

# **FCC RF Test Report**

FCC ID : UZ7WCMTA

**EQUIPMENT**: Touch Computer

BRAND NAME : Zebra

MODEL NAME : WCMTA

APPLICANT : Zebra Technologies Corporation

1 Zebra Plaza, Holtsville, NY 11742

Manufacturer : Zebra Technologies Corporation

1 Zebra Plaza, Holtsville, NY 11742

STANDARD : 47 CFR Part 2, 96

CLASSIFICATION : Citizens Band End User Devices (CBE)

**EQUIPMENT TYPE**: End User Equipment

TEST DATE(S) : Feb. 10, 2023 ~ Mar. 01, 2023

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26 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 Inc. (Kunshan), the test report shall not be reproduced except in full.

JasonJia

Approved by: Jason Jia





Report No.: FG311602F

Sporton International Inc. (Kunshan)

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# History of this test report

Report No.	Version	Description	Issued Date
FG311602F	01	Initial issue of report	Apr. 27, 2023

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# **Summary of Test Result**

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power	Reporting only	-
-	§96.41	Peak-to-Average Ratio   Not Applicable		Not applicable for End User Devices
		Maximum E.I.R.P	Pass	-
3.3	§96.41	Maximum Power Spectral Density	Not Applicable	Not applicable for End User Devices
3.4	§2.1049 §96.41	Occupied Bandwidth	Reporting only	-
3.5	§2.1051 §96.41	Conducted Band Edge Measurement Adjacent Channel Leakage Ratio	Pass	-
3.6	§2.1051 §96.41	Conducted Spurious Emission	Pass	
3.7	§2.1055	Frequency Stability for Temperature & Voltage	Pass	-
4.4	§2.1051 §96.41	Radiated Spurious Emission	Pass	Under limit 16.37 dB at 14730.00 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.

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# 1 General Description

## 1.1 Feature of Equipment Under Test

Product Feature						
Equipment	Touch Computer					
Brand Name	Zebra					
Model Name	WCMTA					
FCC ID	UZ7WCMTA					
Sample 1	Scanner(SE4710)					
Sample 2	Scanner(SE5500)					
HW Version	DV					
SW Version	13-09-09.00-TG-U00-PRD-ATH-04					
MFD	09MAR23					
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. There are two types of EUT: the main differences between them are the scanner and memory. According to the difference, we choose the Sample 1 to perform full test, and verify the worst RSE mode for Sample 2.

Specification of Accessory								
Battery 1	Brand Name	Zebra	Model Number	BT-000473				

Supported Unit used in test configuration and system									
Battery 2	Brand Name	Zebra	Model Number	BT-000473B					
Battery 3	Brand Name	Zebra	Model Number	BT-000473E					
AC Adapter	Brand Name	Zebra	Part Number	PWR-WUA5V12W0US					
Earphone 1	Brand Name	Zebra	Part Number	HDST-35MM-PTT1-01					
Earphone 2	Brand Name	Zebra	Part Number	HDST-USBC-PTT1-01					
USB Cable (Type C to Type A)	Brand Name	Zebra	Part Number	CBL-TC5X-USBC2A-01					
Type C-Audio Cable (Type C to 3.5mm)	Brand Name	Zebra	Part Number	ADP-USBC-35MM1-01					
Trigger Handle	Brand Name	Zebra	Part Number	TRG-TC2L-SNP1-01					
Hand Strap	Brand Name	Zebra	Part Number	SG-TC2L-HSTRP1-01					
Soft Holster	Brand Name	Zebra	Part Number	SG-TC2L-HLSTR1-01					

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## 1.2 Product Specification of Equipment Under Test

Standards-related Product Specification						
Tx Frequency	LTE Band 48: 3550 MHz ~ 3700 MHz					
Rx Frequency	LTE Band 48: 3550 MHz ~ 3700 MHz					
Bandwidth	5MHz / 10MHz / 15MHz / 20MHz					
	<ant.5>:</ant.5>					
Maximum Output Power to Antenna						
	LTE Band 48C: 22.86 dBm					
Antenna Gain	<ant.5>: -1.11 dBi</ant.5>					
Type of Modulation	QPSK / 16QAM / 64QAM / 256QAM					

#### Remark:

The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

# 1.3 Maximum EIRP Power and Emission Designator

Ľ	TE Band 48	QP	SK	16QAM/64QAM			
BW Frequency Range (MHz)		Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)		
5	3552.5~3697.5	0.1483	4M49G7D	0.1253	4M52W7D		
10	3555~3695	0.1479	9M07G7D	0.1178	9M05W7D		
15	3557.5~3692.5	0.1462	13M5G7D	0.1189	13M5W7D		
20	3560~3690	0.1496	17M9G7D	0.1279	17M9W7D		

LTE Band 48 CA	QF	PSK	16QAM/64QAM/256QAM				
BW (MHz) Frequency (MHz)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)			
5MHz+20MHz (3553.5 ~ 3690 MHz)	0.1143	22M8G7D	0.1054	23M1W7D			
10MHz+20MHz (3555.5 ~ 3690 MHz)	0.1262	27M8G7D	0.1161	27M8W7D			
15MHz+20MHz (3557.8 ~ 3690 MHz)	0.1303	32M9G7D	0.1180	32M7W7D			
20MHz+5MHz (3560 ~ 3696.7 MHz)	0.1189	23M2G7D	0.1054	23M2W7D			
20MHz+10MHz (3560 ~ 3694.5 MHz)	0.1262	27M9G7D	0.1143	28M2W7D			
20MHz+15MHz (3560 ~ 3692.2 MHz)	0.1365	32M7G7D	0.1114	32M6W7D			
20MHz+20MHz (3560 ~ 3690 MHz)	0.1496	37M6G7D	0.1183	37M2W7D			

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## 1.4 Testing Site

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

Test Firm	Sporton International Ir	Sporton International Inc. (Kunshan)									
	No. 1098, Pengxi North Road, Kunshan Economic Development Zone										
Test Site Location	Jiangsu Province 215300 People's Republic of China										
	TEL: +86-512-57900158										
	Sporton Sito No	ECC Designation No.	FCC Test Firm								
Test Site No.	Sporton Site No.	FCC Designation No.	Registration No.								
	03CH06-KS TH01-KS	CN1257	314309								

#### 1.5 Test Software

ltem	Site	Manufacturer	Name	Version		
1.	03CH06-KS	AUDIX	E3	6.2009-8-24al		

## 1.6 Applied Standards

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

- ANSI C63.26-2015
- 47 CFR Part 2, 96
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 940660 D01 Part 96 CBRS v03
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01

#### Remark:

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

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#### **Test Configuration of Equipment Under Test** 2

#### 2.1 Test Mode

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

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Z plane) were recorded in this report.

			Ва	ndwic	dth (M	Hz)		Modulation				RB#			Test Channel		
Test Items	Band	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	М	Н
Max. Output Power	48	,		v	v	v	v	v	v	v	v	v		<b>&gt;</b>	v	v	٧
26dB and 99% Bandwidth	48	•	•	v	v	v	v	v	v					v		v	
Conducted Band Edge	48	•	•	٧	v	v	v	v	v	v	v	v		v	٧	v	v
Conducted Spurious Emission	48	•	•	٧	v	v	v	v				v			v	v	v
ACLR	48	•	1	٧	v	v	v	v	v	v	v	v		v	٧	v	v
E.I.R.P.	48	•	•	٧	v	v	v	v	v	v	v	v		v	٧	v	v
Frequency Stability	48		-		v			v				v				v	
Radiated Spurious Emission	48		Worst Case									٧	v	v			
Remark	<ol> <li>The mark "v" means that this configuration is chosen for testing</li> <li>The mark "-" means that this bandwidth is not supported.</li> <li>The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious under different RB size/offset and modulations in exploratory test. Subsequently, only the worst are reported.</li> </ol>																

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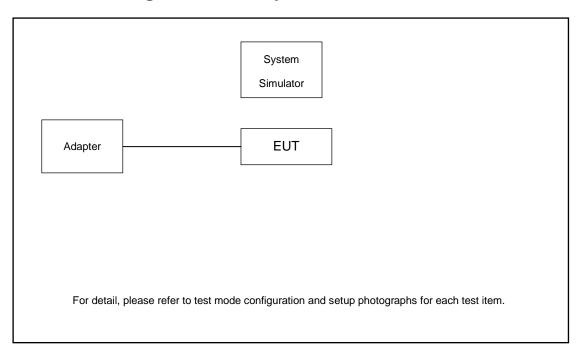
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				Ва	andwic	th (Mi	Hz)				Modul	ation			RB#		Test	Char	nnel
Test Items	Band	20+20	20+15	15+20	20+10	10+20	10+10	20+5	5+20	QPSK	16QAM	64QAM	256 QAM	1	Half	Full	L	М	н
Max. Output Power	48C	v	v	٧	٧	v	•	v	٧	٧	٧	٧	v	٧			٧	٧	v
26dB and 99% Bandwidth	48C	v	v	v	v	v	•	v	٧	٧	v					v		v	
Conducted Band Edge	48C	v	v	v	v	v	•	v	٧	٧	v	٧	٧	٧		٧	٧	٧	v
Conducted Spurious Emission	48C	v	v	v	v	v	•	v	v	v				٧			٧	v	v
Adjacent Channel Leakage Ratio	48C	v	v	v	v	v	•	v	v	v	v	٧	٧	٧		v	٧	v	v
E.I.R.P.	48C	v	٧	٧	٧	v		٧	٧	٧	v	v	v	v			v	v	v
Radiated Spurious Emission	48C		Worst Case							٧	٧	v							
			ne mark "v" means that this configuration is chosen for testing																
	3. T d	he dev	e mark "-" means that this bandwidth is not supported. e device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test unde erent RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are orted.						nder										
	4. A	II test i	tems a	re bas	ed on e	engine	ering e	/aluatio	on.										

# 2.2 Connection Diagram of Test System



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## 2.3 Support Unit used in test configuration

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	MT8821C	N/A	N/A	Unshielded, 1.8 m
3.	Fixture	INTEL	NGFF Card Carrier	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 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 6.5 dB.

#### Example:

 $Offset(dB) = RF \ cable \ loss(dB).$ = 6.5 (dB)

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2.5 Frequency List of Low/Middle/High Channels

	LTE Band 48 Channel and Frequency List									
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest						
20	Channel	55340	55990	56640						
20	Frequency	3560.0	3625.0	3690.0						
45	Channel	55315	55990	56665						
15	Frequency	3557.5	3625.0	3692.5						
40	Channel	55290	55990	56690						
10	Frequency	3555.0	3625.0	3695.0						
E	Channel	55265	55990	56715						
5	Frequency	3552.5	3625.0	3697.5						

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LTE Band 48C\_CA Channel and Frequency List BW [MHz] Channel/Frequency(MHz) Lowest Middle **Highest** Channel 55273 55898 56523 **PCC** Frequency 3553.3 3615.8 3678.3 5 + 20Channel 55390 56015 56640 SCC Frequency 3565 3627.5 3690 55340 56590 Channel 55965 **PCC** Frequency 3560 3622.5 3685 20 + 556707 Channel 55457 56082 SCC Frequency 3571.7 3634.2 3696.7 Channel 55295 55896 56496 **PCC** Frequency 3555.5 3615.6 3675.6 10 + 2056640 Channel 55439 56040 SCC Frequency 3569.9 3630 3690 55340 55941 56541 Channel **PCC** 3560 3620.1 3680.1 Frequency 20 + 10Channel 55484 56085 56685 SCC Frequency 3574.4 3634.5 3694.5 55318 55893 Channel 56469 **PCC** Frequency 3557.8 3615.3 3672.9 15 + 2055489 56064 56640 Channel SCC 3574.9 3632.4 3690 Frequency Channel 55340 55916 56491 **PCC** Frequency 3560 3617.6 3675.1 20 + 15Channel 55511 56087 56662 SCC Frequency 3577.1 3634.7 3692.2 55340 55891 56442 Channel **PCC** Frequency 3560 3615.1 3670.2 20 + 2055538 56640 Channel 56089 SCC 3579.8 3634.9 3690 Frequency

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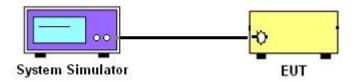
## 3 Conducted Test Items

## 3.1 Measuring Instruments

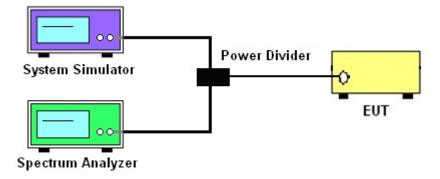
See list of measuring instruments of this test report.

