

Report No.: FG042038C



## FCC RADIO TEST REPORT

FCC ID : ACJFZN1E

**Equipment**: Tablet Computer

Brand Name : Panasonic Model Name : FZ-N1KB Marketing Name : FZ-N1

Applicant : Panasonic Corporation of North America

Two Riverfront Plaza, 9th Floor, Newark, NJ

07102-5490

Manufacturer : Panasonic Mobile Communications Co., Ltd.

600 Saedo-cho, Tsuzuki-ku, Yokohama City

224-8539, Japan

Standard : FCC 47 CFR Part 2, 90(R)

The product was received on Apr. 22, 2020 and testing was started from May 05, 2020 and completed on May 12, 2020. 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Louis Wu

Louis Win

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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

TEL: 886-3-327-3456 Page Number : 1 of 23 FAX: 886-3-328-4978 Issued Date : Jun. 04, 2020

### **Table of Contents**

	•	of this test report	
		y of Test Result	
1	Gene	eral Description	
	1.1	Product Feature of Equipment Under Test	
	1.2	Modification of EUT	5
	1.3	Testing Site	6
	1.4	Applied Standards	
2	Test	Configuration of Equipment Under Test	7
	2.1	Test Mode	
	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	10
	3.1	Measuring Instruments	10
	3.2	Conducted Output Power Measurement and ERP	11
	3.3	Peak-to-Average Ratio	12
	3.4	Occupied Bandwidth	13
	3.5	Conducted Band Edge	14
	3.6	Emission Mask	15
	3.7	Conducted Spurious Emission	16
	3.8	Frequency Stability	17
4	Radi	ated Test Items	18
	4.1	Measuring Instruments	18
	4.2	Radiated Spurious Emission	20
5	List	of Measuring Equipment	21
6	Unce	ertainty of Evaluation	23
•		x A. Test Results of Conducted Test	
•	•	x B. Test Results of ERP and Radiated Test	
Аp	pendi	x C. Test Setup Photographs	

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

Report Template No.: BU5-FGLTE90R Version 2.4

Page Number Issued Date

: 2 of 23

Report No.: FG042038C

Report Version

: Jun. 04, 2020

ersion : 02

### History of this test report

Report No. : FG042038C

Report No.	Version	Description	Issued Date
FG042038C	01	Initial issue of report	May 19, 2020
FG042038C	02	Adding Accessories Information	Jun. 04, 2020

TEL: 886-3-327-3456 Page Number : 3 of 23 FAX: 886-3-328-4978 Issued Date : Jun. 04, 2020 : 02

### **Summary of Test Result**

Report No.: FG042038C

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power	Reporting only	-
3.2	§90.542 (a)(7)	Effective Radiated Power	Pass	-
3.3	-	Peak-to-Average Ratio	Reporting only	-
3.4	§2.1049	Occupied Bandwidth	Reporting only	-
3.5	§2.1053 §90.543 (e)(2)	Conducted Band Edge Measurement	Pass	-
3.6	§2.1051 §90.210 (n)	Emission Mask	Pass	-
3.7	§2.1053 §90.543 (e)(3)	Conducted Spurious Emission	Pass	-
3.8	§2.1055 §90.539 (e)	Frequency Stability Temperature & Voltage	Pass	-
4.2	§2.1053 §90.543 (e)(3) §90.543 (f)	Radiated Spurious Emission	Pass	Under limit 19.55 dB at 1577.000 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.

Reviewed by: Wii Chang Report Producer: Lucy Wu

TEL: 886-3-327-3456 Page Number : 4 of 23 FAX: 886-3-328-4978 Issued Date : Jun. 04, 2020

### 1 **General Description**

### 1.1 Product Feature of Equipment Under Test

WCDMA/LTE, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n/ac, Wi-Fi 5GHz 802.11a/n/ac, NFC, and GNSS.

Report No.: FG042038C

Product Specification subjective to this standard						
	WWAN: Fixed Internal Antenna					
	WLAN: Monopole Antenna					
Antenna Type	Bluetooth: Monopole Antenna					
	GPS / Glonass : Monopole Antenna					
	NFC: Loop Antenna					

	Accessories Information							
Cradia	Brand Name	Panasonic						
Cradle	Model Name	FZ-VEBN111A						
AC Adoptor 1	Brand Name	Panasonic						
AC Adapter 1	Model Name	CF-AA6413A						
AC Adomtor 2	Brand Name	Panasonic						
AC Adapter 2	Model Name	FZ-AAE184EM						
USB Cable 1	Brand Name	Panasonic						
OSB Cable I	Model Name	K2KYYYY00221						
USD Cable 2	Brand Name	N/A						
USB Cable 2	Model Name	SPA-US15						
Pattory	Brand Name	Panasonic						
Battery	Model Name	FZ-VZSUN110U						

### 1.2 Modification of EUT

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

TEL: 886-3-327-3456 Page Number : 5 of 23 FAX: 886-3-328-4978 Issued Date : Jun. 04, 2020

#### 1.3 Testing Site

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
	No.52, Huaya 1st Rd., Guishan Dist.,
Test Site Location	Taoyuan City, Taiwan (R.O.C.)
Tool One Location	TEL: +886-3-327-3456
	FAX: +886-3-328-4978
Test Site No.	Sporton Site No.
Test Site No.	TH05-HY
Test Engineer	Bryant Liu
Temperature	22~25℃
Relative Humidity	50~53%

Report No.: FG042038C

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

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	Sporton Site No.
rest site No.	03CH13-HY
Test Engineer	Daniel Lee, Jacky Hung and Wilson Wu
Temperature	20~25℃
Relative Humidity	50~60%

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

FCC Designation No.: TW1190 and TW0007

### 1.4 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, Part 90(R)
- ANSI / TIA-603-E
- 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 test items were verified and recorded according to the standards and without any deviation during the test.
- 2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.
- 3. The TAF code is not including all the FCC KDB listed without accreditation.

TEL: 886-3-327-3456 Page Number : 6 of 23
FAX: 886-3-328-4978 Issued Date : Jun. 04, 2020

## 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.

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

Conducted	Dand	Bandwidth (MHz)				Modulation			RB#			Test Channel				
Test Cases	Band	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	M	Н
Max. Output Power	14		•	V	V	ı		٧	v		٧	v	V	>	v	٧
Peak-to-Average Ratio	14	•	•		v	•	•	٧	v		٧		v		v	
26dB and 99% Bandwidth	14	1	1	٧	V	-	1	٧	v				v	>	v	<b>&gt;</b>
Conducted Band Edge	14	-	-	v	v	-	-	v	v		V		v	v		v
Emission Mask	14	1	•	v	v	-	1	٧	v		٧		v	٧	v	v
Conducted Spurious Emission	14	•	•	٧	V	1	•	٧	v		>			>	v	>
Frequency Stability	14	-	•		v	-	-	V	v				v		v	
E.R.P	14	-	•	v	v	-	-	٧	v		٧			٧	v	v
Radiated Spurious Emission	14		Worst Case							v	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 sputest under different RB size/offset and modulations in exploratory test. Subsequently, only emissions are reported.</li> <li>All the radiated test cases were performed with Adapter 2 and USB Cable 1.</li> </ol>															

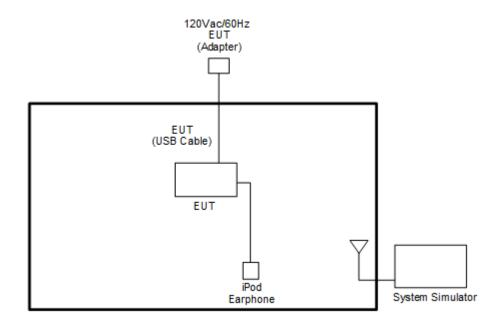
TEL: 886-3-327-3456 Page Number : 7 of 23
FAX: 886-3-328-4978 Issued Date : Jun. 04, 2020

Report Template No.: BU5-FGLTE90R Version 2.4

Report Version : 02

Report No.: FG042038C

#### 2.2 Connection Diagram of Test System



Report No.: FG042038C

#### 2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	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 4.5 dB and 10dB attenuator.

