FCC RF Test Report

APPLICANT	:	Sierra Wireless, Inc.
EQUIPMENT	:	Wireless Module
BRAND NAME	:	AirPrime
MODEL NAME	:	EM9190
FCC ID	:	N7NEM91
STANDARD	:	47 CFR Part 2, 90(R)
CLASSIFICATION	:	PCS Licensed Transmitter (PCB)

The product was received on Feb. 15, 2020 and completely tested on May 10, 2020. We, Sporton International (ShenZhen) Inc., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26 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 (ShenZhen) Inc., the test report shall not be reproduced except in full.

Reviewed by: Derreck Chen / Supervisor

Approved by: Eric Shih / Manager

ACCREDITED
Cert #5145.01

Sporton International (ShenZhen) Inc.

1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 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
FG021501E	Rev. 01	Initial issue of report	May. 25, 2020
FG021501E	Rev. 02	Update FCC ID information	Jun. 05, 2020

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.2	§2.1046	Conducted Output Power	Reporting only	PASS	-
	§90.542 (a)(7)	Effective Radiated Power	ERP < 3Watt	PASS	-
3.3	-	Peak-to-Average Ratio	Reporting only	-	-
3.4	§2.1049	Occupied Bandwidth	Reporting only	PASS	-
3.5	§2.1053 §90.543 (e)(2)(3)	Conducted Band Edge Measurement	Refer standard	PASS	-
3.6	§2.1051 §90.210(n)	Emission Mask	Mask B	PASS	-
3.7	§2.1053 §90.543 (e)(3)	Conducted Spurious Emission	< $43+10\log_{10}$(P[Watts])	PASS	-
3.8	§2.1055 §90.539 (e)	Frequency Stability Temperature & Voltage	< ±1.25 ppm	PASS	-
4.4	§2.1053 §90.543 (e)(3) §90.543 (f)	Radiated Spurious Emission	< $43+10\log_{10}$(P[Watts])	PASS	Under limit 28.75 dB at 1581.50 MHz

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

Sierra Wireless, Inc.
13811 Wireless Way, Richmond, BC, Canada V6A 3A4

1.2 Manufacturer

Sierra Wireless, Inc.
13811 Wireless Way, Richmond, BC, Canada V6A 3A4

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Wireless Module
Brand Name	AirPrime
Model Name	EM9190
FCC ID	N7NEM91
Tx Frequency	LTE Band 14: 790.5 MHz ~ 795.5 MHz
Rx Frequency	LTE Band 14: 760.5 MHz ~ 765.5 MHz
Bandwidth	5MHz / 10MHz
Maximum Output Power to Antenna	23.22 dBm
Antenna Gain	2.0 dBi
Type of Modulation	QPSK / 16QAM / 64QAM / 256QAM
IMEI Code	Conducted/ Radiation: 351735110001290
HW Version	1.0
SW Version	00.15.01.00
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. For modulation of QPSK / 16QAM / 64QAM / 256QAM supports uplink and measurement output power, according to the maximum power of 256QAM is lower than other modulation, therefore, 256QAM measurement is unnecessary. We always chose higher power (QPSK / 16QAM / 64QAM) to perform all tests.

1.4 Maximum Conducted Power, Frequency Tolerance, and Emission Designator

LTE Band 14		QPSK			16QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum Conducted power (W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum Conducted power (W)
5	790.5~795.5	4M50G7D	-	0.2065	4M49W7D	-	0.1774
10	793	9M05G7D	0.0080	0.2099	9M05W7D	-	0.1795

LTE Band 14		64QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum Conducted power (W)
5	790.5~795.5	4M51W7D	-	0.1387
10	793	9M05W7D	-	0.1387

1.5 Testing Site

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

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

Test Firm	Sporton International (Shenzhen) Inc.		
Test Site Location	No. 3 Bldg the third floor of south, Shahe River west, Fengzeyuan Warehouse, Nanshan Shenzhen, 518055 People's Republic of China TEL: +86-755-33202398		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	03CH02-SZ	CN1256	421272

1.6 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH02-SZ	AUDIX	E3	6.2009-8-24a

1.7 Applied Standards

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

- 47 CFR Part 2, Part 90(R)
- ANSI C63.26
- KDB 971168 D01 Power Meas License Digital Systems v03r01
- 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

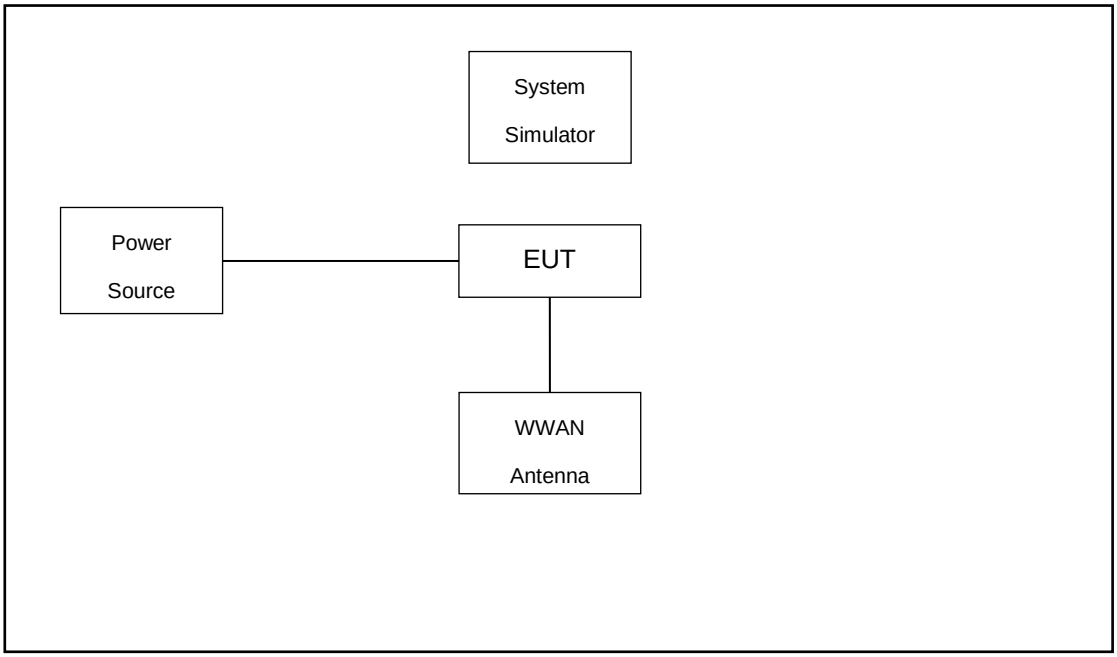
2.1 Test Mode

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.

Conducted Test Cases	Band	Bandwidth (MHz)						Modulation			RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	M	H
Max. Output Power	14	-	-	V	-	-	-	V	V	V	V	V	V	V	V	V
	14	-	-		V	-	-	V	V	V	V	V	V		V	
Peak-to-Average Ratio	14	-	-		V	-	-	V	V	V	V		V		V	
26dB and 99% Bandwidth	14	-	-	V		-	-	V	V	V			V	V	V	V
	14	-	-		V	-	-	V	V	V			V		V	
Conducted Band Edge	14	-	-	V		-	-	V	V	V	V		V	V		V
	14	-	-		V	-	-	V	V	V	V		V		V	
Emission Mask	14	-	-	V		-	-	V	V	V	V		V	V	V	V
	14	-	-		V	-	-	V	V	V	V		V		V	
Conducted Spurious Emission	14	-	-	V		-	-	V	V	V	V			V	V	V
	14	-	-		V	-	-	V	V	V	V				V	
Frequency Stability	14	-	-		V	-	-	V					V		V	
E.R.P	14	-	-	V		-	-	V	V	V	V			V	V	V
	14	-	-		V	-	-	V	V	V	V				V	
Radiated Spurious Emission	14	-	-	V		-	-	V			V			V	V	V
		-	-		V			V			V				V	
Note	1. The mark "v " means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.															

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8m
2.	DC Power Supply	Topward	3303DR	N/A	N/A	Unshielded, 1.8m
3.	WWAN Antenna	PANORAMA	PWB-6-60-RSMAP	N/A	N/A	N/A

2.4 Measurement Results Explanation Example

For all conducted test items:

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

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

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with RF cable loss 4.0 dB and a 10dB attenuator.

Example :

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

= 4.0 + 10 = 14.0 (dB)

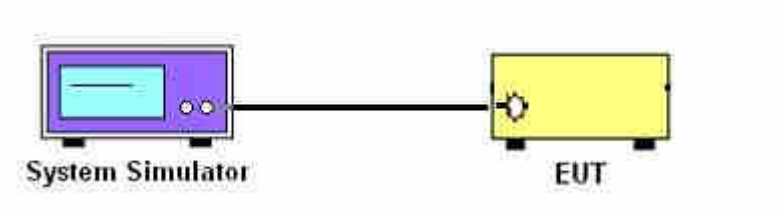
3 Conducted Test Items

3.1 Measuring Instruments

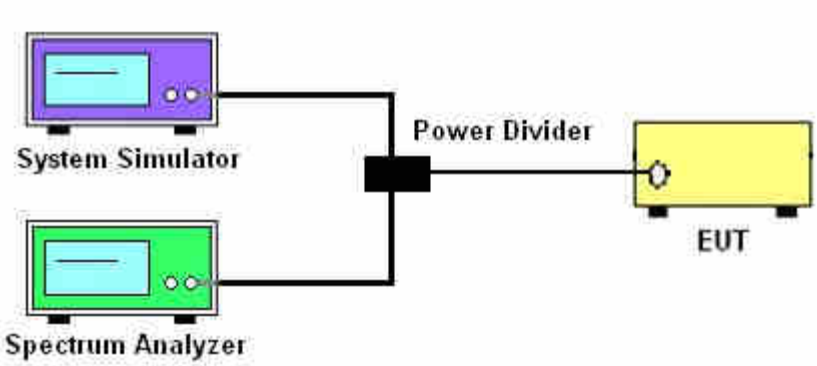
See list of measuring instruments of this test report.

3.1.1 Test Setup

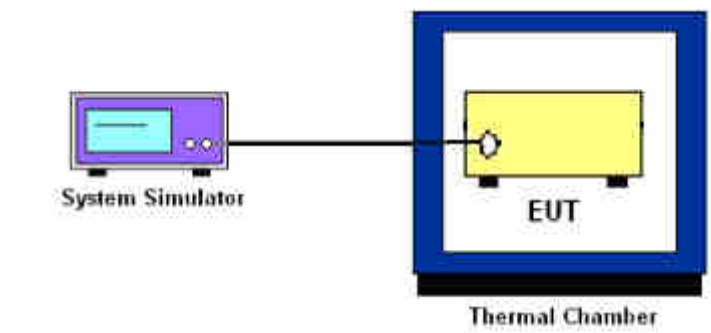
3.1.2 Conducted Output Power



3.1.3 Peak-to-Average Ratio, Occupied Bandwidth, Conducted Band-Edge, Emission Mask, 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 and ERP

3.2.1 Description of the Conducted Output Power Measurement and ERP

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.

The ERP of mobile transmitters must not exceed 3 Watts for LTE Band 14.

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

3.2.2 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.

3.3 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

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 Occupied Bandwidth

3.4.1 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.

3.4.2 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.

3.5 Conducted Band Edge Measurement

3.5.1 Description of Conducted Band Edge Measurement

For operations in the 758-768 MHz and the 788-798 MHz bands

(1) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.

(2) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

(3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.

Compliance with the provisions of paragraph (3) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 30 kHz may be employed.

3.5.2 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 spectrum analyzer with RMS detector.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. Checked that all the results comply with the emission limit line.

   Example:

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

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

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

3.6 Emission Mask

3.6.1 Test Procedures

For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

(1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.

(2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.

(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.

3.6.2 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. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
5. Set spectrum analyzer with RMS detector.
6. Taking the record of maximum spurious emission.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.

3.7 Conducted Spurious Emission Measurement

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 43 + 10 log (P) dB.

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

3.7.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and base station via 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, for under 1GHz RBW = 100kHz, VBW = 300kHz and for above 1GHz RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
7. Set spectrum analyzer with RMS detector.
8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
9. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.

3.8 Frequency Stability Measurement

3.8.1 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 ±1.25 ppm of the center frequency.

3.8.2 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.

3.8.3 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.

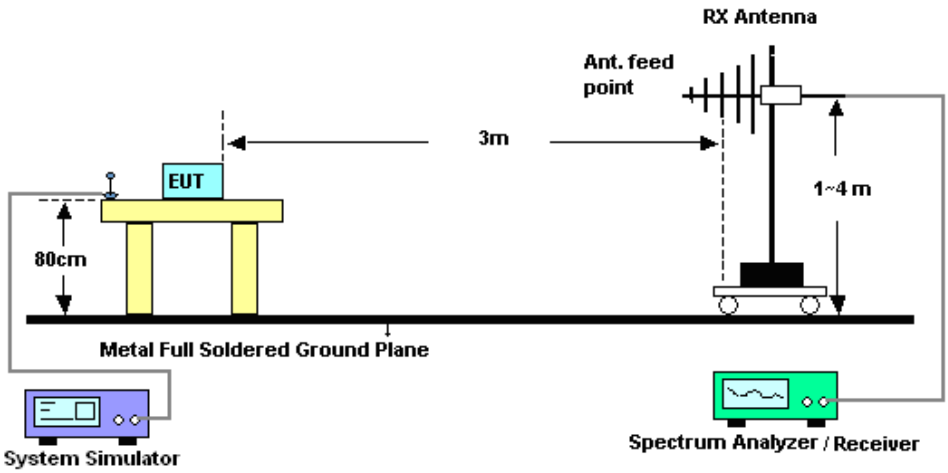
4 Radiated Test Items

4.1 Measuring Instruments

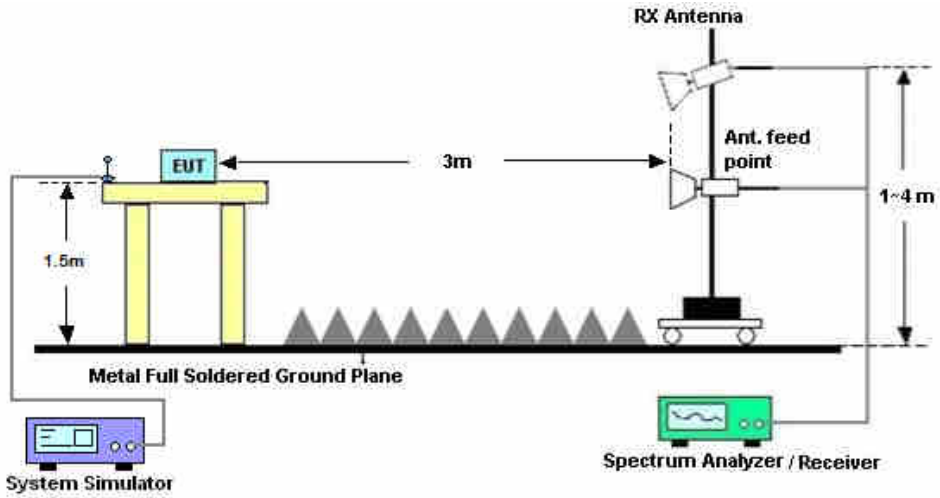
See list of measuring instruments of this test report.

4.2 Test Setup

4.2.1 For radiated test from 30MHz to 1GHz



4.2.2 For radiated test above 1GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.

4.4 Radiated Spurious Emission Measurement

4.4.1 Description of Radiated Spurious Emission

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

For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559–1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

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.

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 18, 2019	Mar. 20, 2020~ May 10, 2020	Apr. 17, 2020	Conducted (TH01-SZ)
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 16, 2020		Apr. 15, 2021	Conducted (TH01-SZ)
DC Power Supply	GWINSTEK	AnritsuGPS-3030D	EM882636	Max 30V	Apr. 18, 2019	Mar. 20, 2020~ May 10, 2020	Apr. 17, 2020	Conducted (TH01-SZ)
DC Power Supply	GWINSTEK	AnritsuGPS-3030D	EM882636	Max 30V	Apr. 16, 2020		Apr. 15, 2021	Conducted (TH01-SZ)
Thermal Chamber	Ten Billion Hongzhangroup	LP-150U	H2014081803	-40~+150°C	Dec. 26, 2019	Mar. 20, 2020~ May 10, 2020	Dec. 25, 2020	Conducted (TH01-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Apr. 19, 2019	Mar. 25, 2020	Apr. 18, 2020	Radiation (03CH02-SZ)
Bilog Antenna	TeseQ	CBL6112D	35407	30MHz-2GHz	Jul. 19, 2019	Mar. 25, 2020	Jul. 18, 2020	Radiation (03CH02-SZ)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00119436	1GHz~18GHz	Aug. 27, 2019	Mar. 25, 2020	Aug. 26, 2020	Radiation (03CH02-SZ)
LF Amplifier	Burgeon	BPA-530	102211	0.01~3000Mhz	Oct. 18, 2019	Mar. 25, 2020	Oct. 17, 2020	Radiation (03CH02-SZ)
HF Amplifier	KEYSIGHT	83017A	MY53270105	0.5GHz~26.5Ghz	Oct. 18, 2019	Mar. 25, 2020	Oct. 17, 2020	Radiation (03CH02-SZ)
AC Power Source	Chroma	61601	616010002470	N/A	NCR	Mar. 25, 2020	NCR	Radiation (03CH02-SZ)
Turn Table	Chaintek	T-200	N/A	0~360 degree	NCR	Mar. 25, 2020	NCR	Radiation (03CH02-SZ)
Antenna Mast	Chaintek	MBS-400	N/A	1 m~4 m	NCR	Mar. 25, 2020	NCR	Radiation (03CH02-SZ)

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))	**2.5dB**

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

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

Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

LTE Band 14 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0	QPSK	-	23.22	-
10	1	25			23.05	
10	1	49			22.78	
10	25	0			22.86	
10	25	12			22.98	
10	25	25			22.17	
10	50	0			22.13	
10	1	0	16-QAM		22.54	
10	1	25			22.49	
10	1	49			22.41	
10	25	0			21.16	
10	25	12			21.19	
10	25	25			21.20	
10	50	0			21.13	
10	1	0	64QAM		21.35	
10	1	25			21.38	
10	1	49			21.42	
10	25	0			20.15	
10	25	12			20.18	
10	25	25			20.20	
10	50	0			20.15	

