FCC RF Test Report

APPLICANT	:	HMD Global Oy
EQUIPMENT	:	GSM/WCDMA/LTE Mobile Phone
BRAND NAME	:	NOKIA
MODEL NAME	:	TA-1386
FCC ID	:	2AJOTTA-1386
STANDARD	:	47 CFR Part 2, 22(H), 27(M)
CLASSIFICATION	:	Licensed Non-Broadcast Transmitter Held toEar(TNE)
TEST DATE(S)	:	Jul. 30, 2021 ~ Aug. 05, 2021

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

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

Jason Jia

Reviewed by: Jason Jia / Supervisor

Alexwang

Approved by: Alex Wang / Manager

ACCREDITED
Cert #5145.02

Sporton International (Kunshan) Inc.

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

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APPENDIX A. TEST RESULTS OF CONDUCTED TEST

APPENDIX B. TEST RESULTS OF RADIATED TEST

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG170505B	Rev. 01	Initial issue of report	Aug. 12, 2021

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	—	Report Only	-
	§22.913(a)(5)	Effective Radiated Power (Band 5)	ERP < 7 Watt	PASS	-
	§27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 7)	EIRP < 2Watt		-
3.5	N/A	Peak-to-Average Ratio	<13 dB	PASS	-
3.6	§2.1049	Occupied Bandwidth	—	Report Only	-
3.7	§2.1051 §22.917(a)	Conducted Band Edge Measurement (Band 5)	< 43+10log10(P[Watts])	PASS	-
	§27.53(m)(4)	Conducted Band Edge Measurement (Band 7)	§27.53(m)(4)		
3.8	§2.1051 §22.917(a)	Conducted Spurious Emission (Band 5)	< 43+10log10(P[Watts])	PASS	-
	§2.1051 §27.53(m)(4)	Conducted Spurious Emission (Band 7)	< 55+10log$_{10}$(P[Watts])		
3.9	§2.1055 §22.355	Frequency Stability Temperature & Voltage	< 2.5 ppm for Part 22	PASS	-
	§2.1055 §24.235 §27.54		Within Authorized Band		

Report Section	FCC Rule	Description	Limit	Result	Remark
4.4	§2.1053 §22.917(a)	Radiated Spurious Emission (Band 5)	< 43+10log$_{10}$(P[Watts])	PASS	Under limit 20.43 dB at 10100.000 MHz
	§2.1053 §27.53(m)(4)	Radiated Spurious Emission (Band 7)	< 55+10log$_{10}$(P[Watts])		

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Applicant

HMD Global Oy
Bertel Jungin aukio 9, 02600 Espoo, Finland

1.2 Manufacturer

HMD Global Oy
Bertel Jungin aukio 9, 02600 Espoo, Finland

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	GSM/WCDMA/LTE Mobile Phone
Brand Name	NOKIA
Model Name	TA-1386
FCC ID	2AJOTTA-1386
IMEI Code	Conducted: 004402972549608 Radiation: 004402972550044/004402972552040
HW Version	HW0112
SW Version	0.2105.11.10
EUT Stage	Identical Prototype

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	LTE Band 5 : 824 MHz ~ 849 MHz LTE Band 7 : 2500 MHz ~ 2570 MHz
Rx Frequency	LTE Band 5 : 869 MHz ~ 894 MHz LTE Band 7 : 2620 MHz ~ 2690 MHz
Bandwidth	LTE Band 5 : 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 7 : 5MHz/ 10MHz / 15MHz / 20MHz
Maximum Output Power to Antenna	LTE Band 5 : 22.97 dBm LTE Band 7 : 23.42 dBm
Antenna Gain	LTE Band 5 : -2.7 dBi LTE Band 7 : -2.46 dBi
Type of Modulation	QPSK / 16QAM

1.5 Modification of EUT

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

1.6 Maximum ERP/EIRP Power and Emission Designator

LTE Band 5		QPSK		16QAM	
BW (MHz)	Frequency Range (MHz)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)
10	829.0 ~ 844.0	0.0649	9M03G7D	0.0526	9M05W7D
LTE Band 7		**QPSK**		**16QAM**	
BW (MHz)	**Frequency Range (MHz)**	**Maximum EIRP(W)**	**Emission Designator (99%OBW)**	**Maximum EIRP(W)**	**Emission Designator (99%OBW)**
20	2510.0 ~ 2560.0	0.1247	18M3G7D	0.0991	18M5W7D

1.7 Testing Location

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

Test Firm	Sporton International (Kunshan) Inc.		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	03CH04-KS TH01-KS	CN1257	314309

1.8 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH04-KS	AUDIX	E3	6.2009-8-24a

1.9 Applicable Standards

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

- 47 CFR Part 2, 22(H), 27M
- ANSI C63.26-2015
- FCC KDB 971168 D01 Power Meas License Digital Systems v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark:

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

2 Test Configuration of Equipment Under Test

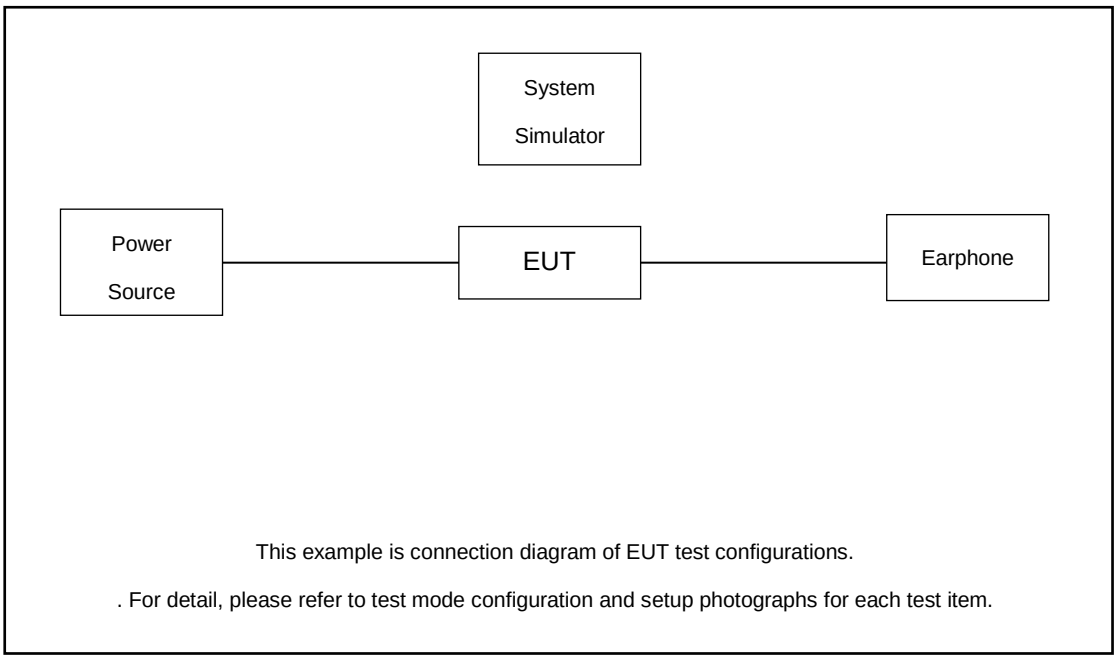
2.1 Test Mode

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

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

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

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	Power Supply	GWINSTEK	PSS-2002	N/A	N/A	Unshielded, 1.8 m
2.	Base Station	Anritsu	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 4.50 dB

Example :

Offset(dB) = RF cable loss(dB)

= 4.50 (dB)

2.5 Frequency List of Low/Middle/High Channels

LTE Band 5 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
10	Channel	20450	20525	20600
	Frequency	829	836.5	844
5	Channel	20425	20525	20625
	Frequency	826.5	836.5	846.5
3	Channel	20415	20525	20635
	Frequency	825.5	836.5	847.5
1.4	Channel	20407	20525	20643
	Frequency	824.7	836.5	848.3

LTE Band 7 Channel and Frequency List				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
20	Channel	20850	21100	21350
	Frequency	2510	2535	2560
15	Channel	20825	21100	21375
	Frequency	2507.5	2535	2562.5
10	Channel	20800	21100	21400
	Frequency	2505	2535	2565
5	Channel	20775	21100	21425
	Frequency	2502.5	2535	2567.5

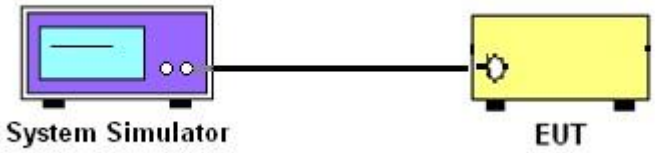
3 Conducted Test Items

3.1 Measuring Instruments

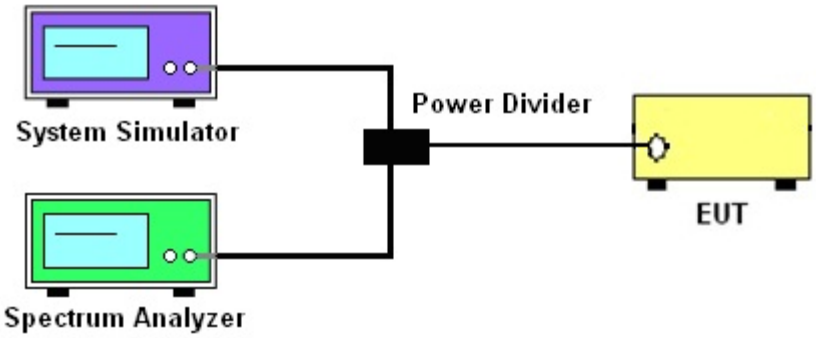
See list of measuring instruments of this test report.

3.2 Test Setup

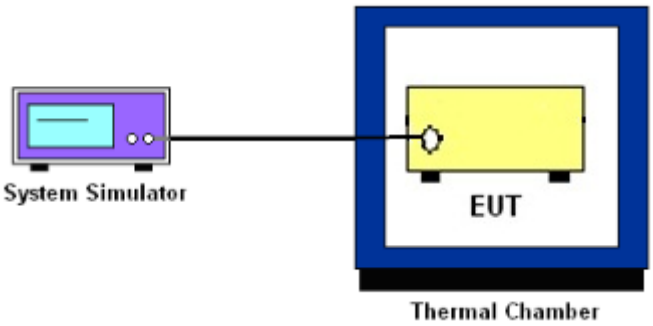
3.2.1 Conducted Output Power



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



3.2.3 Frequency Stability



3.3 Test Result of Conducted Test

Please refer to Appendix A.

3.4 Conducted Output Power and ERP/EIRP

3.4.1 Description of the Conducted Output Power Measurement and ERP/EIRP Measurement

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

The ERP of mobile transmitters must not exceed 7 Watts for LTE Band 5

The EIRP of mobile transmitters must not exceed 2 Watts for Band 7

According to KDB 412172 D01 Power Approach,

EIRP = $P_T + G_T – L_C$, ERP = EIRP -2.15, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

3.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2
2. The transmitter output port was connected to the system simulator.
3. Set EUT at maximum power through the system simulator.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure and record the power level from the system simulator.

3.5 Peak-to-Average Ratio

3.5.1 Description of the PAR Measurement

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

3.5.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2.3.4 (CCDF).
2. The EUT was connected to spectrum and system simulator via a power divider.
3. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
4. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
5. Record the deviation as Peak to Average Ratio.

3.6 Occupied Bandwidth

3.6.1 Description of Occupied Bandwidth Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

3.6.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.4
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be between two and five times the anticipated OBW.
4. The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
5. Set the detection mode to peak, and the trace mode to max hold.
6. Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace.
   (this is the reference value)
7. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
8. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “–X dB down amplitude” determined in step 6. If a marker is below this “-X dB down amplitude” value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.
9. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

3.7 Conducted Band Edge

3.7.1 Description of Conducted Band Edge Measurement

22.917(a)

For operations in the 824 – 849 MHz band, the FCC limit is 43 + 10log$_{10}$(P[Watts]) dB below the transmitter power P(Watts) in a 100kHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

27.53(m)(4)

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

3.7.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured.
4. Set RBW >= 1% 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 usedSet 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.

   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.
8. For LTE Band 7, the other 40 dB, and 55 dB have additionally applied same calculation above.

