. 23, 2022 | Sep. 26, 2023 | Conducted (TH03-HY) |
| Thermal Chamber | ESPEC | SH-641 | 92013720 | -40℃ ~90℃ | Sep. 09, 2021 | Aug. 13, 2022~ Sep. 07, 2022 | Sep. 08, 2022 | Conducted (TH03-HY) |
| Thermal Chamber | ESPEC | SH-641 | 92013720 | -40℃ ~90℃ | Sep. 07, 2022 | Sep. 08, 2022~ Nov. 23, 2022 | Sep. 06, 2023 | Conducted (TH03-HY) |
| DC Power Supply | GW Instek | GPP-2323 | GES906037 | 0V~64V；0A~6A | Jan. 06, 2022 | Aug. 13, 2022~ Nov. 23, 2022 | Jan. 05, 2023 | Conducted (TH03-HY) |
| Coupler | Warison | 20dB 25W SMA Directional Coupler | #B | 1-18GHz | Jan. 07, 2022 | Aug. 13, 2022~ Nov. 23, 2022 | Jan. 06, 2023 | Conducted (TH03-HY) |

# 6 Uncertainty of Evaluation

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

| | |
|---|---|
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **3.40 dB** |

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

| | |
|---|---|
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **3.81 dB** |

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

| | |
|---|---|
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **3.46 dB** |

# Appendix A. Test Results of Conducted Test

## Conducted Output Power(Average power & EIRP)

| LTE Band 30 Maximum Average Power [dBm] (GT - LC = 1 dB) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| BW [MHz] | RB Size | RB Offset | Mod | Lowest | Middle | Highest | EIRP (dBm) | EIRP (W) |
| 10 | 1 | 0 | QPSK | - | 22.76 | - | 23.76 | 0.2377 |
| 10 | 1 | 25 | | | 22.75 | | | |
| 10 | 1 | 49 | | | 22.68 | | | |
| 10 | 25 | 0 | | | 21.76 | | | |
| 10 | 25 | 12 | | | 21.75 | | | |
| 10 | 25 | 25 | | | 21.70 | | | |
| 10 | 50 | 0 | | | 21.70 | | | |
| 10 | 1 | 0 | 16-QAM | | 22.01 | | 23.10 | 0.2042 |
| 10 | 1 | 25 | | | 22.10 | | | |
| 10 | 1 | 49 | | | 22.10 | | | |
| 10 | 25 | 0 | | | 20.71 | | | |
| 10 | 25 | 12 | | | 20.76 | | | |
| 10 | 25 | 25 | | | 20.74 | | | |
| 10 | 50 | 0 | | | 20.70 | | | |
| 10 | 1 | 0 | 64-QAM | | 20.89 | | 21.95 | 0.1567 |
| 10 | 1 | 25 | | | 20.95 | | | |
| 10 | 1 | 49 | | | 20.93 | | | |
| 10 | 25 | 0 | | | 19.73 | | | |
| 10 | 25 | 12 | | | 19.76 | | | |
| 10 | 25 | 25 | | | 19.73 | | | |
| 10 | 50 | 0 | | | 19.70 | | | |
| 10 | 1 | 0 | 256-QAM | | 17.57 | | 18.79 | 0.0757 |
| 10 | 1 | 25 | | | 17.67 | | | |
| 10 | 1 | 49 | | | 17.79 | | | |
| 10 | 25 | 0 | | | 17.52 | | | |
| 10 | 25 | 12 | | | 17.49 | | | |
| 10 | 25 | 25 | | | 17.55 | | | |
| 10 | 50 | 0 | | | 17.59 | | | |
| Limit | EIRP < 250mW/5MHz | | | Result | | | Pass | |

Total EIRP power is less than partial EIRP limit 250 mW/5MHz.

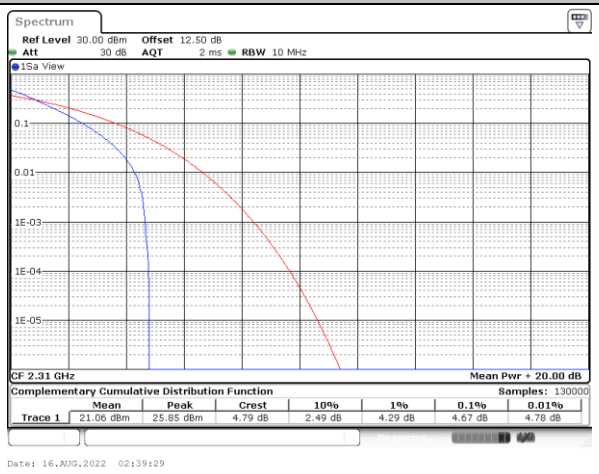
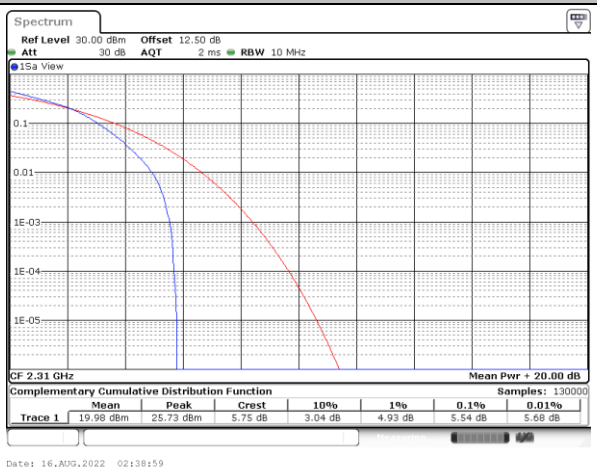
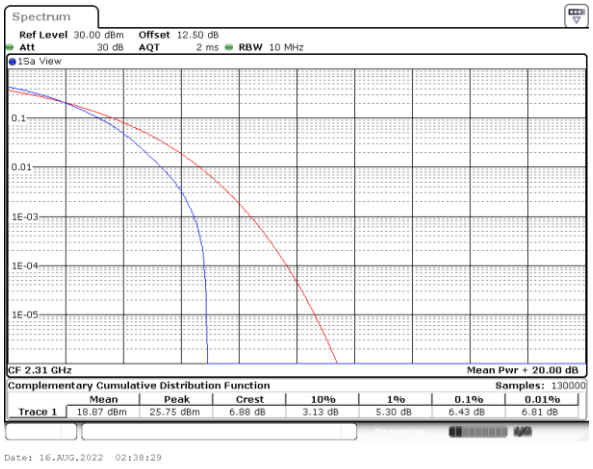
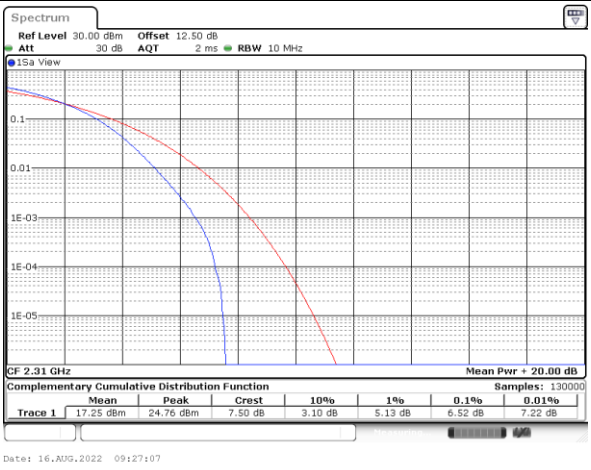
| LTE Band 30 Maximum Average Power [dBm] (GT - LC = 1 dB) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| BW [MHz] | RB Size | RB Offset | Mod | Lowest | Middle | Highest | EIRP (dBm) | EIRP (W) |
| 5 | 1 | 0 | QPSK | 22.56 | 22.65 | 22.65 | 23.74 | 0.2366 |
| 5 | 1 | 12 | | 22.66 | 22.74 | 22.68 | | |
| 5 | 1 | 24 | | 22.60 | 22.63 | 22.58 | | |
| 5 | 12 | 0 | | 21.59 | 21.64 | 21.69 | | |
| 5 | 12 | 7 | | 21.71 | 21.69 | 21.72 | | |
| 5 | 12 | 13 | | 21.68 | 21.65 | 21.69 | | |
| 5 | 25 | 0 | | 21.66 | 21.64 | 21.70 | | |
| 5 | 1 | 0 | 16-QAM | 21.89 | 21.92 | 22.04 | 23.12 | 0.2051 |
| 5 | 1 | 12 | | 22.03 | 22.12 | 22.10 | | |
| 5 | 1 | 24 | | 21.99 | 22.03 | 22.00 | | |
| 5 | 12 | 0 | | 20.64 | 20.74 | 20.71 | | |
| 5 | 12 | 7 | | 20.75 | 20.73 | 20.77 | | |
| 5 | 12 | 13 | | 20.69 | 20.67 | 20.73 | | |
| 5 | 25 | 0 | | 20.70 | 20.68 | 20.70 | | |
| 5 | 1 | 0 | 64-QAM | 20.86 | 20.88 | 20.90 | 21.93 | 0.1560 |
| 5 | 1 | 12 | | 20.88 | 20.93 | 20.91 | | |
| 5 | 1 | 24 | | 20.92 | 20.87 | 20.82 | | |
| 5 | 12 | 0 | | 19.61 | 19.65 | 19.72 | | |
| 5 | 12 | 7 | | 19.74 | 19.72 | 19.77 | | |
| 5 | 12 | 13 | | 19.75 | 19.67 | 19.74 | | |
| 5 | 25 | 0 | | 19.70 | 19.68 | 19.71 | | |
| 5 | 1 | 0 | 256-QAM | 17.31 | 17.56 | 17.36 | 18.64 | 0.0731 |
| 5 | 1 | 12 | | 17.42 | 17.64 | 17.56 | | |
| 5 | 1 | 24 | | 17.41 | 17.61 | 17.49 | | |
| 5 | 12 | 0 | | 17.18 | 17.39 | 17.26 | | |
| 5 | 12 | 7 | | 17.21 | 17.49 | 17.39 | | |
| 5 | 12 | 13 | | 17.22 | 17.47 | 17.30 | | |
| 5 | 25 | 0 | | 17.36 | 17.56 | 17.50 | | |
| Limit | EIRP < 250mW/5MHz | | | Result | | | Pass | |

Total EIRP power is less than partial EIRP limit 250 mW/5MHz.

# LTE Band 30

## Peak-to-Average Ratio

| Mode | LTE Band 30 / 10MHz | | | | |
|---|---|---|---|---|---|
| Mod. | QPSK | 16QAM | 64QAM | 256QAM | Limit: 13dB |
| RB Size | Full RB | Full RB | Full RB | Full RB | Result |
| Middle CH | 4.67 | 5.54 | 6.43 | 6.52 | PASS |

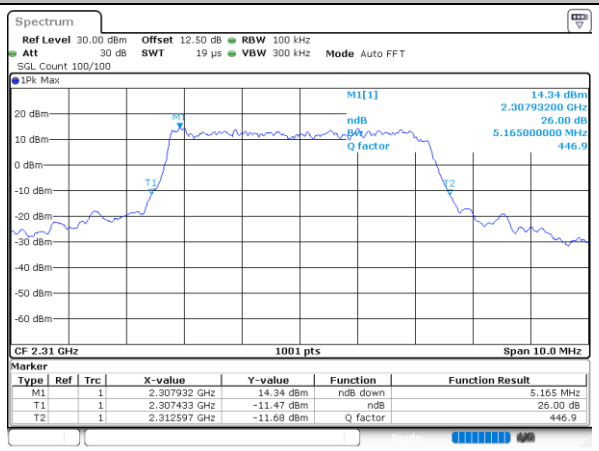
| LTE Band 30 / 10MHz / QPSK | LTE Band 30 / 10MHz / 16QAM |
|---|---|
| Middle Channel / Full RB | Middle Channel / Full RB |
|  |  |
| LTE Band 30 / 10MHz / 64QAM | LTE Band 30 / 10MHz / 256QAM |
| Middle Channel / Full RB | Middle Channel / Full RB |
|  |  |

# 26dB Bandwidth

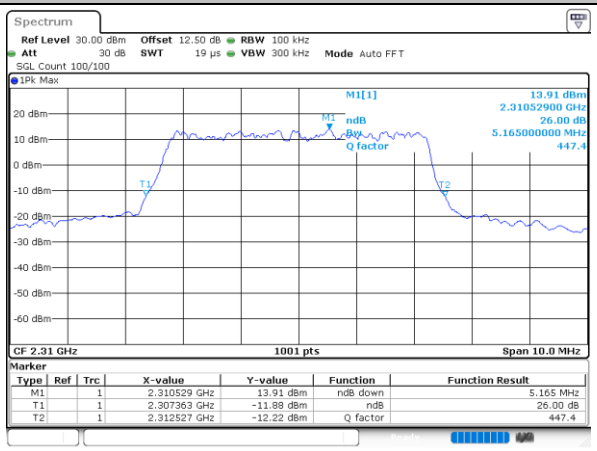
| Mode | LTE Band 30 : 26dB BW(MHz) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BW | 1.4MHz | | 3MHz | | 5MHz | | 10MHz | | 15MHz | | 20MHz | |
| Mod. | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM |
| Middle CH | - | - | - | - | 5.17 | 5.17 | 10.17 | 9.65 | - | - | - | - |
| Mode | LTE Band 30 : 26dB BW(MHz) | | | | | | | | | | | |
| BW | 1.4MHz | | 3MHz | | 5MHz | | 10MHz | | 15MHz | | 20MHz | |
| Mod. | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM |
| Middle CH | - | - | - | - | 5.12 | 5.02 | 9.95 | 9.97 | - | - | - | - |

