

Report No.: FG890633D



FCC RADIO TEST REPORT

FCC ID : 2ABVH-INARI8B2

Equipment : Tablet Brand Name : AAVA

Model Name : INARI8B-LTG-1
Applicant : Aava Mobile Oy

NAHKATEHTAANKATU 2 90130 OULU FINLAND

Manufacturer : Aava Mobile Oy

NAHKATEHTAANKATU 2 90130 OULU FINLAND

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

The product was received on Sep. 06, 2018 and testing was started from Oct. 07, 2018 and completed on Dec. 20, 2018. 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: Jones Tsai

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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

Report Template No.: BU5-FGLTE27D Version 2.4

History of this test report

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Report No.	Version	Description	Issued Date
FG890633D	01	Initial issue of report	Jan. 08, 2019

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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	-
4.4	§2.1053 §27.53 (a)(4)	Radiated Spurious Emission	Pass	Under limit 0.34 dB at 13851.000 MHz

Reviewed by: Wii Chang Report Producer: Yimin Ho

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1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature					
Equipment	Tablet				
Brand Name	AAVA				
Model Name	INARI8B-LTG-1				
FCC ID	2ABVH-INARI8B2				
EUT supports Radios application	WCDMA/HSPA/LTE/NFC/GNSS WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE				
HW Version	DV1				
SW Version	Windows 10				
EUT Stage	Identical Prototype				

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

Specification of Accessories								
AC Adapter	Brand Name	PHIHONG	Model Name	AQ18A-59CFA				
Battery	Brand Name	Aava	Model Name	AMME3735				
USB Cable	Brand Name	PHIHONG	Model Name	UES-1001A160-R				

1.2 Product Specification of Equipment Under Test

Product Feature					
	Floudet i eature				
Tx Frequency	LTE Band 30 : 2305 MHz ~ 2315 MHz				
Rx Frequency	LTE Band 30 : 2350 MHz ~ 2360 MHz				
Bandwidth	5MHz / 10MHz				
Maximum Output Power to Antenna	LTE Band 30 : 23.57 dBm				
Antenna Type	Flexible Antenna				
Antenna Gain	LTE Band 30 : 2.00 dBi				
Type of Modulation	QPSK / 16QAM				

1.3 Modification of EUT

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

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1.4 Maximum Conducted power, Frequency Tolerance and Emission Designator

L	TE Band 30		QPSK		16QAM			
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum EIRP(W)	
5	2307.5 ~ 2312.5	4M49G7D	-	0.3491	4M49W7D	-	0.2931	
10	2310.0	8M99G7D	0.0075	0.3606	9M05W7D	-	0.3062	

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1.5 Testing Site

Test Site	SPORTON INTERNATIONAL INC.				
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.				
lest Site No.	TH05-HY				
Temperature	24~26℃				
Relative Humidity	52~55%				
Test Engineer	Aking Chang				

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

Test Site	SPORTON INTERNATIONAL INC.			
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.	03CH12-HY			
Temperature	22~26℃			
Relative Humidity	56~67%			
Test Engineer	Jack Cheng, Lance Chiang, and Peter Liao			

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

FCC Designation No. TW1190 and TW0007

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1.6 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
- 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

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.

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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.

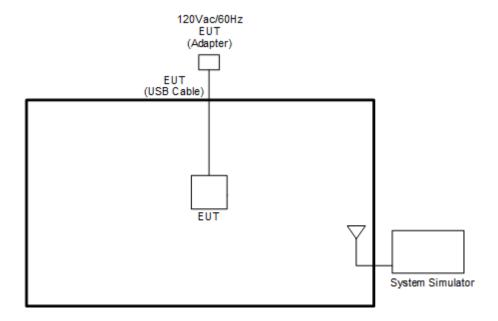
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For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

_		Bandwidth (MHz)		Modu	lation	RB#			Test Channel						
Test Items	Band	1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	Н
Max. Output Power	30	-	•	v	v	-	•	v	v	v	v	v	v	v	v
Peak-to-Avera ge Ratio	30	•	•		v	-	•	v	v	v		v		v	
E.I.R.P PSD	30	-	•	>	v	•	•	٧	٧	v		v	v	v	v
26dB and 99% Bandwidth	30	-	•	v	v	-	•	v	v			v	v	v	v
Conducted Band Edge	30	-	-	V	v	-	-	v	v	v		v	v		v
Conducted Spurious Emission	30	-	•	v	v	-	•	v	v	v			v	v	v
Frequency Stability	30	-	•		v	-	•	v				v		v	
Radiated Spurious Emission	30						٧	Vorst Case					v	v	v
1. The mark "v" means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious em different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emireported.						nder									