LTE Band 14 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	23.06	23.01	23.08
5	1	12		23.15	23.14	23.05
5	1	24		23.10	23.07	23.00
5	12	0		22.17	22.15	22.07
5	12	7		22.24	22.17	22.14
5	12	13		22.19	22.15	22.09
5	25	0		22.20	22.13	22.10
5	1	0	16-QAM	22.41	22.36	22.31
5	1	12		22.49	22.49	22.39
5	1	24		22.49	22.42	22.39
5	12	0		21.22	21.10	21.12
5	12	7		21.25	21.17	21.15
5	12	13		21.20	21.15	21.10
5	25	0		21.19	21.12	21.09
5	1	0	64QAM	21.33	21.29	21.23
5	1	12		21.38	21.42	21.28
5	1	24		21.39	21.35	21.29
5	12	0		20.27	20.01	20.17
5	12	7		20.29	20.23	20.19
5	12	13		20.24	20.21	20.14
5	25	0		20.24	20.17	20.14

ERP

LTE Band 14 (G_T - L_C = 2.0 dBi) QPSK						
Bandwidth	5M			10M		
Channel	23305	23330	23355	-	23330	-
	(Low)	(Mid)	(High)	-	(Mid)	-
Frequency (MHz)	790.5	793	795.5	-	793	-
Conducted Power (dBm)	23.15	23.14	23.05	-	23.22	-
Conducted Power (Watts)	0.2065	0.2061	0.2018	-	0.2099	-
ERP(dBm)	23.00	22.99	22.90	-	23.07	-
ERP(Watts)	0.1995	0.1991	0.1950	-	0.2028	-

LTE Band 14 (G_T - L_C = 2.0 dBi) 16QAM						
Bandwidth	5M			10M		
Channel	23305	23330	23355	-	23330	-
	(Low)	(Mid)	(High)	-	(Mid)	-
Frequency (MHz)	790.5	793	795.5	-	793	-
Conducted Power (dBm)	22.49	22.49	22.39	-	22.54	-
Conducted Power (Watts)	0.1774	0.1774	0.1734	-	0.1795	-
ERP(dBm)	22.34	22.34	22.24	-	22.39	-
ERP(Watts)	0.1714	0.1714	0.1675	-	0.1734	-

LTE Band 14 (G_T - L_C = 2.0 dBi) 64QAM						
Bandwidth	5M			10M		
Channel	23305	23330	23355	-	23330	-
	(Low)	(Mid)	(High)	-	(Mid)	-
Frequency (MHz)	790.5	793	795.5	-	793	-
Conducted Power (dBm)	21.38	21.42	21.28	-	21.42	-
Conducted Power (Watts)	0.1374	0.1387	0.1343	-	0.1387	-
ERP(dBm)	21.23	21.27	21.13	-	21.27	-
ERP(Watts)	0.1327	0.1340	0.1297	-	0.1340	-

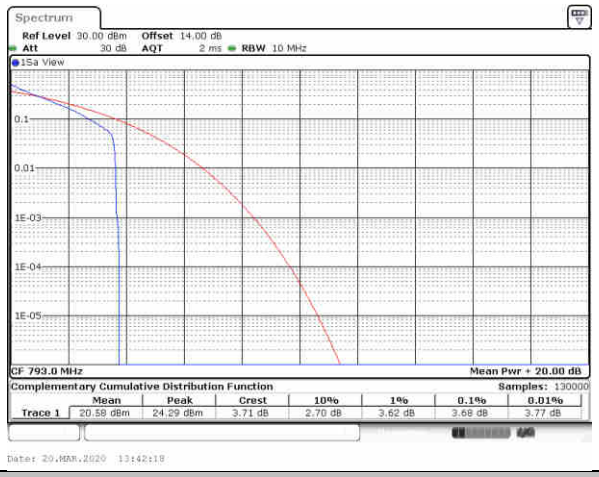
Peak-to-Average Ratio

Mode	LTE Band 14 / 10MHz				
Mod.	QPSK		16QAM		Limit: 13dB
RB Size	1RB	Full RB	1RB	Full RB	Result
Lowest CH	-	-	-	-	PASS
Middle CH	3.68	5.01	5.36	5.83	
Highest CH	-	-	-	-	

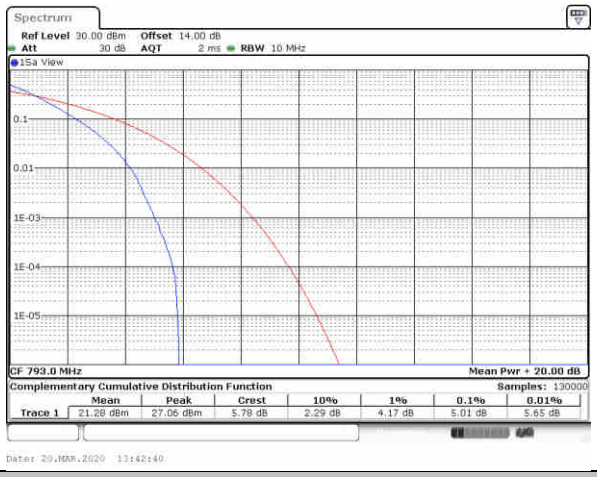
Mode	LTE Band 14 / 10MHz		
Mod.	64QAM		Limit: 13dB
RB Size	1RB	Full RB	Result
Lowest CH	-	-	PASS
Middle CH	5.33	5.88	
Highest CH	-	-	

LTE Band 14 / 10MHz / QPSK

Middle Channel/ 1RB

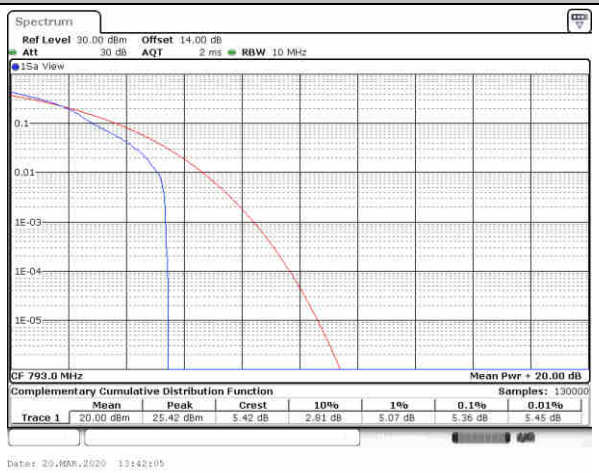


Middle Channel / Full RB

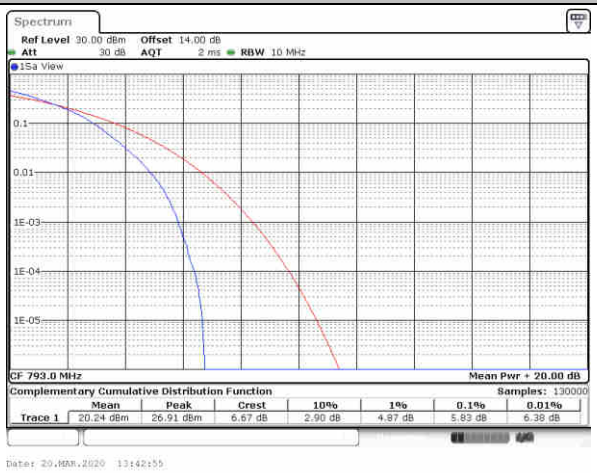


LTE Band 14 / 10MHz / 16QAM

Middle Channel/ 1RB

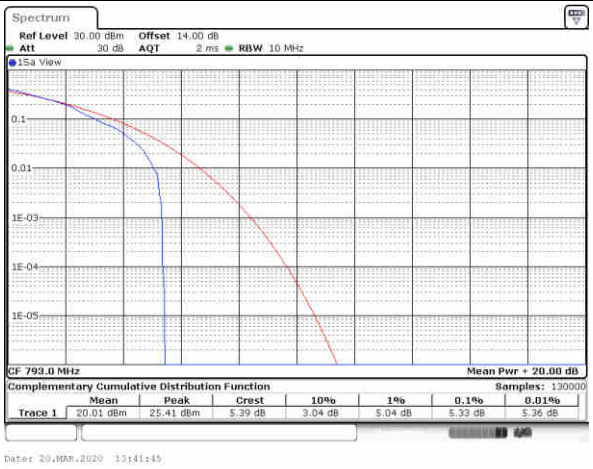


Middle Channel / Full RB

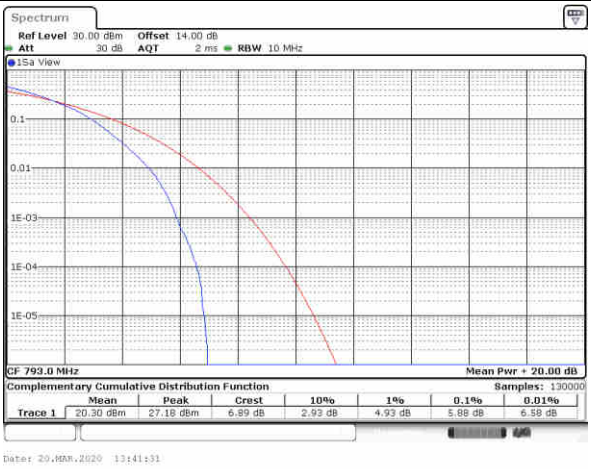


LTE Band 14 / 10MHz / 64QAM

Middle Channel/ 1RB



Middle Channel / Full RB

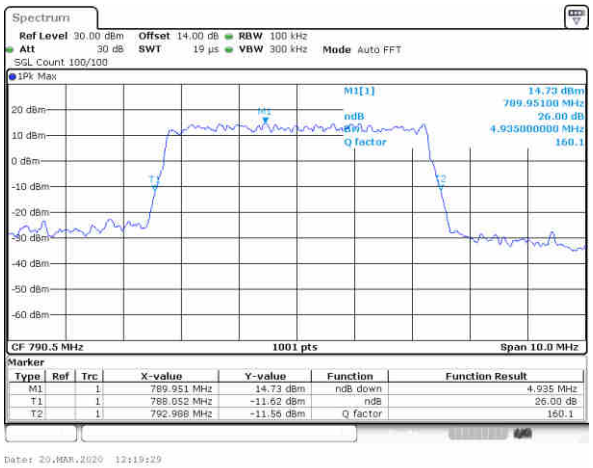


26dB Bandwidth

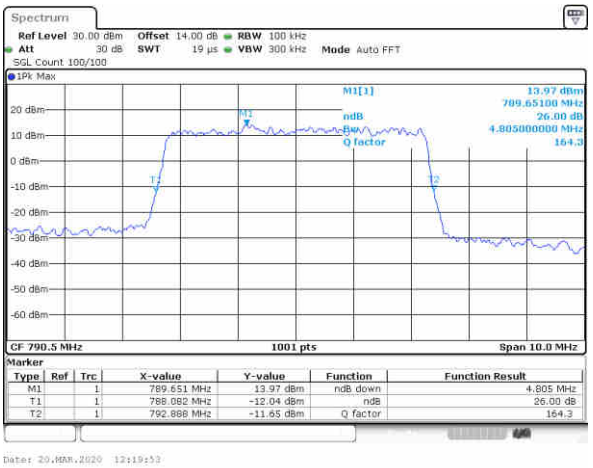
Mode	LTE Band 14 : 26dB BW(MHz)					
BW	5MHz		10MHz		5MHz	10MHz
Mod.	QPSK	16QAM	QPSK	16QAM	64QAM	64QAM
Lowest CH	4.94	4.81	-	-	4.92	-
Middle CH	4.80	4.87	9.87	9.95	4.84	9.73
Highest CH	4.93	4.92	-	-	4.89	-

LTE Band 14

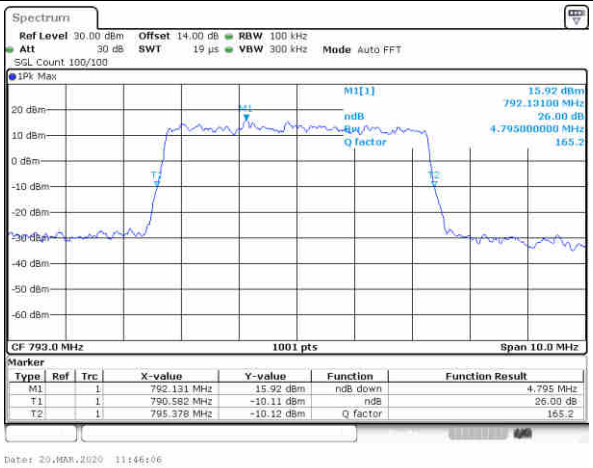
Lowest Channel / 5MHz / QPSK



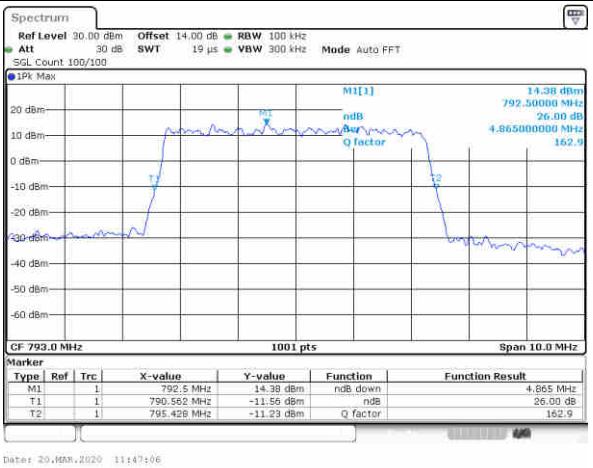
Lowest Channel / 5MHz / 16QAM



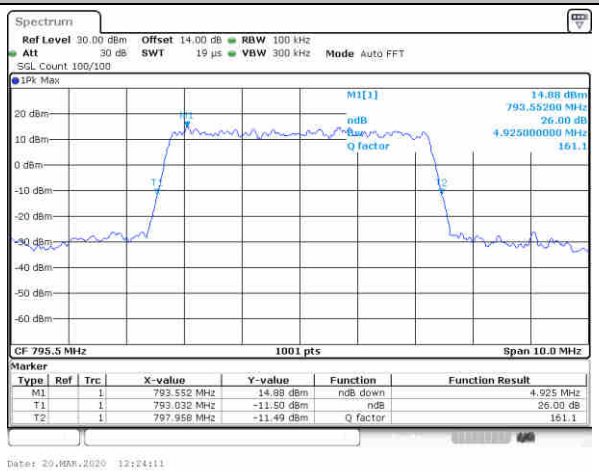
Middle Channel / 5MHz / QPSK



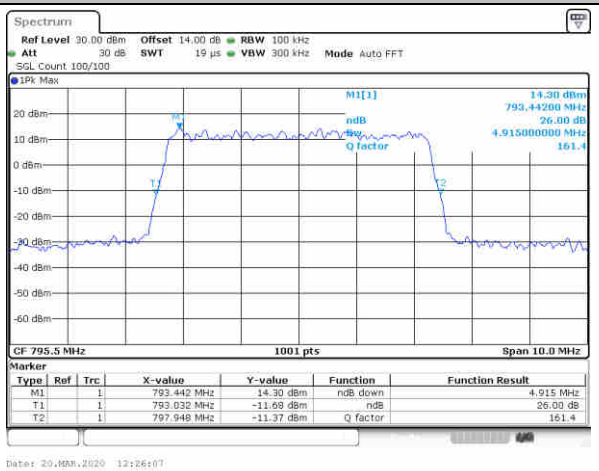
Middle Channel / 5MHz / 16QAM



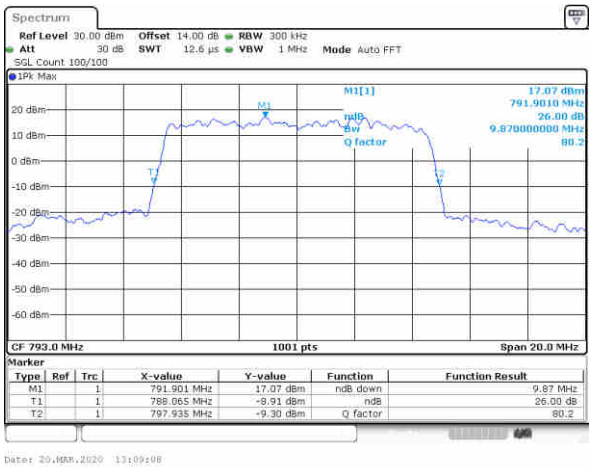
Highest Channel / 5MHz / QPSK

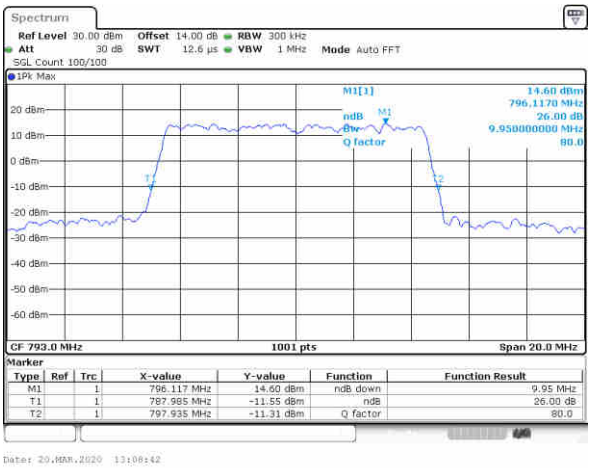


Highest Channel / 5MHz / 16QAM



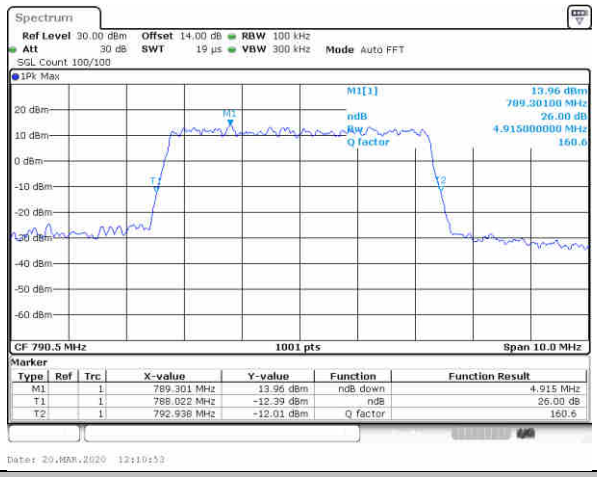
LTE Band 14	
Middle Channel / 10MHz / QPSK	**Middle Channel / 10MHz / 16QAM**



