

Report No.: FG051232-02D



FCC RADIO TEST REPORT

FCC ID : IHDT56ZB1

Equipment : Mobile Cellular Phone

Brand Name : Motorola

Model Name : XT2071-2, XT2071-3, XT2071-5

Applicant : Motorola Mobility, LLC

222 W Merchandise Mart Plaza, Suite 1800,

Chicago, IL 60654, United States

Manufacturer : Motorola Mobility, LLC

222 W Merchandise Mart Plaza, Suite 1800,

Chicago, IL 60654, United States

Standard : FCC 47 CFR Part 2, Part 27(D)

The product was received on May 22, 2020 and testing was started from Jun. 13, 2020 and completed on Jul. 26, 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 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.

Lunis Wu

Approved by: Louis Wu

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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

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Report Version : 01

History of this test report

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Report No.	Version	Description	Issued Date
FG051232-02D	01	Initial issue of report	Jul. 30, 2020

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Summary of Test Result

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Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark	
3.2	§2.1046	Conducted Output Power and Effective Isotropic Radiated Power	Reporting only	-	
3.3	-	Peak-to-Average Ratio	Reporting only	-	
3.4	§27.50 (a)(3)	EIRP Power Density	Pass	-	
3.5	§2.1049	Occupied Bandwidth	Reporting only	-	
3.6	§2.1051 §27.53 (a)(4)	Conducted Band Edge Measurement	Pass	-	
3.7	§2.1051 §27.53 (a)(4)	Conducted Spurious Emission	Pass	-	
3.8	§2.1055 §27.54	Frequency Stability Temperature & Voltage	Pass	-	
4.2	§2.1053 §27.53 (a)(4)	Radiated Spurious Emission	Pass	Under limit 17.00 dB at 9241.500 MHz for PT Antenna Under limit 17.20 dB at 9241.500 MHz for ASDIV Antenna	

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: Ruby Zou

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1 General Description

1.1 Product Feature of Equipment Under Test

	Product Feature							
Equipment	Mobile Cellular F	hone						
Brand Name	Motorola							
Model Name	XT2071-2, XT20	71-3, XT2071-5						
FCC ID	IHDT56ZB1							
	Conducted :	IMEI 1: 353590110016717						
IMEI Code	Conducted:	IMEI 2: 353590110016725						
IWEI Code	Radiation :	IMEI 1: 353590110017517						
	Radiation .	IMEI 2: 353590110017525						
	CDMA/EV-DO/G	SM/EGPRS/WCDMA/HSPA/LTE/5G NR/						
	GNSS/NFC							
EUT supports Radios application	WLAN 11a/b/g/n	HT20/HT40						
	WLAN 11ac VHT	C20/VHT40/VHT80						
	Bluetooth BR/EDR/LE							
HW Version	DVT2							
EUT Stage	Identical Prototyp	oe						

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

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	Accessory List
	Brand Name: Motorola
AC Adapter 1 (US)	Model Name: SC-51
	Manufacturer : Chenyang
	Brand Name : Motorola
AC Adapter 1 (EU)	Model Name: SC-52
. , ,	Manufacturer : Chenyang
	Brand Name : Motorola
AC Adapter 1 (UK)	Model Name: SC-53UK
. , ,	Manufacturer : Chenyang
	Brand Name: Motorola
AC Adapter 1 (AR)	Model Name: SC-56
. , ,	Manufacturer: Chenyang
	Brand Name : Motorola
AC Adapter 1 (AU)	Model Name: SC-55AU
' ' '	Manufacturer: Chenyang
	Brand Name : Motorola
AC Adapter 2 (US)	Model Name : SC-51
(3.3)	Manufacturer : Acbel
	Brand Name: Motorola
AC Adapter 2 (EU)	Model Name: SC-52
10 / map 10/ 2 (20)	Manufacturer: Acbel
	Brand Name : Motorola
AC Adapter 2 (AR)	Model Name: SC-56
/ / / / / / / / / / / / / / / / / / /	Manufacturer: Acbel
	Brand Name : Motorola
AC Adapter 3 (IN)	Model Name: SC-54
(1.1)	Manufacturer: Salom
	Brand Name: Motorola
Battery 1	Model Name: LS30
	Manufacturer: ATL
	Brand Name : Motorola
Battery 2	Model Name: LS40
,	Manufacturer: ATL
	Brand Name: Motorola
Standard 3.5mm Headset 1	Model Name: SH38C37773
	Manufacturer: Lianyun
	Brand Name : Motorola
Standard 3.5mm Headset 2	Model Name: SH38C44959
	Manufacturer: Lianyun
	Brand Name: Motorola
USB-C to 3.5mm headset adaptor 1	Model Name: SC18C27844
	Brand Name: Motorola
USB-C to 3.5mm headset adaptor 2	Model Name: SC18C27845
	Brand Name: Motorola
USB Cable 1	Model Name: SC18C24367
1 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 -	Manufacturer: Saibao
	Brand Name : Motorola
USB Cable 2	Model Name: SC18C24368
	Manufacturer: Luxshare

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1.2 Product Specification of Equipment Under Test

Product Specification subjective to this standard					
Tx Frequency	LTE Band 30 : 2307.5 MHz ~ 2312.5 MHz				
Rx Frequency	LTE Band 30 : 2352.5 MHz ~ 2357.5 MHz				
Bandwidth	5MHz / 10MHz				
Maximum Output Bower to Antonno	<pt antenna="">: 22.65 dBm</pt>				
Maximum Output Power to Antenna	<asdiv antenna="">: 20.43 dBm</asdiv>				
Antenna Type	Fixed Internal Antenna				
Antonno Osin	<pt antenna="">: -2.1 dBi</pt>				
Antenna Gain	<asdiv antenna="">: -1.3 dBi</asdiv>				
Type of Modulation	QPSK / 16QAM / 64QAM				

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1.3 Modification of EUT

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

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory				
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978				
Test Site No.	Sporton Site No.				
rest site No.	TH02-HY				
Test Engineer	Jacky Wang				
Temperature	21.2~24 ℃				
Relative Humidity	51~64%				

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.
lest site No.	03CH11-HY
Test Engineer	Cookie Ku, Fu Chen, and Troye Hsieh
Temperature	19~26.9℃
Relative Humidity	50~68.9%

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

FCC Designation No. TW1190 and TW0007

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1.5 Applied Standards

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

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- ANSI C63.26-2015
- FCC 47 CFR Part 2, Part 27(D)
- ANSI / TIA-603-E
- FCC KDB 971168 Power Meas License Digital Systems D01 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.

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Test Configuration of Equipment Under Test 2

Test Mode 2.1

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.

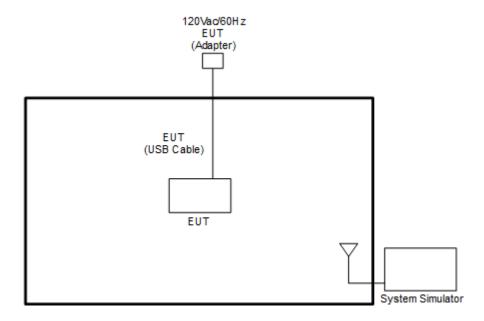
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For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z and Accessory (Adapter or Earphone). The worst cases (Open Mode with PT Antenna: Y plane with Adapter; Close Mode with ASDIV Antenna: X plane with Adapter) were recorded in this report.

Took Itamaa	Dand		Ва	andwic	th (MF	łz)		ı	Modulatio	n		RB#		Tes	t Chan	nel
Test Items	Band	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	٦	М	Н
Max. Output Power	30	-	-	v	v	•	•	>	v	v	>	v	٧	٧	v	v
Peak-to-Avera ge Ratio	30	-	-		v	-	-	٧	v	v	٧		٧		v	
E.I.R.P PSD	30	-	-	v	v	-	-	٧	v	v	٧	v	v	>	v	v
26dB and 99% Bandwidth	30	-	-	v	v	-	-	٧	v	v			v	٧	v	v
Conducted Band Edge	30	-	-	v	v	-	-	v	v	v	v		v	v		v
Conducted Spurious Emission	30	-	-	v	v	-	-	٧	v	v	>			٧	v	v
Frequency Stability	30	-	-		v	-	-	٧					V		v	
Radiated Spurious Emission	30						٧	Vorst Cas	e					v	v	v
Remark	 The diffe 	2. The mark "-" means that this bandwidth is not supported.														
	4. All t	he radia	ated tes	t cases	were	perforn	ned wit	h AC Ada	oter 1 (US)), USB Cal	ole 1, a	and SIM	l 1.			

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2.2 Connection Diagram of Test System



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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	MT8821C	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss 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)

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2.5 Frequency List of Low/Middle/High Channels

LTE Band 30 Channel and Frequency List									
BW [MHz]	Hz] Channel/Frequency(MHz) Lowest Middle High								
10	Channel	-	27710	-					
10	Frequency	-	2310	-					
5	Channel	27685	27710	27735					
5	Frequency	2307.5	2310	2312.5					

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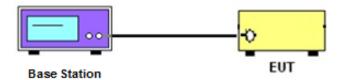
3 Conducted Test Items

3.1 Measuring Instruments

See list of measuring instruments of this test report.

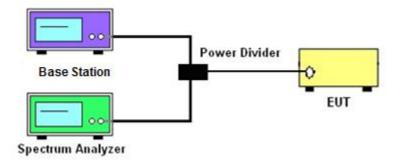
3.1.1 Test Setup

3.1.2 Conducted Output Power

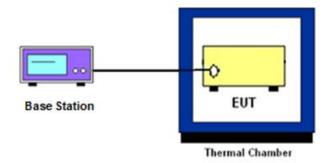


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3.1.3 Peak-to-Average Ratio, Occupied Bandwidth, 26dB Bandwidth ,Band-Edge and Conducted Spurious Emission



3.1.4 Frequency Stability



3.1.5 Test Result of Conducted Test

Please refer to Appendix A.

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3.2 Conducted Output Power Measurement and EIRP Measurement

3.2.1 Description of the Conducted Output Power Measurement and EIRP 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.

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According to KDB 412172 D01 Power Approach,

 $EIRP = P_T + G_T - L_C$, where

 P_T = transmitter output power in dBm

 G_T = gain of the transmitting antenna in dBi

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

3.2.2 Test Procedures

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

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3.3 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.

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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.

