FCC RF Test Report

APPLICANT	:	Casa Systems, Inc.
EQUIPMENT	:	Apex Enterprise Femto cell (E-Femto) (B4/B13/B66 with LAA)
BRAND NAME	:	APEX 4G LTE Femto for Enterprose (eFemto)
MODEL NAME	:	LTE-2004-04
FCC ID	:	2AO38LTE2004-04
STANDARD	:	47 CFR Part 2, 27(L), 27(F)
CLASSIFICATION	:	Licensed Non-Broadcast Station Transmitter (TNB)

The product was received on Aug. 27, 2020 and completely tested on Oct. 15, 2020. 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

James Huang

Approved by: James Huang / 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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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG082710A	Rev. 01	Initial issue of report	Nov. 23, 2020

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting Only	PASS	-
	§27.50(b)(9)	Effective Radiated Power (Band 13)	ERP < 30 Watt	PASS	-
	§27.50(d)(2)	Equivalent Isotropic Radiated Power (Band 4) (Band 66)	EIRP < 1640 Watt	PASS	-
3.5	§27.50(d)(5)	Peak-to-Average Ratio	<13 dB	PASS	-
3.6	§2.1049	Occupied Bandwidth	Reporting Only	PASS	-
3.7	§2.1051 §27.53(c)(1)(3) §27.53(h)	Conducted Band Edge Measurement (Band 4) (Band 13) (Band 66)	< 43+10log10(P[Watts])	PASS	-
3.8	§2.1051 §27.53(c)(1) §27.53(h)	Conducted Spurious Emission (Band 4) (Band 13) (Band 66)	< 43+10log10(P[Watts])	PASS	-
3.9	§2.1055 §27.54	Frequency Stability Temperature & Voltage	Within Authorized Band	PASS	-
4.4	§2.1053 §27.53(c)(1) §27.53(f) §27.53(h)	Radiated Spurious Emission (Band 4) (Band 13) (Band 66)	< 43+10$\log_{10}$(P[Watts])	PASS	Under limit 48.30 dB at 8544.00 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

Casa Systems, Inc.
100 Old River Road Suite 100 Andover, Massachusetts 01810 United States

1.2 Manufacturer

Casa Systems, Inc.
100 Old River Road Suite 100 Andover, Massachusetts 01810 United States

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Apex Enterprise Femto cell (E-Femto) (B4/B13/B66 with LAA)
Brand Name	APEX 4G LTE Femto for Enterprose (eFemto)
Model Name	LTE-2004-04
FCC ID	2AO38LTE2004-04
EUT supports Radios application	LTE/GPS WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80
HW Version	V01
SW Version	V01
EUT Stage	Identical Prototype

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	LTE Band 4 : 2112.5 MHz ~ 2152.5 MHz LTE Band 13 : 748.5 MHz ~ 753.5 MHz LTE Band 66 : 2112.5 MHz~ 2177.5 MHz
Rx Frequency	LTE Band 4 : 1712.5 MHz ~ 1752.5 MHz LTE Band 13 : 779.5 MHz ~ 784.5 MHz LTE Band 66 : 1712.5 MHz ~ 1777.5 MHz
Bandwidth	LTE Band 4 : 5MHz / 10MHz / 15MHz / 20MHz LTE Band 13 : 5MHz / 10MHz LTE Band 66 : 5MHz / 10MHz / 15MHz / 20MHz
Maximum Output Power to Antenna	**MIMO <Ant.1+2>:** LTE Band 4 : 25.10 dBm LTE Band 13 : 24.26 dBm LTE Band 66 : 24.94 dBm
Antenna Type	WWAN : PIFA Antenna
Antenna Gain	**SISO Ant. 1/2:** LTE Band 4 : 1.0 dBi LTE Band 13 : 1.0 dBi LTE Band 66 : 1.0. dBi **MIMO Ant. 1+2:** LTE Band 4 : 4.01 dBi LTE Band 13 : 4.01 dBi LTE Band 66 : 4.01 dBi
Type of Modulation	QPSK / 16QAM / 64QAM

Note:

1. For SISO & MIMO mode, the RSE testing has assessed only MIMO mode by referring to their higher conducted power.
2. The maximum ERP/EIRP is calculated from max output power and max antenna gain, only the maximum ERP/EIRP is shown on the report for MIMO mode.
3. The small cell is a low-power RF transmitter for LTE.
4. LTE Tx is non-signaling mode.
5. MIMO Gain = SISO Gain + Array Gain(10log 2)

1.5 Modification of EUT

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

1.6 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

LTE Band 4		QPSK			16QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)
5	2112.5 ~ 2152.5	4M44G7D	-	0.7215	4M47W7D	-	0.7234
10	2115.0 ~ 2150.0	9M09G7D	0.0034	0.7165	9M06W7D	-	0.7165
15	2117.5 ~ 2147.5	13M4G7D	-	0.7340	13M4W7D	-	0.6866
20	2120.0 ~ 2145.0	19M4G7D	-	0.7853	18M5W7D	-	0.7521

LTE Band 4		64QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)
5	2112.5 ~ 2152.5	4M44W7D	-	0.7198
10	2115.0 ~ 2150.0	9M03W7D	-	0.7109
15	2117.5 ~ 2147.5	13M4W7D	-	0.7411
20	2120.0 ~ 2145.0	18M5W7D	-	0.7331

LTE Band 13		QPSK			16QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)
5	748.5 ~ 753.5	4M62G7D	-	0.3978	4M62W7D	-	0.4056
10	751.0	9M23G7D	0.0068	0.4090	9M26W7D	-	0.4085

LTE Band 13		64QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum ERP(W)
5	748.5 ~ 753.5	4M65W7D	-	0.4023
10	751.0	9M29W7D	-	0.4060

LTE Band 66		QPSK			16QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)
5	2112.5 ~ 2177.5	4M44G7D	-	0.7215	4M47W7D	-	0.7234
10	2115.0 ~ 2175.0	9M09G7D	0.0034	0.7165	9M06W7D	-	0.7165
15	2117.5 ~ 2172.5	13M4G7D	-	0.7340	13M4W7D	-	0.6866
20	2120.0 ~ 2170.0	19M4G7D	-	0.7853	18M5W7D	-	0.7521

LTE Band 66		64QAM		
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)
5	2112.5 ~ 2177.5	4M44W7D	-	0.7198
10	2115.0 ~ 2175.0	9M03W7D	-	0.7109
15	2117.5 ~ 2172.5	13M4W7D	-	0.7411
20	2120.0 ~ 2170.0	18M5W7D	-	0.7331

Note: LTE Band 66 overlaps the entire frequency range of LTE Band 4. Therefore, the test results provided in this report covers Band 66 as well as Band 4.

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.**
	03CH06-KS TH01-KS	CN1257	314309

1.8 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH06-KS	AUDIX	E3	6.2009-8-24al

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, 27(L), 27(F)
- 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

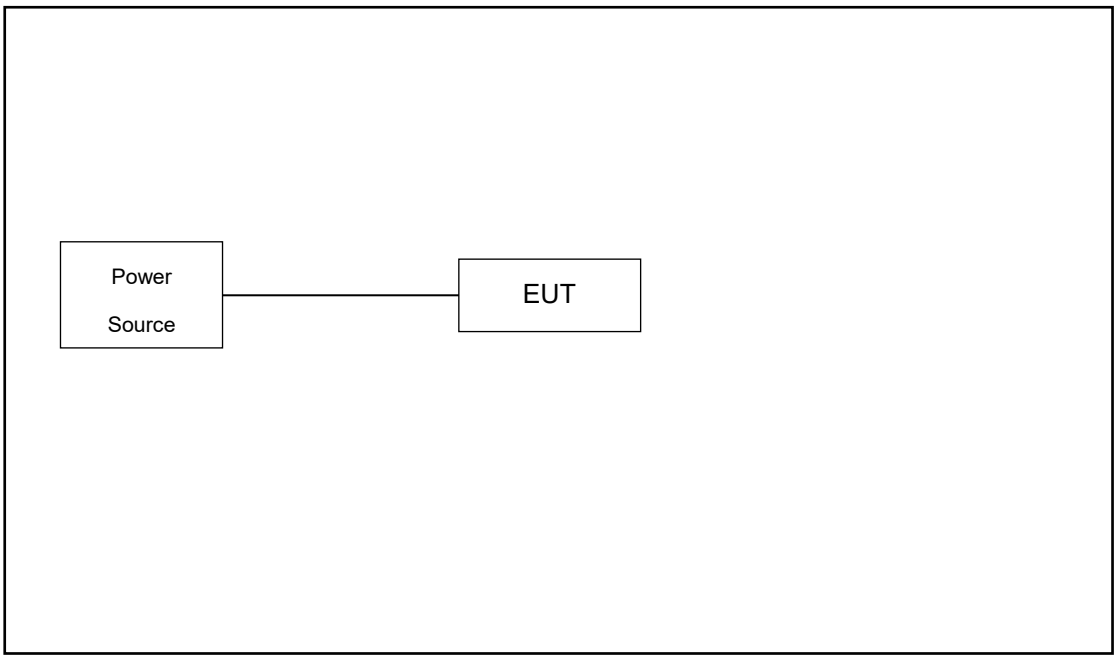
2.1 Test Mode

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	4	-	-	v	v	v	v	v	v	v	v	v	v	v	v	v
	13	-	-	v	v	-	-	v	v	v	v	v	v	v	v	v
	66	-	-	v	v	v	v	v	v	v	v	v	v	v	v	v
Peak-to-Average Ratio	13	-	-		v	-	-	v	v	v	v		v	v	v	v
	66	-	-				v	v	v	v	v		v	v	v	v
26dB and 99% Bandwidth	13	-	-	v	v	-	-	v	v	v			v	v	v	v
	66	-	-	v	v	v	v	v	v	v			v	v	v	v
Conducted Band Edge	13	-	-	v	v	-	-	v	v	v	v		v	v		v
	66	-	-	v	v	v	v	v	v	v	v		v	v		v
Conducted Spurious Emission	13	-	-	v	v	-	-	v	v	v	v			v	v	v
	66	-	-	v	v	v	v	v	v	v	v			v	v	v
Frequency Stability	13	-	-		v	-	-	v					v		v	
	66	-	-		v			v					v		v	
E.R.P / E.I.R.P	13	-	-	v	v	-	-	v	v	v	v			v	v	v
	66	-	-	v	v	v	v	v	v	v	v			v	v	v
Radiated Spurious Emission	13	Worst Case													v	
	66	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. 4. LTE Band 66 overlaps the entire frequency range of LTE Band 4. Therefore, the test results provided in this report covers Band 66 as well as Band 4.															

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	Power Supply	GWINSTEK	PSS-2002	N/A	N/A	Unshielded, 1.8 m
2.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
3.	LTE Base Station	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss 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 4.5dB.