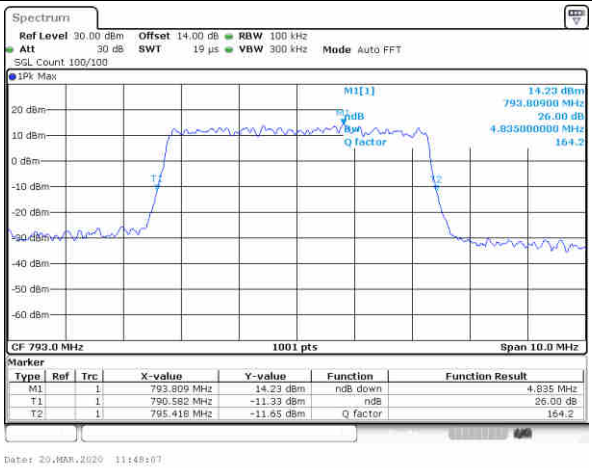


LTE Band 14

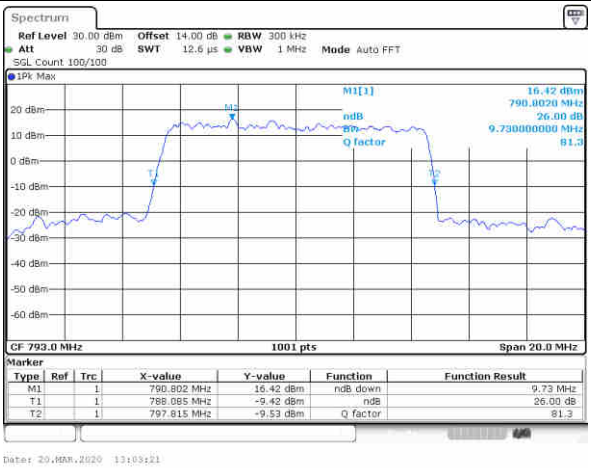
Lowest Channel / 5MHz / 64QAM



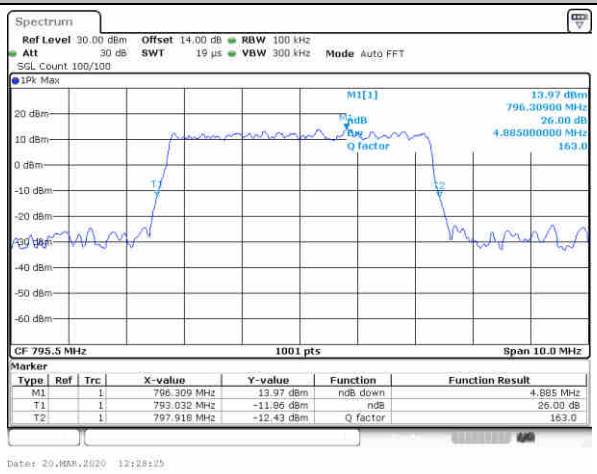
Middle Channel / 5MHz / 64QAM



Middle Channel / 10MHz / 64QAM



Highest Channel / 5MHz / 64QAM

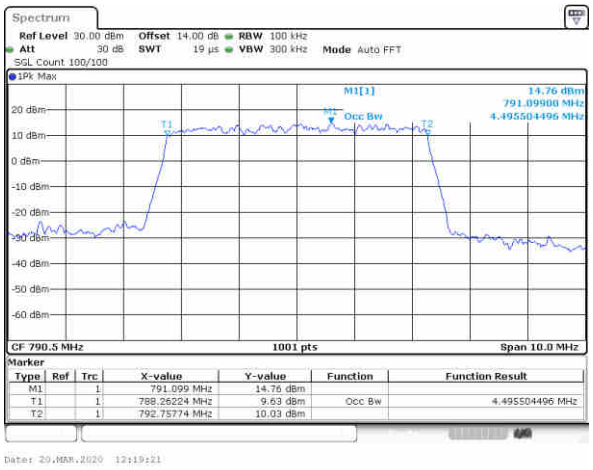


Occupied Bandwidth

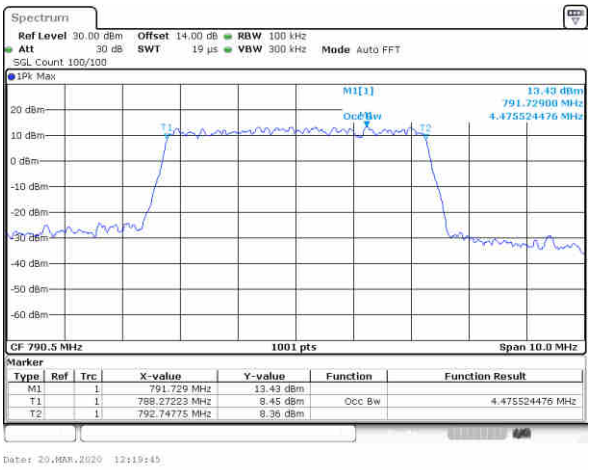
Mode	LTE Band 14 : 99%OBW(MHz)					
BW	5MHz		10MHz		5MHz	10MHz
Mod.	QPSK	16QAM	QPSK	16QAM	64QAM	64QAM
Lowest CH	4.50	4.48	-	-	4.47	-
Middle CH	4.48	4.49	9.05	9.05	4.49	9.05
Highest CH	4.49	4.49	-	-	4.51	-

LTE Band 14

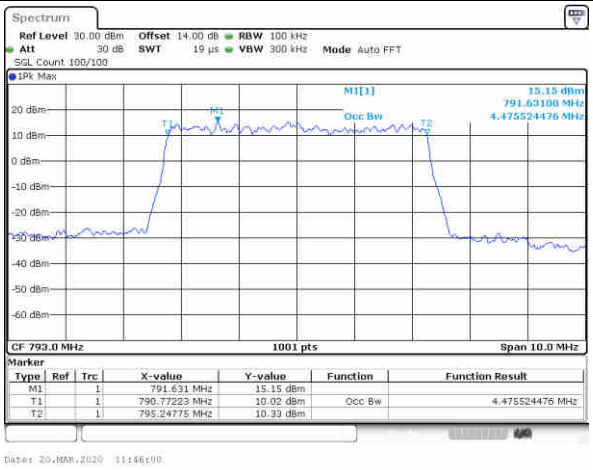
Lowest Channel / 5MHz / QPSK



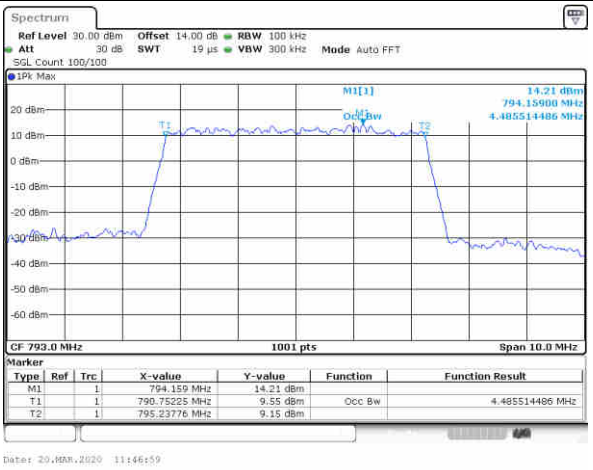
Lowest Channel / 5MHz / 16QAM



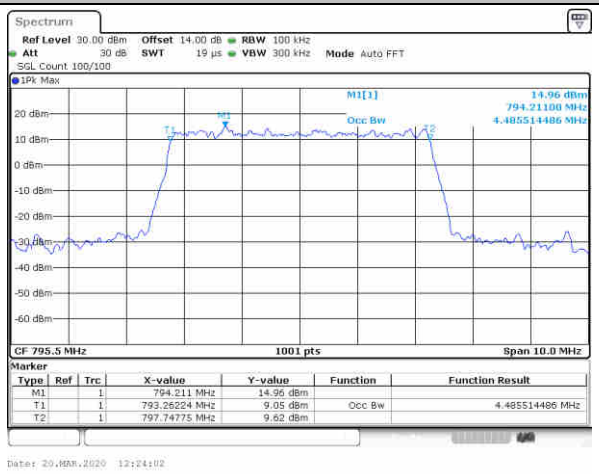
Middle Channel / 5MHz / QPSK



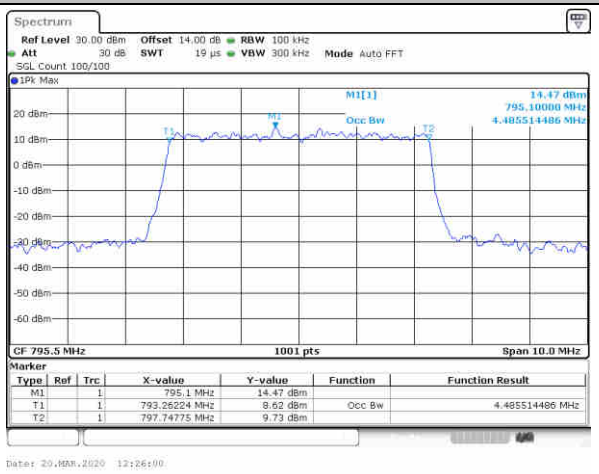
Middle Channel / 5MHz / 16QAM

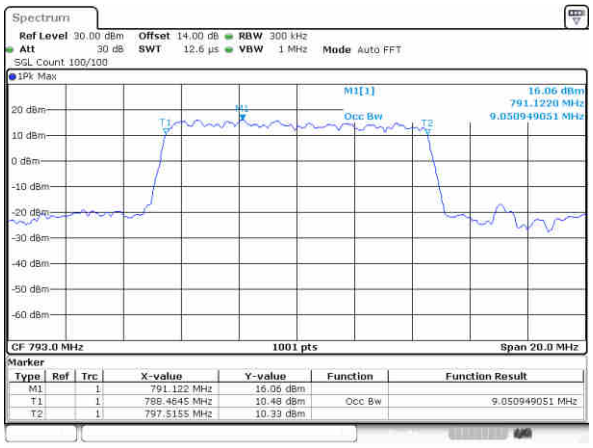
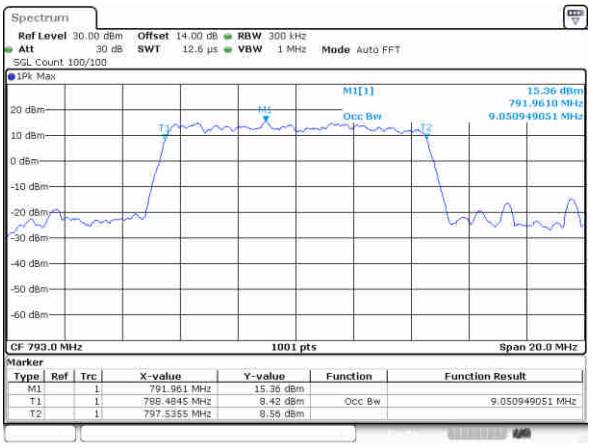


Highest Channel / 5MHz / QPSK



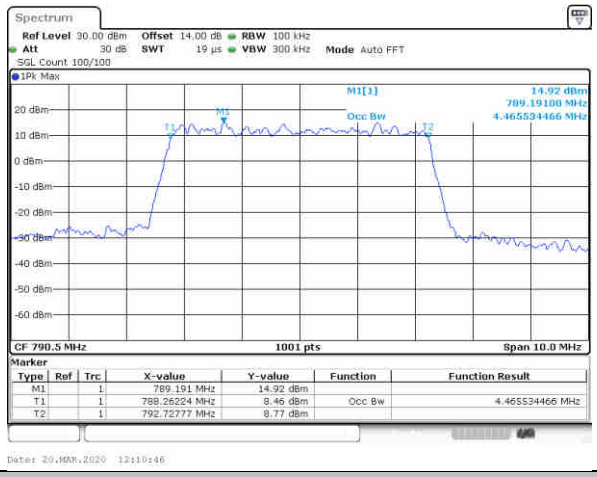
Highest Channel / 5MHz / 16QAM



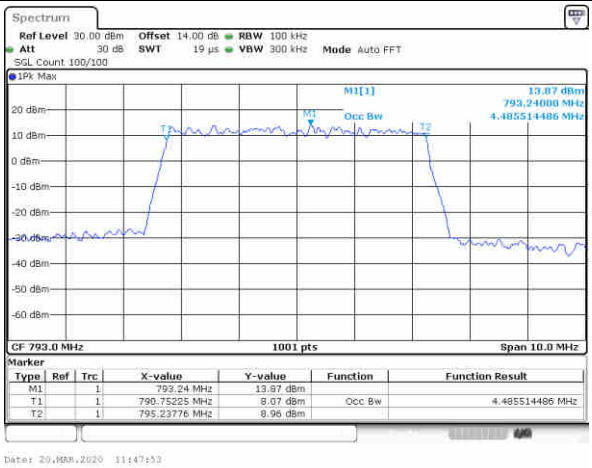
LTE Band 14	
Middle Channel / 10MHz / QPSK	**Middle Channel / 10MHz / 16QAM**
	

LTE Band 14

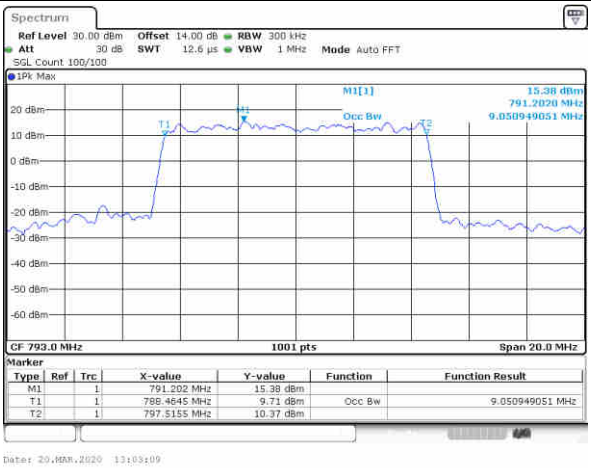
Lowest Channel / 5MHz / 64QAM



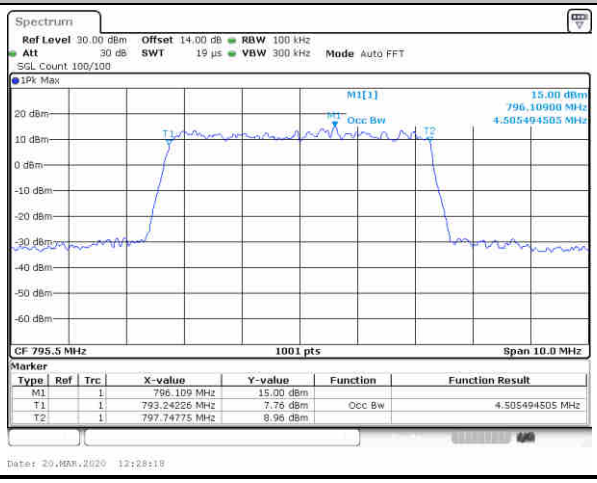
Middle Channel / 5MHz / 64QAM



Middle Channel / 10MHz / 64QAM



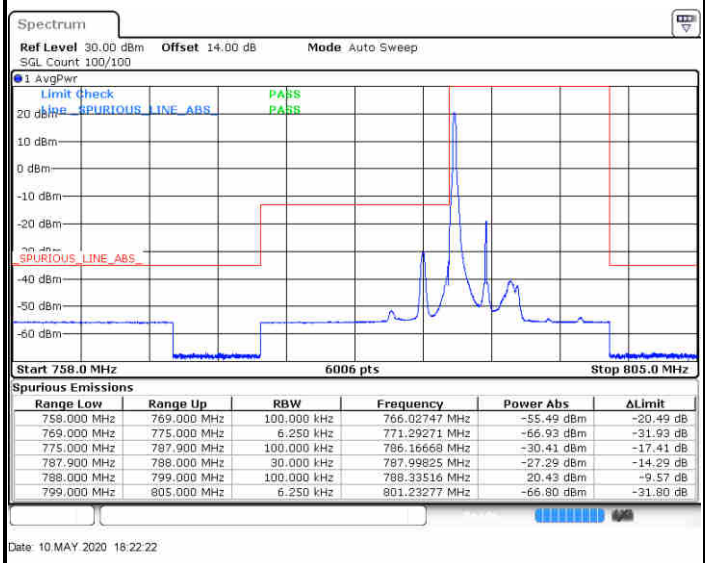
Highest Channel / 5MHz / 64QAM



Conducted Band Edge

LTE Band 14 / 5MHz / QPSK

Lowest Band Edge / 1 RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	766.02747 MHz	-55.49 dBm	-20.49 dB
769.000 MHz	775.000 MHz	6.250 kHz	771.29271 MHz	-66.93 dBm	-31.93 dB
775.000 MHz	787.900 MHz	100.000 kHz	786.16668 MHz	-30.41 dBm	-17.41 dB
787.900 MHz	788.000 MHz	30.000 kHz	787.99825 MHz	-27.29 dBm	-14.29 dB
788.000 MHz	799.000 MHz	100.000 kHz	788.33516 MHz	20.43 dBm	-9.57 dB
799.000 MHz	805.000 MHz	6.250 kHz	801.23277 MHz	-66.80 dBm	-31.80 dB

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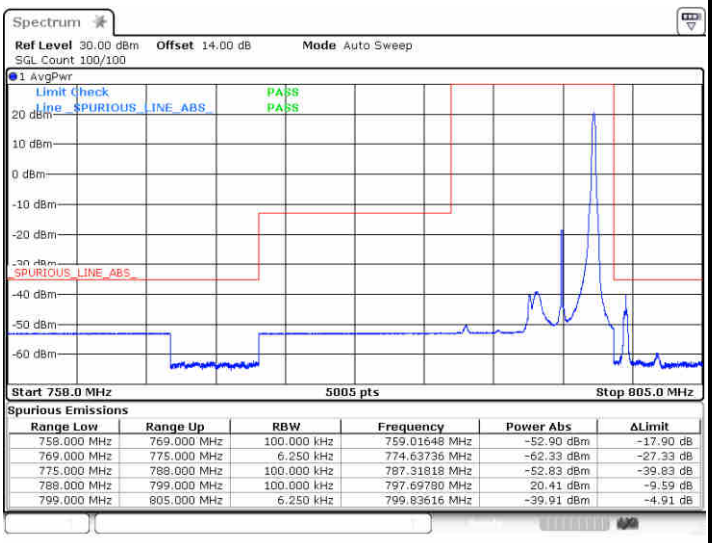
Highest Band Edge / 1 RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	759.01648 MHz	-52.90 dBm	-17.90 dB
769.000 MHz	775.000 MHz	6.250 kHz	774.63736 MHz	-62.33 dBm	-27.33 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.31818 MHz	-52.83 dBm	-39.83 dB
788.000 MHz	799.000 MHz	100.000 kHz	797.69780 MHz	20.41 dBm	-9.59 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.83616 MHz	-39.91 dBm	-4.91 dB