#### 3.1.1 Test Setup

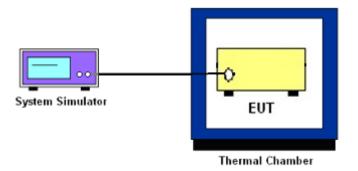
#### 3.1.2 Conducted Output Power



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



## 3.1.4 Frequency Stability



### 3.1.5 Test Result of Conducted Test

Please refer to Appendix A.

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## 3.2 Conducted Output Power

#### 3.2.1 Description of the Conducted Output Power 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.

#### 3.2.2 Test Procedures

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

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#### **3.3 EIRP**

#### 3.3.1 Description of the EIRP Measurement

EIRP limits for CBRS equipment as below table:

De	evice	Maximum EIRP	Maximum PSD
		(dBm/10 MHz)	(dBm/MHz)
Applied	End User Device	23	n/a
	Category A CBSD	30	20
	Category B CBSD	47	37

#### Remark:

The worst case EIRP shown in this section is found with LTE operating only using 1RB. As such, the EIRP/10MHz and full channel EIRP values will be identical since 1RB is fully contained within all available channel bandwidths for LTE Band 48 (i.e. 5, 10, 15, 20MHz)

#### 3.3.2 Test Procedures for EIRP

- Establishing a communications link with the call box (Base station) to measure the Maximum conducted power, the parameters were set to force the EUT transmitting at maximum output power level. Use the average power measurement function to measure total channel power of each channel bandwidth (per ANSI C63.26-2015 Section 5.2.1)
- 2. Determining ERP and/or EIRP from conducted RF output power measurements (Per ANSI C63.26-2015 Section 5.2.5.5)

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

 $P_T$  = transmitter output power in dBm

 $G_T$  = gain of the transmitting antenna in dBi

L<sub>C</sub> = signal attenuation in the connecting cable between the transmitter and antenna in dB

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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

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

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.

2. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency.

The span range for the spectrum analyzer shall be between two and five times the anticipated

OBW.

3. The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated

OBW, and the VBW shall be at least 3 times the RBW.

4. Set the detection mode to peak, and the trace mode to max hold.

5. Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to

stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace.

(this is the reference value)

6. Determine the "-26 dB down amplitude" as equal to (Reference Value – X).

7. Place two markers, one at the lowest and the other at the highest frequency of the envelope of

the spectral display such that each marker is at or slightly below the "-X dB down amplitude"

determined in step 6. If a marker is below this "-X dB down amplitude" value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the

two markers.

8. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured

bandwidth.

## 3.5 Conducted Band Edge

#### 3.5.1 Description of Conducted Band Edge Measurement

Part 96.41 (e) (1) (i)

For CBSD the emission limits outside the fundamental are as follows:

Within 0 MHz to 10 MHz above and below the assigned channel ≤ −13 dBm/MHz

Greater than 10 MHz above and below the assigned channel ≤ -25 dBm/MHz

Part 96.41 (e) (1) (ii)

For End User Devices the emission limits outside the fundamental are as follows:

Within 0 MHz to B MHz above and below the assigned channel ≤ −13 dBm/MHz

Greater than B MHz above and below the assigned channel ≤ -25 dBm/MHz

where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device.

Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB.

Part 96.41 (e) (2)

For CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz

#### 3.5.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

- 1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
- 2. The band edges of low and high channels for the highest RF powers were measured.
- 3. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
- 4. Beyond the 1 MHz band from the band edge, RBW=1MHz was used
- 5. Offset has included the duty factor for LTE Band 48. Duty factor =10 log (1/x), where x is the measured duty cycle.
- 6. Set spectrum analyzer with RMS detector.
- The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

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## 3.6 Conducted Spurious Emission

#### 3.6.1 Description of Conducted Spurious Emission Measurement

96.41 (e)(2)

The conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.

#### 3.6.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

- 1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
- The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.
   The path loss was compensated to the results for each measurement.
- 3. The middle channel for the highest RF power within the transmitting frequency was measured.
- 4. The conducted spurious emission for the whole frequency range was taken.
- 5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
- 6. Set spectrum analyzer with RMS detector.
- 7. Taking the record of maximum spurious emission.
- 8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
- 9. The limit line is -40dBm/MHz.

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## 3.7 Frequency Stability

#### 3.7.1 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

#### 3.7.2 Test Procedures for Temperature Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

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

#### 3.7.3 Test Procedures for Voltage Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

- The EUT was placed in a temperature chamber at 25±5° C and connected with the system 1. simulator.
- 2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
- 3. The variation in frequency was measured for the worst case.

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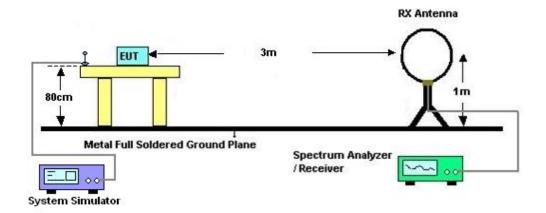
## 4 Radiated Test Items

## 4.1 Measuring Instruments

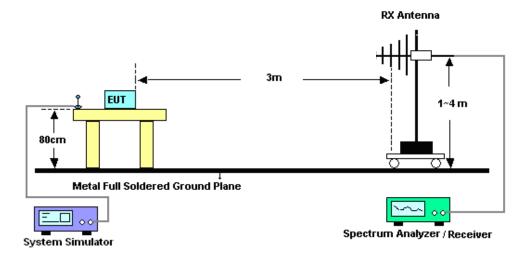
See list of measuring instruments of this test report.

## 4.2 Test Setup

#### 4.2.1 For radiated test below 30MHz



#### 4.2.2 For radiated test from 30MHz to 1GHz



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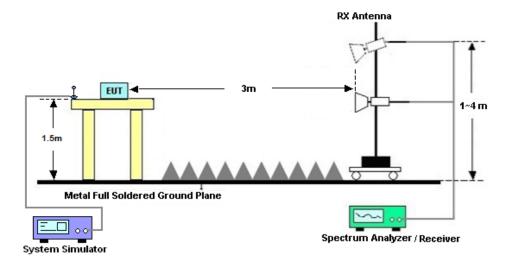
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#### For radiated test above 1GHz 4.2.3



#### 4.3 Test Result of Radiated Test

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

Please refer to Appendix B.

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## 4.4 Radiated Spurious Emission

#### 4.4.1 Description of Radiated Spurious Emission Measurement

The radiated spurious emission was measured by substitution method according to ANSI C63.26-2015.

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 -40dBm / MHz.

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

#### 4.4.2 Test Procedures

- 1. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
- 2. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
- 3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
- 4. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
- 5. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
- 6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
- A horn antenna was substituted in place of the EUT and was driven by a signal generator.
   Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.

EIRP (dBm) = S.G. Power - Tx Cable Loss + Tx Antenna GainERP (dBm) = EIRP - 2.15

8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is -40dBm/MHz

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# 5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 12, 2022	Feb. 10, 2023~ Feb. 28, 2023	Oct. 11, 2023	Conducted (TH01-KS)
Power divider	STI	STI08-0055	-	0.5~40GHz	NCR	Feb. 10, 2023~ Feb. 28, 2023	NCR	Conducted (TH01-KS)
Temperature &h umidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 15, 2022	Feb. 10, 2023~ Feb. 28, 2023	Jul. 14, 2023	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY60242126	10Hz-44GHz	Oct. 13, 2022	Mar. 01, 2023	Oct. 12, 2023	Radiation (03CH06-KS)
Bilog Antenna	TeseQ	CBL6111D	49921	30MHz-1GHz	May 24, 2022	Mar. 01, 2023	May 23, 2023	Radiation (03CH06-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 16, 2022	Mar. 01, 2023	Oct. 15, 2023	Radiation (03CH06-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00218642	1GHz~18GHz	Apr. 18, 2022	Mar. 01, 2023	Apr. 17, 2023	Radiation (03CH06-KS)
SHF-EHF Horn	Com-power	AH-840	101093	18GHz~40GHz	Jan. 08, 2023	Mar. 01, 2023	Jan. 07, 2024	Radiation (03CH06-KS)
Amplifier	SONOMA	310N	380827	9KHz ~1GHZ	Jul. 11, 2022	Mar. 01, 2023	Jul. 10, 2023	Radiation (03CH06-KS)
Amplifier	MITEQ	EM18G40G GA	060728	18~40GHz	Jan. 05, 2023	Mar. 01, 2023	Jan. 04, 2024	Radiation (03CH06-KS)
high gain Amplifier	MITEQ	AMF-7D-00 101800-30-1 0P	2082395	1Ghz-18Ghz	Jan. 05, 2023	Mar. 01, 2023	Jan. 04, 2024	Radiation (03CH06-KS)
Amplifier	Keysight	83017A	MY53270319	500MHz~26.5GHz	Oct. 12, 2022	Mar. 01, 2023	Oct. 12, 2023	Radiation (03CH06-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Mar. 01, 2023	NCR	Radiation (03CH06-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Mar. 01, 2023	NCR	Radiation (03CH06-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Mar. 01, 2023	NCR	Radiation (03CH06-KS)

NCR: No Calibration Required

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# 6 Uncertainty of Evaluation

#### **Uncertainty of Conducted Measurement**

Test Item	Uncertainty
Conducted Power	±0.46 dB
Conducted Emissions	±0.48 dB
Occupied Channel Bandwidth	±0.1 %

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

Macauring Uncortainty for a Layal of	
Measuring Uncertainty for a Level of	2.5dB
Confidence of 95% (U = 2Uc(y))	2.300

#### <u>Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)</u>

Measuring Uncertainty for a Level of	2.14D
Confidence of 95% (U = 2Uc(y))	2.1dB

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

	<del></del>
Measuring Uncertainty for a Level of	2.440
Confidence of 95% (U = 2Uc(y))	2.1dB

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

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# **Appendix A. Test Results of Conducted Test**

# Conducted Output Power(Average power)and EIRP

#### LTE Band 48:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.		EIRP(W)	
	Cha	nnel		55340	55990	56640			
	Frequency (MHz)			3560	3625	3690	L	M	Н
20	QPSK	1	0	22.86	22.83	22.81	0.1496	0.1486	0.1479
20	QPSK	1	99	22.43	22.66	22.72	0.1355	0.1429	0.1449
20	QPSK	100	0	21.59	21.67	21.66	0.1117	0.1138	0.1135
20	16QAM	1	0	22.11	22.18	22.06	0.1259	0.1279	0.1245
20	64QAM	1	0	20.39	20.43	20.51	0.0847	0.0855	0.0871
20	256QAM	1	0	17.64	17.54	17.68	0.0450	0.0440	0.0454
	Cha	nnel		55315	55990	56665	EIRP(W)		
	Frequenc	cy (MHz)		3557.5	3625	3692.5	L M H		
15	QPSK	1	0	22.63	22.76	22.69	0.1419	0.1462	0.1439
15	16QAM	1	0	21.58	21.86	21.73	0.1114	0.1189	0.1153
	Cha	nnel		55290	55990	56690	EIRP(W)		
	Frequenc	cy (MHz)		3555	3625	3695	L	M	Н
10	QPSK	1	0	22.73	22.79	22.81	0.1452	0.1472	0.1479
10	16QAM	1	0	21.63	21.71	21.82	0.1127	0.1148	0.1178
	Channel			55265	55990	56715		EIRP(W)	
	Frequency (MHz)			3552.5	3625	3697.5	L	M	Н
5	QPSK	1	0	22.79	22.71	22.82	0.1472	0.1445	0.1483
5	16QAM	1	0	22.03	22.06	22.09	0.1236	0.1245	0.1253