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3.4 EIRP Power Density

3.4.1 Description of EIRP Power Density

For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth. For mobile and portable stations using time division duplexing (TDD) technology, the duty cycle must not exceed 38 percent in the 2305-2315 MHz and 2350-2360 MHz bands. Mobile and portable stations using FDD technology are restricted to transmitting in the 2305-2315 MHz band. Power averaging shall not include intervals in which the transmitter is off.

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3.4.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.2.4.5

- 1. Set instrument center frequency to OBW center frequency.
- 2. Set span to at least 1.5 times the OBW.
- 3. Set the RBW to the specified reference bandwidth (5MHz).
- 4. Set VBW ≥ 3 × RBW.
- 5. Detector = RMS (power averaging).
- 6. Ensure that the number of measurement points in the sweep ≥ 2 × span/RBW.
- 7. Sweep time = auto couple.
- 8. Employ trace averaging (RMS) mode over a minimum of 100 traces.
- 9. Use the peak marker function to determine the maximum amplitude level within the reference bandwidth (PSD).
- 10. Determine the EIRP by adding the effective antenna gain to the adjusted power level.

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3.5 Occupied Bandwidth

3.5.1 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.

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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.

3.5.2 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.

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3.6 Conducted Band Edge

3.6.1 Description of Conducted Band Edge Measurement

27.53 (a)(4)

For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

(i) By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337 MHz.

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(ii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300 MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296 MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292 MHz, and 70 + 10 log (P) dB below 2288 MHz.

(iii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

3.6.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

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

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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 70 + 10 log (P) dB.

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It is measured by means of a calibrated spectrum analyzer and scanned from 9 kHz up to a frequency including its 10th 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 system simulator via a 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.
- 8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
- 9. The limit line is derived from 70 + 10log(P)dB below the transmitter power P(Watts)

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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.

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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 system simulator.
- 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 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.

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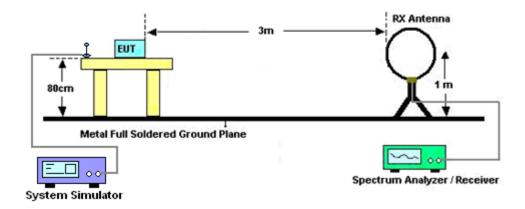
4 Radiated Test Items

4.1 Measuring Instruments

See list of measuring instruments of this test report.

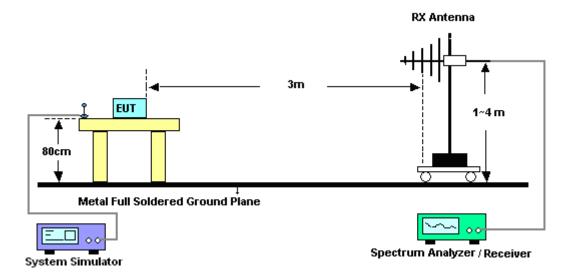
4.1.1 Test Setup

For radiated emissions below 30MHz



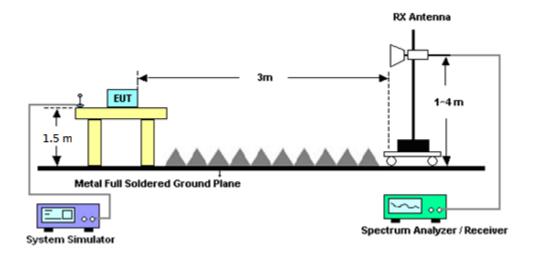
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For radiated test from 30MHz to 1GHz



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For radiated test above 1GHz



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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.

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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 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 70 + 10 log (P) dB.

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

```
EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain ERP (dBm) = EIRP - 2.15
```

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

The limit line is derived from 70 + 10log(P)dB below the transmitter power P(Watts)

- = P(W)- [70 + 10log(P)] (dB)
- = [30 + 10log(P)] (dBm) [70 + 10log(P)] (dB)
- = -40 dBm.

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5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Preamplifier	EMCE	EM18G40G	060715	18GHz ~ 40GHz	Dec. 13, 2019	Jun. 13, 2020~ Jul. 16, 2020	Dec. 12, 2020	Radiation (03CH11-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 576	18GHz- 40GHz	May 22, 2020	Jun. 13, 2020~ Jul. 16, 2020	May 21, 2021	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Dec. 03, 2019	Jun. 13, 2020~ Jul. 16, 2020	Dec. 02, 2020	Radiation (03CH11-HY)
Bilog Antenna	TESEQ	CBL 6111D & N-6-06	35414 & AT-N0602	30MHz~1GHz	Oct. 12, 2019	Jun. 13, 2020~ Jul. 16, 2020	Oct. 11, 2020	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-132 6	1GHz ~ 18GHz	Nov. 04, 2019	Jun. 13, 2020~ Jul. 16, 2020	Nov. 03, 2020	Radiation (03CH11-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Dec. 26, 2019	Jun. 13, 2020~ Jul. 16, 2020	Dec. 25, 2020	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY532700 80	1GHz~26.5GHz	Nov. 13, 2019	Jun. 13, 2020~ Jul. 16, 2020	Nov. 12, 2020	Radiation (03CH11-HY)
Preamplifier	Jet-Power	JPA0118-55-3 03K	171000180 0054002	1GHz~18GHz	Feb. 07, 2020	Jun. 13, 2020~ Jul. 16, 2020	Feb. 06, 2021	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY542004 86	10Hz ~ 44GHz	Oct. 28, 2019	Jun. 13, 2020~ Jul. 16, 2020	Oct. 27, 2020	Radiation (03CH11-HY)
Filter	Wainwright	WHKX12-108 0-1200-15000 -60SS	SN2	1.2GHz High Pass Filter	Sep. 15, 2019	Jun. 13, 2020~ Jul. 16, 2020	Sep. 14, 2020	Radiation (03CH11-HY)
Filter	Wainwright	WHKX12-270 0-3000-18000 -60SS	SN3	3GHz High Pass	Sep. 15, 2019	Jun. 13, 2020~ Jul. 16, 2020	Sep. 14, 2020	Radiation (03CH11-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	Jun. 13, 2020~ Jul. 16, 2020	N/A	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500- B	N/A	1~4m	N/A	Jun. 13, 2020~ Jul. 16, 2020	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	Jun. 13, 2020~ Jul. 16, 2020	N/A	Radiation (03CH11-HY)
Software	Audix	E3 6.2009-8-24	RK-00104 2	N/A	N/A	Jun. 13, 2020~ Jul. 16, 2020	N/A	Radiation (03CH11-HY)
Hygrometer	TECPEL	DTN-303B	TP161237	N/A	Oct. 25, 2019	Jun. 13, 2020~ Jul. 16, 2020	Oct. 24, 2020	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4 PE	9kHz-30MHz	Mar. 12, 2020	Jun. 13, 2020~ Jul. 16, 2020	Mar. 11, 2021	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2859/2	30MHz-40GHz	Mar. 12, 2020	Jun. 13, 2020~ Jul. 16, 2020	Mar. 11, 2021	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4 PE	30M-18G	Mar. 12, 2020	Jun. 13, 2020~ Jul. 16, 2020	Mar. 11, 2021	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY4274/2	30MHz-40GHz	Mar. 12, 2020	Jun. 13, 2020~ Jul. 16, 2020	Mar. 11, 2021	Radiation (03CH11-HY)
Hygrometer	TECPEL	DTN-303B	TP140325	N/A	Nov. 07, 2019	Jun. 13, 2020~ Jul. 16, 2020	Nov. 06, 2020	Radiation (03CH11-HY)
Signal Generator	Rohde & Schwarz	SMF100A	101107	100kHz~40GHz	Aug. 27, 2019	Jun. 13, 2020~ Jul. 16, 2020	Aug. 26, 2020	Radiation (03CH11-HY)

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Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
				GSM / GPRS				
				/WCDMA / LTE				
Base	Anritsu	MT8821C	626202528	FDD/TDD with	Oct. 25, 2019	Jun. 20, 2020~	Oct 24 2020	Conducted
Station(Measure)	Annisu	W110021C	0	44) /LTE-3CC	Oct. 25, 2019	Jul. 26, 2020	Oct. 24, 2020	(TH05-HY)
				DLCA,2CC				
				ULCA				
Spectrum	Rohde &	Rohde & FSV40 101908 10Hz~40GH.		10Hz~40GHz	May 13, 2020	Jun. 20, 2020~	May 12, 2021	Conducted
Analyzer	Schwarz	F3V40	101906	10HZ~40GHZ	May 13, 2020	Jul. 26, 2020	May 12, 2021	(TH05-HY)
Temperature	ESPEC	SH-641	02042720	40°C 00°C	Con 02 2010	Jun. 20, 2020~	Con 01 2020	Conducted
Chamber	ESPEC	SH-041	92013720	-40°C ~90°C	Sep. 02, 2019	Jul. 26, 2020	Sep. 01, 2020	(TH05-HY)
Programmable	GW Instek	PSS-2005	EL890094	1V~20V	Oct. 09, 2019	Jun. 20, 2020~	Oat 00 2020	Conducted
Power Supply	GW Instek	PSS-2005	EL090094	0.5A~5A	Oct. 09, 2019	Jul. 26, 2020	Oct. 08, 2020	(TH05-HY)
		20dB 25W						
Coupler	Wariaan	SMA	44		lon 12 2020	Jun. 20, 2020~	lon 12 2021	Conducted
Coupler	Warison	Directional	#A	1-18GHz	Jan. 13, 2020	Jul. 26, 2020	Jan. 12, 2021	(TH05-HY)
		Coupler						

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6 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of	3.09
Confidence of 95% (U = 2Uc(y))	

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

Measuring Uncertainty for a Level of	3.44
Confidence of 95% (U = 2Uc(y))	3.44

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

Measuring Uncertainty for a Level of	3.95
Confidence of 95% (U = 2Uc(y))	3.95

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Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