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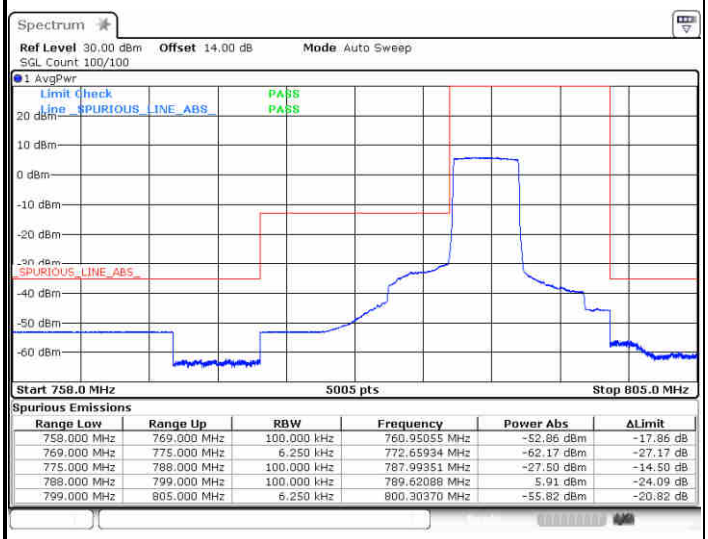
Lowest Band Edge / Full RB

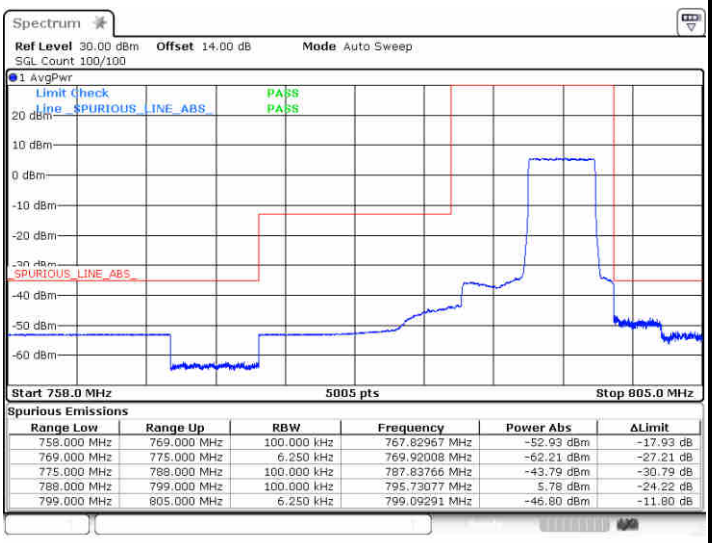


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	760.95055 MHz	-52.86 dBm	-17.86 dB
769.000 MHz	775.000 MHz	6.250 kHz	772.65934 MHz	-62.17 dBm	-27.17 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99351 MHz	-27.50 dBm	-14.50 dB
788.000 MHz	799.000 MHz	100.000 kHz	789.62088 MHz	5.91 dBm	-24.09 dB
799.000 MHz	805.000 MHz	6.250 kHz	800.30370 MHz	-55.82 dBm	-20.82 dB

Date: 29.APR.2020 19:17:59

Highest Band Edge / Full RB



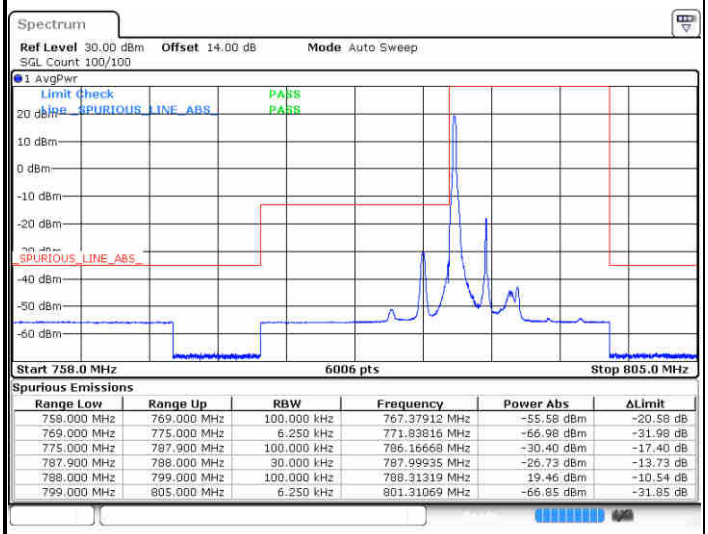
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	767.82967 MHz	-52.93 dBm	-17.93 dB
769.000 MHz	775.000 MHz	6.250 kHz	769.92008 MHz	-62.21 dBm	-27.21 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.83766 MHz	-43.79 dBm	-30.79 dB
788.000 MHz	799.000 MHz	100.000 kHz	795.73077 MHz	5.78 dBm	-24.22 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.09291 MHz	-46.80 dBm	-11.80 dB

Date: 29.APR.2020 20:04:12

LTE Band 14 / 5MHz / 16QAM

Lowest Band Edge /1 RB

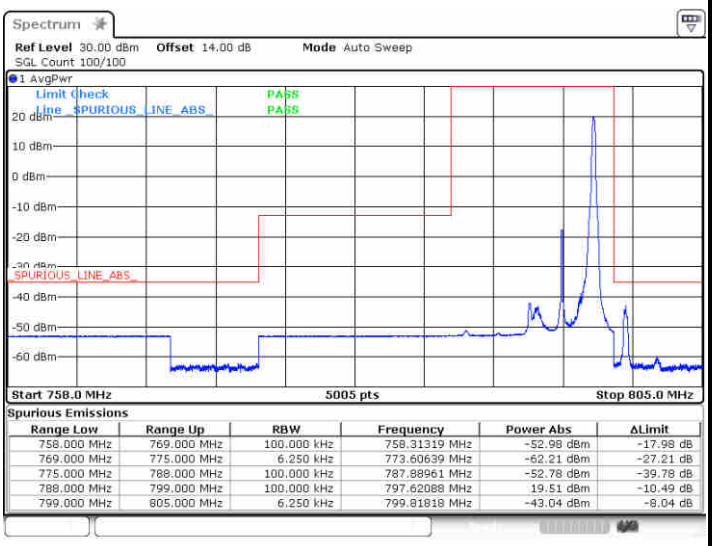


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	767.37912 MHz	-55.58 dBm	-20.58 dB
769.000 MHz	775.000 MHz	6.250 kHz	771.83816 MHz	-66.98 dBm	-31.98 dB
775.000 MHz	787.900 MHz	100.000 kHz	786.16668 MHz	-30.40 dBm	-17.40 dB
787.900 MHz	788.000 MHz	30.000 kHz	787.99935 MHz	-26.73 dBm	-13.73 dB
788.000 MHz	799.000 MHz	100.000 kHz	788.31319 MHz	19.46 dBm	-10.54 dB
799.000 MHz	805.000 MHz	6.250 kHz	801.31069 MHz	-66.85 dBm	-31.85 dB

Date: 10.MAY.2020 18:27:10

Highest Band Edge / 1 RB

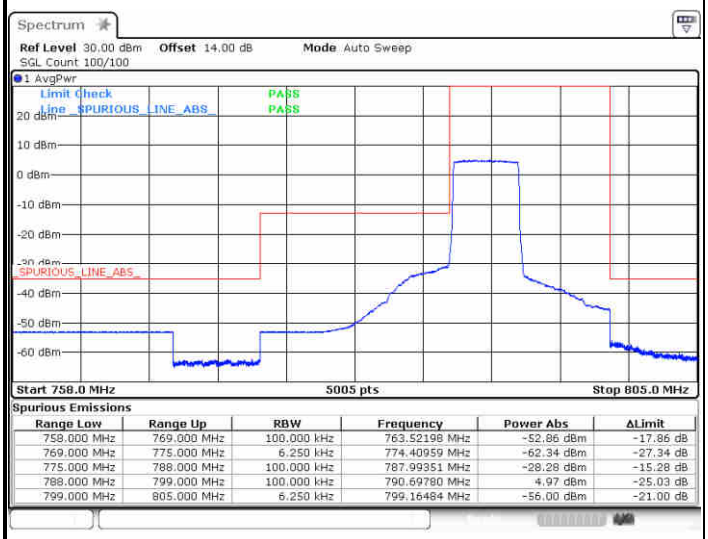


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	758.31319 MHz	-52.98 dBm	-17.98 dB
769.000 MHz	775.000 MHz	6.250 kHz	773.60639 MHz	-62.21 dBm	-27.21 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.88961 MHz	-52.78 dBm	-39.78 dB
788.000 MHz	799.000 MHz	100.000 kHz	797.62088 MHz	19.51 dBm	-10.49 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.81818 MHz	-43.04 dBm	-8.04 dB

Date: 29.APR.2020 20:00:33

Lowest Band Edge / Full RB

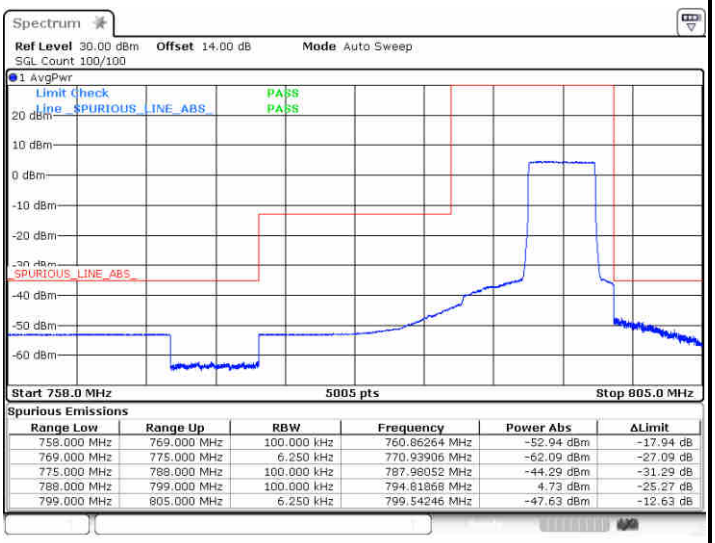


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	763.52198 MHz	-52.86 dBm	-17.86 dB
769.000 MHz	775.000 MHz	6.250 kHz	774.40959 MHz	-62.34 dBm	-27.34 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99351 MHz	-28.28 dBm	-15.28 dB
788.000 MHz	799.000 MHz	100.000 kHz	790.69780 MHz	4.97 dBm	-25.03 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.16484 MHz	-56.00 dBm	-21.00 dB

Date: 29.APR.2020 19:24:38

Highest Band Edge / Full RB



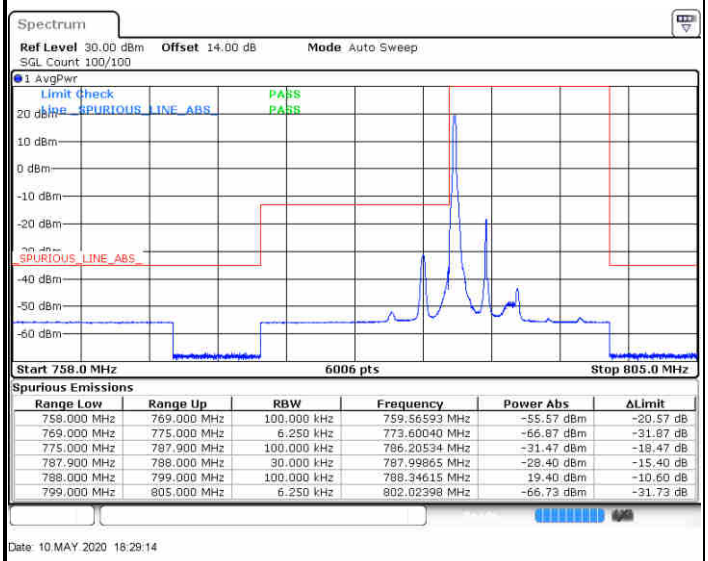
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	760.86264 MHz	-52.94 dBm	-17.94 dB
769.000 MHz	775.000 MHz	6.250 kHz	770.93906 MHz	-62.09 dBm	-27.09 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.98052 MHz	-44.29 dBm	-31.29 dB
788.000 MHz	799.000 MHz	100.000 kHz	794.81868 MHz	4.73 dBm	-25.27 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.54246 MHz	-47.63 dBm	-12.63 dB

Date: 29.APR.2020 20:06:32

LTE Band 14 / 5MHz / 64QAM

Lowest Band Edge / 1 RB

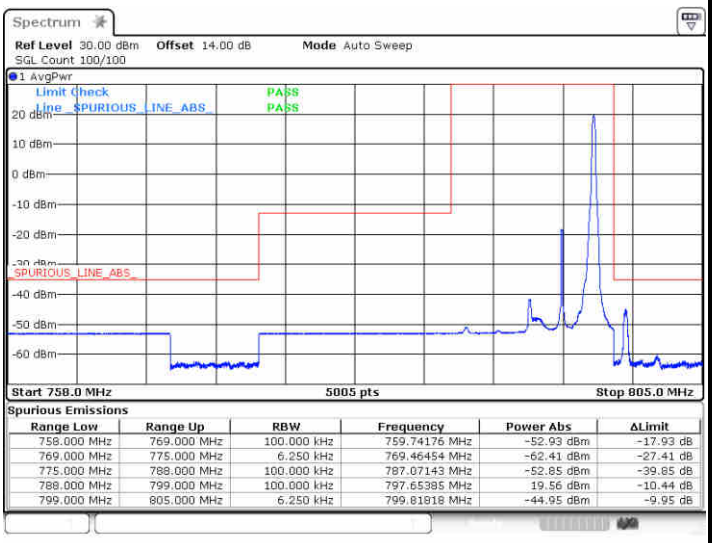


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	759.56593 MHz	-55.57 dBm	-20.57 dB
769.000 MHz	775.000 MHz	6.250 kHz	773.60040 MHz	-66.87 dBm	-31.87 dB
775.000 MHz	787.900 MHz	100.000 kHz	786.20534 MHz	-31.47 dBm	-18.47 dB
787.900 MHz	788.000 MHz	30.000 kHz	787.99865 MHz	-28.40 dBm	-15.40 dB
788.000 MHz	799.000 MHz	100.000 kHz	788.34615 MHz	19.40 dBm	-10.60 dB
799.000 MHz	805.000 MHz	6.250 kHz	802.02398 MHz	-66.73 dBm	-31.73 dB

Date: 10.MAY.2020 18:29:14

Highest Band Edge / 1 RB

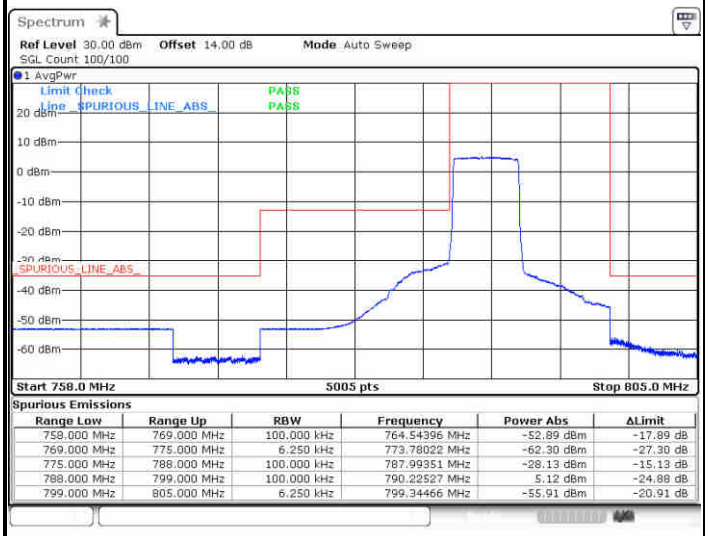


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	759.74176 MHz	-52.93 dBm	-17.93 dB
769.000 MHz	775.000 MHz	6.250 kHz	769.46454 MHz	-62.41 dBm	-27.41 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.07143 MHz	-52.85 dBm	-39.85 dB
788.000 MHz	799.000 MHz	100.000 kHz	797.65385 MHz	19.56 dBm	-10.44 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.81818 MHz	-44.95 dBm	-9.95 dB

Date: 29.APR.2020 19:58:50

Lowest Band Edge / Full RB

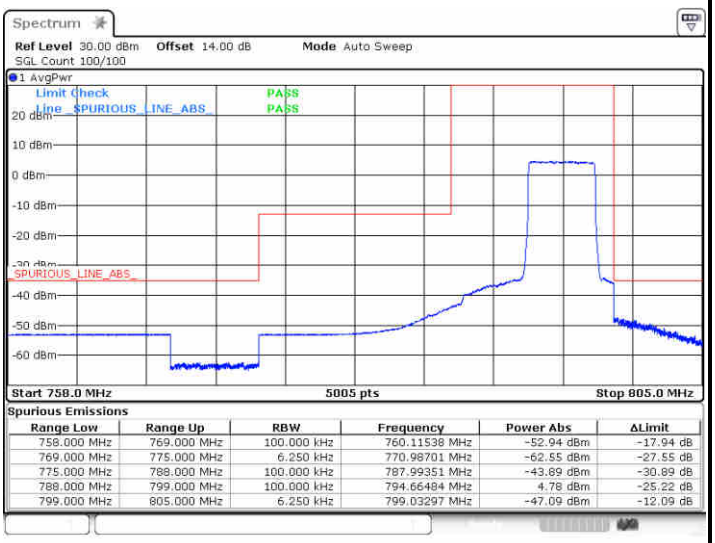


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	764.54396 MHz	-52.89 dBm	-17.89 dB
769.000 MHz	775.000 MHz	6.250 kHz	773.78022 MHz	-62.30 dBm	-27.30 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99351 MHz	-28.13 dBm	-15.13 dB
788.000 MHz	799.000 MHz	100.000 kHz	790.22527 MHz	5.12 dBm	-24.88 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.34466 MHz	-55.91 dBm	-20.91 dB