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#### LTE Band 48C:

		Com	bination 20MHz+2	20MHz (100RB+1	OURB)		
Channel	Modulation	Р	CC	S	CC	Measured	
Channel	Modulation	RB Size	RB offset	RB Size	RB offset	Power	EIRP(W)
L	QPSK	1	Max	1	0	18.42	0.0538
М	QPSK	1	Max	1	0	22.86	0.1496
Н	QPSK	1	Max	1	0	18.24	0.0516
L	16QAM	1	Max	1	0	18.33	0.0527
M	16QAM	1	Max	1	0	21.84	0.1183
Н	16QAM	1	Max	1	0	18.20	0.0512
L	64QAM	1	Max	1	0	18.29	0.0522
М	64QAM	1	Max	1	0	21.34	0.1054
Н	64QAM	1	Max	1	0	18.16	0.0507
L	256QAM	1	Max	1	0	18.25	0.0518
М	256QAM	1	Max	1	0	18.20	0.0512
Н	256QAM	1	Max	1	0	18.15	0.0506
		Con	nbination 20MHz+	15MHz (100RB+7	75RB)		
Channel	Manhalatian	Р	CC	S	CC	Measured	
Channel	Modulation	RB Size	RB offset	RB Size	RB offset	Power	EIRP(W)
M	QPSK	1	Max	1	0	22.46	0.1365
М	16QAM	1	Max	1	0	21.58	0.1114
		Com	nbination 15MHz+2	20MHz (100RB+7	75RB)		
01	Marketaday	Р	CC	S	CC	Measured	FIDDAM
Channel	Channel Modulation -	RB Size	RB offset	RB Size	RB offset	Power	EIRP(W
М	QPSK	1	Max	1	0	22.26	0.1303
М	16QAM	1	Max	1	0	21.83	0.1180
		Com	nbination 20MHz+	10MHz (100RB+5	50RB)		
01	Marketaday	Р	CC	S	CC	Measured	EIDD(M
Channel	Modulation	RB Size	RB offset	RB Size	RB offset	Power	EIRP(W
М	QPSK	1	Max	1	0	22.12	0.1262
М	16QAM	1	Max	1	0	21.69	0.1143
		Con	nbination 10MHz+:	20MHz (50RB+10	00RB)		
<u> </u>		Р	CC	S	CC	Measured	E15504
Channel	Modulation	RB Size	RB offset	RB Size	RB offset	Power	EIRP(W
M	QPSK	1	Max	1	0	22.12	0.1262
M	16QAM	1	Max	1	0	21.76	0.1161
		Cor	nbination 20MHz+		5RB)		
0.		P	CC	S	CC	Measured	
Channel	Modulation	RB Size	RB offset	RB Size	RB offset	Power	EIRP(W
М	QPSK	1	Max	1	0	21.86	0.1189
М	16QAM	1	Max	1	0	21.34	0.1054
		<u> </u>	nbination 5MHz+2		0RB)		
PCC SCC Measured FIDERAN							
Channel	Modulation	RB Size	RB offset	RB Size	RB offset	Power	EIRP(W)
M	QPSK	1	Max	1	0	21.69	0.1143
M	16QAM	1	Max	1	0	21.34	0.1054

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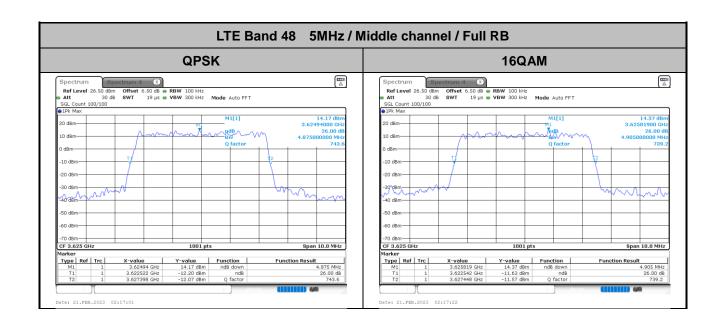
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LTE Band 48

# 26dB Bandwidth

Mode	LTE Band 48 : 26dB BW(MHz)						
BW		5MHz					
Mod.	QPSK	16QAM					
Middle CH	4.88	4.91					
BW	1	10MHz					
Mod.	QPSK	16QAM					
Middle CH	9.87	9.69					
BW	1	5MHz					
Mod.	QPSK	16QAM					
Middle CH	14.33	14.27					
BW	2	20MHz					
Mod.	QPSK	16QAM					
Middle CH	18.94	18.74					

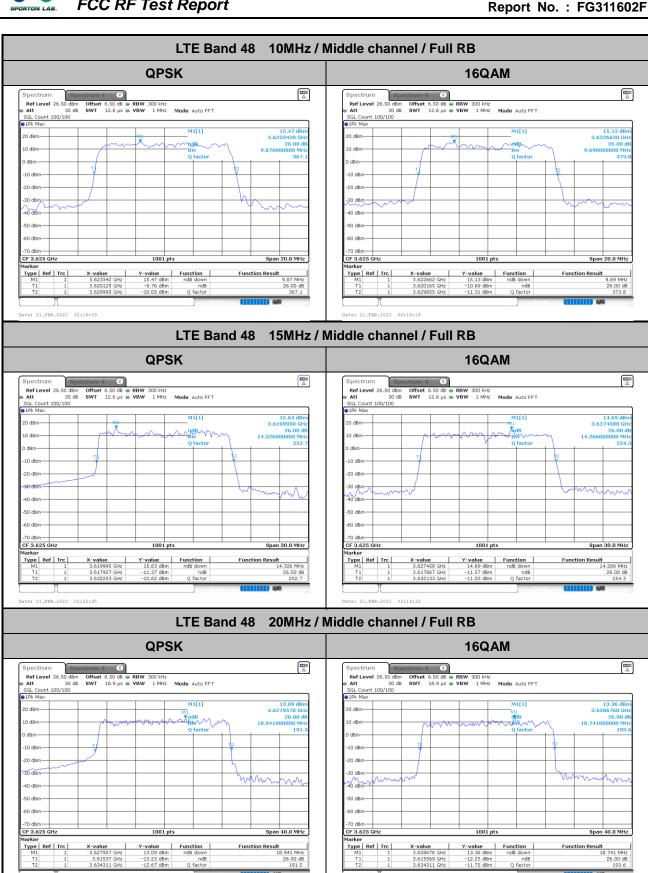


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Type Ref Trc

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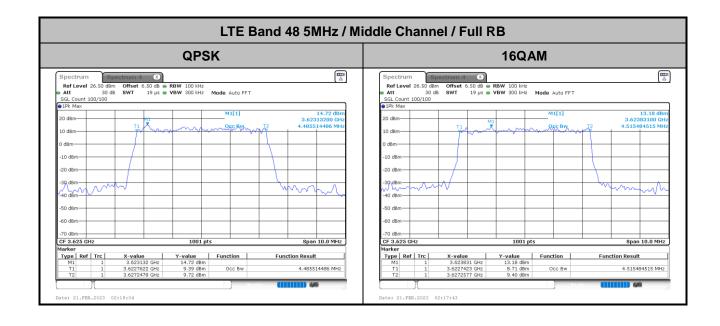
Type | Ref | Trc |

Y-value : 13.36 dBm : -12.25 dBm : -11.75 dBm



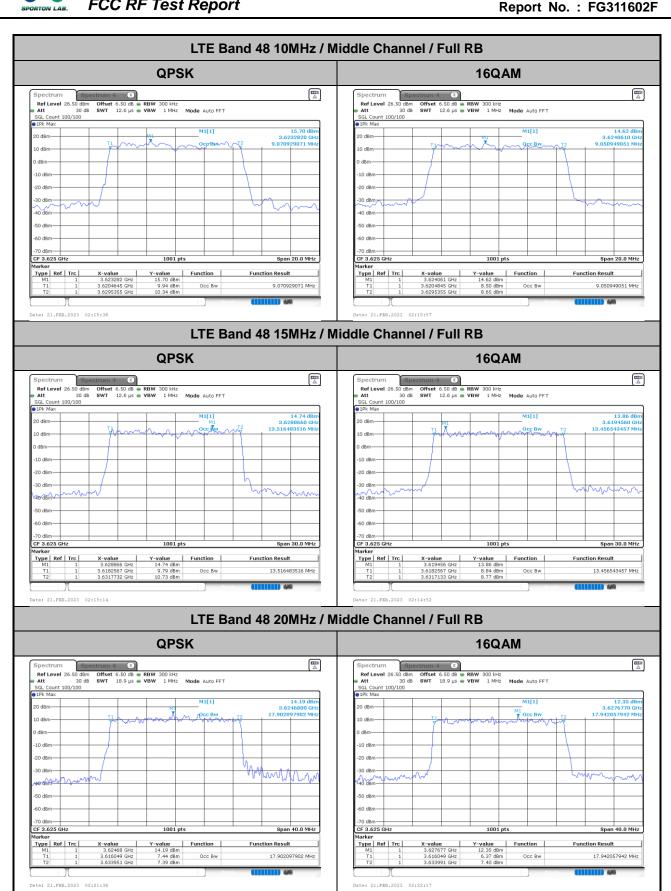
Occupied Bandwidth

Mode	LTE Band 48 : 99%OBW(MHz)	
BW	5MHZ	
Mod.	QPAK	16QAM
Middle CH	4.49	4.52
BW	10MHZ	
Mod.	QPAK	16QAM
Middle CH	9.07	9.05
BW	15MHZ	
Mod.	QPAK	16QAM
Middle CH	13.52	13.46
BW	20MHZ	
Mod.	QPAK	16QAM
Middle CH	17.90	17.94



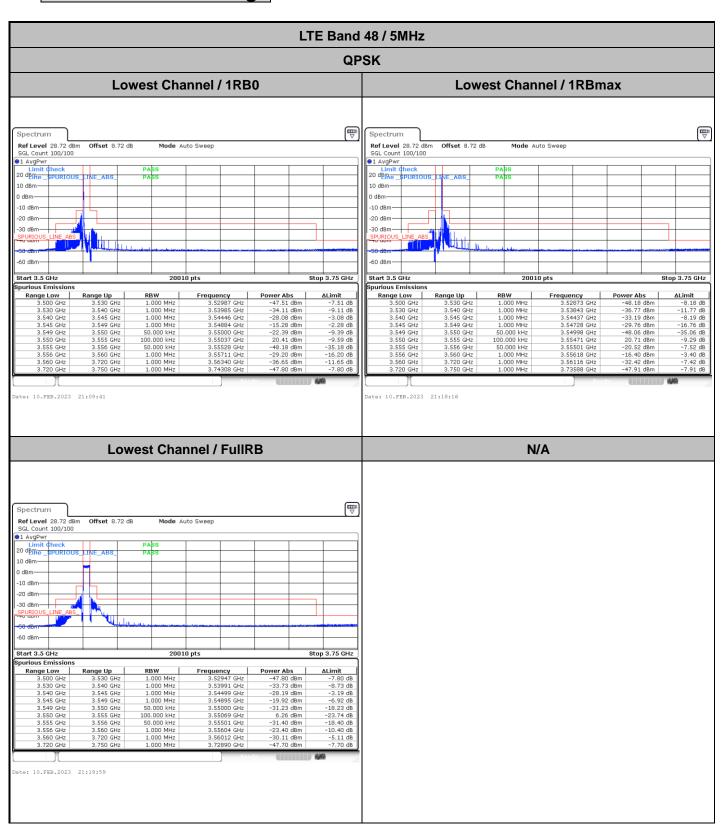
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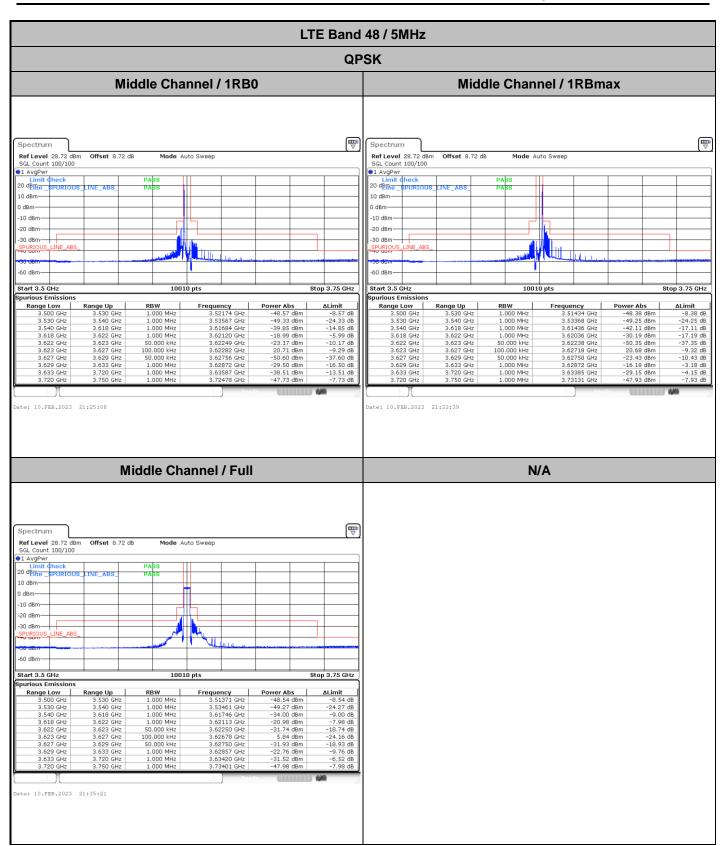