3.8 Conducted Spurious Emission

3.8.1 Description of Conducted Spurious Emission Measurement

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

For Band 7:

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

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

3.8.2 Test Procedures

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

3.9 Frequency Stability

3.9.1 Description of Frequency Stability Measurement

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

3.9.2 Test Procedures for Temperature Variation

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

3.9.3 Test Procedures for Voltage Variation

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

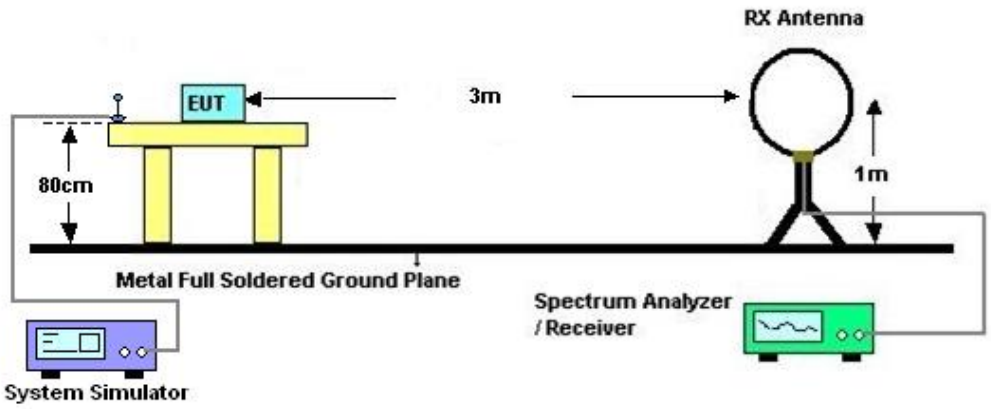
4 Radiated Test Items

4.1 Measuring Instruments

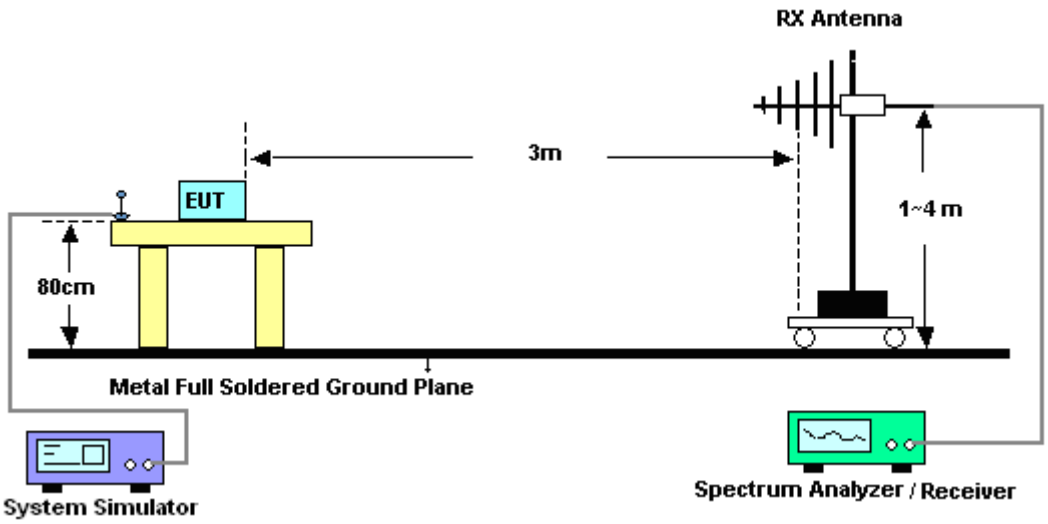
See list of measuring instruments of this test report.

4.2 Test Setup

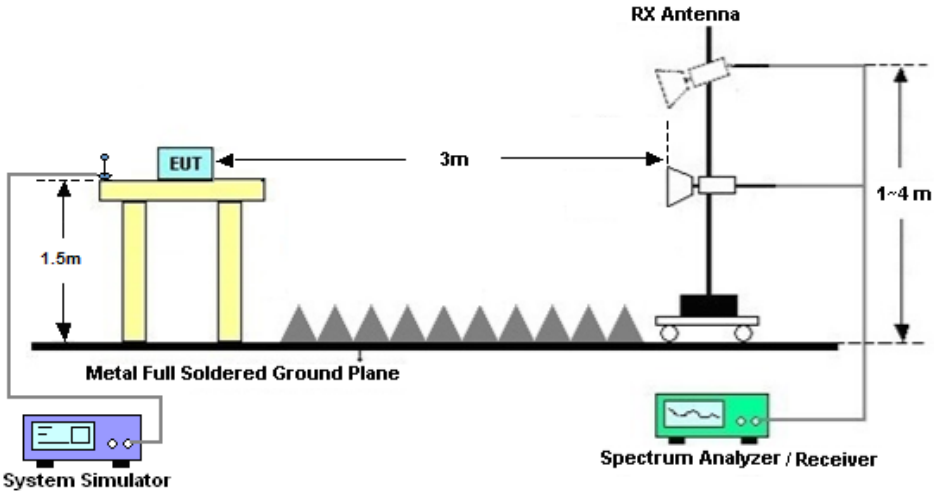
4.2.1 For radiated test below 30MHz



4.2.2 For radiated test from 30MHz to 1GHz



4.2.3 For radiated test above 1GHz



4.3 Test Result of Radiated Test

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

Please refer to Appendix B.

4.4 Radiated Spurious Emission

4.4.1 Description of Radiated Spurious Emission

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

For Band 7

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

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

4.4.2 Test Procedures

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

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Nov. 01, 2020	Aug. 04, 2021~ Aug. 05, 2021	Oct. 31, 2021	Conducted (TH01-KS)
Power Divider	TOJOIN	PS-2SM-04 265	60.06.020.007 7	0.4GHz~26.5GHz	Dec. 26, 2020	Aug. 04, 2021~ Aug. 05, 2021	Dec. 25, 2021	Conducted (TH01-SZ)
Temperature & humidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 03, 2021	Aug. 04, 2021~ Aug. 05, 2021	Jul. 02, 2022	Conducted (TH01-SZ)
Thermometer & hygrometer	SHENTUO	HTC-1	KS100807JCG S04	HTC-106	Apr. 14, 2021	Aug. 04, 2021~ Aug. 05, 2021	Apr. 13, 2022	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44G,MAX 30dB	Apr. 13, 2021	Jul. 30, 2021	Apr. 12, 2022	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 01, 2020	Jul. 30, 2021	Oct. 31, 2021	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	May 30, 2021	Jul. 30, 2021	May 29, 2022	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1356	1GHz~18GHz	Apr. 18, 2021	Jul. 30, 2021	Apr. 17, 2022	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101115	18GHz~40GHz	Jan. 06, 2021	Jul. 30, 2021	Jan. 05, 2022	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Jan. 06, 2021	Jul. 30, 2021	Jan. 05, 2022	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40G GA	060728	18~40GHz	Jan. 07, 2021	Jul. 30, 2021	Jan. 06, 2022	Radiation (03CH04-KS)
high gain Amplifier	MITEQ	AMF-7D-00 101800-30-1 0P	2025788	1Ghz-18Ghz	Jan. 06, 2021	Jul. 30, 2021	Jan. 05, 2022	Radiation (03CH04-KS)
Amplifier	Keysight	83017A	MY57280106	500MHz~26.5GHz	Oct. 14, 2020	Jul. 30, 2021	Oct. 13, 2021	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Jul. 30, 2021	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Jul. 30, 2021	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Jul. 30, 2021	NCR	Radiation (03CH04-KS)
Thermometer & hygrometer	SHENTUO	HTC-1	KS150428JCG S01	HTC-109	Apr. 14, 2021	Jul. 30, 2021	Apr. 13, 2022	Radiation (03CH04-KS)

NCR: No Calibration Required

6 Uncertainty of Evaluation

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

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

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

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

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

Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power) and ERP/EIRP

LTE Band 5:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	ERP(W)		
Channel				20450	20525	20600			
Frequency (MHz)				829	836.5	844	L	M	H
10	QPSK	1	0	22.80	22.97	22.94	0.0624	0.0649	0.0644
10	QPSK	1	49	22.87	22.90	22.95	0.0634	0.0638	0.0646
10	QPSK	50	0	21.80	21.88	21.82	0.0495	0.0505	0.0498
10	16QAM	1	0	21.77	21.84	22.06	0.0492	0.0500	0.0526
Channel				20425	20525	20625	ERP(W)		
Frequency (MHz)				826.5	836.5	846.5	L	M	H
5	QPSK	1	0	22.77	22.75	22.95	0.0619	0.0617	0.0646
5	16QAM	1	0	21.96	21.88	21.58	0.0514	0.0505	0.0471
Channel				20415	20525	20635	ERP(W)		
Frequency (MHz)				825.5	836.5	847.5	L	M	H
3	QPSK	1	0	22.60	22.80	22.91	0.0596	0.0624	0.0640
3	16QAM	1	0	21.63	21.71	21.92	0.0476	0.0485	0.0509
Channel				20407	20525	20643	ERP(W)		
Frequency (MHz)				824.7	836.5	848.3	L	M	H
1.4	QPSK	1	0	22.92	22.96	22.83	0.0641	0.0647	0.0628
1.4	16QAM	1	0	21.91	22.05	21.73	0.0508	0.0525	0.0488

LTE Band 7:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	EIRP(W)		
Channel				20850	20850	21350			
Frequency (MHz)				2510	2535	2560	L	M	H
20	QPSK	1	0	23.29	23.42	23.26	0.1211	0.1247	0.1202
20	QPSK	1	99	23.22	23.34	23.30	0.1191	0.1225	0.1213
20	QPSK	100	0	22.37	22.28	22.25	0.0979	0.0959	0.0953
20	16QAM	1	0	22.22	22.26	22.42	0.0946	0.0955	0.0991
Channel				20825	21100	21375	EIRP(W)		
Frequency (MHz)				2507.5	2535	2562.5	L	M	H
15	QPSK	1	0	23.33	23.32	23.29	0.1222	0.1219	0.1211
15	16QAM	1	0	22.29	22.19	22.42	0.0962	0.0940	0.0991
Channel				20800	21100	21400	EIRP(W)		
Frequency (MHz)				2505	2535	2565	L	M	H
10	QPSK	1	0	23.14	23.31	23.10	0.1169	0.1216	0.1159
10	16QAM	1	0	22.14	22.34	22.39	0.0929	0.0973	0.0984
Channel				20775	21100	21425	EIRP(W)		
Frequency (MHz)				2502.5	2535	2567.5	L	M	H
5	QPSK	1	0	23.11	23.33	23.33	0.1161	0.1222	0.1222
5	16QAM	1	0	22.20	22.40	22.30	0.0942	0.0986	0.0964

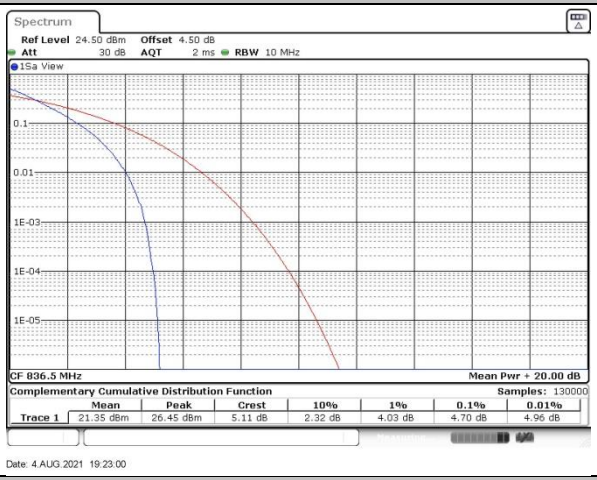
LTE Band 5

Peak-to-Average Ratio

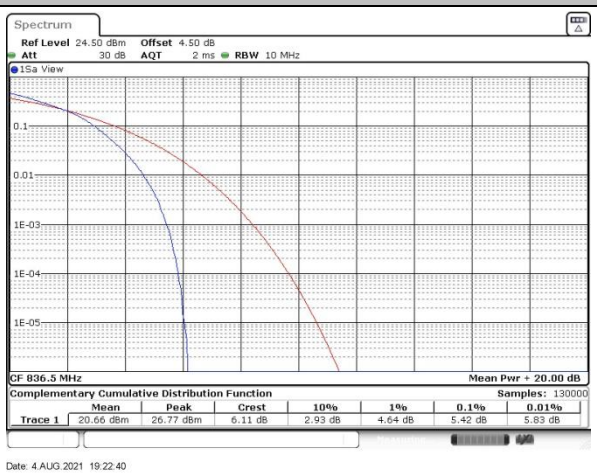
Mode	LTE Band 5 / 10MHz		
Mod.	QPSK	16QAM	Limit: 13dB
RB Size	Full RB	Full RB	Result
Middle CH	4.70	5.42	PASS

LTE Band 5 / 10MHz

Middle Channel / Full RB/ QPSK



Middle Channel / Full RB/ 16QAM

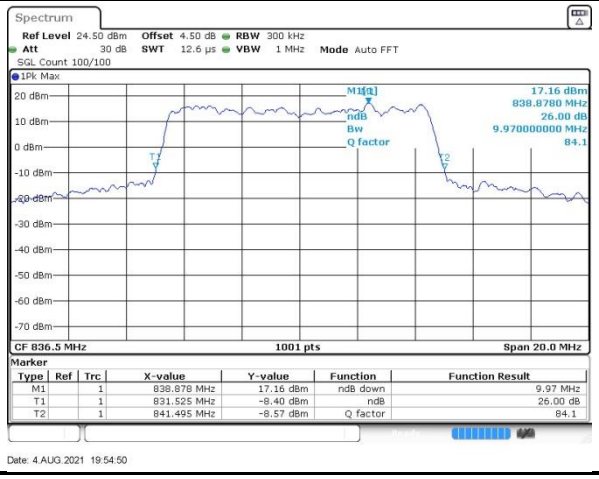


26dB Bandwidth

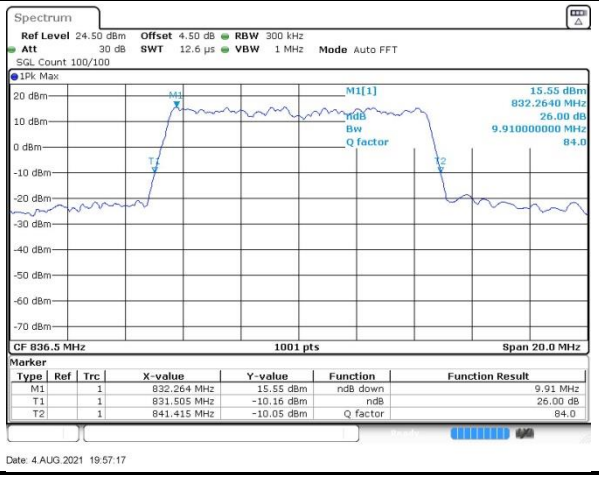
Mode	LTE Band 5 : 26dB BW(MHz)	
BW	10MHz	
Mod.	QPSK	16QAM
Middle CH	9.97	9.91