Date: 29.APR.2020 19:26:46

Highest Band Edge / Full RB



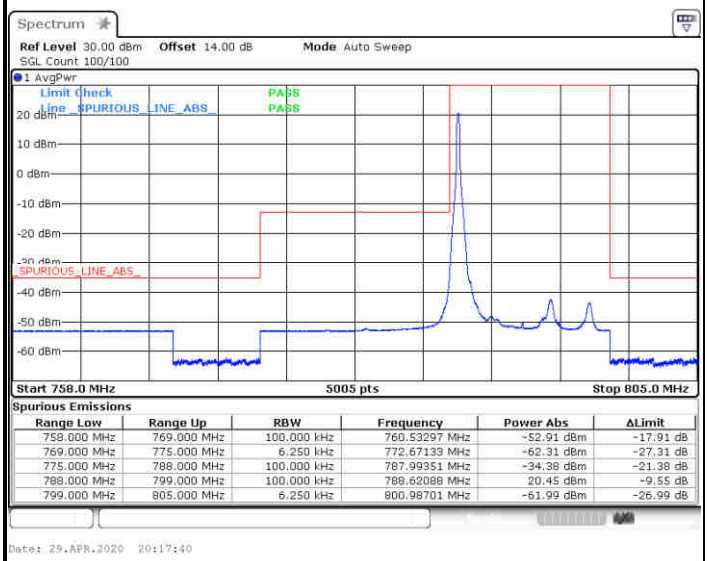
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	760.11538 MHz	-52.94 dBm	-17.94 dB
769.000 MHz	775.000 MHz	6.250 kHz	770.98701 MHz	-62.55 dBm	-27.55 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99351 MHz	-43.89 dBm	-30.89 dB
788.000 MHz	799.000 MHz	100.000 kHz	794.66484 MHz	4.78 dBm	-25.22 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.03297 MHz	-47.09 dBm	-12.09 dB

Date: 29.APR.2020 20:09:29

LTE Band 14 / 10MHz / QPSK

Lowest Band Edge / 1 RB

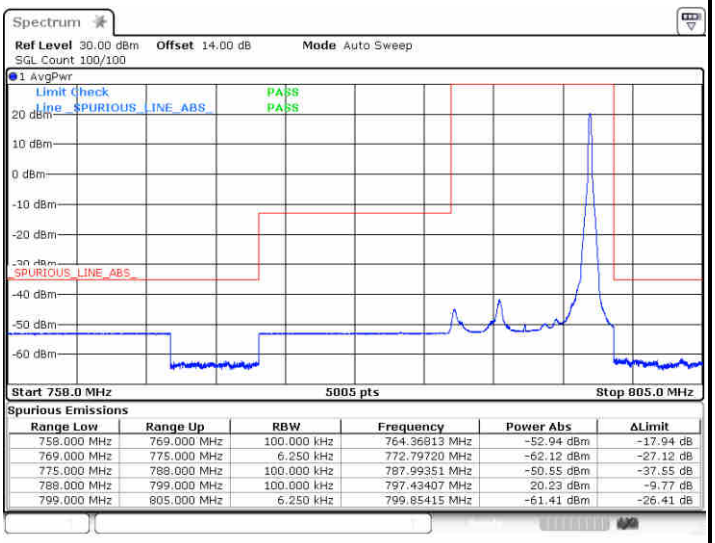


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	760.53297 MHz	-52.91 dBm	-17.91 dB
769.000 MHz	775.000 MHz	6.250 kHz	772.67133 MHz	-62.31 dBm	-27.31 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99351 MHz	-34.38 dBm	-21.38 dB
788.000 MHz	799.000 MHz	100.000 kHz	788.62088 MHz	20.45 dBm	-9.55 dB
799.000 MHz	805.000 MHz	6.250 kHz	800.98701 MHz	-61.99 dBm	-26.99 dB

Date: 29.APR.2020 20:17:40

Highest Band Edge / 1 RB

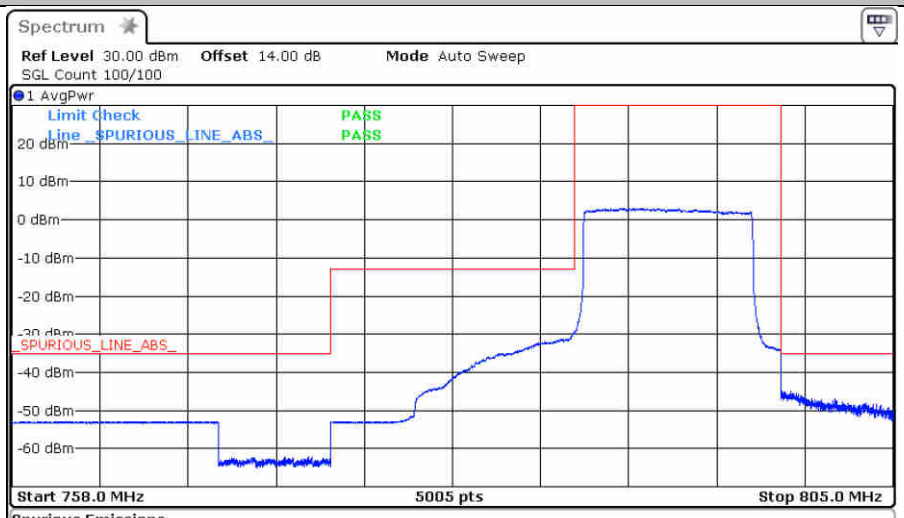


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	764.36813 MHz	-52.94 dBm	-17.94 dB
769.000 MHz	775.000 MHz	6.250 kHz	772.79720 MHz	-62.12 dBm	-27.12 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99351 MHz	-50.55 dBm	-37.55 dB
788.000 MHz	799.000 MHz	100.000 kHz	797.43407 MHz	20.23 dBm	-9.77 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.85415 MHz	-61.41 dBm	-26.41 dB

Date: 29.APR.2020 20:26:20

Band Edge / Full RB



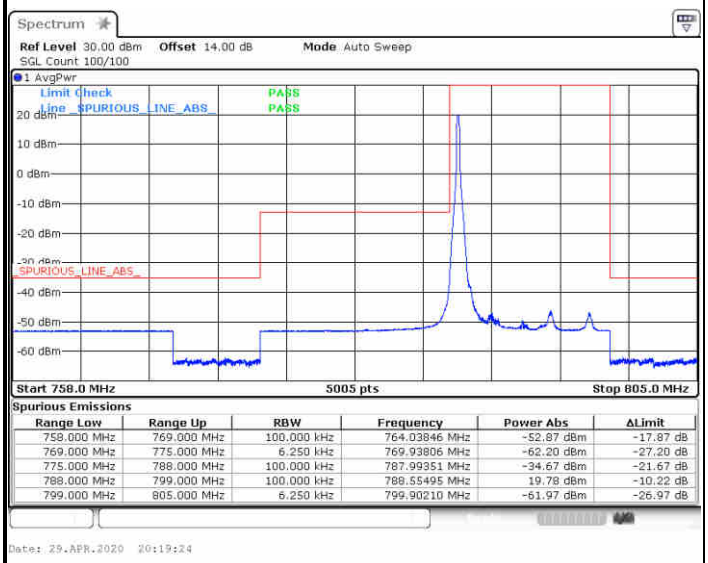
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	765.75275 MHz	-52.86 dBm	-17.86 dB
769.000 MHz	775.000 MHz	6.250 kHz	773.82817 MHz	-62.16 dBm	-27.16 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.98052 MHz	-29.70 dBm	-16.70 dB
788.000 MHz	799.000 MHz	100.000 kHz	791.45604 MHz	2.96 dBm	-27.04 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.07493 MHz	-44.79 dBm	-9.79 dB

Date: 29.APR.2020 20:15:11

LTE Band 14 / 10MHz / 16QAM

Lowest Band Edge / 1 RB

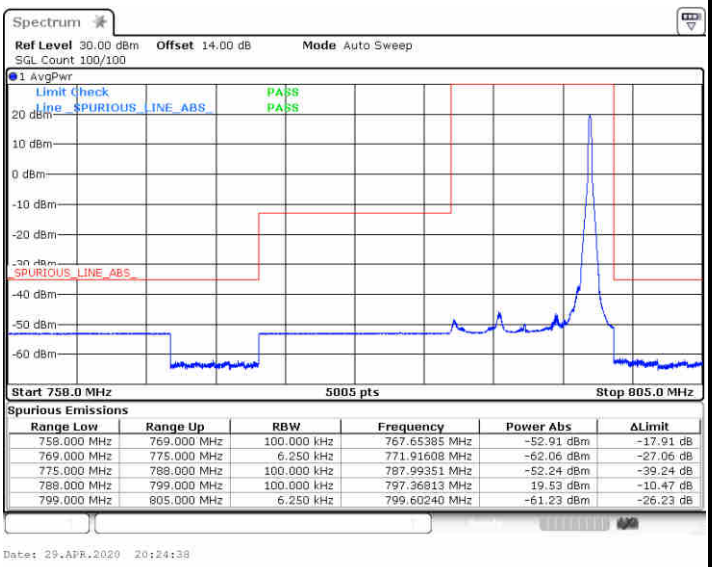


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	764.03846 MHz	-52.87 dBm	-17.87 dB
769.000 MHz	775.000 MHz	6.250 kHz	769.93806 MHz	-62.20 dBm	-27.20 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99351 MHz	-34.67 dBm	-21.67 dB
788.000 MHz	799.000 MHz	100.000 kHz	788.55495 MHz	19.78 dBm	-10.22 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.90210 MHz	-61.97 dBm	-26.97 dB

Date: 29.APR.2020 20:19:24

Highest Band Edge / 1 RB

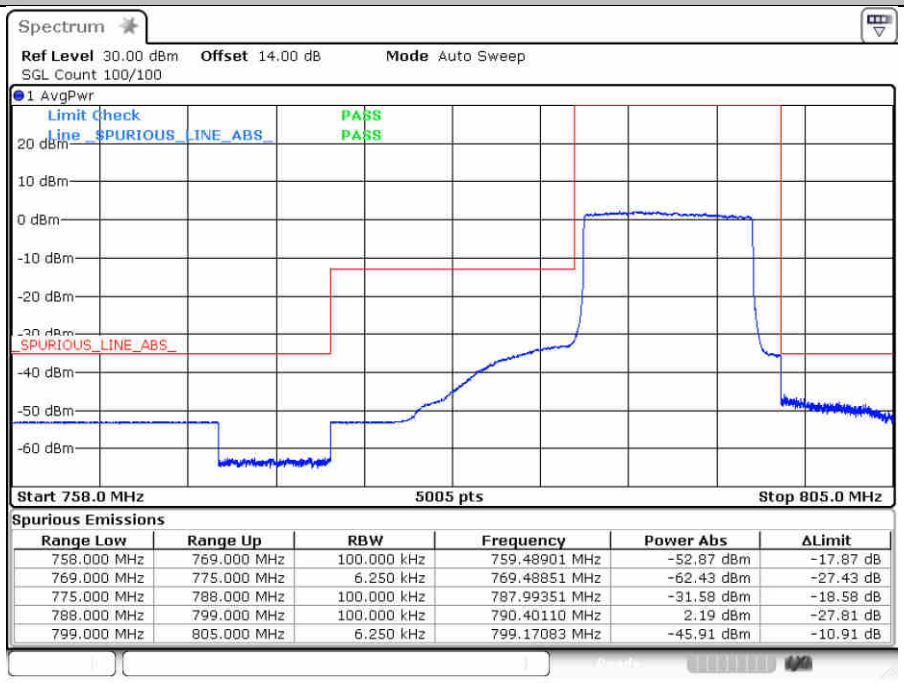


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	767.65385 MHz	-52.91 dBm	-17.91 dB
769.000 MHz	775.000 MHz	6.250 kHz	771.91608 MHz	-62.06 dBm	-27.06 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99351 MHz	-52.24 dBm	-39.24 dB
788.000 MHz	799.000 MHz	100.000 kHz	797.36813 MHz	19.53 dBm	-10.47 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.60240 MHz	-61.23 dBm	-26.23 dB

Date: 29.APR.2020 20:24:38

Band Edge / Full RB



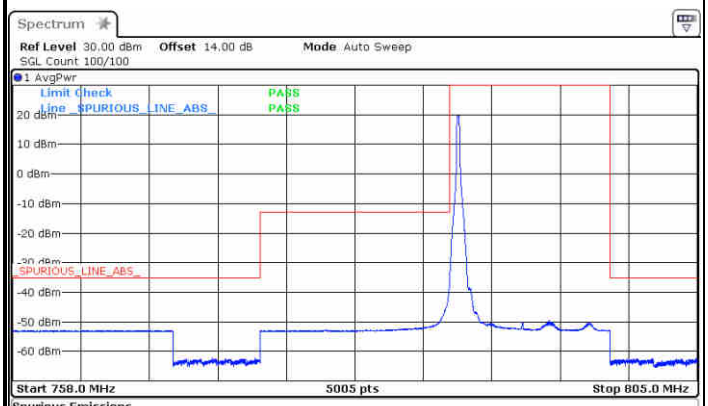
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	759.48901 MHz	-52.87 dBm	-17.87 dB
769.000 MHz	775.000 MHz	6.250 kHz	769.48851 MHz	-62.43 dBm	-27.43 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99351 MHz	-31.58 dBm	-18.58 dB
788.000 MHz	799.000 MHz	100.000 kHz	790.40110 MHz	2.19 dBm	-27.81 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.17083 MHz	-45.91 dBm	-10.91 dB

Date: 29.APR.2020 20:13:09

LTE Band 14 / 10MHz / 64QAM

Lowest Band Edge / 1 RB

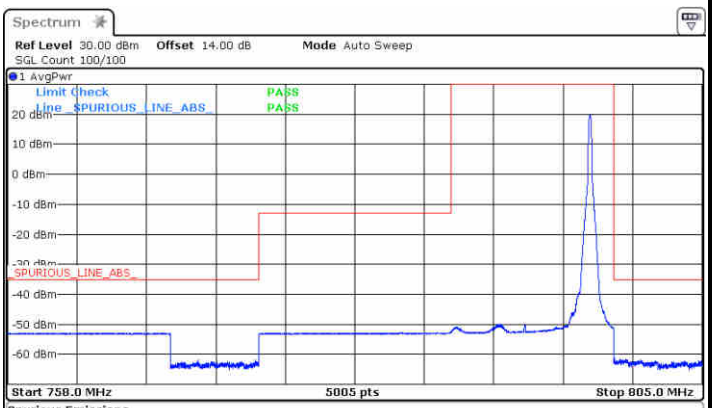


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	767.75275 MHz	-52.95 dBm	-17.95 dB
769.000 MHz	775.000 MHz	6.250 kHz	771.71828 MHz	-62.22 dBm	-27.22 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.99351 MHz	-36.41 dBm	-23.41 dB
788.000 MHz	799.000 MHz	100.000 kHz	788.62088 MHz	19.73 dBm	-10.27 dB
799.000 MHz	805.000 MHz	6.250 kHz	803.60040 MHz	-62.39 dBm	-27.39 dB

Date: 29.APR.2020 20:21:10

Highest Band Edge / 1 RB

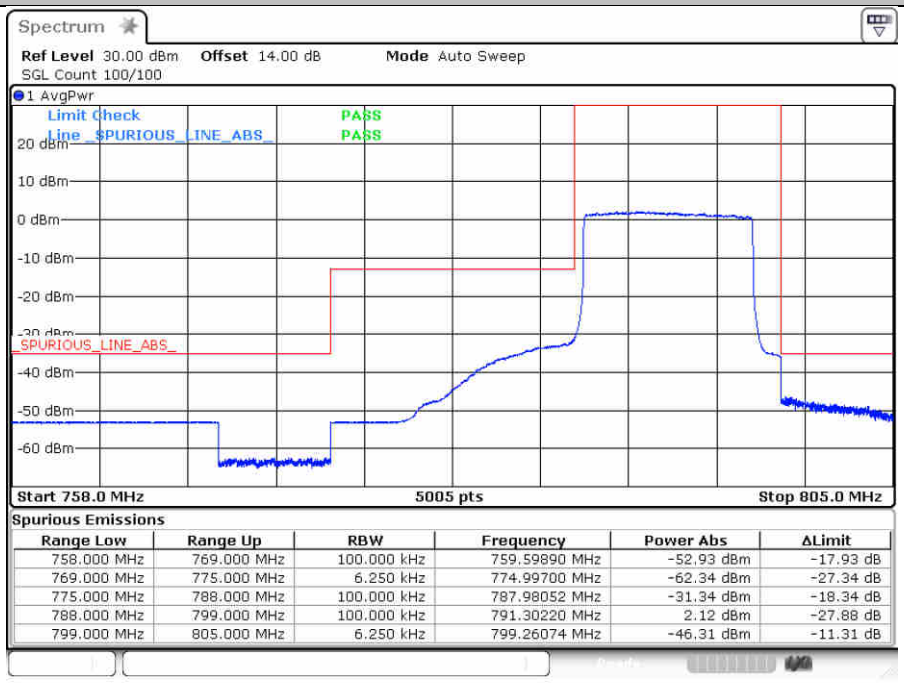


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	762.07143 MHz	-52.92 dBm	-17.92 dB
769.000 MHz	775.000 MHz	6.250 kHz	774.77522 MHz	-61.94 dBm	-26.94 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.98052 MHz	-52.63 dBm	-39.63 dB
788.000 MHz	799.000 MHz	100.000 kHz	797.39011 MHz	19.53 dBm	-10.47 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.06294 MHz	-61.34 dBm	-26.34 dB