Example :

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

= 4.5 (dB)

2.5 Frequency List of Low/Middle/High Channels

LTE Band 4 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	2050	2175	2300
	Frequency	2120	2132.5	2145
15	Channel	2025	2175	2325
	Frequency	2117.5	2132.5	2147.5
10	Channel	2000	2175	2350
	Frequency	2115	2132.5	2150
5	Channel	1975	2175	2375
	Frequency	2112.5	2132.5	2152.5

LTE Band 13 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	-	5230	-
	Frequency	-	751	-
5	Channel	5205	5230	5255
	Frequency	748.5	751	753.5

LTE Band 66 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	66536	66786	67036
	Frequency	2120	2145	2170
15	Channel	66511	66786	67061
	Frequency	2117.5	2145	2172.5
10	Channel	66486	66786	67086
	Frequency	2115	2145	2175
5	Channel	66461	66786	67111
	Frequency	2112.5	2145	2177.5

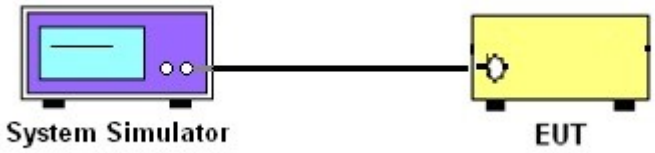
3 Conducted Test Items

3.1 Measuring Instruments

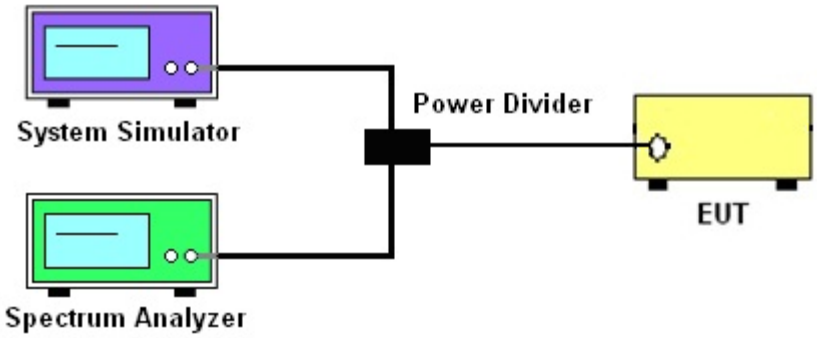
See list of measuring instruments of this test report.

3.2 Test Setup

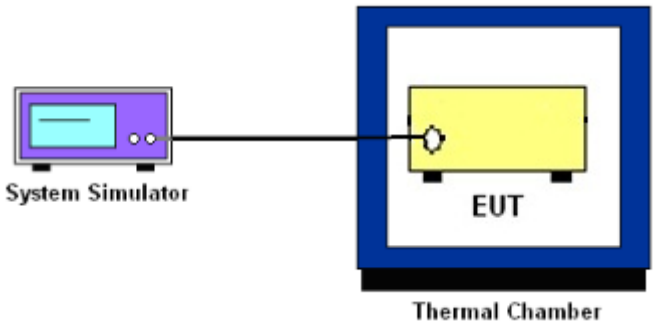
3.2.1 Conducted Output Power



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.

LTE Band 13

§27.50(b)(9) Control stations and mobile stations transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands and fixed stations transmitting in the 787-788 MHz and 805-806 MHz bands are limited to 30 watts ERP.

LTE Band 4 and Band 66

§27.50(d)(2) The power of each fixed or base station transmitting in the 1995-2000 MHz, the 2110-2155 MHz 2155-2180 MHz band, or 2180-2200 MHz band and situated in any geographic location other than that described in paragraph (d)(1) of this section is limited to:

(i) An equivalent isotropically radiated power (EIRP) of 1640 watts when transmitting with an emission bandwidth of 1 MHz or less;

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

27.53 (c)

For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations;

(5) Compliance with the provisions of paragraphs (c)(1) 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 at least 30 kHz may be employed.

27.53 (h)

For operations in the 2110-2155 MHz and 2155-2180 MHz band, the FCC limit is 43 + $10\log_{10}$(P[Watts]) dB below the transmitter power P(Watts) in a 1 MHz 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.

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

   Example:

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

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

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

3.8 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.

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

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.

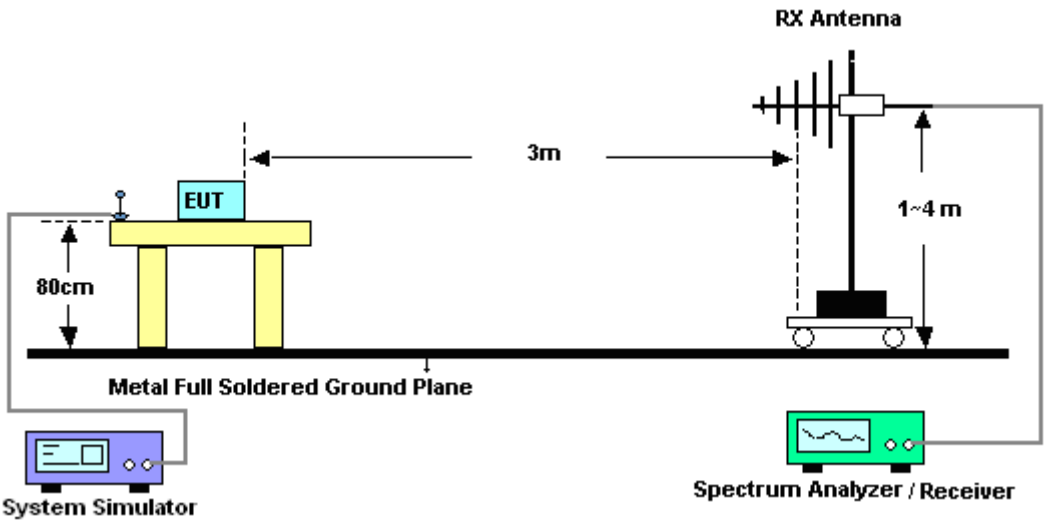
4 Radiated Test Items

4.1 Measuring Instruments

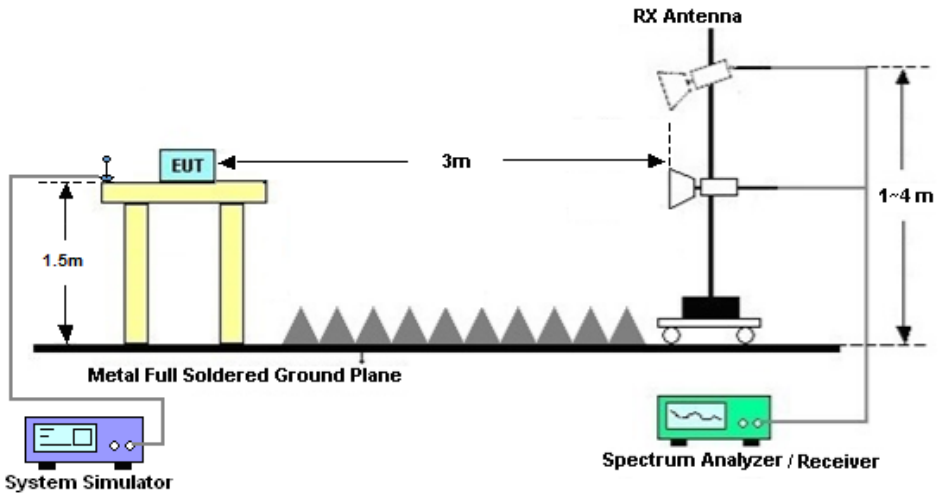
See list of measuring instruments of this test report.

4.2 Test Setup

4.2.1 For radiated test 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

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 LTE Band 13

For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions 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.

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, 38, 41:
    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. 02, 2019	Sep. 09, 2020~ Oct. 15, 2020	Nov. 01, 2020	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Oct. 28, 2019	Sep. 09, 2020~ Oct. 15, 2020	Oct. 27, 2020	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150208	10Hz-44GHz	Apr. 14, 2020	Sep. 09, 2020	Apr. 13, 2021	Radiation (03CH06-KS)
Bilog Antenna	TeseQ	CBL6111D	49921	30MHz-1GHz	May 29, 2020	Sep. 09, 2020	May 28, 2021	Radiation (03CH06-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00218652	1GHz~18GHz	Apr. 27, 2020	Sep. 09, 2020	Apr. 26, 2021	Radiation (03CH06-KS)
SHF-EHF Horn	Com-power	AH-840	101115	18GHz~40GHz	Nov. 10, 2019	Sep. 09, 2020	Nov. 09, 2020	Radiation (03CH06-KS)
Amplifier	SONOMA	310N	187289	9KHz ~1GHZ	Apr. 14, 2020	Sep. 09, 2020	Apr. 13, 2021	Radiation (03CH06-KS)
Amplifier	MITEQ	EM18G40G GA	060728	18~40GHz	Jan. 08, 2020	Sep. 09, 2020	Jan. 07, 2021	Radiation (03CH06-KS)
high gain Amplifier	MITEQ	AMF-7D-00 101800-30-1 0P	2025788	1Ghz-18Ghz	Jan. 08, 2020	Sep. 09, 2020	Jan. 07, 2021	Radiation (03CH06-KS)
Amplifier	Keysight	83017A	MY53270203	500MHz~26.5GHz	Apr. 15, 2020	Sep. 09, 2020	Apr. 14, 2021	Radiation (03CH06-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Sep. 09, 2020	NCR	Radiation (03CH06-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Sep. 09, 2020	NCR	Radiation (03CH06-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Sep. 09, 2020	NCR	Radiation (03CH06-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))	**2.5dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.1dB**

Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

LTE Band 4:

Ant	BW	Channel	Frequency (MHz)	Power (dBm)	Modulation
MIMO 1+2	5M	1975	2112.5	24.22	QPSK
		2175	2132	24.41	
		2375	2152.5	24.53	
	10M	2000	2115	24.19	
		2175	2132.5	24.36	
		2350	2150	24.55	
	15M	2025	2117.5	24.34	
		2175	2132.5	24.46	
		2325	2147.5	24.58	
	20M	2050	2120	24.85	
		2175	2132.5	24.71	
		2300	2145	24.57	
	5M	1975	2112.5	24.26	16QAM
		2175	2132	24.45	
		2375	2152.5	25.10	
	10M	2000	2115	24.27	
		2175	2132.5	24.30	
		2350	2150	24.49	
	15M	2025	2117.5	24.12	
		2175	2132.5	24.23	
		2325	2147.5	24.32	
	20M	2050	2120	24.38	
		2175	2132.5	24.44	
		2300	2145	24.70	
	5M	1975	2112.5	24.31	64QAM
		2175	2132	24.42	
		2375	2152.5	24.52	
	10M	2000	2115	24.16	
		2175	2132.5	24.35	
		2350	2150	24.46	
	15M	2025	2117.5	24.33	
		2175	2132.5	24.52	
		2325	2147.5	24.65	
	20M	2050	2120	24.43	
		2175	2132.5	24.59	
		2300	2145	24.43	

LTE Band 13:

Ant	BW	Channel	Frequency (MHz)	Power (dBm)	Modulation
MIMO 1+2	5M	5205	748.5	24.12	QPSK
		5230	751	24.03	
		5255	753.5	24.14	
	10M	5230	751	24.26	
	5M	5205	748.5	24.22	16QAM
		5230	751	24.13	
		5255	753.5	24.19	
	10M	5230	751	24.25	
	5M	5205	748.5	24.19	64QAM
		5230	751	24.11	
		5255	753.5	24.11	
	10M	5230	751	24.22	