<PT Antenna>

LTE Band 30 Maximum Average Power [dBm]										
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest				
10	1	0			22.65					
10	1	25			22.62					
10	1	49			22.56					
10	25	0	QPSK		21.66					
10	25	12			21.60					
10	25	25			21.55					
10	50	0			21.78					
10	1	0			21.94					
10	1	25			22.01					
10	1	49			22.05					
10	25	0	16-QAM	-	20.67	-				
10	25	12			20.72					
10	25	25			20.82					
10	50	0			20.78					
10	1	0			20.85					
10	1	25			20.97					
10	1	49			20.94					
10	25	0	64-QAM		19.70					
10	25	12			19.80					
10	25	25			19.87					
10	50	0			19.84					
5	1	0		22.47	22.49	22.53				
5	1	12		22.62	22.62	22.54				
5	1	24		22.55	22.58	22.62				
5	12	0	QPSK	21.60	21.65	21.60				
5	12	7		21.61	21.62	21.71				
5	12	13		21.74	21.74	21.83				
5	25	0		21.78	21.76	21.68				
5	1	0		21.85	21.92	21.89				
5	1	12		21.91	22.00	22.00				
5	1	24		21.95	22.00	22.03				
5	12	0	16-QAM	20.58	20.58	20.58				
5	12	7		20.65	20.62	20.70				
5	12	13		20.81	20.80	20.72				
5	25	0		20.74	20.70	20.69				
5	1	0		20.85	20.80	20.76				
5	1	12		20.91	20.92	20.90				
5	1	24		20.84	20.87	20.85				
5	12	0	64-QAM	19.63	19.63	19.68				
5	12	7		19.79	19.78	19.77				
5	12	13		19.79	19.82	19.81				
5	25	0		19.80	19.74	19.78				



<ASDIV Antenna>

		LTE	Band 30 Ma	ximum Average Po	ower [dBm]	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0			20.43	
10	1	25			20.33	1
10	1	49			20.38	1
10	25	0	QPSK		19.36	1
10	25	12			19.32	
10	25	25			19.34	
10	50	0			19.51	
10	1	0			19.73	
10	1	25			19.74	
10	1	49			19.76	
10	25	0	16-QAM	-	18.38	-
10	25	12			18.44	
10	25	25			18.53	
10	50	0			18.51	1
10	1	0			18.55	1
10	1	25			18.66	1
10	1	49			18.66	1
10	25	0	64-QAM		17.44	1
10	25	12			17.51	1
10	25	25			17.62	1
10	50	0			17.58	1
5	1	0		20.43	20.35	20.39
5	1	12		20.24	20.23	20.29
5	1	24		20.30	20.32	20.36
5	12	0	QPSK	19.34	19.36	19.26
5	12	7		19.40	19.35	19.36
5	12	13		19.50	19.48	19.46
5	25	0		19.49	19.42	19.45
5	1	0		19.65	19.69	19.68
5	1	12		19.73	19.64	19.65
5	1	24		19.76	19.68	19.69
5	12	0	16-QAM	18.37	18.36	18.35
5	12	7		18.42	18.35	18.44
5	12	13		18.47	18.45	18.49
5	25	0		18.45	18.50	18.50
5	1	0		18.54	18.55	18.50
5	1	12		18.56	18.66	18.57
5	1	24		18.66	18.66	18.56
5	12	0	64-QAM	17.35	17.44	17.37
5	12	7		17.46	17.41	17.41
5	12	13		17.61	17.55	17.58
5	25	0		17.58	17.51	17.48

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LTE Band 30

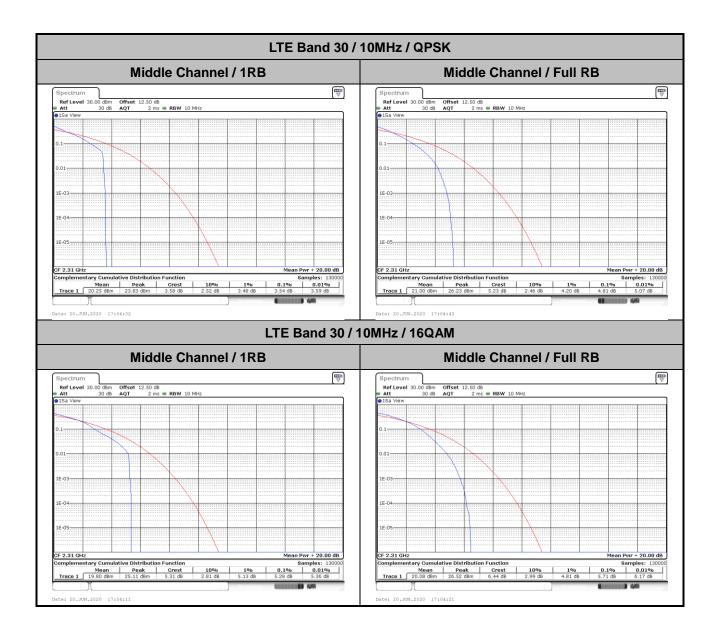
Peak-to-Average Ratio

Mode					
Mod.	QP	SK	160	Limit: 13dB	
RB Size	1RB	Full RB	1RB	Full RB	Result
Lowest CH			-	-	
Middle CH	3.54	4.81	5.28	5.71	PASS
Highest CH	-	-	-	-	
Mode		LTE Band	30 / 10MHz		
Mod.	64Q	Limit: 13dB			
	074	(Alvi			Limit: 130D
RB Size	1RB	Full RB			Result
RB Size Lowest CH		<u> </u>		-	
	1RB	Full RB	-	-	

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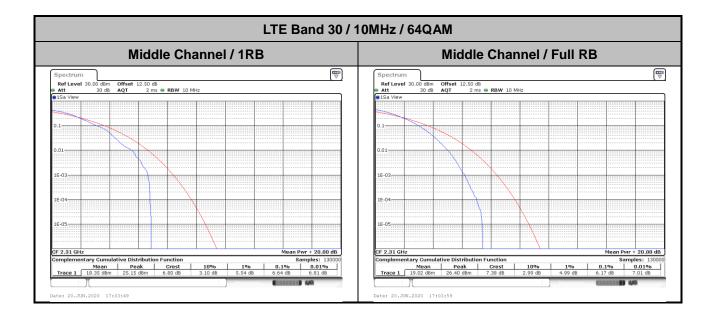
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EIRP Power Density

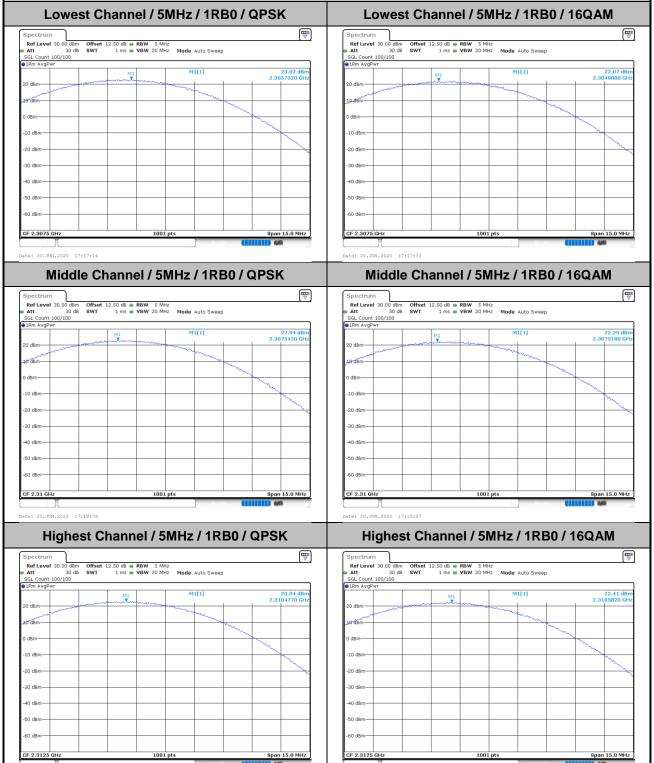
Mode		LTE Band 30 : Conducted Power Density (dBm/5MHz)											
BW	1.4MHz			3MHz		5MHz		10MHz		ИHz	20MHz		
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	
Lowest CH	-	-	-	-	23.02	22.07	-	-	-	-	-	-	
Middle CH	-	-	-	-	22.94	22.29	23.08	22.46	-	-	-	-	
Highest CH	-	-	-	-	23.04	22.41	-	-	-	-	-	-	
Mode			LT	E Band	30 : Con	ducted I	Power D	ensity (d	IBm/5MH	lz)			
BW	1.4	ИHz	3M	lHz	5MHz 10MHz			15N	ИHz	20MHz			
Mod.	64QAM		64QAM		64QAM		64QAM		64QAM		64QAM		
Lowest CH	-	-	-	-	20.16	-	-	-	-	-	-	-	
Middle CH	-	-	-	-	20.79	-	21.43	-	-	-	-	-	
Highest CH	-	-	-	-	20.86	-	-	-	-	-	-	-	

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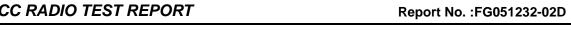
Mode				LTE Ba	nd 30 : E	IRP Pov	ver Dens	ity (dBn	n/5MHz)			
BW	1.4	ИHz	3M	lHz	5M	lHz	101	ЛHz	15N	15MHz		ЛHz
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	-	-	-	-	20.92	19.97	-	-	-	-	-	-
Middle CH	-	-	-	-	20.84	20.19	20.98	20.36	-	-	-	-
Highest CH	-		-	-	20.94	20.31	-	-	-	-	-	-
Mode			ı	LTE Ba	nd 30 : E	IRP Pov	ver Dens	ity (dBn	n/5MHz)	ı	1	ı
BW	1.4	ИHz	3M	lHz	5M	lHz	101	ЛHz	15N	ЛHz	20MHz	
Mod.	64QAM		64QAM		64QAM		64QAM		64QAM		64QAM	
Lowest CH	-	-	-	-	18.06	-	-	-	-	-	-	-
Middle CH	-	-	-	-	18.69	-	19.33	-	-	-	-	-
Highest CH	-	-	-	-	18.76	-	-	-	-	-	-	-
Antenna Gain						-2.1	dBi				1	
Limit					250mW	/ 5MHz :	= 24dBm	/5MHz				
Result						Pa	ISS					