Date: 29.APR.2020 20:22:54

Band Edge / Full RB



Spurious Emissions

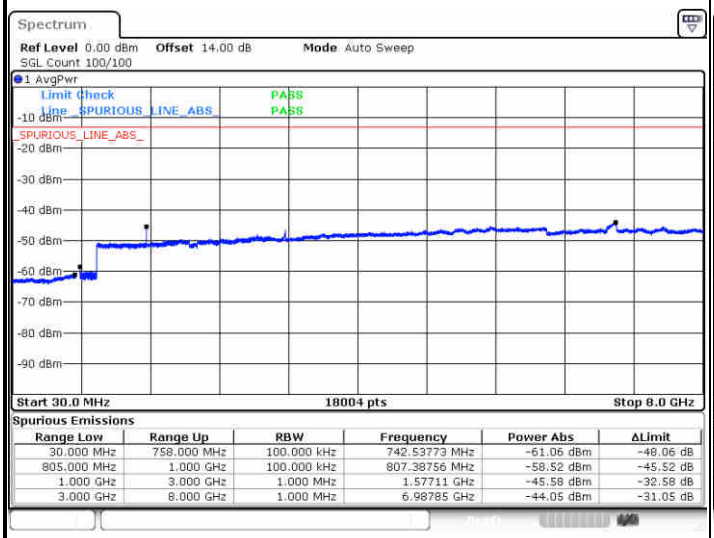
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
758.000 MHz	769.000 MHz	100.000 kHz	759.59890 MHz	-52.93 dBm	-17.93 dB
769.000 MHz	775.000 MHz	6.250 kHz	774.99700 MHz	-62.34 dBm	-27.34 dB
775.000 MHz	788.000 MHz	100.000 kHz	787.98052 MHz	-31.34 dBm	-18.34 dB
788.000 MHz	799.000 MHz	100.000 kHz	791.30220 MHz	2.12 dBm	-27.88 dB
799.000 MHz	805.000 MHz	6.250 kHz	799.26074 MHz	-46.31 dBm	-11.31 dB

Date: 29.APR.2020 20:11:26

Conducted Spurious Emission

LTE Band 14 / 5MHz

Lowest Channel / QPSK

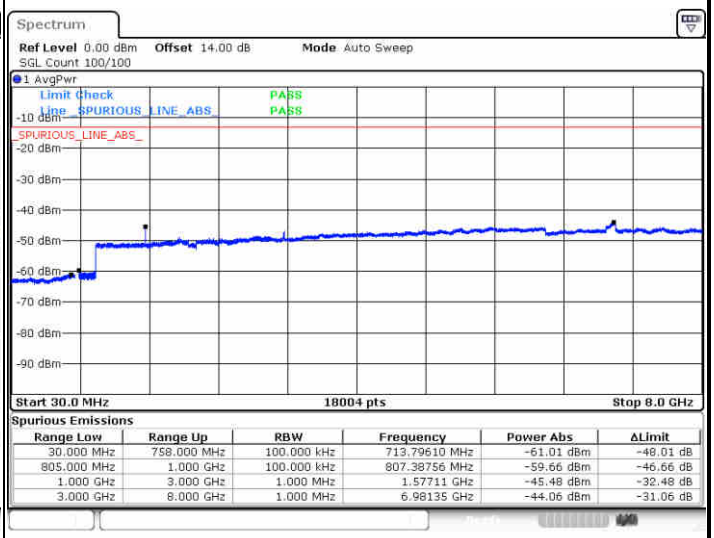


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	742.53773 MHz	-61.06 dBm	-48.06 dB
805.000 MHz	1.000 GHz	100.000 kHz	807.38756 MHz	-58.52 dBm	-45.52 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.57711 GHz	-45.58 dBm	-32.58 dB
3.000 GHz	8.000 GHz	1.000 MHz	6.98785 GHz	-44.05 dBm	-31.05 dB

Date: 20.MAR.2020 12:19:05

Lowest Channel / 16QAM

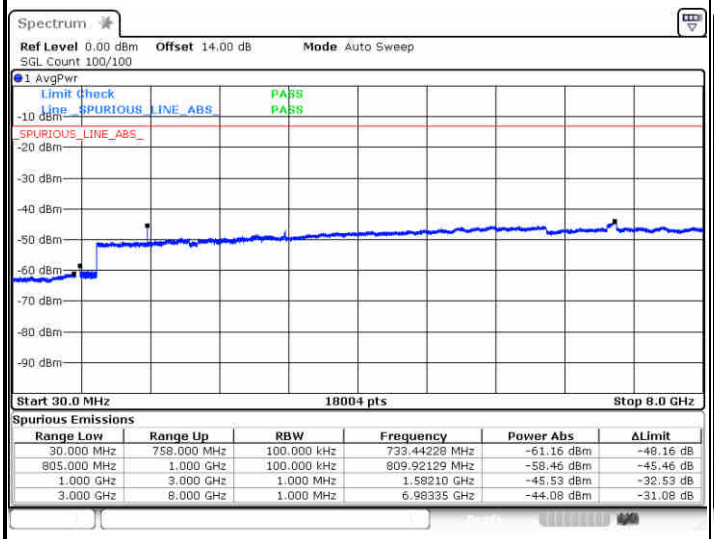


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	713.79610 MHz	-61.01 dBm	-48.01 dB
805.000 MHz	1.000 GHz	100.000 kHz	807.38756 MHz	-59.66 dBm	-46.66 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.57711 GHz	-45.48 dBm	-32.48 dB
3.000 GHz	8.000 GHz	1.000 MHz	6.98135 GHz	-44.06 dBm	-31.06 dB

Date: 20.MAR.2020 12:16:34

Middle Channel / QPSK

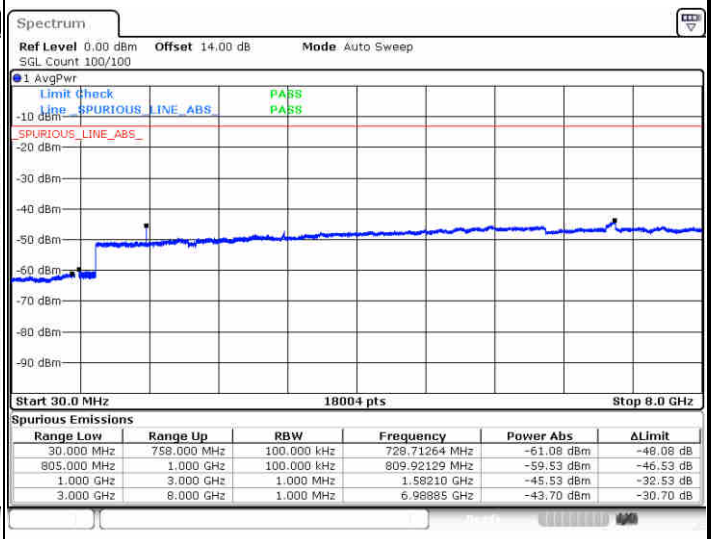


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	733.44228 MHz	-61.16 dBm	-48.16 dB
805.000 MHz	1.000 GHz	100.000 kHz	809.92129 MHz	-58.46 dBm	-45.46 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.58210 GHz	-45.53 dBm	-32.53 dB
3.000 GHz	8.000 GHz	1.000 MHz	6.98335 GHz	-44.08 dBm	-31.08 dB

Date: 20.MAR.2020 12:03:41

Middle Channel / 16QAM



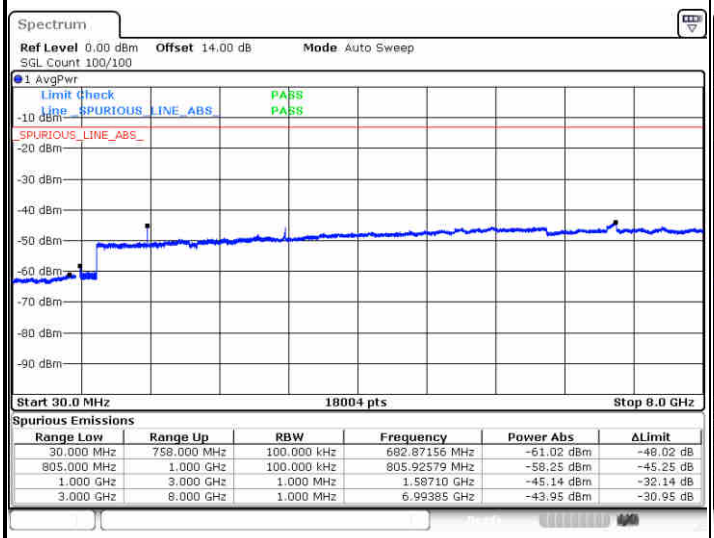
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	728.71264 MHz	-61.08 dBm	-48.08 dB
805.000 MHz	1.000 GHz	100.000 kHz	809.92129 MHz	-59.53 dBm	-46.53 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.58210 GHz	-45.53 dBm	-32.53 dB
3.000 GHz	8.000 GHz	1.000 MHz	6.98885 GHz	-43.70 dBm	-30.70 dB

Date: 20.MAR.2020 11:50:41

LTE Band 14 / 5MHz

Highest Channel / QPSK

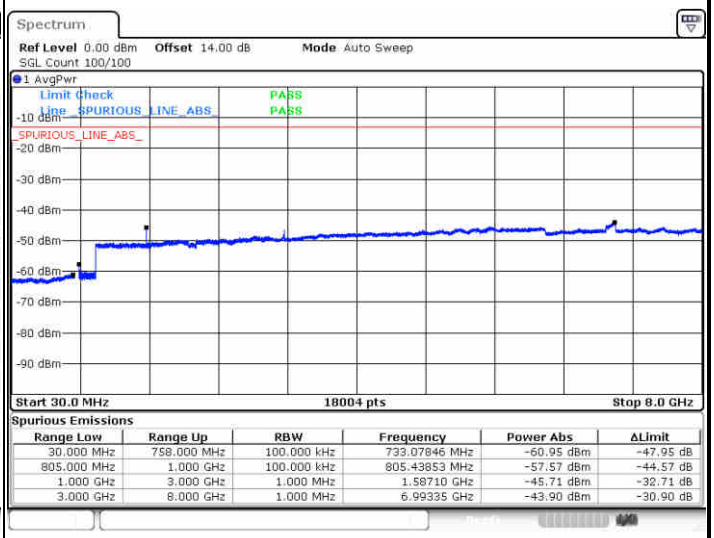


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	682.87156 MHz	-61.02 dBm	-48.02 dB
805.000 MHz	1.000 GHz	100.000 kHz	805.92579 MHz	-58.25 dBm	-45.25 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.58710 GHz	-45.14 dBm	-32.14 dB
3.000 GHz	8.000 GHz	1.000 MHz	6.99385 GHz	-43.95 dBm	-30.95 dB

Date: 20.MAR.2020 12:35:33

Highest Channel / 16QAM



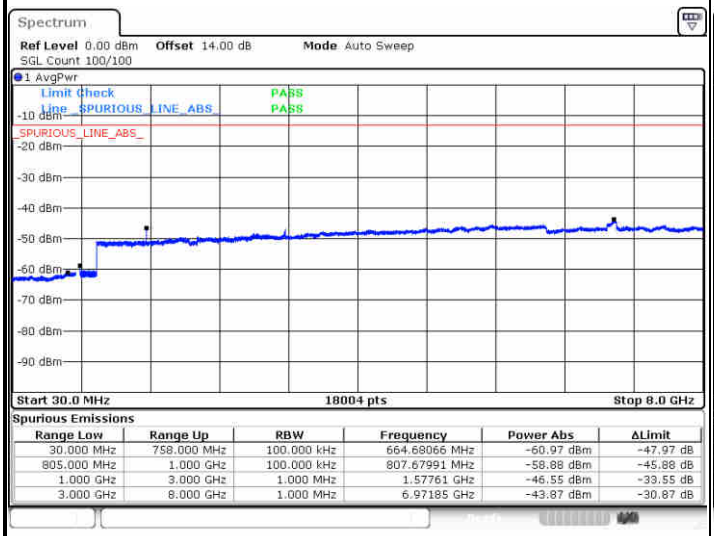
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	733.07846 MHz	-60.95 dBm	-47.95 dB
805.000 MHz	1.000 GHz	100.000 kHz	805.43853 MHz	-57.57 dBm	-44.57 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.58710 GHz	-45.71 dBm	-32.71 dB
3.000 GHz	8.000 GHz	1.000 MHz	6.99335 GHz	-43.90 dBm	-30.90 dB

Date: 20.MAR.2020 12:33:33

LTE Band 14 / 10MHz

Middle Channel / QPSK

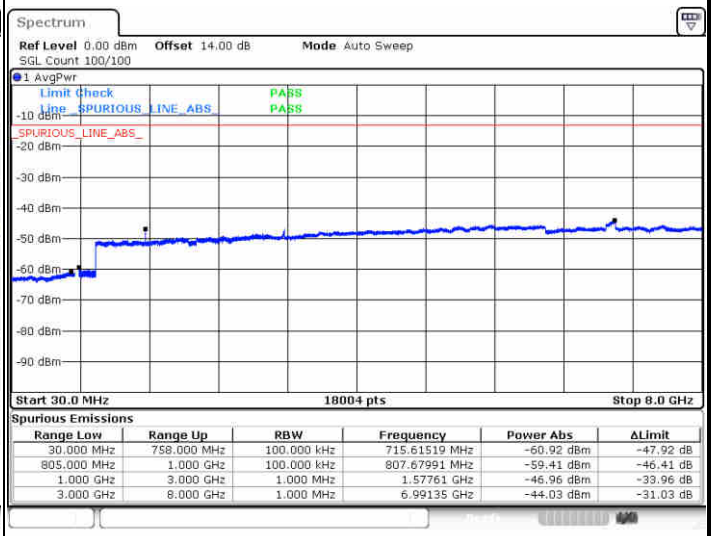


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	664.68066 MHz	-60.97 dBm	-47.97 dB
805.000 MHz	1.000 GHz	100.000 kHz	807.67991 MHz	-58.88 dBm	-45.88 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.57761 GHz	-46.55 dBm	-33.55 dB
3.000 GHz	8.000 GHz	1.000 MHz	6.97185 GHz	-43.87 dBm	-30.87 dB

Date: 20.MAR.2020 13:24:01

Middle Channel / 16QAM



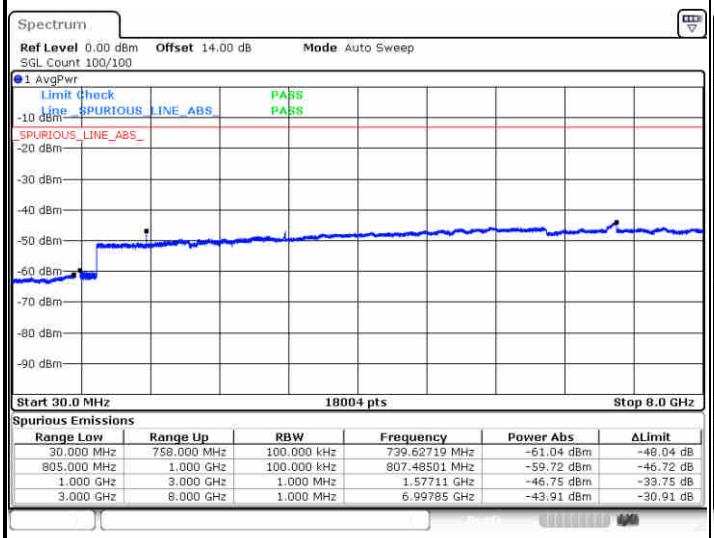
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	715.61519 MHz	-60.92 dBm	-47.92 dB
805.000 MHz	1.000 GHz	100.000 kHz	807.67991 MHz	-59.41 dBm	-46.41 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.57761 GHz	-46.96 dBm	-33.96 dB
3.000 GHz	8.000 GHz	1.000 MHz	6.99135 GHz	-44.03 dBm	-31.03 dB

Date: 20.MAR.2020 13:21:15

LTE Band 14 / 5MHz

Lowest Channel / 64QAM

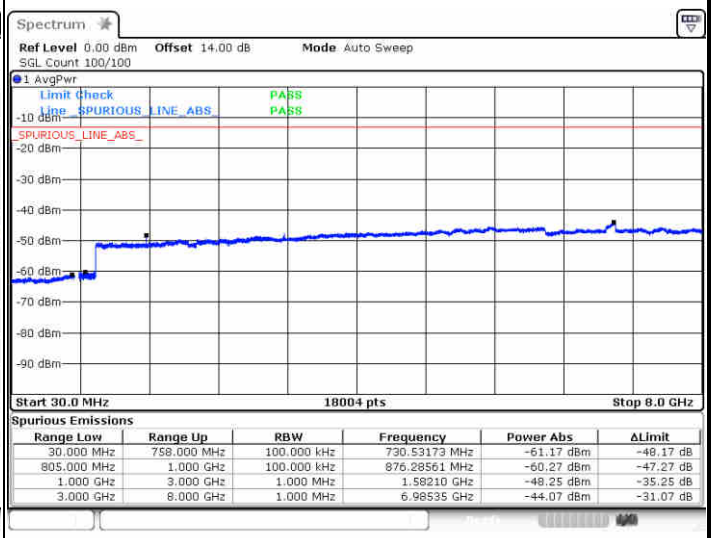


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	739.62719 MHz	-61.04 dBm	-48.04 dB
805.000 MHz	1.000 GHz	100.000 kHz	807.48501 MHz	-59.72 dBm	-46.72 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.57711 GHz	-46.75 dBm	-33.75 dB
3.000 GHz	8.000 GHz	1.000 MHz	6.99785 GHz	-43.91 dBm	-30.91 dB

Date: 20.MAR.2020 12:13:16

Middle Channel / 64QAM

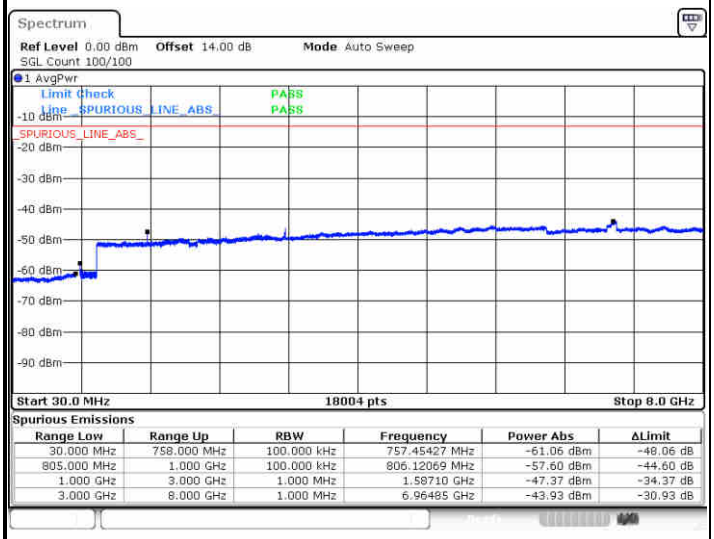


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	730.53173 MHz	-61.17 dBm	-48.17 dB
805.000 MHz	1.000 GHz	100.000 kHz	876.28561 MHz	-60.27 dBm	-47.27 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.58210 GHz	-48.25 dBm	-35.25 dB
3.000 GHz	8.000 GHz	1.000 MHz	6.98535 GHz	-44.07 dBm	-31.07 dB