#### Example:

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

= 4.5 + 10 = 14.5 (dB)

TEL: 886-3-327-3456 Page Number: 8 of 23
FAX: 886-3-328-4978 Issued Date: 3 un. 04, 2020

### 2.5 Frequency List of Low/Middle/High Channels

LTE Band 14 Channel and Frequency List									
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest					
10	Channel	-	23330	-					
10	Frequency	-	793	-					
E	Channel	23305	23330	23355					
5	Frequency	790.5	793	795.5					

Report No. : FG042038C

TEL: 886-3-327-3456 Page Number : 9 of 23 : Jun. 04, 2020 FAX: 886-3-328-4978 Issued Date : 02



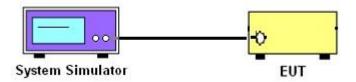
#### 3 Conducted Test Items

### 3.1 Measuring Instruments

See list of measuring instruments of this test report.

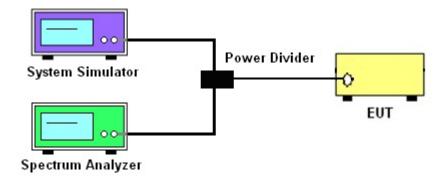
#### 3.1.1 Test Setup

#### 3.1.2 Conducted Output Power

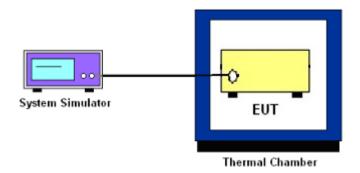


Report No.: FG042038C

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



#### 3.1.4 Frequency Stability



#### 3.1.5 Test Result of Conducted Test

Please refer to Appendix A.

TEL: 886-3-327-3456 Page Number : 10 of 23
FAX: 886-3-328-4978 Issued Date : Jun. 04, 2020

#### 3.2 Conducted Output Power Measurement and ERP

## 3.2.1 Description of the Conducted Output Power Measurement and ERP Measurement

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

Report No.: FG042038C

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

According to KDB 412172 D01 Power Approach,

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

 $P_T$  = transmitter output power in dBm

 $G_T$  = gain of the transmitting antenna in dBi

L<sub>C</sub> = 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 base station.
- 2. Set EUT at maximum power through base station.
- 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 23
FAX: 886-3-328-4978 Issued Date : Jun. 04, 2020

#### 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.: FG042038C

#### 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 23 : Jun. 04, 2020 FAX: 886-3-328-4978 Issued Date Report Version : 02

Report Template No.: BU5-FGLTE90R Version 2.4

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

Report No.: FG042038C

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.

TEL: 886-3-327-3456 Page Number : 13 of 23 FAX: 886-3-328-4978 Issued Date : Jun. 04, 2020

#### 3.5 Conducted Band Edge

#### 3.5.1 Description of Conducted Band Edge Measurement

90.543(e)

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

Report No.: FG042038C

- (2) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.
- (3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.

#### 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.
- 6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
- 7. Checked that all the results comply with the emission limit line.

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

TEL: 886-3-327-3456 : 14 of 23 Page Number : Jun. 04, 2020 FAX: 886-3-328-4978 Issued Date Report Version : 02

Report Template No.: BU5-FGLTE90R Version 2.4

#### 3.6 Emission Mask

#### 3.6.1 Description of Emissions Mask Measurement

Transmitters designed must meet the emission mask comply with the emission mask provisions of FCC Part 90.210(n).

Report No.: FG042038C

#### 3.6.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.0.

- 1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
- 2. The power of the modulated signal was measured on a spectrum analyzer using an RMS and 10 second sweep time in order to maximize the level.
- 3. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

TEL: 886-3-327-3456 Page Number : 15 of 23
FAX: 886-3-328-4978 Issued Date : Jun. 04, 2020

#### 3.7 Conducted Spurious Emission

#### 3.7.1 Description of Conducted Spurious Emission Measurement

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

Report No.: FG042038C

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

#### 3.7.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

- 1. The EUT was connected to spectrum analyzer and base station via power divider.
- 2. 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.
- 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)

TEL: 886-3-327-3456 Page Number : 16 of 23
FAX: 886-3-328-4978 Issued Date : Jun. 04, 2020

#### 3.8 Frequency Stability

#### 3.8.1 Description of Frequency Stability Measurement

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

Report No.: FG042038C

#### 3.8.2 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 base station.
- 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.

#### 3.8.3 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 base station.
- 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 : 17 of 23 : Jun. 04, 2020 FAX: 886-3-328-4978 Issued Date : 02



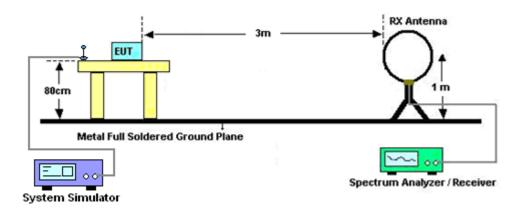
#### 4 Radiated Test Items

### 4.1 Measuring Instruments

See list of measuring instruments of this test report.

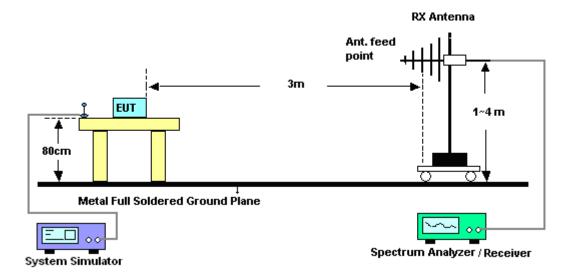
#### 4.1.1 Test Setup

#### For radiated emissions below 30MHz



Report No.: FG042038C

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



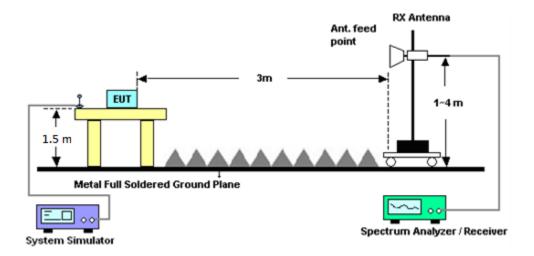
TEL: 886-3-327-3456 Page Number : 18 of 23
FAX: 886-3-328-4978 Issued Date : Jun. 04, 2020

Report Version

: 02

Report Template No.: BU5-FGLTE90R Version 2.4

#### For radiated test above 1GHz



Report No.: FG042038C

#### 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 a comparison data 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 : 19 of 23 FAX: 886-3-328-4978 Issued Date : Jun. 04, 2020 Report Version : 02

Report Template No.: BU5-FGLTE90R Version 2.4

4.2 Radiated Spurious Emission

4.2.1 Description of Radiated Spurious Emission

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

Report No.: FG042038C

The power of any emission outside of the authorized operating frequency ranges must be attenuated

below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the

band 1559–1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP)

for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the

purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative

of the type that will be used with the equipment in normal operation.

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.

1. 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, Sweep =

500ms, 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.

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

frequency band.