## LTE Band 30

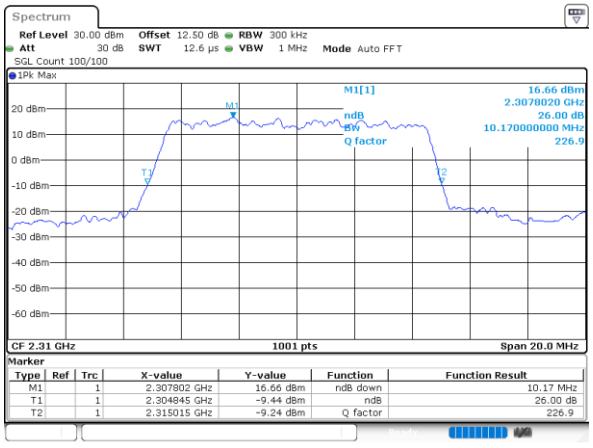
### Middle Channel / 5MHz / QPSK



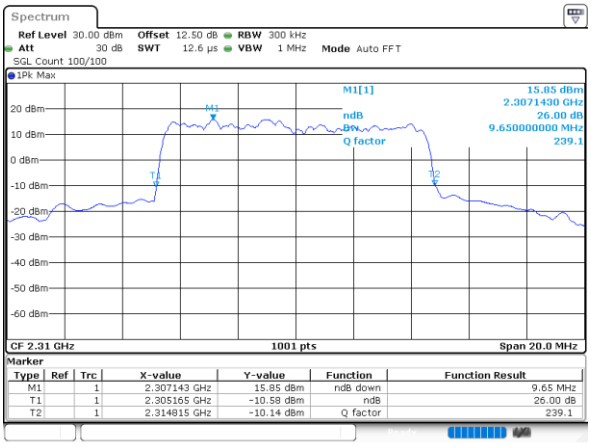

### Middle Channel / 5MHz / 16QAM



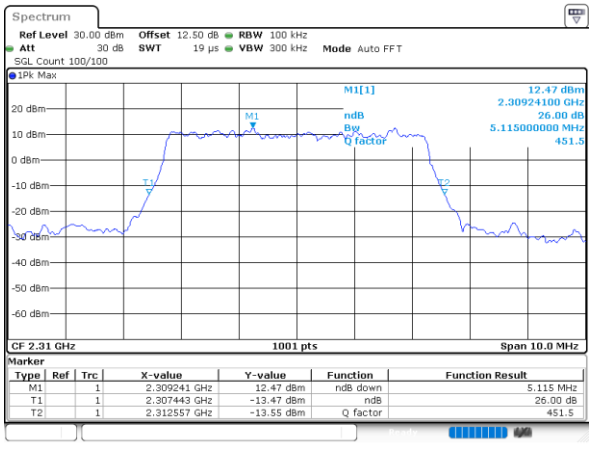

### Middle Channel / 10MHz / QPSK



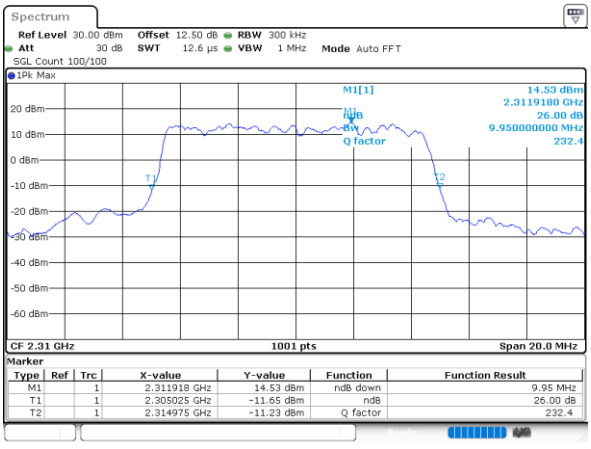

### Middle Channel / 10MHz / 16QAM



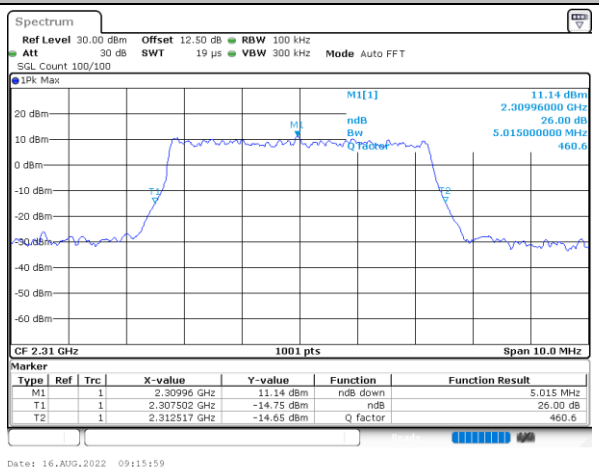

### Middle Channel / 5MHz / 64QAM

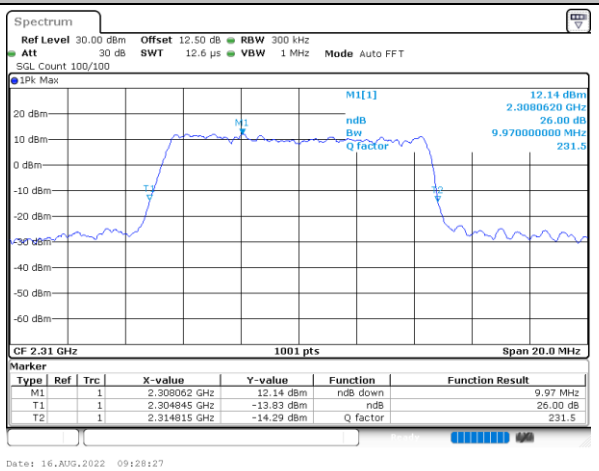



### Middle Channel / 10MHz / 64QAM



| LTE Band 30 | |
|---|---|
| **Middle Channel / 5MHz / 256QAM** | **Middle Channel / 10MHz / 256QAM** |



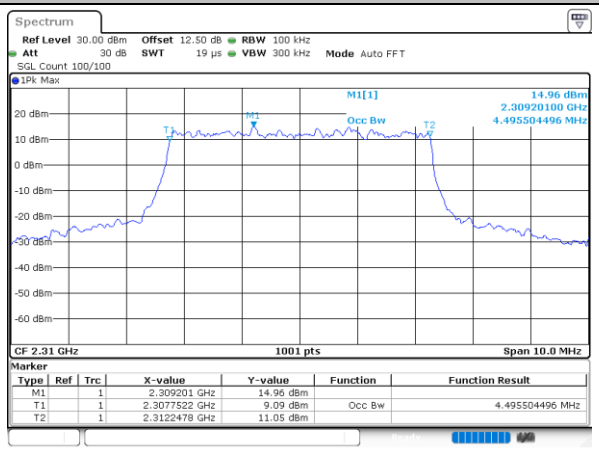



# Occupied Bandwidth

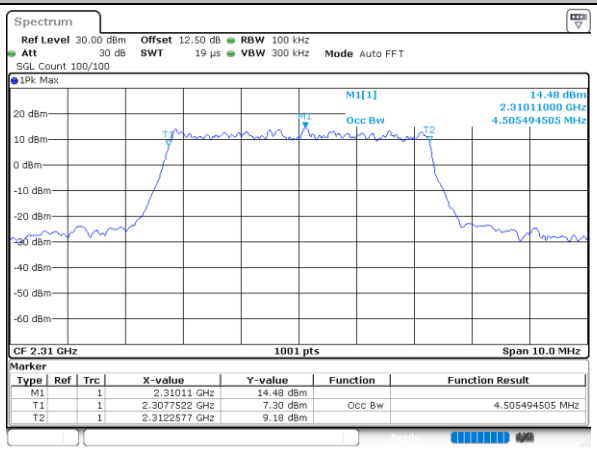
| Mode | LTE Band 30 : 99%OBW(MHz) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BW | 1.4MHz | | 3MHz | | 5MHz | | 10MHz | | 15MHz | | 20MHz | |
| Mod. | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM |
| Middle CH | - | - | - | - | 4.50 | 4.51 | 9.09 | 9.03 | - | - | - | - |
| Mode | LTE Band 30 : 99%OBW(MHz) | | | | | | | | | | | |
| BW | 1.4MHz | | 3MHz | | 5MHz | | 10MHz | | 15MHz | | 20MHz | |
| Mod. | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM |
| Middle CH | - | - | - | - | 4.51 | 4.50 | 9.03 | 9.03 | - | - | - | - |

## LTE Band 30

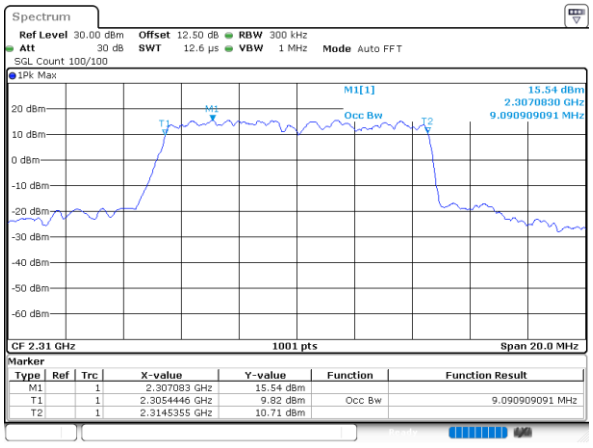
### Middle Channel / 5MHz / QPSK



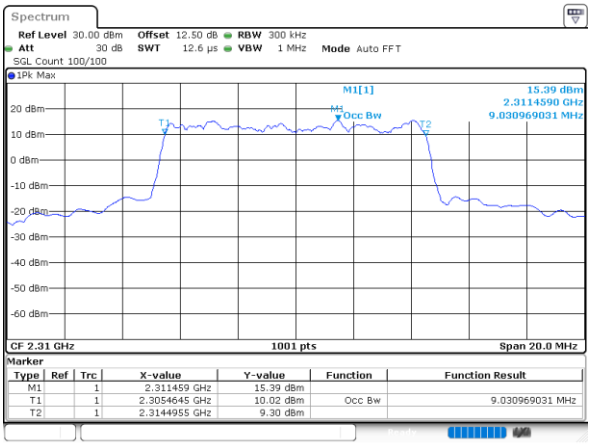

### Middle Channel / 5MHz / 16QAM



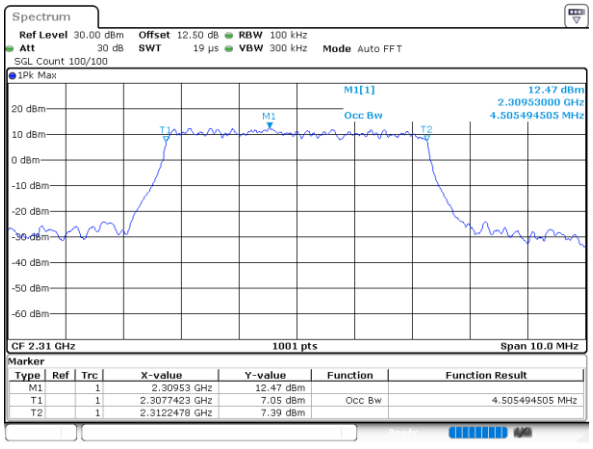

### Middle Channel / 10MHz / QPSK



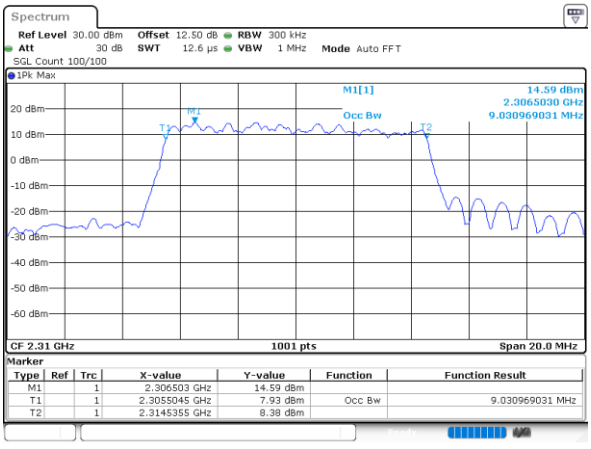

### Middle Channel / 10MHz / 16QAM



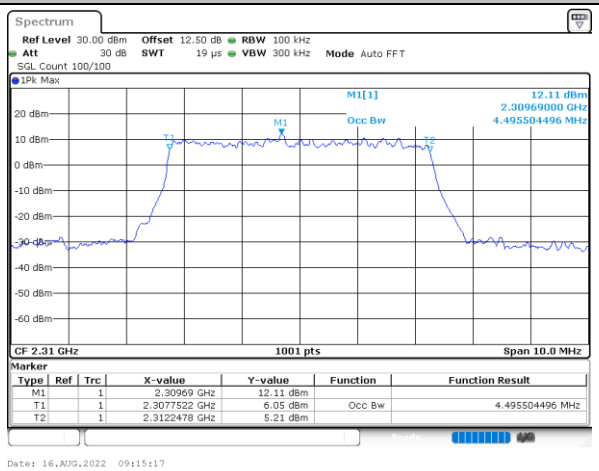

### Middle Channel / 5MHz / 64QAM

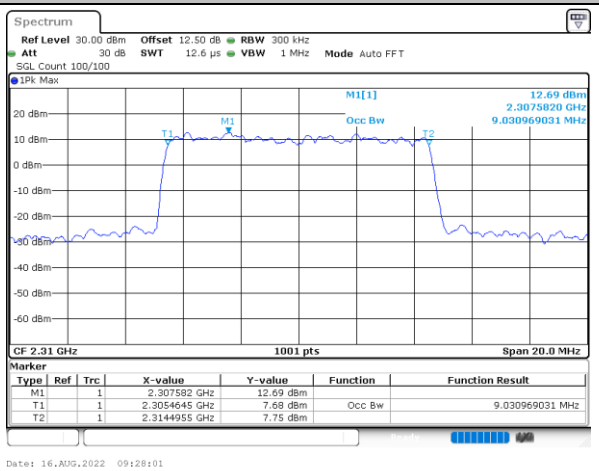



### Middle Channel / 10MHz / 64QAM



| LTE Band 30 | |
|---|---|
| **Middle Channel / 5MHz / 256QAM** | **Middle Channel / 10MHz / 256QAM** |

