



# FCC RADIO TEST REPORT

FCC ID : A4RGC3G8

Equipment : Wireless Device

Model Name : GC3G8

Applicant : Google LLC

1600 Amphitheatre Parkway,

Mountain View, California, 94043 USA

**Standard** : FCC 47 CFR Part 2, 22(H), 27

The product was received on Mar. 15, 2023 and testing was performed from Mar. 16, 2023 to Jul. 06, 2023. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

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

Approved by: Louis Wu

TEL: 886-3-327-3456

Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)

FAX: 886-3-328-4978 Report Template No.: BU5-FGLTE Version 2.4

Report Version : 03

: 1 of 21

: Jul. 14, 2023

Page Number

Issue Date

# **Table of Contents**

His	story o	of this test report	3
Su	mmar	y of Test Result	4
1	Gene	eral Description	5
	1.1	Product Feature of Equipment Under Test	5
	1.2	Product Specification of Equipment Under Test	5
	1.3	Modification of EUT	5
	1.4	Testing Location	6
	1.5	Applicable Standards	6
2	Test	Configuration of Equipment Under Test	7
	2.1	Test Mode	7
	2.2	Connection Diagram of Test System	8
	2.3	Support Unit used in test configuration and system	8
	2.4	Measurement Results Explanation Example	8
	2.5	Frequency List of Low/Middle/High Channels	9
3	Cond	ducted Test Items	
	3.1	Measuring Instruments	10
	3.2	Conducted Output Power and ERP/EIRP	11
	3.3	Peak-to-Average Ratio	12
	3.4	Occupied Bandwidth	13
	3.5	Conducted Band Edge	
	3.6	Conducted Spurious Emission	15
	3.7	Frequency Stability	16
4	Radi	ated Test Items	17
	4.1	Measuring Instruments	
	4.2	Radiated Spurious Emission Measurement	
5	List	of Measuring Equipment	20
6	Meas	surement Uncertainty	21
-	-	x A. Test Results of Conducted Test	
Аp	pendi	x B. Test Results of Radiated Test	
Δn	nendi	x C. Test Setup Photographs	

TEL: 886-3-327-3456 FAX: 886-3-328-4978

Report Template No.: BU5-FGLTE Version 2.4

Page Number Issue Date

: 2 of 21 : Jul. 14, 2023

Report Version

Report No. : FG330717B

: 03

# History of this test report

Report No.: FG330717B

Report No.	Version	Description	Issue Date
FG330717B	01	Initial issue of report	Jun. 26, 2023
FG330717B	02	Revise Section 2.1, List of Measuring Equipment and Appendix A  This report is an updated version, replacing the report issued on Jun. 26, 2023.	Jul. 06, 2023
FG330717B	03	Revise Section 1.2 and Section 2.1  This report is an updated version, replacing the report issued on Jul. 06, 2023.	Jul. 14, 2023

TEL: 886-3-327-3456 Page Number : 3 of 21 FAX: 886-3-328-4978 Issue Date : Jul. 14, 2023

# **Summary of Test Result**

Report No.: FG330717B

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
	§2.1046	Conducted Output Power	Reporting only	
3.2	§22.913 (a)(5)	Effective Radiated Power (Band 5)	Door	-
	§27.50 (h)(2)	Equivalent Isotropic Radiated Power (Band 7)	Pass	
3.3	-	Peak-to-Average Ratio	Reporting only	-
3.4	§2.1049 Occupied Bandwidth		Reporting only	-
3.5	§2.1051 §22.917 (a)	Conducted Band Edge Measurement (Band 5)	- Pass	
3.5	§2.1051 §27.53 (m)(4)	Conducted Band Edge Measurement (Band 7)		-
3.6	§2.1051 §22.917 (a)	Conducted Spurious Emission (Band 5)	Pass	-
0.0	§2.1051 §27.53 (m)(4)	Conducted Spurious Emission (Band 7)	. 333	
3.7	§2.1055 §22.355 §27.54	Frequency Stability Temperature & Voltage	Pass	-
4.2	§2.1053 §22.917 (a)	Radiated Spurious Emission (Band 5)	Pass	11.97 dB under the limit at
7.2	§2.1051 §27.53 (m)(4)	Radiated Spurious Emission (Band 7)	1 433	10004.000 MHz

#### **Conformity Assessment Condition:**

- The test results (PASS/FAIL) with all measurement uncertainty excluded are presented
  against the regulation limits or in accordance with the requirements stipulated by the
  applicant/manufacturer who shall bear all the risks of non-compliance that may potentially
  occur if measurement uncertainty is taken into account.
- 2. The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty".

#### Disclaimer:

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

Reviewed by: Yun Huang

Report Producer: Michelle Chen

TEL: 886-3-327-3456 Page Number : 4 of 21 FAX: 886-3-328-4978 Issue Date : Jul. 14, 2023

# 1 General Description

# 1.1 Product Feature of Equipment Under Test

Product Feature				
Equipment	Wireless Device			
FCC ID	A4RGC3G8			
Model Name	GC3G8			
	WCDMA/HSPA/LTE			
EUT supports Radios application	WLAN 11b/g/n HT20			
	Bluetooth BR/EDR/LE			

Report No.: FG330717B

**Remark:** The above EUT's information was declared by manufacturer.

EUT Information List					
S/N	Performed Test Item				
233680220000001	Conducted Measurement ERP/EIRP				
32271RUJWR06US	Radiated Spurious Emission				

# 1.2 Product Specification of Equipment Under Test

Product 9	Product Specification is subject to this standard					
Tx Frequency	LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz					
Rx Frequency	LTE Band 5: 869.7 MHz ~ 893.3 MHz LTE Band 7: 2622.5 MHz ~ 2687.5 MHz					
Bandwidth	LTE Band 5: 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 7: 5MHz / 10MHz / 15MHz / 20MHz					
Maximum Output Power to Antenna	<pre><ant. 1=""> LTE Band 5 : 23.77 dBm <ant. 0=""> LTE Band 7 : 23.38 dBm</ant.></ant.></pre>					
Antenna Type	<ant. 0="">: PIFA Antenna<ant. 1="">: Monopole Antenna</ant.></ant.>					
Antenna Gain	<a href="#">Ant. 0&gt;</a> LTE Band 7: -5.40 dBi <a href="#">Ant. 1&gt;</a> LTE Band 5: -10.80 dBi					
Type of Modulation QPSK / 16QAM						
UE Category	Category 1					

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

## 1.3 Modification of EUT

No modifications made to the EUT during the testing.

TEL: 886-3-327-3456 Page Number : 5 of 21
FAX: 886-3-328-4978 Issue Date : Jul. 14, 2023

# 1.4 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory					
No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (In Test Site Location TEL: +886-3-327-3456 FAX: +886-3-328-4978						
Test Site No.	Sporton Site No.					
Test Site No.	TH03-HY					
Test Engineer	Cotty Hsu					
Temperature (°C)	22.1~22.8					
Relative Humidity (%)	53~55					

Report No.: FG330717B

Test Site	Sporton International Inc. Wensan Laboratory		
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855		
Test Site No.	Sporton Site No.		
rest Site No.	03CH12-HY (TAF Code: 3786)		
Test Engineer	Jesse Fan, Tim Lee and Wilson Wu		
Temperature (°C)	20~25		
Relative Humidity (%)	50~60		
Remark	The Radiated Spurious Emission test item subcontracted to Sporton International Inc. Wensan Laboratory.		

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

FCC Designation No.: TW1190 and TW3786

# 1.5 Applicable Standards

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

- + ANSI C63.26-2015
- ANSI / TIA-603-E
- FCC 47 CFR Part 2, 22(H), 27
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01
- FCC KDB 414788 D01 Radiated Test Site v01r01.

#### Remark:

- 1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
- 2. The TAF code is not including all the FCC KDB listed without accreditation.

TEL: 886-3-327-3456 Page Number : 6 of 21 FAX: 886-3-328-4978 Issue Date : Jul. 14, 2023

# 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.

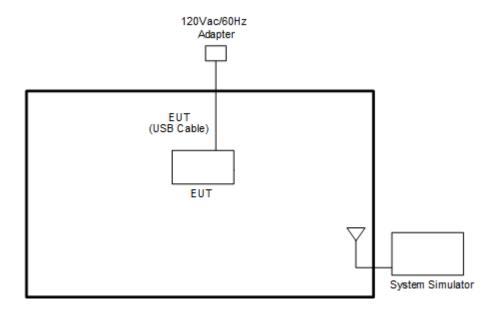
Report No.: FG330717B

a. For radiated measurement, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.26 exploratory test procedures and find Z plane with Adapter for Band 5 and Y plane with Adapter for Band 7 as worst plane.