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

TEL: 886-3-327-3456 Page Number : 20 of 23 FAX: 886-3-328-4978 Issued Date : Jun. 04, 2020

## 5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
LTE Base Station	Anritsu	MT8820C	62014328 21	GSM/GPRS /WCDMA/LTE	Oct. 18, 2019	May 06, 2020~ May 12, 2020	Oct. 17, 2020	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101397	10Hz~40GHz	Nov. 15, 2019	May 06, 2020~ May 12, 2020	Nov. 14, 2020	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SH-641	92013720	-40°C~90°C	Sep. 02, 2019	May 06, 2020~ May 12, 2020	Sep. 01, 2020	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890094	1V~20V 0.5A~5A	Oct. 09, 2019	May 06, 2020~ May 12, 2020	Oct. 08, 2020	Conducted (TH05-HY)
Coupler	Warison	20dB 25W SMA Directional Coupler	#A	1-18GHz	Jan. 13, 2020	May 06, 2020~ May 12, 2020	Jan. 12, 2021	Conducted (TH05-HY)
Amplifier	Sonoma-Instru ment	310 N	187282	9KHz~1GHz	Dec. 17, 2019	May 05, 2020~ May 06, 2020	Dec. 16, 2020	Radiation (03CH13-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800N1 D01N-06	40103&07	30MHz to 1GHz	Apr. 29, 2020	May 05, 2020~ May 06, 2020	Apr. 28, 2021	Radiation (03CH13-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800N1 D01N-06	41912 & 07	30MHz to 1GHz	Apr. 29, 2020	May 05, 2020~ May 06, 2020	Apr. 28, 2021	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-12 41	1GHz ~ 18GHz	Jul. 02, 2019	May 05, 2020~ May 06, 2020	Jul. 01, 2020	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-12 12	1GHz ~ 18GHz	May 14, 2019	May 05, 2020~ May 06, 2020	May 13, 2020	Radiation (03CH13-HY)
Preamplifier	MITEQ	AMF-7D-001018 00-30-10P	1590074	1GHz~18GHz	May 20, 2019	May 05, 2020~ May 06, 2020	May 19, 2020	Radiation (03CH13-HY)
Preamplifier	Keysight	83017A	MY532701 47	1GHz~26.5GHz	Oct. 28, 2019	May 05, 2020~ May 06, 2020	Oct. 27, 2010	Radiation (03CH13-HY)
Signal Generator	Rohde & Schwarz	SMF100A	101107	100kHz~40GHz	Aug. 27, 2019	May 05, 2020~ May 06, 2020	Aug. 26, 2020	Radiation (03CH13-HY)
Spectrum Analyzer	Keysight	N9010A	MY553705 26	10Hz~44GHz	Mar. 20, 2020	May 05, 2020~ May 06, 2020	Mar. 19, 2021	Radiation (03CH13-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	May 05, 2020~ May 06, 2020	N/A	Radiation (03CH13-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	May 05, 2020~ May 06, 2020	N/A	Radiation (03CH13-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	May 05, 2020~ May 06, 2020	N/A	Radiation (03CH13-HY)
Software	Audix	E3 6.2009-8-24	RK-00099 2	N/A	N/A	May 05, 2020~ May 06, 2020	N/A	Radiation (03CH13-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz ~ 40GHz	Dec. 13, 2019	May 05, 2020~ May 06, 2020	Dec. 12, 2020	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0030/126E	30M-18G	Feb. 12, 2020	May 05, 2020~ May 06, 2020	Feb. 21, 2021	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	804793/4	30M-18G	Feb. 12, 2020	May 05, 2020~ May 06, 2020	Feb. 21, 2021	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30M~40GHz	Feb. 25, 2020	May 05, 2020~ May 06, 2020	Feb. 24, 2021	Radiation (03CH13-HY)

Report No.: FG042038C

TEL: 886-3-327-3456 Page Number : 21 of 23 FAX: 886-3-328-4978 Issued Date : Jun. 04, 2020

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA917058 4	18GHz- 40GHz	Dec. 10, 2019	May 05, 2020~ May 06, 2020	Dec. 09, 2020	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA917057 6	18GHz~40GHz	May 14, 2019	May 05, 2020~ May 06, 2020	May 13, 2020	Radiation (03CH13-HY)
Filter	Wainwright	WHKX12-2700 -3000-18000-6 0SS	SN2	3GHz High Pass Filter	Jul. 14, 2019	May 05, 2020~ May 06, 2020	Jul. 13, 2020	Radiation (03CH13-HY)
Filter	Wainwright	WHKX12-1080 -1200-15000-6 0SS	SN3	1.2GHz High Pass Filter	Jul. 03, 2019	May 05, 2020~ May 06, 2020	Jul. 02, 2020	Radiation (03CH13-HY)
Hygrometer	TECPEL	DTM-303B	TP157151	N/A	Jun. 17, 2019	May 05, 2020~ May 06, 2020	Jun. 16, 2020	Radiation (03CH13-HY)

Report No. : FG042038C

TEL: 886-3-327-3456 Page Number : 22 of 23
FAX: 886-3-328-4978 Issued Date : Jun. 04, 2020



### 6 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of	0.04
Confidence of 95% (U = 2Uc(y))	3.21

Report No.: FG042038C

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

Measuring Uncertainty for a Level of	3.24
Confidence of 95% (U = 2Uc(y))	3.24

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

Measuring Uncertainty for a Level of	3.99
Confidence of 95% (U = 2Uc(y))	3.99

TEL: 886-3-327-3456 Page Number : 23 of 23 FAX: 886-3-328-4978 Issued Date : Jun. 04, 2020

Report Template No.: BU5-FGLTE90R Version 2.4

Report Version : 02



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

### Conducted Output Power(Average power)

LTE Band 14 Maximum Average Power [dBm]									
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest			
10	1	0			23.16				
10	1	25			23.10				
10	1	49			23.13				
10	25	0	QPSK		22.21				
10	25	12			22.18				
10	25	25			22.13				
10	50	0			22.18				
10	1	0		-	22.50	-			
10	1	25			22.45				
10	1	49			22.49				
10	25	0	16-QAM		21.34				
10	25	12			21.29				
10	25	25			21.24				
10	50	0			21.27				
5	1	0		23.05	23.12	23.02			
5	1	12		22.96	22.96	22.92			
5	1	24		23.00	23.00	22.95			
5	12	0	QPSK	22.06	22.12	22.03			
5	12	7		22.11	22.12	22.08			
5	12	13		21.91	21.97	21.90			
5	25	0		22.11	22.12	22.02			
5	1	0		22.31	22.41	22.35			
5	1	12		22.30	22.32	22.26			
5	1	24		22.32	22.40	22.33			
5	12	0	16-QAM	21.18	21.22	21.20			
5	12	7		21.00	21.12	21.04			
5	12	13		21.04	21.13	21.13			
5	25	0		20.99	21.08	21.02			

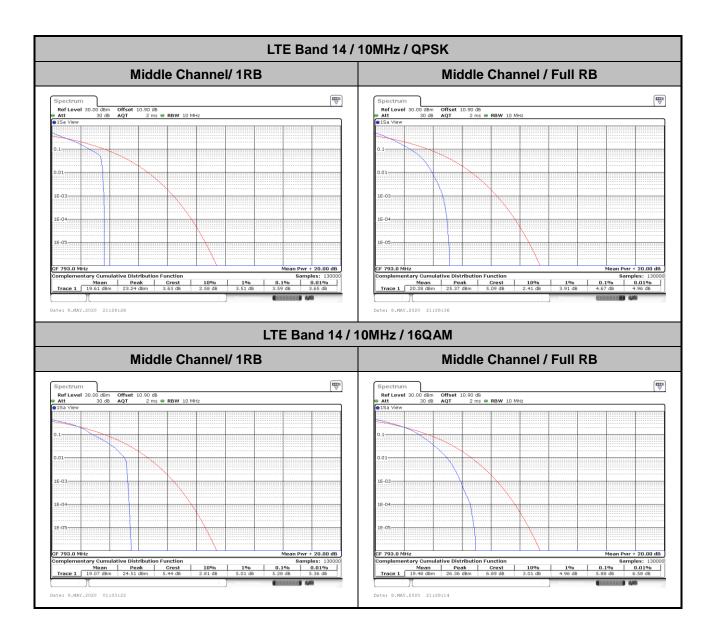
### LTE Band 14

## Peak-to-Average Ratio

Mode					
Mod.	QP	SK	16C	Limit: 13dB	
RB Size	1RB	Full RB	1RB	Full RB	Result
Lowest CH	-	-	-	-	
Middle CH	3.59	4.67	5.28	5.88	PASS
Highest CH	-	-	-	-	

Report No. : FG042038C

TEL: 886-3-327-3456 Page Number : A2-1 of 23



Report No.: FG042038C

TEL: 886-3-327-3456 Page Number : A2-2 of 23

## 26dB Bandwidth

Mode	LTE Band 14 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	-	-	-	-	4.93	4.88	-	-	-	-	-	-
Middle CH	-	-	-	-	4.94	4.89	9.77	9.71	-	-	-	-
Highest CH	-	-	-	-	4.98	4.95		-	-	-	-	-