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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

Ite	n 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] Channel/Frequency(MHz) Lowest Middle Highest								
10	Channel	-	27710	-				
10	Frequency	-	2310	-				
E	Channel	27685	27710	27735				
5	Frequency	2307.5	2310	2312.5				

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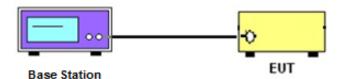
3 Conducted Test Items

3.1 Measuring Instruments

See list of measuring instruments of this test report.

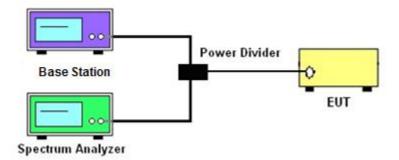
3.1.1 Test Setup

3.1.2 Conducted Output Power

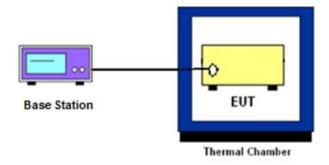


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3.1.3 Peak-to-Average Ratio, Occupied Bandwidth, 26dB Bandwidth ,Band-Edge and Conducted Spurious Emission



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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The EIRP of mobile transmitters must not exceed 0.25 Watts for LTE Band 30.

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 FCC KDB 971168 D01 v03r01 Section 5.7.1

- 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 FCC KDB 971168 D01 v03r01 Section 5.4

- 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.
- 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 FCC KDB 971168 D01 v03r01 Section 4.1 and 4.2

- 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.
- 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.

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3.6 Conducted Band Edge Measurement

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 6.0

- 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 Measurement

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 6.0.

- 1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
- The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.The path loss was compensated to the results for each measurement.
- 3. The middle channel for the highest RF power within the transmitting frequency was measured.
- 4. The conducted spurious emission for the whole frequency range was taken.
- 5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
- 6. Set spectrum analyzer with RMS detector.
- 7. Taking the record of maximum spurious emission.
- 8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
- 9. The limit line is derived from 70 + 10log(P)dB below the transmitter power P(Watts)

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3.8 Frequency Stability Measurement

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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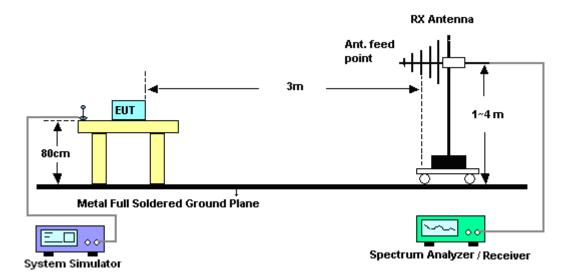
4 Radiated Test Items

4.1 Measuring Instruments

See list of measuring instruments of this test report.

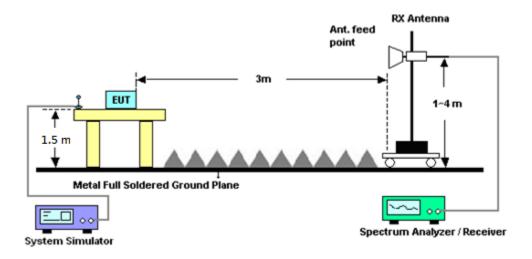
4.2 Test Setup

For radiated test from 30MHz to 1GHz



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For radiated test above 1GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.

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4.4 Radiated Spurious Emission Measurement

4.4.1 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.

4.4.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI / TIA-603-E Section 2.2.12.