Adapter for Barid 7 as worst plane.															
Toot Itama	Band		Ва	andwid	lth (MH	łz)		Modu	ulation		RB#		Test Channel		
Test Items	вапо	1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	М	н
Max.	5	v	v	v	v	-	-	v	v	v	v	v	v	v	v
Output Power	7	-	-	v	v	v	٧	v	v	v	v	v	v	v	٧
Peak-to-Av	5				v	-	•	v	v			v		v	
erage Ratio	7	•	•				٧	v	v			v		v	
26dB and 99%	5	v	v	v	v	-	-	v	v			v		v	
Bandwidth	7	-	-	v	v	٧	v	v	v			v		v	
Conducted	5	v	v	v	v	-	-	v	v	v		v	v		v
Band Edge	7	-	-	v	v	٧	v	v	v	v		v	v		v
Conducted Spurious	5	v	v	v	v	-	-	v		v			v	v	V
Emission	7	-	-	v	v	v	٧	v		v			v	v	V
Frequency	5				v	-	-	v				v		v	
Stability	7	-	-		v			v				v		v	
E.R.P/	5	v	v	v	v	-	-	v	v	Max. Power					
E.I.R.P	7	-	-	v	v	v	v	v	V	Wax. 1 Owel				ı	
Radiated Spurious	5							Worst Case					v	v	v
Emission	7							Worst Case					v	v	V
	2. Th	e mark	"-" me	ans tha	at this b	andwi	dth is n	is chosen for tes not supported. 0 times of fundar	S .					der	
Remark	1R 4. Or 5. Sir	B0 QP ne repre	SK em esentat eous tra	issions ive bar ansmis	are re ndwidth sion be	ported is sele	when tected to	the tune up of all perform PAR ar	Subsequently, only bandwidths is the nd frequency stabuletooth have beer	same. ility.					vidth

TEL: 886-3-327-3456 Page Number : 7 of 21
FAX: 886-3-328-4978 Issue Date : Jul. 14, 2023

# 2.2 Connection Diagram of Test System



Report No.: FG330717B

## 2.3 Support Unit used in test configuration and system

	ltem	Equipment	Brand Name	Model No.	FCC ID	Data Cable	Power Cord
	1.	System Simulator	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m
Ī	2.	Adapter	Google	G1000	N/A	N/A	N/A

# 2.4 Measurement Results Explanation Example

#### For all conducted test items:

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

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

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Example:

 $Offset(dB) = RF \ cable \ loss(dB) + attenuator \ factor(dB).$ = 4.2 + 10 = 14.2 (dB)

TEL: 886-3-327-3456 Page Number : 8 of 21 FAX: 886-3-328-4978 Issue Date : Jul. 14, 2023

# 2.5 Frequency List of Low/Middle/High Channels

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

Report No.: FG330717B

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

TEL: 886-3-327-3456 Page Number : 9 of 21 FAX: 886-3-328-4978 Issue Date : Jul. 14, 2023

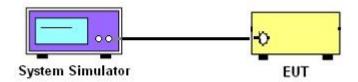
## 3 Conducted Test Items

# 3.1 Measuring Instruments

See list of measuring instruments of this test report.

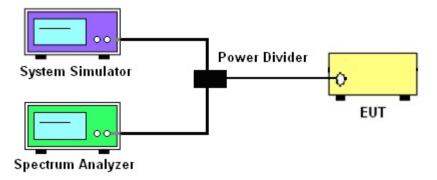
#### 3.1.1 Test Setup

#### 3.1.2 Conducted Output Power

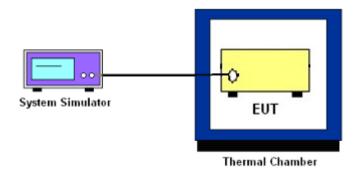


Report No.: FG330717B

# 3.1.3 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.

TEL: 886-3-327-3456 Page Number : 10 of 21 FAX: 886-3-328-4978 Issue Date : Jul. 14, 2023

## 3.2 Conducted Output Power and ERP/EIRP

# 3.2.1 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.

Report No.: FG330717B

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

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

According to KDB 412172 D01 Power Approach,

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

 $P_T$  = transmitter output power in dBm

G<sub>T</sub> = gain of the transmitting antenna in dBi

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

#### 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.

TEL: 886-3-327-3456 Page Number : 11 of 21 FAX: 886-3-328-4978 Issue Date : Jul. 14, 2023

## 3.3 Peak-to-Average Ratio

#### 3.3.1 Description of the PAR Measurement

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

Report No.: FG330717B

#### 3.3.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.2.6

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

TEL: 886-3-327-3456 Page Number : 12 of 21 FAX: 886-3-328-4978 Issue Date : Jul. 14, 2023

## 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.

Report No.: FG330717B

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.
- 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.
- 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.

TEL: 886-3-327-3456 Page Number : 13 of 21 FAX: 886-3-328-4978 Issue Date : Jul. 14, 2023

## 3.5 Conducted Band Edge

#### 3.5.1 Description of Conducted Band Edge Measurement

22.917(a)

For operations in the 824 – 849 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 100kHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

Report No.: FG330717B

27.53(m)(4)

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

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

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

For LTE Band 7

The other 40 dB, and 55 dB have additionally applied same calculation above.

TEL: 886-3-327-3456 Page Number : 14 of 21
FAX: 886-3-328-4978 Issue Date : Jul. 14, 2023

## 3.6 Conducted Spurious Emission

#### 3.6.1 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.

Report No.: FG330717B

For LTE Band 7

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

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

#### 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 derived from 43 + 10log(P)dB below the transmitter power P(Watts)

For LTE Band 7

The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)

TEL: 886-3-327-3456 Page Number : 15 of 21
FAX: 886-3-328-4978 Issue Date : Jul. 14, 2023

## 3.7 Frequency Stability

#### 3.7.1 Description of Frequency Stability Measurement

22.355

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  $\pm 0.00025\%$  ( $\pm 2.5$ ppm) of the center frequency.

Report No.: FG330717B

27.54

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

#### 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.

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

TEL: 886-3-327-3456 Page Number : 16 of 21 FAX: 886-3-328-4978 Issue Date : Jul. 14, 2023

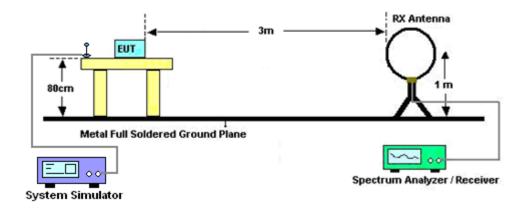
## 4 Radiated Test Items

# 4.1 Measuring Instruments

See list of measuring instruments of this test report.

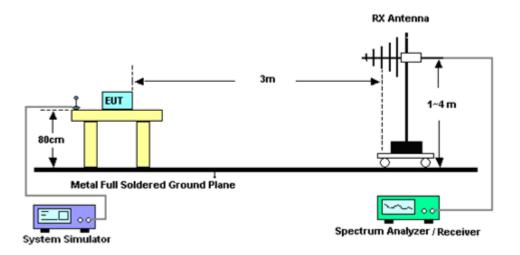
# 4.1.1 Test Setup

#### For radiated test below 30MHz



Report No.: FG330717B

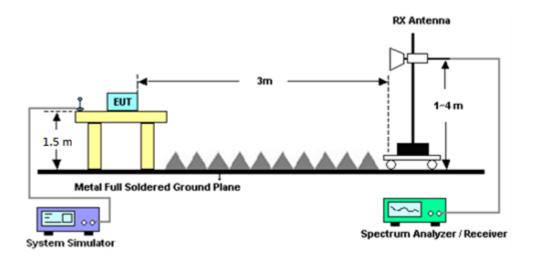
#### For radiated test from 30MHz to 1GHz



TEL: 886-3-327-3456 Page Number : 17 of 21
FAX: 886-3-328-4978 Issue Date : Jul. 14, 2023

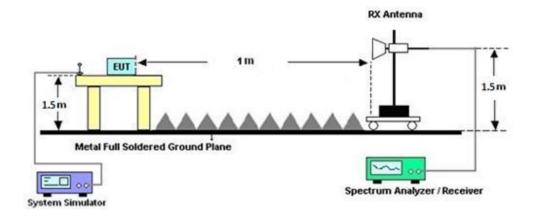
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#### For radiated test from 1GHz to 18GHz



Report No.: FG330717B

#### For radiated test above 18GHz



#### 4.1.2 Test Result of Radiated Test

Please refer to Appendix B.

#### Note:

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

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

TEL: 886-3-327-3456 Page Number : 18 of 21 FAX: 886-3-328-4978 Issue Date : Jul. 14, 2023

## 4.2 Radiated Spurious Emission Measurement

#### 4.2.1 Description of Radiated Spurious Emission Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E.

Report No.: FG330717B

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 7

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

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

#### 4.2.2 Test Procedures

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

- The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
- 2. The EUT was set 3 meters from the receiving antenna, which was 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 one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
- 5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
- 6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
- 7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
- 8. Taking the record of output power at antenna port.
- 9. Repeat step 7 to step 8 for another polarization.
- 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)

For LTE Band 7

The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)

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

ERP (dBm) = EIRP - 2.15

TEL: 886-3-327-3456 Page Number : 19 of 21 FAX: 886-3-328-4978 Issue Date : Jul. 14, 2023