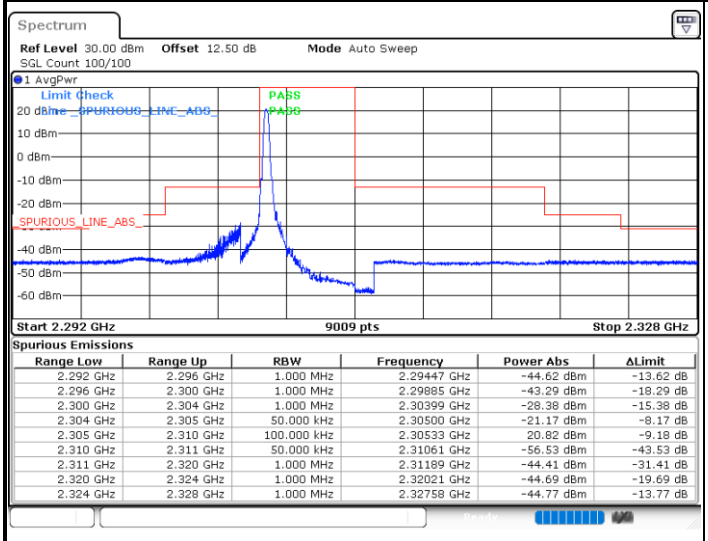


# Conducted Band Edge

## LTE Band 30 / 5MHz / QPSK

### Lowest Band Edge / 1 RB

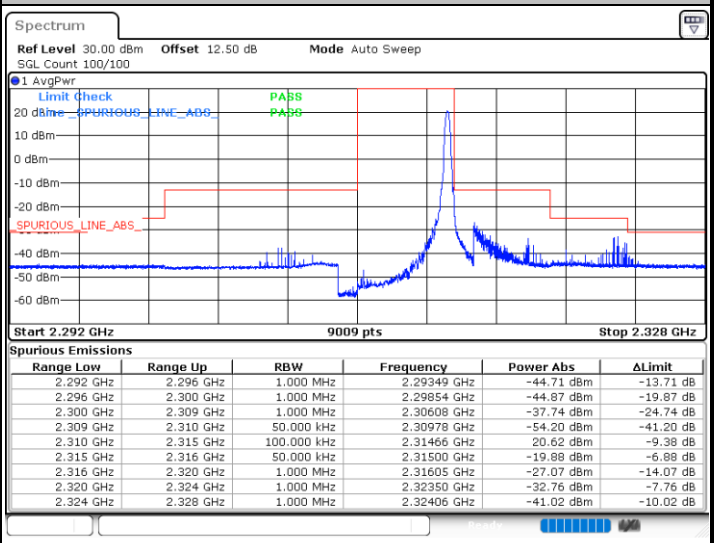



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29447 GHz | -44.62 dBm | -13.62 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29885 GHz | -43.29 dBm | -18.29 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30399 GHz | -28.38 dBm | -15.38 dB |
| 2.304 GHz | 2.305 GHz | 50.000 kHz | 2.30500 GHz | -21.17 dBm | -8.17 dB |
| 2.305 GHz | 2.310 GHz | 100.000 kHz | 2.30533 GHz | 20.82 dBm | -9.18 dB |
| 2.310 GHz | 2.311 GHz | 50.000 kHz | 2.31061 GHz | -56.53 dBm | -43.53 dB |
| 2.311 GHz | 2.320 GHz | 1.000 MHz | 2.31189 GHz | -44.41 dBm | -31.41 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32021 GHz | -44.69 dBm | -19.69 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32758 GHz | -44.77 dBm | -13.77 dB |

Date: 16.AUG.2022 09:32:11

### Highest Band Edge / 1 RB

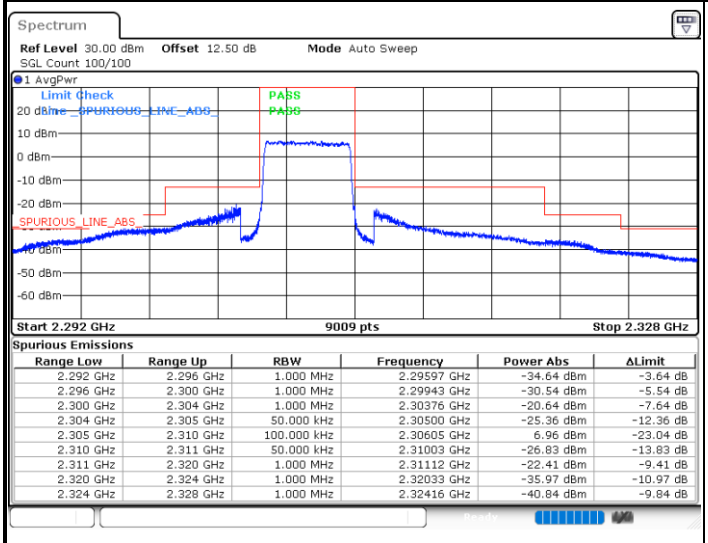



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29349 GHz | -44.71 dBm | -13.71 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29854 GHz | -44.87 dBm | -19.87 dB |
| 2.300 GHz | 2.309 GHz | 1.000 MHz | 2.30608 GHz | -37.74 dBm | -24.74 dB |
| 2.309 GHz | 2.310 GHz | 50.000 kHz | 2.30978 GHz | -54.20 dBm | -41.20 dB |
| 2.310 GHz | 2.315 GHz | 100.000 kHz | 2.31466 GHz | 20.62 dBm | -9.38 dB |
| 2.315 GHz | 2.316 GHz | 50.000 kHz | 2.31500 GHz | -19.88 dBm | -6.88 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31605 GHz | -27.07 dBm | -14.07 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32350 GHz | -32.76 dBm | -7.76 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32406 GHz | -41.02 dBm | -10.02 dB |

Date: 16.AUG.2022 09:38:02

### Lowest Band Edge / Full RB

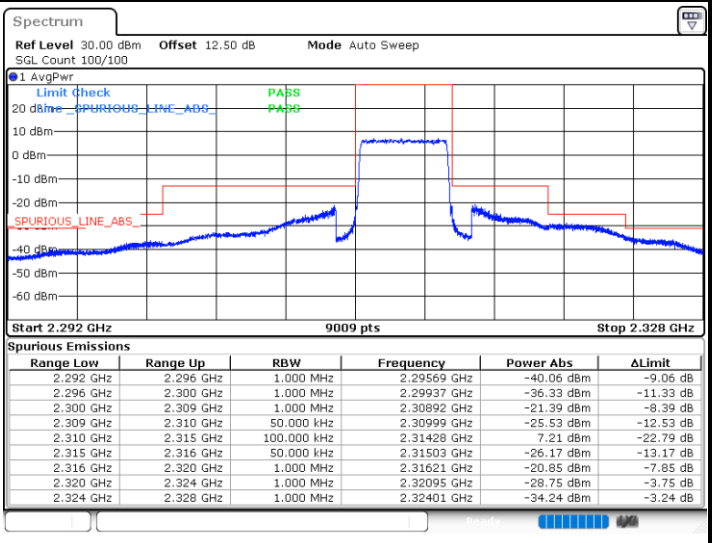



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29597 GHz | -34.64 dBm | -3.64 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29943 GHz | -30.54 dBm | -5.54 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30376 GHz | -20.64 dBm | -7.64 dB |
| 2.304 GHz | 2.305 GHz | 50.000 kHz | 2.30500 GHz | -25.36 dBm | -12.36 dB |
| 2.305 GHz | 2.310 GHz | 100.000 kHz | 2.30605 GHz | 6.96 dBm | -23.04 dB |
| 2.310 GHz | 2.311 GHz | 50.000 kHz | 2.31003 GHz | -26.83 dBm | -13.83 dB |
| 2.311 GHz | 2.320 GHz | 1.000 MHz | 2.31112 GHz | -22.41 dBm | -9.41 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32033 GHz | -35.97 dBm | -10.97 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32416 GHz | -40.84 dBm | -9.84 dB |

Date: 16.AUG.2022 09:35:07

### Highest Band Edge / Full RB



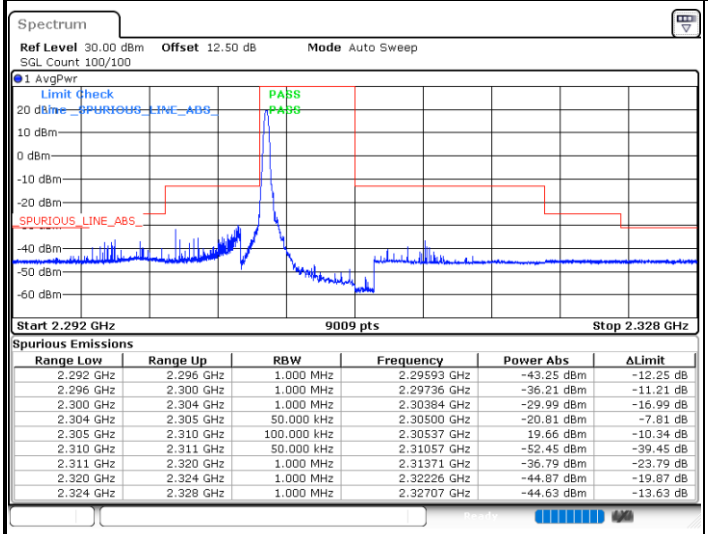

Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29569 GHz | -40.06 dBm | -9.06 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29937 GHz | -36.33 dBm | -11.33 dB |
| 2.300 GHz | 2.309 GHz | 1.000 MHz | 2.30892 GHz | -21.39 dBm | -8.39 dB |
| 2.309 GHz | 2.310 GHz | 50.000 kHz | 2.30999 GHz | -25.53 dBm | -12.53 dB |
| 2.310 GHz | 2.315 GHz | 100.000 kHz | 2.31428 GHz | 7.21 dBm | -22.79 dB |
| 2.315 GHz | 2.316 GHz | 50.000 kHz | 2.31503 GHz | -26.17 dBm | -13.17 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31621 GHz | -20.85 dBm | -7.85 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32095 GHz | -28.75 dBm | -3.75 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32401 GHz | -34.24 dBm | -3.24 dB |