- 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
```

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

The limit line is derived from $70 + 10\log(P)dB$ 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
Base Station(Measure)	Anritsu	MT8820C	620102648 0	MIMO/LTE (FDD)/ IP Throughput	Dec. 20, 2017	Oct. 07, 2018 ~ Dec. 14, 2018	Dec. 19, 2018	Conducted (TH05-HY)
LTE Base Station	Anritsu	MT8820C	620143282 1	GSM/GPRS /WCDMA/LTE	Oct. 14, 2018	Dec. 15, 2018 ~ Dec. 20, 2018	Oct. 13, 2019	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101408	10Hz~40GHz	Jul. 30, 2018	Oct. 07, 2018 ~ Dec. 20, 2018	Jul. 29, 2019	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SH-641	92013720	-40°C~90°C	Aug. 29, 2018	Oct. 07, 2018 ~ Dec. 20, 2018	Aug. 28, 2019	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890094 1V~20V Oct. 02, 2018		Oct. 07, 2018 ~ Dec. 20, 2018	Oct. 01, 2019	Conducted (TH05-HY)	
Coupler	Woken	0.5-18G 10d B 30W	DOM5CIW 3A1	0.5-18GHz	Feb. 21, 2018	Oct. 07, 2018 ~ Dec. 20, 2018	Feb. 20, 2019	Conducted (TH05-HY)

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		Calibration						
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	TESEQ	HLA 6120	31244	9 kHz~30 MHz	Mar. 29, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Mar. 28, 2019	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	37059&01	30MHz~1GHz	Oct. 13, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Oct. 12, 2019	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120D	9120D-132 8	1GHz ~ 18GHz	Oct. 19, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Oct. 18, 2019	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 576	18GHz ~ 40GHz	May 08, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	May 07, 2019	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 26, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Mar. 25, 2019	Radiation (03CH12-HY)
Preamplifier	Keysight	83017A	MY532701 48	1GHz~26.5GHz	Jan. 15, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Jan. 14, 2019	Radiation (03CH12-HY)
Preamplifier	Jet-Power	JPA0118-55-3 03K	171000180 0054002	1GHz~18GHz	Apr. 17, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Apr. 16, 2019	Radiation (03CH12-HY)