# **Conducted Band Edge**



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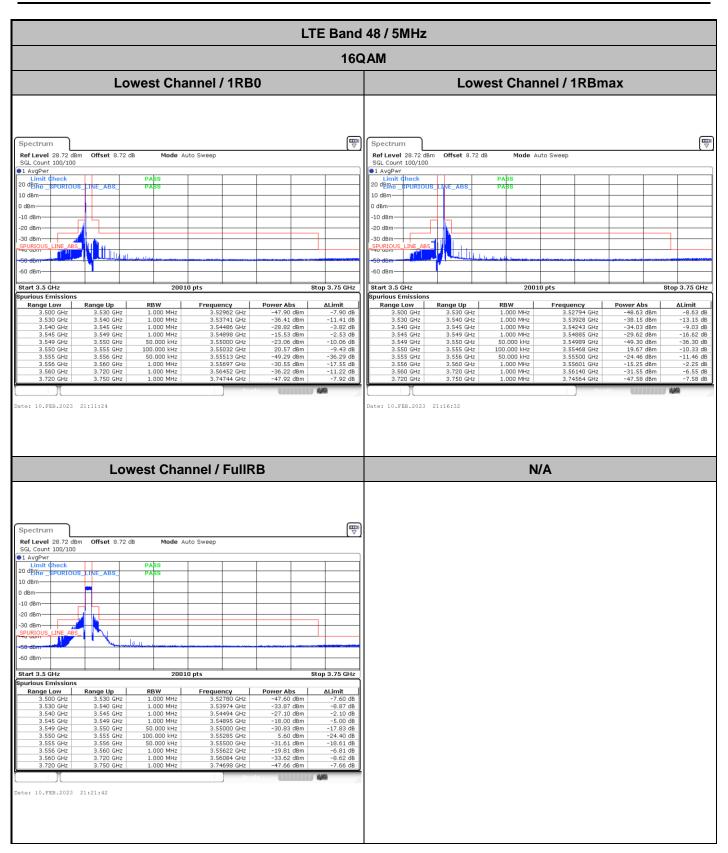
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LTE Band 48 / 5MHz **QPSK Highest Channel / 1RB0 Highest Channel / 1RBmax** Spectrum Spectrum Ref Level 28.72 dB SGL Count 100/100 Ref Level 28.72 dBr SGL Count 100/100 Offset 8.72 dB Mode Auto Sween Offset 8.72 dB Mode Auto Sweep SGL Coun. 1 AvgPwr Limit di SGL co... 1 AvgPwr Limit ¢h 20 dBMe 20 dBMe 10 dBm-10 dBm-0 dBm 0 dBm -10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -60 dBm--60 dBm-Start 3.5 GHz Stop 3.75 GHz 10010 pts Start 3.5 GHz urious Emissions Spurious Emission: Power Abs
-48.44 dBm
-49.20 dBm
-41.99 dBm
-29.22 dBm
20.41 dBm
-22.77 dBm
-16.24 dBm
-27.94 dBm Power Abs
-48.37 dBm
-49.20 dBm
-41.71 dBm
-19.22 dBm
20.53 dBm
-50.16 dBm
-34.52 dBm Range Low 3.500 GH: 1.000 MHz 3.50625 GHz 3.53563 GHz 3.68888 GHz ΔLimit ∆Limit -8.44 dB
-8.42 dB
-16.99 dB
-16.22 dB
-37.02 dB
-9.59 dB
-9.77 dB
-3.24 dB
-2.94 dB
-7.54 dB -8.37 dB
-24.20 dB
-16.71 dB
-6.22 dB
-10.62 dB
-9.47 dB
-37.16 dB
-17.20 dB
-9.52 dB
-7.98 dB 3.50202 GHz 3.53693 GHz 3.68978 GHz 3.69347 GHz 3.69484 GHz 3.6969 GHz 3.500 GHz 3.530 GHz 3.540 GHz 3.690 GHz 3.694 GHz 3.695 GHz 3.700 GHz 3.701 GHz 3.705 GHz 3.720 GHz 3.530 GHz 3.540 GHz 3.690 GHz 3.694 GHz 3.695 GHz 3.700 GHz 3.701 GHz 3.530 GHz 3.540 GHz 3.690 GHz 3.694 GHz 3.695 GHz 3.700 GHz 3.540 GHz 3.690 GHz 3.694 GHz 3.695 GHz 3.700 GHz 3.701 GHz 3.69400 GHz 3.69499 GHz 3.69534 GHz 50.000 kHz 100.000 kHz 100.000 kHz 50.000 kHz 3.70001 GHz 3.70108 GHz .701 GHz .705 GHz 3.70029 GHz 3.70125 GHz 720 GHz 750 GHz -27.94 dBm -47.54 dBm ate: 10.FEB.2023 21:40:28 Date: 10.FEB.2023 21:49:03 **Highest Channel / FullRB** N/A Spectrum Ref Level 28.72 dBm SGL Count 100/100 Offset 8.72 dB Mode Auto Sweep ●1 AvgPwr Limit Check 20 den \_ spur 10 dBm-0 dBm -10 dBm -20 dBm--30 dBm LINE\_ABS Start 3.5 GHz Stop 3.75 GHz rious Emissions Requency
3.51950 GHz
3.53298 GHz
3.68903 GHz
3.69967 GHz
3.6976 GHz
3.70000 GHz
3.70109 GHz
3.70149 GHz
3.70149 GHz
3.70243 GHz Range Low 3.500 GHz te: 10.FEB.2023 21:50:46

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LTE Band 48 / 5MHz **16QAM** Middle Channel / 1RB0 Middle Channel / 1RBmax Spectrum Spectrum Ref Level 28.72 dBr SGL Count 100/100 Offset 8.72 dB Mode Auto Sween Ref Level 28.72 Offset 8.72 dB Mode Auto Sweep SGL Count 100/100 SGL Cour. 1 AvgPwr Limit ch SGL co... 1 AvgPwr Limit ¢h 20 dBMe 20 dBMe 10 dBm-10 dBm-0 dBm 0 dBm -10 dBm -10 dBm -20 dBm -30 dBm -30 dBm SPURIOU -60 dBm--60 dBm-Start 3.5 GHz Stop 3.75 GHz Start 3.5 GHz Stop 3.75 GHz urious Emissions Spurious Emissions -48.53 dBm -49.30 dBm -36.79 dBm -16.72 dBm -24.34 dBm 19.13 dBm -50.28 dBm -30.33 dBm -37.14 dBm Power Abs
-48.65 dBm
-49.33 dBm
-43.20 dBm
-28.18 dBm
-51.14 dBm
19.48 dBm
-24.87 dBm
-17.24 dBm 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz Frequency
3.52669 GHz
3.52469 GHz
3.61731 GHz
3.62129 GHz
3.62249 GHz
3.62280 GHz
3.62756 GHz
3.62897 GHz
3.62897 GHz 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz Frequency
3.50130 GHz
3.50130 GHz
3.50326 GHz
3.61615 GHz
3.62276 GHz
3.62246 GHz
3.62247 GHz
3.62773 GHz
3.62877 GHz
3.63691 GHz Range Low 3.500 GH ΔLimit -8.53 dB -24.30 dB -11.79 dB -3.72 dB -11.34 dB -10.87 dB -37.28 dB -17.33 dB -12.18 dB -8.65 dB
-24.33 dB
-18.20 dB
-15.18 dB
-38.14 dB
-10.52 dB
-11.87 dB
-4.24 dB
-10.68 dB
-7.82 dB 3.530 GHz 3.540 GHz 3.618 GHz 3.622 GHz 3.623 GHz 3.627 GHz 3.629 GHz 3.633 GHz 3.530 GHz 3.540 GHz 3.618 GHz 3.622 GHz 3.623 GHz 3.627 GHz 3.500 GHz 3.530 GHz 3.540 GHz 3.618 GHz 3.622 GHz 3.623 GHz 3.627 GHz 3.629 GHz 3.640 GHz 3.618 GHz 3.622 GHz 3.623 GHz 3.627 GHz 50.000 kHz 100.000 kHz 100.000 kHz 50.000 kHz 3.629 GHz 3.633 GHz .720 GHz .750 GHz .633 GHz -35.68 dBm -47.82 dBm ate: 10.FEB.2023 21:26:51 Date: 10.FEB.2023 21:31:57 Middle Channel / Full N/A Spectrum Ref Level 28.72 dBm SGL Count 100/100 Offset 8.72 dB Mode Auto Sweep ●1 AvgPwr Limit Check 20 den \_ spur 10 dBm-0 dBm -10 dBm -20 dBm--30 dBm LINE\_ABS Start 3.5 GHz Stop 3.75 GHz 10010 pts rious Emissions Renge Low
3.500 GHz
3.500 GHz
3.530 GHz
3.540 GHz
3.618 GHz
3.622 GHz
3.623 GHz
3.623 GHz
3.627 GHz
3.629 GHz
3.633 GHz Frequency
3.50436 GHz
3.53761 GHz
3.51659 GHz
3.62094 GHz
3.62279 GHz
3.62790 GHz
3.62750 GHz
3.62890 GHZ
3.63831 GHz
3.74705 GHz ALimit
-8.48 dB
-24.35 dB
-9.16 dB
-7.08 dB
-18.29 dB
-24.94 dB
-20.02 dB
-6.73 dB
-7.78 dB te: 10.FEB.2023 21:37:04