# 5 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Sep. 20, 2022	Apr. 11, 2023	Sep. 19, 2023	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	37059 & 01	30MHz~1GHz	Nov. 10, 2022	Apr. 11, 2023	Nov. 09, 2023	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-02114	1GHz~18GHz	Aug. 09, 2022	Apr. 11, 2023	Aug. 08, 2023	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA9170	00993	18GHz-40GHz	Nov. 24, 2022	Apr. 11, 2023	Nov. 23, 2023	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	Oct. 03, 2022	Apr. 11, 2023	Oct. 02, 2023	Radiation (03CH12-HY)
Preamplifier	Agilent	8449B	3008A02375	1GHz~26.5GHz	May 24, 2022	Apr. 11, 2023	May 23, 2023	Radiation (03CH12-HY)
Preamplifier	E-INSTRUME NT TECH LTD.	ERA-100M-18 G-56-01-A70	EC1900249	1GHz-18GHz	Dec. 21, 2022	Apr. 11, 2023	Dec. 20, 2023	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 07, 2022	Apr. 11, 2023	Dec. 06, 2023	Radiation (03CH12-HY)
Spectrum Analyzer	Agilent	N9010A	MY53470118	10Hz~44GHz	Jan. 10, 2023	Apr. 11, 2023	Jan. 09, 2024	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-1080 -1200-15000-6 0SS	SN1	1.2GHz High Pass Filter	Mar. 14, 2023	Apr. 11, 2023	Mar. 13, 2024	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-2700 -3000-18000-6 0ST	SN2	3GHz High Pass Filter	Mar. 14, 2023	Apr. 11, 2023	Mar. 13, 2024	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803951/2	9kHz~30MHz	Mar. 07, 2023	Apr. 11, 2023	Mar. 06, 2024	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30MHz~18GHz	Dec. 20, 2022	Apr. 11, 2023	Dec. 19, 2023	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz~40GHz	Dec. 20, 2022	Apr. 11, 2023	Dec. 19, 2023	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803953/2	30MHz~40GHz	Dec. 20, 2022	Apr. 11, 2023	Dec. 19, 2023	Radiation (03CH12-HY)
Hygrometer	TECPEL	DTM-303B	TP210090	N/A	Oct. 03, 2022	Apr. 11, 2023	Oct. 02, 2023	Radiation (03CH12-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Apr. 11, 2023	N/A	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Apr. 11, 2023	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Apr. 11, 2023	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Apr. 11, 2023	N/A	Radiation (03CH12-HY)
Radio Communication Analyzer	Anritsu	MT8821C	6262025353	LTE FDD/TDD LTE-2CC DLCA/ULCA	Oct. 13, 2022	Mar. 16, 2023~ Jul. 06, 2023	Oct. 12, 2023	Conducted (TH03-HY)
Thermal Chamber	ESPEC	SH-641	92013720	-40℃ ~90℃	Sep. 07, 2022	Mar. 16, 2023~ Jul. 06, 2023	Sep. 06, 2023	Conducted (TH03-HY)
DC Power Supply	GW Instek	GPP-2323	GES906037	0V~64V ; 0A~6A	Dec. 29, 2022	Mar. 16, 2023~ Jul. 06, 2023	Dec. 28, 2023	Conducted (TH03-HY)
Coupler	Warison	20dB 25W SMA Directional Coupler	#B	1-18GHz	Jan. 06, 2023	Mar. 16, 2023~ Jul. 06, 2023	Jan. 05, 2024	Conducted (TH03-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101908	10Hz~40GHz	Sep. 27, 2022	Mar. 16, 2023~ Jul. 06, 2023	Sep. 26, 2023	Conducted (TH03-HY)

Report No.: FG330717B

TEL: 886-3-327-3456 Page Number : 20 of 21 FAX: 886-3-328-4978 Issue Date : Jul. 14, 2023

# **6 Measurement Uncertainty**

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

Measuring Uncertainty for a Level of	2 24 40
Confidence of 95% (U = 2Uc(y))	3.31 dB

Report No.: FG330717B

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

Measuring Uncertainty for a Level of	3.25 dB
Confidence of 95% (U = 2Uc(y))	3.25 UB

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

Measuring Uncertainty for a Level of	3.81 dB
Confidence of 95% (U = 2Uc(y))	3.01 UB

TEL: 886-3-327-3456 Page Number : 21 of 21 FAX: 886-3-328-4978 Issue Date : Jul. 14, 2023

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

# Conducted Output Power(Average power & ERP/EIRP)

	LTE	Band 5 Ma	ximum Av	erage Pow	/er [dBm] (	GT - LC =	-10.8 dB)	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
10	1	0		23.52	23.55	23.77		
10	1	25		23.03	23.15	23.36		
10	1	49		23.14	23.17	23.46		
10	25	0	QPSK	22.15	22.24	22.53	10.82	0.0121
10	25	12		22.21	22.26	22.48		
10	25	25		22.32	22.36	22.62		
10	50	0		22.20	22.29	22.52		
10	1	0		22.40	22.52	22.74		
10	1	25	16 OAM	22.48	22.57	22.78	9.83	0.0000
10	1	49	16-QAM -	22.43	22.55	22.77	9.83	0.0096
10	27	0		22.07	22.13	22.32		
Limit		ERP < 7W			Result		Pa	ISS

Report No. : FG330717B

	LTE	Band 5 Ma	ximum Av	erage Pow	/er [dBm] (	GT - LC =	-10.8 dB)		
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)	
5	1	0		23.48	23.54	23.69			
5	1	12		23.02	23.15	23.35			
5	1	24		23.06	23.09	23.45			
5	12	0	QPSK	22.11	22.14	22.45	10.74	0.0119	
5	12	7		22.21	22.24	22.45			
5	12	13		22.22	22.31	22.53			
5	25	0		22.12	22.23	22.47			
5	1	0		22.38	22.45	22.69			
5	1	12		22.40	22.47	22.68			
5	1	24		22.39	22.45	22.73			
5	12	0	16-QAM	22.01	22.05	22.29	9.78	0.0095	
5	12	7		21.97	22.12	22.31			
5	12	13		22.06	22.22	22.45			
5	25	0		21.08	21.19	21.43	7		
Limit		ERP < 7W			Result		Pass		



	LTE	Band 5 Ma	ximum Av	erage Pow	/er [dBm] (	(GT - LC =	-10.8 dB)	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
3	1	0		23.43	23.49	23.74		
3	1	8		23.00	23.13	23.33		
3	1	14		23.06	23.08	23.46		
3	8	0	QPSK	22.11	22.20	22.51	10.79	0.0120
3	8	4		22.20	22.22	22.44		
3	8	7		22.28	22.27	22.56		
3	15	0		22.11	22.27	22.49		
3	1	0		22.40	22.47	22.70		
3	1	8		22.44	22.57	22.71		
3	1	14		22.38	22.55	22.68		
3	8	0	16-QAM	22.06	22.09	22.25	9.76	0.0095
3	8	4		21.97	22.11	22.30		
3	8	7	-	22.13	22.24	22.42	<u></u>	
3	15	0		21.09	21.13	21.45		
Limit		ERP < 7W			Result		Pa	iss

	LTE	Band 5 Ma	ximum Av	erage Pow	/er [dBm] (	GT - LC =	-10.8 dB)	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
1.4	1	0		23.43	23.49	23.74		
1.4	1	3		23.00	23.13	23.33		
1.4	1	5		23.06	23.08	23.46		
1.4	3	0	QPSK	23.43	23.49	23.74	10.79	0.0120
1.4	3	1		23.00	23.13	23.33		
1.4	3	3		23.06	23.08	23.46		
1.4	6	0		22.11	22.20	22.51		
1.4	1	0		22.40	22.47	22.70		
1.4	1	3		22.44	22.57	22.71		
1.4	1	5		22.38	22.55	22.68		
1.4	3	0	16-QAM	22.40	22.47	22.70	9.76	0.0095
1.4	3	1		22.44	22.57	22.71		
1.4	3	3		22.38	22.55	22.68		
1.4	6	0		22.06	22.09	22.25	1	
Limit		ERP < 7W			Result	<u> </u>	Pa	ISS



	LTE	Band 7 Ma	aximum A	erage Pov	wer [dBm]	(GT - LC =	-5.4 dB)	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
20	1	0		23.18	23.38	23.12		
20	1	49		23.26	23.32	23.23		
20	1	99		22.87	22.97	22.83		
20	50	0	QPSK	22.36	22.48	22.32	17.98	0.0628
20	50	24		22.43	22.46	22.38		
20	50	50		22.34	22.45	22.33		
20	100	0		22.47	22.50	22.37		
20	1	0		22.52	22.58	22.45		
20	1	12		22.58	22.61	22.47		
20	1	24		22.60	22.62	22.49		
20	12	0	16-QAM	22.23	22.45	22.09	17.22	0.0527
20	12	7		22.30	22.50	22.14		
20	12	13	-	22.26	22.50	22.18		
20	27	0		21.36	21.45	21.33		
Limit		EIRP < 2W			Result		Pa	iss

	LTE	Band 7 M	aximum A	verage Pov	wer [dBm]	(GT - LC =	-5.4 dB)	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
15	1	0		23.17	23.37	23.12		
15	1	37		23.25	23.27	23.19		
15	1	74		22.79	22.96	22.83		
15	36	0	QPSK	22.34	22.41	22.23	17.97	0.0627
15	36	20		22.37	22.38	22.30		
15	36	39		22.26	22.40	22.33		
15	75	0		22.47	22.48	22.31		
15	1	0		22.50	22.58	22.42		
15	1	12		22.49	22.56	22.38		
15	1	24		22.55	22.52	22.43		
15	12	0	16-QAM	22.18	22.38	22.03	17.18	0.0522
15	12	7		22.21	22.40	22.06		
15	12	13		22.21	22.40	22.12		
15	27	0		21.34	21.35	21.26	1	
Limit		EIRP < 2W			Result	_	Pa	ISS