LTE Band 5

Middle Channel / 10MHz / QPSK



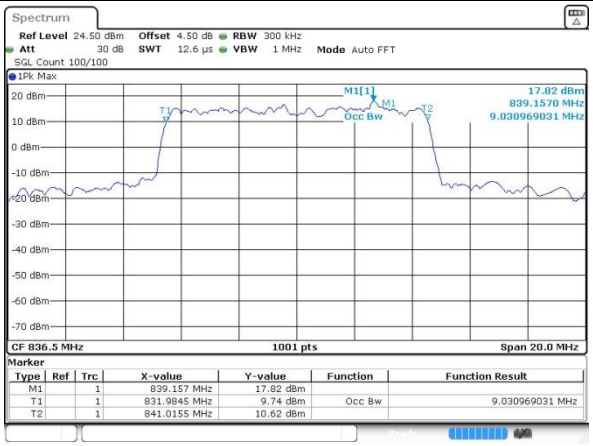
Middle Channel / 10MHz / 16QAM

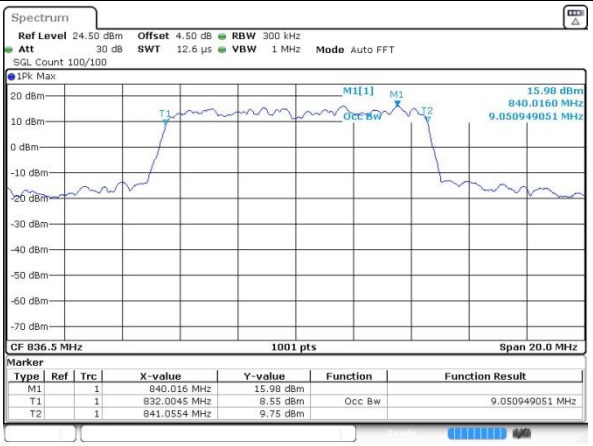


Occupied Bandwidth

Mode	LTE Band 5 : 99%OBW(MHz)	
BW	10MHz	
Mod.	QPSK	16QAM
Middle CH	9.03	9.05

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

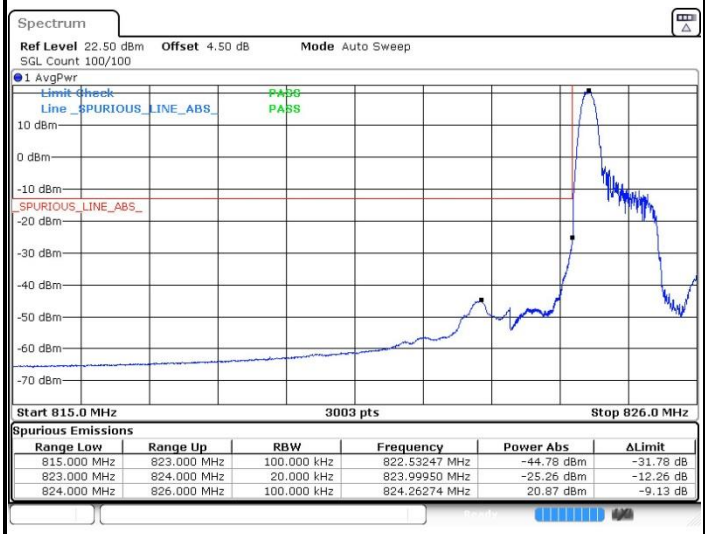




Conducted Band Edge

LTE Band 5 / 1.4MHz / QPSK

Lowest Band Edge / 1RB

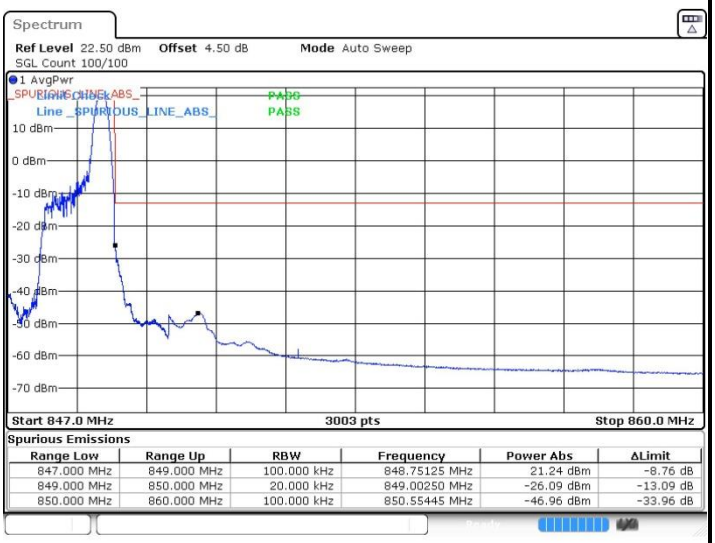


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.53247 MHz	-44.78 dBm	-31.78 dB
823.000 MHz	824.000 MHz	20.000 kHz	823.99950 MHz	-25.26 dBm	-12.26 dB
824.000 MHz	826.000 MHz	100.000 kHz	824.26274 MHz	20.87 dBm	-9.13 dB

Date: 4.AUG.2021 18:05:50

Highest Band Edge / 1RB

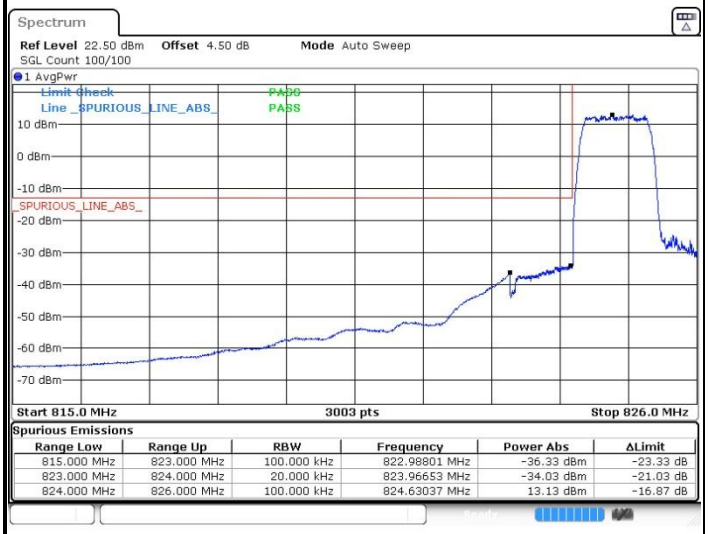


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
847.000 MHz	849.000 MHz	100.000 kHz	848.75125 MHz	21.24 dBm	-8.76 dB
849.000 MHz	850.000 MHz	20.000 kHz	849.00250 MHz	-26.09 dBm	-13.09 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.55445 MHz	-46.96 dBm	-33.96 dB

Date: 4.AUG.2021 18:17:36

Lowest Band Edge / Full RB

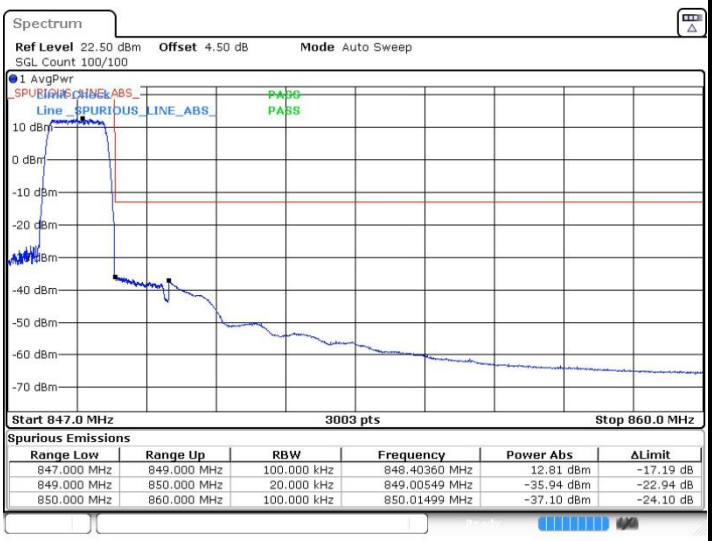


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.98801 MHz	-36.33 dBm	-23.33 dB
823.000 MHz	824.000 MHz	20.000 kHz	823.96653 MHz	-34.03 dBm	-21.03 dB
824.000 MHz	826.000 MHz	100.000 kHz	824.63037 MHz	13.13 dBm	-16.87 dB

Date: 4.AUG.2021 18:09:08

Highest Band Edge / Full RB



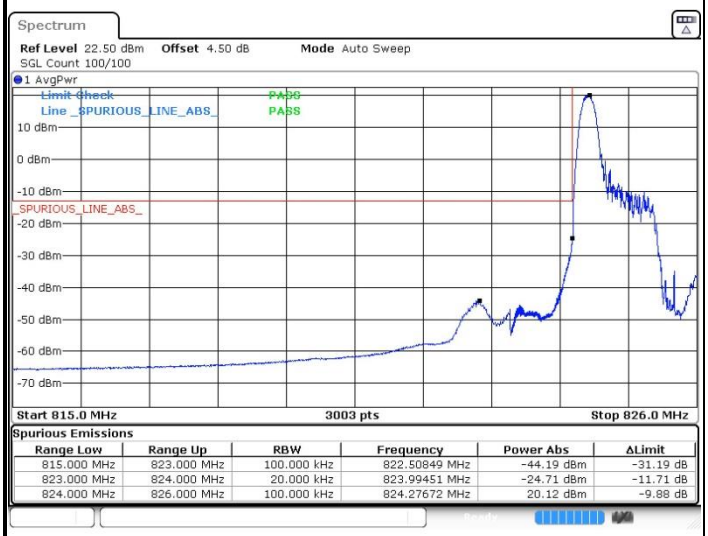
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
847.000 MHz	849.000 MHz	100.000 kHz	848.40360 MHz	12.81 dBm	-17.19 dB
849.000 MHz	850.000 MHz	20.000 kHz	849.00549 MHz	-35.94 dBm	-22.94 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.01499 MHz	-37.10 dBm	-24.10 dB

Date: 4.AUG.2021 18:14:18

LTE Band 5 / 1.4MHz / 16QAM

Lowest Band Edge / 1 RB

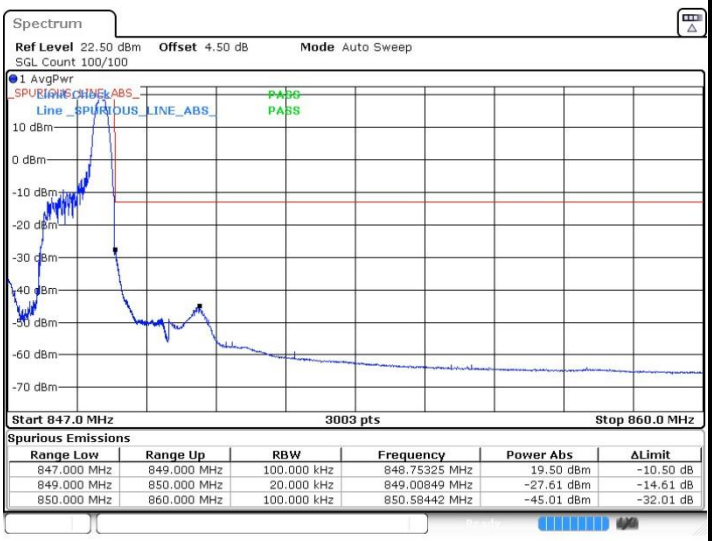


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.50849 MHz	-44.19 dBm	-31.19 dB
823.000 MHz	824.000 MHz	20.000 kHz	823.99451 MHz	-24.71 dBm	-11.71 dB
824.000 MHz	826.000 MHz	100.000 kHz	824.27672 MHz	20.12 dBm	-9.88 dB

Date: 4.AUG.2021 18:07:29

Highest Band Edge / 1 RB

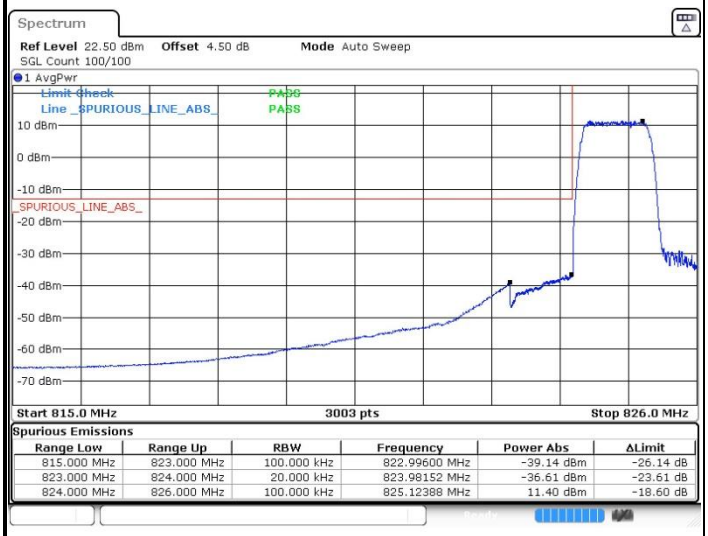


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
847.000 MHz	849.000 MHz	100.000 kHz	848.75325 MHz	19.50 dBm	-10.50 dB
849.000 MHz	850.000 MHz	20.000 kHz	849.00849 MHz	-27.61 dBm	-14.61 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.58442 MHz	-45.01 dBm	-32.01 dB