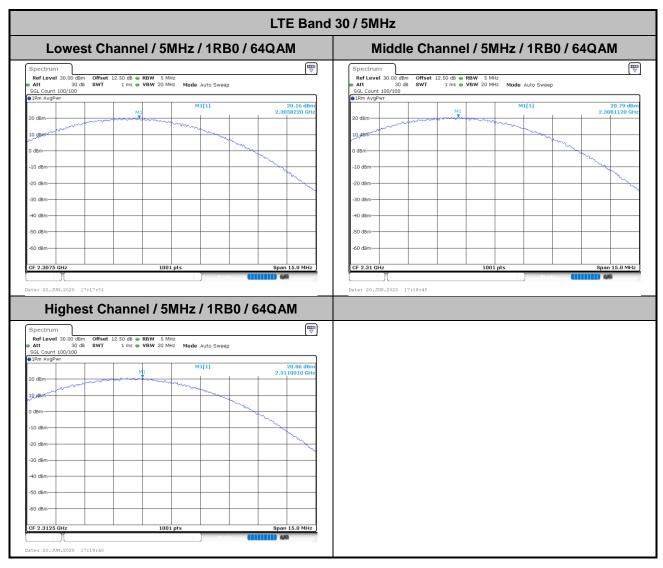
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Report No. :FG051232-02D LTE Band 30 / 5MHz Lowest Channel / 5MHz / 1RB0 / QPSK Lowest Channel / 5MHz / 1RB0 / 16QAM ### AVENUE | Control | Con 23.02 dBn 2.3057320 GH Date: 20.JUN.2020 17:17:14 Middle Channel / 5MHz / 1RB0 / QPSK Middle Channel / 5MHz / 1RB0 / 16QAM SGL Count 100/100 • 1Rm AvgPwr Highest Channel / 5MHz / 1RB0 / 16QAM Highest Channel / 5MHz / 1RB0 / QPSK Ref Level 30.00 dBm Offset Att 30 dB SWT 12.50 dB • RBW 5 MHz 1 ms • VBW 20 MHz Mode Auto Sweep SGL Count 100/100 • 1Rm AvgPwr 20 dBm-10 dBm-



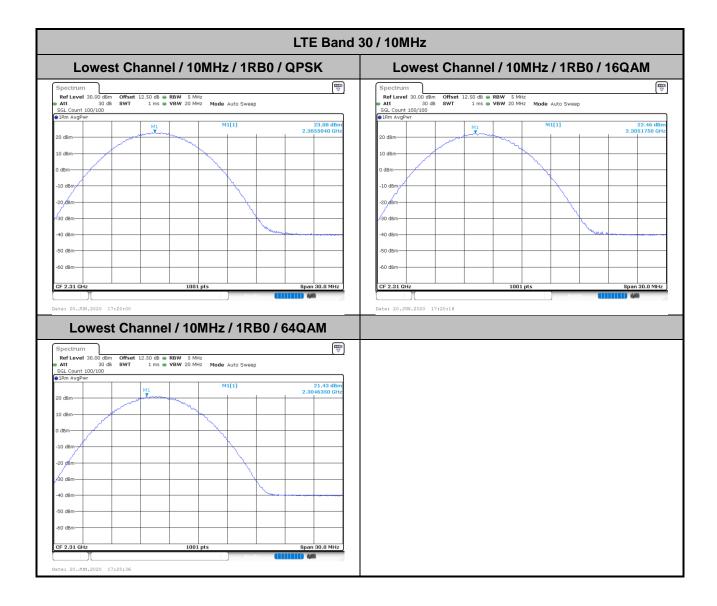
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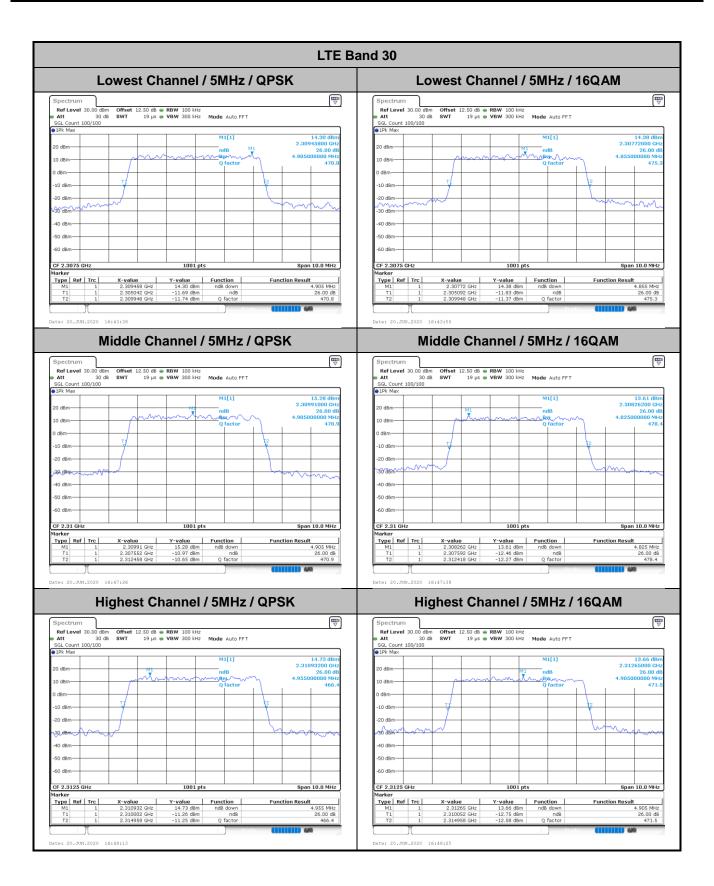
26dB Bandwidth

Mode		LTE Band 30 : 26dB BW(MHz)											
BW	1.4MHz 3MHz			5N	5MHz 10MHz			15N	ЛHz	20MHz			
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	
Lowest CH	-	-	-	-	4.91	4.86	-	-	-	-	-	-	
Middle CH	-	-	-	-	4.91	4.83	9.79	9.75	-	-	-	-	
Highest CH	-	-	-	-	4.96	4.91	-	-	-	-	-	-	
Mode					LTE Ba	and 30 : :	26dB BV	V(MHz)					
BW	1.4	ИHz	3M	lHz	5N	lHz	101	ЛHz	15N	ЛHz	20MHz		
Mod.	64QAM		64QAM		64QAM		64QAM		64QAM		64QAM		
Lowest CH	-	-	-	-	4.93	-	-	-	-	-	-	-	
Middle CH	-	-	-	-	4.94	-	9.73	-	-	-	-	-	
Highest CH	-	-	-	-	4.91	-	-	-	ı	-	-	-	

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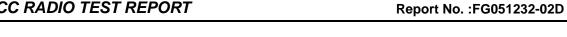
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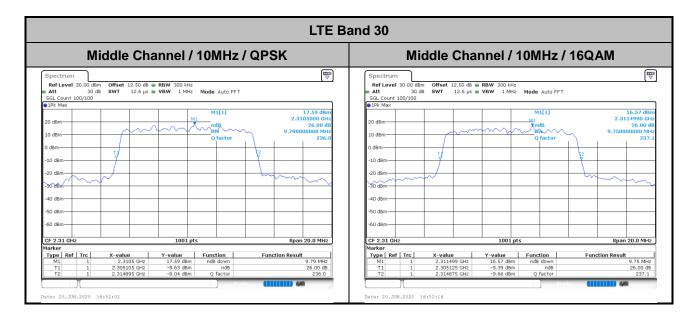
FCC RADIO TEST REPORT



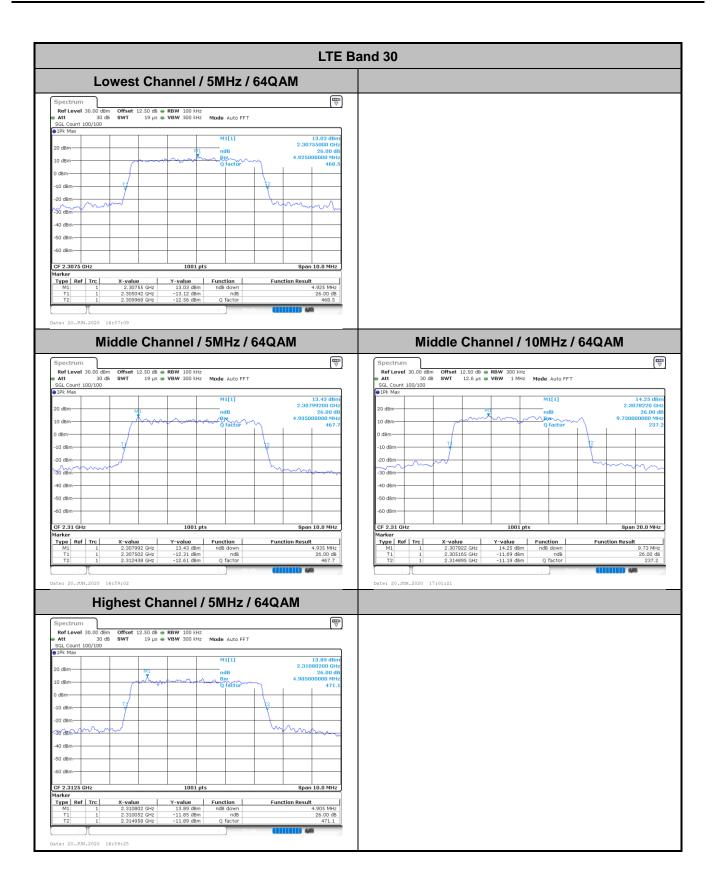
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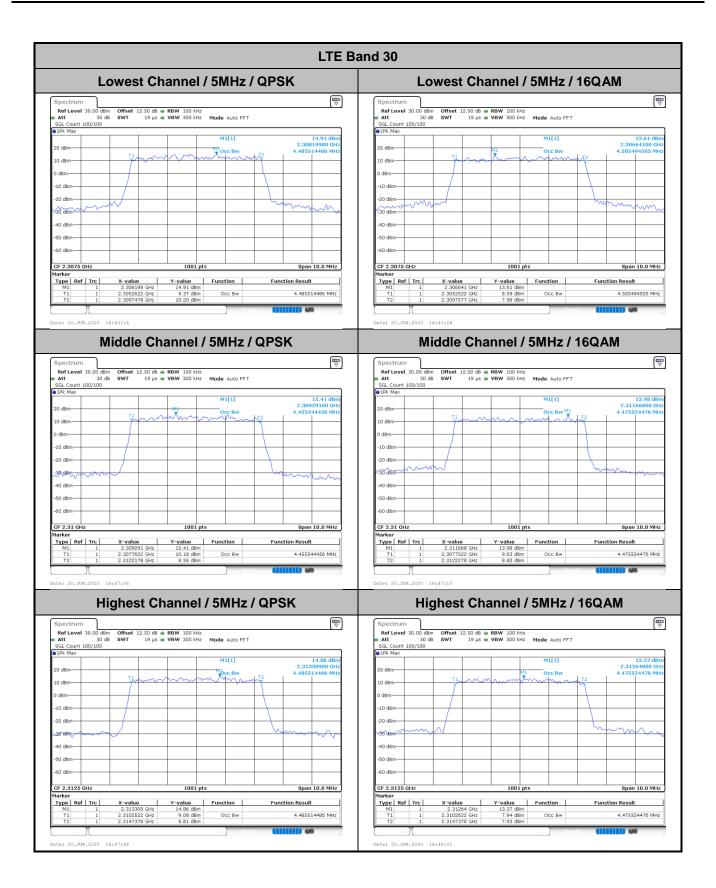
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Occupied Bandwidth