LTE Band 66:

Ant	BW	Channel	Frequency (MHz)	Power (dBm)	Modulation
MIMO 1+2	5M	66461	2112.5	24.26	QPSK
		66786	2145	24.45	
		67111	2177.5	24.57	
	10M	66486	2115	24.19	
		66786	2145	24.38	
		67086	2175	24.54	
	15M	66511	2117.5	24.39	
		66786	2145	24.51	
		67061	2172.5	24.65	
	20M	66536	2120	24.94	
		66786	2145	24.75	
		67036	2170	24.61	
	5M	66461	2112.5	24.29	16QAM
		66786	2145	24.49	
		67111	2177.5	24.58	
	10M	66486	2115	24.27	
		66786	2145	24.32	
		67086	2175	24.54	
	15M	66511	2117.5	24.16	
		66786	2145	24.28	
		67061	2172.5	24.36	
	20M	66536	2120	24.41	
		66786	2145	24.47	
		67036	2170	24.75	
	5M	66461	2112.5	24.34	64QAM
		66786	2145	24.45	
		67111	2177.5	24.56	
	10M	66486	2115	24.20	
		66786	2145	24.38	
		67086	2175	24.51	
	15M	66511	2117.5	24.36	
		66786	2145	24.58	
		67061	2172.5	24.69	
	20M	66536	2120	24.44	
		66786	2145	24.64	
		67036	2170	24.51	

ERP/EIRP

LTE Band 13 (GT - LC = 4.01 dB) QPSK						
Bandwidth	5M			10M		
Channel	5205	5230	5255	5230		
	(Low)	(Mid)	(High)	-	(Mid)	-
Frequency (MHz)	748.5	751	753.5	-	751	-
Conducted Power (dBm)	24.12	24.03	24.14	-	24.26	-
Conducted Power (Watts)	0.2583	0.2528	0.2592	-	0.2665	-
ERP(dBm)	25.98	25.89	26.00	-	26.12	-
ERP(Watts)	0.3963	0.3880	0.3978	-	0.4090	-

LTE Band 13 (GT - LC = 4.01 dB) 16QAM						
Bandwidth	5M			10M		
Channel	5205	5230	5255	5230		
	(Low)	(Mid)	(High)	-	(Mid)	-
Frequency (MHz)	748.5	751	753.5	-	751	-
Conducted Power (dBm)	24.22	24.13	24.19	-	24.25	-
Conducted Power (Watts)	0.2643	0.2590	0.2626	-	0.2662	-
ERP(dBm)	26.08	25.99	26.05	-	26.11	-
ERP(Watts)	0.4056	0.3975	0.4029	-	0.4085	-

LTE Band 13 (GT - LC = 4.01 dB) 64QAM						
Bandwidth	5M			10M		
Channel	5205	5230	5255	5230		
	(Low)	(Mid)	(High)	-	(Mid)	-
Frequency (MHz)	748.5	751	753.5	-	751	-
Conducted Power (dBm)	24.19	24.11	24.11	-	24.22	-
Conducted Power (Watts)	0.2621	0.2574	0.2574	-	0.2645	-
ERP(dBm)	26.05	25.97	25.97	-	26.08	-
ERP(Watts)	0.4023	0.3949	0.3951	-	0.4060	-

LTE Band 66 (GT - LC = 4.01 dB) QPSK			
Bandwidth	5M		
Channel	66461	66786	67111
	(Low)	(Mid)	(High)
Frequency (MHz)	2112.5	2145	2177.5
Conducted Power (dBm)	24.26	24.45	24.57
Conducted Power (Watts)	0.2666	0.2783	0.2866
EIRP(dBm)	28.27	28.46	28.58
EIRP(Watts)	0.6713	0.7008	0.7215

LTE Band 66 (GT - LC = 4.01 dB) QPSK									
Bandwidth	10M			15M			20M		
Channel	66486	66786	67086	66511	66786	67061	66536	66786	67036
	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(Mid)
Frequency (MHz)	2115	2145	2175	2117.5	2145	2172.5	2120	2145	2170
Conducted Power (dBm)	24.19	24.38	24.54	24.39	24.51	24.65	24.94	24.75	24.61
Conducted Power (Watts)	0.2626	0.2740	0.2846	0.2748	0.2822	0.2915	0.3119	0.2987	0.2888
EIRP(dBm)	28.20	28.39	28.55	28.40	28.52	28.66	28.95	28.76	28.62
EIRP(Watts)	0.6612	0.6900	0.7165	0.6919	0.7106	0.7340	0.7853	0.7519	0.7271

LTE Band 66 (GT - LC = 4.01 dB) 16QAM			
Bandwidth	5M		
Channel	66461	66786	67111
	(Low)	(Mid)	(High)
Frequency (MHz)	2112.5	2145	2177.5
Conducted Power (dBm)	24.29	24.49	24.58
Conducted Power (Watts)	0.2686	0.2810	0.2873
EIRP(dBm)	28.30	28.50	28.59
EIRP(Watts)	0.6763	0.7074	0.7234

LTE Band 66 (GT - LC = 4.01 dB) 16QAM									
Bandwidth	10M			15M			20M		
Channel	66486	66786	67086	66511	66786	67061	66536	66786	67036
	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(Mid)
Frequency (MHz)	2115	2145	2175	2117.5	2145	2172.5	2120	2145	2170
Conducted Power (dBm)	24.27	24.32	24.54	24.16	24.28	24.36	24.41	24.47	24.75
Conducted Power (Watts)	0.2672	0.2705	0.2846	0.2609	0.2679	0.2727	0.2763	0.2798	0.2987
EIRP(dBm)	28.28	28.33	28.55	28.17	28.29	28.37	28.42	28.48	28.76
EIRP(Watts)	0.6728	0.6809	0.7165	0.6568	0.6745	0.6866	0.6957	0.7045	0.7521

LTE Band 66 (GT - LC = 4.01 dB) 64QAM			
Bandwidth	5M		
Channel	66461	66786	67111
	(Low)	(Mid)	(High)
Frequency (MHz)	2112.5	2145	2177.5
Conducted Power (dBm)	24.34	24.45	24.56
Conducted Power (Watts)	0.2718	0.2784	0.2859
EIRP(dBm)	28.35	28.46	28.57
EIRP(Watts)	0.6842	0.7009	0.7198

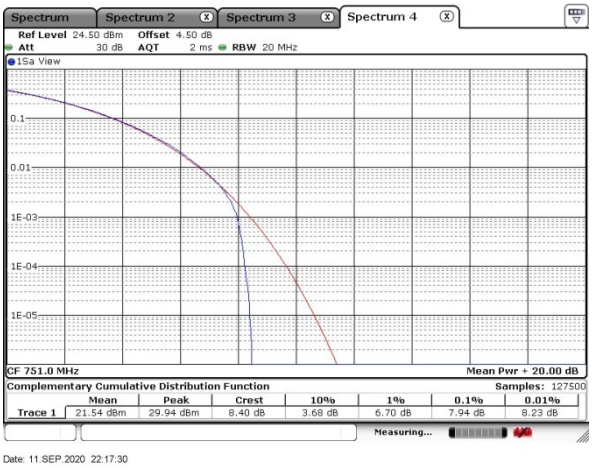
LTE Band 66 (GT - LC = 4.01 dB) 64QAM									
Bandwidth	10M			15M			20M		
Channel	66486	66786	67086	66511	66786	67061	66536	66786	67036
	(Low)	(Mid)	(High)	(Low)	(Mid)	(High)	(Low)	(Mid)	(Mid)
Frequency (MHz)	2115	2145	2175	2117.5	2145	2172.5	2120	2145	2170
Conducted Power (dBm)	24.20	24.38	24.51	24.36	24.58	24.69	24.44	24.64	24.51
Conducted Power (Watts)	0.2629	0.2741	0.2824	0.2729	0.2869	0.2944	0.2777	0.2912	0.2828
EIRP(dBm)	28.21	28.39	28.52	28.37	28.59	28.70	28.45	28.65	28.52
EIRP(Watts)	0.6618	0.6902	0.7109	0.6872	0.7224	0.7411	0.6992	0.7331	0.7120

LTE Band 13 MIMO<Ant.1>

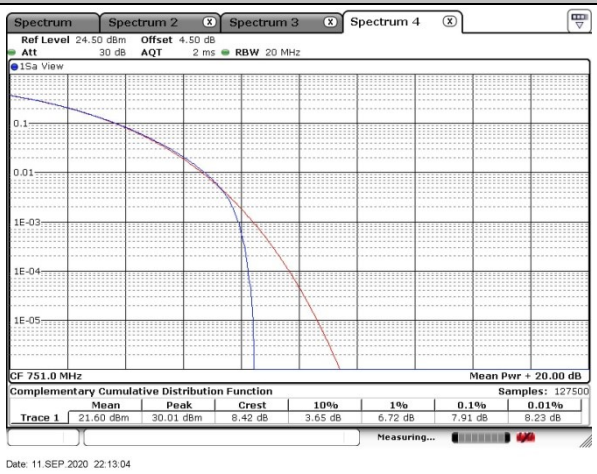
Peak-to-Average Ratio

Mode	LTE Band 13 / 10MHz		
Mod.	QPSK	16QAM	Limit: 13dB
RB Size	Full RB	Full RB	Result
Lowest CH	-	-	PASS
Middle CH	7.94	7.91	
Highest CH	-	-	
Mode	LTE Band 13 / 10MHz		
Mod.	64QAM	-	Limit: 13dB
RB Size	Full RB	-	Result
Lowest CH	-	-	PASS
Middle CH	7.97	-	
Highest CH	-	-	

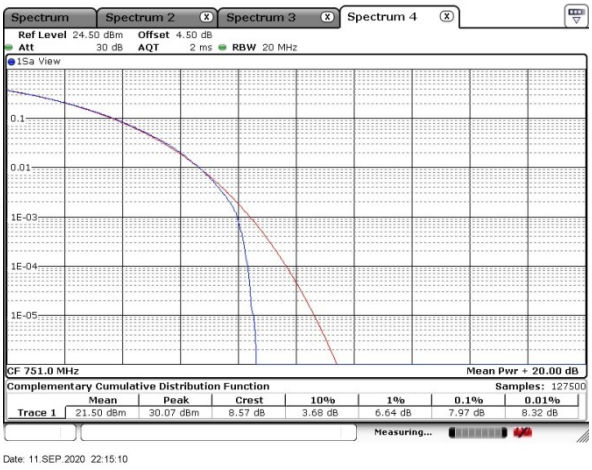
LTE Band 13 / 10MHz / QPSK
Middle Channel / Full RB