Date: 20.MAR.2020 11:49:46

Highest Channel / 64QAM

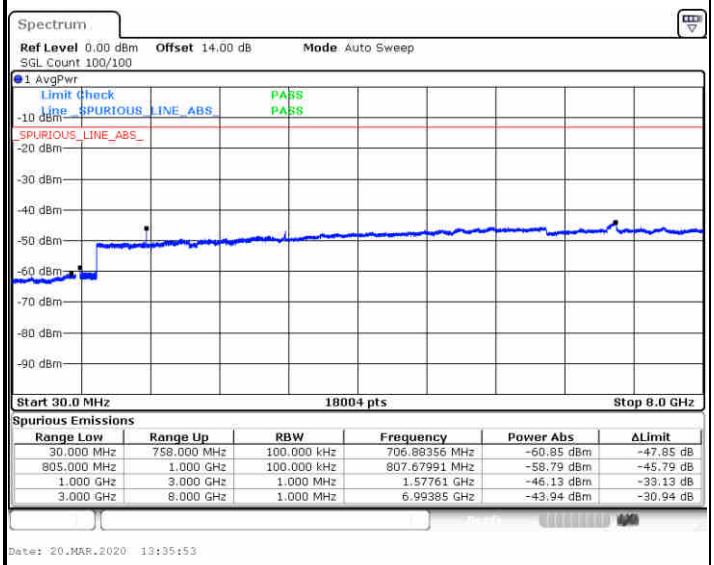


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	757.45427 MHz	-61.06 dBm	-48.06 dB
805.000 MHz	1.000 GHz	100.000 kHz	806.12069 MHz	-57.60 dBm	-44.60 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.58710 GHz	-47.37 dBm	-34.37 dB
3.000 GHz	8.000 GHz	1.000 MHz	6.96485 GHz	-43.93 dBm	-30.93 dB

Date: 20.MAR.2020 12:32:27

LTE Band 14 / 10MHz	
Middle Channel / 64QAM	



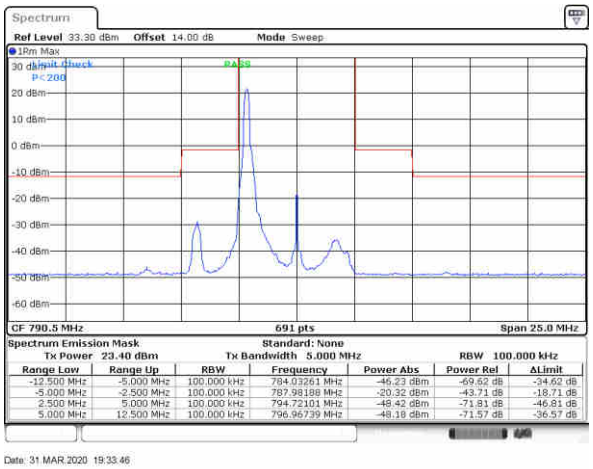
Spurious Emissions

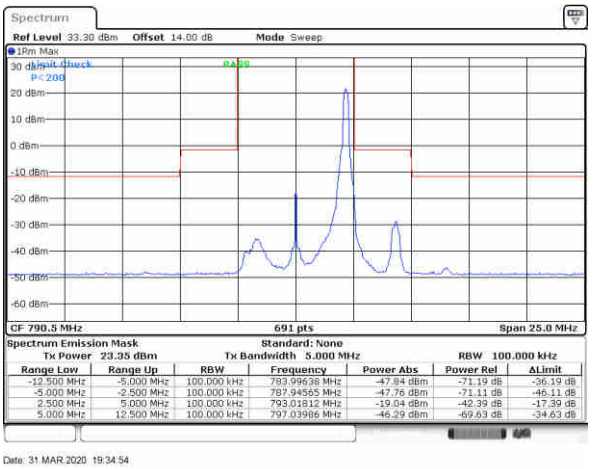
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	758.000 MHz	100.000 kHz	706.88356 MHz	-60.85 dBm	-47.85 dB
805.000 MHz	1.000 GHz	100.000 kHz	807.67991 MHz	-58.79 dBm	-45.79 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.57761 GHz	-46.13 dBm	-33.13 dB
3.000 GHz	8.000 GHz	1.000 MHz	6.99385 GHz	-43.94 dBm	-30.94 dB