Preamplifier	MITEQ	TTA1840-35- HG	1864481	18GHz ~ 40GHz	Aug. 24, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Aug. 23, 2019	Radiation (03CH12-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100390	20Hz~26.5GHz	Dec. 25, 2017	Nov. 21, 2018 ~ Dec. 20, 2018	Dec. 24, 2018	Radiation (03CH12-HY)
Spectrum Analyzer	Keysight	N9010A	MY553705 26	10Hz~44GHz	Mar. 15, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Mar. 14, 2019	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120D	9120D-152 2	1GHz ~ 18GHz	May 10, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	May 09, 2019	Radiation (03CH12-HY)
Signal Generator	Rohde & Schwarz	SMF100A	101107	100kHz~40GHz	May 21, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	May 20, 2019	Radiation (03CH12-HY)
Base Station	Anritsu	MT8821C	620143281 6	GSM / GPRS /WCDMA / LTE FDD/TDD with 44) /LTE-3CC DLCA,2CC ULCA	May 02, 2017	Nov. 21, 2018 ~ Dec. 20, 2018	May 01, 2019	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-1 2SS	SN2	1.2GHz Low Pass	Mar. 21, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Mar. 20, 2019	Radiation (03CH12-HY)
Notch Filter	Wainwright	WRCT2300/2 500-20/40-10 SSK	SN1	2300/2500	May 23, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	May 22, 2019	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30M-18G	Mar. 14, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Mar. 13, 2019	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30M~40GHz	Oct. 16, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Oct. 15, 2019	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30M~40GHz	Oct. 16, 2018	Nov. 21, 2018 ~ Dec. 20, 2018	Oct. 15, 2019	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500- B	N/A	1m~4m	N/A	Nov. 21, 2018 ~ Dec. 20, 2018	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Nov. 21, 2018 ~ Dec. 20, 2018	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-00098 9	N/A	N/A	Nov. 21, 2018 ~ Dec. 20, 2018	N/A	Radiation (03CH12-HY)

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6 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.36
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	3.70
Confidence of 95% (U = 2Uc(y))	3.70