Report No.: FG042038C

TEL: 886-3-327-3456 Page Number : A2-3 of 23

CF 795.5 MHz Marker

Type Ref Trc

Date: 8.MAY.2020 20:58:23

FAX: 886-3-328-4978

 X-value
 Y-value
 Function

 797.658 MHz
 13.78 dbm
 nd8 down

 792.993 MHz
 -12.56 dbm
 nd8

 797.968 MHz
 -12.06 dbm
 Q factor

LTE Band 14 Lowest Channel / 5MHz / QPSK Lowest Channel / 5MHz / 16QAM Ref Level 30.00 dBm Offset 10.90 dB • RBW 100 kHz
Att 30 dB SWT 19 µs • VBW 300 kHz Mode Auto FFT
\$1PK Max Ref Level 30.00 dBm Offset 10.90 dB ● RBW 100 kHz
Att 30 dB SWT 19 µs ● VBW 300 kHz Mode Auto FFT
SGL Count 100/100 14.39 dBr 791.57900 MH 26.00 d 4.925000000 MH 12.77 dBn 788.45200 MH 26.00 dl M1[1] M1[1] 161 -30 dBn -30 dBm 40 dBm CF 790.5 MHz Y-value Function
2 14.39 dBm ndB down
3 -11.54 dBm ndB
4 -11.43 dBm Q factor Type | Ref | Trc | Function ndB down Date: 8.MAY.2020 20:47:15 Middle Channel / 5MHz / QPSK Middle Channel / 5MHz / 16QAM 30.00 dBm 30 dB SGL Count 100/100 13.00 dBn 791.37200 MH 26.00 dl 14.71 dBr 791.11200 MH 26.00 d M1[1] M1[1] -10 dBm-30.dBm-40 dBm -50 dBm-Function Result 4.935 MHz 26.00 dB 160.3 Type Ref Trc 
 X-value
 Y-value
 Function

 791.112 MHz
 14.71 dBm
 nd8 down

 790.522 MHz
 -11.18 dBm
 nd8

 795.458 MHz
 -11.47 dBm
 Q factor

 X-value
 Y-value
 Function

 791.372 MHz
 13.00 dBm
 nd8 down

 790.562 MHz
 -12.87 dBm
 nd8

 795.448 MHz
 -12.93 dBm
 Q factor
 Highest Channel / 5MHz / 16QAM Highest Channel / 5MHz / QPSK | Spectrum | Ref Level 30.00 dBm | Offset | 10.90 dB | RBW | 100 kHz | 100 k 13.78 dBi 797.65800 Am 20 dBm--10 dBm -20 dBm--60 dBm-

Report No.: FG042038C

Function Result 4.945 MHz 26.00 dB 161.2

Function Result 4.975 MHz CF 795.5 MHz

Type Ref Trc

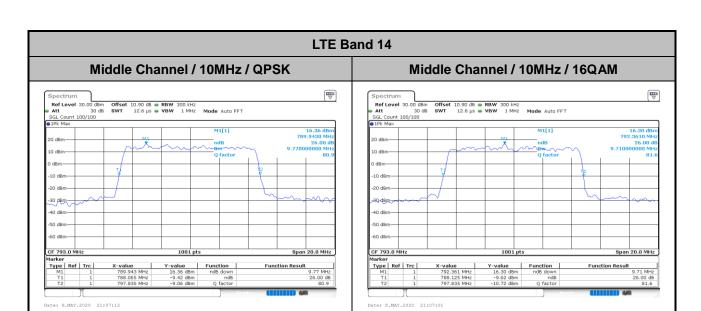
Date: 8.MAY.2020 20:58:11

 X-value
 Y-value
 Function

 797.058 MHz
 13.92 dBm
 nd8 down

 793.012 MHz
 -11.76 dBm
 nd8

 797.958 MHz
 -12.41 dBm
 Q factor



Report No.: FG042038C

TEL: 886-3-327-3456 Page Number: A2-5 of 23

## **Occupied Bandwidth**

Mode	LTE Band 14 : 99%OBW(MHz)											
BW	1.4	ИHz	31/	lHz	5MHz 10MHz		15MHz		20MHz			
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	-	-	-	-	4.49	4.46	-	-	-	-	-	-
Middle CH	-	-	-	-	4.48	4.49	9.03	9.03	-	-	-	-
Highest CH	-	-	-	-	4.47	4.50	-	-	-	-	-	-

Report No.: FG042038C

TEL: 886-3-327-3456 Page Number : A2-6 of 23

CF 795.5 MHz Marker

Type Ref Trc

Date: 8.MAY.2020 20:57:47

1001 pt:

 X-value
 Y-value
 Function

 796.429 MHz
 14.32 dBm
 793.26224 MHz
 8.61 dBm
 Occ Bw

 797.72777 MHz
 9.82 dBm
 9.82 dBm
 Occ Bw

LTE Band 14 Lowest Channel / 5MHz / QPSK Lowest Channel / 5MHz / 16QAM 14.97 dBr 792.53800 MH 4.485514486 MH 13.86 dBn 790.87000 MH 4.455544456 MH M1[1] M1[1] 10 dBmdBm--20 dBm--30 dBm -38°d8m-40 dBm--50 dBm-CF 790.5 MHz CF 798.5 MHz Date: 8.MAY.2020 20:47:03 Date: 8.MAY.2020 20:46:51 Middle Channel / 5MHz / QPSK Middle Channel / 5MHz / 16QAM Ref Level 30.00 dBm
Att 30 dB
SGL Count 100/100
1Pk Max 13.28 dBn 791.48200 MH 4.485514486 MH 14.81 dBn 793.29000 MH 4.475524476 MH M1[1] M1[1] -10 dBm--30 dBm-40 dBm--50 dBm -50 dBm 1001 pts 
 Marker
 Trc
 X-value
 Y-value
 Function

 M1
 1
 791.492 MHz
 13.28 dbm
 13.28 dbm

 T1
 1
 790.76224 MHz
 7.42 dbm
 Occ Bw

 T2
 1
 795.24775 MHz
 8.34 dbm
 Occ Bw

 X-value
 Y-value
 Function

 793.29 MHz
 14.81 dBm
 Occ Bw

 790.76224 MHz
 9.78 dBm
 Occ Bw

 795.23776 MHz
 9.97 dBm
 Occ Bw
 Function Result Function Result 4.475524476 MHz 4.485514486 MHz Highest Channel / 5MHz / QPSK Highest Channel / 5MHz / 16QAM | Spectrum | Ref Level 30.00 dem | Offset 10.50 dB | RBW 100 kHz | Ref Level 30.00 | SWT | 19 µs | VBW 300 kHz | Mode | Auto FFT | SGL Count 100/100 | SWT | SGL Count 100/100 20 dBm-10 dBm--10 dBm -20 dBm -20 dBm--40 dBm -60 dBm--60 dBm-