Mask

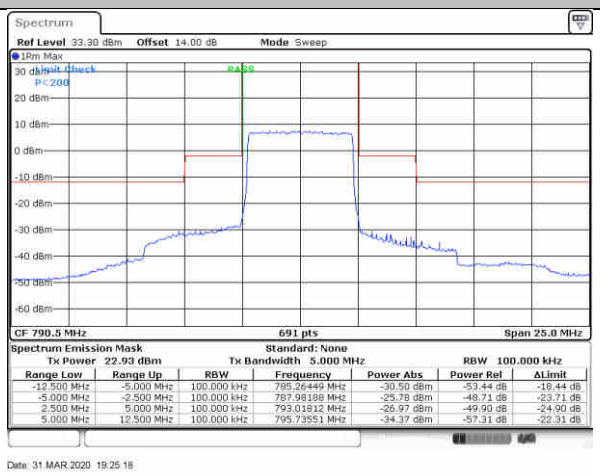
LTE Band 14 / 5MHz / QPSK

Lowest Channel / 1RB



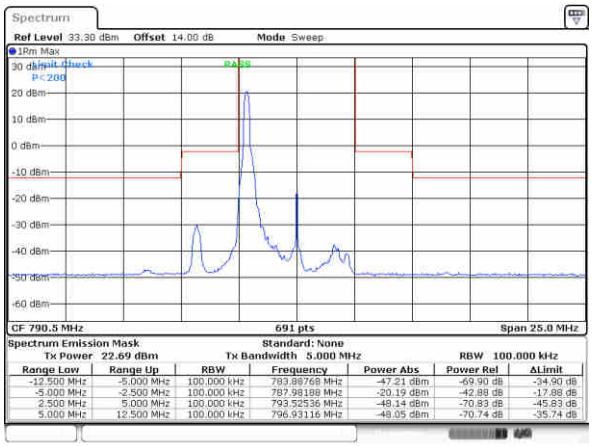


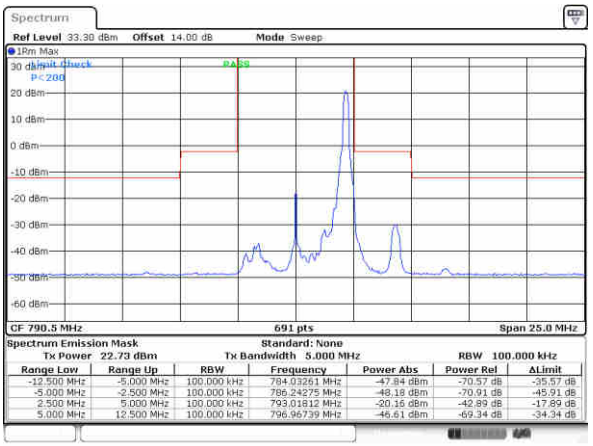
Lowest Channel / Full RB



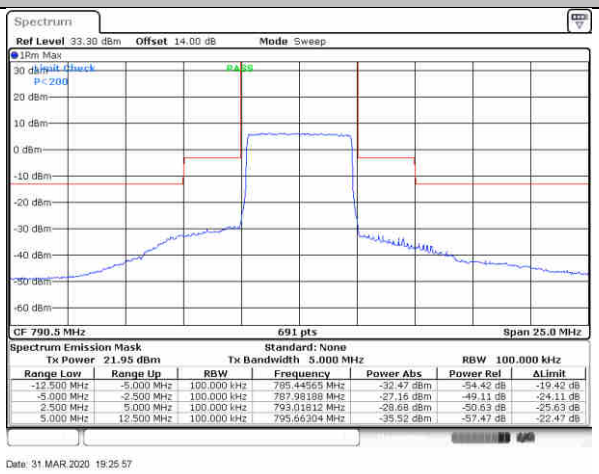
LTE Band 14 / 5MHz / 16QAM

Lowest Channel / 1RB



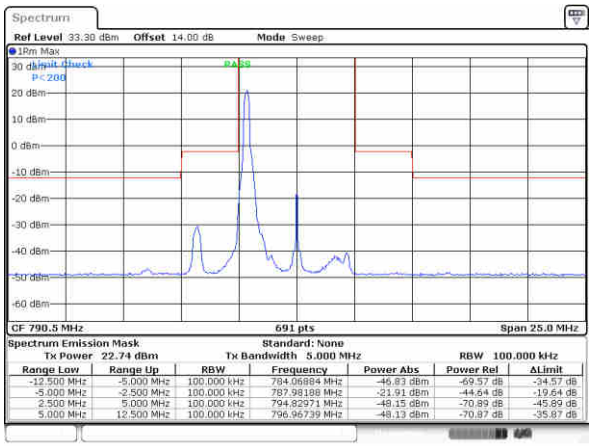


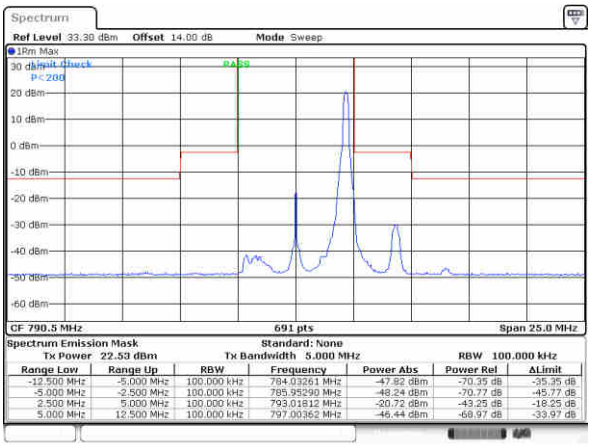
Lowest Channel / Full RB



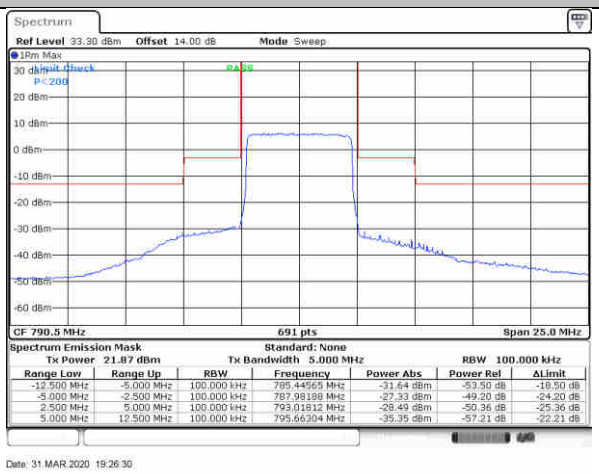
LTE Band 14 / 5MHz / 64QAM

Lowest Channel / 1RB



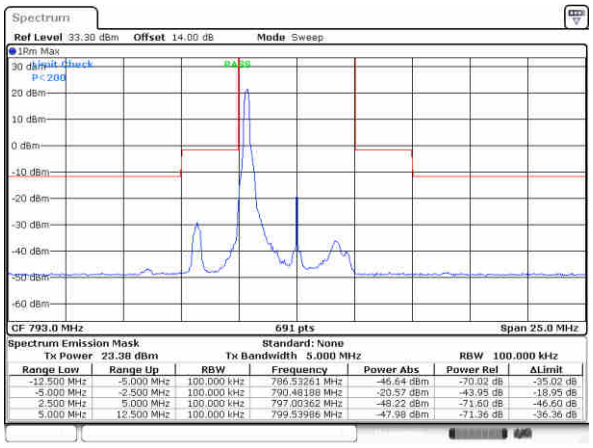


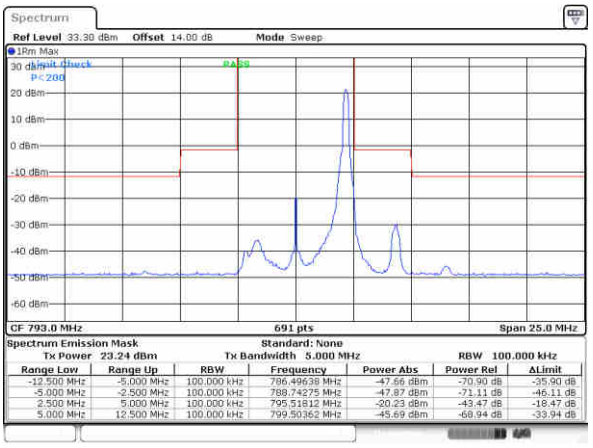
Lowest Channel / Full RB



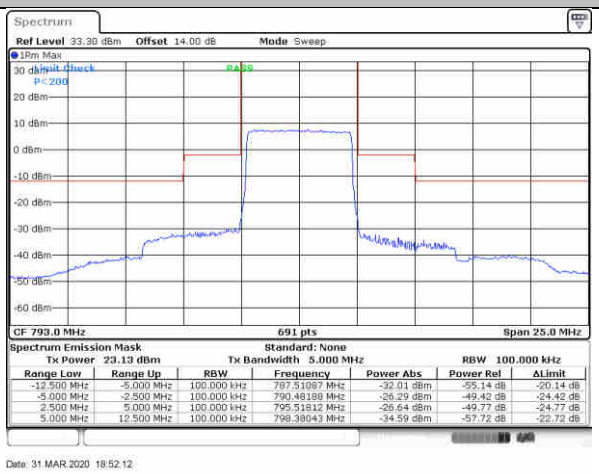
LTE Band 14 / 5MHz / QPSK

Middle Channel / 1RB



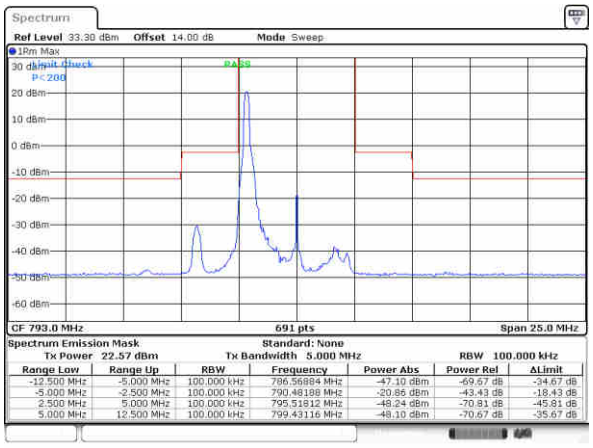


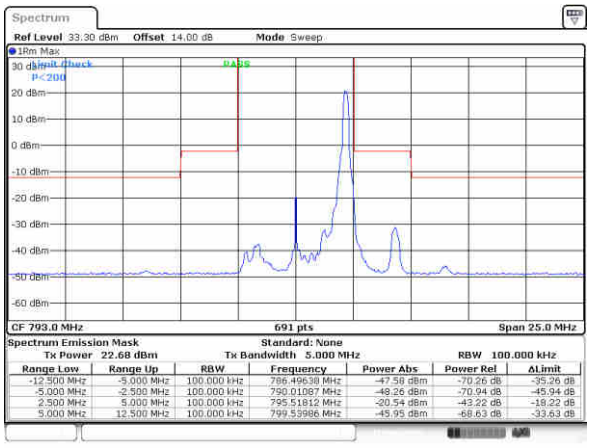
Middle Channel / Full RB



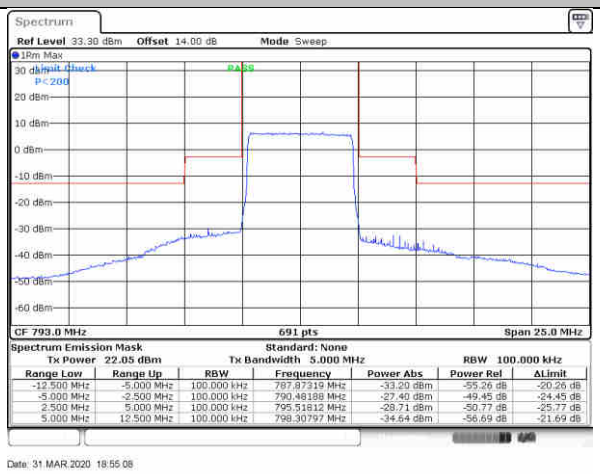
LTE Band 14 / 5MHz / 16QAM

Middle Channel / 1RB



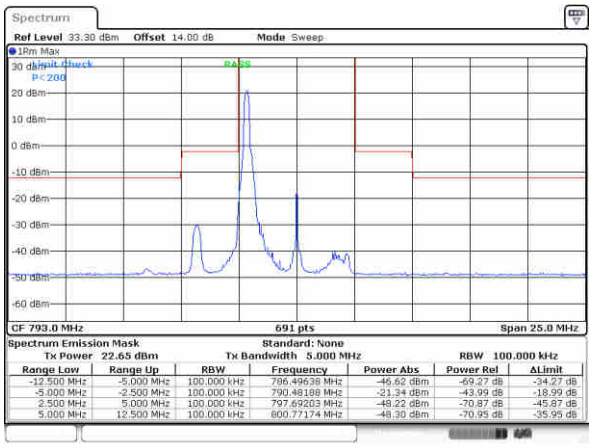


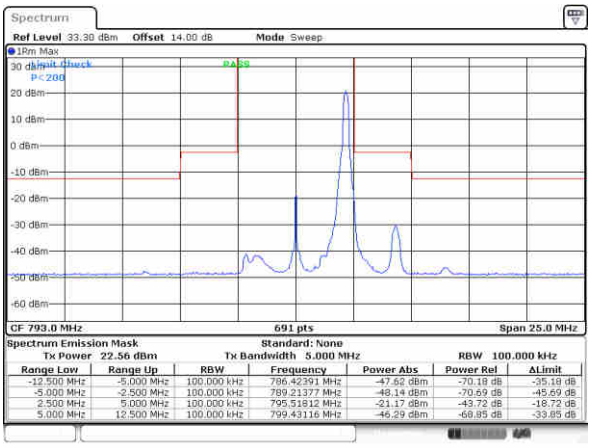
Middle Channel / Full RB



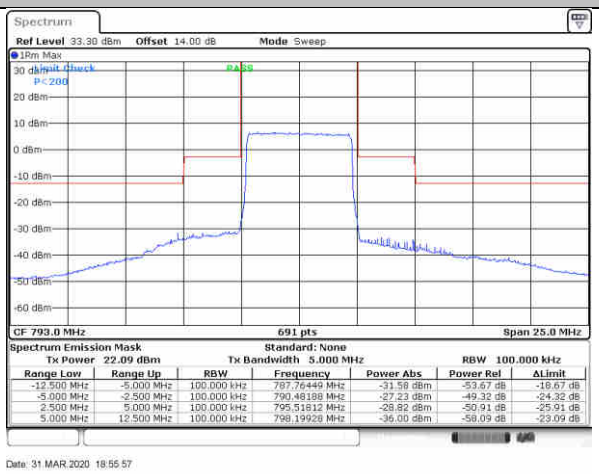
LTE Band 14 / 5MHz / 64QAM

Middle Channel / 1RB



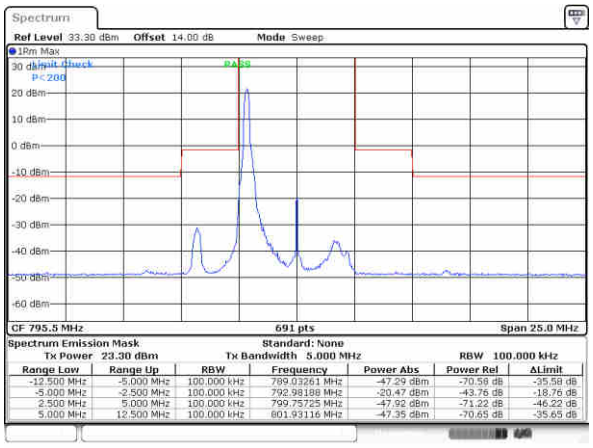


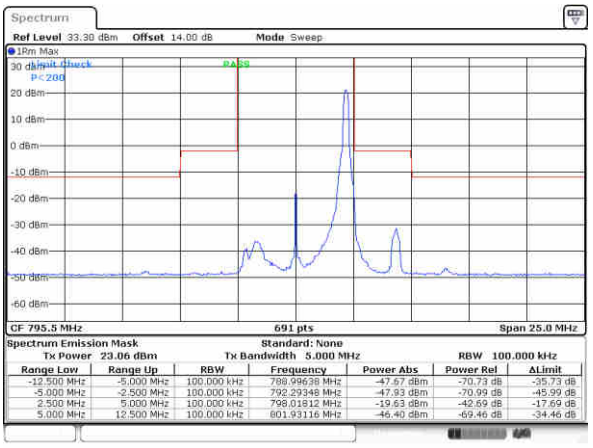
Middle Channel / Full RB



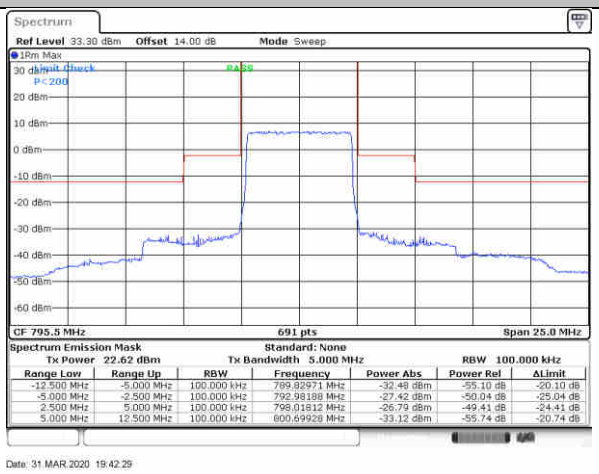
LTE Band 14 / 5MHz / QPSK

Highest Channel / 1RB



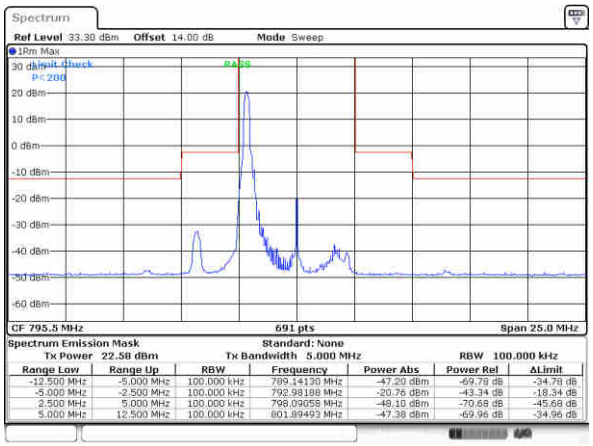


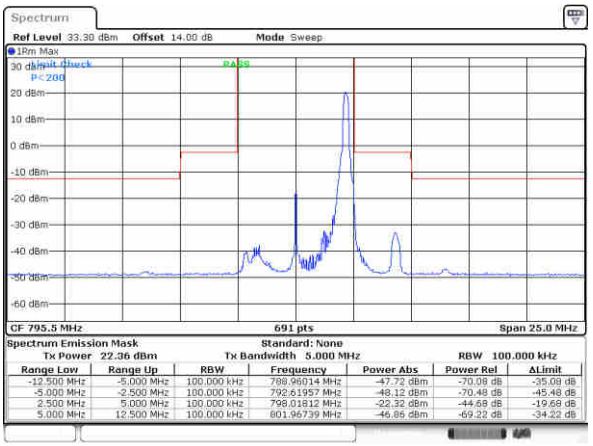
Highest Channel / Full RB



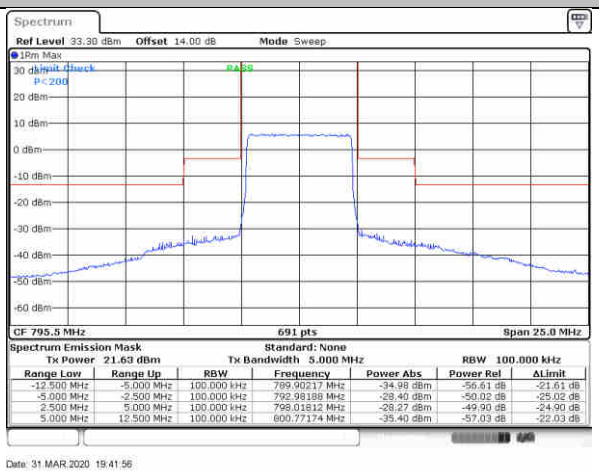
LTE Band 14 / 5MHz / 16QAM

Highest Channel / 1RB



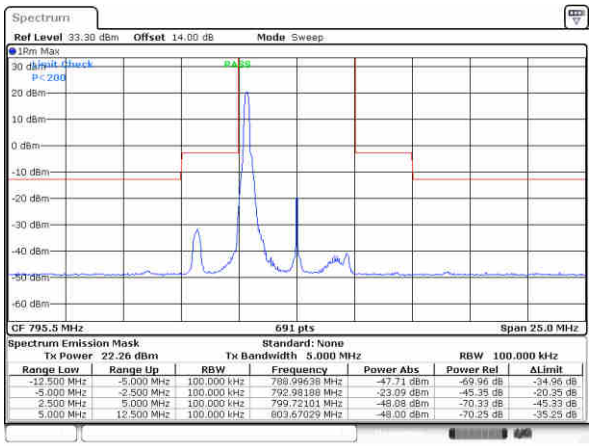


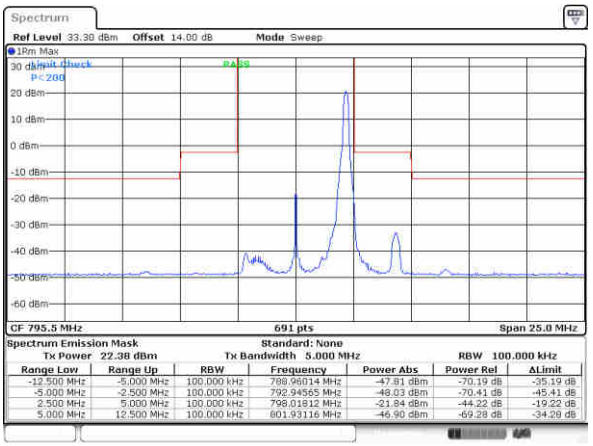
Highest Channel / Full RB



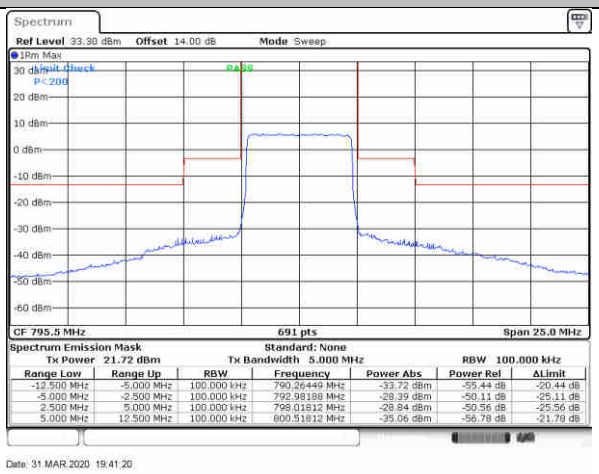
LTE Band 14 / 5MHz / 64QAM

Highest Channel / 1RB



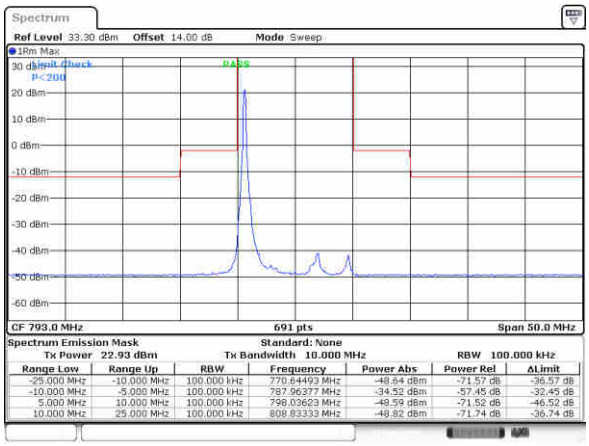


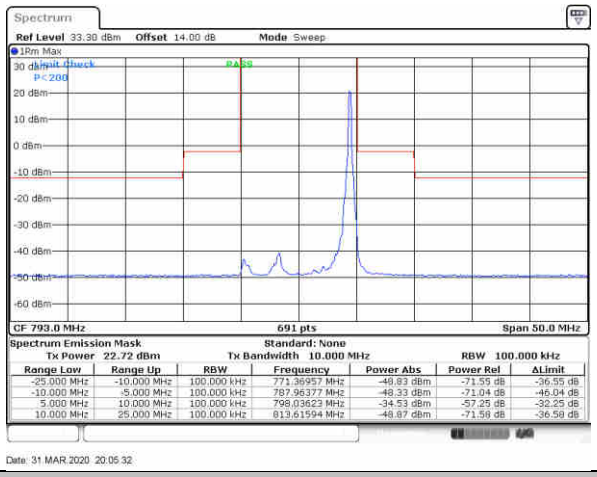
Highest Channel / Full RB



LTE Band 14 / 10MHz / QPSK

Middle Channel / 1RB

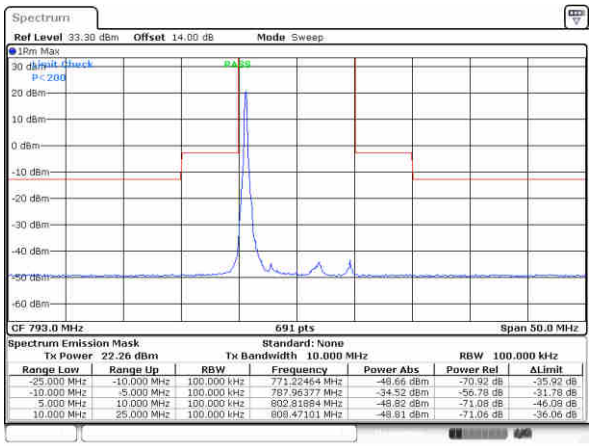


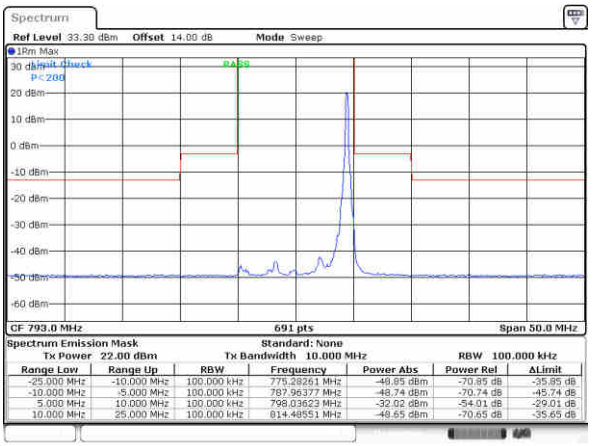


Middle Channel / Full RB

LTE Band 14 / 10MHz / 16QAM

Middle Channel / 1RB

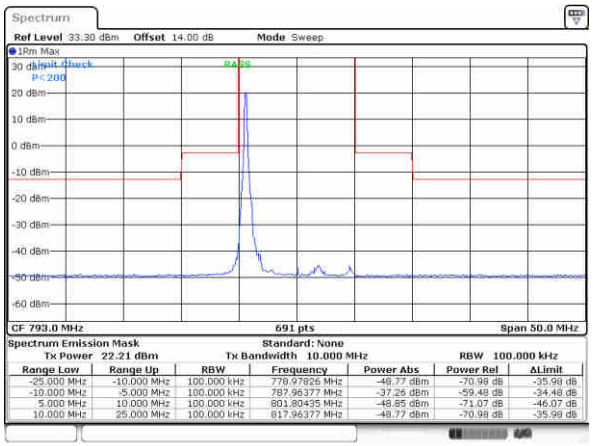


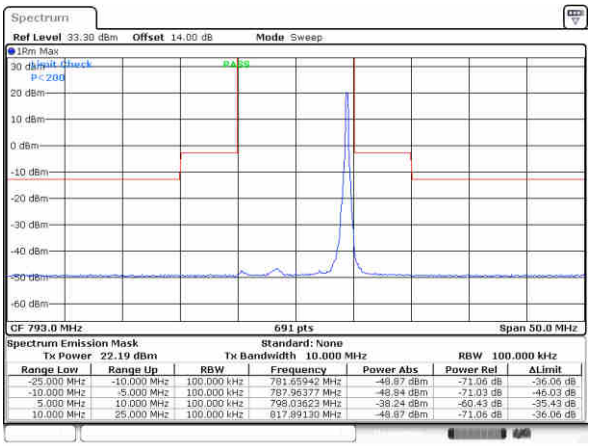


Middle Channel / Full RB

LTE Band 14 / 10MHz / 64QAM

Middle Channel / 1RB





Middle Channel / Full RB

Frequency Stability

Test Conditions		LTE Band 14 (QPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 10MHz	Note 2.
		Deviation (ppm)	Result
50	Normal Voltage	0.0018	PASS
40	Normal Voltage	0.0080	
30	Normal Voltage	0.0037	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0042	
0	Normal Voltage	0.0012	
-10	Normal Voltage	0.0017	
-20	Normal Voltage	0.0050	
-30	Normal Voltage	0.0007	
20	Maximum Voltage	0.0027	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0057	

Note:

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

Appendix B. Test Results of Radiated Test

Field Strength of Spurious Radiated

LTE Band 14 / QPSK / RB Size 1 Offset 0									
Bandwidth	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
5MHz (Lowest)	1576.5	-69.03	-40	-29.03	-78.47	-72.26	3.98	9.36	H
	2364.75	-66.79	-13	-53.79	-80.46	-70.34	4.85	10.55	H
	3153	-65.34	-13	-52.34	-81.12	-70.27	5.50	12.58	H
	1576.5	-69.45	-40	-29.45	-78.33	-72.68	3.98	9.36	V
	2364.75	-66.52	-13	-53.52	-80.26	-70.07	4.85	10.55	V
	3153	-65.59	-13	-52.59	-81.44	-70.52	5.50	12.58	V
5MHz (Middle)	1581.5	-68.75	-40	-28.75	-78.19	-72.00	4.00	9.40	H
	2372.25	-66.69	-13	-53.69	-80.28	-70.26	4.88	10.60	H
	3163	-65.06	-13	-52.06	-80.84	-69.99	5.52	12.60	H
	1581.5	-69.22	-40	-29.22	-78.10	-72.47	4.00	9.40	V
	2372.25	-66.90	-13	-53.90	-80.59	-70.47	4.88	10.60	V
	3163	-65.03	-13	-52.03	-80.88	-69.96	5.52	12.60	V
5MHz (Highest)	1586.5	-69.20	-40	-29.20	-78.64	-72.37	4.10	9.42	H
	2379.75	-66.53	-13	-53.53	-80.12	-70.11	4.90	10.63	H
	3173	-65.29	-13	-52.29	-81.08	-70.21	5.55	12.62	H
	1586.5	-69.67	-40	-29.67	-78.55	-72.84	4.10	9.42	V
	2379.75	-66.74	-13	-53.74	-80.43	-70.32	4.90	10.63	V
	3173	-64.89	-13	-51.89	-80.83	-69.81	5.55	12.62	V
10MHz	1577	-69.05	-40	-29.05	-78.49	-72.30	4.00	9.40	H
	2365.5	-66.52	-13	-53.52	-80.19	-70.09	4.88	10.60	H
	3154	-65.28	-13	-52.28	-81.06	-70.21	5.52	12.60	H
	1577	-69.55	-40	-29.55	-78.43	-72.80	4.00	9.40	V
	2365.5	-66.66	-13	-53.66	-80.40	-70.23	4.88	10.60	V
	3154	-65.34	-13	-52.34	-81.19	-70.27	5.52	12.60	V
	Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.								
Test Result						PASS			