Date: 16.AUG.2022 09:40:58

## LTE Band 30 / 5MHz / 16QAM

### Lowest Band Edge / 1 RB

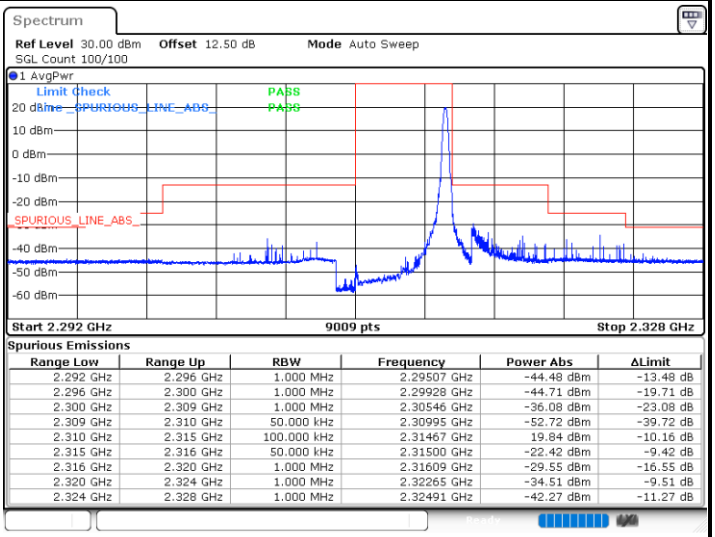



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29593 GHz | -43.25 dBm | -12.25 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29736 GHz | -36.21 dBm | -11.21 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30384 GHz | -29.99 dBm | -16.99 dB |
| 2.304 GHz | 2.305 GHz | 50.000 kHz | 2.30500 GHz | -20.81 dBm | -7.81 dB |
| 2.305 GHz | 2.310 GHz | 100.000 kHz | 2.30537 GHz | 19.66 dBm | -10.34 dB |
| 2.310 GHz | 2.311 GHz | 50.000 kHz | 2.31057 GHz | -52.45 dBm | -39.45 dB |
| 2.311 GHz | 2.320 GHz | 1.000 MHz | 2.31371 GHz | -36.79 dBm | -23.79 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32226 GHz | -44.87 dBm | -19.87 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32707 GHz | -44.63 dBm | -13.63 dB |

Date: 16.AUG.2022 09:33:10

### Highest Band Edge / 1 RB

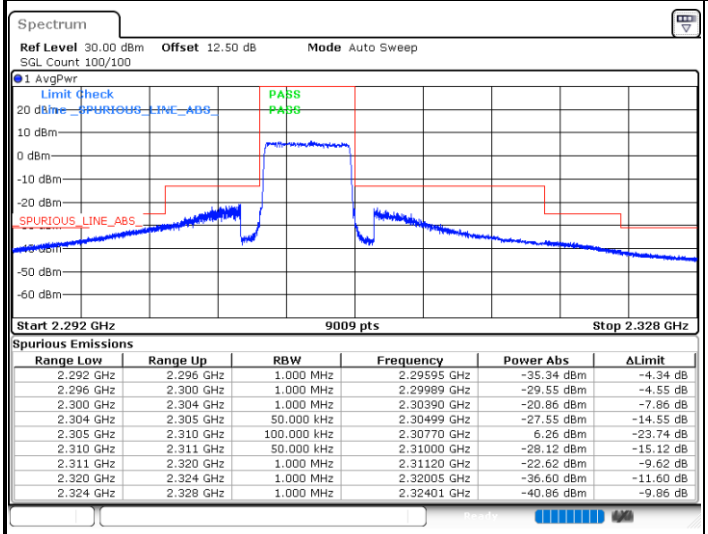



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29507 GHz | -44.48 dBm | -13.48 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29928 GHz | -44.71 dBm | -19.71 dB |
| 2.300 GHz | 2.309 GHz | 1.000 MHz | 2.30546 GHz | -36.08 dBm | -23.08 dB |
| 2.309 GHz | 2.310 GHz | 50.000 kHz | 2.30995 GHz | -52.72 dBm | -39.72 dB |
| 2.310 GHz | 2.315 GHz | 100.000 kHz | 2.31467 GHz | 19.84 dBm | -10.16 dB |
| 2.315 GHz | 2.316 GHz | 50.000 kHz | 2.31500 GHz | -22.42 dBm | -9.42 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31609 GHz | -29.55 dBm | -16.55 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32265 GHz | -34.51 dBm | -9.51 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32491 GHz | -42.27 dBm | -11.27 dB |

Date: 16.AUG.2022 09:39:01

### Lowest Band Edge / Full RB

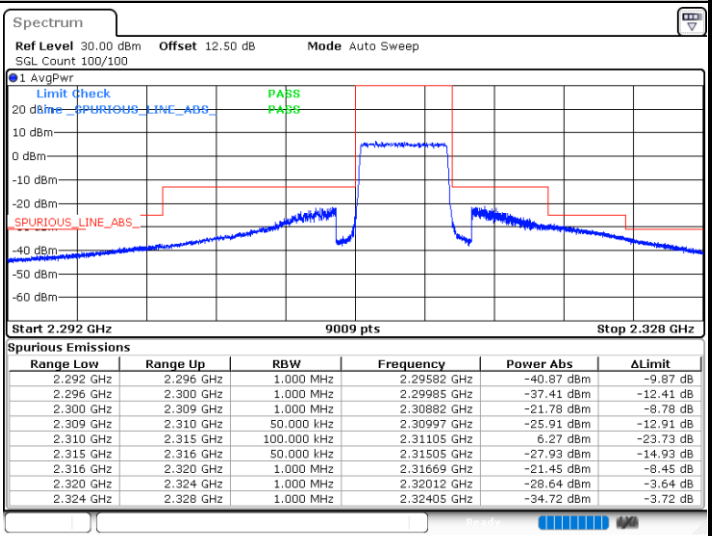



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29595 GHz | -35.34 dBm | -4.34 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29989 GHz | -29.55 dBm | -4.55 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30390 GHz | -20.86 dBm | -7.86 dB |
| 2.304 GHz | 2.305 GHz | 50.000 kHz | 2.30499 GHz | -27.55 dBm | -14.55 dB |
| 2.305 GHz | 2.310 GHz | 100.000 kHz | 2.30770 GHz | 6.26 dBm | -23.74 dB |
| 2.310 GHz | 2.311 GHz | 50.000 kHz | 2.31000 GHz | -28.12 dBm | -15.12 dB |
| 2.311 GHz | 2.320 GHz | 1.000 MHz | 2.31120 GHz | -22.62 dBm | -9.62 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32005 GHz | -36.60 dBm | -11.60 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32401 GHz | -40.86 dBm | -9.86 dB |

Date: 16.AUG.2022 09:36:05

### Highest Band Edge / Full RB



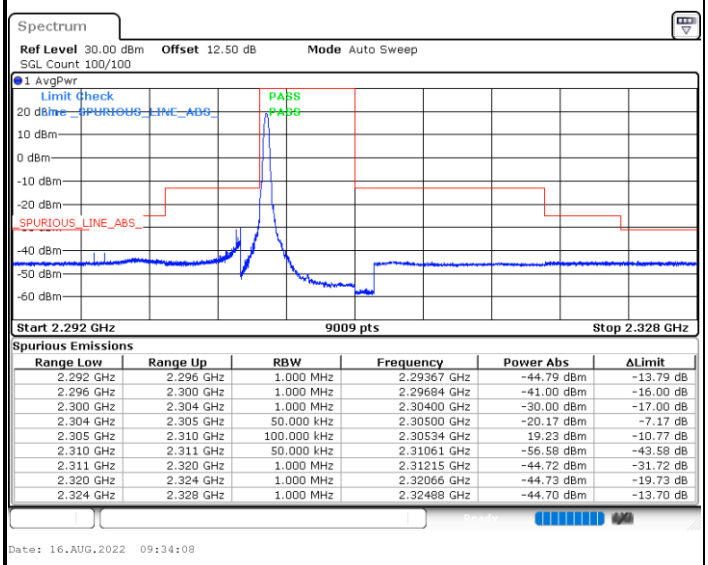

Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29582 GHz | -40.87 dBm | -9.87 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29985 GHz | -37.41 dBm | -12.41 dB |
| 2.300 GHz | 2.309 GHz | 1.000 MHz | 2.30882 GHz | -21.78 dBm | -8.78 dB |
| 2.309 GHz | 2.310 GHz | 50.000 kHz | 2.30997 GHz | -25.91 dBm | -12.91 dB |
| 2.310 GHz | 2.315 GHz | 100.000 kHz | 2.31105 GHz | 6.27 dBm | -23.73 dB |
| 2.315 GHz | 2.316 GHz | 50.000 kHz | 2.31505 GHz | -27.93 dBm | -14.93 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31669 GHz | -21.45 dBm | -8.45 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32012 GHz | -28.64 dBm | -3.64 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32405 GHz | -34.72 dBm | -3.72 dB |

Date: 16.AUG.2022 09:41:57

## LTE Band 30 / 5MHz / 64QAM

### Lowest Band Edge / 1 RB

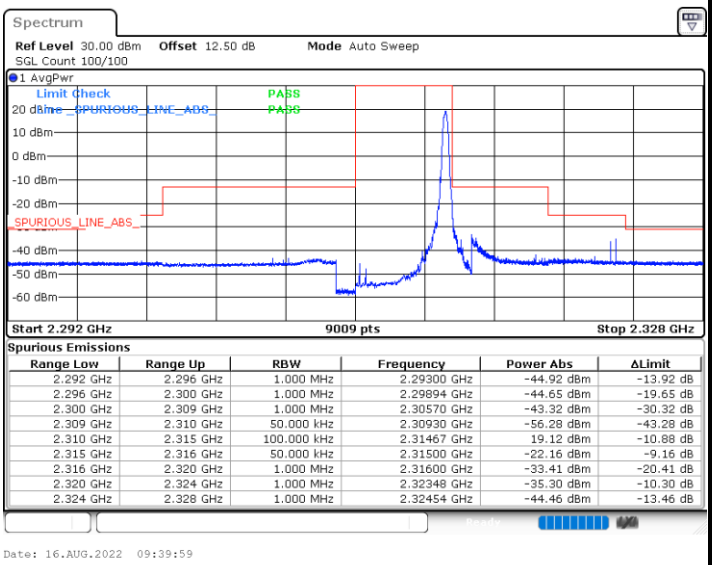



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29367 GHz | -44.79 dBm | -13.79 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29684 GHz | -41.00 dBm | -16.00 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30400 GHz | -30.00 dBm | -17.00 dB |
| 2.304 GHz | 2.305 GHz | 50.000 kHz | 2.30500 GHz | -20.17 dBm | -7.17 dB |
| 2.305 GHz | 2.310 GHz | 100.000 kHz | 2.30534 GHz | 19.23 dBm | -10.77 dB |
| 2.310 GHz | 2.311 GHz | 50.000 kHz | 2.31061 GHz | -56.58 dBm | -43.58 dB |
| 2.311 GHz | 2.320 GHz | 1.000 MHz | 2.31215 GHz | -44.72 dBm | -31.72 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32066 GHz | -44.73 dBm | -19.73 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32488 GHz | -44.70 dBm | -13.70 dB |

Date: 16.AUG.2022 09:34:08

### Highest Band Edge / 1 RB

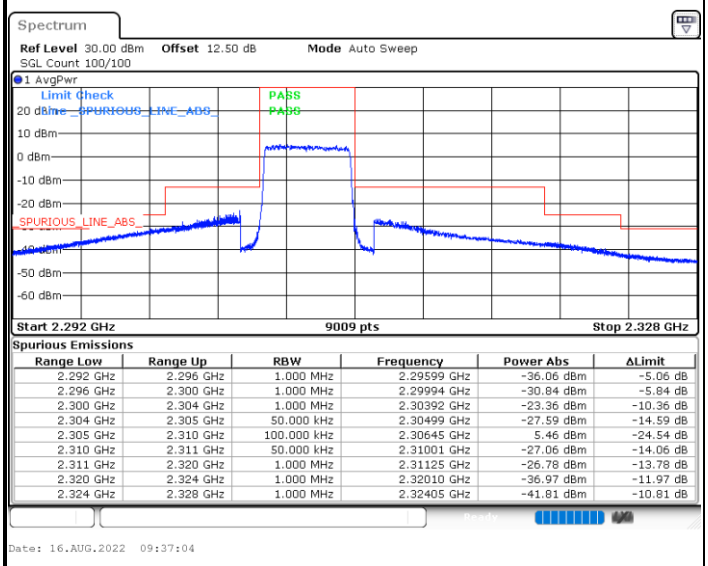



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29300 GHz | -44.92 dBm | -13.92 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29894 GHz | -44.65 dBm | -19.65 dB |
| 2.300 GHz | 2.309 GHz | 1.000 MHz | 2.30570 GHz | -43.32 dBm | -30.32 dB |
| 2.309 GHz | 2.310 GHz | 50.000 kHz | 2.30930 GHz | -56.28 dBm | -43.28 dB |
| 2.310 GHz | 2.315 GHz | 100.000 kHz | 2.31467 GHz | 19.12 dBm | -10.88 dB |
| 2.315 GHz | 2.316 GHz | 50.000 kHz | 2.31500 GHz | -22.16 dBm | -9.16 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31600 GHz | -33.41 dBm | -20.41 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32348 GHz | -35.30 dBm | -10.30 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32454 GHz | -44.46 dBm | -13.46 dB |