LTE Band 13 / 10MHz / 16QAM
Middle Channel / Full RB



LTE Band 13 / 10MHz / 64QAM
Middle Channel / Full RB

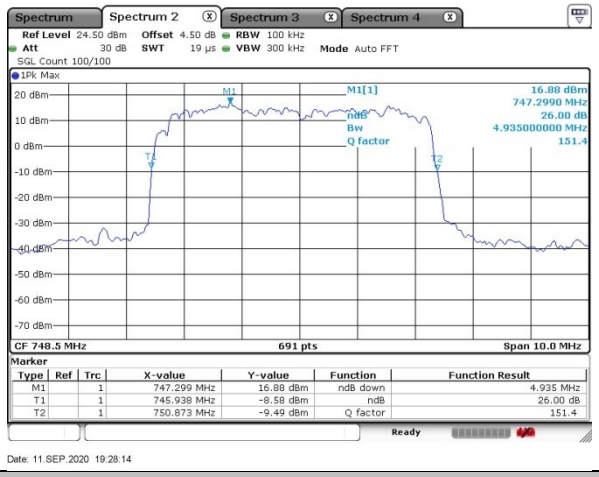


26dB Bandwidth

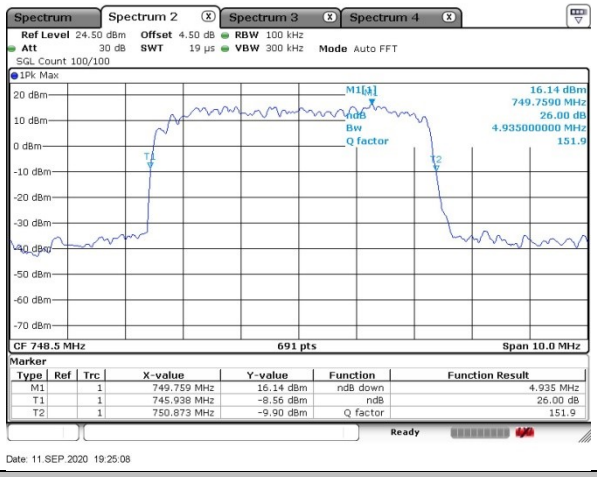
Mode	LTE Band 13 : 26dB BW(MHz)			
BW	5MHz		10MHz	
Mod.	QPSK	16QAM	QPSK	16QAM
Lowest CH	4.94	4.94	-	-
Middle CH	4.92	4.92	9.87	9.87
Highest CH	4.95	4.91	-	-
Mode	LTE Band 13 : 26dB BW(MHz)			
BW	5MHz		10MHz	
Mod.	64QAM		64QAM	
Lowest CH	4.96		-	
Middle CH	4.96		9.84	
Highest CH	4.96		-	