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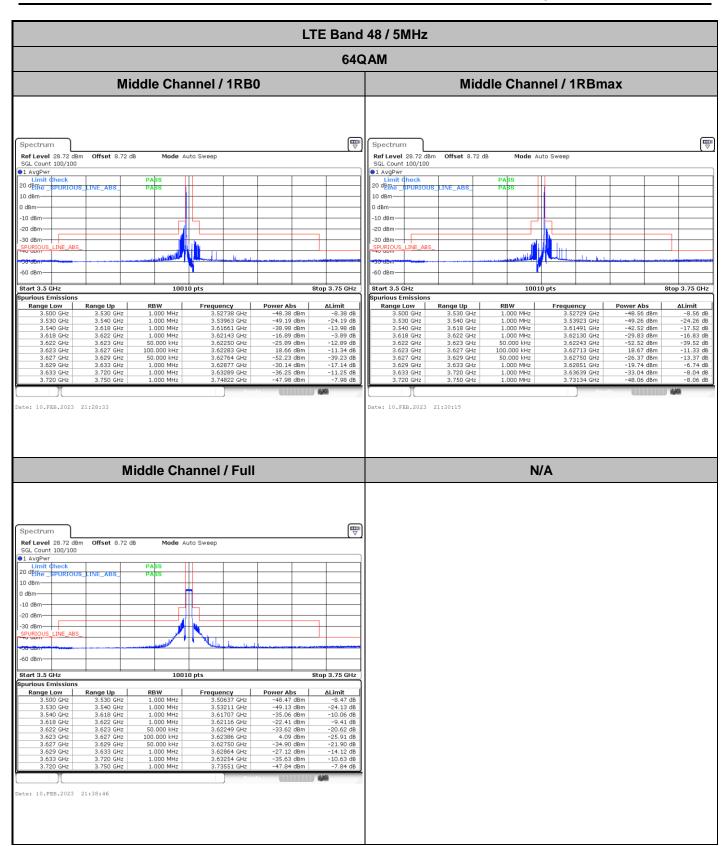
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3.51509 GHz
3.53408 GHz
3.69933 GHz
3.69963 GHz
3.69963 GHz
3.70001 GHz
3.70102 GHz
3.70541 GHz
3.72004 GHz urious Emissions Spurious Emission: -48.48 dBm -49.35 dBm -40.25 dBm -17.08 dBm -24.62 dBm -51.17 dBm -30.19 dBm -32.95 dBm Range Low 3.500 GH: 1.000 MHz 3.52621 GHz 3.52621 GHz 3.53755 GHz 3.68918 GHz 3.69388 GHz 3.69499 GHz 3.69532 GHz ΔLimit -8.55 dB -8.55 dB -24.24 dB -19.66 dB -16.67 dB -37.33 dB -10.67 dB -12.43 dB -2.60 dB -5.63 dB -8.12 dB -24.35 dB -24.35 dB -15.25 dB -4.08 dB -11.62 dB -10.57 dB -38.17 dB -17.19 dB -7.85 dB -8.40 dB -48.55 dBm -49.24 dBm -44.66 dBm -29.67 dBm -50.33 dBm 19.33 dBm -25.43 dBm -15.60 dBm -30.63 dRm 3.500 GHz 3.530 GHz 3.540 GHz 3.690 GHz 3.694 GHz 3.695 GHz 3.700 GHz 3.701 GHz 3.705 GHz 3.720 GHz 3.530 GHz 3.540 GHz 3.690 GHz 3.694 GHz 3.695 GHz 3.700 GHz 3.701 GHz 3.530 GHz 3.540 GHz 3.690 GHz 3.694 GHz 3.695 GHz 3.700 GHz 3.540 GHz 3.690 GHz 3.694 GHz 3.695 GHz 3.700 GHz 3.701 GHz 50.000 kHz 100.000 kHz 100.000 kH .701 GHz .705 GHz 3.70015 GHz 3.70192 GHz 50.000 kH; 720 GHz 750 GHz 30.63 dBm 48.12 dBm ate: 10.FEB.2023 21:42:11 Date: 10.FEB.2023 21:47:20 **Highest Channel / FullRB** N/A Spectrum Ref Level 28.72 dBm SGL Count 100/100 Offset 8.72 dB Mode Auto Sweep ●1 AvgPwr Limit Check 20 den \_ spur 10 dBm-0 dBm -10 dBm -20 dBm--30 dBm LINE\_ABS Start 3.5 GHz Stop 3.75 GHz rious Emissions Range Low 3.500 GHz

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LTE Band 48 / 5MHz **64QAM** Lowest Channel / 1RB0 **Lowest Channel / 1RBmax** Spectrum Spectrum Ref Level 28.72 dB SGL Count 100/100 Offset 8.72 dB Mode Auto Sween Ref Level 28.72 Offset 8.72 dB Mode Auto Sweep SGL Cour.. 1 AvgPwr Limit d SGL Count 100/100 SGL co... 1 AvgPwr Limit ¢h 20 deme 20 dBMe 10 dBm-10 dBm-0 dBm dBm -10 dBm -10 dBm -20 dBm -30 dBm -50 dha -60 dBm--60 dBm-Start 3.5 GHz Stop 3.75 GHz 20010 pts Stop 3.75 GHz Start 3.5 GHz urious Emissions Power Abs
-48.20 dBm
-35.25 dBm
-30.51 dBm
-17.84 dBm
-25.41 dBm
18.82 dBm
-50.20 dBm
-31.29 dBm
-47.85 dBm Spurious Emission: Frequency
3.52876 GHz
3.52873 GHz
3.54961 GHz
3.54857 GHz
3.54962 GHz
3.55464 GHz
3.55501 GHz
3.55506 GHz
3.55606 GHz ALimit
-8.59 dB
-12.45 dB
-9.73 dB
-17.40 dB
-38.18 dB
-11.73 dB
-12.69 dB
-6.33 dB
-9.13 dB
-7.88 dB 1.000 MHz ΔLimit Range Low 3.500 GH -8.20 dB -10.25 dB -5.51 dB -5.51 dB -12.41 dB -11.18 dB -37.20 dB -18.29 dB -12.90 dB -7.85 dB -48.59 dBm -37.45 dBm -34.73 dBm -30.40 dBm -51.18 dBm 18.27 dBm -25.69 dBm -19.33 dBm -34.13 dRm 3.530 GHz 3.540 GHz 3.545 GHz 3.549 GHz 3.550 GHz 3.555 GHz 3.556 GHz 3.560 GHz 3.500 GHz 3.530 GHz 3.540 GHz 3.545 GHz 3.549 GHz 3.550 GHz 3.555 GHz 3.500 GHz 3.530 GHz 3.540 GHz 3.545 GHz 3.549 GHz 3.550 GHz 3.555 GHz 3.556 GHz 3.540 GH 3.545 GH .53973 GHz .54454 GHz 3.549 GHz 3.550 GHz 3.555 GHz 50.000 kHz 100.000 kHz 3.55030 GHz 3.55519 GHz 3.55636 GHz 100.000 kHz 50.000 kHz 3.556 GHz 3.560 GHz 720 GHz 750 GHz 3.56132 GHz 3.74785 GHz .560 GHz .720 GHz -34.13 dBm -47.88 dBm ate: 10.FEB.2023 21:13:06 Date: 10.FEB.2023 21:14:49 **Lowest Channel / FullRB** N/A Spectrum Ref Level 28.72 dBm SGL Count 100/100 Offset 8.72 dB Mode Auto Sweep ●1 AvgPwr Limit Check 20 dBMe \_\$PUR 10 dBm-0 dBm -10 dBm -20 dBm Stop 3.75 GHz Start 3.5 GH 20010 pts rious Emissions 3.52933 GHz 3.52933 GHz 3.52933 GHz 3.54479 GHz 3.54884 GHz 3.55000 GHz 3.55432 GHz 3.55500 GHz 3.55713 GHz 3.55713 GHz Range Low 3.500 GHz te: 10.FEB.2023 21:23:25

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LTE Band 48 / 5MHz **64QAM Highest Channel / 1RB0 Highest Channel / 1RBmax** Spectrum Spectrum Ref Level 28.72 dB SGL Count 100/100 Ref Level 28.72 dBr SGL Count 100/100 Offset 8.72 dB Mode Auto Sween Offset 8.72 dB Mode Auto Sweep SGL Coun. 1 AvgPwr Limit di SGL co... 1 AvgPwr Limit ¢h 20 dBMe 20 dBMe 10 dBm-10 dBm-0 dBm 0 dBm -10 dBm -10 dBm -20 dBm 30 dBm -30 dBm -60 dBm--60 dBm-Start 3.5 GHz Start 3.5 GHz 10010 pts Stop 3.75 GHz Power Abs
-48.51 dBm
-49.28 dBm
-45.25 dBm
-30.45 dBm
-52.02 dBm
18.31 dBm
-26.51 dBm
-20.95 dBm
-32.35 dBm urious Emissions Spurious Emission: -48.62 dBm -49.39 dBm -40.87 dBm -18.91 dBm -26.02 dBm -51.82 dBm -30.91 dBm -33.43 dBm Range Low 3.500 GH: 1.000 MHz 3.50946 GHz 3.50946 GHz 3.53473 GHz 3.68993 GHz 3.69348 GHz 3.69487 GHz 3.69965 GHz 2.70001 GHz ΔLimit -8.51 dB -8.51 dB -24.28 dB -20.25 dB -17.45 dB -39.02 dB -11.69 dB -13.51 dB -7.95 dB -7.35 dB -7.85 dB -8.62 dB
-24.39 dB
-15.87 dB
-5.91 dB
-13.02 dB
-11.90 dB
-38.82 dB
-17.91 dB
-8.43 dB
-8.50 dB 3.500 GHz 3.530 GHz 3.540 GHz 3.690 GHz 3.694 GHz 3.695 GHz 3.700 GHz 3.701 GHz 3.705 GHz 3.720 GHz 3.530 GHz 3.540 GHz 3.690 GHz 3.694 GHz 3.695 GHz 3.700 GHz 3.701 GHz 3.540 GHz 3.690 GHz 3.694 GHz 3.695 GHz 3.700 GHz 3.701 GHz 50.000 kHz 100.000 kHz 3.69500 GHz 3.69535 GHz 3.700 GH 100.000 kHz 50.000 kHz 3.70001 GHz 3.70115 GHz .701 GHz .705 GHz 3.70017 GHz 3.70135 GHz 720 GHz 750 GHz -32.35 dBm -47.85 dBm ate: 10.FEB.2023 21:43:54 Date: 10.FEB.2023 21:45:37 **Highest Channel / FullRB** N/A Spectrum Ref Level 28.72 dBm SGL Count 100/100 Offset 8.72 dB Mode Auto Sweep ●1 AvgPwr Limit Check 20 den \_ spur 10 dBm-0 dBm -10 dBm -20 dBm--30 dBm LINE\_ABS Start 3.5 GHz Stop 3.75 GHz rious Emissions Frequency
3.50949 GHz
3.50949 GHz
3.68993 GHz
3.69949 GHz
3.69949 GHz
3.69530 GHz
3.70000 GHz
3.70010 3G GHz
3.70513 GHz
3.72061 GHz Range Low 3.500 GHz te: 10.FEB.2023 21:54:11