Date: 4.AUG.2021 18:19:14

Lowest Band Edge / Full RB

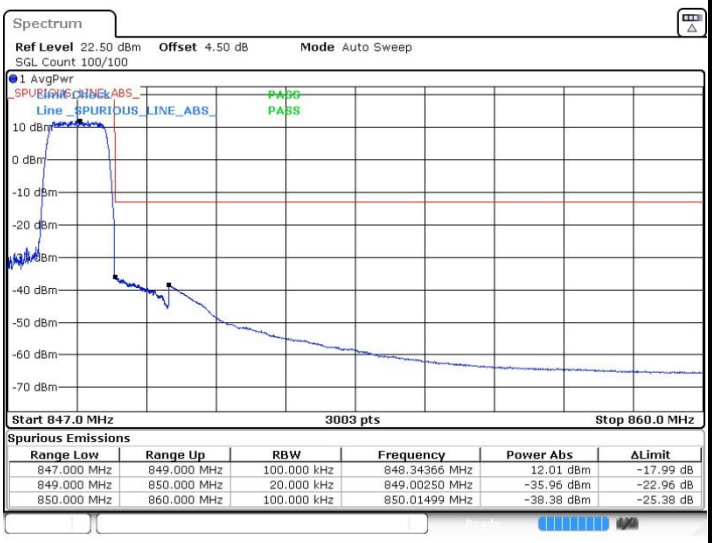


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.99600 MHz	-39.14 dBm	-26.14 dB
823.000 MHz	824.000 MHz	20.000 kHz	823.98152 MHz	-36.61 dBm	-23.61 dB
824.000 MHz	826.000 MHz	100.000 kHz	825.12388 MHz	11.40 dBm	-18.60 dB

Date: 4.AUG.2021 18:10:47

Highest Band Edge / Full RB



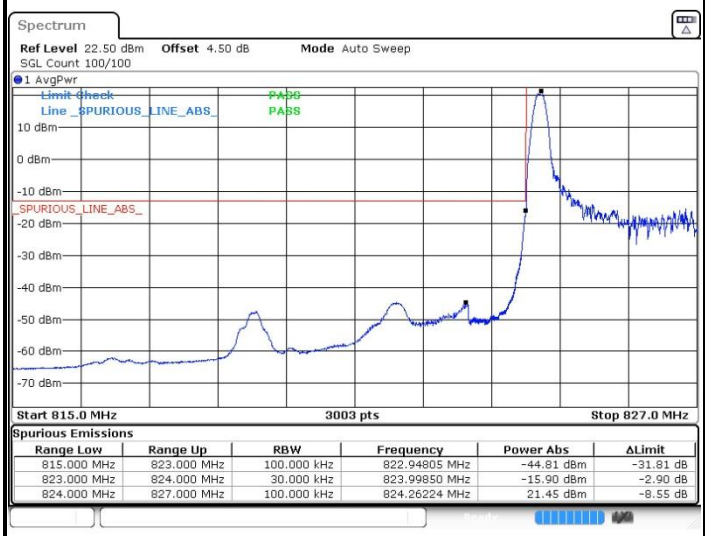
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
847.000 MHz	849.000 MHz	100.000 kHz	848.34366 MHz	12.01 dBm	-17.99 dB
849.000 MHz	850.000 MHz	20.000 kHz	849.00250 MHz	-35.96 dBm	-22.96 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.01499 MHz	-38.38 dBm	-25.38 dB

Date: 4.AUG.2021 18:15:57

LTE Band 5 / 3MHz / QPSK

Lowest Band Edge / 1RB

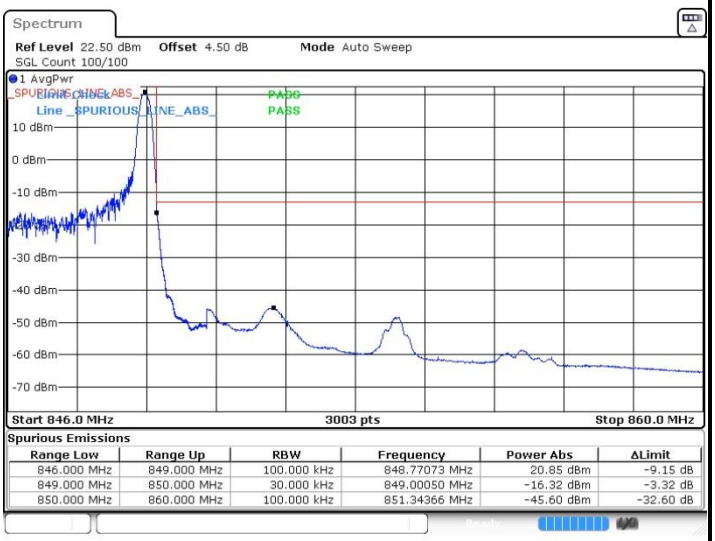


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.94805 MHz	-44.81 dBm	-31.81 dB
823.000 MHz	824.000 MHz	30.000 kHz	823.99850 MHz	-15.90 dBm	-2.90 dB
824.000 MHz	827.000 MHz	100.000 kHz	824.26224 MHz	21.45 dBm	-8.55 dB

Date: 4.AUG.2021 18:21:17

Highest Band Edge / 1 RB

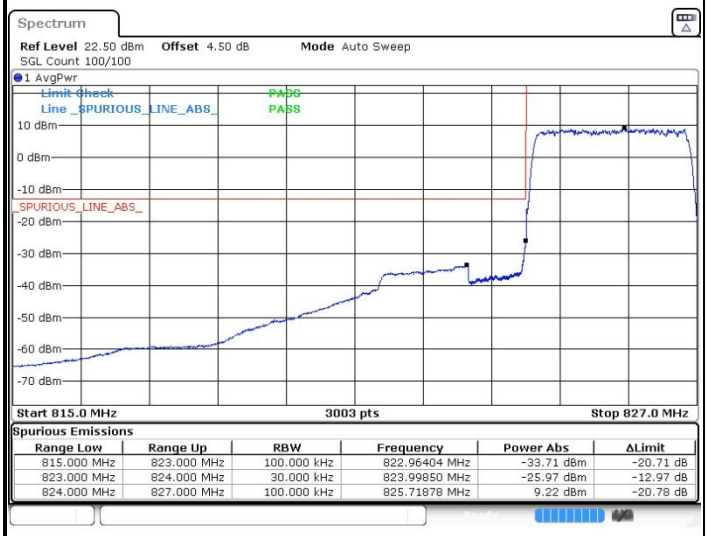


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
846.000 MHz	849.000 MHz	100.000 kHz	848.77073 MHz	20.85 dBm	-9.15 dB
849.000 MHz	850.000 MHz	30.000 kHz	849.00050 MHz	-16.32 dBm	-3.32 dB
850.000 MHz	860.000 MHz	100.000 kHz	851.34366 MHz	-45.60 dBm	-32.60 dB

Date: 4.AUG.2021 18:28:40

Lowest Band Edge / Full RB

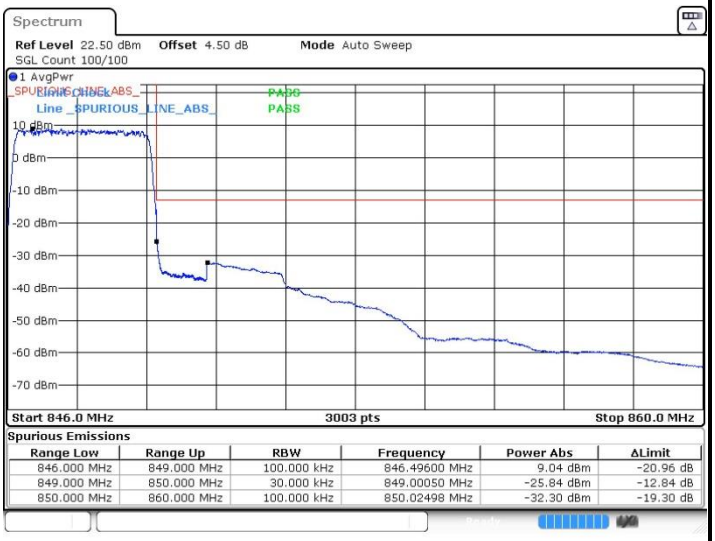


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.96404 MHz	-33.71 dBm	-20.71 dB
823.000 MHz	824.000 MHz	30.000 kHz	823.99850 MHz	-25.97 dBm	-12.97 dB
824.000 MHz	827.000 MHz	100.000 kHz	825.71878 MHz	9.22 dBm	-20.78 dB

Date: 4.AUG.2021 18:24:35

Highest Band Edge / Full RB



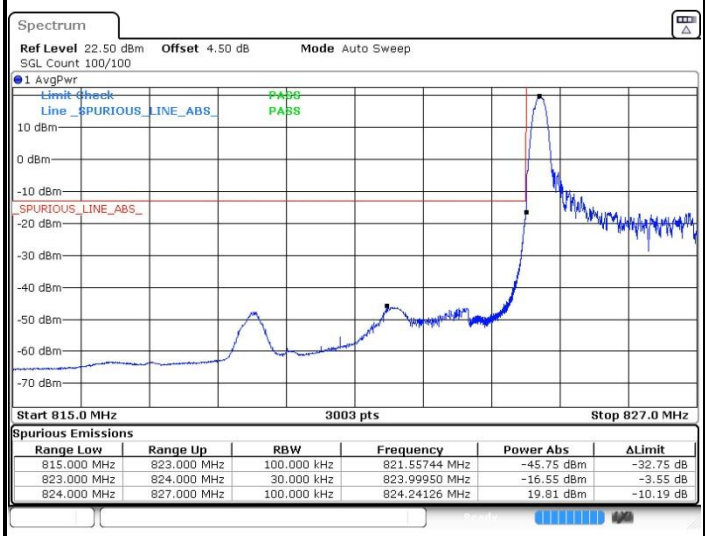
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
846.000 MHz	849.000 MHz	100.000 kHz	846.49600 MHz	9.04 dBm	-20.96 dB
849.000 MHz	850.000 MHz	30.000 kHz	849.00050 MHz	-25.84 dBm	-12.84 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.02498 MHz	-32.30 dBm	-19.30 dB

Date: 4.AUG.2021 18:31:58

LTE Band 5 / 3MHz / 16QAM

Lowest Band Edge / 1 RB

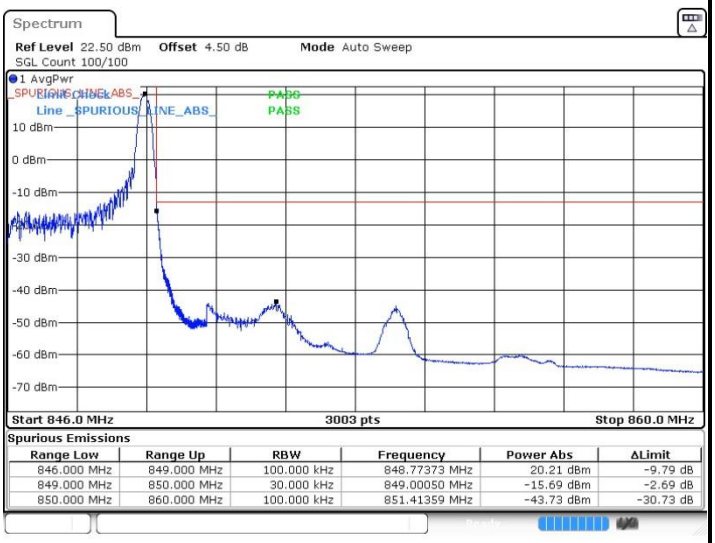


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	821.55744 MHz	-45.75 dBm	-32.75 dB
823.000 MHz	824.000 MHz	30.000 kHz	823.99950 MHz	-16.55 dBm	-3.55 dB
824.000 MHz	827.000 MHz	100.000 kHz	824.24126 MHz	19.81 dBm	-10.19 dB