Mode		LTE Band 30 : 99%OBW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz		
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	
Lowest CH	-	-	-	-	4.49	4.51	-	-	-	-	-	-	
Middle CH	-	-	-	-	4.46	4.48	9.01	8.95	-	-	-	-	
Highest CH	-	-	-	-	4.49	4.48	-	-	-	-	-	-	
Mode					LTE Ba	and 26 :	99%OBV	V(MHz)					
BW	1.4	ИHz	3MHz		5MHz		10MHz		15MHz		20MHz		
Mod.	64QAM		64QAM		64QAM		64QAM		64QAM		64QAM		
Lowest CH	-	-	-	-	4.51	-	-	-	-	-	-	-	
Middle CH	-	-	-	-	4.51	-	9.05	-	-	-	-	-	
Highest CH		-	-	-	4.50	-	-	-	-	-	ı	-	

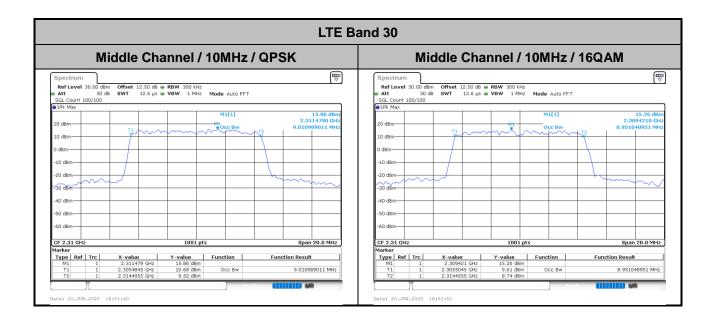
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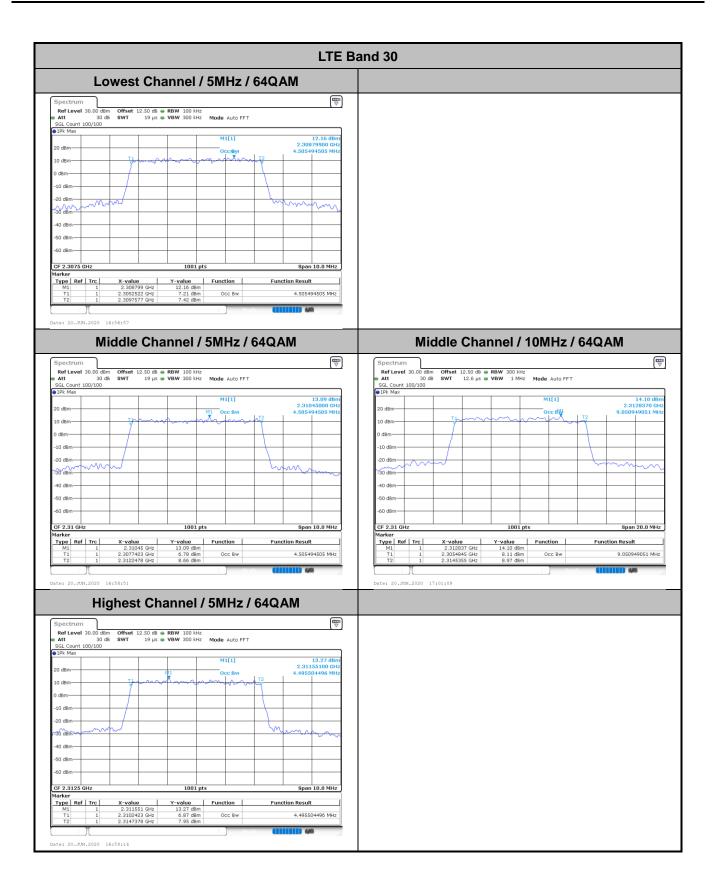


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CC RADIO TEST REPORT Report No. :FG051232-02D

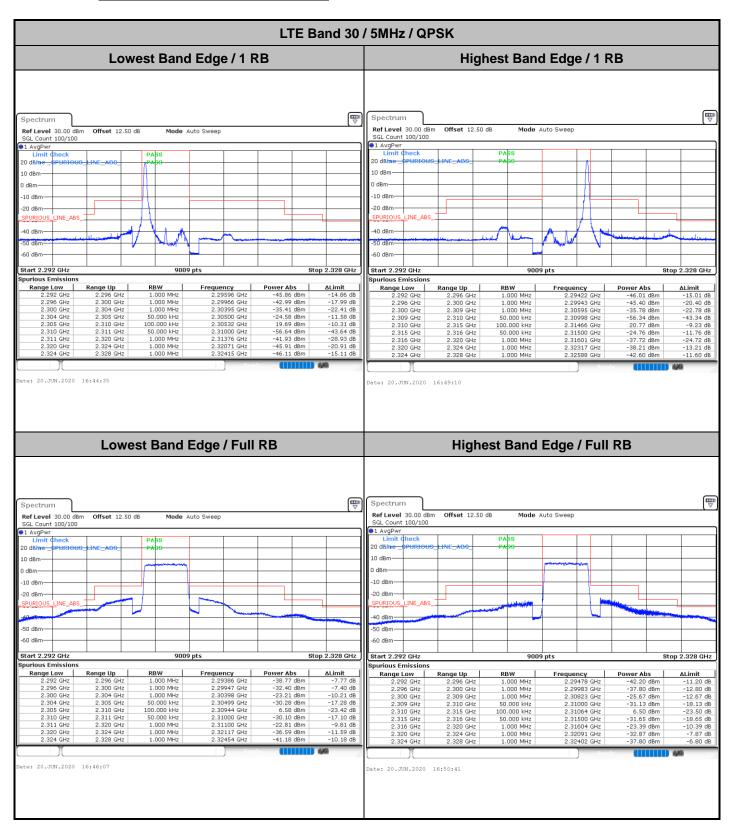


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Conducted Band Edge



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LTE Band 30 / 5MHz / 16QAM Lowest Band Edge / 1RB Highest Band Edge / 1 RB Spectrum Spectrum Ref Level 30.00 Offset 12.50 dB Mode Auto Sweep Ref Level 30.00 dBm Offset 12.50 dB Mode Auto Sweep SGL Count 100/100 1 AvgPw 10 dBm dBm -10 dBm -10 dBm -20 dBm--20 dBm-40 dBm-40 dBm-60 dBm -60 dBm Start 2.292 GHz rious Emissions purious Emission Range Low 2 292 GHz Range Up Power Abs -45.79 dBr ΔLimit
-14.79 dB
-20.16 dB
-18.81 dB
-9.40 dB
-10.63 dB
-45.25 dB
-27.74 dB
-21.12 dB
-15.11 dB ALIMIT -15.29 dB -20.99 dB -22.33 dB -44.97 dB -10.98 dB -11.15 dB -18.96 dB -13.17 dB 2.300 GHz 2.304 GHz 1.000 MHz 1.000 MHz 1.000 MHz 2.29521 GHz 2.29702 GHz 2.30396 GHz 2.310 GHz 2.305 GHz 2.310 GHz 2.311 GHz 2.311 GHz 2.320 GHz 50.000 kHz 2.31001 GHz 2.31429 GHz 1.000 MHz 1.000 MHz te: 20.JUN.2020 16:45:21 Lowest Band Edge / Full RB **Highest Band Edge / Full RB** Spectrum Offset 12.50 dB Mode Auto Sweep Offset 12.50 dB Mode Auto Sweep Ref Level 30.00 dBm SGL Count 100/100 91 AvgPwr I imit Check 1 AvgPw 10 dBm dBm -10 dBm--10 dBm-20 dBm--20 dBm--40 dBm 50 dBn 60 dBm Start 2.292 GHz 9009 pts Stop 2.328 GHz Start 2.292 GHz Stop 2.328 GHz ırious Emissions urious Emissions 2.292 GHz
2.296 GHz
2.296 GHz
2.300 GHz
2.309 GHz
2.310 GHz
2.315 GHz
2.316 GHz
2.324 GHz nge Up 2.296 GHz 2.300 GHz 2.304 GHz 2.305 GHz 2.310 GHz 2.311 GHz 2.320 GHz 2.324 GHz Power Abs
-37.57 dBm
-30.11 dBm
-21.31 dBm
-30.58 dBm
5.54 dBm
-30.20 dBm
-21.31 dBm
-38.21 dBm
-41.76 dBm 2.292 GHz 2.296 GHz 2.300 GHz 2.304 GHz 2.305 GHz Range Up -6.57 dB -5.11 dB -8.31 dB -17.58 dB -24.46 dB -17.20 dB -8.31 dB -13.21 dB -10.76 dB 2.31001 GHz 2.31103 GHz 2.311 GHz te: 20.JUN.2020 16:46:52 Date: 20.JUN.2020 16:51:27

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LTE Band 30 / 5MHz / 64QAM Lowest Band Edge / 1RB Highest Band Edge / 1 RB Spectrum Spectrum Ref Level 30.00 Offset 12.50 dB Mode Auto Sweep Ref Level 30.00 dBm Offset 12.50 dB Mode Auto Sweep SGL Count 100/100 1 AvgPw 10 dBm dBm -10 dBm -10 dBm -20 dBm--20 dBm-40 dBm-40 dBm-50 dBm 50 dBm 60 dBm -60 dBm Start 2.292 GHz rious Emissions purious Emission Frequency
2.29395 GHz
2.29395 GHz
2.30609 GHz
2.30918 GHz
2.31466 GHz
2.31500 GHz
2.31501 GHz
2.31614 GHz
2.32135 GHz
2.32678 GHz Range Up Power Abs -45.89 dBr ΔLimit
-14.89 dB
-19.96 dB
-25.31 dB
-13.93 dB
-11.69 dB
-45.27 dB
-30.70 dB
-21.13 dB
-15.05 dB -15.17 dB -21.06 dB -26.30 dB -45.08 dB -12.63 dB -14.11 dB -24.33 dB -16.68 dB -13.41 dB -45.89 dBm -44.96 dBm -38.31 dBm -26.93 dBm 18.31 dBm -58.27 dBm -43.70 dBm -46.13 dBm -46.05 dBm 2.29511 GHz 2.29614 GHz 2.300 GHz 2.304 GHz 1.000 MHz 1.000 MHz 2.310 GHz 2.305 GHz 2.310 GHz 2.311 GHz 2.311 GHz 2.320 GHz 50.000 kHz 2.31009 GHz 2.31428 GHz 1.000 MHz 1.000 MHz te: 20.JUN.2020 16:57:54 Lowest Band Edge / Full RB **Highest Band Edge / Full RB** Spectrum Mode Auto Sweep Ref Level 30.00 dBm SGL Count 100/100 Offset 12.50 dB Mode Auto Sweep Ref Level 30.00 dBm Offset 12.50 dB SGL Count 100/100 91 AvgPwr I imit Check 1 AvgPw 10 dBm dBm -10 dBm--10 dBm-20 dBm--20 dBm--40 dBm 50 dBn 60 dBm Start 2.292 GHz 9009 pts Stop 2.328 GHz Start 2.292 GHz Stop 2.328 GHz ırious Emissions urious Emissions 2.292 GHz
2.296 GHz
2.296 GHz
2.300 GHz
2.309 GHz
2.310 GHz
2.315 GHz
2.316 GHz
2.324 GHz nge Up 2.296 GHz 2.300 GHz 2.304 GHz 2.305 GHz 2.310 GHz 2.311 GHz 2.320 GHz 2.324 GHz 2.292 GHz 2.296 GHz 2.300 GHz 2.304 GHz 2.305 GHz Range Up -7.89 dB -5.87 dB -8.24 dB -18.15 dB -24.71 dB -17.61 dB -8.23 dB -13.59 dB 2.31000 GHz 2.311 GHz 2.31100 GHz 2.32007 GHz te: 20.JUN.2020 16:58:39 Date: 20.JUN.2020 17:00:56