LTE Band 13

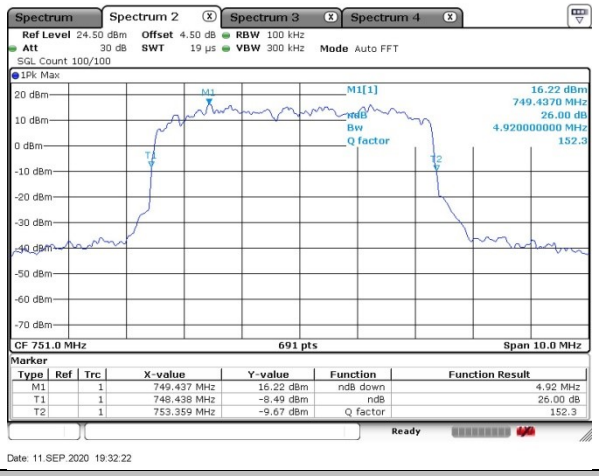
Lowest Channel / 5MHz / QPSK



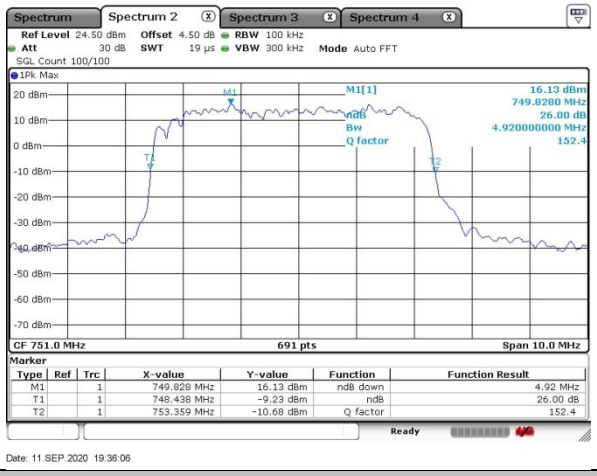
Lowest Channel / 5MHz / 16QAM



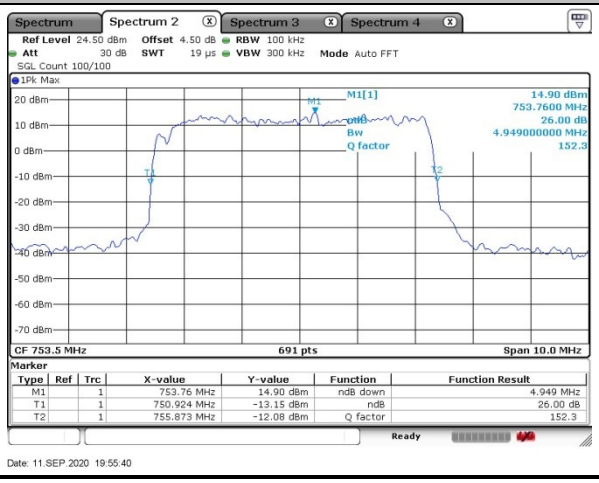
Middle Channel / 5MHz / QPSK



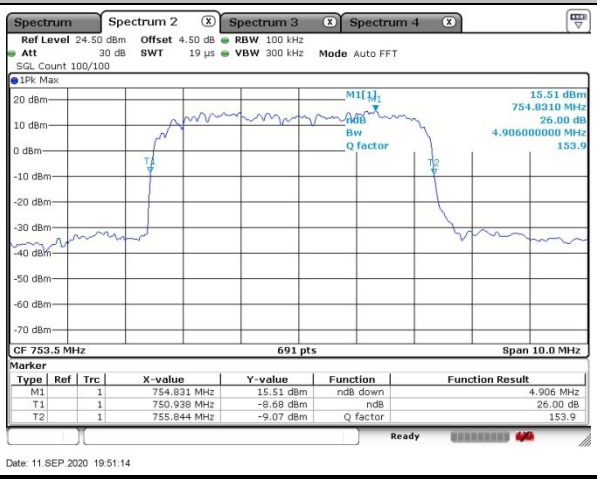
Middle Channel / 5MHz / 16QAM



Highest Channel / 5MHz / QPSK

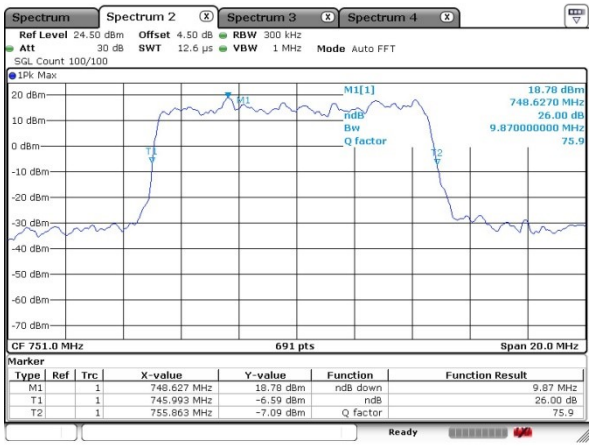


Highest Channel / 5MHz / 16QAM

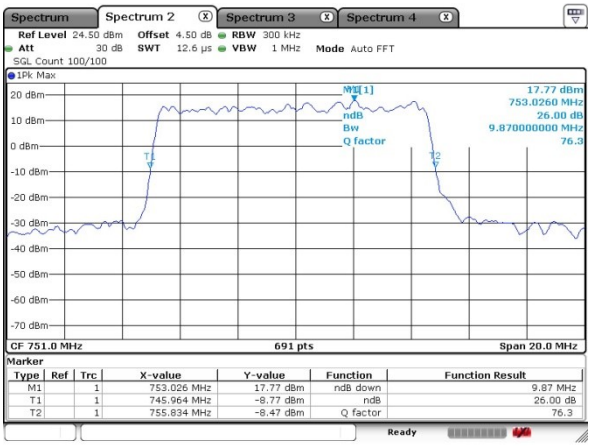


LTE Band 13

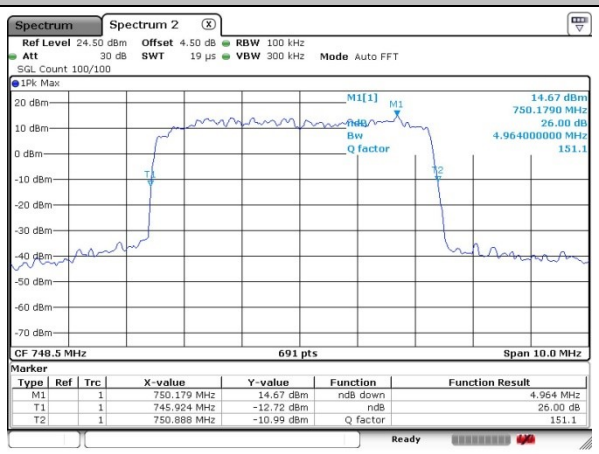
Middle Channel / 10MHz / QPSK



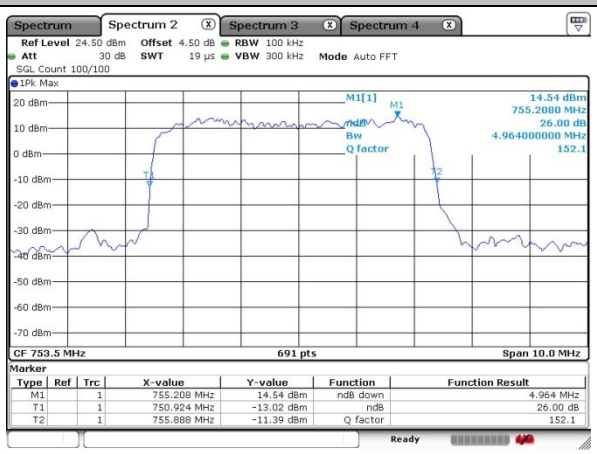
Middle Channel / 10MHz / 16QAM



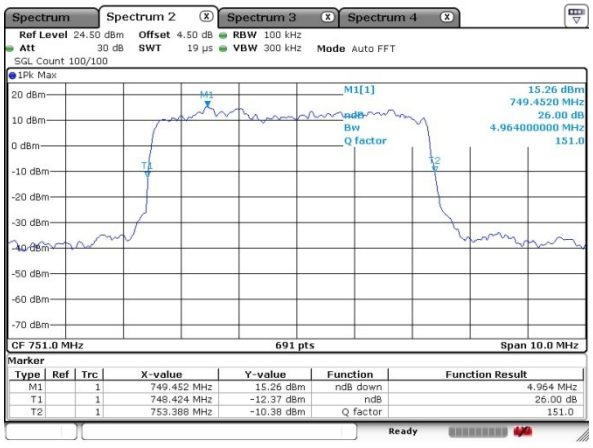
Lowest Channel / 5MHz / 64QAM



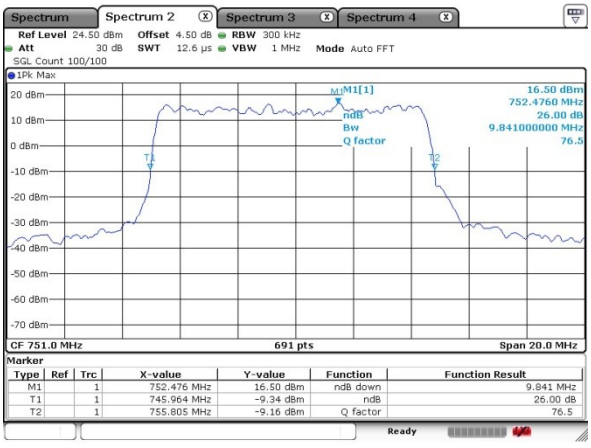
Highest Channel / 5MHz / 64QAM



Middle Channel / 5MHz / 64QAM



Middle Channel / 10MHz / 64QAM

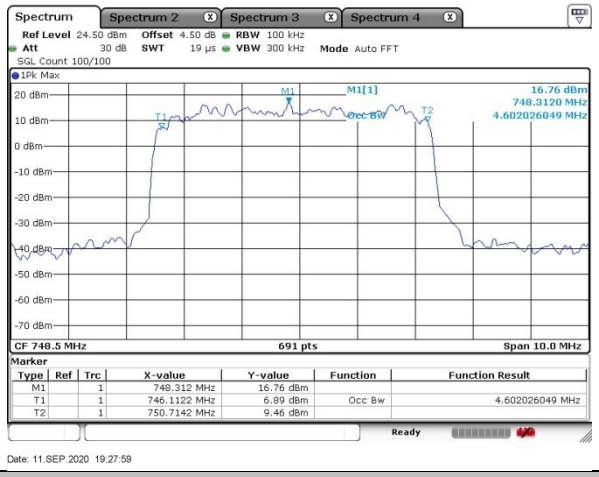


Occupied Bandwidth

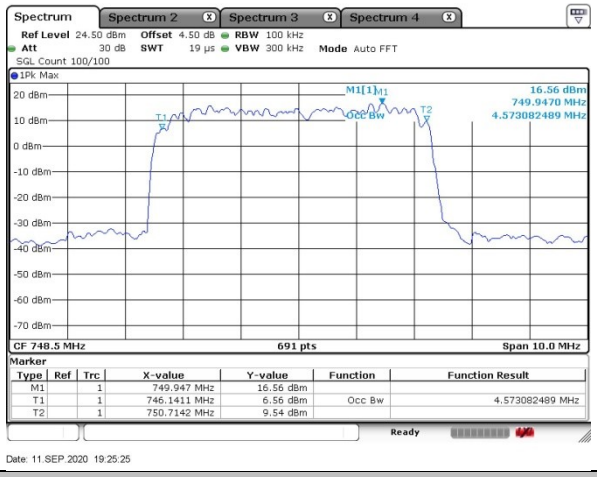
Mode	LTE Band 13 : 99%OBW(MHz)			
BW	5MHz		10MHz	
Mod.	QPSK	16QAM	QPSK	16QAM
Lowest CH	4.602	4.573	-	-
Middle CH	4.588	4.588	9.233	9.262
Highest CH	4.616	4.530	-	-
Mode	LTE Band 13 : 99%OBW(MHz)			
BW	5MHz		10MHz	
Mod.	64QAM		64QAM	
Lowest CH	4.602		-	
Middle CH	4.645		9.291	
Highest CH	4.631		-	