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LTE Band 48 / 5MHz 256QAM Lowest Channel / 1RB0 **Lowest Channel / 1RBmax** Spectrum Spectrum Ref Level 28.72 dB SGL Count 100/100 Offset 8.72 dB Mode Auto Sween Ref Level 28.72 Offset 8.72 dB Mode Auto Sweep SGL Count 100/100 SGL Coun. 1 AvgPwr Limit di ●1 AvgPwr Limit ¢h 20 deme 20 dBMe 10 dBm-10 dBm-0 dBm dBm -10 dBm -10 dBm -20 dBm -30 dBm -50 dan -60 dBm--60 dBm-Start 3.5 GHz Stop 3.75 GHz 20010 pts Stop 3.75 GHz Start 3.5 GHz urious Emissions Spurious Emission: Power Abs
-48.22 dBm
-35.89 dBm
-29.92 dBm
-19.96 dBm
-27.22 dBm
-31.54 dBm
-51.32 dBm
-30.28 dBm
-34.61 dBm 3.52768 GHZ 3.52768 GHZ 3.52590 GHZ 3.54465 GHZ 3.54881 GHZ 3.54989 GHZ 3.55466 GHZ 3.55500 GHZ 3.55608 GHZ 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz Range Low 2 500 GHz 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz ΔLimit Range Up ∆Limit -8.22 dB -10.89 dB -4.92 dB -6.96 dB -14.22 dB -16.46 dB -38.32 dB -17.28 dB -8.59 dB -14.28 dB -10.11 dB -17.40 dB -37.61 dB -16.20 dB -14.30 dB -6.14 dB -10.96 dB -8.38 dB -48.59 dBm -39.28 dBm -35.11 dBm -30.40 dBm -50.61 dBm 13.80 dBm -27.30 dBm -19.14 dBm -35.96 dRm 3.530 GHz 3.540 GHz 3.545 GHz 3.549 GHz 3.550 GHz 3.555 GHz 3.556 GHz 3.560 GHz 3.500 GHz 3.530 GHz 3.540 GHz 3.545 GHz 3.549 GHz 3.550 GHz 3.555 GHz 3.500 GHz 3.530 GHz 3.540 GHz 3.545 GHz 3.549 GHz 3.550 GHz 3.555 GHz 3.556 GHz 3.540 GH 3.545 GH 3.54467 GHz 3.54873 GHz 3.54999 GHz 3.55031 GHz 3.55518 GHz 3.55617 GHz 3.549 GHz 3.550 GHz 3.555 GHz 50.000 kHz 100.000 kHz 100.000 kHz 50.000 kHz 3.556 GHz 3.560 GHz 1.000 MHz -9.61 dB -8.40 dB 720 GHz 750 GHz 1.000 MHz 1.000 MHz 3.56244 GHz 3.72717 GHz .560 GHz 1.000 MHz 1.000 MHz 3.56588 GHz 3.72107 GHz -35.96 dBm -48.38 dBm ate: 20.FEB.2023 02:28:37 Date: 20.FEB.2023 02:30:40 **Lowest Channel / FullRB** N/A Spectrum Ref Level 28.72 dBm SGL Count 100/100 Offset 8.72 dB Mode Auto Sweep ●1 AvgPwr Limit Check 20 den \_ spur 10 dBm-0 dBm -10 dBm -20 dBm Stop 3.75 GHz Start 3.5 GH rious Emissions Power Abs
-47.85 dBm
-34.73 dBm
-28.95 dBm
-20.00 dBm
-34.11 dBm
0.01 dBm
-36.02 dBm
-22.63 dBm
-30.79 dBm
-48.49 dBm Range Low 3.500 GHz 8.500 GHz 8.530 GHz 8.540 GHz 8.545 GHz 8.549 GHz 8.550 GHz 8.555 GHz 8.556 GHz te: 20.FEB.2023 02:32:43

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LTE Band 48 / 5MHz 256QAM Middle Channel / 1RB0 Middle Channel / 1RBmax Spectrum Spectrum Ref Level 28.72 dBr SGL Count 100/100 Offset 8.72 dB Mode Auto Sween Ref Level 28.72 Offset 8.72 dB Mode Auto Sweep SGL Count 100/100 SGL Cour. 1 AvgPwr Limit ch SGL co... 1 AvgPwr Limit ¢h 20 deme 20 dBMe 10 dBm-10 dBm-0 dBm 0 dBm -10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -60 dBm--60 dBm-Start 3.5 GHz Stop 3.75 GHz Start 3.5 GHz Stop 3.75 GHz urious Emissions Spurious Emissions Range Low 3 500 GH: 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz Frequency
3.52006 GHz
3.52006 GHz
3.53842 GHz
3.61731 GHz
3.62066 GHz
3.62248 GHz
3.62286 GHz
3.62755 GHz
3.62947 GHz 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz Frequency
3.50649 GHz
3.53758 GHz
3.61723 GHz
3.62146 GHz
3.62246 GHz
3.62716 GHz
3.62750 GHz
3.62855 GHz
3.6285412 GHz ΔLimit -7.88 dB -7.86 dB -17.25 dB -17.70 dB -39.09 dB -16.21 dB -14.42 dB -2.24 dB -5.94 dB -8.49 dB -7.94 dB
-7.94 dB
-23.84 dB
-14.91 dB
-7.87 dB
-13.61 dB
-16.34 dB
-38.97 dB
-17.65 dB
-13.19 dB
-8.36 dB -47.94 dBm -48.84 dBm -39.91 dBm -20.87 dBm -26.61 dBm 13.66 dBm -51.97 dBm -30.65 dBm 3.530 GHz 3.540 GHz 3.618 GHz 3.622 GHz 3.623 GHz 3.627 GHz 3.629 GHz 3.633 GHz -47.88 dBm -48.66 dBm -42.25 dBm -30.70 dBm -52.09 dBm 13.79 dBm -27.42 dBm -15.24 dBm 3.500 GHz 3.530 GHz 3.540 GHz 3.618 GHz 3.622 GHz 3.623 GHz 3.627 GHz 3.530 GHz 3.540 GHz 3.618 GHz 3.622 GHz 3.623 GHz 3.627 GHz 3.500 GHz 3.530 GHz 3.540 GHz 3.618 GHz 3.622 GHz 3.623 GHz 3.627 GHz 3.629 GHz 50.000 kHz 100.000 kHz 100.000 kHz 50.000 kHz 3.629 GHz 3.633 GHz 1.000 MHz 3.633 GHz 3.720 GHz 3.750 GHz 1.000 MHz 1.000 MHz 38.19 dBm 48.36 dBm .633 GHz 1.000 MHz 1.000 MHz 3.63412 GHz 3.74828 GHz -30.94 dBm -48.49 dBm ate: 20.FEB.2023 02:36:37 Date: 20.FEB.2023 02:38:37 Middle Channel / Full N/A Spectrum Ref Level 28.72 dBm SGL Count 100/100 Offset 8.72 dB Mode Auto Sweep ●1 AvgPwr Limit Check 20 den \_ spur 10 dBm-0 dBm -10 dBm -20 dBm--30 dBm LINE\_ABS Start 3.5 GHz Stop 3.75 GHz 10010 pts rious Emissions urious Emission
Range Low
3.500 GHz
3.500 GHz
3.540 GHz
3.540 GHz
3.618 GHz
3.622 GHz
3.623 GHz
3.627 GHz
3.629 GHz
3.633 GHz Power Abs
-47.90 dBm
-48.52 dBm
-37.32 dBm
-22.54 dBm
-35.91 dBm
0.26 dBm
-37.06 dBm
-20.57 dBm
-31.05 dBm
-48.43 dBm te: 20.FEB.2023 02:40:36

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LTE Band 48 / 5MHz 256QAM **Highest Channel / 1RB0 Highest Channel / 1RBmax** Spectrum # Spectrum Ref Level 28.72 dBm SGL Count 100/100 Ref Level 28.72 dBr SGL Count 100/100 Offset 8.72 dB Mode Auto Sween Offset 8.72 dB Mode Auto Sweep SGL Coun. 1 AvgPwr Limit di SGL co... 1 AvgPwr Limit ¢h 20 deme 20 dBMe 10 dBm-10 dBm-0 dBm 0 dBm -10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -60 dBm--60 dBm-Start 3.5 GHz Start 3.5 GHz 10010 pts Stop 3.75 GHz Power Abs
-47.11 dBm
-48.31 dBm
-38.29 dBm
-15.20 dBm
-25.45 dBm
13.86 dBm
-49.26 dBm
-25.10 dBm
-33.46 dBm
-48.62 dBm urious Emissions Spurious Emission: Frequency
3.52120 GHz
3.53329 GHz
3.68888 GHz
3.69328 GHz
3.69493 GHz
3.69968 GHz
3.70000 GHz
3.70010 GHz
3.70573 GHz
3.72025 GHz 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz Frequency
3.52981 GHz
3.52981 GHz
3.53244 GHz
3.68993 GHz
3.69303 GHz
3.69500 GHz
3.70001 GHz
3.70150 GHz
2.70594 GHz 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz ΔLimit Range Low 3,500 GH -7.11 dB -7.11 dB -23.31 dB -13.29 dB -2.20 dB -12.45 dB -16.14 dB -36.26 dB -12.10 dB -8.46 dB -8.62 dB -7.81 dB
-7.81 dB
-23.78 dB
-20.17 dB
-18.31 dB
-39.10 dB
-16.11 dB
-14.39 dB
-5.27 dB
-4.13 dB
-8.59 dB -47.81 dBm -48.78 dBm -45.17 dBm -31.31 dBm -52.10 dBm 13.89 dBm -27.39 dBm -18.27 dBm 3.500 GHz 3.530 GHz 3.540 GHz 3.690 GHz 3.694 GHz 3.695 GHz 3.700 GHz 3.701 GHz 3.705 GHz 3.720 GHz 3.530 GHz 3.540 GHz 3.690 GHz 3.694 GHz 3.695 GHz 3.700 GHz 3.701 GHz 3.705 GHz 3.530 GHz 3.540 GHz 3.690 GHz 3.694 GHz 3.695 GHz 3.700 GHz 3.540 GHz 3.690 GHz 3.694 GHz 3.695 GHz 3.700 GHz 3.701 GHz 50.000 kHz 100.000 kHz 100.000 kHz 50.000 kHz 3.701 GHz 3.705 GHz 720 GHz 750 GHz 1.000 MHz 1.000 MHz -29.13 dBm -48.59 dBm 4 ate: 20.FEB.2023 02:42:37 Date: 20.FEB.2023 02:44:40 **Highest Channel / FullRB** N/A Spectrum Ref Level 28.72 dBm SGL Count 100/100 Offset 8.72 dB Mode Auto Sweep ●1 AvgPwr Limit Check 20 den \_ spur 10 dBm-0 dBm -10 dBm -20 dBm--30 dBm LINE\_ABS Start 3.5 GHz Stop 3.75 GHz rious Emissions 3.51086 GHz
3.51086 GHz
3.53492 GHz
3.68873 GHz
3.69995 GHz
3.69499 GHz
3.70972 GHz
3.70157 GHz
3.70157 GHz
3.70157 GHz Power Abs
-47.80 dBm
-48.75 dBm
-38.63 dBm
-20.63 dBm
-35.70 dBm
0.40 dBm
-36.62 dBm
-23.08 dBm
-29.52 dBm
-47.44 dBm Range Low 3.500 GHz te: 20.FEB.2023 02:46:43

Report No.: FG311602F

LTE Band 48 / 10MHz **QPSK** Lowest Channel / 1RB0 **Lowest Channel / 1RBmax** Spectrum Spectrum Ref Level 28.72 dB SGL Count 100/100 Offset 8.72 dB Mode Auto Sweep Ref Level 28.72 Offset 8.72 dB Mode Auto Sweep SGL Cour.. 1 AvgPwr Limit d SGL Count 100/100 SGL co... 1 AvgPwr Limit ¢h 20 deme 20 dBMe 10 dBm-10 dBm-0 dBm dBm -10 dBm -10 dBm -20 dBm -30 dBm -50 dBii -60 dBm--60 dBm-Start 3.5 GHz Stop 3.75 GHz 10010 pts Stop 3.75 GHz Start 3.5 GHz urious Emissions Spurious Emission: 3.500 GHz 3.500 GHz 3.530 GHz 3.540 GHz 3.549 GHz 3.550 GHz 3.550 GHz 3.550 GHz 3.570 GHz 3.570 GHz Power Abs -46.89 dBm -34.01 dBm -20.74 dBm -23.84 dBm 20.35 dBm -49.66 dBm 3.52972 GHz 3.52972 GHz 3.53999 GHz 3.54872 GHz 3.54999 GHz 3.55058 GHz 3.56004 GHz 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz ΔLimit ΔLimit ΔLimit
-6.89 dB
-9.01 dB
-7.74 dB
-10.84 dB
-9.65 dB
-36.66 dB
-22.69 dB
-22.42 dB
-22.92 dB
-7.72 dB 3.52957 GHz 3.53652 GHz 3.54882 GHz 3.54989 GHz 3.55945 GHz 3.55945 GHz 3.56003 GHz 3.56121 GHz 3.57091 GHz -8.08 dB
-14.10 dB
-22.90 dB
-36.09 dB
-9.40 dB
-13.68 dB
-8.69 dB
-18.13 dB
-23.14 dB
-7.89 dB -48.08 dBm -39.10 dBm -35.90 dBm -49.09 dBm 20.60 dBm -26.68 dBm -21.69 dBm -43.13 dBm -48.14 dBm 3.530 GHz 3.540 GHz 3.549 GHz 3.550 GHz 3.560 GHz 3.561 GHz 3.570 GHz 3.710 GHz 3.500 GHz 3.530 GHz 3.540 GHz 3.549 GHz 3.550 GHz 3.560 GHz 3.561 GHz 3.570 GHz 3.530 GHZ 3.540 GHZ 3.549 GHZ 3.550 GHZ 3.560 GHZ 100.000 kHz 100.000 kHz 100.000 kHz 3.561 GHz 3.561 GHz 3.570 GHz 3.710 GHz 3.56118 GHz 3.57147 GHz -35.69 dBm -47.42 dBm 720 GHz 750 GHz .710 GHz .720 GHz -48.14 dBm -47.89 dBm ate: 10.FEB.2023 21:55:55 Date: 10.FEB.2023 22:04:29 **Lowest Channel / FullRB** N/A Spectrum Ref Level 28.72 dBm SGL Count 100/100 Offset 8.72 dB Mode Auto Sweep ●1 AvgPwr Limit Check 20 dBMe \_\$PURI 10 dBm-0 dBm -10 dBm -20 dBm--30 dBm -60 dBm-Start 3.5 GHz Stop 3.75 GHz 10010 pts rious Emissions RBW