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

Measuring Uncertainty for a Level of	3.98
Confidence of 95% (U = 2Uc(y))	3.90

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FCC RADIO TEST REPORT

Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

		LTE	Band 30 Ma	ximum Average Po	ower [dBm]	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0			23.57	
10	1	25			23.35	
10	1	49			23.25	
10	25	0	QPSK		21.52	
10	25	12			21.40	
10	25	25			21.30	
10	50	0		_	21.42	_
10	1	0		_	22.86	_
10	1	25			22.58	
10	1	49			22.55	
10	25	0	16-QAM		20.46	
10	25	12			20.40	
10	25	25			20.28	
10	50	0			20.40	
5	1	0		23.34	23.43	23.41
5	1	12		23.32	23.33	23.23
5	1	24		23.30	23.34	23.26
5	12	0	QPSK	21.38	21.39	21.33
5	12	7		21.43	21.37	21.30
5	12	13		21.38	21.27	21.30
5	25	0		21.32	21.34	21.26
5	1	0		22.62	22.67	22.63
5	1	12		22.57	22.59	22.48
5	1	24		22.49	22.52	22.47
5	12	0	16-QAM	20.40	20.41	20.37
5	12	7		20.44	20.37	20.29
5	12	13		20.39	20.30	20.31
5	25	0		20.32	20.34	20.30

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LTE Band 30

Peak-to-Average Ratio

Mode		LTE Band 30 / 10MHz									
Mod.	QP	SK	16C	Limit: 13dB							
RB Size	1RB	Full RB	1RB	Full RB	Result						
Lowest CH	-	-	-	-							
Middle CH	4.84	5.07	6.03	6	PASS						
Highest CH	-	-	-	-							

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LTE Band 30 / 10MHz / QPSK

Middle Channel / 1RB

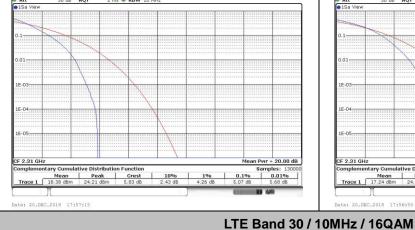
Middle Channel / Full RB

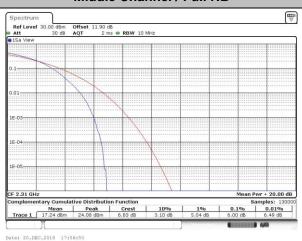
Spectrum
Ref Level 30.00 dbm Offset 11.90 db
Att 30 db AQY 2 ms se RBW 10 Mez

Spectrum
Ref Level 30.00 dbm Offset 11.90 db
Att 30 db AQY 2 ms se RBW 10 Mez

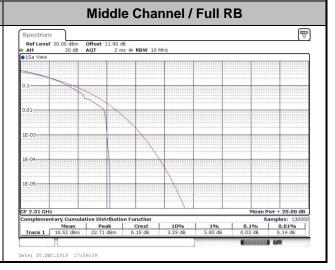
Spectrum
Ref Level 30.00 dbm Offset 11.90 db
Att 30 db AQY 2 ms se RBW 10 Mez

Spectrum
Ref Level 30.00 dbm Offset 11.90 db
Att 30 db AQY 2 ms se RBW 10 Mez





Samples: 130000 196 0.196 0.0196 4 40 dB 4 84 dB 4 93 dB



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EIRP Power Density

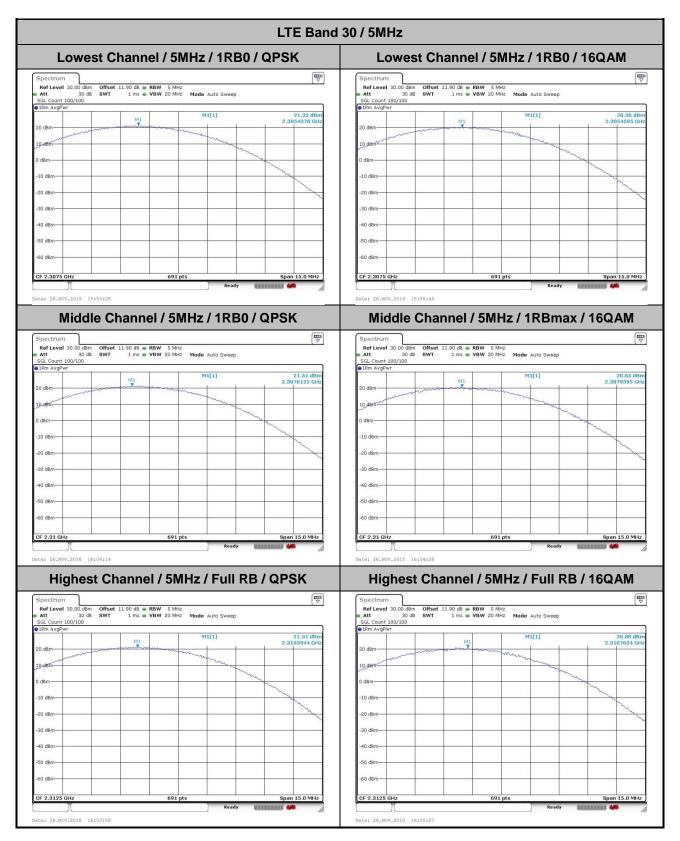
Mode		LTE Band 30 : Conducted Power Density (dBm/5MHz)										
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	-	-	-	-	21.32	20.36	-	-	-	-	-	-