Date: 16.AUG.2022 09:39:59

### Lowest Band Edge / Full RB

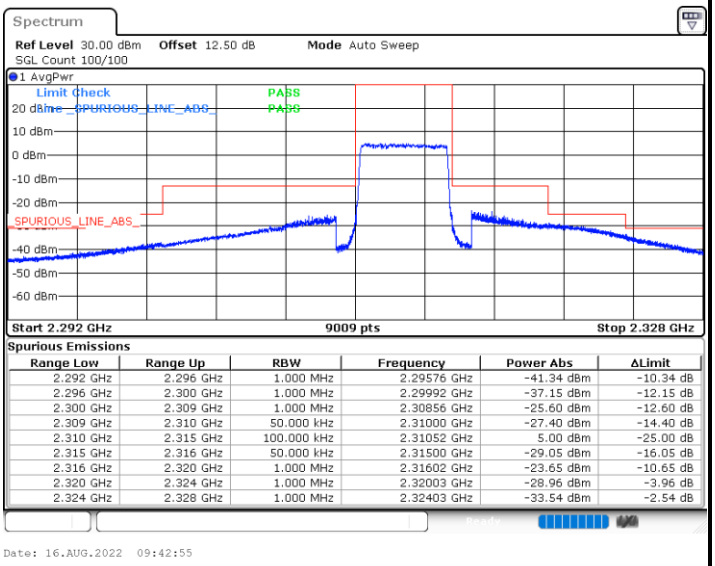



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29599 GHz | -36.06 dBm | -5.06 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29994 GHz | -30.84 dBm | -5.84 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30392 GHz | -23.36 dBm | -10.36 dB |
| 2.304 GHz | 2.305 GHz | 50.000 kHz | 2.30499 GHz | -27.59 dBm | -14.59 dB |
| 2.305 GHz | 2.310 GHz | 100.000 kHz | 2.30645 GHz | 5.46 dBm | -24.54 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 | 2.31125 GHz | -26.78 dBm | -13.78 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32010 GHz | -36.97 dBm | -11.97 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32405 GHz | -41.81 dBm | -10.81 dB |

Date: 16.AUG.2022 09:37:04

### Highest Band Edge / Full RB



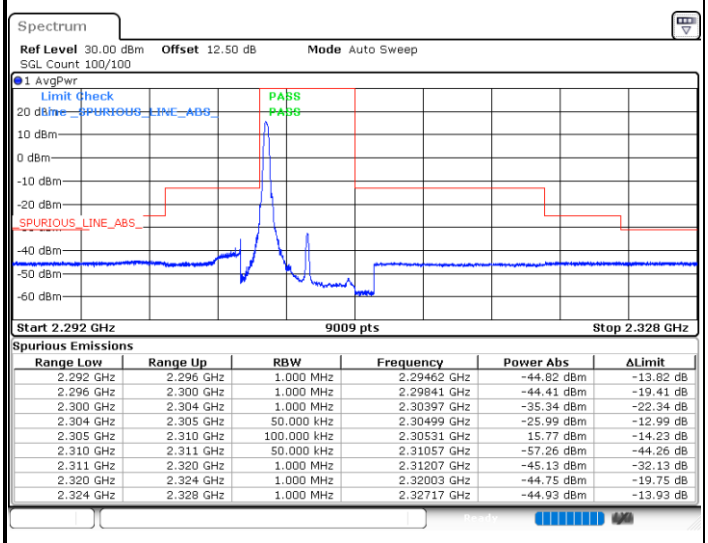

Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29576 GHz | -41.34 dBm | -10.34 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29992 GHz | -37.15 dBm | -12.15 dB |
| 2.300 GHz | 2.309 GHz | 1.000 MHz | 2.30856 GHz | -25.60 dBm | -12.60 dB |
| 2.309 GHz | 2.310 GHz | 50.000 kHz | 2.31000 GHz | -27.40 dBm | -14.40 dB |
| 2.310 GHz | 2.315 GHz | 100.000 kHz | 2.31052 GHz | 5.00 dBm | -25.00 dB |
| 2.315 GHz | 2.316 GHz | 50.000 kHz | 2.31500 GHz | -29.05 dBm | -16.05 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31602 GHz | -23.65 dBm | -10.65 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32003 GHz | -28.96 dBm | -3.96 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32403 GHz | -33.54 dBm | -2.54 dB |

Date: 16.AUG.2022 09:42:55

## LTE Band 30 / 5MHz / 256QAM

### Lowest Band Edge / 1 RB

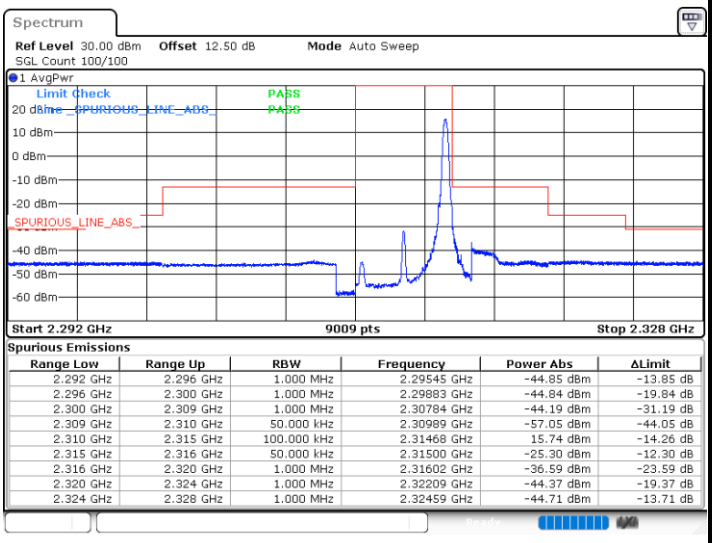



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29462 GHz | -44.82 dBm | -13.82 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29841 GHz | -44.41 dBm | -19.41 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30397 GHz | -35.34 dBm | -22.34 dB |
| 2.304 GHz | 2.305 GHz | 50.000 kHz | 2.30499 GHz | -25.99 dBm | -12.99 dB |
| 2.305 GHz | 2.310 GHz | 100.000 kHz | 2.30531 GHz | 15.77 dBm | -14.23 dB |
| 2.310 GHz | 2.311 GHz | 50.000 kHz | 2.31057 GHz | -57.26 dBm | -44.26 dB |
| 2.311 GHz | 2.320 GHz | 1.000 MHz | 2.31207 GHz | -45.13 dBm | -32.13 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32003 GHz | -44.75 dBm | -19.75 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32717 GHz | -44.93 dBm | -13.93 dB |

Date: 16.AUG.2022 09:20:41

### Highest Band Edge / 1 RB

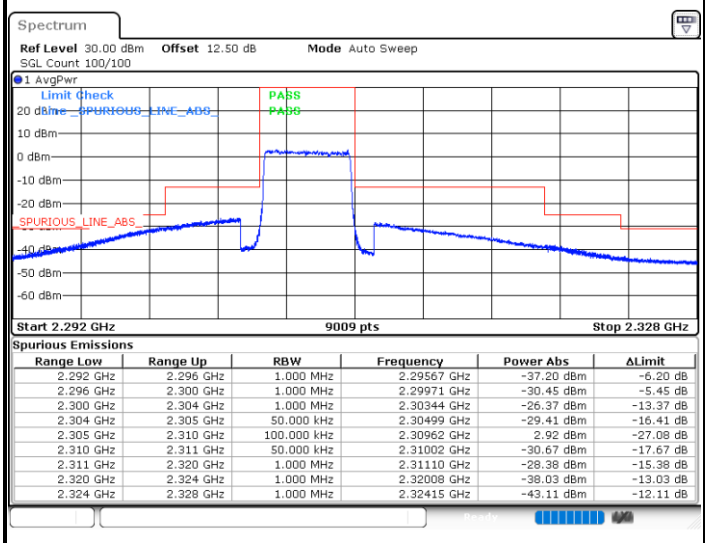



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29545 GHz | -44.85 dBm | -13.85 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29883 GHz | -44.84 dBm | -19.84 dB |
| 2.300 GHz | 2.309 GHz | 1.000 MHz | 2.30784 GHz | -44.19 dBm | -31.19 dB |
| 2.309 GHz | 2.310 GHz | 50.000 kHz | 2.30989 GHz | -57.05 dBm | -44.05 dB |
| 2.310 GHz | 2.315 GHz | 100.000 kHz | 2.31468 GHz | 15.74 dBm | -14.26 dB |
| 2.315 GHz | 2.316 GHz | 50.000 kHz | 2.31500 GHz | -25.30 dBm | -12.30 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31602 GHz | -36.59 dBm | -23.59 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32209 GHz | -44.37 dBm | -19.37 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32459 GHz | -44.71 dBm | -13.71 dB |

Date: 16.AUG.2022 09:21:26

### Lowest Band Edge / Full RB

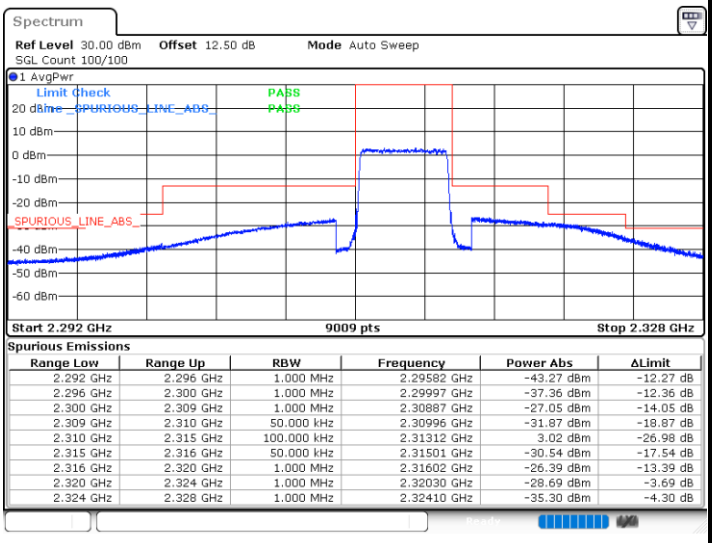



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29567 GHz | -37.20 dBm | -6.20 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29971 GHz | -30.45 dBm | -5.45 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30344 GHz | -26.37 dBm | -13.37 dB |
| 2.304 GHz | 2.305 GHz | 50.000 kHz | 2.30499 GHz | -29.41 dBm | -16.41 dB |
| 2.305 GHz | 2.310 GHz | 100.000 kHz | 2.30962 GHz | 2.92 dBm | -27.08 dB |
| 2.310 GHz | 2.311 GHz | 50.000 kHz | 2.31002 GHz | -30.67 dBm | -17.67 dB |
| 2.311 GHz | 2.320 GHz | 1.000 MHz | 2.31110 GHz | -28.38 dBm | -15.38 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32008 GHz | -38.03 dBm | -13.03 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32415 GHz | -43.11 dBm | -12.11 dB |

Date: 16.AUG.2022 09:20:03

### Highest Band Edge / Full RB



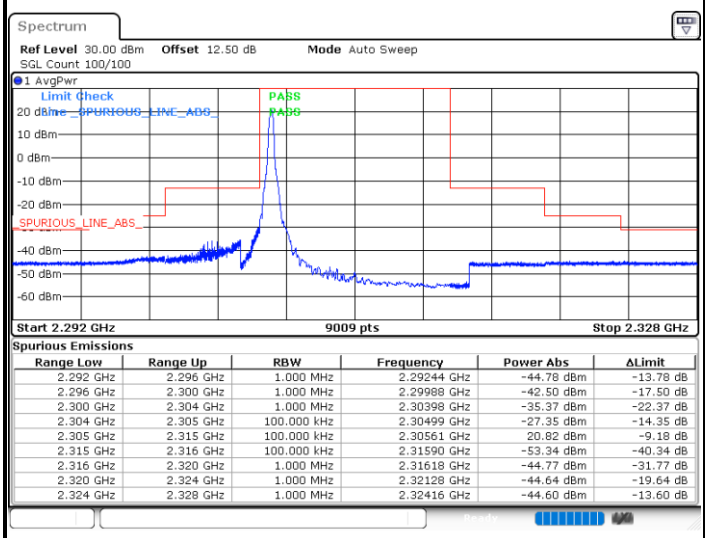

Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29582 GHz | -43.27 dBm | -12.27 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29997 GHz | -37.36 dBm | -12.36 dB |
| 2.300 GHz | 2.309 GHz | 1.000 MHz | 2.30887 GHz | -27.05 dBm | -14.05 dB |
| 2.309 GHz | 2.310 GHz | 50.000 kHz | 2.30996 GHz | -31.87 dBm | -18.87 dB |
| 2.310 GHz | 2.315 GHz | 100.000 kHz | 2.31312 GHz | 3.02 dBm | -26.98 dB |
| 2.315 GHz | 2.316 GHz | 50.000 kHz | 2.31501 GHz | -30.54 dBm | -17.54 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31602 GHz | -26.39 dBm | -13.39 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32030 GHz | -28.69 dBm | -3.69 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32410 GHz | -35.30 dBm | -4.30 dB |