Date: 4.AUG.2021 18:22:56

Highest Band Edge /1 RB

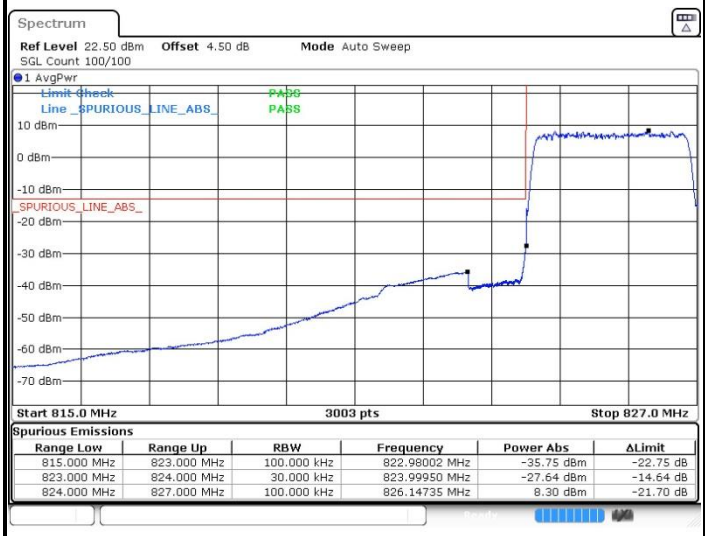


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
846.000 MHz	849.000 MHz	100.000 kHz	848.77373 MHz	20.21 dBm	-9.79 dB
849.000 MHz	850.000 MHz	30.000 kHz	849.00050 MHz	-15.69 dBm	-2.69 dB
850.000 MHz	860.000 MHz	100.000 kHz	851.41359 MHz	-43.73 dBm	-30.73 dB

Date: 4.AUG.2021 18:30:19

Lowest Band Edge / Full RB

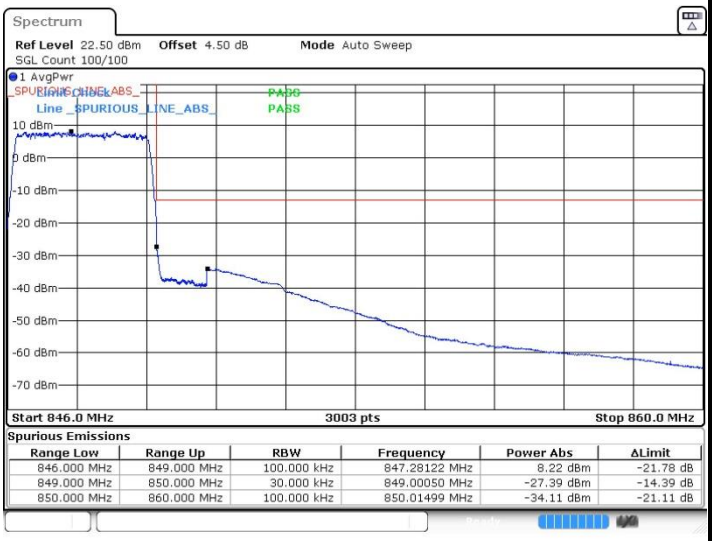


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.98002 MHz	-35.75 dBm	-22.75 dB
823.000 MHz	824.000 MHz	30.000 kHz	823.99950 MHz	-27.64 dBm	-14.64 dB
824.000 MHz	827.000 MHz	100.000 kHz	826.14735 MHz	8.30 dBm	-21.70 dB

Date: 4.AUG.2021 18:26:14

Highest Band Edge / Full RB



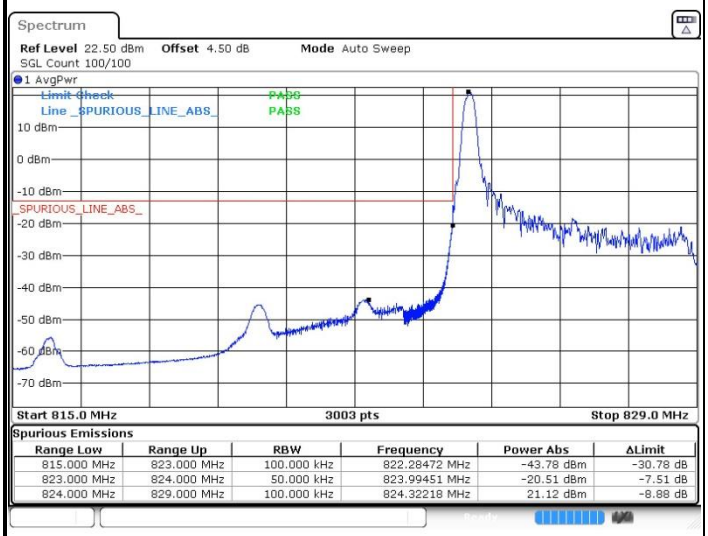
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
846.000 MHz	849.000 MHz	100.000 kHz	847.28122 MHz	8.22 dBm	-21.78 dB
849.000 MHz	850.000 MHz	30.000 kHz	849.00050 MHz	-27.39 dBm	-14.39 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.01499 MHz	-34.11 dBm	-21.11 dB

Date: 4.AUG.2021 18:33:36

LTE Band 5 / 5MHz / QPSK

Lowest Band Edge / 1 RB

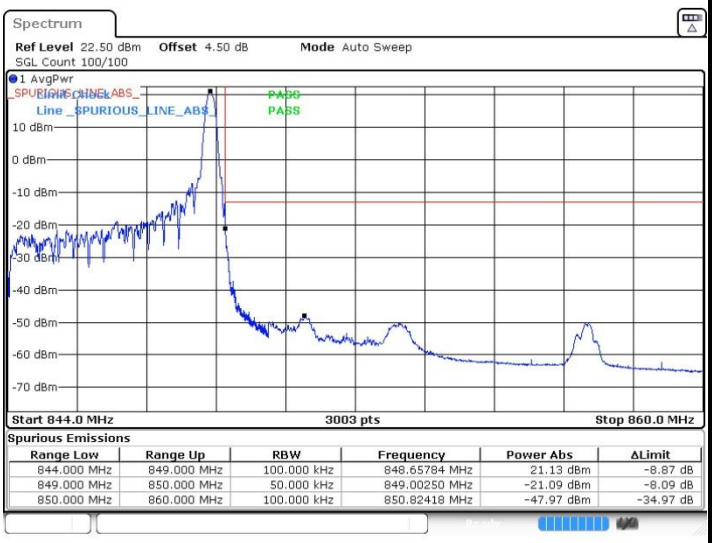


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.28472 MHz	-43.78 dBm	-30.78 dB
823.000 MHz	824.000 MHz	50.000 kHz	823.99451 MHz	-20.51 dBm	-7.51 dB
824.000 MHz	829.000 MHz	100.000 kHz	824.32218 MHz	21.12 dBm	-8.88 dB

Date: 4.AUG.2021 18:35:39

Highest Band Edge / 1 RB

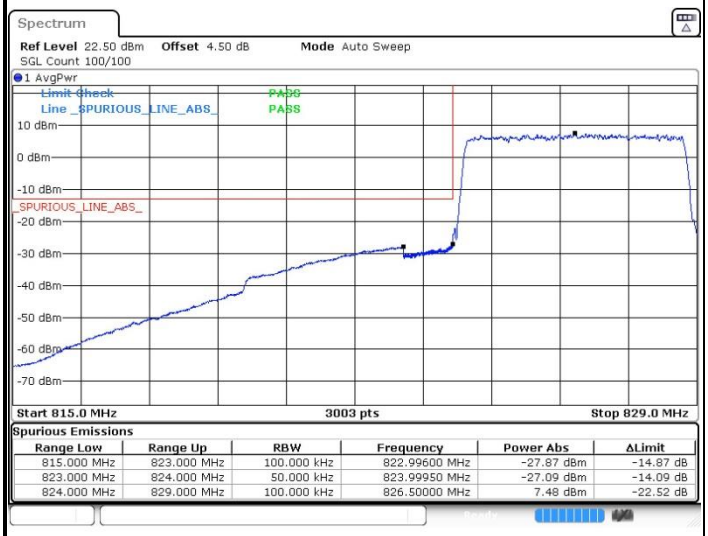


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
844.000 MHz	849.000 MHz	100.000 kHz	848.65784 MHz	21.13 dBm	-8.87 dB
849.000 MHz	850.000 MHz	50.000 kHz	849.00250 MHz	-21.09 dBm	-8.09 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.82418 MHz	-47.97 dBm	-34.97 dB

Date: 4.AUG.2021 19:02:35

Lowest Band Edge / Full RB

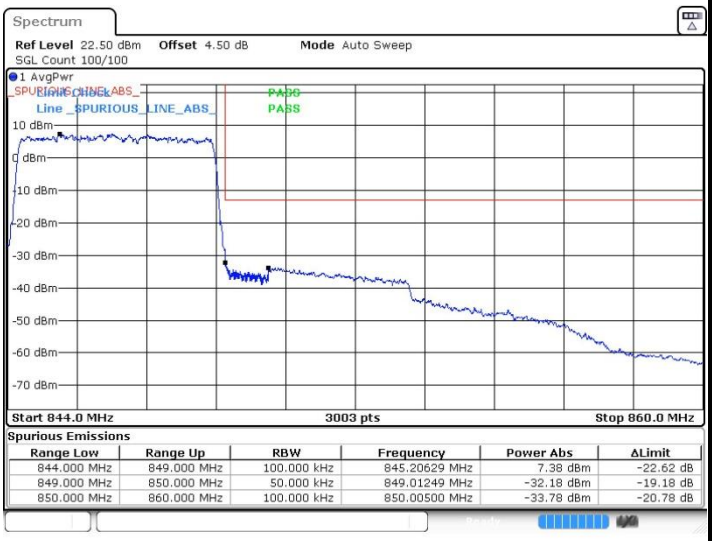


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.99600 MHz	-27.87 dBm	-14.87 dB
823.000 MHz	824.000 MHz	50.000 kHz	823.99950 MHz	-27.09 dBm	-14.09 dB
824.000 MHz	829.000 MHz	100.000 kHz	826.50000 MHz	7.48 dBm	-22.52 dB

Date: 4.AUG.2021 18:38:57

Highest Band Edge / Full RB



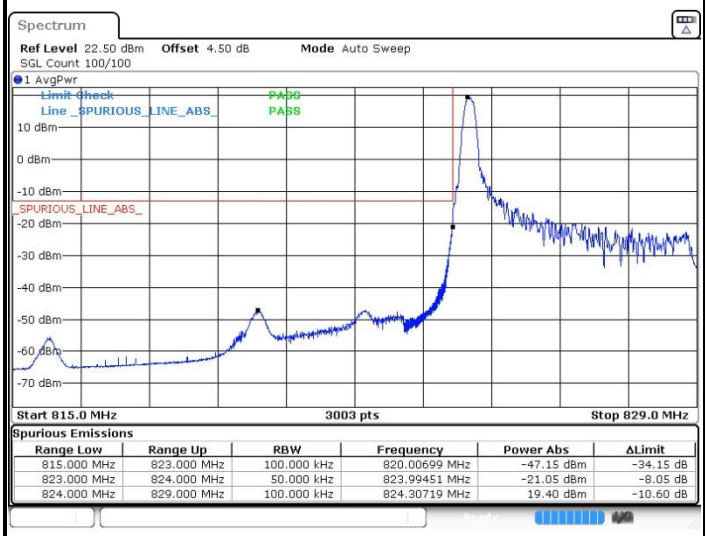
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
844.000 MHz	849.000 MHz	100.000 kHz	845.20629 MHz	7.38 dBm	-22.62 dB
849.000 MHz	850.000 MHz	50.000 kHz	849.01249 MHz	-32.18 dBm	-19.18 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.00500 MHz	-33.78 dBm	-20.78 dB

Date: 4.AUG.2021 19:05:53

LTE Band 5 / 5MHz / 16QAM

Lowest Band Edge / 1RB

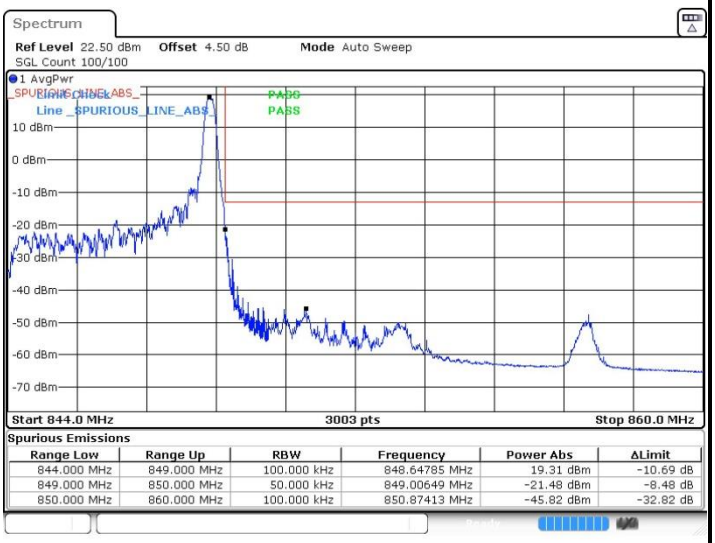


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	820.00699 MHz	-47.15 dBm	-34.15 dB
823.000 MHz	824.000 MHz	50.000 kHz	823.99451 MHz	-21.05 dBm	-8.05 dB
824.000 MHz	829.000 MHz	100.000 kHz	824.30719 MHz	19.40 dBm	-10.60 dB