Middle CH	-	-	-	-	21.51	20.65	21.48	20.57	-	-	-	-
Highest CH	-	-	-	-	21.32	20.88	-	-	-	-	-	-

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Mode		LTE Band 30 : EIRP Power Density (dBm/5MHz)										
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	-	-	-	-	23.32	22.36	-	-	-	-	-	-
Middle CH	-	-	-	-	23.51	22.65	23.48	22.57	-	-	-	-
Highest CH	-	-	-	-	23.32	22.88	-	-	-	-	-	-
Antenna Gain						2.0	dBi					
Limit		250mW / 5MHz = 24dBm / 5MHz										
Result						Pa	ss					

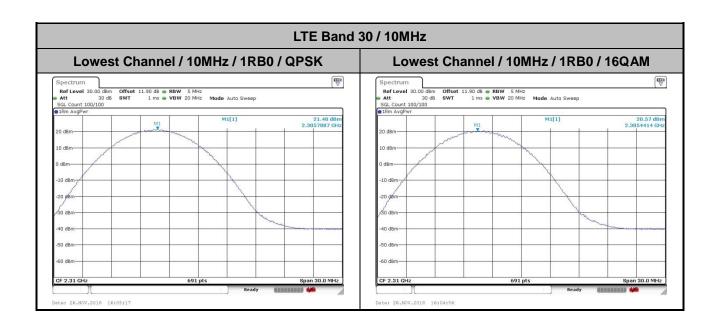
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26dB Bandwidth

Mode		LTE Band 30 : 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	-	-	-	-	4.88	4.90	-	-	-	-	-	-
Middle CH	-	-	-	-	4.92	4.88	9.75	9.69	-	-	-	-
Highest CH	-	-	-	-	4.94	4.90	-	-	-	-	-	-

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Report No.: FG890633D LTE Band 30 Lowest Channel / 5MHz / QPSK Lowest Channel / 5MHz / 16QAM 12.58 dBn 2.30687100 GH 26.00 dl M1[1] 13.10 dBr 2.30739000 GF M1[1] -10 dBm -30 dBm Type Ref Trc Type | Ref | Trc |
 X-value
 Y-value
 Function

 2,30739 GHz
 13,10 dBm
 ndB down
 Function ndB down Middle Channel / 5MHz / QPSK Middle Channel / 5MHz / 16QAM 12.72 dBr 2.30844200 GH 26.00 d 4.915000000 MH 12.18 dBn 2.30873100 GH; 26.00 dE 4.875000000 MH; M1[1] M1[1] 10 dBm 469 -20 dBm-30 dB/m 40 dBm-1001 pts CF 2.31 GH 1001 pts Span 10.0 MHz CF 2.31 GH Span 10.0 MHz Y-value 12.18 dBm -13.46 dBm -13.79 dBm Type | Ref | Trc | Type Ref Trc Highest Channel / 5MHz / QPSK Highest Channel / 5MHz / 16QAM 12.75 dBr 2.31145100 GH 26.00 d 2.312 26.00 di 10 dBm WANT 50 d8m

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CF 2.3125 GHz

Type Ref Trc

X-value 2.31209 GHz 2.310052 GHz 2.314948 GHz

1001 pt

Function n ndB down

Span 10.0 MHz

Function Result 4.895 MHz 26.00 dB 472.3

Function Result 4,935 MHz 26.00 dB 468.4

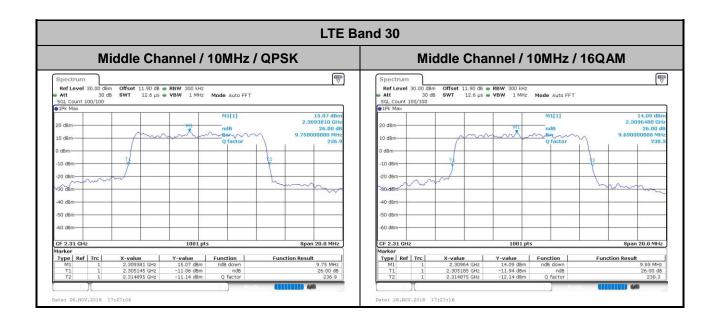
Y-value Function 12.75 dBm ndB down

Span 10.0 MHz

CF 2.3125 GHz Marker

Type | Ref | Trc |

Report No.: FG890633D



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Occupied Bandwidth

Mode		LTE Band 30 : 99%OBW(MHz)											
BW	1.4MHz 3MHz			lHz	5MHz		10MHz		15MHz		20MHz		