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Report No.: FG051232-02D LTE Band 30 / 10MHz / QPSK Lowest Band Edge / 1 RB Highest Band Edge / 1 RB Spectrum Spectrum Ref Level 30.00 dBm Offset 12.50 dB Ref Level 30.00 dBm Offset 12.50 dB Mode Auto Sweep Mode Auto Sweep SGL Count 100/100 1 AvgPwr 10 dBmdBm -10 dBm -10 dBm -20 dBm--20 dBm-40 dBm--40 dBm-SO dan 50 dBm 60 dBm--60 dBm-Start 2.292 GHz rious Emissions Power Abs
-45.28 dBm
-43.51 dBm
-36.19 dBm
-32.16 dBm
20.13 dBm
-54.15 dBm
-44.93 dBm
-45.55 dBm
-46.14 dBm ΔLimit
-14.28 dB
-18.51 dB
-23.19 dB
-19.16 dB
-9.87 dB
-41.15 dB
-31.93 dB
-20.55 dB Frequency
2.29389 GHz
2.29989 GHz
2.30395 GHz
2.30500 GHz
2.31441 GHz
2.31501 GHz
2.31501 GHz
2.32032 GHz
2.32492 GHz RBW

1.000 MHz
1.000 MHz
1.000 MHz
100.000 kHz
100.000 kHz
100.000 kHz
1.000 MHz
1.000 MHz
1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz Range Up Range Up ALimit
-15.20 dB
-20.07 dB
-30.27 dB
-40.05 dB
-9.93 dB
-16.56 dB
-23.64 dB
-13.50 dB
-12.83 dB 2.296 GHz 2.300 GHz 2.304 GHz 2.305 GHz 2.315 GHz 2.316 GHz 2.320 GHz 2.324 GHz 2.328 GHz 2.29513 GHz 2.29972 GHz 2.30380 GHz 2.300 GHz 2.304 GHz 100.000 kHz 100.000 kHz 100.000 kHz .304 GHz 2.305 GHz 2.315 GHz 2.305 GHz 2.315 GHz 2.316 GHz 2.316 GHz 2.320 GHz 2.31501 GHz 2.31810 GHz te: 20.JUN.2020 16:52:58 Date: 20.JUN.2020 16:54:28 Band Edge / Full RB Spectrum Ref Level 30.00 dBm SGL Count 100/100 ●1 AvgPwr Limit Check 20 dAime _SPUR 10 dBm 0 dBm -10 dBm -20 dBm-SPURIOUS -40 dBm -50 dBm -60 dBm Start 2.292 GHz 9009 pts Stop 2.328 GHz Spurious Emissions Range Low Range Up Frequency 2.29217 GHz Power Abs 1.000 MHz -34.78 dBm -29.79 dBm -26.49 dBm -3.78 dB 2.296 GHz 2.300 GHz 2.300 GHz 2.304 GHz 1.000 MHz 1.000 MHz 2.29872 GHz 2.30383 GHz -4.79 dB -13.49 dB 2.304 GHz 2.305 GHz 100.000 kHz 2.30500 GHz -32.61 dBm -19.61 dB 2.305 GHz 2.315 GHz 2.315 GHz 2.316 GHz 100.000 kHz 100.000 kHz 2.30865 GHz 2.31501 GHz 4.14 dBm -31.99 dBm -25.86 dB -18.99 dB 2.320 GHz 2.324 GHz 1.000 MHz 1.000 MHz 2.31617 GHz 2.32005 GHz -24.48 dBm -28.39 dBm -11.48 dB -3.39 dB 2.316 GHz

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1.000 MHz

2.32416 GHz

-3.91 dB

-34.91 dBm

FAX: 886-3-328-4978

2.320 GHz

2.324 GHz

Date: 20.JUN.2020 16:55:59

2.328 GHz

LTE Band 30 / 10MHz / 16QAM Lowest Band Edge / 1 RB Highest Band Edge / 1 RB Spectrum Spectrum Ref Level 30.00 dBm Offset 12.50 dB Ref Level 30.00 dBm Offset 12.50 dB Mode Auto Sweep Mode Auto Sweep SGL Count 100/100 10 dBmdBm -10 dBm -10 dBm -20 dBm--20 dBm-40 dBm--40 dBm-50 dBm 60 dBm--60 dBm-Start 2.292 GHz rious Emissions Power Abs
-45.12 dBm
-44.45 dBm
-38.78 dBm
-32.86 dBm
19.69 dBm
-55.17 dBm
-44.85 dBm
-45.90 dBm
-45.99 dBm ALimit
-14.12 dB
-19.45 dB
-25.78 dB
-19.86 dB
-10.31 dB
-42.17 dB
-31.85 dB
-20.90 dB
-14.99 dB Frequency
2.29207 GHz
2.29876 GHz
2.30310 GHz
2.30403 GHz
2.31442 GHz
2.31504 GHz
2.31607 GHz
2.32095 GHz
2.32471 GHz RBW

1.000 MHz
1.000 MHz
1.000 MHz
100.000 kHz
100.000 kHz
100.000 kHz
1.000 MHz
1.000 MHz
1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz Range Up ALimit
-15.35 dB
-21.09 dB
-32.88 dB
-41.77 dB
-10.65 dB
-16.27 dB
-22.05 dB
-16.43 dB
-14.11 dB 2.296 GHz 2.300 GHz 2.304 GHz 2.305 GHz 2.315 GHz 2.316 GHz 2.320 GHz 2.324 GHz 2.328 GHz 2.396 GHz 2.300 GHz 2.304 GHz 2.305 GHz 2.315 GHz 2.29384 GHZ 2.29949 GHZ .30381 GHz 100.000 kHz 100.000 kHz 100.000 kHz 2.305 GHz 2.31501 GHz 2.31641 GHz 2.32242 GHz 2.32243 GHz 2.315 GHz 2.316 GHz 2.316 GHz 2.320 GHz te: 20.JUN.2020 16:53:43 Date: 20.JUN.2020 16:55:13 Band Edge / Full RB Ref Level 30.00 dBm Offset 12.50 dB Mode Auto Sweep SGL Count 100/100 ●1 AvgPwr Limit ¢h 20 dBime 10 dBm -10 dBm -20 dBm--40 dBm--50 dBm -60 dBm-Start 2.292 GHz 9009 pts Stop 2.328 GHz Spurious Emissions 2.292 GHz 2.296 GHz 2.296 GHz 2.300 GHz 2.29599 GHz 2.29995 GHz -33.03 dBm -28.59 dBm RBW 1.000 MHz 1.000 MHz -2.03 dB -3.59 dB 2.300 GHz 2.304 GHz -24.91 dBm -33.05 dBm -11.91 dB -20.05 dB -27.09 dB 2.304 GHz 1.000 MHz 30392 GHz 2.305 GHz 2.315 GHz 100.000 kHz 100.000 kHz 2.91 dBm -32.32 dBm -24.55 dBm -28.58 dBm -35.64 dBm 2.305 GHz .30949 GHz 2.315 GHz 2.316 GHz 2.320 GHz 2.324 GHz 2.328 GHz 100.000 kHz 1.000 MHz -19.32 dB -11.55 dB 2.315 GHz 2.316 GHz .31500 GHz .31608 GHz