Date: 4.AUG.2021 18:37:18

Highest Band Edge / 1 RB

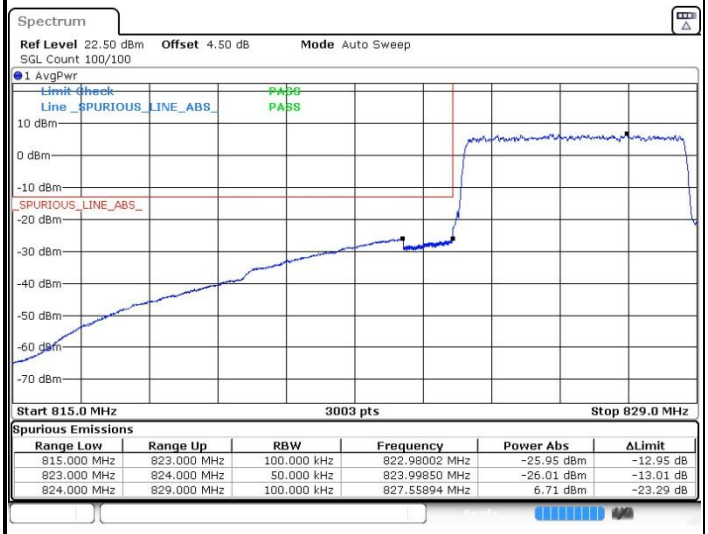


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
844.000 MHz	849.000 MHz	100.000 kHz	848.64785 MHz	19.31 dBm	-10.69 dB
849.000 MHz	850.000 MHz	50.000 kHz	849.00649 MHz	-21.48 dBm	-8.48 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.87413 MHz	-45.82 dBm	-32.82 dB

Date: 4.AUG.2021 19:04:14

Lowest Band Edge / Full RB

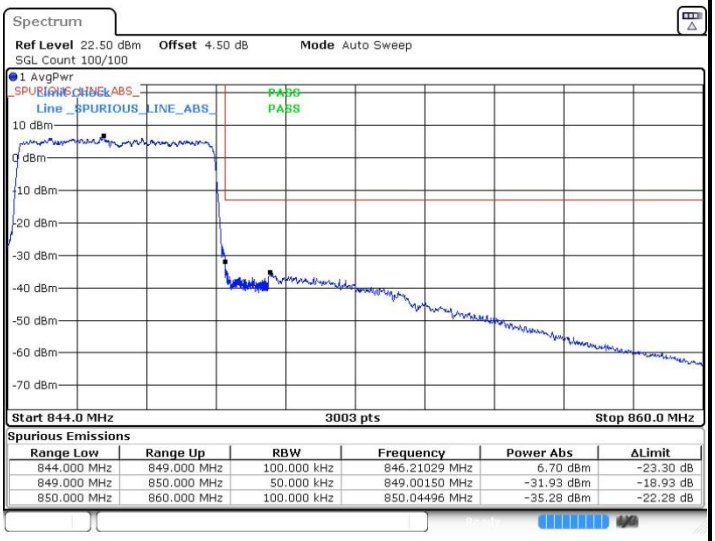


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.98002 MHz	-25.95 dBm	-12.95 dB
823.000 MHz	824.000 MHz	50.000 kHz	823.99850 MHz	-26.01 dBm	-13.01 dB
824.000 MHz	829.000 MHz	100.000 kHz	827.55894 MHz	6.71 dBm	-23.29 dB

Date: 4.AUG.2021 18:40:36

Highest Band Edge / Full RB



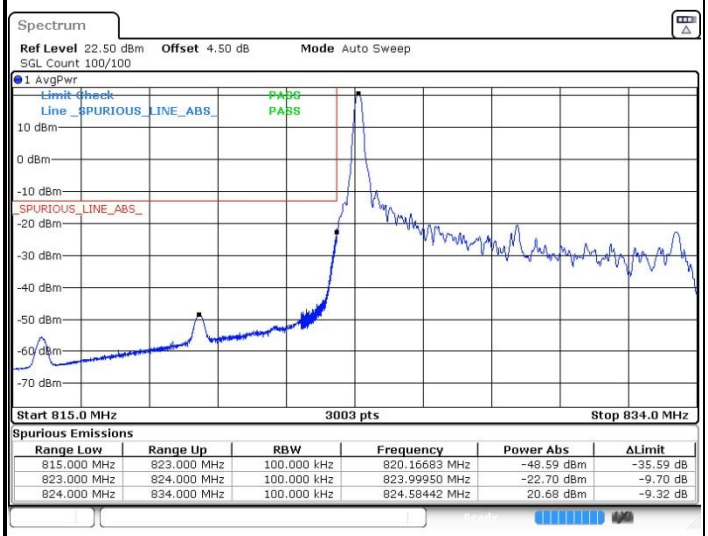
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
844.000 MHz	849.000 MHz	100.000 kHz	846.21029 MHz	6.70 dBm	-23.30 dB
849.000 MHz	850.000 MHz	50.000 kHz	849.00150 MHz	-31.93 dBm	-18.93 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.04496 MHz	-35.28 dBm	-22.28 dB

Date: 4.AUG.2021 19:07:32

LTE Band 5 / 10MHz / QPSK

Lowest Band Edge / 1 RB

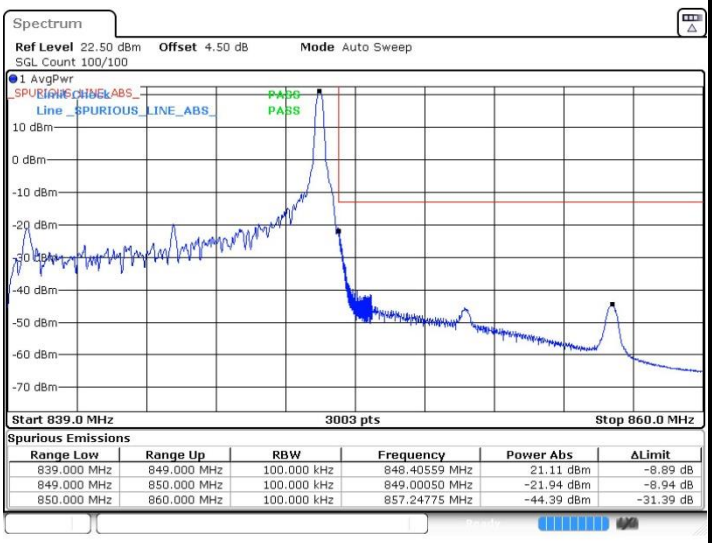


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	820.16683 MHz	-48.59 dBm	-35.59 dB
823.000 MHz	824.000 MHz	100.000 kHz	823.99950 MHz	-22.70 dBm	-9.70 dB
824.000 MHz	834.000 MHz	100.000 kHz	824.58442 MHz	20.68 dBm	-9.32 dB

Date: 4.AUG.2021 19:09:34

Highest Band Edge / 1 RB

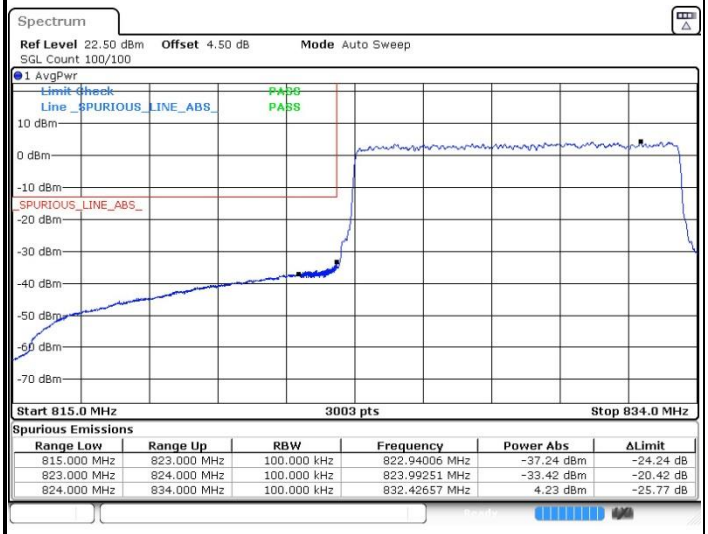


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
839.000 MHz	849.000 MHz	100.000 kHz	848.40559 MHz	21.11 dBm	-8.89 dB
849.000 MHz	850.000 MHz	100.000 kHz	849.00050 MHz	-21.94 dBm	-8.94 dB
850.000 MHz	860.000 MHz	100.000 kHz	857.24775 MHz	-44.39 dBm	-31.39 dB

Date: 4.AUG.2021 19:16:57

Lowest Band Edge / Full RB

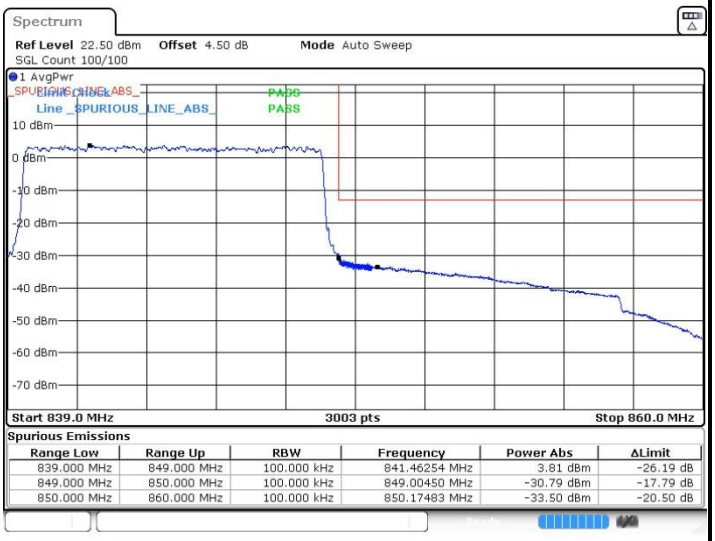


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.94006 MHz	-37.24 dBm	-24.24 dB
823.000 MHz	824.000 MHz	100.000 kHz	823.99251 MHz	-33.42 dBm	-20.42 dB
824.000 MHz	834.000 MHz	100.000 kHz	832.42657 MHz	4.23 dBm	-25.77 dB

Date: 4.AUG.2021 19:12:52

Highest Band Edge / Full RB



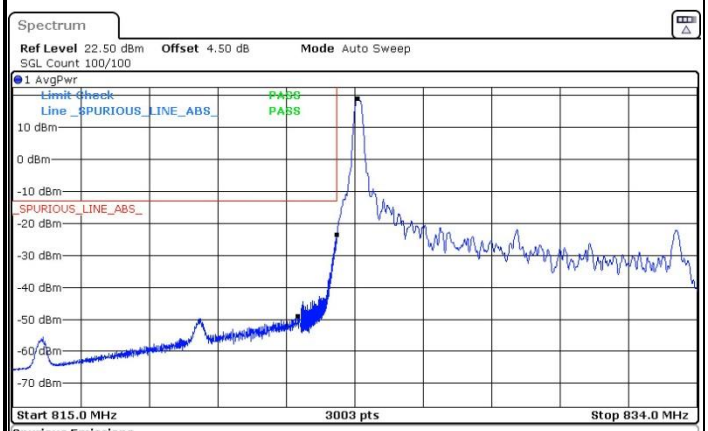
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
839.000 MHz	849.000 MHz	100.000 kHz	841.46254 MHz	3.81 dBm	-26.19 dB
849.000 MHz	850.000 MHz	100.000 kHz	849.00450 MHz	-30.79 dBm	-17.79 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.17483 MHz	-33.50 dBm	-20.50 dB

Date: 4.AUG.2021 19:20:14

LTE Band 5 / 10MHz / 16QAM

Lowest Band Edge / 1 RB

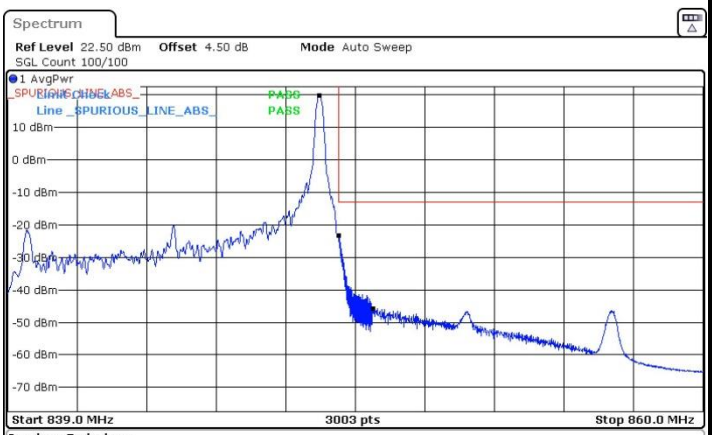


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.90809 MHz	-48.99 dBm	-35.99 dB
823.000 MHz	824.000 MHz	100.000 kHz	823.99650 MHz	-23.52 dBm	-10.52 dB
824.000 MHz	834.000 MHz	100.000 kHz	824.56444 MHz	19.11 dBm	-10.89 dB

Date: 4.AUG.2021 19:11:13

Highest Band Edge / 1 RB

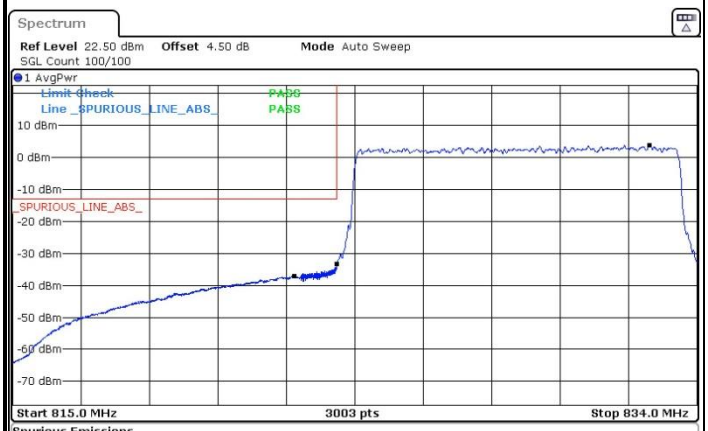


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
839.000 MHz	849.000 MHz	100.000 kHz	848.40559 MHz	19.80 dBm	-10.20 dB
849.000 MHz	850.000 MHz	100.000 kHz	849.00150 MHz	-23.29 dBm	-10.29 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.02498 MHz	-45.67 dBm	-32.67 dB