Date: 16.AUG.2022 09:22:32

## LTE Band 30 / 10MHz / QPSK

### Lowest Band Edge / 1 RB

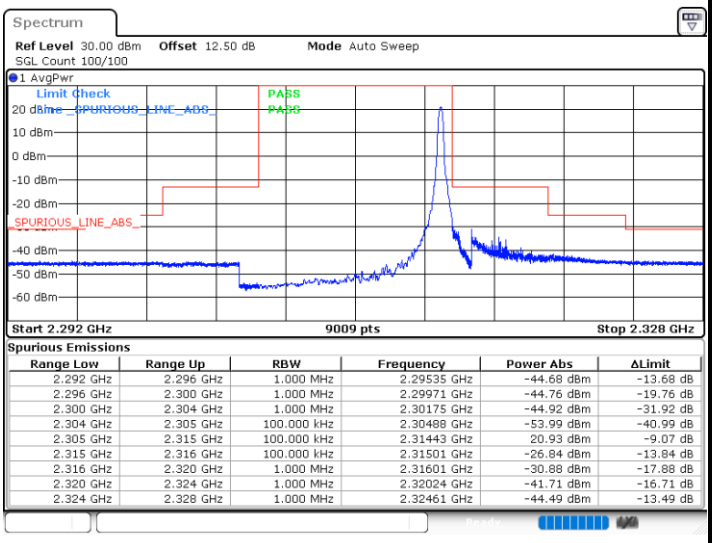



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29244 GHz | -44.78 dBm | -13.78 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29988 GHz | -42.50 dBm | -17.50 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30398 GHz | -35.37 dBm | -22.37 dB |
| 2.304 GHz | 2.305 GHz | 100.000 kHz | 2.30499 GHz | -27.35 dBm | -14.35 dB |
| 2.305 GHz | 2.315 GHz | 100.000 kHz | 2.30561 GHz | 20.82 dBm | -9.18 dB |
| 2.315 GHz | 2.316 GHz | 100.000 kHz | 2.31590 GHz | -53.34 dBm | -40.34 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31618 GHz | -44.77 dBm | -31.77 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32128 GHz | -44.64 dBm | -19.64 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32416 GHz | -44.60 dBm | -13.60 dB |

Date: 16.AUG.2022 09:43:55

### Highest Band Edge / 1 RB

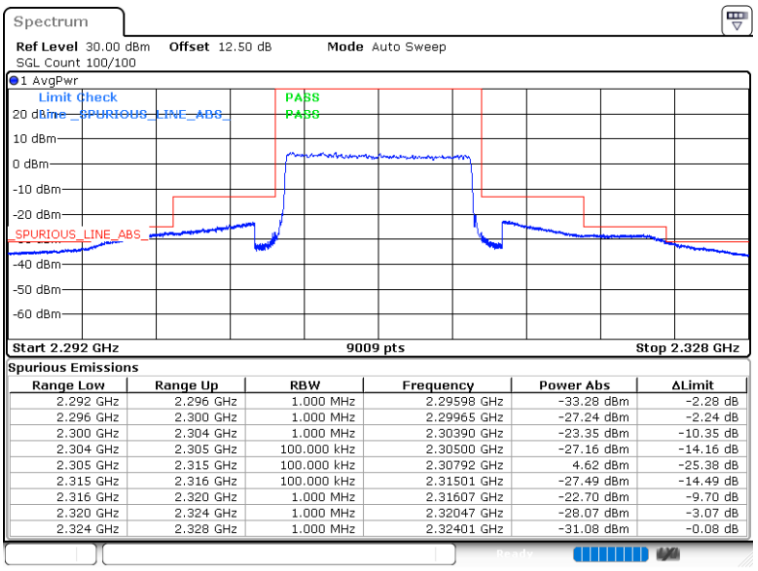



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29535 GHz | -44.68 dBm | -13.68 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29971 GHz | -44.76 dBm | -19.76 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30175 GHz | -44.92 dBm | -31.92 dB |
| 2.304 GHz | 2.305 GHz | 100.000 kHz | 2.30488 GHz | -53.99 dBm | -40.99 dB |
| 2.305 GHz | 2.315 GHz | 100.000 kHz | 2.31443 GHz | 20.93 dBm | -9.07 dB |
| 2.315 GHz | 2.316 GHz | 100.000 kHz | 2.31501 GHz | -26.84 dBm | -13.84 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31601 GHz | -30.88 dBm | -17.88 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32024 GHz | -41.71 dBm | -16.71 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32461 GHz | -44.49 dBm | -13.49 dB |

Date: 16.AUG.2022 09:46:50

### Band Edge / Full RB



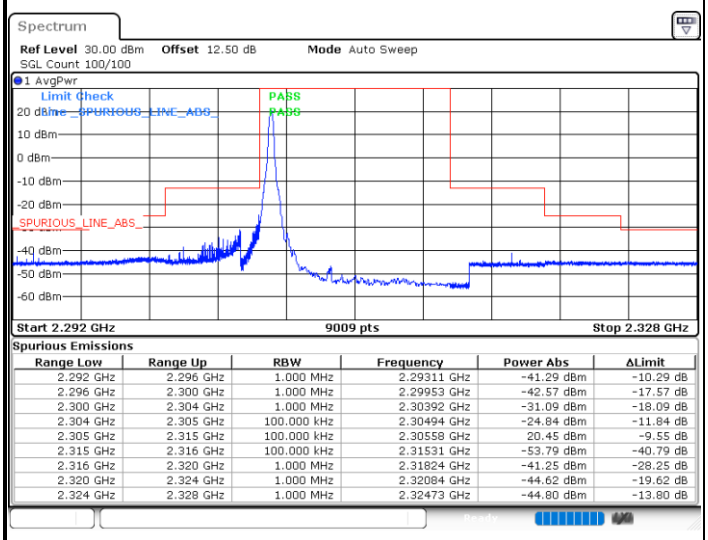

Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29598 GHz | -33.28 dBm | -2.28 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29965 GHz | -27.24 dBm | -2.24 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30390 GHz | -23.35 dBm | -10.35 dB |
| 2.304 GHz | 2.305 GHz | 100.000 kHz | 2.30500 GHz | -27.16 dBm | -14.16 dB |
| 2.305 GHz | 2.315 GHz | 100.000 kHz | 2.30792 GHz | 4.62 dBm | -25.38 dB |
| 2.315 GHz | 2.316 GHz | 100.000 kHz | 2.31501 GHz | -27.49 dBm | -14.49 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31607 GHz | -22.70 dBm | -9.70 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32047 GHz | -28.07 dBm | -3.07 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32401 GHz | -31.08 dBm | -0.08 dB |

Date: 16.AUG.2022 10:30:44

## LTE Band 30 / 10MHz / 16QAM

### Lowest Band Edge / 1 RB

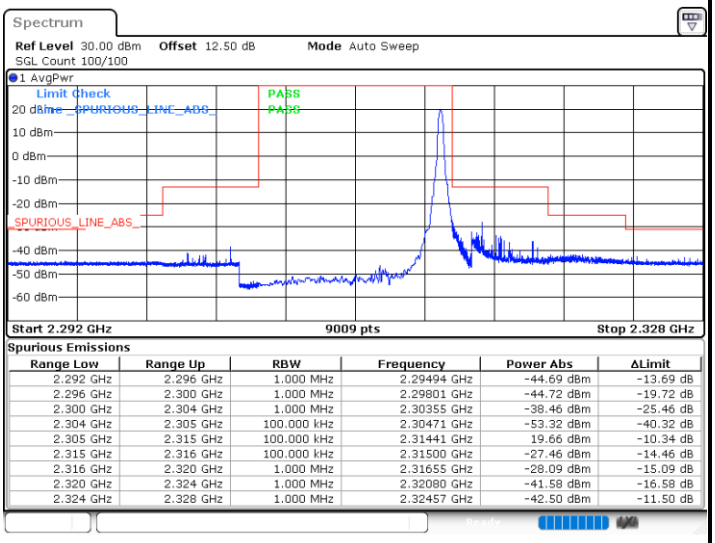



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29311 GHz | -41.29 dBm | -10.29 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29953 GHz | -42.57 dBm | -17.57 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30392 GHz | -31.09 dBm | -18.09 dB |
| 2.304 GHz | 2.305 GHz | 100.000 kHz | 2.30494 GHz | -24.84 dBm | -11.84 dB |
| 2.305 GHz | 2.315 GHz | 100.000 kHz | 2.30558 GHz | 20.45 dBm | -9.55 dB |
| 2.315 GHz | 2.316 GHz | 100.000 kHz | 2.31531 GHz | -53.79 dBm | -40.79 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31824 GHz | -41.25 dBm | -28.25 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32084 GHz | -44.62 dBm | -19.62 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32473 GHz | -44.80 dBm | -13.80 dB |

Date: 16.AUG.2022 09:44:53

### Highest Band Edge / 1 RB

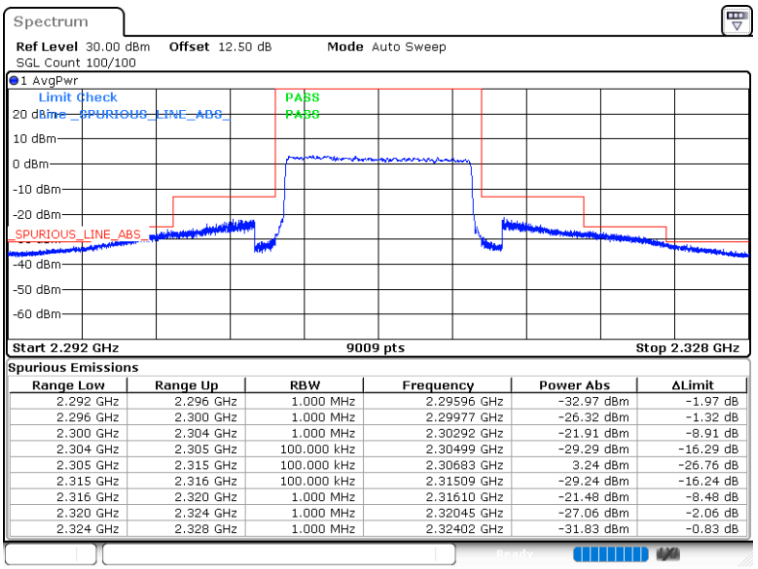



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29494 GHz | -44.69 dBm | -13.69 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29801 GHz | -44.72 dBm | -19.72 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30355 GHz | -38.46 dBm | -25.46 dB |
| 2.304 GHz | 2.305 GHz | 100.000 kHz | 2.30471 GHz | -53.32 dBm | -40.32 dB |
| 2.305 GHz | 2.315 GHz | 100.000 kHz | 2.31441 GHz | 19.66 dBm | -10.34 dB |
| 2.315 GHz | 2.316 GHz | 100.000 kHz | 2.31500 GHz | -27.46 dBm | -14.46 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31655 GHz | -28.09 dBm | -15.09 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32080 GHz | -41.58 dBm | -16.58 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32457 GHz | -42.50 dBm | -11.50 dB |

Date: 16.AUG.2022 09:47:48

### Band Edge / Full RB



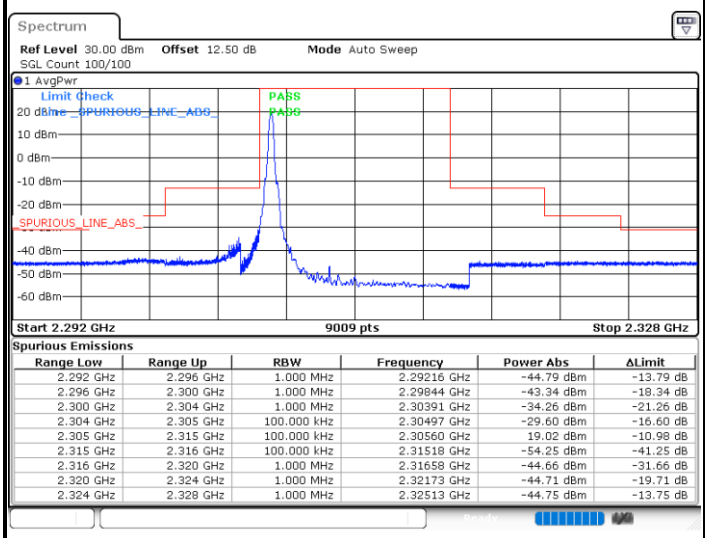

Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29596 GHz | -32.97 dBm | -1.97 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29977 GHz | -26.32 dBm | -1.32 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30292 GHz | -21.91 dBm | -8.91 dB |
| 2.304 GHz | 2.305 GHz | 100.000 kHz | 2.30499 GHz | -29.29 dBm | -16.29 dB |
| 2.305 GHz | 2.315 GHz | 100.000 kHz | 2.30683 GHz | 3.24 dBm | -26.76 dB |
| 2.315 GHz | 2.316 GHz | 100.000 kHz | 2.31509 GHz | -29.24 dBm | -16.24 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31610 GHz | -21.48 dBm | -8.48 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32045 GHz | -27.06 dBm | -2.06 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32402 GHz | -31.83 dBm | -0.83 dB |