LTE Band 13

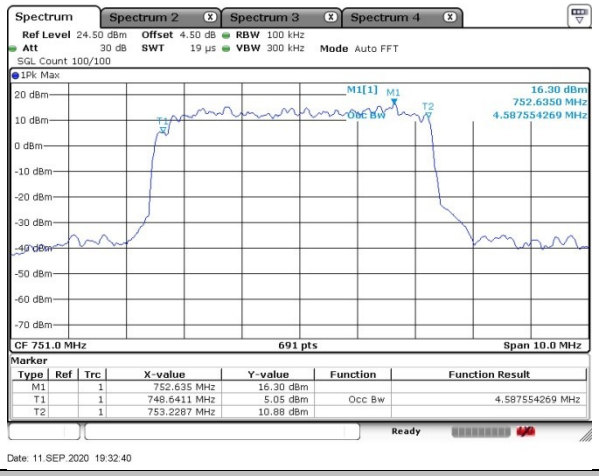
Lowest Channel / 5MHz / QPSK



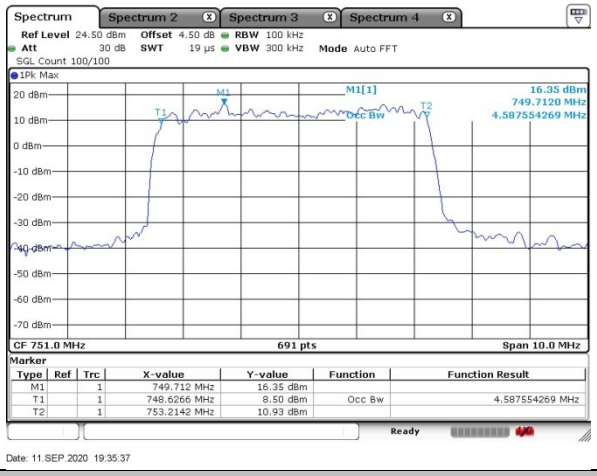
Lowest Channel / 5MHz / 16QAM



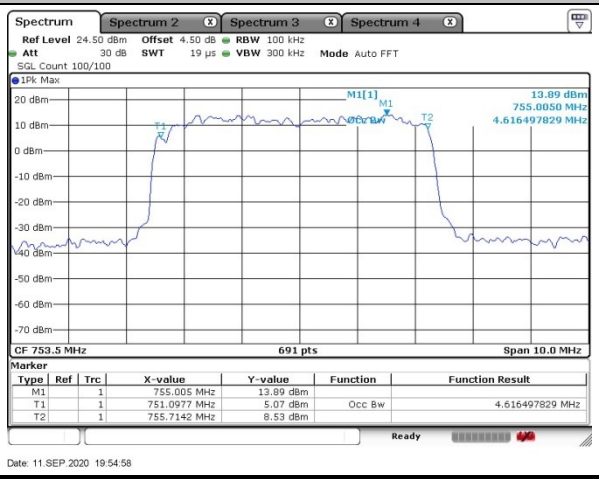
Middle Channel / 5MHz / QPSK



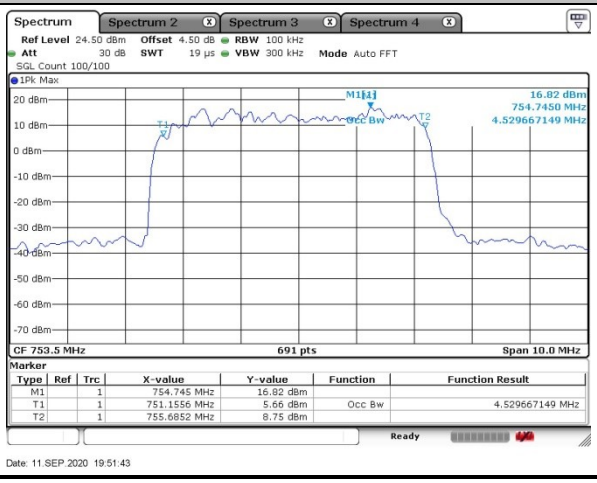
Middle Channel / 5MHz / 16QAM



Highest Channel / 5MHz / QPSK

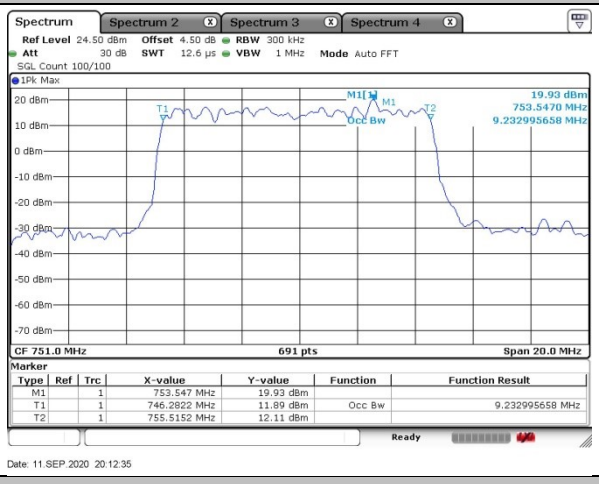


Highest Channel / 5MHz / 16QAM

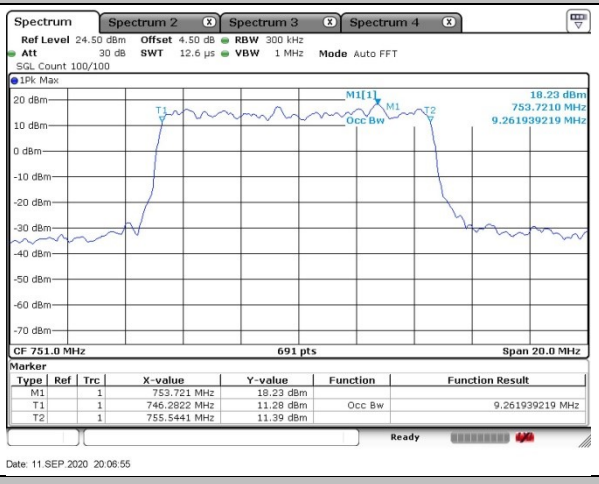


LTE Band 13

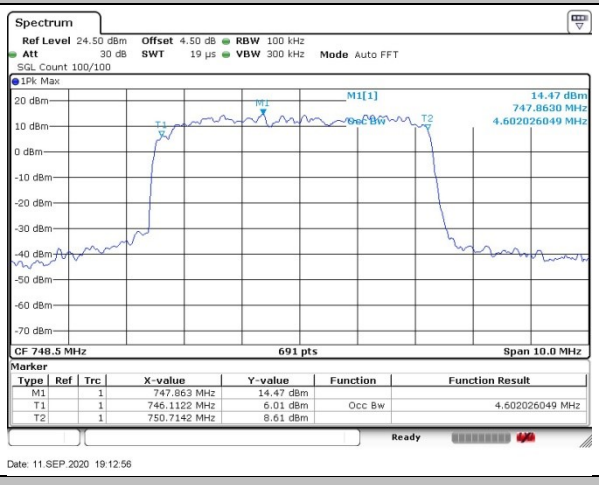
Middle Channel / 10MHz / QPSK



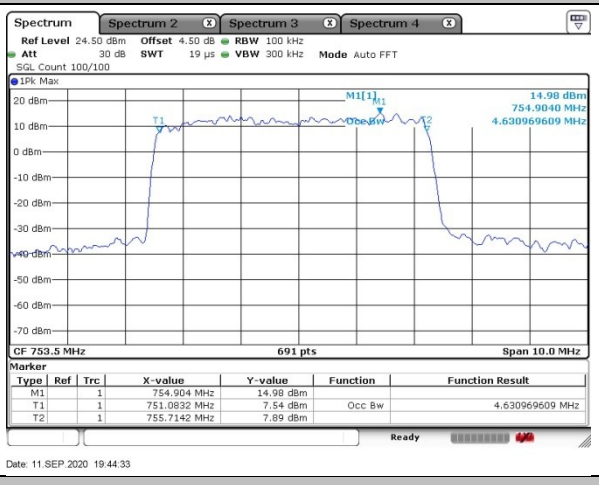
Middle Channel / 10MHz / 16QAM



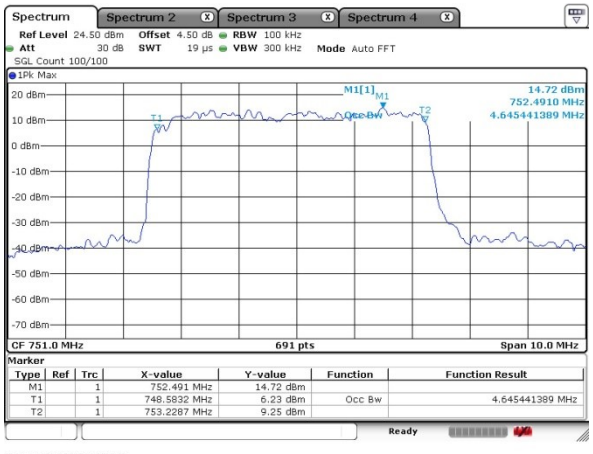
Lowest Channel / 5MHz / 64QAM



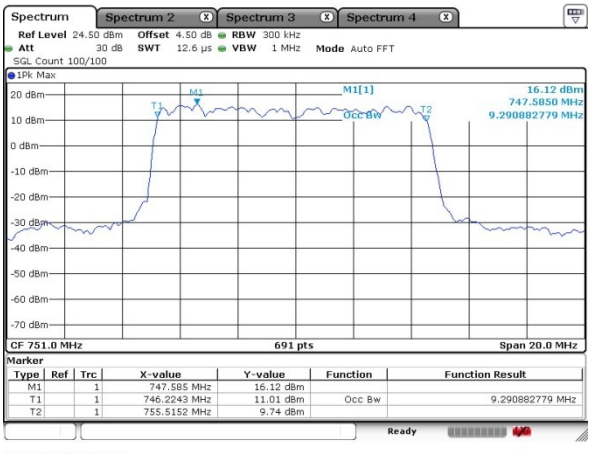
Highest Channel / 5MHz / 64QAM



Middle Channel / 5MHz / 64QAM



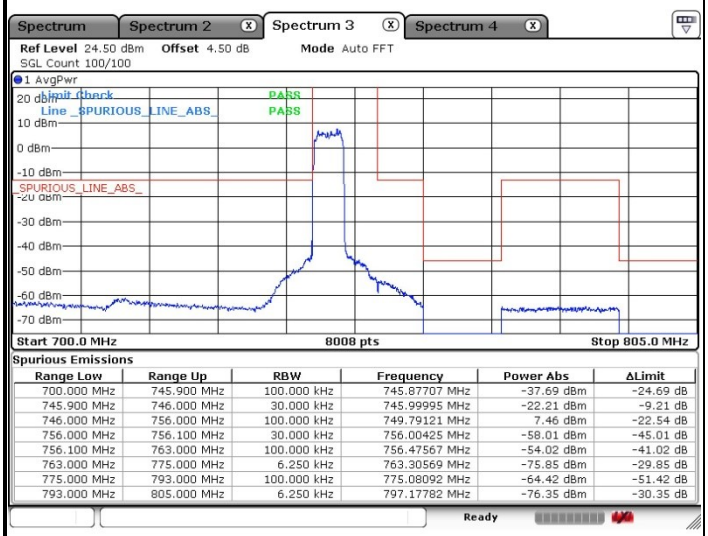
Middle Channel / 10MHz / 64QAM



Conducted Band Edge

LTE Band 13 / 5MHz

Lowest Band Edge / Full RB / QPSK

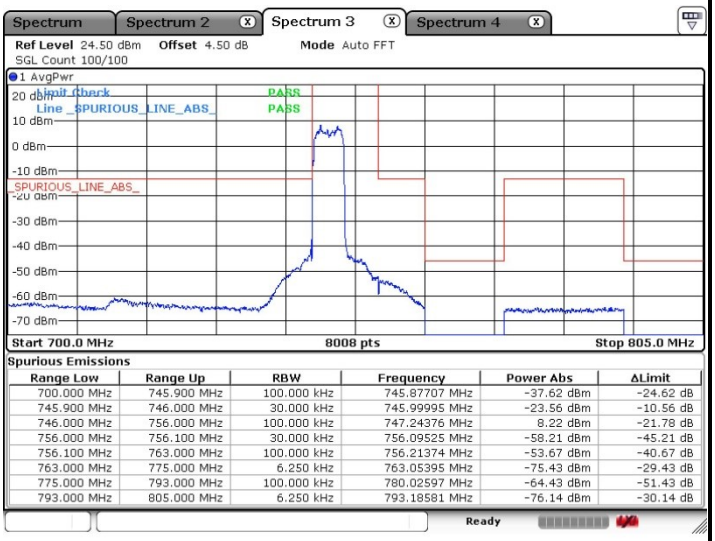


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
700.000 MHz	745.900 MHz	100.000 kHz	745.87707 MHz	-37.69 dBm	-24.69 dB
745.900 MHz	746.000 MHz	30.000 kHz	745.99995 MHz	-22.21 dBm	-9.21 dB
746.000 MHz	756.000 MHz	100.000 kHz	749.79121 MHz	7.46 dBm	-22.54 dB
756.000 MHz	756.100 MHz	30.000 kHz	756.00425 MHz	-58.01 dBm	-45.01 dB
756.100 MHz	763.000 MHz	100.000 kHz	756.47567 MHz	-54.02 dBm	-41.02 dB
763.000 MHz	775.000 MHz	6.250 kHz	763.30569 MHz	-75.85 dBm	-29.85 dB
775.000 MHz	793.000 MHz	100.000 kHz	775.08092 MHz	-64.42 dBm	-51.42 dB
793.000 MHz	805.000 MHz	6.250 kHz	797.17782 MHz	-76.35 dBm	-30.35 dB

Date: 11.SEP.2020 19:28:32

Lowest Band Edge / Full RB / 16QAM

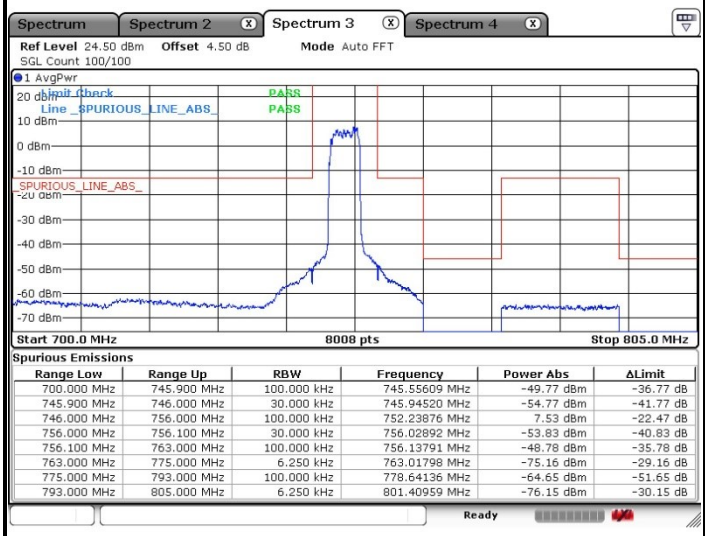


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
700.000 MHz	745.900 MHz	100.000 kHz	745.87707 MHz	-37.62 dBm	-24.62 dB
745.900 MHz	746.000 MHz	30.000 kHz	745.99995 MHz	-23.56 dBm	-10.56 dB
746.000 MHz	756.000 MHz	100.000 kHz	747.24376 MHz	8.22 dBm	-21.78 dB
756.000 MHz	756.100 MHz	30.000 kHz	756.09525 MHz	-58.21 dBm	-45.21 dB
756.100 MHz	763.000 MHz	100.000 kHz	756.21374 MHz	-53.67 dBm	-40.67 dB
763.000 MHz	775.000 MHz	6.250 kHz	763.05395 MHz	-75.43 dBm	-29.43 dB
775.000 MHz	793.000 MHz	100.000 kHz	780.02597 MHz	-64.43 dBm	-51.43 dB
793.000 MHz	805.000 MHz	6.250 kHz	793.18581 MHz	-76.14 dBm	-30.14 dB

Date: 11.SEP.2020 19:24:45

Middle Band Edge / Full RB / QPSK

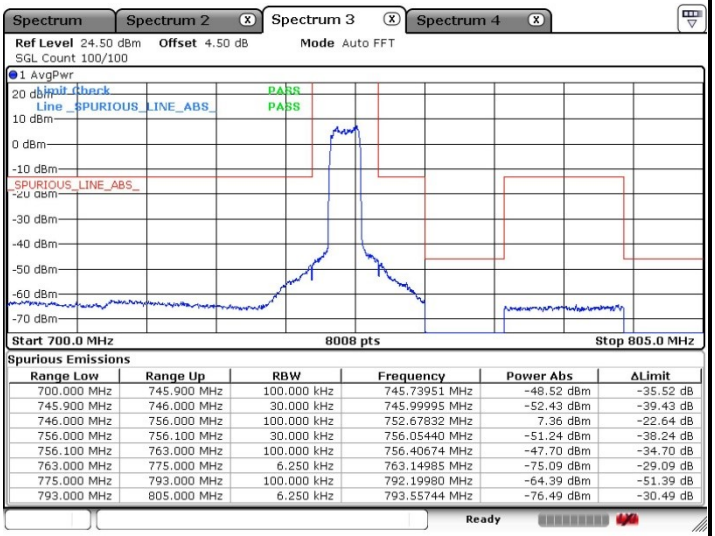


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
700.000 MHz	745.900 MHz	100.000 kHz	745.55609 MHz	-49.77 dBm	-36.77 dB
745.900 MHz	746.000 MHz	30.000 kHz	745.94520 MHz	-54.77 dBm	-41.77 dB
746.000 MHz	756.000 MHz	100.000 kHz	752.23876 MHz	7.53 dBm	-22.47 dB
756.000 MHz	756.100 MHz	30.000 kHz	756.02892 MHz	-53.83 dBm	-40.83 dB
756.100 MHz	763.000 MHz	100.000 kHz	756.13791 MHz	-48.78 dBm	-35.78 dB
763.000 MHz	775.000 MHz	6.250 kHz	763.01798 MHz	-75.16 dBm	-29.16 dB
775.000 MHz	793.000 MHz	100.000 kHz	778.64136 MHz	-64.65 dBm	-51.65 dB
793.000 MHz	805.000 MHz	6.250 kHz	801.40959 MHz	-76.15 dBm	-30.15 dB