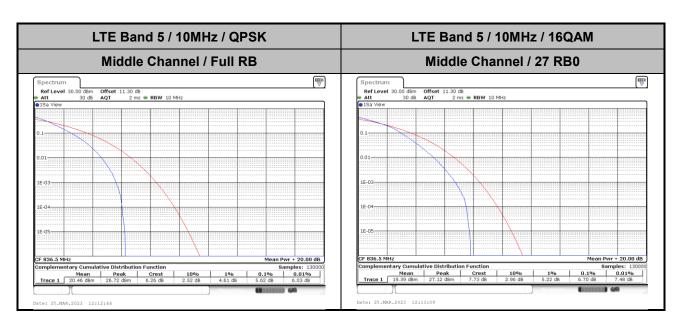
	LTE	Band 7 Ma	aximum A	erage Pov	wer [dBm]	(GT - LC =	-5.4 dB)	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
10	1	0		23.08	23.33	23.03		
10	1	25		23.18	23.31	23.14		0.0621
10	1	49		22.83	22.97	22.82		
10	25	0	QPSK	22.32	22.38	22.26	17.93	
10	25	12		22.39	22.38	22.30		
10	25	25		22.29	22.38	22.30		
10	50	0		22.43	22.40	22.33		
10	1	0		22.50	22.50	22.43		
10	1	12		22.49	22.53	22.37		
10	1	24		22.52	22.53	22.45		
10	12	0	16-QAM	22.18	22.36	22.04	17.13	0.0516
10	12	7		22.20	22.50	22.07		
10	12	13		22.16	22.49	22.11		
10	27	0		21.36	21.35	21.23		
Limit	·	EIRP < 2W			Result		Pa	iss

	LTE	Band 7 M	aximum A	verage Pov	wer [dBm]	(GT - LC =	-5.4 dB)	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
5	1	0		23.16	23.34	23.05		
5	1	12		23.17	23.32	23.23		
5	1	24		22.80	22.91	22.77		
5	12	0	QPSK	22.34	22.45	22.27	17.94	0.0622
5	12	7		22.33	22.43	22.29		
5	12	13		22.24	22.38	22.25		
5	25	0		22.46	22.49	22.35		
5	1	0		22.42	22.56	22.37		
5	1	12		22.49	22.61	22.38		
5	1	24		22.50	22.62	22.49		
5	12	0	16-QAM	22.22	22.41	22.04	17.22	0.0527
5	12	7		22.24	22.46	22.08		
5	12	13		22.26	22.47	22.15		
5	25	0		21.26	21.42	21.31	1	
Limit		EIRP < 2W			Result	esult Pass		

# LTE Band 5

# Peak-to-Average Ratio

Mode	LTE Band 5 / 10MHz					
Mod.	QPSK 16QAM Limit:					
RB Size	Full RB	27RB0	Result			
Middle CH	5.62	6.70	PASS			



Report No.: FG330717B

TEL: 886-3-327-3456 Page Number : A2-1 of 17

# 26dB Bandwidth

Mode	LTE Band 5 : 26dB BW(MHz)							
BW	1.4MHz		3MHz		5MHz		10MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Middle CH	1.27	1.29	2.97	2.97	5.02	4.88	9.89	5.415

Report No. : FG330717B

TEL: 886-3-327-3456 Page Number : A2-2 of 17

LTE Band 5 Middle Channel / 1.4MHz / QPSK Middle Channel / 1.4MHz / 16QAM Ref Level 30.00 dBm Offset 11.30 dB ■ RBW 30 kHz 
■ Att 30 dB SWT 63.2 μs ■ VBW 100 kHz Mode Auto FFT 
SGL Count 100/100 
■ 1Pk Max 15.94 dB 14.34 dBr 10 dBm 658 647. -10 dBm--30 dBr 30 d8fil 40 dBm -50 dBm-Type Ref Trc Type Ref Trc 
 X-value
 Y-value
 Function

 836.4189 MHz
 14.34 dBm
 ndB down
 Middle Channel / 3MHz / QPSK Middle Channel / 3MHz / 16QAM 282 Span 6.0 MHz Span 6.0 MHz 
 Y-value
 Function

 2
 17.58 dBm
 ndB down

 2
 -8.03 dBm
 ndB

 z
 -8.13 dBm
 Q factor
 Type | Ref | Trc | Date: 25.MAR.2023 12:02:40 Middle Channel / 5MHz / QPSK Middle Channel / 5MHz / 16QAM Offset 11.30 dB ● RBW 100 kHz SWT 19 µs ● VBW 300 kHz Mode Auto FFT Att 30 dB
SGL Count 100/100
1Pk Max 13.79 dB 834.98200 MF 14.00 dBn 835.31100 MH 30 dBm Function Result 5.015 MHz 
 Type
 Ref
 Trc
 X-value
 Y-value
 Function

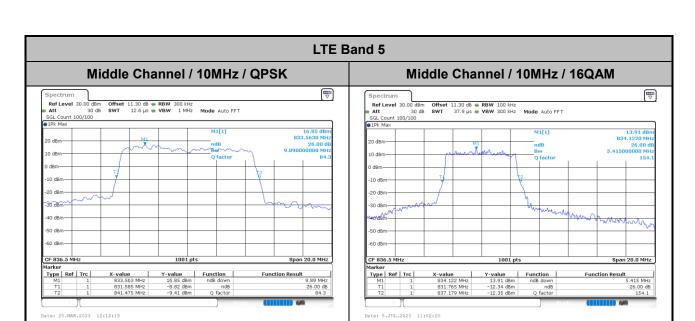
 M1
 1
 834.982 MHz
 13.79 dBm
 ndB down

 Type
 Ref
 Trc
 X-value
 Y-value
 Function

 M1
 1
 835.311 MHz
 14.00 dBm
 ndB down

Report No.: FG330717B

TEL: 886-3-327-3456 Page Number : A2-3 of 17



TEL: 886-3-327-3456 Page Number: A2-4 of 17

# **Occupied Bandwidth**

Mode	LTE Band 5 : 99%OBW(MHz)							
BW	1.4MHz		3MHz		5MHz		10MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Middle CH	1.09	1.10	2.73	2.73	4.49	4.50	8.97	4.855

Report No. : FG330717B

TEL: 886-3-327-3456 Page Number : A2-5 of 17

LTE Band 5 Middle Channel / 1.4MHz / QPSK Middle Channel / 1.4MHz / 16QAM Ref Level 30.00 dBm
Att 30 dB
SGL Count 100/100 10 dBm -10 dBm -10 dBn -20 dBm-40 dBm Span 2.8 MHz CF 836.5 MHz Span 2.8 MHz X-value 836.5727 MHz 835.95455 MHz 837.04545 MHz Y-value 14.35 dBm 6.88 dBm 5.69 dBm Type Ref Trc Function Result Type Ref Trc 1.090909091 MHz Date: 25.MAR.2023 11:54:01 Middle Channel / 3MHz / QPSK Middle Channel / 3MHz / 16QAM SGL Count 100/100 15.91 dB 836.93760 MH 2.727272727 MH dBm-40 dBm -50 d8m-CF 836.5 MHz Type | Ref | Trc | **Function Result** Function **Function Result** 2.727272727 MHz 2.733266733 MHz Middle Channel / 5MHz / QPSK Middle Channel / 5MHz / 16QAM Ref Level 30.00 dBm Offset 11.30 dB ● RBW 100 kHz

■ Att 30 db ■ SWT 19 μs ● VBW 300 kHz Mode Auto FFT

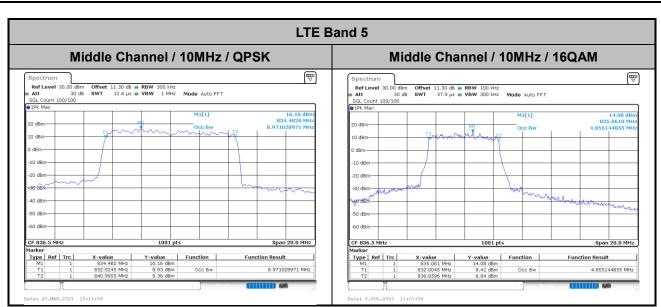
SGL Count 100/100

■ IPk Max 15.16 dBr 836.82000 MH 4.485514486 MH M1[1] M1[1] -10 dBm Type | Ref | Trc | 
 Type
 Ref
 Trc
 X-value
 Y-value
 Function

 M1
 1
 836.11 MHz
 12.75 dBm
 15.16 dBm 9.97 dBm Occ Bw 8.94 dBm 12.75 dBm 7.78 dBm Occ Bw 8.48 dBm 4.485514486 MHz 4.495504496 MHz