Date: 16.AUG.2022 09:50:42

## LTE Band 30 / 10MHz / 64QAM

### Lowest Band Edge / 1 RB

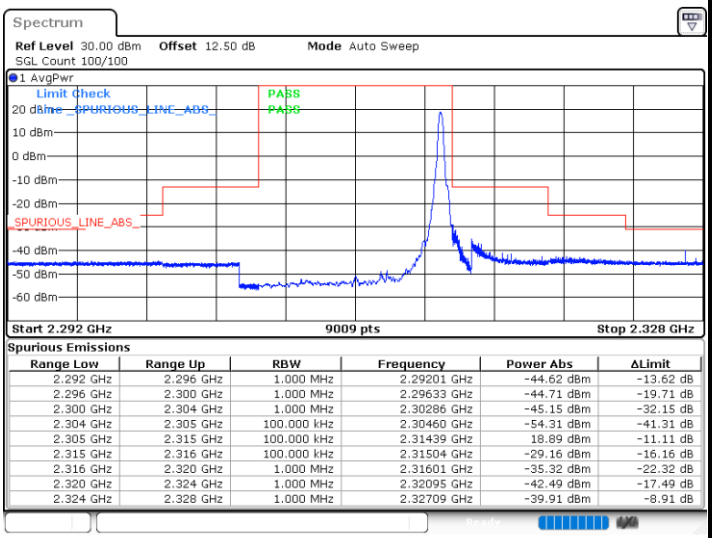



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29216 GHz | -44.79 dBm | -13.79 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29844 GHz | -43.34 dBm | -18.34 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30391 GHz | -34.26 dBm | -21.26 dB |
| 2.304 GHz | 2.305 GHz | 100.000 kHz | 2.30497 GHz | -29.60 dBm | -16.60 dB |
| 2.305 GHz | 2.315 GHz | 100.000 kHz | 2.30560 GHz | 19.02 dBm | -10.98 dB |
| 2.315 GHz | 2.316 GHz | 100.000 kHz | 2.31518 GHz | -54.25 dBm | -41.25 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31658 GHz | -44.66 dBm | -31.66 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32173 GHz | -44.71 dBm | -19.71 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32513 GHz | -44.75 dBm | -13.75 dB |

Date: 16.AUG.2022 09:45:52

### Highest Band Edge / 1 RB

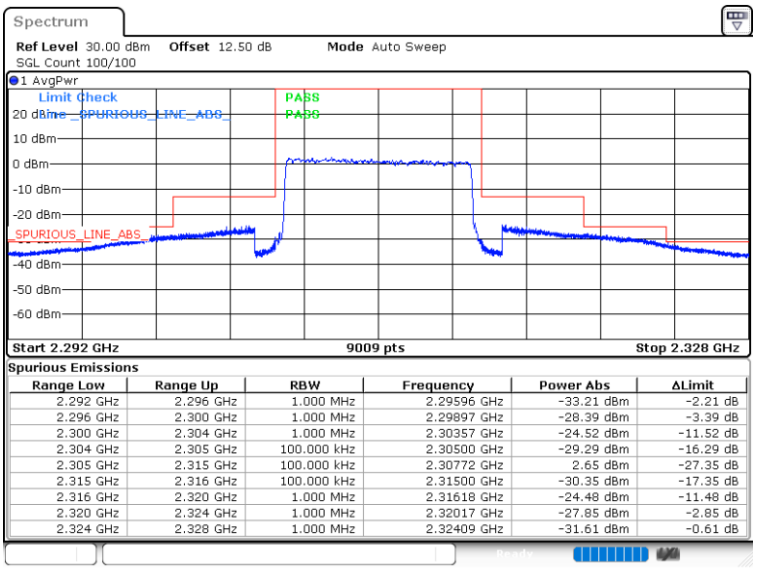



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29201 GHz | -44.62 dBm | -13.62 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29633 GHz | -44.71 dBm | -19.71 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30286 GHz | -45.15 dBm | -32.15 dB |
| 2.304 GHz | 2.305 GHz | 100.000 kHz | 2.30460 GHz | -54.31 dBm | -41.31 dB |
| 2.305 GHz | 2.315 GHz | 100.000 kHz | 2.31439 GHz | 18.89 dBm | -11.11 dB |
| 2.315 GHz | 2.316 GHz | 100.000 kHz | 2.31504 GHz | -29.16 dBm | -16.16 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31601 GHz | -35.32 dBm | -22.32 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32095 GHz | -42.49 dBm | -17.49 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32709 GHz | -39.91 dBm | -8.91 dB |

Date: 16.AUG.2022 09:48:46

### Band Edge / Full RB



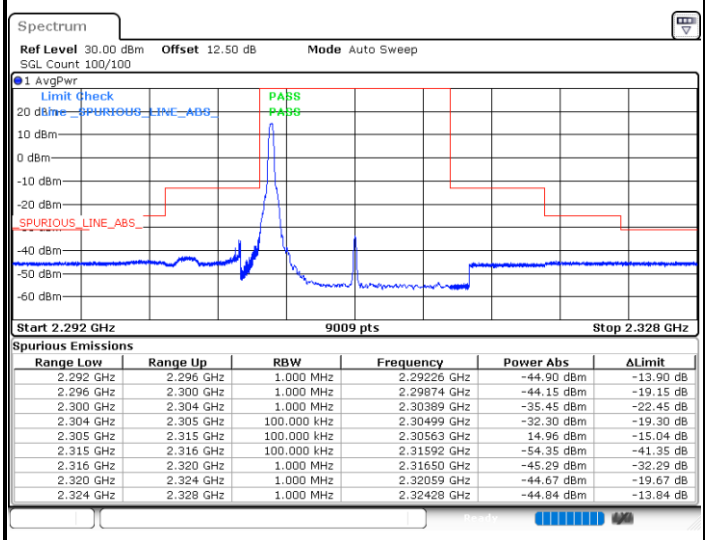

Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29596 GHz | -33.21 dBm | -2.21 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29897 GHz | -28.39 dBm | -3.39 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30357 GHz | -24.52 dBm | -11.52 dB |
| 2.304 GHz | 2.305 GHz | 100.000 kHz | 2.30500 GHz | -29.29 dBm | -16.29 dB |
| 2.305 GHz | 2.315 GHz | 100.000 kHz | 2.30772 GHz | 2.65 dBm | -27.35 dB |
| 2.315 GHz | 2.316 GHz | 100.000 kHz | 2.31500 GHz | -30.35 dBm | -17.35 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31618 GHz | -24.48 dBm | -11.48 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32017 GHz | -27.85 dBm | -2.85 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32409 GHz | -31.61 dBm | -0.61 dB |

Date: 16.AUG.2022 09:51:40

## LTE Band 30 / 10MHz / 256QAM

### Lowest Band Edge / 1 RB

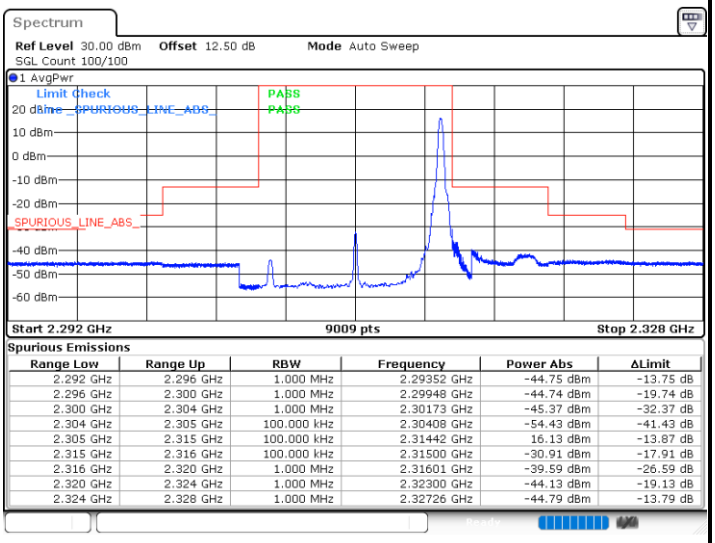



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29226 GHz | -44.90 dBm | -13.90 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29874 GHz | -44.15 dBm | -19.15 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30389 GHz | -35.45 dBm | -22.45 dB |
| 2.304 GHz | 2.305 GHz | 100.000 kHz | 2.30499 GHz | -32.30 dBm | -19.30 dB |
| 2.305 GHz | 2.315 GHz | 100.000 kHz | 2.30563 GHz | 14.96 dBm | -15.04 dB |
| 2.315 GHz | 2.316 GHz | 100.000 kHz | 2.31592 GHz | -54.35 dBm | -41.35 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31650 GHz | -45.29 dBm | -32.29 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32059 GHz | -44.67 dBm | -19.67 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32428 GHz | -44.84 dBm | -13.84 dB |

Date: 16.AUG.2022 09:23:51

### Highest Band Edge / 1 RB

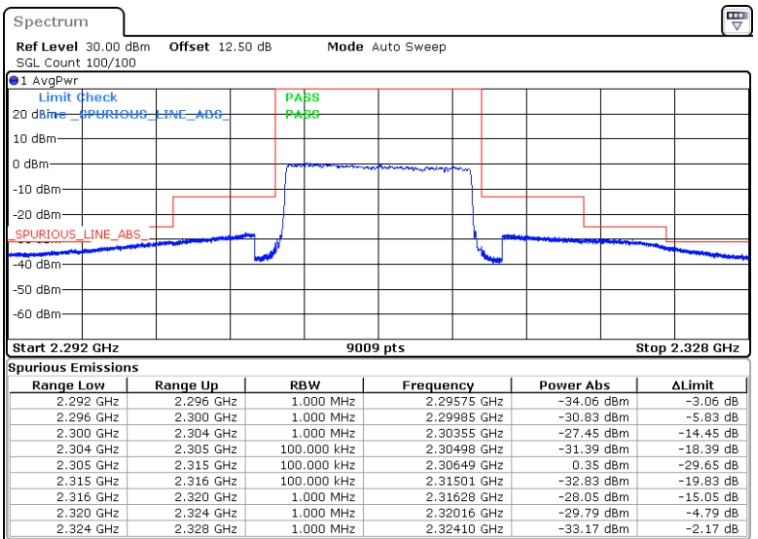



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29352 GHz | -44.75 dBm | -13.75 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29948 GHz | -44.74 dBm | -19.74 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30173 GHz | -45.37 dBm | -32.37 dB |
| 2.304 GHz | 2.305 GHz | 100.000 kHz | 2.30408 GHz | -54.43 dBm | -41.43 dB |
| 2.305 GHz | 2.315 GHz | 100.000 kHz | 2.31442 GHz | 16.13 dBm | -13.87 dB |
| 2.315 GHz | 2.316 GHz | 100.000 kHz | 2.31500 GHz | -30.91 dBm | -17.91 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31601 GHz | -39.59 dBm | -26.59 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32300 GHz | -44.13 dBm | -19.13 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32726 GHz | -44.79 dBm | -13.79 dB |

Date: 16.AUG.2022 09:25:58

### Band Edge / Full RB




Spurious Emissions

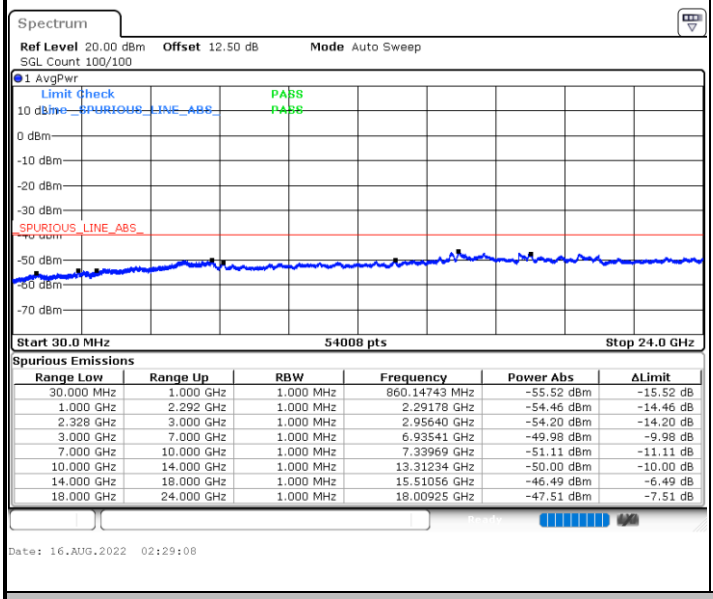
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 2.292 GHz | 2.296 GHz | 1.000 MHz | 2.29575 GHz | -34.06 dBm | -3.06 dB |
| 2.296 GHz | 2.300 GHz | 1.000 MHz | 2.29985 GHz | -30.83 dBm | -5.83 dB |
| 2.300 GHz | 2.304 GHz | 1.000 MHz | 2.30355 GHz | -27.45 dBm | -14.45 dB |
| 2.304 GHz | 2.305 GHz | 100.000 kHz | 2.30498 GHz | -31.39 dBm | -18.39 dB |
| 2.305 GHz | 2.315 GHz | 100.000 kHz | 2.30649 GHz | 0.35 dBm | -29.65 dB |
| 2.315 GHz | 2.316 GHz | 100.000 kHz | 2.31501 GHz | -32.83 dBm | -19.83 dB |
| 2.316 GHz | 2.320 GHz | 1.000 MHz | 2.31628 GHz | -28.05 dBm | -15.05 dB |
| 2.320 GHz | 2.324 GHz | 1.000 MHz | 2.32016 GHz | -29.79 dBm | -4.79 dB |
| 2.324 GHz | 2.328 GHz | 1.000 MHz | 2.32410 GHz | -33.17 dBm | -2.17 dB |