Date: 4.AUG.2021 19:18:35

Lowest Band Edge / Full RB

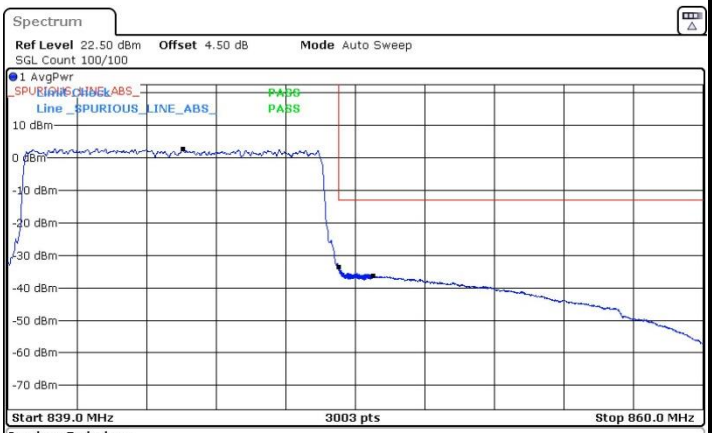


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
815.000 MHz	823.000 MHz	100.000 kHz	822.82018 MHz	-37.08 dBm	-24.08 dB
823.000 MHz	824.000 MHz	100.000 kHz	823.99750 MHz	-33.34 dBm	-20.34 dB
824.000 MHz	834.000 MHz	100.000 kHz	832.68631 MHz	3.88 dBm	-26.12 dB

Date: 4.AUG.2021 19:14:31

Highest Band Edge / Full RB



Spurious Emissions

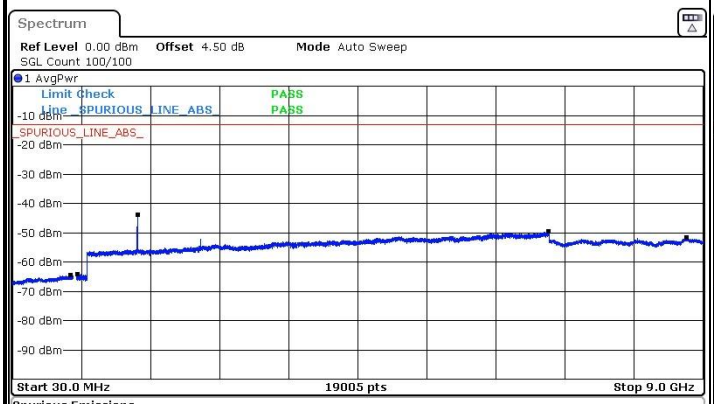
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
839.000 MHz	849.000 MHz	100.000 kHz	844.28971 MHz	2.81 dBm	-27.19 dB
849.000 MHz	850.000 MHz	100.000 kHz	849.00250 MHz	-33.64 dBm	-20.64 dB
850.000 MHz	860.000 MHz	100.000 kHz	850.03497 MHz	-36.39 dBm	-23.39 dB

Date: 4.AUG.2021 19:21:53

Conducted Spurious Emission

LTE Band 5 / 1.4MHz

Lowest Channel / QPSK

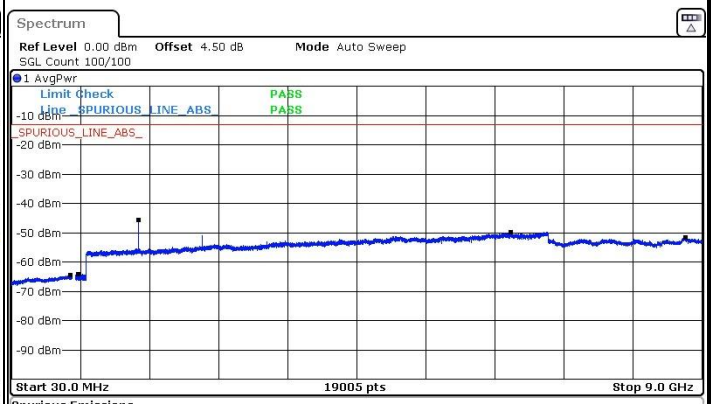


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	779.49650 MHz	-64.48 dBm	-51.48 dB
860.000 MHz	1.000 GHz	100.000 kHz	865.94406 MHz	-64.16 dBm	-51.16 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.64859 GHz	-43.90 dBm	-30.90 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99425 GHz	-49.62 dBm	-36.62 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.78130 GHz	-51.73 dBm	-38.73 dB

Date: 4.AUG.2021 18:11:09

Middle Channel / QPSK

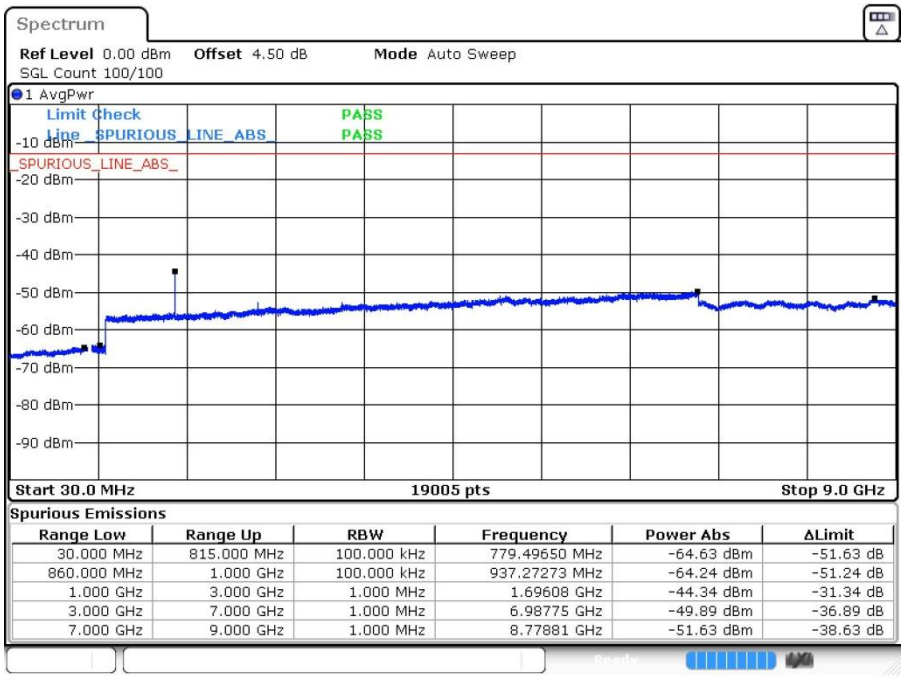


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	791.26562 MHz	-64.50 dBm	-51.50 dB
860.000 MHz	1.000 GHz	100.000 kHz	893.77622 MHz	-64.19 dBm	-51.19 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.67258 GHz	-45.56 dBm	-32.56 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.50831 GHz	-49.81 dBm	-36.81 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.78480 GHz	-51.71 dBm	-38.71 dB

Date: 4.AUG.2021 18:12:38

Highest Channel / QPSK



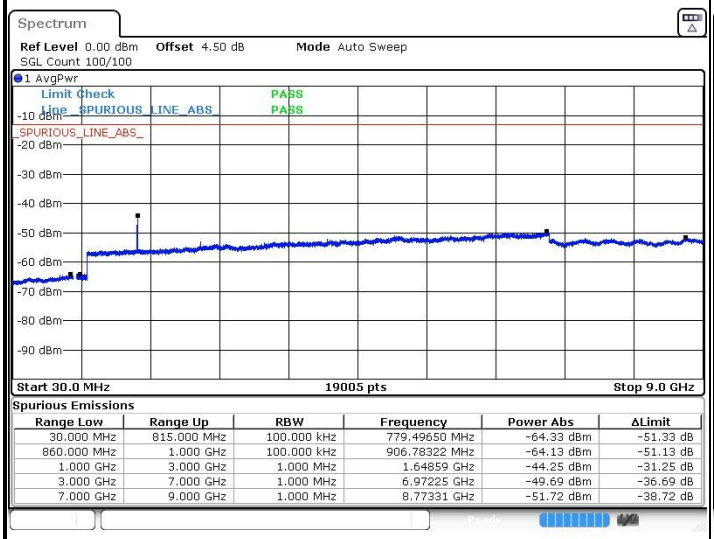
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	779.49650 MHz	-64.63 dBm	-51.63 dB
860.000 MHz	1.000 GHz	100.000 kHz	937.27273 MHz	-64.24 dBm	-51.24 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.69608 GHz	-44.34 dBm	-31.34 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.98775 GHz	-49.89 dBm	-36.89 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.77881 GHz	-51.63 dBm	-38.63 dB

Date: 4.AUG.2021 18:19:37

LTE Band 5 / 3MHz

Lowest Channel / QPSK

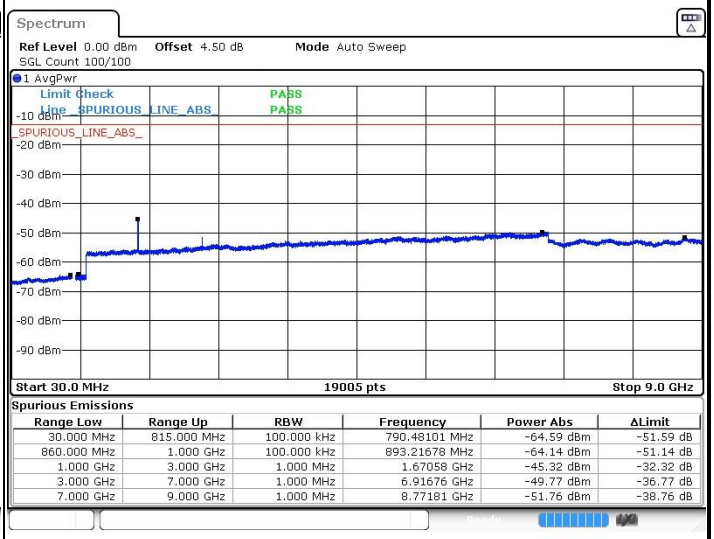


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	779.49650 MHz	-64.33 dBm	-51.33 dB
860.000 MHz	1.000 GHz	100.000 kHz	906.78322 MHz	-64.13 dBm	-51.13 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.64859 GHz	-44.25 dBm	-31.25 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.97225 GHz	-49.69 dBm	-36.69 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.77331 GHz	-51.72 dBm	-38.72 dB

Date: 4.AUG.2021 18:26:36

Middle Channel / QPSK

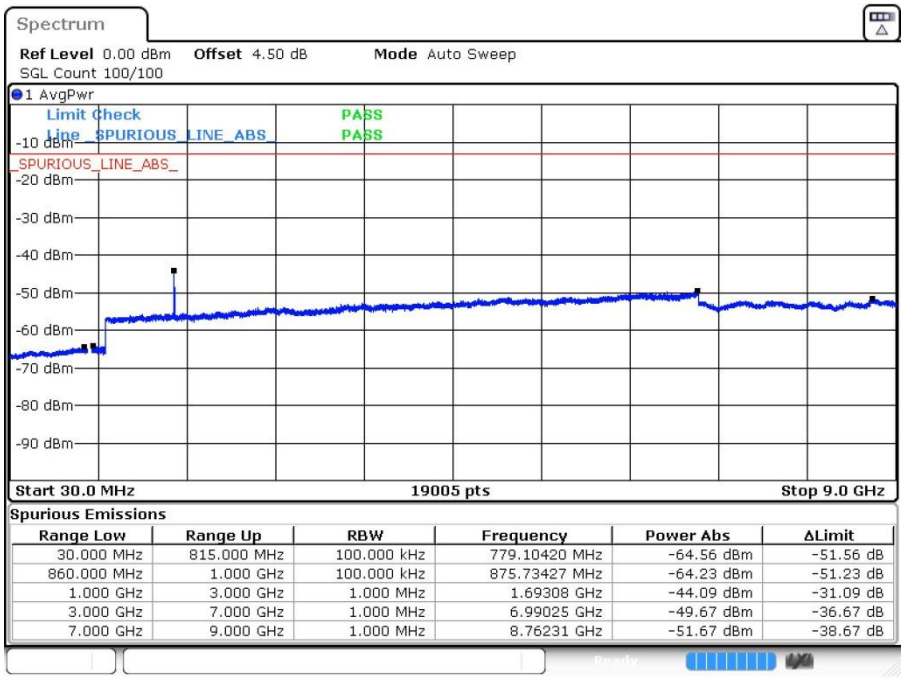


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	790.48101 MHz	-64.59 dBm	-51.59 dB
860.000 MHz	1.000 GHz	100.000 kHz	893.21678 MHz	-64.14 dBm	-51.14 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.67058 GHz	-45.32 dBm	-32.32 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.91676 GHz	-49.77 dBm	-36.77 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.77181 GHz	-51.76 dBm	-38.76 dB