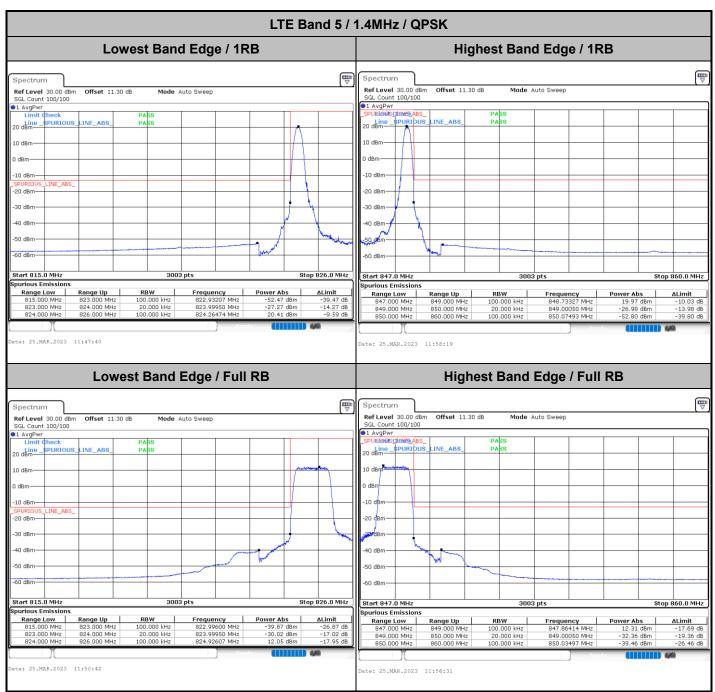
Report No.: FG330717B

TEL: 886-3-327-3456 Page Number : A2-6 of 17



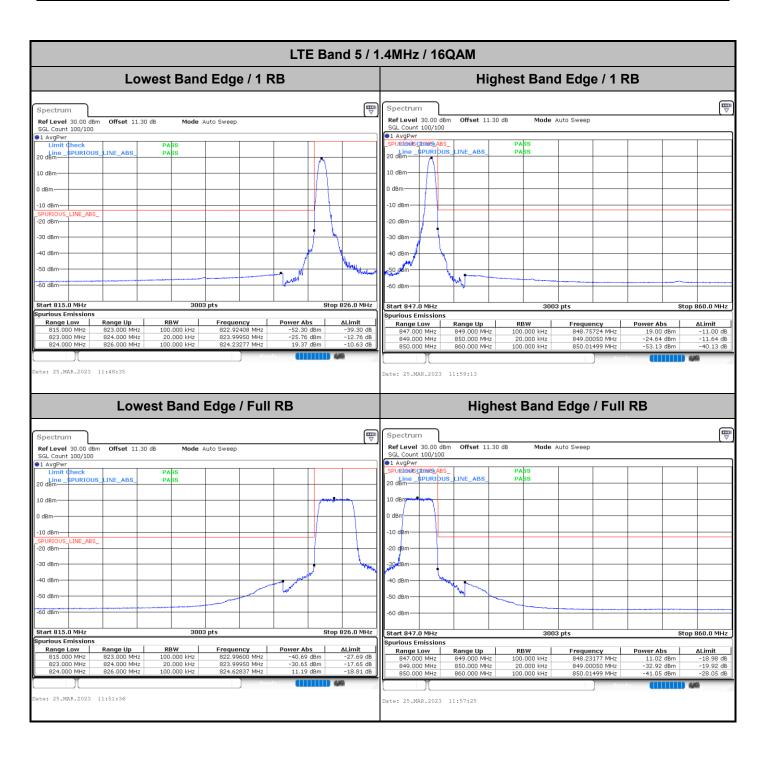
TEL: 886-3-327-3456 Page Number: A2-7 of 17

# **Conducted Band Edge**



Report No.: FG330717B

TEL: 886-3-327-3456 Page Number: A2-8 of 17



TEL: 886-3-327-3456 Page Number: A2-9 of 17

LTE Band 5 / 3MHz / QPSK **Highest Band Edge / Full RB** Lowest Band Edge / Full RB Spectrum Ref Level 30.00 dBm Offset 11.30 dB Mode Auto Sweep Ref Level 30.00 dBm SGL Count 100/100 Offset 11.30 dB Mode Auto Sweep SGL Count 100/100 ■1 AvgPw ●1 AvgPwr \_SPURIOUSCHINELABS\_ Line \_SPURIOUS 10 dBm 10 dBmdBm INE\_ABS -20 dBm-20 dBm -30 dBm -30 dBm-60 dBm Start 815.0 MHz 3003 Stop 827.0 MHz Start 846.0 MHz Stop 860.0 MHz purious Emissions Range Up 823.000 MHz 824.000 MHz 827.000 MHz Frequency 822.98801 MHz 823.99950 MHz 825.67383 MHz Power Abs Range Low 846.000 MHz 849.000 MHz 850.000 MHz Range Low 815.000 MHz **RBW** .00.000 kHz ΔLimit -33.41 dBm -29.52 dBm 8.14 dBm -16.52 dB -21.86 dB ate: 25.MAR.2023 12:00:09 LTE Band 5 / 3MHz / 16QAM Lowest Band Edge / Full RB **Highest Band Edge / Full RB** Spectrum Spectrum Ref Level 30.00 dBm SGL Count 100/100 Ref Level 30.00 dBm Offset 11.30 dB Mode Auto Sweep Offset 11.30 dB Mode Auto Sweep SGL Count 100/100 AvgPwr
 SPURIOUS CHNEKABS
 Line SPURIOUS
 OBm 1 AvgPı PURIOUS 10 dBm dBm--20 dBm 20 dBm--30 dBm 30 dBm--50 dBm -60 dBm Start 815.0 MHz 3003 pts Stop 827.0 MHz Start 846.0 MHz Stop 860.0 MHz Frequency 822.82817 MHz 823.99950 MHz 926.14735 MHz purious Emissions Range Up 823.000 MHz 824.000 MHz 827.000 MHz RBW 100.000 kHz 30.000 kHz 100.000 kHz Power Abs
2 -34.31 dBm
2 -31.62 dBm
2 7.22 dBm Range Low 846.000 MHz 849.000 MHz 850.000 MHz Range Low 815.000 MHz ΔLimit -21.31 dB -18.62 dB -22.78 dB te: 25.MAR.2023 12:01:03 Date: 25.MAR.2023 12:04:27

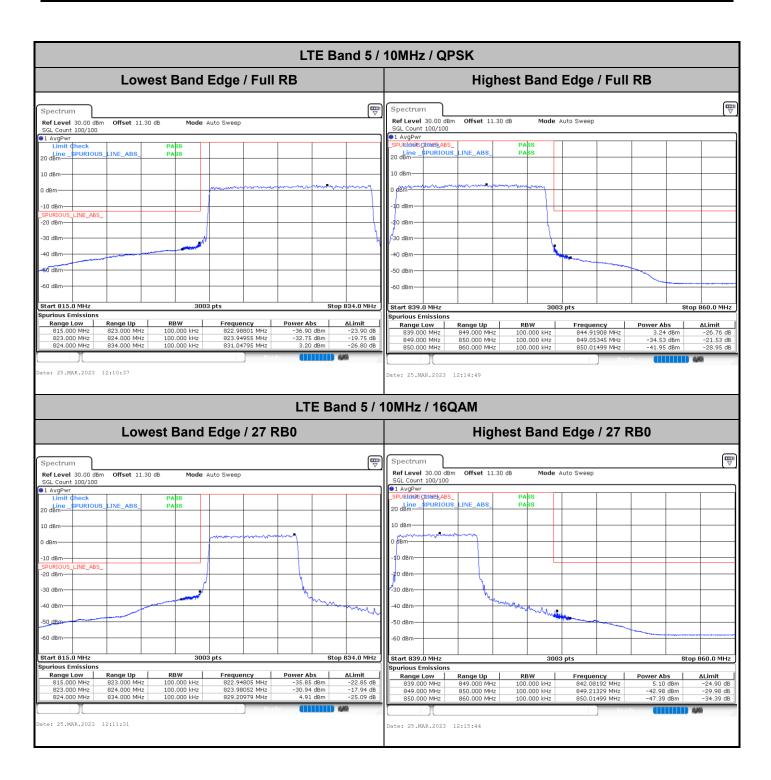
Report No.: FG330717B

TEL: 886-3-327-3456 Page Number : A2-10 of 17

LTE Band 5 / 5MHz / QPSK **Highest Band Edge / Full RB** Lowest Band Edge / Full RB Spectrum Ref Level 30.00 dBm Offset 11.30 dB Mode Auto Sweep Ref Level 30.00 dBm SGL Count 100/100 Offset 11.30 dB Mode Auto Sweep SGL Count 100/100 1 AvgPw ●1 AvgPwr \_SPURIOUSCHINELABS\_ Line \_SPURIOUS\_ 20 dBm 10 dBm 10 dBm dBm--20 dBm-20 dBm -30 dBm -30 dBm--60 dBm-Start 815.0 MHz 3003 Stop 829.0 MHz Start 844.0 MHz Stop 860.0 MHz purious Emissions Range Up 823.000 MHz 824.000 MHz 829.000 MHz Frequency 822.98801 MHz 823.97453 MHz 828.53297 MHz Range Low 844.000 MHz 849.000 MHz 850.000 MHz Range Low 815.000 MHz **RBW** .00.000 kHz -34.31 dBm -29.43 dBm 6.31 dBm -21.31 dB -16.43 dB -23.69 dB ate: 25.MAR.2023 12:05:24 LTE Band 5 / 5MHz / 16QAM Lowest Band Edge / Full RB **Highest Band Edge / Full RB** Spectrum Spectrum Ref Level 30.00 dBm SGL Count 100/100 Ref Level 30.00 dBm Offset 11.30 dB Mode Auto Sweep Offset 11.30 dB Mode Auto Sweep SGL Count 100/100 AvgPwr
 SPURIOUS CHNEKABS
 Line SPURIOUS
 OBm 1 AvgPv PURIOUS. 10 dBm 10 dBm 0 dBm--20 dBm 20 dBm--30 dBm 30 dBm--50 dBm -60 dBm--60 dBm Start 815.0 MHz 3003 pts Stop 829.0 MHz Start 844.0 MHz Stop 860.0 MHz purious Emissions Range Up 823.000 MHz 824.000 MHz 829.000 MHz RBW 100.000 kHz 50.000 kHz 100.000 kHz Frequency 822.94006 MHz 823.99850 MHz 827.48402 MHz Power Abs 2 -35.37 dBm 2 -30.97 dBm 2 5.24 dBm Range Low 844.000 MHz 849.000 MHz 850.000 MHz Range Low 815.000 MHz ΔLimit te: 25.MAR.2023 12:06:18 Date: 25.MAR.2023 12:09:41