Report No.: FG042038C

Function Result

4.465534466 MHz

CF 795.5 MHz

Date: 8.MAY.2020 20:57:59

1001 pts

 Marker
 Y-value
 Y-value
 Function

 M1
 1
 796.569 MHz
 13.59 dBm
 13.59 dBm

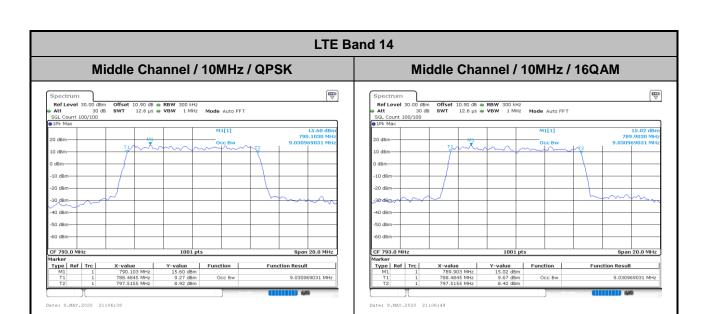
 T1
 1
 792.5225 MHz
 7.86 dBm
 Occ Bw

 T2
 1
 797.74775 MHz
 8.98 dBm
 Occ Bw

Span 10.0 MHz

4.495504496 MHz

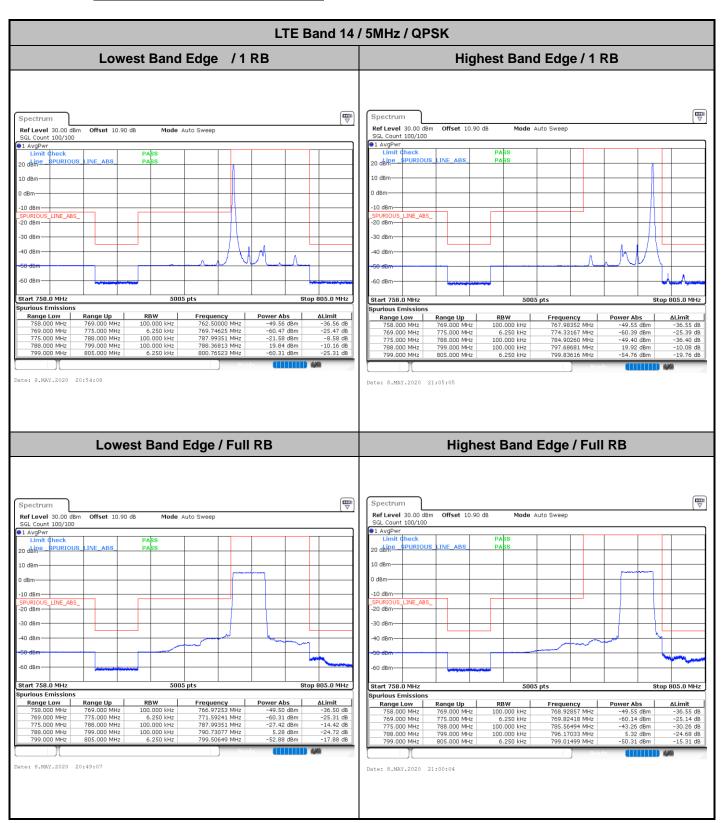
Function Result



Report No. : FG042038C

TEL: 886-3-327-3456 Page Number: A2-8 of 23

### **Conducted Band Edge**



Report No.: FG042038C

TEL: 886-3-327-3456 Page Number : A2-9 of 23

LTE Band 14 / 5MHz / 16QAM Lowest Band Edge /1 RB Highest Band Edge / 1 RB Spectrum Ref Level 30.00 dBm Offset 10.90 dB Mode Auto Sweep Ref Level 30.00 dBm Offset 10.90 dB Mode Auto Sweep SGL Count 100/100 SGL Count 100/100 1 AvgPwr 20 deine SPURIOUS\_ PAS 20 dkine 10 dBm-10 dBm 0 dBmdBm -10 dBm -10 dBm-20 dBm 20 dBm-60 dBm-Stop 805.0 MHz Start 758.0 MHz 5005 pts Start 758.0 MH: purious Emission Spurious Emission Range Up 769.000 MHz 775.000 MHz 788.000 MHz 799.000 MHz 805.000 MHz Power Abs -49.53 dBm -60.57 dBm -22.42 dBm 19.13 dBm -60.00 dBm Range Low Range Low 758.000 MHz 769.000 MHz 775.000 MHz Frequency
768.30220 MHz
770.89111 MHz
784.82468 MHz
797.63187 MHz
801.95205 MHz -36.51 dB -25.44 dB -36.42 dB -10.86 dB -21.21 dB ∆Limit -36.53 dB -25.57 dB -9.42 dB -10.87 dB -25.00 dB 775.000 MHz 775.000 MHz 788.000 MHz 799.000 MHz 805.000 MHz 6.250 kHz 100.000 kHz 100.000 kHz 6.250 kHz -60.44 dBm -49.42 dBm 769.000 MHz 775.000 MHz Date: 8.MAY.2020 20:52:28 Lowest Band Edge / Full RB **Highest Band Edge / Full RB** Spectrum Spectrum Ref Level 30.00 dBm Offset 10.90 dB Mode Auto Sweep Ref Level 30.00 dBm Offset 10.90 dB SGL Count 100/100 Mode Auto Sweep SGL Count 100/100 1 AvgPwr imit ¢heck ●1 AvgPwr SPURIOUS PASS an akine 10 dBm-0 dBm--10 dBm--10 dBm-20 dBm--20 dBm-30 dBm -30 dBm 40 dBm-05.0 MHz Start 758.0 MHz Spurious Emissions Spurious Emission Range Up 769.000 MHz 775.000 MHz 788.000 MHz 799.000 MHz 805.000 MHz Power Abs
-49.56 dBm
-60.60 dBm
-30.39 dBm
4.34 dBm
-53.99 dBm RBW 100.000 kHz 6.250 kHz 100.000 kHz 100.000 kHz 767.86264 MHz 771.86214 MHz 787.99351 MHz 791.46703 MHz Range Up 769.000 MHz 775.000 MHz 788.000 MHz 799.000 MHz 805.000 MHz Frequency
763.25824 MHz
772.83317 MHz
787.92857 MHz
796.47802 MHz
799.08691 MHz Range Low 769.000 MHz 775.000 MHz 788.000 MHz 799.32667 MHz Date: 8.MAY.2020 20:50:48 Date: 8.MAY.2020 21:01:44

Report No.: FG042038C

TEL: 886-3-327-3456 Page Number : A2-10 of 23

LTE Band 14 / 10MHz / QPSK Lowest Band Edge / 1 RB Highest Band Edge / 1 RB Spectrum Spectrum Ref Level 30.00 dBm Offset 10.90 dB Offset 10.90 dB Mode Auto Sweep Ref Level 30.00 dBm Mode Auto Sweep SGL Count 100/100 SGL Count 100/100 ●1 AvgPwr Limit 20 deine SPURIOUS LINE ABS SPURIOUS\_LINE\_ABS -10 dBm--10 dBm-LINE\_ABS .INE\_ABS\_ 20 dBm -20 dBm-30 dBm 30 dBm-Stop 805.0 MHz Start 758.0 MHz Spurious Emissio Start 758.0 MHz Spurious Emissio 5005 pts Stop 805.0 MHz Range Up 769.000 MHz 775.000 MHz 788.000 MHz 799.000 MHz 805.000 MHz Power Abs -49.51 dBm -60.17 dBm -34.03 dBm 19.77 dBm -59.13 dBm Range Low
758.000 MHz
769.000 MHz
775.000 MHz
775.000 MHz
788.000 MHz
799.000 MHz Range Up 769.000 MHz 775.000 MHz 788.000 MHz 799.000 MHz 805.000 MHz Frequency
768.88462 MHz
773.73227 MHz
779.78571 MHz
797.40110 MHz
801.83217 MHz Power Abs -49.55 dBm -60.39 dBm -47.01 dBm 19.90 dBm -54.73 dBm ∆Limit Range Low Date: 8.MAY.2020 21:13:52 Date: 8.MAY.2020 21:15:31 Band Edge / Full RB Spectrum Ref Level 30.00 dBm Offset 10.90 dB Mode Auto Sweep SGL Count 100/100 ●1 AvgPwr PASS 20 dbine SPURIOUS LINE ABS PABS 10 dBm-0 dBm--10 dBm-LINE\_ABS -20 dBm--30 dBm--40 dBm--60 dBm-Start 758.0 MHz 5005 pts Stop 805.0 MHz Spurious Emissions Frequency 761.39011 MHz 774.79321 MHz Range Low Range Up 769.000 MHz Power Abs 100.000 kHz -49.51 dBm -60.23 dBm -36.51 dB -25.23 dB 758,000 MHz 769.000 MHz 775.000 MHz 100.000 kHz 775.000 MHz 788.000 MHz 787.99351 MHz -31.82 dBm -18.82 dB 788.000 MHz 799.000 MHz 100.000 kHz 790.51099 MHz 2.32 dBm -27.68 dB 799.000 MHz 805.000 MHz 6.250 kHz 799.24875 MHz -49.95 dBm -14.95 dB Date: 8.MAY.2020 21:08:52