1.000 MHz

1.000 MHz

1.000 MHz

100.000 kHz

100.000 kHz

100.000 MHz

1.000 MHz

1.000 MHz

1.000 MHz 3.52897 GHz
3.52897 GHz
3.52897 GHz
3.54955 GHz
3.54959 GHz
3.55830 GHz
3.55036 GHz
3.55036 GHz
3.57413 GHz
3.71314 GHz
3.73317 GHz Range Low 3.500 GHz -2.36 dB -9.03 dB -12.81 dB -21.64 dB -27.05 dB -21.04 dB -14.88 dB -12.41 dB -22.93 dB -7.97 dB te: 10.FEB.2023 22:06:12

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Report No.: FG311602F LTE Band 48 / 10MHz **QPSK** Middle Channel / 1RB0 Middle Channel / 1RBmax Spectrum Spectrum Ref Level 28.72 dBr SGL Count 100/100 Ref Level 28.72 dBr SGL Count 100/100 Offset 8.72 dB Mode Auto Sween Offset 8.72 dB Mode Auto Sweep SGL cou... 1 AvgPwr Limit (I SGL co... 1 AvgPwr Limit ¢h 20 dBMe 20 dBMe 10 dBm-10 dBm-0 dBm 0 dBm -10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -60 dBm--60 dBm-Start 3.5 GHz Stop 3.75 GHz ırious Emissions Power Abs
-48.56 dBm
-49.26 dBm
-39.90 dBm
-19.19 dBm
-26.56 dBm
20.48 dBm
-49.60 dBm
-44.68 dBm
-47.79 dBm Spurious Emissions 1.000 MHz Frequency
3.52132 GHz
3.52146 GHz
3.53746 GHz
3.60787 GHz
3.61798 GHz
3.61998 GHz
3.62943 GHz
3.63007 GHz
3.63112 GHz
3.63012 GHz 3.50130 GHz 3.53084 GHz 3.60836 GHz Range Low 3.500 GHz ∆Limit -8.56 Range Low 3.500 GH ∆Limit -8.40 dB
-24.22 dB
-20.65 dB
-21.79 dB
-35.85 dB
-9.74 dB
-14.58 dB
-8.55 dB
-12.00 dB
-7.80 dB -48.40 dBm -49.22 dBm -45.65 dBm -34.79 dBm -48.85 dBm 20.26 dBm -27.58 dBm -21.55 dBm -37.00 dBm -47.80 dBm -8.56 dB -24.26 dB -14.90 dB -6.19 dB -13.56 dB -9.52 dB -36.60 dB -21.58 dB -15.61 dB -7.79 dB 3.500 GHz 3.530 GHz 3.540 GHz 3.610 GHz 3.619 GHz 3.620 GHz 3.630 GHz 3.631 GHz 3.530 GHz 3.540 GHz 3.610 GHz 3.619 GHz 3.620 GHz 3.630 GHz 3.631 GHz 3.640 GHz 3.530 GHz 3.540 GHz 3.540 GHz 3.610 GHz 1.000 MHz 100.000 kHz 100.000 kHz 100.000 kHz 1.000 MHz 1.000 MHz 1.000 MHz 100.000 kHz 100.000 kHz 100.000 kHz .619 GHz 8.620 GHz 8.630 GHz 8.631 GHz 3.631 GHz 3.640 GHz 3.720 GHz 3.750 GHz .640 GHz ate: 10.FEB.2023 22:11:21 Date: 10.FEB.2023 22:16:28 Middle Channel / Full N/A Spectrum Ref Level 28.72 dBm SGL Count 100/100 Offset 8.72 dB Mode Auto Sweep ●1 AvgPwr Limit Check 20 den \_ spur 10 dBm-0 dBm -10 dBm -20 dBm--30 dBm LINE\_ABS Start 3.5 GHz Stop 3.75 GHz 10010 pts rious Emissions Renge Low 3.500 GHz 3.500 GHz 3.540 GHz 3.540 GHz 3.610 GHz 3.619 GHz 3.620 GHz 3.630 GHz 3.630 GHz 3.640 3.52186 GHz 3.52186 GHz 3.53384 GHz 3.60773 GHz 3.61874 GHz 3.61999 GHz 3.62264 GHz 3.63001 GHz 3.63108 GHz 3.64268 GHz 3.74277 GHz te: 10.FEB.2023 22:24:59

LTE Band 48 / 10MHz **QPSK Highest Channel / 1RB0 Highest Channel / 1RBmax** Spectrum Spectrum 💥 Ref Level 28.72 dB SGL Count 100/100 Offset 8.72 dB Mode Auto Sween Ref Level 28.72 dBm Offset 8.72 dB Mode Auto Sweep SGL Count 100/100 SGL Coun. 1 AvgPwr Limit di SGL co... 1 AvgPwr Limit ¢h 20 dBMe 20 dBMe 10 dBm-10 dBm-0 dBm 0 dBm -10 dBm -10 dBm -20 dBm 30 dBm -30 dBm -60 dBm--60 dBm-Start 3.5 GHz Stop 3.75 GHz Start 3.5 GHz 10010 pts urious Emissions ALimit
-8.41 dB
-24.30 dB
-16.64 dB
-5.85 dB
-11.82 dB
-9.87 dB
-36.56 dB
-22.67 dB
-12.98 dB
-3.29 dB Spurious Emission: -48.62 dBm -49.28 dBm -49.28 dBm -46.89 dBm -32.71 dBm 20.14 dBm -26.08 dBm -19.79 dBm -35.66 dBm Power Abs
-48.41 dBm
-49.30 dBm
-41.64 dBm
-18.85 dBm
-24.82 dBm
20.13 dBm
-49.56 dBm
-35.67 dBm Range Low 3.500 GH: 1.000 MHz 3.51101 GHz 3.51101 GHz 3.53447 GHz 3.67895 GHz 3.68855 GHz 3.68999 GHz 3.69940 GHz 3.70100 GHz 3.70100 GHz 3.71260 GHz -8.62 dB
-8.62 dB
-24.28 dB
-21.89 dB
-19.71 dB
-35.77 dB
-9.86 dB
-13.08 dB
-6.79 dB
-10.66 dB
-7.26 dB 3.530 GHz 3.540 GHz 3.680 GHz 3.689 GHz 3.690 GHz 3.700 GHz 3.701 GHz 3.500 GHz 3.530 GHz 3.540 GHz 3.680 GHz 3.689 GHz 3.690 GHz 3.700 GHz 3.710 GHz 3.540 GHz 3.680 GHz 3.540 GHz 3.680 GHz 3.689 GHz 3.690 GHz 3.700 GHz 3.701 GHz 3.689 GHz 3.689 GHz 3.690 GHz 3.700 GHz 3.68870 GHz 3.69000 GHz 3.69058 GHz 100.000 kHz 100.000 kHz 100.000 kHz 100.000 kHz 100.000 kHz 3.701 GHz 3.710 GHz 3.70002 GHz 3.70154 GHz .710 GHz .720 GHz .720 GHz .750 GHz -35.66 dBm -47.26 dBm ate: 10.FEB.2023 22:26:42 Date: 11.FEB.2023 00:45:41 **Highest Channel / FullRB** N/A Spectrum 💥 Ref Level 28.72 dBm SGL Count 100/100 Offset 8.72 dB Mode Auto Sweep ●1 AvgPwr Limit Check 20 den \_ spur 10 dBm-0 dBm -10 dBm -20 dBm--30 dBm LINE\_ABS Start 3.5 GHz Stop 3.75 GHz rious Emissions Range Low 3.500 GHz -8.42 dB -24.13 dB -13.39 dB -14.61 dB -21.79 dB -27.09 dB -20.82 dB -15.57 dB -10.19 dB -3.76 dB te: 11.FEB.2023 00:40:24

Report No.: FG311602F

LTE Band 48 / 10MHz **16QAM** Lowest Channel / 1RB0 **Lowest Channel / 1RBmax** Spectrum Spectrum Ref Level 28.72 dB SGL Count 100/100 Offset 8.72 dB Mode Auto Sweep Ref Level 28.72 Offset 8.72 dB Mode Auto Sweep SGL Cour.. 1 AvgPwr Limit d SGL Count 100/100 SGL co... 1 AvgPwr Limit ¢h 20 deme 20 dBMe 10 dBm-10 dBm-0 dBm dBm -10 dBm -10 dBm -20 dBm -30 dBm 50 dBir 50 dBm -60 dBm--60 dBm-Start 3.5 GHz Stop 3.75 GHz 10010 pts Stop 3.75 GHz Start 3.5 GHz urious Emissions Spurious Emission: Power Abs
-47.51 dBm
-37.85 dBm
-21.05 dBm
-27.34 dBm
-50.30 dBm
-50.30 dBm
-49.49 dBm
-49.49 dBm Frequency
3.52738 GHz
3.52893 GHz
3.54866 GHz
3.54997 GHz
3.55005 GHz
3.55007 GHz
3.56415 GHz
3.57007 GHz
2.271741 GHz ΔLimit

-7.51 dB
-12.85 dB
-8.05 dB
-14.34 dB
-10.70 dB
-37.30 dB
-24.88 dB
-22.49 dB 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz Range Low 3.500 GH Range Up ΔLimit -8.25 dB -17.47 dB -24.73 dB -37.70 dB -10.30 dB -14.68 dB -7.96 dB -19.33 dB -23.19 dB -8.07 dB 3.52987 GHz 3.52987 GHz 3.53164 GHz 3.54837 GHz 3.54923 GHz 3.55941 GHz 3.56004 GHz 3.56142 GHz 3.57161 GHz -48.25 dBm -42.47 dBm -37.73 dBm -50.70 dBm 19.70 dBm -27.68 dBm -20.96 dBm -44.33 dBm 3.530 GHz 3.540 GHz 3.549 GHz 3.550 GHz 3.560 GHz 3.561 GHz 3.570 GHz 3.710 GHz 3.500 GHz 3.530 GHz 3.540 GHz 3.549 GHz 3.550 GHz 3.560 GHz 3.561 GHz 3.570 GHz 3.500 GHz 3.530 GHz 3.540 GHz 3.549 GHz 3.550 GHz 3.560 GHz 3.561 GHz 3.570 GHz 3.530 GHz 3.540 GHz 3.549 GHz 3.550 GHz 3.560 GHz 100.000 kHz 100.000 kHz 100.000 kHz 3.561 GHz 3.561 GHz 3.570 GHz 3.710 GHz 720 GHz 750 GHz 3.71741 GHz 3.74753 GHz -23.31 dB -7.80 dB .710 GHz .720 GHz -48.19 dBm -48.07 dBm ate: 10.FEB.2023 21:57:38 Date: 10.FEB.2023 22:02:46 **Lowest Channel / FullRB** N/A Spectrum Ref Level 28.72 dBm SGL Count 100/100 Offset 8.72 dB Mode Auto Sweep ●1 AvgPwr Limit Check 20 dBMe \_\$PURI 10 dBm-0 dBm -10 dBm -20 dBm--30 dBm -60 dBm Start 3.5 GHz Stop 3.75 GHz 10010 pts rious Emissions RBW