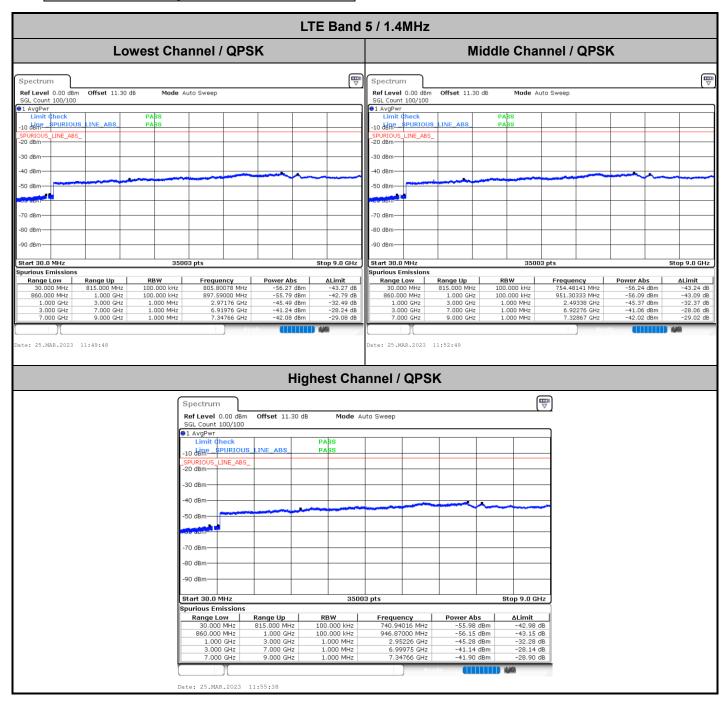
Report No.: FG330717B

TEL: 886-3-327-3456 Page Number : A2-11 of 17



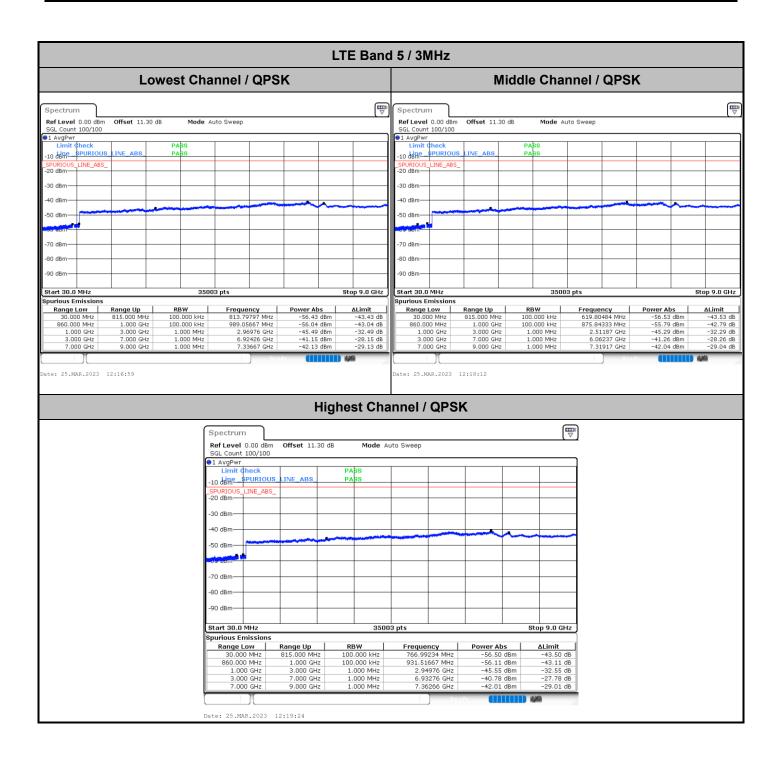
TEL: 886-3-327-3456 Page Number : A2-12 of 17

### **Conducted Spurious Emission**

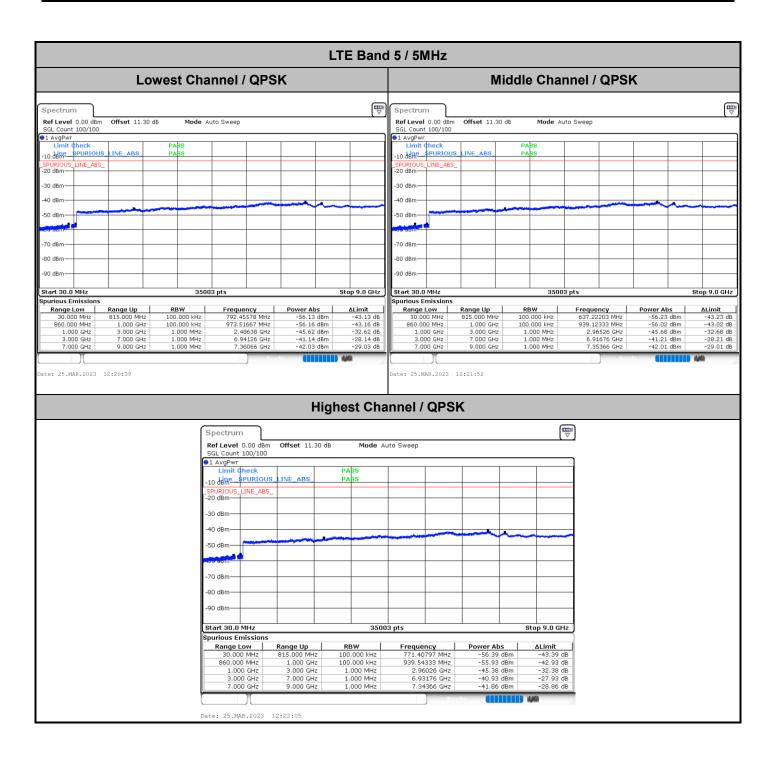


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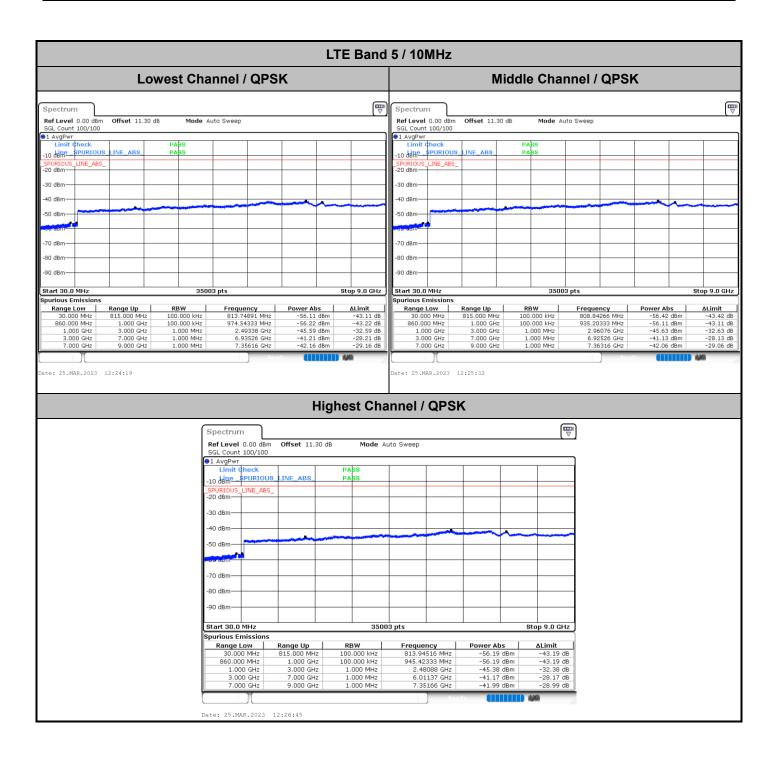
TEL: 886-3-327-3456 Page Number: A2-13 of 17



TEL: 886-3-327-3456 Page Number : A2-14 of 17



TEL: 886-3-327-3456 Page Number: A2-15 of 17



TEL: 886-3-327-3456 Page Number: A2-16 of 17

# Frequency Stability

Test Conditions		LTE Band 5 (QPSK) / Middle Channel	Limit	
Temperature	Voltage	BW 10MHz	Note 2.	
(°C)	(Volt)	Deviation (ppm)	Result	
35	Normal Voltage	0.0035		
30	Normal Voltage	0.0025		
20(Ref.)	Normal Voltage	0.0000		
10	Normal Voltage	0.0161	PASS	
0	Normal Voltage	0.0148	PASS	
20	Maximum Voltage	0.0010		
20	Normal Voltage	0.0030		
20	Battery End Point	0.0159		

Report No. : FG330717B

#### Note:

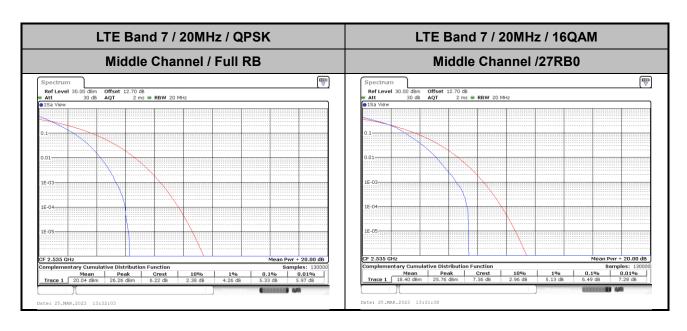
- 1. Normal Voltage = 3.87 V.; Battery End Point (BEP) = 3.6 V.; Maximum Voltage = 4.4 V.
- 2. The frequency fundamental emissions stay within the authorized frequency block.