Report No.: FG042038C

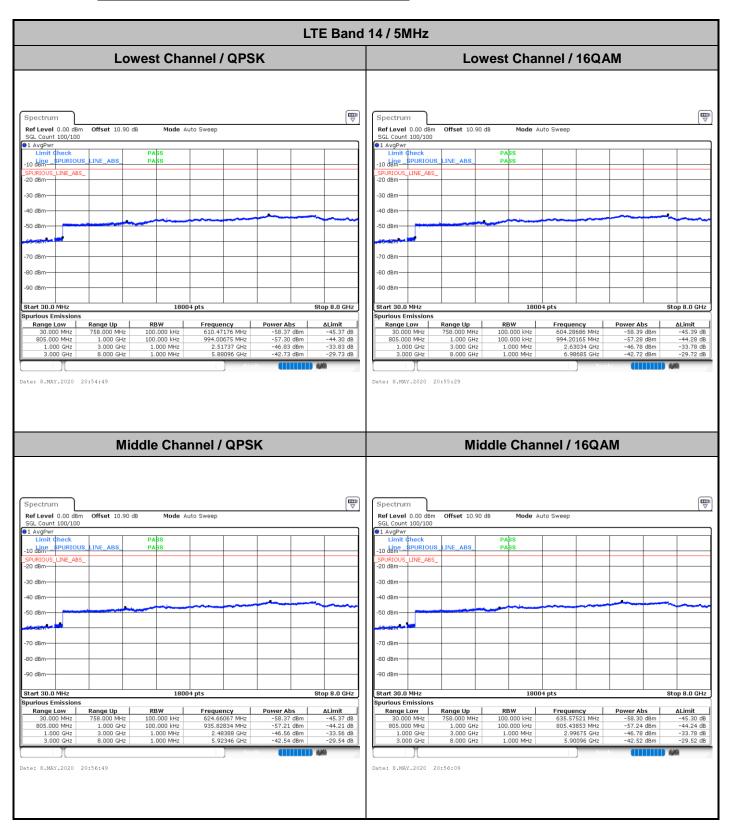
TEL: 886-3-327-3456 Page Number : A2-11 of 23

LTE Band 14 / 10MHz / 16QAM Lowest Band Edge / 1 RB Highest Band Edge / 1 RB Spectrum Spectrum Ref Level 30.00 dBm Offset 10.90 dB Offset 10.90 dB Mode Auto Sweep Ref Level 30.00 dBm Mode Auto Sweep SGL Count 100/100 SGL Count 100/100 ●1 AvgPwr Limit 20 deine SPURIOUS LINE ABS SPURIOUS\_LINE\_ABS -10 dBm--10 dBm-LINE\_ABS .INE\_ABS\_ 20 dBm -20 dBm-30 dBm 30 dBm-Stop 805.0 MHz Start 758.0 MHz Spurious Emissio Start 758.0 MHz Spurious Emissio 5005 pts Stop 805.0 MHz Range Up 769.000 MHz 775.000 MHz 788.000 MHz 799.000 MHz 805.000 MHz Power Abs
-49.54 dBm
-60.51 dBm
-35.05 dBm
19.10 dBm
-59.95 dBm Range Low
758.000 MHz
769.000 MHz
775.000 MHz
775.000 MHz
788.000 MHz
799.000 MHz Frequency
760.70879 MHz
774.88911 MHz
787.99351 MHz
788.56593 MHz
801.80819 MHz Range Up 769.000 MHz 775.000 MHz 788.000 MHz 799.000 MHz 805.000 MHz 765.73077 MHz 765.73077 MHz 769.05694 MHz 779.74675 MHz 797.37912 MHz 801.81419 MHz Power Abs -49.58 dBm -60.48 dBm -47.45 dBm 19.24 dBm -57.35 dBm ∆Limit Range Low Date: 8.MAY.2020 21:12:12 Date: 8.MAY.2020 21:17:11 Band Edge / Full RB Spectrum Ref Level 30.00 dBm Offset 10.90 dB Mode Auto Sweep SGL Count 100/100 ●1 AvgPwr PASS 20 dbine SPURIOUS LINE ABS PABS 10 dBm-0 dBm--10 dBm-LINE\_ABS -20 dBm--30 dBm--40 dBm--60 dBm-Start 758.0 MHz 5005 pts Stop 805.0 MHz Spurious Emissions Frequency 768.15934 MHz 771.25075 MHz Range Low Range Up 769.000 MHz Power Abs 100.000 kHz -49.53 dBm -60.34 dBm -36.53 dB -25.34 dB 758,000 MHz 769.000 MHz 775.000 MHz 100.000 kHz 775.000 MHz 788.000 MHz 787.99351 MHz -36.08 dBm -23.08 dB 788.000 MHz 799.000 MHz 100.000 kHz 791.26923 MHz 1.59 dBm -28.41 dB 799.000 MHz 805.000 MHz 6.250 kHz 800.20180 MHz -50.03 dBm -15.03 dB Date: 8.MAY.2020 21:10:32

Report No.: FG042038C

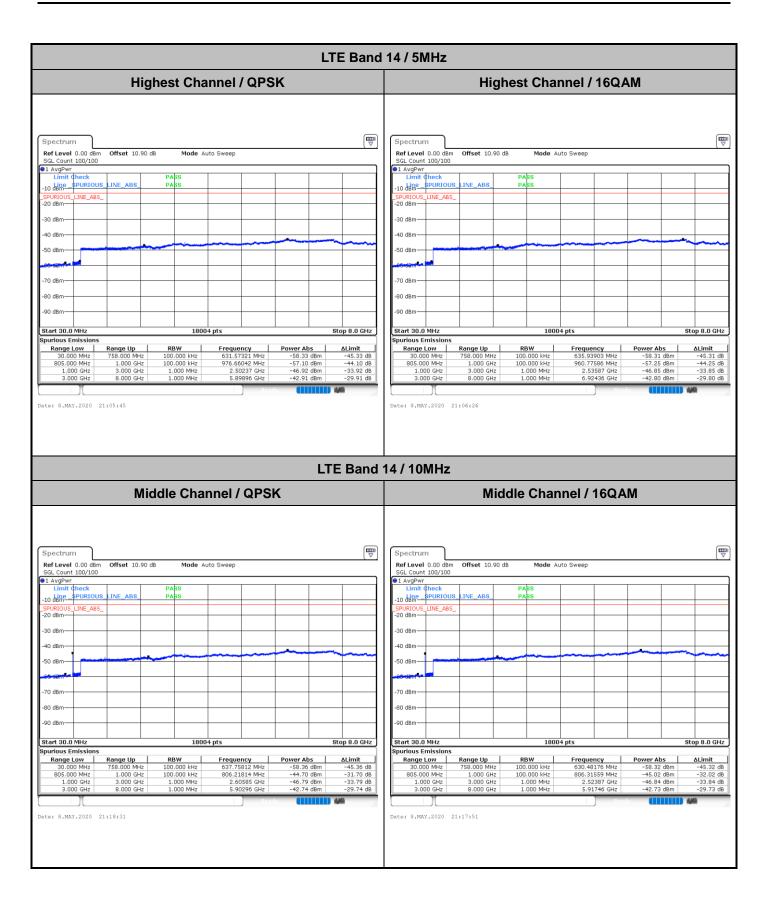
TEL: 886-3-327-3456 Page Number : A2-12 of 23