Date: 4.AUG.2021 18:27:00

Highest Channel / QPSK



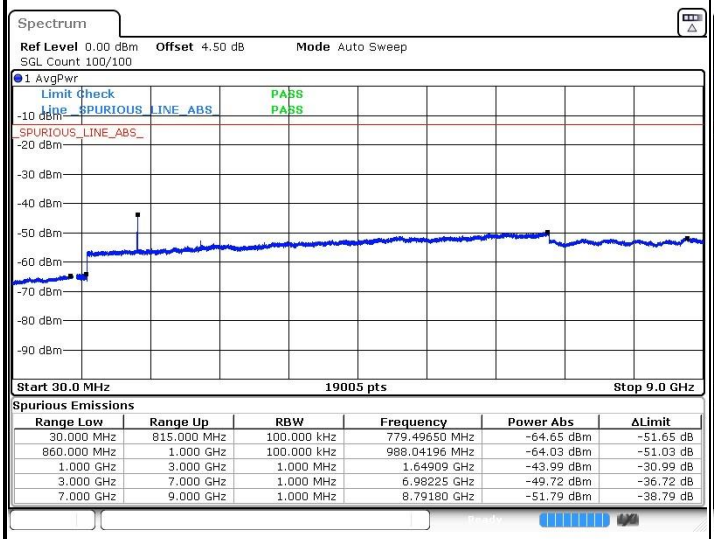
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	779.10420 MHz	-64.56 dBm	-51.56 dB
860.000 MHz	1.000 GHz	100.000 kHz	875.73427 MHz	-64.23 dBm	-51.23 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.69308 GHz	-44.09 dBm	-31.09 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99025 GHz	-49.67 dBm	-36.67 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.76231 GHz	-51.67 dBm	-38.67 dB

Date: 4.AUG.2021 18:33:59

LTE Band 5 / 5MHz

Lowest Channel / QPSK

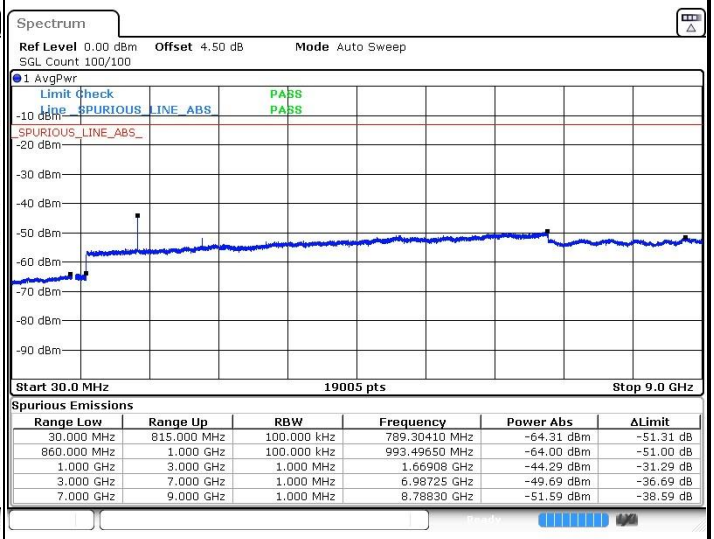


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	779.49650 MHz	-64.65 dBm	-51.65 dB
860.000 MHz	1.000 GHz	100.000 kHz	988.04196 MHz	-64.03 dBm	-51.03 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.64909 GHz	-43.99 dBm	-30.99 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.98225 GHz	-49.72 dBm	-36.72 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.79180 GHz	-51.79 dBm	-38.79 dB

Date: 4.AUG.2021 19:00:32

Middle Channel / QPSK

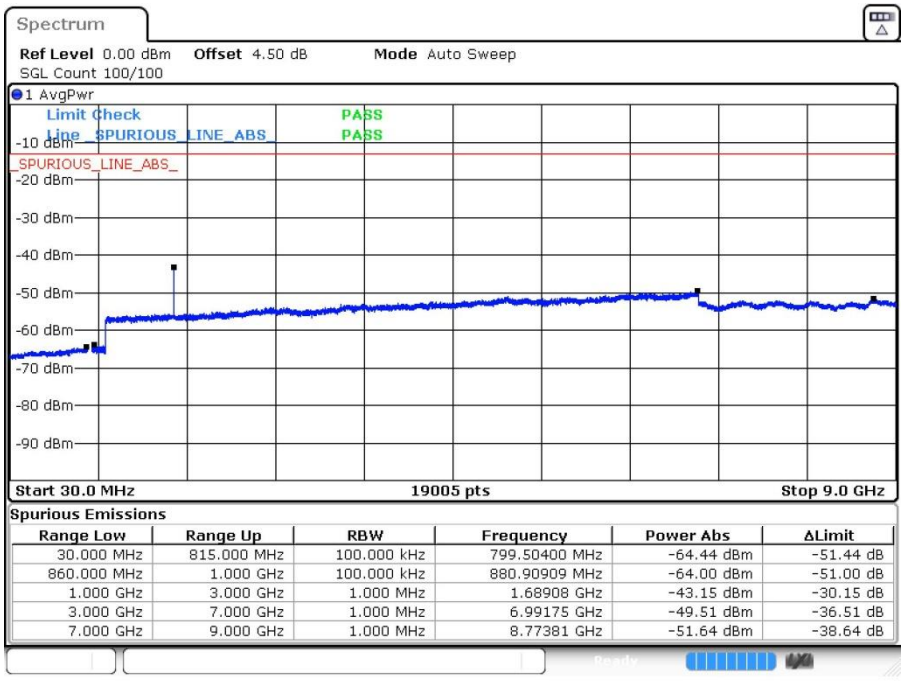


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	789.30410 MHz	-64.31 dBm	-51.31 dB
860.000 MHz	1.000 GHz	100.000 kHz	993.49650 MHz	-64.00 dBm	-51.00 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.66908 GHz	-44.29 dBm	-31.29 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.98725 GHz	-49.69 dBm	-36.69 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.78830 GHz	-51.59 dBm	-38.59 dB

Date: 4.AUG.2021 19:00:55

Highest Channel / QPSK



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	799.50400 MHz	-64.44 dBm	-51.44 dB
860.000 MHz	1.000 GHz	100.000 kHz	880.90909 MHz	-64.00 dBm	-51.00 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.68908 GHz	-43.15 dBm	-30.15 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99175 GHz	-49.51 dBm	-36.51 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.77381 GHz	-51.64 dBm	-38.64 dB

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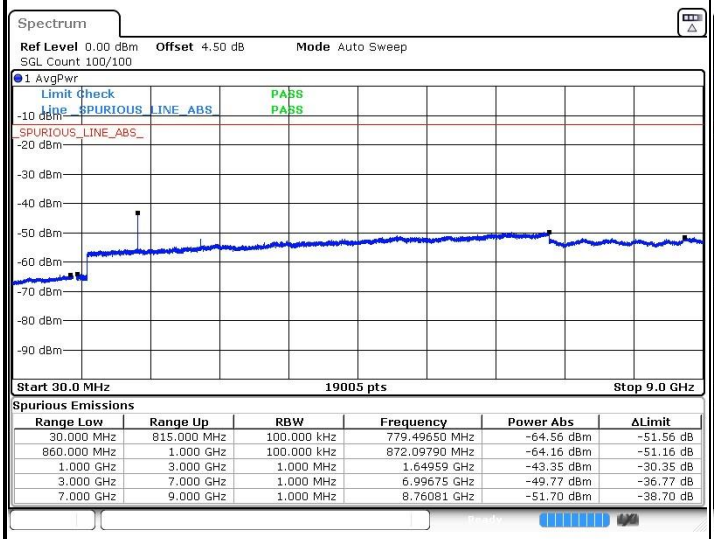
LTE Band 5 / 10MHz

Lowest Channel / QPSK



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	779.49650 MHz	-64.56 dBm	-51.56 dB
860.000 MHz	1.000 GHz	100.000 kHz	872.09790 MHz	-64.16 dBm	-51.16 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.64959 GHz	-43.35 dBm	-30.35 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99675 GHz	-49.77 dBm	-36.77 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.76081 GHz	-51.70 dBm	-38.70 dB

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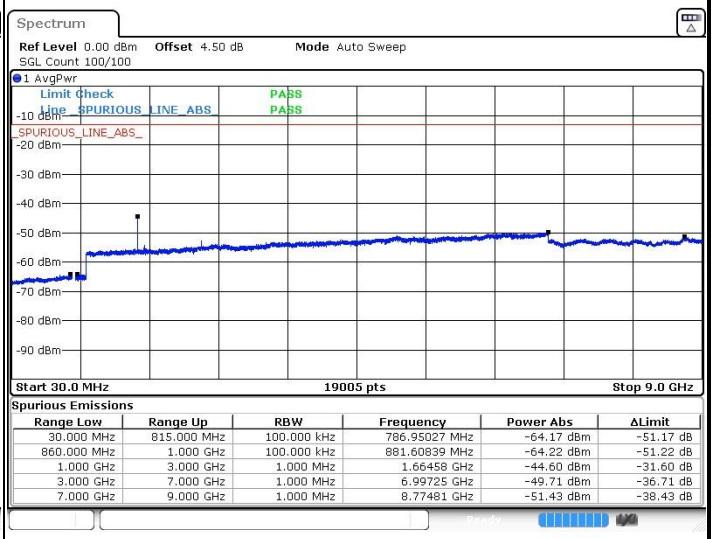
Middle Channel / QPSK



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	786.95027 MHz	-64.17 dBm	-51.17 dB
860.000 MHz	1.000 GHz	100.000 kHz	881.60839 MHz	-64.22 dBm	-51.22 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.66458 GHz	-44.60 dBm	-31.60 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99725 GHz	-49.71 dBm	-36.71 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.77481 GHz	-51.43 dBm	-38.43 dB

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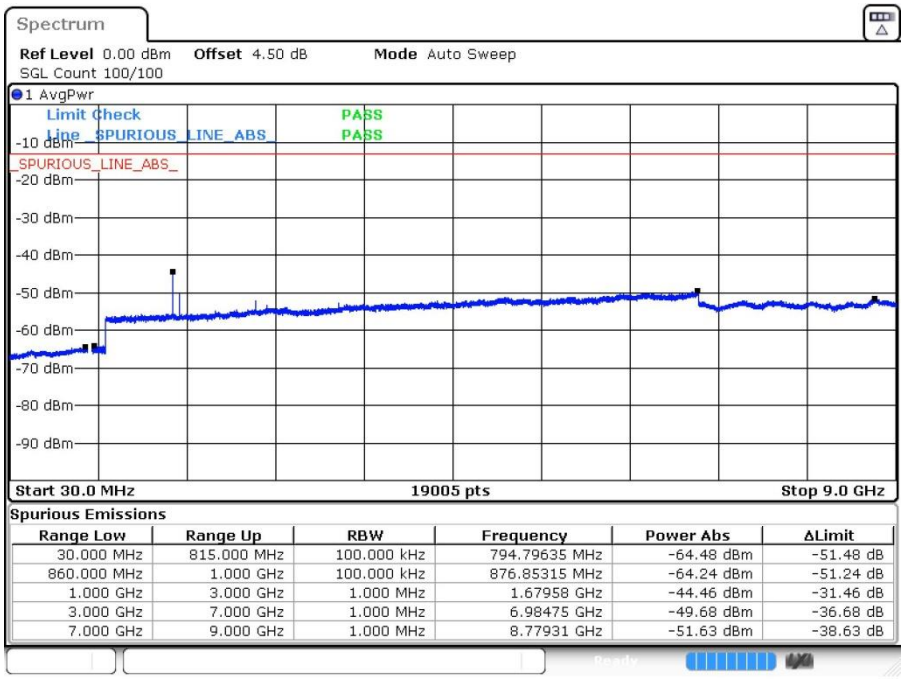
Highest Channel / QPSK



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	815.000 MHz	100.000 kHz	794.79635 MHz	-64.48 dBm	-51.48 dB
860.000 MHz	1.000 GHz	100.000 kHz	876.85315 MHz	-64.24 dBm	-51.24 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.67958 GHz	-44.46 dBm	-31.46 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.98475 GHz	-49.68 dBm	-36.68 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.77931 GHz	-51.63 dBm	-38.63 dB

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Frequency Stability

Test Conditions		LTE Band 5 (QPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 10MHz	Note 2.
		Deviation (ppm)	Result
50	Normal Voltage	0.0012	PASS
40	Normal Voltage	0.0013	
30	Normal Voltage	0.0018	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0012	
0	Normal Voltage	0.0012	
-10	Normal Voltage	0.0012	
-20	Normal Voltage	0.0025	
-30	Normal Voltage	0.0009	
20	Maximum Voltage	0.0013	
20	Normal Voltage	0.0011	
20	Battery End Point	0.0012	

Note:

1. Normal Voltage =3.9 V.；Battery End Point (BEP) =3.6 V.；Maximum Voltage =4.2 V.
2. Note: The frequency fundamental emissions stay within the authorized frequency block.

LTE Band 7

Peak-to-Average Ratio

Mode	LTE Band 7 / 20MHz		
Mod.	QPSK	16QAM	Limit: 13dB
RB Size	Full RB	Full RB	Result
Middle CH	5.28	6.06	PASS