TEL: 886-3-327-3456 Page Number : A2-17 of 17

#### LTE Band 7

## Peak-to-Average Ratio

Mode	LTE Band 7 / 20MHz					
Mod.	QPSK	16QAM	Limit: 13dB			
RB Size	Full RB	Full RB	Result			
Middle CH	5.33	6.49	PASS			



Report No.: FG330717B

TEL: 886-3-327-3456 Page Number : A3-1 of 17

# 26dB Bandwidth

Mode	LTE Band 7 : 26dB BW(MHz)							
BW	5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Middle CH	4.83	4.88	9.77	5.42.	14.39	5.54	19.02	5.48

Report No. : FG330717B

TEL: 886-3-327-3456 Page Number : A3-2 of 17

LTE Band 7 Middle Channel / 5MHz / QPSK Middle Channel / 5MHz / 16QAM 14.22 dB 13.54 dBr 525 519. -10 dBm--50 dBm- 
 X-value
 Y-value
 Function

 2.53459 GHz
 13.54 dBm
 nd8 down

 2.532552 GHz
 -12.15 dBm
 nd8

 2.537438 GHz
 -12.45 dBm
 Q factor
 Middle Channel / 10MHz / QPSK Middle Channel / 10MHz / 16QAM 10 dBm Span 20.0 MHz Type | Ref | Trc | Function n ndB down Type Ref Trc Middle Channel / 15MHz / QPSK Middle Channel / 15MHz / 16QAM 12.70 dB • RBW 100 kHz 37.9 μs • VBW 300 kHz Mode Auto FFT SGL Count 100/100 1Pk Max 12.81 dBn 2.5300250 14.26 dBr 2.5307140 GF 30 dBm--50 dBm CF 2.535 GHz

Report No.: FG330717B

TEL: 886-3-327-3456 Page Number: A3-3 of 17 FAX: 886-3-328-4978

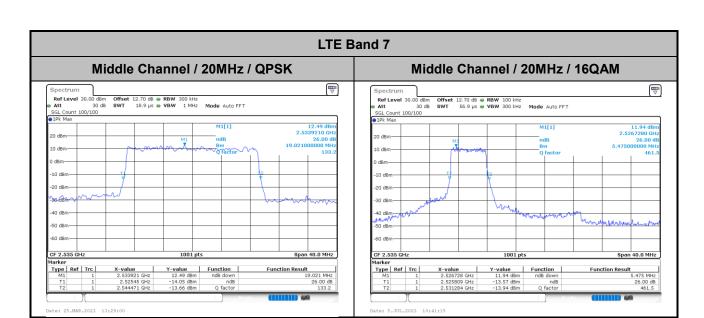
 Type
 Ref
 Trc
 X-value
 Y-value
 Function

 M1
 1
 2.530025 GHz
 12.81 dBm
 ndB down

Function Result 14.386 MHz

 X-value
 Y-value
 Function

 2.530714 GHz
 14.26 dBm
 ndB down



TEL: 886-3-327-3456 Page Number: A3-4 of 17

# **Occupied Bandwidth**

Mode	LTE Band 7 : 99%OBW(MHz)							
BW	5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Middle CH	4.48	4.51	9.05	4.86	13.58	4.86	17.90	4.92

Report No. : FG330717B

TEL: 886-3-327-3456 Page Number : A3-5 of 17

LTE Band 7 Middle Channel / 5MHz / QPSK Middle Channel / 5MHz / 16QAM 13.33 dBn 2.53437100 GH 4.505494505 MH 13.79 dB M1[1] 10 dBm -10 dBm-40 dBm -50 dBm--60 dBm- 
 Marker
 Trc
 X-value
 Y-value
 Function

 M1
 1
 2.534371 GHz
 13.33 dBm
 1.2532722 GHz
 7.71 dBm
 Occ Bw

 T1
 1
 2.5372527 GHz
 7.71 dBm
 Occ Bw

 T2
 1
 2.5372577 GHz
 6.96 dBm
 Occ Bw

 X-value
 Y-value
 Function

 2.533002 GHz
 13.79 dBm
 2.5327622 GHz

 2.537237622 GHz
 8.54 dBm
 Occ Bw

 2.5372378 GHz
 8.03 dBm
 Middle Channel / 10MHz / QPSK Middle Channel / 10MHz / 16QAM 10 dBm--20 dBm 40 dBm 50 dBm 1001 pts 
 X-value
 Y-value
 Function

 2.531523 GHz
 15.73 dBm
 2.5304446 GHz
 11.48 dBm
 Occ Bw

 2.53944955 GHz
 9.76 dBm
 0.00 BW
 0.00 BW
 0.00 BW

 X-value
 Y-value
 Function

 2.533941 GHz
 12.41 dBm
 2.5305045 GHz
 8.34 dBm
 Occ Bw

 2.53553596 GHz
 6.82 dBm
 Occ Bw
 0.82 dBm
 <td Type | Ref | Trc | Function Result Type Ref Trc **Function Result** 9.050949051 MHz 4.855144855 MHz Middle Channel / 15MHz / QPSK Middle Channel / 15MHz / 16QAM 12.70 dB • RBW 100 kHz 37.9 μs • VBW 300 kHz Mode Auto FFT SGL Count 100/100 1Pk Max 11.92 dBn 2.5329320 GH 4.855144855 MH M1[1] 20 dBm 0 dBm--10 dBm -20 dBm -30 dBm--30 dBmmore 40 dBm/r transport -50 dBm-CF 2.535 GHz Span 30.0 MHz 
 Type
 Ref
 Trc
 X-value
 Y-value
 Function

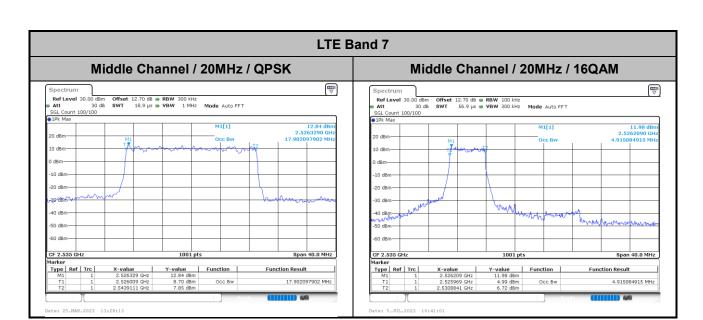
 M1
 1
 2.533412 GHz
 13.72 dBm

 Type
 Ref
 Trc
 X-value
 Y-value
 Function

 M1
 1
 2.532932 GHz
 11.92 dBm
 11.92 dBm 8.22 dBm Occ Bw 6.16 dBm 8.86 dBm Occ Bw 9.66 dBm 13.576423576 MHz 4.855144855 MHz

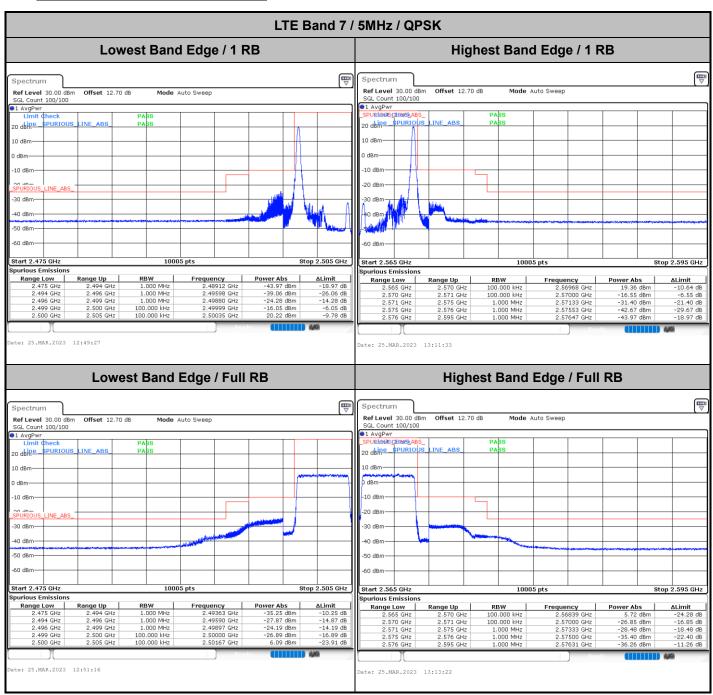
Report No.: FG330717B

TEL: 886-3-327-3456 Page Number : A3-6 of 17 FAX: 886-3-328-4978



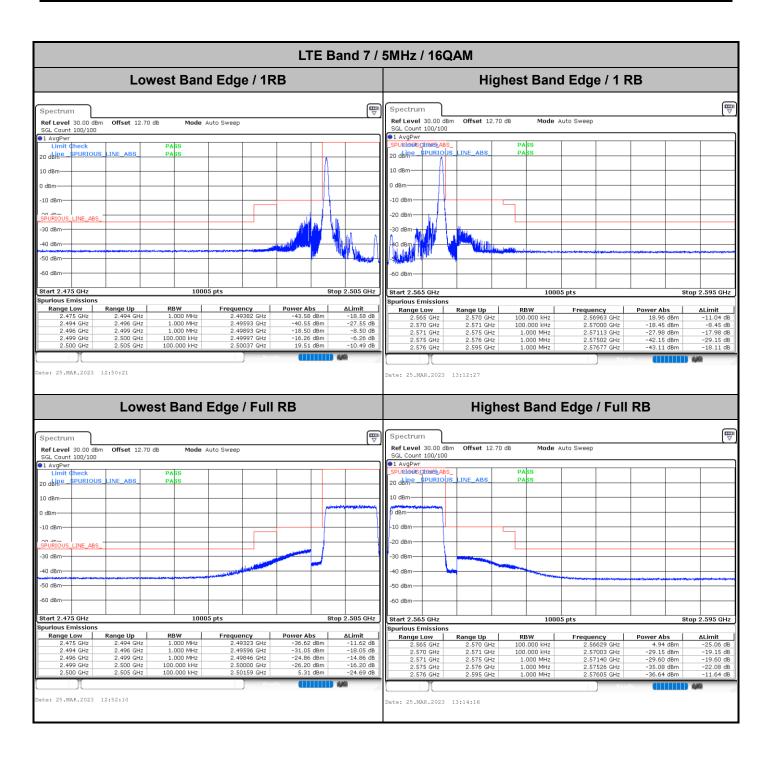
TEL: 886-3-327-3456 Page Number: A3-7 of 17