# **Conducted Spurious Emission**



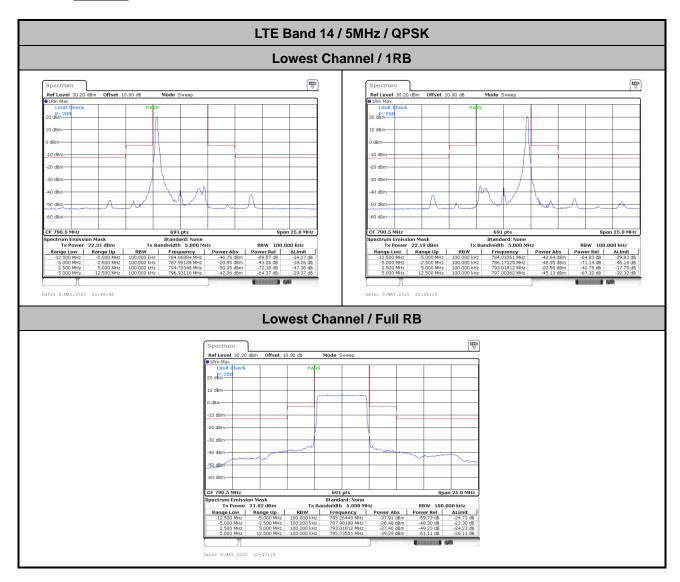
Report No.: FG042038C

TEL: 886-3-327-3456 Page Number : A2-13 of 23

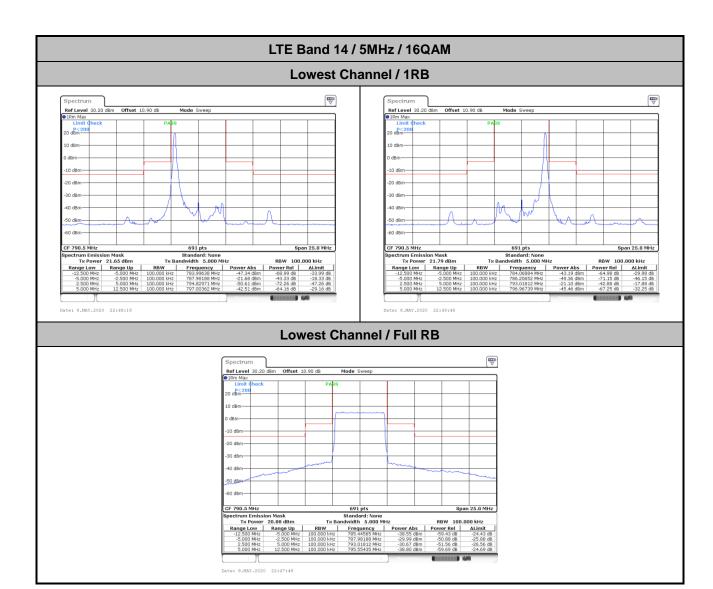


TEL: 886-3-327-3456 Page Number: A2-14 of 23 FAX: 886-3-328-4978

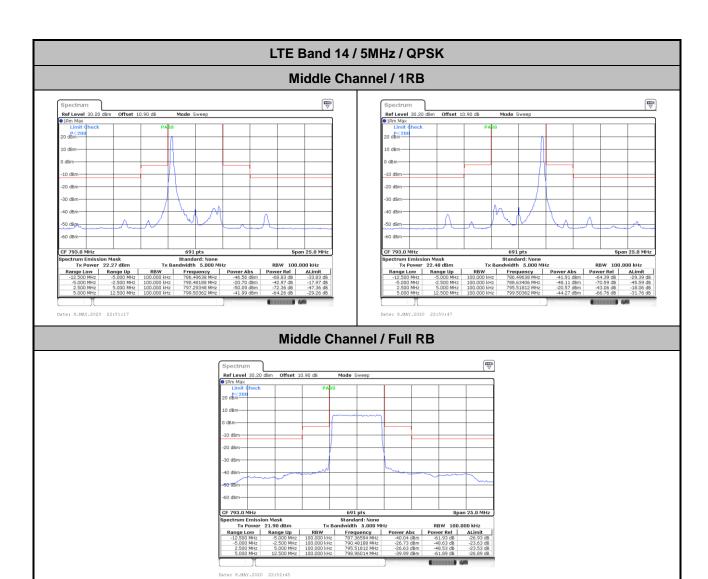




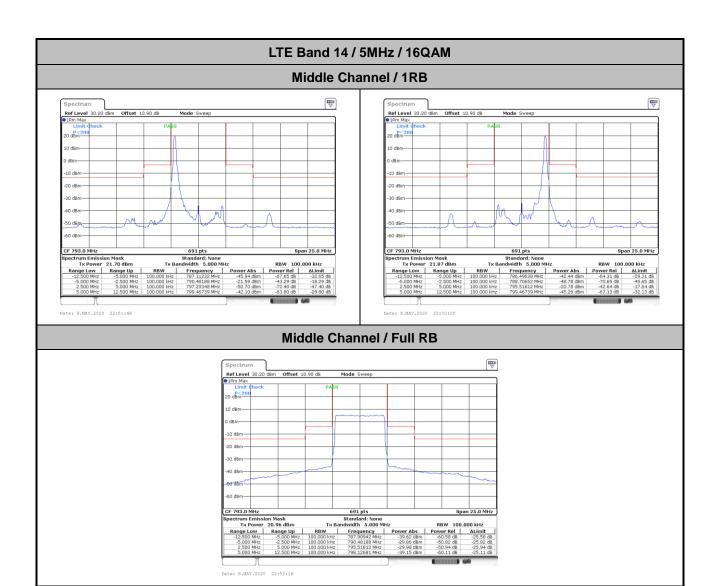
TEL: 886-3-327-3456 Page Number : A2-15 of 23



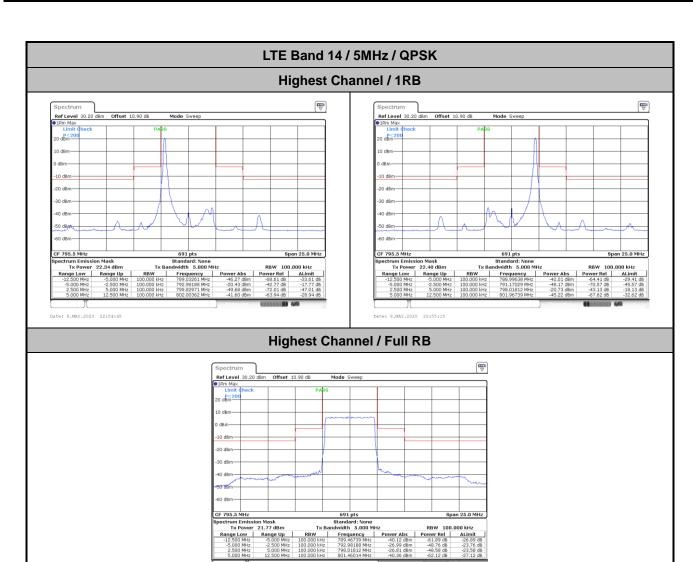
TEL: 886-3-327-3456 Page Number : A2-16 of 23



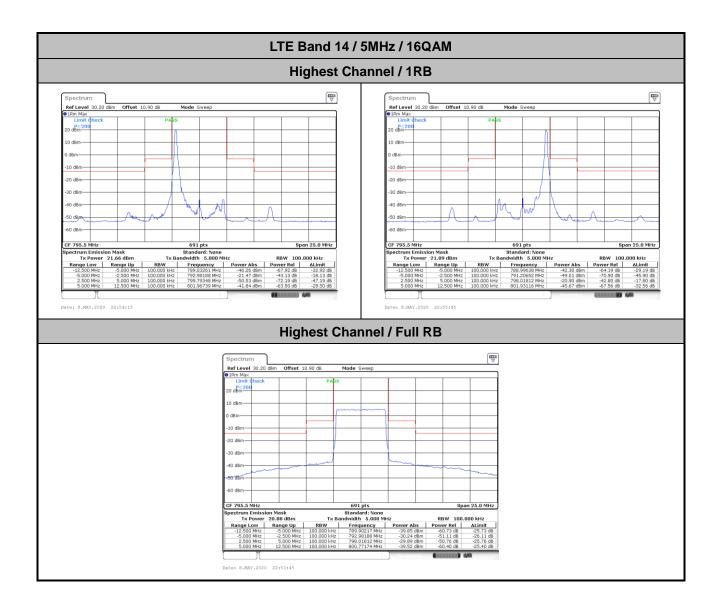
TEL: 886-3-327-3456 Page Number : A2-17 of 23