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1.000 MHz 1.000 MHz

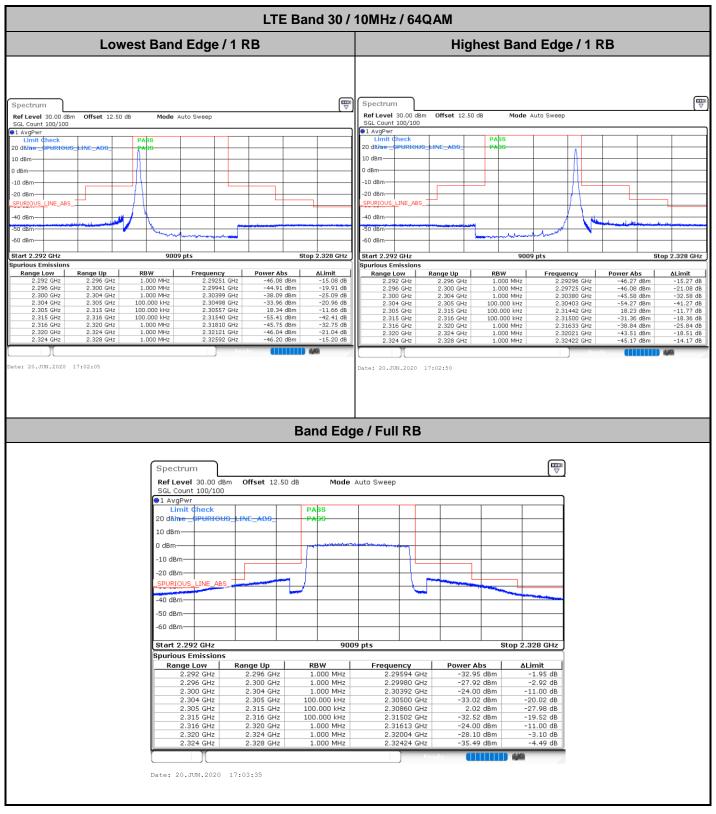
2.320 GHz 2.324 GHz

FAX: 886-3-328-4978

Date: 20.JUN.2020 16:56:43

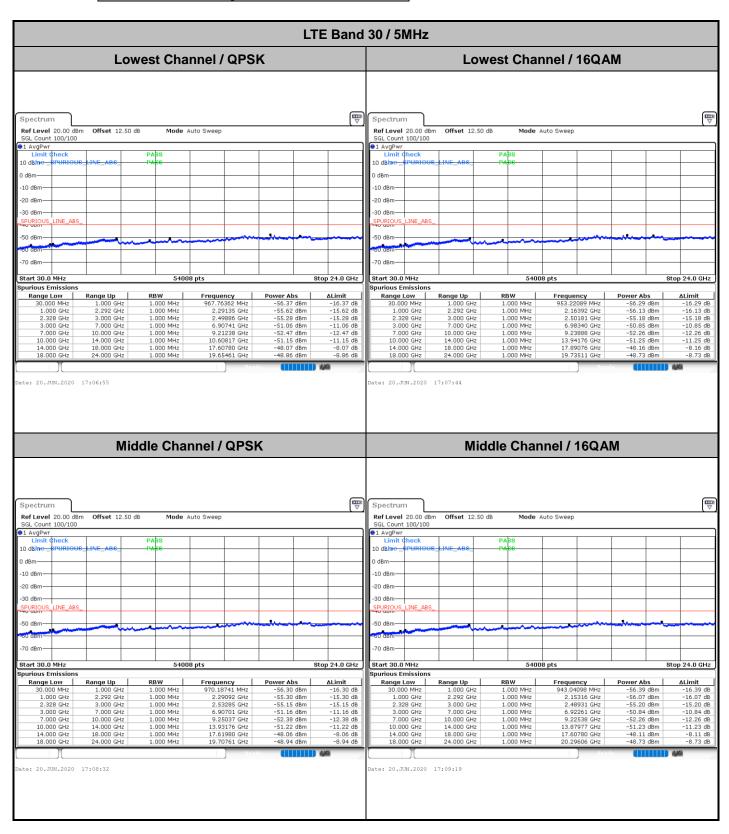
2.32006 GHz 2.32422 GHz

-3.58 dB -4.64 dB



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Conducted Spurious Emission



Report No.: FG051232-02D

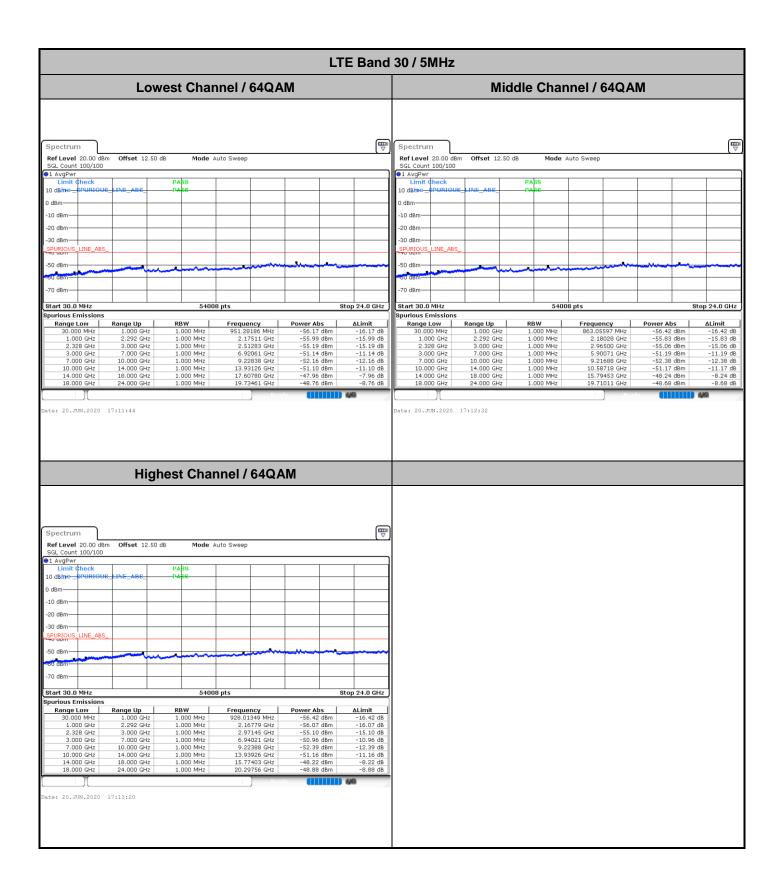
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LTE Band 30 / 5MHz **Highest Channel / QPSK Highest Channel / 16QAM** ₩ Spectrum Spectrum Ref Level 20.00 dBm Offset 12.50 dB Mode Auto Sweep Ref Level 20.00 dBm Offset 12.50 dB Mode Auto Sweep GL Count 100/100 SGL Count 100/100 ●1 AvgPwr ■ imit ¢ 1 AvgPwr Limit Check dBm dBm -10 dBm -10 dBm -30 dBm LINE_ABS 50 dBm -50 dBm 70 dBm--70 dBm-Start 30.0 MHz 5400 Stop 24.0 GHz Start 30.0 MHz 54008 Stop 24.0 GHz rious Emissions Spurious Emissions ΔLimit
-16.29 dB
-15.91 dB
-14.66 dB
-11.17 dB
-12.40 dB
-11.16 dB
-8.19 dB
-8.90 dB 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz Range Up 1.000 GHz 2.292 GHz 3.000 GHz 952.25137 MHz 2.20137 GHz 2.52089 GHz Range Low 30,000 MH Range Up Range Low 30.000 MH; ΔLimit ΔLimit
-16.37 dB
-16.13 dB
-15.17 dB
-10.98 dB
-12.26 dB
-11.17 dB
-8.11 dB
-8.90 dB 66.30935 MHz 2.20008 GHz 2.32860 GHz 5.96630 GHz 7.99608 GHz 13.92426 GHz 15.77753 GHz 20.29906 GHz -56.29 dBm -55.91 dBm -54.66 dBm -51.17 dBm -52.40 dBm -51.16 dBm -48.19 dBm 1.000 MHz 30.000 MHz 1.000 GHz 2.328 GHz 3.000 GHz 7.000 GHz 10.000 GHz 14.000 GHz 18.000 GHz -56.37 dBm -56.13 dBm -55.17 dBm -50.98 dBm -52.26 dBm -51.17 dBm -48.11 dBm -48.90 dBm 1.000 GHz 2.328 GHz 7.000 GHz 7.000 GHz 10.000 GHz 14.000 GHz 18.000 GHz 24.000 GHz 7.000 GHz 10.000 GHz 14.000 GHz .000 GHz 6.88101 GHz 9.22488 GHz 10.000 GHz .000 MH 13.91976 GH 18.000 GHz 24.000 GHz .000 MHz 17.62030 GHz 19.71561 GHz 18.000 GHz te: 20.JUN.2020 17:10:08 ate: 20.JUN.2020 17:10:56 LTE Band 30 / 10MHz Middle Channel / QPSK Middle Channel / 16QAM Spectrum Spectrum Ref Level 20.00 dBm Offset 12.50 dB Mode Auto Sweep Ref Level 20.00 dBm Offset 12.50 dB Mode Auto Sweep SGL Count 100/100 SGL Count 100/100 ●1 AvgPwr ●1 AvgPwi 10 dBim dBm dBn -10 dBm -10 dBm 20 dBm -20 dBm LINE_ABS 50 dBm -50 dBm -70 dBm-70 dBm Start 30.0 MHz Start 30.0 MH Range Low rious Emissio Frequency 09595 MHz Spurious Emissions * 000 MHz Power Abs
-56.40 dBm
-55.99 dBm
-55.17 dBm
-50.75 dBm
-52.42 dBm
-51.15 dBm
-48.13 dBm
-48.85 dBm Frequency 916.37931 MHz 2.16693 GHz 2.51149 GHz 6.90581 GHz 9.23738 GHz 13.92876 GHz 15.78003 GHz 19.73961 GHz Power Abs
-56.51 dBm
-56.11 dBm
-55.39 dBm
-50.98 dBm
-52.24 dBm
-51.02 dBm
-48.10 dBm
-48.84 dBm ALimit
-16.40 dB
-15.99 dB
-15.17 dB
-10.75 dB
-12.42 dB
-11.15 dB
-8.13 dB
-8.85 dB RBW 1.000 MHz 1.000 MHz Range Up Range Low 30.000 MHz Range Up 1.000 G ∆Limit -16.51 dB -16.11 dB -15.39 dB -10.98 dB -12.24 dB -11.02 dB -8.10 dB -8.84 dB 73.09595 MHz 2.15014 GHz 2.49375 GHz 6.92381 GHz 7.99858 GHz 13.94326 GHz 1.000 MHz 2.292 GHz 3.000 GHz 1.000 GHz 1.000 GHz 2.292 GHz 1.000 GHz 2.328 GHz 3.000 GHz 7.000 GHz 10.000 GHz 14.000 GHz 18.000 GHz .000 MHz .000 MHz 7.000 GHz 10.000 GHz 14.000 GHz 18.000 GHz 24.000 GHz 7.000 GHz 10.000 GHz 14.000 GHz .000 GHz 7.000 GHz 10.000 GHz .000 MHz .000 MHz .61680 GHz te: 20.JUN.2020 17:14:58 ate: 20.JUN.2020 17:15:45

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LTE Band 30 / 10MHz Middle Channel / 64QAM Spectrum Ref Level 20.00 dBm Offset 12.50 dB Mode Auto Sweep SGL Count 100/100 ●1 AvgPwr Limit Check 0 dBm -10 dBm--30 dBm-LINE_ABS_ 70 dBm-Start 30.0 MHz 54008 pts Stop 24.0 GHz rious Emissions Range Low
30.000 MHz
1.000 GHz
2.328 GHz
3.000 GHz
7.000 GHz
10.000 GHz
11.000 GHz
11.000 GHz
11.000 GHz
11.000 GHz
11.000 GHz 991.03198 MHz 2.12259 GHz 2.49052 GHz 6.02910 GHz 9.2308 GHz 13.92676 GHz 15.80652 GHz 20.31266 GHz Power Abs
-56.21 dBm
-56.02 dBm
-55.17 dBm
-50.99 dBm
-52.21 dBm
-51.02 dBm
-48.25 dBm
-48.86 dBm Range Up
1.000 GHz
2.292 GHz
3.000 GHz
7.000 GHz
10.000 GHz
14.000 GHz
18.000 GHz RBW
1.000 MHz
1.000 MHz ΔLimit
-16.21 dB
-16.02 dB
-15.17 dB
-10.99 dB
-12.21 dB
-11.02 dB
-8.25 dB
-8.86 dB ate: 20.JUN.2020 17:14:10

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Frequency Stability

Test (Conditions	LTE Band 30 (QPSK) / Middle Channel	Limit
T	W-16	BW 10MHz	Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0052	
40	Normal Voltage	0.0075	
30	Normal Voltage	0.0063	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0053	
0	Normal Voltage	0.0080	
-10	Normal Voltage	0.0043	PASS
-20	Normal Voltage	0.0033	
-30	Normal Voltage	0.0032	
20	Maximum Voltage	0.0050	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0064	

Report No. :FG051232-02D

Note:

- 1. Normal Voltage =4.0 V.; Battery End Point (BEP) =3.5 V.; Maximum Voltage =4.45 V.
- 2. The frequency fundamental emissions stay within the authorized frequency block.