Date: 16.AUG.2022 09:23:19

# Conducted Spurious Emission

## LTE Band 30 / 5MHz

### Lowest Channel / QPSK

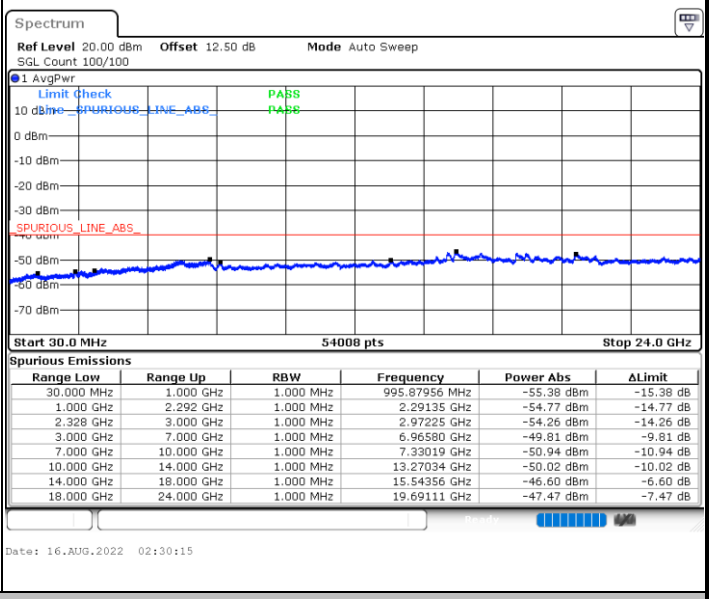



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 30.000 MHz | 1.000 GHz | 1.000 MHz | 860.14743 MHz | -55.52 dBm | -15.52 dB |
| 1.000 GHz | 2.292 GHz | 1.000 MHz | 2.29178 GHz | -54.46 dBm | -14.46 dB |
| 2.328 GHz | 3.000 GHz | 1.000 MHz | 2.95640 GHz | -54.20 dBm | -14.20 dB |
| 3.000 GHz | 7.000 GHz | 1.000 MHz | 6.93541 GHz | -49.98 dBm | -9.98 dB |
| 7.000 GHz | 10.000 GHz | 1.000 MHz | 7.33969 GHz | -51.11 dBm | -11.11 dB |
| 10.000 GHz | 14.000 GHz | 1.000 MHz | 13.31234 GHz | -50.00 dBm | -10.00 dB |
| 14.000 GHz | 18.000 GHz | 1.000 MHz | 15.51056 GHz | -46.49 dBm | -6.49 dB |
| 18.000 GHz | 24.000 GHz | 1.000 MHz | 18.00925 GHz | -47.51 dBm | -7.51 dB |

Date: 16.AUG.2022 02:29:08

### Middle Channel / QPSK

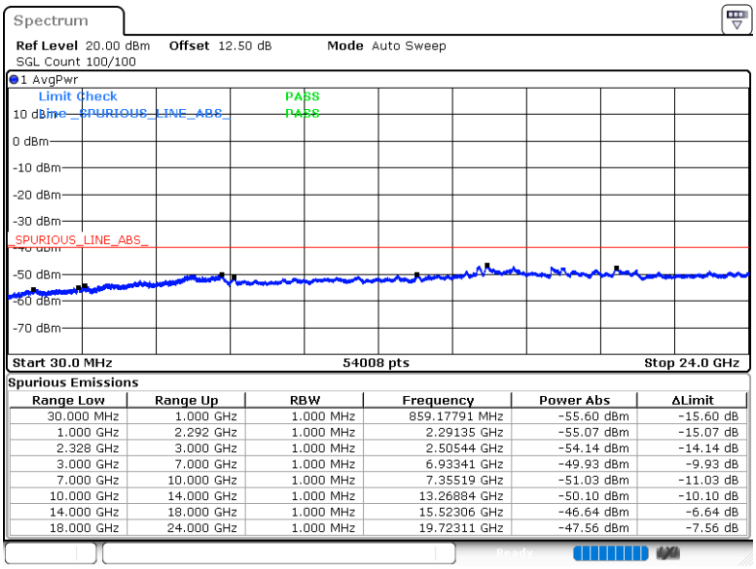



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 30.000 MHz | 1.000 GHz | 1.000 MHz | 995.87956 MHz | -55.38 dBm | -15.38 dB |
| 1.000 GHz | 2.292 GHz | 1.000 MHz | 2.29135 GHz | -54.77 dBm | -14.77 dB |
| 2.328 GHz | 3.000 GHz | 1.000 MHz | 2.97225 GHz | -54.26 dBm | -14.26 dB |
| 3.000 GHz | 7.000 GHz | 1.000 MHz | 6.96580 GHz | -49.81 dBm | -9.81 dB |
| 7.000 GHz | 10.000 GHz | 1.000 MHz | 7.33019 GHz | -50.94 dBm | -10.94 dB |
| 10.000 GHz | 14.000 GHz | 1.000 MHz | 13.27034 GHz | -50.02 dBm | -10.02 dB |
| 14.000 GHz | 18.000 GHz | 1.000 MHz | 15.54356 GHz | -46.60 dBm | -6.60 dB |
| 18.000 GHz | 24.000 GHz | 1.000 MHz | 19.69111 GHz | -47.47 dBm | -7.47 dB |

Date: 16.AUG.2022 02:30:15

### Highest Channel / QPSK

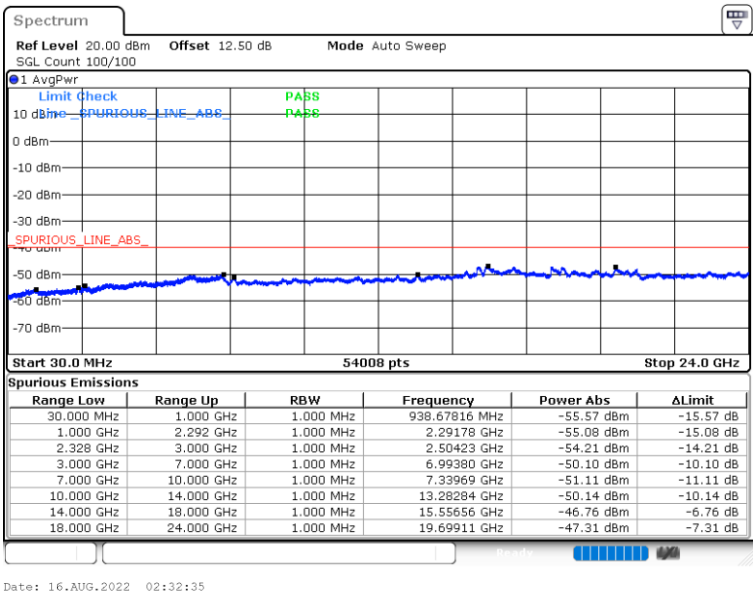



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 30.000 MHz | 1.000 GHz | 1.000 MHz | 859.17791 MHz | -55.60 dBm | -15.60 dB |
| 1.000 GHz | 2.292 GHz | 1.000 MHz | 2.29135 GHz | -55.07 dBm | -15.07 dB |
| 2.328 GHz | 3.000 GHz | 1.000 MHz | 2.50544 GHz | -54.14 dBm | -14.14 dB |
| 3.000 GHz | 7.000 GHz | 1.000 MHz | 6.93341 GHz | -49.93 dBm | -9.93 dB |
| 7.000 GHz | 10.000 GHz | 1.000 MHz | 7.35519 GHz | -51.03 dBm | -11.03 dB |
| 10.000 GHz | 14.000 GHz | 1.000 MHz | 13.26884 GHz | -50.10 dBm | -10.10 dB |
| 14.000 GHz | 18.000 GHz | 1.000 MHz | 15.52306 GHz | -46.64 dBm | -6.64 dB |
| 18.000 GHz | 24.000 GHz | 1.000 MHz | 19.72311 GHz | -47.56 dBm | -7.56 dB |

Date: 16.AUG.2022 02:31:22

| 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 | 938.67816 MHz | -55.57 dBm | -15.57 dB |
| 1.000 GHz | 2.292 GHz | 1.000 MHz | 2.29178 GHz | -55.08 dBm | -15.08 dB |
| 2.328 GHz | 3.000 GHz | 1.000 MHz | 2.50423 GHz | -54.21 dBm | -14.21 dB |
| 3.000 GHz | 7.000 GHz | 1.000 MHz | 6.99380 GHz | -50.10 dBm | -10.10 dB |
| 7.000 GHz | 10.000 GHz | 1.000 MHz | 7.33969 GHz | -51.11 dBm | -11.11 dB |
| 10.000 GHz | 14.000 GHz | 1.000 MHz | 13.28284 GHz | -50.14 dBm | -10.14 dB |
| 14.000 GHz | 18.000 GHz | 1.000 MHz | 15.55656 GHz | -46.76 dBm | -6.76 dB |
| 18.000 GHz | 24.000 GHz | 1.000 MHz | 19.69911 GHz | -47.31 dBm | -7.31 dB |

Date: 16.AUG.2022 02:32:35

# 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 | 0.0000 | PASS |
| 40 | Normal Voltage | 0.0031 | |
| 30 | Normal Voltage | 0.0062 | |
| 20(Ref.) | Normal Voltage | 0.0000 | |
| 10 | Normal Voltage | 0.0006 | |
| 0 | Normal Voltage | 0.0025 | |
| -10 | Normal Voltage | 0.0063 | |
| -20 | Normal Voltage | 0.0059 | |
| -30 | Normal Voltage | 0.0016 | |
| 20 | Maximum Voltage | 0.0049 | |
| 20 | Normal Voltage | 0.0000 | |
| 20 | Battery End Point | 0.0010 | |

**Note:**

1. Normal Voltage = 3.3 V.；Battery End Point (BEP) = 3.135 V.；Maximum Voltage = 4.4 V.
2. The frequency fundamental emissions stay within the authorized frequency block.

# Appendix B. Test Results of Radiated Test

**<Ant. 0>**

## LTE Band 30

| LTE Band 30 / 5MHz / QPSK | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Channel | Frequency ( MHz ) | EIRP ( dBm ) | Limit ( dBm ) | Margin ( dB ) | SPA Reading (dBm) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Lowest | 4610 | -65.69 | -40 | -25.69 | -58.24 | -67.11 | 11.18 | 12.60 | H |
| | 6916 | -61.90 | -40 | -21.90 | -61.6 | -60.02 | 14.02 | 12.14 | H |
| | 9221 | -58.86 | -40 | -18.86 | -62.97 | -54.10 | 15.94 | 11.18 | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | 4610 | -64.81 | -40 | -24.81 | -57.39 | -66.23 | 11.18 | 12.60 | V |
| | 6916 | -61.49 | -40 | -21.49 | -61.03 | -59.61 | 14.02 | 12.14 | V |
| | 9221 | -59.57 | -40 | -19.57 | -62.74 | -54.81 | 15.94 | 11.18 | V |
| | | | | | | | | | V |
| | | | | | | | | | V |
| | | | | | | | | | V |
| | | | | | | | | | V |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Middle | 4615 | -65.27 | -40 | -25.27 | -57.83 | -66.65 | 11.21 | 12.59 | H |
| | 6923 | -62.11 | -40 | -22.11 | -61.81 | -60.20 | 14.02 | 12.11 | H |
| | 9231 | -58.94 | -40 | -18.94 | -63.05 | -54.17 | 15.94 | 11.17 | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | 4615 | -64.68 | -40 | -24.68 | -57.28 | -66.06 | 11.21 | 12.59 | V |
| | 6923 | -61.97 | -40 | -21.97 | -61.52 | -60.06 | 14.02 | 12.11 | V |
| | 9231 | -60.03 | -40 | -20.03 | -63.19 | -55.26 | 15.94 | 11.17 | V |
| | | | | | | | | | V |
| | | | | | | | | | V |
| | | | | | | | | | V |
| | | | | | | | | | V |
| Highest | 4620 | -65.51 | -40 | -25.51 | -58.07 | -66.87 | 11.23 | 12.59 | H |
| | 6931 | -61.57 | -40 | -21.57 | -61.26 | -59.62 | 14.03 | 12.08 | H |
| | 9241 | -58.91 | -40 | -18.91 | -63.01 | -54.13 | 15.94 | 11.16 | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | 4620 | -65.19 | -40 | -25.19 | -57.8 | -66.55 | 11.23 | 12.59 | V |
| | 6931 | -61.16 | -40 | -21.16 | -60.71 | -59.21 | 14.03 | 12.08 | V |
| | 9241 | -59.83 | -40 | -19.83 | -62.98 | -55.05 | 15.94 | 11.16 | V |
| | | | | | | | | | V |
| | | | | | | | | | V |
| | | | | | | | | | V |
| | | | | | | | | | V |

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