1.000 MHz

1.000 MHz

1.000 MHz

100.000 kHz

100.000 kHz

100.000 MHz

1.000 MHz

1.000 MHz

1.000 MHz 3.52996 GHz 3.52996 GHz 3.52996 GHz 3.54948 GHz 3.54999 GHz 3.55498 GHz 3.56001 GHz 3.56103 GHz 3.57049 GHz 3.71587 GHz 3.73821 GHz Range Low 3.500 GHz te: 10.FEB.2023 22:07:55

Report No.: FG311602F

LTE Band 48 / 10MHz 16QAM Middle Channel / 1RB0 Middle Channel / 1RBmax Spectrum Spectrum Ref Level 28.72 dBr SGL Count 100/100 Ref Level 28.72 dBr SGL Count 100/100 Offset 8.72 dB Mode Auto Sween Offset 8.72 dB Mode Auto Sweep SGL Coun. 1 AvgPwr Limit di SGL co... 1 AvgPwr Limit ¢h 20 dBMe 20 dBMe 10 dBm-10 dBm-0 dBm 0 dBm -10 dBm -10 dBm -20 dBm -30 dBm -30 dBm SPURIOU -60 dBm--60 dBm-Start 3.5 GHz Stop 3.75 GHz Start 3.5 GHz Stop 3.75 GHz urious Emissions Spurious Emissions -48.57 dBm -49.32 dBm -49.32 dBm -20.74 dBm -27.86 dBm -19.36 dBm -51.20 dBm -37.48 dBm -42.02 dBm Power Abs
-48.46 dBm
-49.39 dBm
-46.15 dBm
-36.55 dBm
-51.13 dBm
19.42 dBm
-28.31 dBm
-20.87 dBm
-41.30 dBm 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz Frequency
3.51161 GHz
3.53140 GHz
3.60857 GHz
3.61899 GHz
3.61999 GHz
3.62055 GHz
3.63007 GHz
3.63378 GHz
3.63478 GHz 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz Frequency
3.52513 GHz
3.52513 GHz
3.53133 GHz
3.60913 GHz
3.61891 GHz
3.61994 GHz
3.62939 GHz
3.63010 GHz
3.63101 GHz
3.63101 GHz Range Low 3.500 GH ∆Limit ## ALIMIT TO SET A CONTROL 

-8.57 dB 
-24.32 dB 
-18.18 dB 
-7.74 dB 
-14.86 dB 
-10.64 dB 
-38.20 dB 
-24.48 dB 
-17.02 dB 
-8.02 dB -8.46 dB
-24.39 dB
-21.15 dB
-23.55 dB
-38.13 dB
-10.58 dB
-15.31 dB
-7.87 dB
-16.39 dB
-7.72 dB 3.530 GHz 3.540 GHz 3.610 GHz 3.619 GHz 3.620 GHz 3.630 GHz 3.500 GHz 3.530 GHz 3.540 GHz 3.610 GHz 3.619 GHz 3.620 GHz 3.630 GHz 3.631 GHz 3.530 GHz 3.540 GHz 3.610 GHz 3.619 GHz 3.620 GHz 3.630 GHz 3.631 GHz 3.640 GHz 3.610 GHz 3.619 GHz 3.620 GHz 3.630 GHz 100.000 kHz 100.000 kHz 100.000 kHz 100.000 kHz 100.000 kHz 3.631 GHz .720 GHz .750 GHz .640 GHz -41.39 dBm -47.72 dBm ate: 10.FEB.2023 22:13:03 Date: 10.FEB.2023 22:18:10 Middle Channel / Full N/A Spectrum Ref Level 28.72 dBm SGL Count 100/100 Offset 8.72 dB Mode Auto Sweep ●1 AvgPwr Limit Check 20 den \_ spur 10 dBm-0 dBm -10 dBm -20 dBm--30 dBm LINE\_ABS Start 3.5 GHz 10010 pts Stop 3.75 GHz rious Emissions Renge Low 3.500 GHz 3.500 GHz 3.540 GHz 3.540 GHz 3.610 GHz 3.619 GHz 3.620 GHz 3.630 GHz 3.630 GHz 3.640 te: 10.FEB.2023 22:23:17

Report No.: FG311602F

LTE Band 48 / 10MHz **16QAM Highest Channel / 1RB0 Highest Channel / 1RBmax** Spectrum Spectrum 💥 Ref Level 28.72 dB SGL Count 100/100 Offset 8.72 dB Mode Auto Sween Ref Level 28.72 dBm Offset 8.72 dB Mode Auto Sweep SGL Count 100/100 SGL Coun. 1 AvgPwr Limit di SGL co... 1 AvgPwr Limit ¢h 20 dBMe 20 dBMe 10 dBm-10 dBm-0 dBm 0 dBm -10 dBm -10 dBm -20 dBm 30 dBm -30 dBm -60 dBm--60 dBm-Start 3.5 GHz Stop 3.75 GHz 10010 pts Start 3.5 GHz Power Abs
-48.61 dBm
-49.35 dBm
-47.58 dBm
-50.59 dBm
19.39 dBm
-27.55 dBm
-20.70 dBm
-34.49 dBm
-47.75 dBm urious Emissions Spurious Emissions Frequency
3.52165 GHz
3.52915 GHz
3.67867 GHz
3.68891 GHz
3.68996 GHz
3.69938 GHz
3.70004 GHz
3.71175 GHz
3.72007 GHz -48.51 dBm -49.39 dBm -43.65 dBm -18.66 dBm -26.76 dBm -51.08 dBm -36.30 dBm -30.32 dBm -8.51 dB -24.39 dB -18.65 dB -5.66 dB -13.76 dB -10.94 dB -38.08 dB -23.30 dB -14.24 dB Range Low 3.500 GH: 1.000 MHz -8.61 dB
-24.35 dB
-22.58 dB
-23.26 dB
-37.59 dB
-10.61 dB
-14.55 dB
-7.70 dB
-9.49 dB
-7.75 dB 3.530 GHz 3.540 GHz 3.680 GHz 3.689 GHz 3.690 GHz 3.700 GHz 3.701 GHz 3.500 GHz 3.530 GHz 3.540 GHz 3.680 GHz 3.689 GHz 3.690 GHz 3.700 GHz 3.710 GHz 3.540 GHz 3.680 GHz 3.540 GHz 3.680 GHz 3.689 GHz 3.690 GHz 3.700 GHz 3.701 GHz 3.689 GHz 3.689 GHz 3.690 GHz 3.700 GHz 100.000 kHz 100.000 kHz 100.000 kHz 100.000 kHz 100.000 kHz 3.68999 GHZ 3.69061 GHZ 3.70005 GHZ 3.70306 GHZ 3.701 GHz 3.710 GHz .720 GHz .750 GHz .71105 GHz .73056 GHz .710 GHz .720 GHz ate: 10.FEB.2023 22:28:25 Date: 11.FEB.2023 00:47:10 **Highest Channel / FullRB** N/A Spectrum 💥 Ref Level 28.72 dBm SGL Count 100/100 Offset 8.72 dB Mode Auto Sweep ●1 AvgPwr Limit Check 20 den \_ spur 10 dBm-0 dBm -10 dBm -20 dBm--30 dBm LINE\_ABS Start 3.5 GHz Stop 3.75 GHz rious Emissions 3.51656 GHz 3.53836 GHz 3.53936 GHz 3.67993 GHz 3.6898 GHz 3.68997 GHz 3.70002 GHz 3.70119 GHz 3.71005 GHz 3.72004 GHz Range Low 3.500 GHz te: 11.FEB.2023 00:41:52

Report No.: FG311602F

Report No.: FG311602F LTE Band 48 / 10MHz 64QAM Lowest Channel / 1RB0 **Lowest Channel / 1RBmax** Spectrum Spectrum Ref Level 28.72 dB SGL Count 100/100 Offset 8.72 dB Mode Auto Sweep Ref Level 28.72 Offset 8.72 dB Mode Auto Sweep SGL Cour.. 1 AvgPwr Limit d SGL Count 100/100 SGL co... 1 AvgPwr Limit ¢h 20 deme 20 dBMe 10 dBm-10 dBm-0 dBm dBm -10 dBm -10 dBm -20 dBm -30 dBm 50 dBm -60 dBm--60 dBm-Start 3.5 GHz Stop 3.75 GHz 10010 pts Stop 3.75 GHz Start 3.5 GHz urious Emissions Spurious Emission: 3.52741 GHz 3.52741 GHz 3.53977 GHz 3.54745 GHz 3.54998 GHz 3.55940 GHz 3.55016 GHz 3.55016 GHz 3.57161 GHz 3.21776 GHz -48.08 dBm -40.23 dBm -35.39 dBm -49.59 dBm -49.59 dBm -28.15 dBm -19.21 dBm -44.21 dBm 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz 3.52732 GHz 3.53894 GHz 3.54876 GHz Range Low 3.500 GH ΔLimit ALimit
-7.09 dB
-10.95 dB
-6.16 dB
-14.19 dB
-11.77 dB
-37.27 dB
-23.15 dB
-22.15 dB
-23.07 dB
-7.85 dB ALimit
-8.08 dB
-15.23 dB
-22.39 dB
-36.59 dB
-11.61 dB
-15.15 dB
-6.21 dB
-19.21 dB
-22.82 dB
-7.90 dB -47.09 dBm -35.95 dBm -19.16 dBm -27.19 dBm 18.23 dBm -50.27 dBm -36.15 dBm -47.15 dBm 3.500 GHz 3.530 GHz 3.540 GHz 3.549 GHz 3.550 GHz 3.560 GHz 3.561 GHz 3.570 GHz 3.500 GHz 3.530 GHz 3.540 GHz 3.549 GHz 3.550 GHz 3.560 GHz 3.561 GHz 3.570 GHz 3.530 GHZ 3.540 GHZ 3.549 GHZ 3.550 GHZ 3.560 GHZ 3.530 GHZ 3.540 GHZ 3.549 GHZ 3.549 GHz 3.550 GHz 3.560 GHz 3.561 GHz 3.570 GHz 3.710 GHz 100.000 kHz 100.000 kHz 100.000 kHz 3.561 GHz 3.561 GHz 3.570 GHz 3.710 GHz 3.56024 GHz 3.56142 GHz 3.57007 GHz 720 GHz 750 GHz .710 GHz .720 GHz -47.82 dBm -47.90 dBm ate: 10.FEB.2023 21:59:21 Date: 10.FEB.2023 22:01:04 **Lowest Channel / FullRB** N/A Spectrum Ref Level 28.72 dBm SGL Count 100/100 Offset 8.72 dB Mode Auto Sweep ●1 AvgPwr Limit Check 20 dBMe \_\$PURI 10 dBm-0 dBm -10 dBm -20 dBm--30 dBm Stop 3.75 GHz Start 3.5 GH 10010 pts rious Emissions RBW

1.000 MHz

1.000 MHz

1.000 MHz

100.000 kHz

100.000 kHz

100.000 MHz

1.000 MHz

1.000 MHz

1.000 MHz Frequency
3.52987 GHz
3.52987 GHz
3.54997 GHz
3.54998 GHz
3.55732 GHz
3.55005 GHz
3.56012 GHz
3.57007 GHz
3.71859 GHz
3.74708 GHz Range Low 3.500 GHz te: 10.FEB.2023 22:09:38