Date: 11.SEP.2020 19:31:59

Middle Band Edge / Full RB / 16QAM



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
700.000 MHz	745.900 MHz	100.000 kHz	745.73951 MHz	-48.52 dBm	-35.52 dB
745.900 MHz	746.000 MHz	30.000 kHz	745.99995 MHz	-52.43 dBm	-39.43 dB
746.000 MHz	756.000 MHz	100.000 kHz	752.67832 MHz	7.36 dBm	-22.64 dB
756.000 MHz	756.100 MHz	30.000 kHz	756.05440 MHz	-51.24 dBm	-38.24 dB
756.100 MHz	763.000 MHz	100.000 kHz	756.40674 MHz	-47.70 dBm	-34.70 dB
763.000 MHz	775.000 MHz	6.250 kHz	763.14985 MHz	-75.09 dBm	-29.09 dB
775.000 MHz	793.000 MHz	100.000 kHz	792.19980 MHz	-64.39 dBm	-51.39 dB
793.000 MHz	805.000 MHz	6.250 kHz	793.55744 MHz	-76.49 dBm	-30.49 dB

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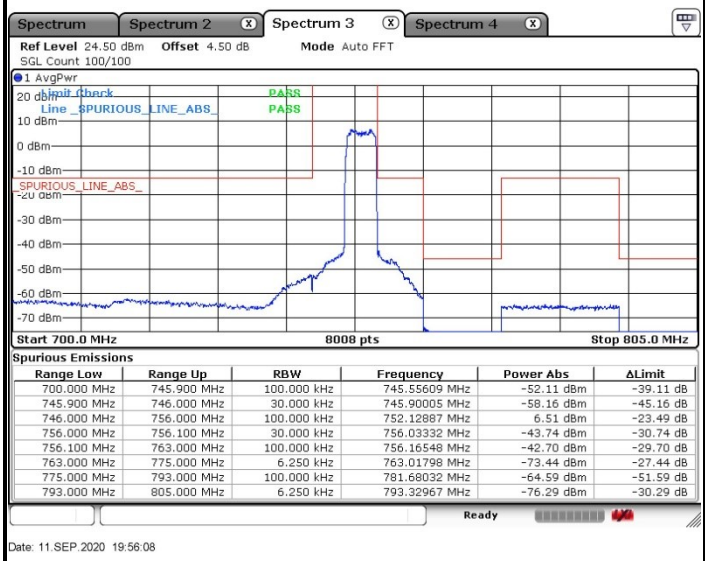
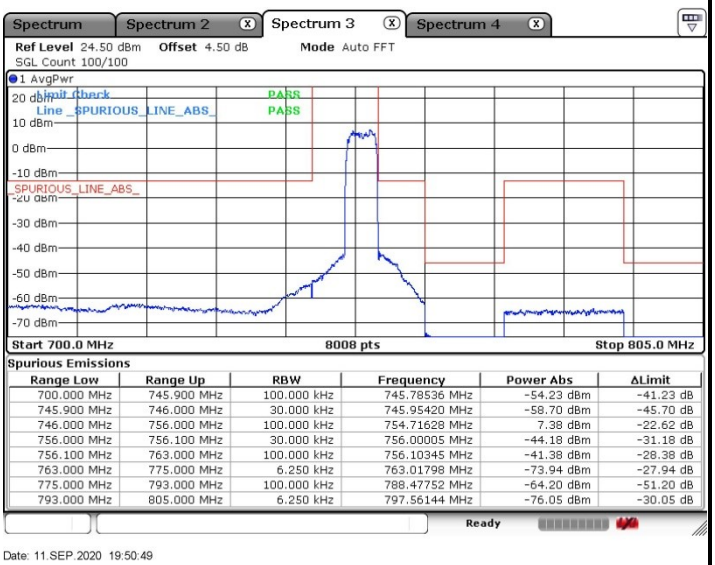
LTE Band 13 / 5MHz	
Highest Band Edge / Full RB / QPSK	**Highest Band Edge / Full RB / 16QAM**



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
700.000 MHz	745.900 MHz	100.000 kHz	745.55609 MHz	-52.11 dBm	-39.11 dB
745.900 MHz	746.000 MHz	30.000 kHz	745.90005 MHz	-58.16 dBm	-45.16 dB
746.000 MHz	756.000 MHz	100.000 kHz	752.12887 MHz	6.51 dBm	-23.49 dB
756.000 MHz	756.100 MHz	30.000 kHz	756.03332 MHz	-43.74 dBm	-30.74 dB
756.100 MHz	763.000 MHz	100.000 kHz	756.16548 MHz	-42.70 dBm	-29.70 dB
763.000 MHz	775.000 MHz	6.250 kHz	763.01798 MHz	-73.44 dBm	-27.44 dB
775.000 MHz	793.000 MHz	100.000 kHz	781.68032 MHz	-64.59 dBm	-51.59 dB
793.000 MHz	805.000 MHz	6.250 kHz	793.32967 MHz	-76.29 dBm	-30.29 dB

Date: 11.SEP.2020 19:56:08



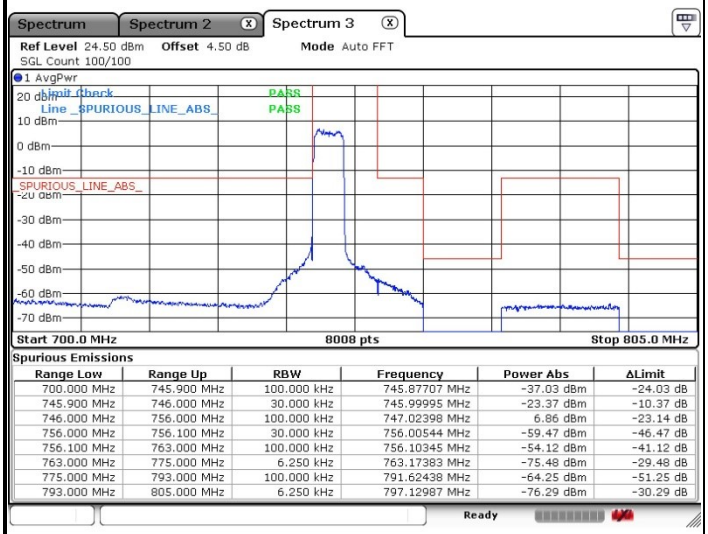
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
700.000 MHz	745.900 MHz	100.000 kHz	745.78536 MHz	-54.23 dBm	-41.23 dB
745.900 MHz	746.000 MHz	30.000 kHz	745.95420 MHz	-58.70 dBm	-45.70 dB
746.000 MHz	756.000 MHz	100.000 kHz	754.71628 MHz	7.38 dBm	-22.62 dB
756.000 MHz	756.100 MHz	30.000 kHz	756.00005 MHz	-44.18 dBm	-31.18 dB
756.100 MHz	763.000 MHz	100.000 kHz	756.10345 MHz	-41.38 dBm	-28.38 dB
763.000 MHz	775.000 MHz	6.250 kHz	763.01798 MHz	-73.94 dBm	-27.94 dB
775.000 MHz	793.000 MHz	100.000 kHz	788.47752 MHz	-64.20 dBm	-51.20 dB
793.000 MHz	805.000 MHz	6.250 kHz	797.56144 MHz	-76.05 dBm	-30.05 dB

Date: 11.SEP.2020 19:50:49

LTE Band 13 / 5MHz / 64QAM

Lowest Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
700.000 MHz	745.900 MHz	100.000 kHz	745.87707 MHz	-37.03 dBm	-24.03 dB
745.900 MHz	746.000 MHz	30.000 kHz	745.99995 MHz	-23.37 dBm	-10.37 dB
746.000 MHz	756.000 MHz	100.000 kHz	747.02398 MHz	6.86 dBm	-23.14 dB
756.000 MHz	756.100 MHz	30.000 kHz	756.00544 MHz	-59.47 dBm	-46.47 dB
756.100 MHz	763.000 MHz	100.000 kHz	756.10345 MHz	-54.12 dBm	-41.12 dB
763.000 MHz	775.000 MHz	6.250 kHz	763.17383 MHz	-75.48 dBm	-29.48 dB
775.000 MHz	793.000 MHz	100.000 kHz	791.62438 MHz	-64.25 dBm	-51.25 dB
793.000 MHz	805.000 MHz	6.250 kHz	797.12987 MHz	-76.29 dBm	-30.29 dB

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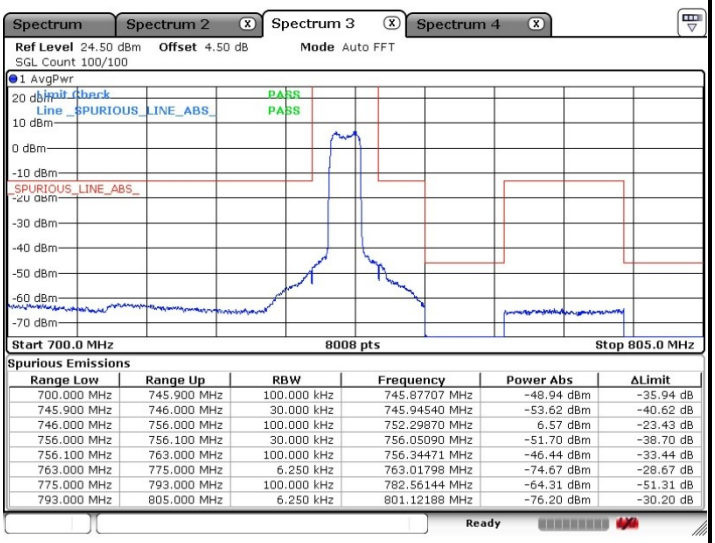
Middle Band Edge / Full RB

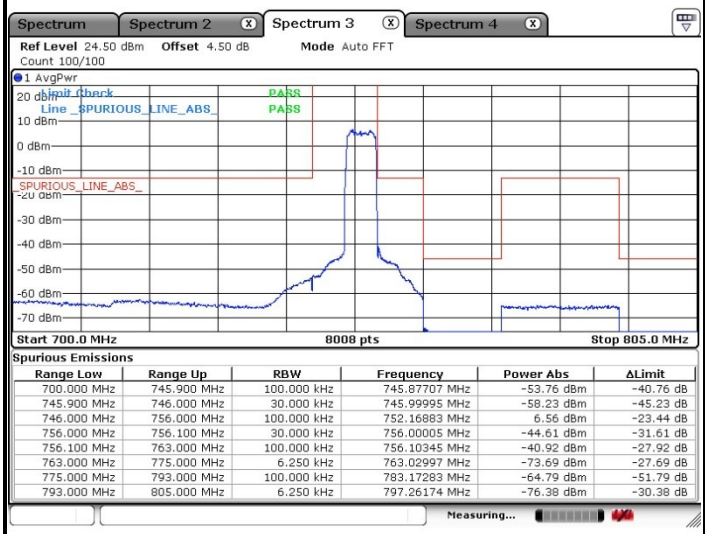


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
700.000 MHz	745.900 MHz	100.000 kHz	745.87707 MHz	-48.94 dBm	-35.94 dB
745.900 MHz	746.000 MHz	30.000 kHz	745.94540 MHz	-53.62 dBm	-40.62 dB
746.000 MHz	756.000 MHz	100.000 kHz	752.29870 MHz	6.57 dBm	-23.43 dB
756.000 MHz	756.100 MHz	30.000 kHz	756.05090 MHz	-51.70 dBm	-38.70 dB
756.100 MHz	763.000 MHz	100.000 kHz	756.34471 MHz	-46.44 dBm	-33.44 dB
763.000 MHz	775.000 MHz	6.250 kHz	763.01798 MHz	-74.67 dBm	-28.67 dB
775.000 MHz	793.000 MHz	100.000 kHz	782.56144 MHz	-64.31 dBm	-51.31 dB
793.000 MHz	805.000 MHz	6.250 kHz	801.12188 MHz	-76.20 dBm	-30.20 dB