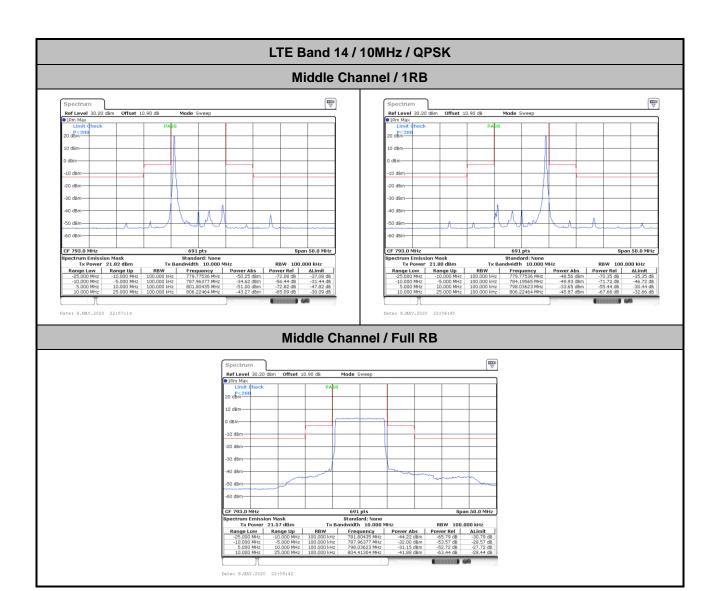
TEL: 886-3-327-3456 Page Number : A2-18 of 23



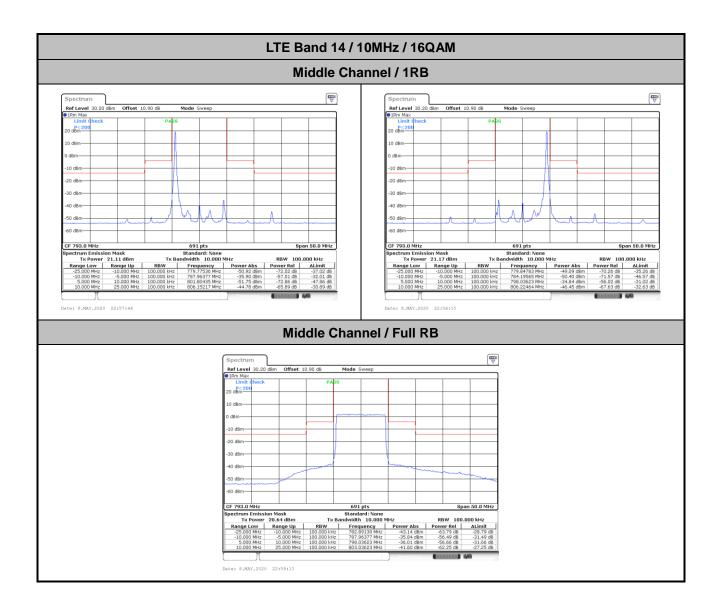
TEL: 886-3-327-3456 Page Number: A2-19 of 23



TEL: 886-3-327-3456 Page Number : A2-20 of 23



TEL: 886-3-327-3456 Page Number : A2-21 of 23



TEL: 886-3-327-3456 Page Number : A2-22 of 23

# Frequency Stability

Test Conditions		LTE Band 14 (QPSK) / Middle Channel				
T	Welfe we	BW 10MHz	Note 2.			
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result			
50	Normal Voltage	0.0016				
40	Normal Voltage	0.0014				
30	Normal Voltage	0.0008				
20(Ref.)	Normal Voltage	0.0000				
10	Normal Voltage	0.0015				
0	Normal Voltage	0.0013				
-10	Normal Voltage	0.0001	PASS			
-20	Normal Voltage	0.0006				
-30	Normal Voltage	0.0016				
20	Maximum Voltage	0.0006				
20	Normal Voltage	0.0000				
20	Battery End Point	0.0026				

Report No.: FG042038C

#### Note:

- 1. Normal Voltage =3.8 V.; Battery End Point (BEP) =3.4 V.; Maximum Voltage =4.2 V.
- **2.** The frequency fundamental emissions stay within the authorized frequency block.

TEL: 886-3-327-3456 Page Number : A2-23 of 23

### **Appendix B. Test Results of ERP and Radiated Test**

# ERP

LTE Band 14 / 5MHz (Average) (GT - LC = -0.5 dB)									
Channel	Mode	RB		Cond	ucted	ERP			
		Size	Offset	Power (dBm)	Power (Watts)	ERP(dBm)	ERP(W)		
Lowest	QPSK	1	0	23.05	0.2018	20.40	0.1096		
Middle		1	0	23.12	0.2051	20.47	0.1114		
Highest		1	0	23.02	0.2004	20.37	0.1089		
Lowest		1	0	22.31	0.1702	19.66	0.0925		
Middle	16QAM	1	0	22.41	0.1742	19.76	0.0946		
Highest		1	0	22.35	0.1718	19.70	0.0933		
Limit	ERP < 3W			Re	sult	PASS			

LTE Band 14 / 10MHz (Average) (GT - LC = -0.5 dB)										
Channel	Mode	RB		Cond	ucted	ERP				
		Size	Offset	Power (dBm)	Power (Watts)	ERP(dBm)	ERP(W)			
Lowest	QPSK	-	-	-	-	-	-			
Middle		1	0	23.16	0.2070	20.51	0.1125			
Highest		-	-	-	-	-	-			
Lowest		-	-	-	-	-	-			
Middle	16QAM	1	0	22.50	0.1778	19.85	0.0966			
Highest		-	-	-	-	-	-			
Limit	ERP < 3W			Re	sult	PASS				

# **Radiated Spurious Emission**

## LTE Band 14

Report No.: FG042038C

LTE Band 14 / 5MHz / QPSK									
Channel	Frequency ( MHz )	ERP (dBm)	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
	1581	-62.04	-42.15	-19.89	-75.11	-67.20	1.20	8.51	Н
	2371.5	-58.61	-13	-45.61	-75.82	-65.44	1.42	10.40	Н
	3162	-56.68	-13	-43.68	-75.71	-64.32	1.59	11.39	Н
Lowest									Н
Lowest	1581	-62.46	-42.15	-20.31	-75.34	-67.62	1.20	8.51	V
	2371.5	-57.74	-13	-44.74	-75.49	-64.57	1.42	10.40	V
	3162	-56.73	-13	-43.73	-75.93	-64.37	1.59	11.39	V
									V
	1577	-61.95	-42.15	-19.80	-75.08	-67.09	1.20	8.49	Н
	2365	-58.40	-13	-45.40	-75.66	-65.22	1.42	10.39	Н
	3154	-56.82	-13	-43.82	-75.8	-64.45	1.59	11.36	Н
N AC -L-II -									Н
Middle	1577	-62.14	-42.15	-19.99	-75.07	-67.28	1.20	8.49	V
	2365	-58.24	-13	-45.24	-76.04	-65.06	1.42	10.39	V
	3154	-56.34	-13	-43.34	-75.53	-63.97	1.59	11.36	V
									V
	1593	-62.03	-42.15	-19.88	-74.99	-67.23	1.21	8.55	Н
	2389.5	-58.57	-13	-45.57	-75.64	-65.41	1.42	10.41	Н
Highest	3186	-57.15	-13	-44.15	-76.26	-64.85	1.61	11.46	Н
									Н
	1593	-62.31	-42.15	-20.16	-75.1	-67.51	1.21	8.55	V
	2389.5	-58.05	-13	-45.05	-75.67	-64.89	1.42	10.41	V
	3186	-56.75	-13	-43.75	-76.02	-64.45	1.61	11.46	V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

TEL: 886-3-327-3456 Page Number: B2-1 of 2

LTE Band 14 / 10MHz / QPSK										
Channel	Frequency ( MHz )	ERP (dBm)	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)	
Middle	1577	-61.70	-42.15	-19.55	-74.83	-66.84	1.20	8.49	Н	
	2365	-58.55	-13	-45.55	-75.81	-65.37	1.42	10.39	Н	
	3154	-56.88	-13	-43.88	-75.86	-64.51	1.59	11.36	Н	
									Н	
	1577	-61.88	-42.15	-19.73	-74.81	-67.02	1.20	8.49	V	
	2365	-57.69	-13	-44.69	-75.49	-64.51	1.42	10.39	V	
	3154	-56.78	-13	-43.78	-75.97	-64.41	1.59	11.36	V	
									V	

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

TEL: 886-3-327-3456 Page Number : B2-2 of 2