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Appendix B. Test Results of EIRP and Radiated Test

EIRP

<PT Antenna>

	LTE Band 30 / 5MHz (Average) (GT - LC = -2.1 dB)											
Channel	Mode	R	В	Cond	lucted	EIRP						
Channel	Wode	Size	Offset	Power (dBm)	Power (Watts)	EIRP(dBm)	EIRP(W)					
Lowest		1	12	22.62	0.1828	20.52	0.1127					
Middle	QPSK	1	12	22.62	0.1828	20.52	0.1127					
Highest		1	12	22.54	0.1795	20.44	0.1107					
Lowest		1	24	21.95	0.1567	19.85	0.0966					
Middle	16QAM	1	24	22.00	0.1585	19.90	0.0977					
Highest		1	24	22.03	0.1596	19.93	0.0984					
Lowest		1	12	20.91	0.1233	18.81	0.0760					
Middle	64QAM	1	12	20.92	0.1236	18.82	0.0762					
Highest		1	12	20.90	0.1230	18.80	0.0759					

	LTE Band 30 / 10MHz (Average) (GT - LC = -2.1 dB)												
Channel	Mode	R	В	Cond	ucted	EIRP							
Chainei	Wode	Size	Offset	Power (dBm)	Power (Watts)	EIRP(dBm)	EIRP(W)						
Lowest	QPSK	ı	-	-	-	-	-						
Middle		1	0	22.65	0.1841	20.55	0.1135						
Highest		1	-	-	-	-	-						
Lowest		1	-	-	-	-	-						
Middle	16QAM	1	49	22.05	0.1603	19.95	0.0989						
Highest		1	-	-	-	-	-						
Lowest		-	-	-	-	-	-						
Middle	64QAM	1	25	20.97	0.1250	18.87	0.0771						
Highest		-	-	-	-	-	-						

<ASDIV Antenna>

7,105117111													
	LTE Band 30 / 5MHz (Average) (GT - LC = -1.3 dB)												
Channel	Mode	R	В	Cond	ucted	EIRP							
Chamilei	Ivioue	Size	Offset	Power (dBm)	Power (Watts)	EIRP(dBm)	EIRP(W)						
Lowest		1	0	20.43	0.1104	19.13	0.0818						
Middle	QPSK	1	0	20.35	0.1084	19.05	0.0804						
Highest		1	0	20.39	0.1094	19.09	0.0811						
Lowest		1	24	19.76	0.0946	18.46	0.0701						
Middle	16QAM	1	24	19.68	0.0929	18.38	0.0689						
Highest		1	24	19.69	0.0931	18.39	0.0690						
Lowest		1	12	18.56	0.0718	17.26	0.0532						
Middle	64QAM	1	12	18.66	0.0735	17.36	0.0545						
Highest		1	12	18.57	0.0719	17.27	0.0533						

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	LTE Band 30 / 10MHz (Average) (GT - LC = -1.3 dB)											
Channel	B.01 -	RB		Cond	ucted	EIRP						
Channel	Mode	Size	Offset	Power (dBm)	Power (Watts)	EIRP(dBm)	EIRP(W)					
Lowest		-	-	-	-	-	-					
Middle	QPSK	1	0	20.43	0.1104	19.13	0.0818					
Highest		-	-	-	-	-	-					
Lowest		1	-	-	-	-	-					
Middle	16QAM	1	49	19.76	0.0946	18.46	0.0701					
Highest		1	-	-	-	-	-					
Lowest		1	-	-	-	-	-					
Middle	64QAM	1	25	18.66	0.0735	17.36	0.0545					
Highest		-	-	-	-	-	-					

Radiated Spurious Emission

<Open Mode>

<PT Antenna>

<Ant. 1>

LTE Band 30

Report No. :FG051232-02D

			L	TE Band 30	/ 5MHz / QP	SK			
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
	4608	-61.18	-40	-21.18	-52.54	-72.53	0.85	12.20	Н
	6912	-63.31	-40	-23.31	-61.48	-73.84	0.97	11.49	Н
	9221	-58.77	-40	-18.77	-62.53	-69.38	1.37	11.98	Н
									Н
									Н
									Н
Lowest									Н
Lowest	4608	-61.11	-40	-21.11	-53.39	-72.46	0.85	12.20	V
	6912	-63.31	-40	-23.31	-61.88	-73.84	0.97	11.49	V
	9221	-57.05	-40	-17.05	-62.57	-67.66	1.37	11.98	V
									V
									V
									V
									V
	4616	-60.22	-40	-20.22	-51.57	-71.61	0.81	12.20	Н
	6924	-62.58	-40	-22.58	-60.81	-73.05	0.99	11.47	Н
	9231	-59.04	-40	-19.04	-62.77	-69.62	1.38	11.95	Н
									Н
Middle									Н
Middle									Н
									Н
	4616	-60.44	-40	-20.44	-52.79	-71.83	0.81	12.20	V
	6924	-61.57	-40	-21.57	-60.17	-72.04	0.99	11.47	V
	9231	-57.03	-40	-17.03	-62.51	-67.61	1.38	11.95	V

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4620 -60.13 -40 -20.13 -51.49 -71.54 0.79 12.20 Н 6931 -61.80 -40 -21.80 -60.04 -72.24 1.01 11.45 Н 9241.5 -58.66 -40 -18.66 -62.35 -69.2 1.38 11.93 Н Н Н Н Н Highest ٧ 4620 -60.13 -40 -20.13 -51.49 -71.54 0.79 12.20 ٧ 6931 -40 -60.04 -72.24 1.01 11.45 ٧ -61.80 -21.80 11.93 ٧ 9241.5 -57.00 -40 -17.00 -62.45 -67.54 1.38 ٧ ٧ ٧

Report No. :FG051232-02D

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

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			I.	TF Band 30	/ 10MHz / QF	PSK			
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)
	4611	-61.76	-40	-21.76	-53.12	-73.12	0.84	12.20	Н
	6917	-62.23	-40	-22.23	-60.41	-72.73	0.98	11.48	Н
	9222.5	-58.99	-40	-18.99	-62.75	-69.6	1.37	11.98	Н
									Н
									Н
									Н
									Н
Middle	4611	-60.78	-40	-20.78	-53.09	-72.14	0.84	12.20	V
	6917	-61.60	-40	-21.60	-60.18	-72.1	0.98	11.48	V
	9222.5	-57.02	-40	-17.02	-62.54	-67.63	1.37	11.98	V
									V
									V
									V
									V
									V

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

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<Close Mode>
<ASDIV Antenna>
<Ant. 2>

LTE Band 30

Report No. :FG051232-02D

			L	TE Band 30	/ 5MHz / QP	SK			
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
	4608	-64.00	-40	-24.00	-55.36	-75.35	0.85	12.20	Н
	6912	-63.76	-40	-23.76	-61.93	-74.29	0.97	11.49	Н
	9221	-58.98	-40	-18.98	-62.74	-69.59	1.37	11.98	Н
									Н
									Н
Lowest									Н
Lowest	4608	-63.03	-40	-23.03	-55.31	-74.38	0.85	12.20	V
	6912	-63.30	-40	-23.30	-61.87	-73.83	0.97	11.49	V
	9221	-57.70	-40	-17.70	-63.22	-68.31	1.37	11.98	V
									V
									V
									V
	4616	-63.48	-40	-23.48	-54.83	-74.87	0.81	12.20	Н
	6924	-63.59	-40	-23.59	-61.82	-74.06	0.99	11.47	Н
	9231	-59.22	-40	-19.22	-62.95	-69.8	1.38	11.95	Н
									Н
									Н
Middle									Н
Middle	4616	-63.27	-40	-23.27	-55.62	-74.66	0.81	12.20	V
	6924	-63.34	-40	-23.34	-61.94	-73.81	0.99	11.47	V
	9231	-57.23	-40	-17.23	-62.71	-67.81	1.38	11.95	V
									V
									V
									V

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4620 -63.82 -40 -23.82 -55.18 -75.23 0.79 12.20 Н 6931 -63.21 -40 -23.21 -61.45 -73.65 1.01 11.45 Н 9241.5 -58.41 -40 -18.41 -62.1 -68.95 1.38 11.93 Н Н Н Н Highest 4620 -55.44 -74.46 0.79 12.20 ٧ -63.05 -40 -23.05 ٧ 6931 -62.98 -40 -22.98 -61.6 -73.42 1.01 11.45 9241.5 -57.20 -40 -17.20 -62.65 -67.74 1.38 11.93 ٧ ٧ ٧ ٧

Report No. :FG051232-02D

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

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			Ľ	TE Band 30	/ 10MHz / QF	PSK			
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)
	4611	-63.98	-40	-23.98	-55.34	-75.34	0.84	12.20	Н
	6917	-63.42	-40	-23.42	-61.6	-73.92	0.98	11.48	Н
	9222.5	-58.95	-40	-18.95	-62.71	-69.56	1.37	11.98	Н
									Н
									Н
									Н
									Н
Middle	4611	-63.10	-40	-23.10	-55.41	-74.46	0.84	12.20	V
	6917	-61.95	-40	-21.95	-60.53	-72.45	0.98	11.48	V
	9222.5	-57.45	-40	-17.45	-62.97	-68.06	1.37	11.98	V
									V
									V
									V
									V
									V

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



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