Date: 11.SEP.2020 19:40:49

Highest Band Edge / Full RB



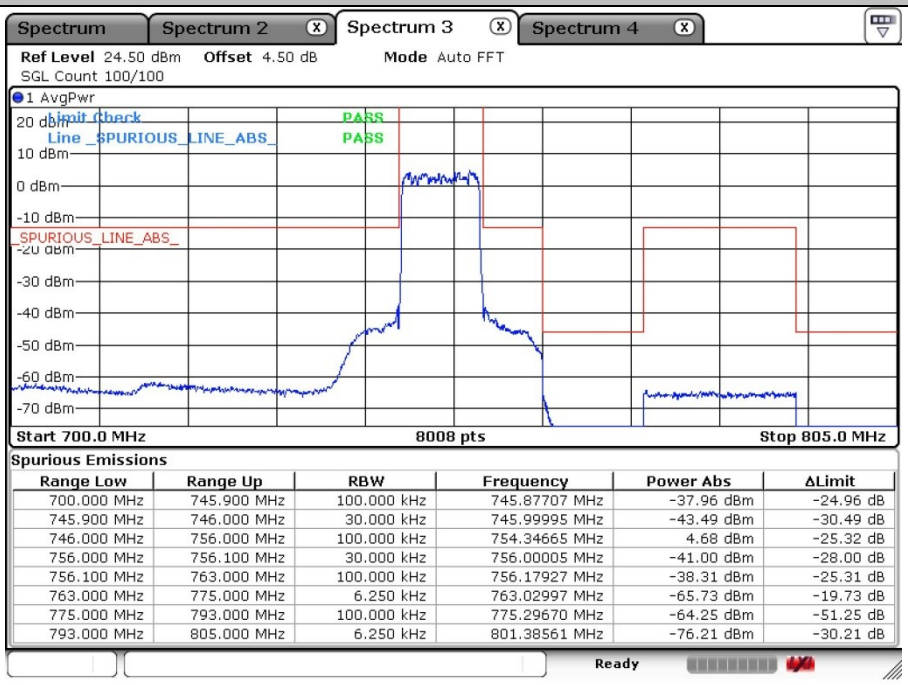
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
700.000 MHz	745.900 MHz	100.000 kHz	745.87707 MHz	-53.76 dBm	-40.76 dB
745.900 MHz	746.000 MHz	30.000 kHz	745.99995 MHz	-58.23 dBm	-45.23 dB
746.000 MHz	756.000 MHz	100.000 kHz	752.16883 MHz	6.56 dBm	-23.44 dB
756.000 MHz	756.100 MHz	30.000 kHz	756.00005 MHz	-44.61 dBm	-31.61 dB
756.100 MHz	763.000 MHz	100.000 kHz	756.10345 MHz	-40.92 dBm	-27.92 dB
763.000 MHz	775.000 MHz	6.250 kHz	763.02997 MHz	-73.69 dBm	-27.69 dB
775.000 MHz	793.000 MHz	100.000 kHz	783.17283 MHz	-64.79 dBm	-51.79 dB
793.000 MHz	805.000 MHz	6.250 kHz	797.26174 MHz	-76.38 dBm	-30.38 dB

Date: 11.SEP.2020 19:45:45

LTE Band 13 / 10MHz / QPSK

Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
700.000 MHz	745.900 MHz	100.000 kHz	745.87707 MHz	-37.96 dBm	-24.96 dB
745.900 MHz	746.000 MHz	30.000 kHz	745.99995 MHz	-43.49 dBm	-30.49 dB
746.000 MHz	756.000 MHz	100.000 kHz	754.34665 MHz	4.68 dBm	-25.32 dB
756.000 MHz	756.100 MHz	30.000 kHz	756.00005 MHz	-41.00 dBm	-28.00 dB
756.100 MHz	763.000 MHz	100.000 kHz	756.17927 MHz	-38.31 dBm	-25.31 dB
763.000 MHz	775.000 MHz	6.250 kHz	763.02997 MHz	-65.73 dBm	-19.73 dB
775.000 MHz	793.000 MHz	100.000 kHz	775.29670 MHz	-64.25 dBm	-51.25 dB
793.000 MHz	805.000 MHz	6.250 kHz	801.38561 MHz	-76.21 dBm	-30.21 dB

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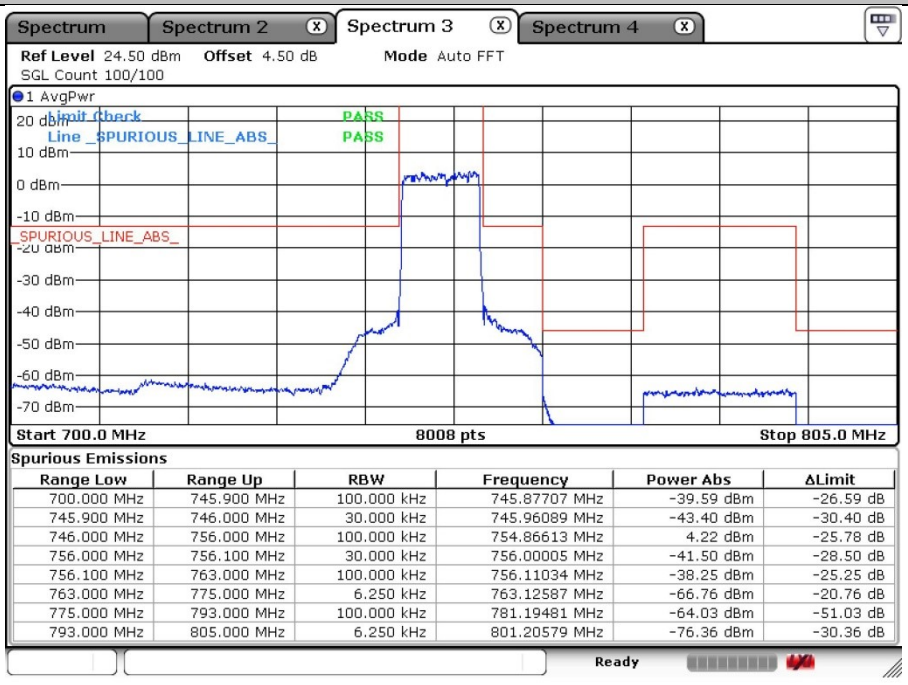
LTE Band 13 / 10MHz / 16QAM

Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
700.000 MHz	745.900 MHz	100.000 kHz	745.87707 MHz	-39.59 dBm	-26.59 dB
745.900 MHz	746.000 MHz	30.000 kHz	745.96089 MHz	-43.40 dBm	-30.40 dB
746.000 MHz	756.000 MHz	100.000 kHz	754.86613 MHz	4.22 dBm	-25.78 dB
756.000 MHz	756.100 MHz	30.000 kHz	756.00005 MHz	-41.50 dBm	-28.50 dB
756.100 MHz	763.000 MHz	100.000 kHz	756.11034 MHz	-38.25 dBm	-25.25 dB
763.000 MHz	775.000 MHz	6.250 kHz	763.12587 MHz	-66.76 dBm	-20.76 dB
775.000 MHz	793.000 MHz	100.000 kHz	781.19481 MHz	-64.03 dBm	-51.03 dB
793.000 MHz	805.000 MHz	6.250 kHz	801.20579 MHz	-76.36 dBm	-30.36 dB

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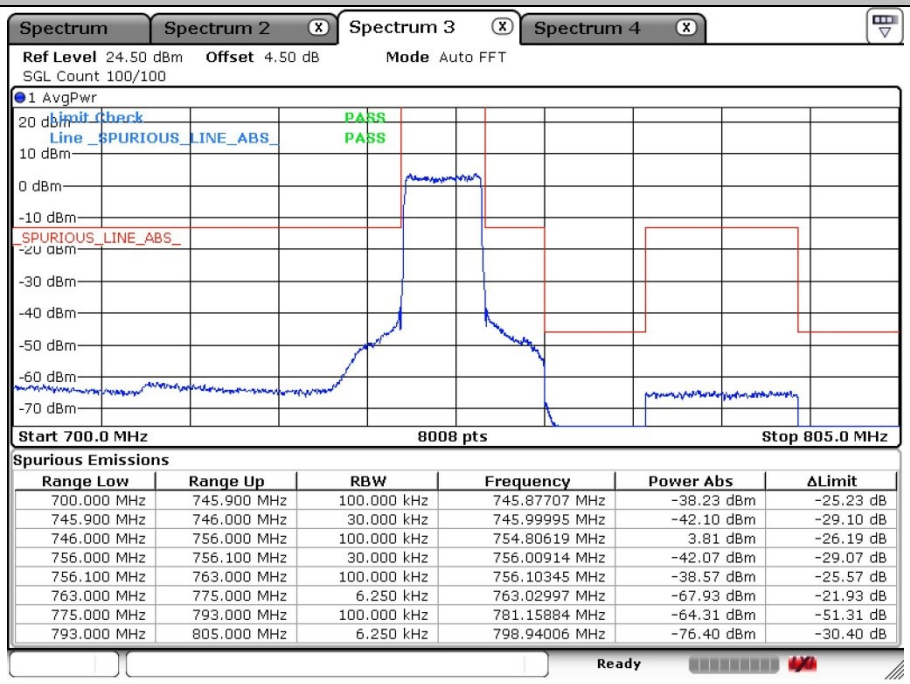
LTE Band 13 / 10MHz / 64QAM
Band Edge / Full RB



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
700.000 MHz	745.900 MHz	100.000 kHz	745.87707 MHz	-38.23 dBm	-25.23 dB
745.900 MHz	746.000 MHz	30.000 kHz	745.99995 MHz	-42.10 dBm	-29.10 dB
746.000 MHz	756.000 MHz	100.000 kHz	754.80619 MHz	3.81 dBm	-26.19 dB
756.000 MHz	756.100 MHz	30.000 kHz	756.00914 MHz	-42.07 dBm	-29.07 dB
756.100 MHz	763.000 MHz	100.000 kHz	756.10345 MHz	-38.57 dBm	-25.57 dB
763.000 MHz	775.000 MHz	6.250 kHz	763.02997 MHz	-67.93 dBm	-21.93 dB
775.000 MHz	793.000 MHz	100.000 kHz	781.15884 MHz	-64.31 dBm	-51.31 dB
793.000 MHz	805.000 MHz	6.250 kHz	798.94006 MHz	-76.40 dBm	-30.40 dB