### **Conducted Band Edge**

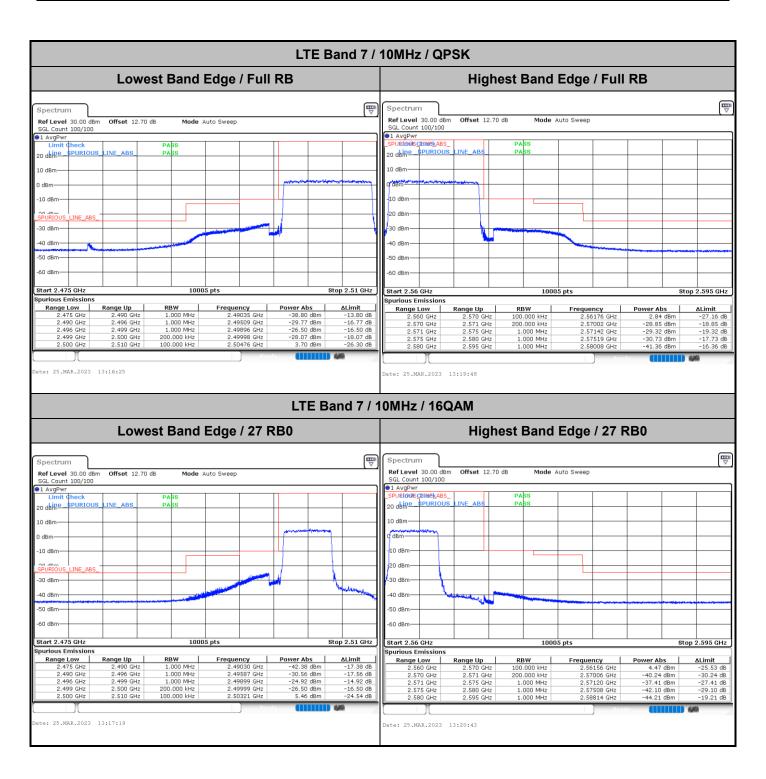


Report No.: FG330717B

TEL: 886-3-327-3456 Page Number: A3-8 of 17



TEL: 886-3-327-3456 Page Number: A3-9 of 17

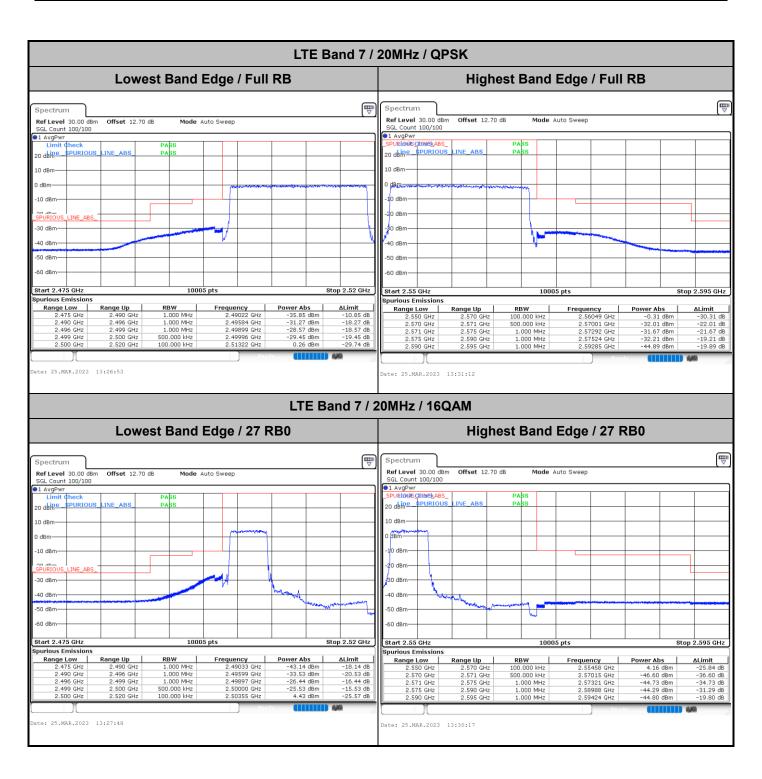


TEL: 886-3-327-3456 Page Number: A3-10 of 17

LTE Band 7 / 15MHz / QPSK **Highest Band Edge / Full RB** Lowest Band Edge / Full RB Spectrum Spectrum Ref Level 30.00 dBm Offset 12.70 dB Mode Auto Sweep Ref Level 30.00 dBm SGL Count 100/100 Offset 12.70 dB Mode Auto Sweep SGL Count 100/100 ●1 AvgPwr SPURIOUSCHMEKABS PURIOUS\_LINE\_ABS 20 dbine SPURIOUS on akine PASS 10 dBm 10 dBm dBm-0 dBm -10 dBm-20 dBm -30 dBm-30 dBm -50 dBm Start 2.475 GHz 10005 10005 pts Stop 2.595 GHz urious Emissions urious Emissions 2.555 GHz 2.557 GHz 2.570 GHz 2.571 GHz 2.575 GHz 2.585 GHz 1.000 MHz 1.000 MHz 1.000 MHz -36.20 dBm -30.61 dBm -28.07 dBm Range Low 2.475 GHz Range Up 2.490 GHz Frequency 2.49049 GHz ∆Limit 2.49593 GHz 2.49844 GHz -17.61 dB -18.07 dB -19.96 dB -28.75 dB 2.496 GHz 2.499 GHz ate: 25.MAR.2023 13:21:39 LTE Band 7 / 15MHz / 16QAM Lowest Band Edge / 27 RB0 Highest Band Edge / 27RB0 Spectrum Spectrum Ref Level 30.00 dBm SGL Count 100/100 Ref Level 30.00 dBm Offset 12.70 dB Mode Auto Sweep Offset 12.70 dB Mode Auto Sweep SGL Count 100/100 PURIOUS 20 d**eine** 20 dbine 10 dBn 10 dBmdBmdBm -10 dBm-0 dBm 20 dBm 30 dBm--50 dBm-Stop 2.515 GHz 1000 Stop 2.595 GHz ırious Emissions Spurious Emissions Range Low 2.555 GHz 2.490 GHz 2.496 GHz 2.496 GHz 2.499 GHz 2.500 GHz 2.515 GHz 2.49033 GHz 2.49591 GHz 2.49591 GHz 2.49898 GHz 2.49992 GHz 2.50410 GHz Power Abs -43.17 dBm -32.76 dBm -26.08 dBm -28.04 dBm 4.69 dBm RBW 100.000 kHz 300.000 kHz 1.000 MHz 1.000 MHz 1.000 MHz 4.50 dBm -46.45 dBm -42.92 dBm -44.15 dBm -44.31 dBm 2.55615 GHz 2.55615 GHz 2.57011 GHz 2.57146 GHz 2.57514 GHz 2.59096 GHz 1.000 MHz 1.000 MHz 1.000 MHz Range Low 2.475 GHz ∆Limit Range Up ∆Limit -25.50 ΔLimit
-18.17 dB
-19.76 dB
-16.08 dB
-18.04 dB
-25.31 dB -25.50 dB -36.45 dB -32.92 dB -31.15 dB -19.31 dB ate: 25.MAR.2023 13:22:34

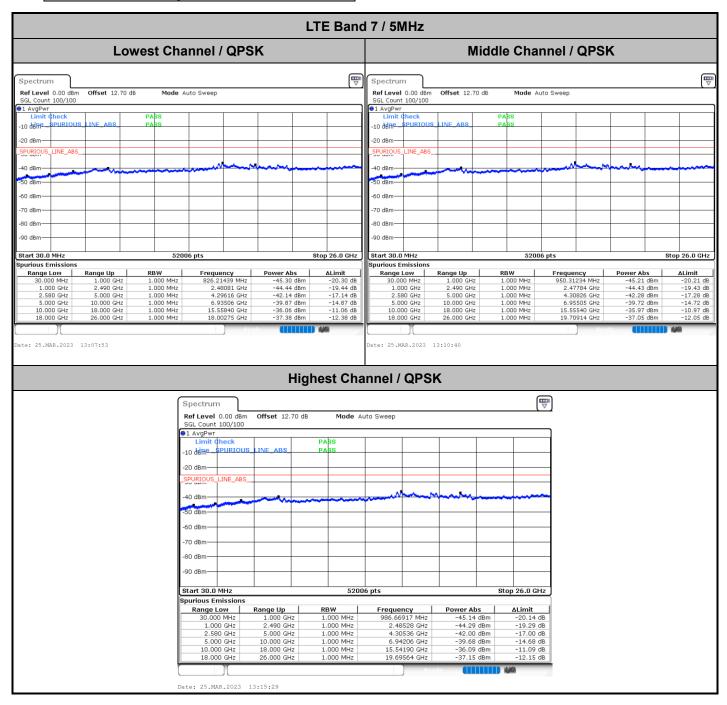
Report No.: FG330717B

TEL: 886-3-327-3456 Page Number: A3-11 of 17



TEL: 886-3-327-3456 Page Number : A3-12 of 17

#### **Conducted Spurious Emission**



Report No.: FG330717B

TEL: 886-3-327-3456 Page Number: A3-13 of 17