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	
Lowest CH	-	-	-	-	4.49	4.47	-	-	-	-	-	-	
Middle CH	-	-	-	-	4.49	4.49	8.99	9.05	-	-	-	-	
Highest CH	-	-	-	-	4.48	4.49	-	-	-	-	-	-	

Report No. : FG890633D

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Report No.: FG890633D LTE Band 30 Lowest Channel / 5MHz / QPSK Lowest Channel / 5MHz / 16QAM 11.73 dBn 2.30823900 GH 4.465534466 MH M1[1] 13.95 dB M1[1] An -10 dBm 30 dBm 40 dBm -50 dBm
 X-value
 Y-value
 Function

 2.30782 GHz
 13.95 dBm

 2.3052522 GHz
 6.98 dBm
 Occ Bw

 2.3097378 GHz
 7.87 dBm
 Type Ref Trc
 X-value
 Y-value
 Function

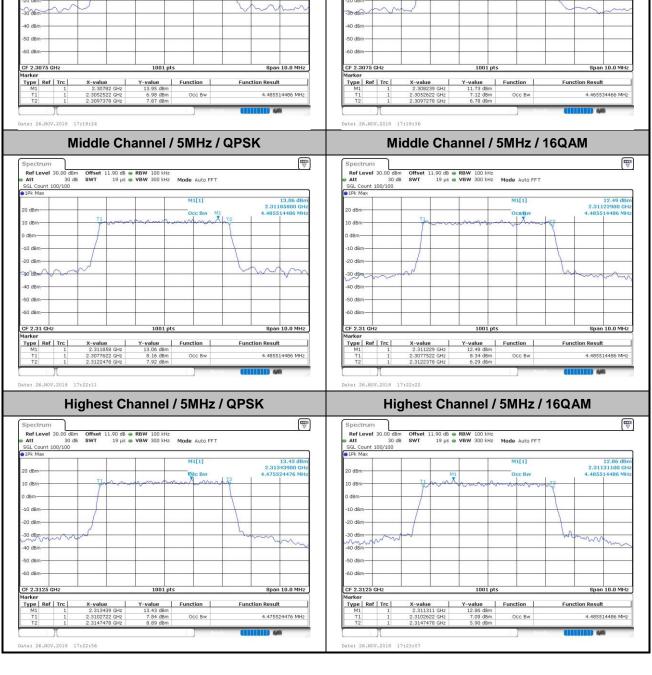
 2.308239 GHz
 11.73 dBm
 0.00 dBm

 2.3052622 GHz
 7.12 dBm
 0.00 BW

 2.3097278 GHz
 6.78 dBm
 Type | Ref | Trc | 4.485514486 MHz 4.465534466 MHz Middle Channel / 5MHz / QPSK Middle Channel / 5MHz / 16QAM Ref Level 30.00 de Att 30 SGL Count 100/100 13.06 dBi 2.31185800 GF 4.485514486 MF 12.49 dBn 2.31122900 GH 4.485514486 MH M1[1] M1[1] 10 dBm--20 dBmmy 30 dBra-40 dBm -60 dBm-CF 2.31 GH 1001 pts Span 10.0 MHz CF 2.31 GH 1001 pts Span 10.0 MHz
 X-value
 Y-value
 Function

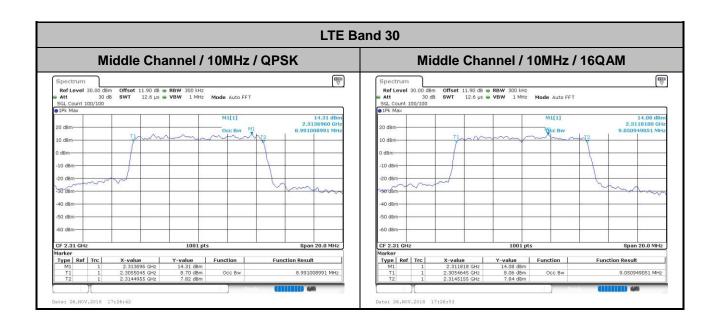
 2.311858 GHz
 13.06 dBm
 2.3077622 GHz
 8.16 dBm
 Occ BW

 2.3122478 GHz
 7.92 dBm
 Occ BW
 Occ BW
 Type | Ref | Trc | Function Result Type Ref Trc **Function Result** 4.485514486 MHz 4.485514486 MHz Highest Channel / 5MHz / QPSK Highest Channel / 5MHz / 16QAM 13.43 dBr 2.31343900 GF 4.475524476 MF 12.86 dBn 2.31131100 GH 4.485514486 MH 10 dBm--20 dBm-



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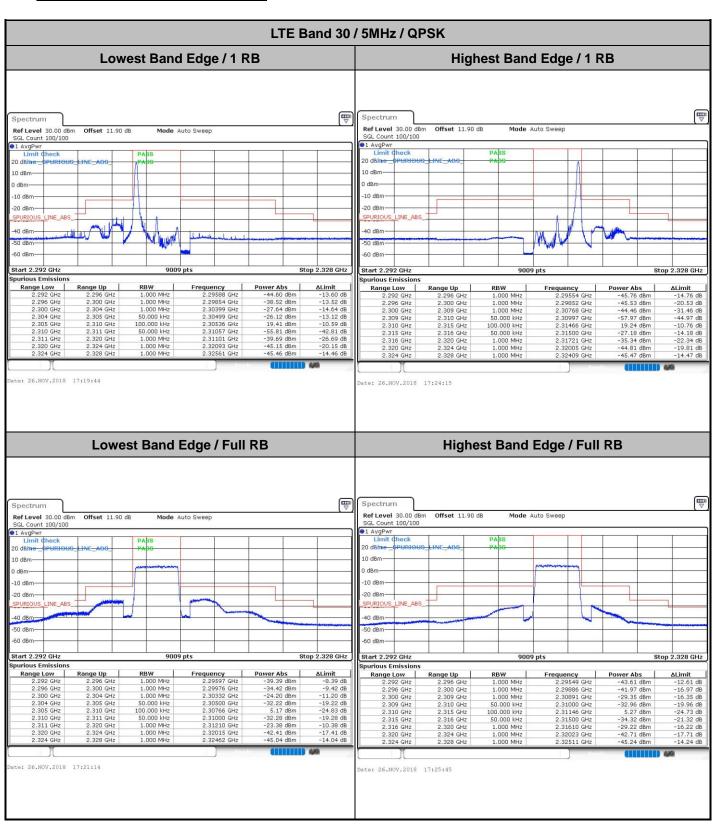
Report No.: FG890633D



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Conducted Band Edge

FAX: 886-3-328-4978



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LTE Band 30 / 5MHz / 16QAM Lowest Band Edge / 1RB Highest Band Edge / 1 RB Spectrum Ref Level 30.00 dBm SGL Count 100/100 Ref Level 30.00 dBm Offset 11.90 dB Mode Auto Sweep Offset 11.90 dB Mode Auto Sweep SGL Count 100/100 10 dBm dBm -10 dBm -10 dBm--20 dBm--20 dBm-PURIOUS INE_ABS 40 dBm -40 dBm-50 dBm 60 dBm -60 dBm Start 2.292 GHz Stop 2.328 GH: Stop 2.328 GHz Start 2.292 GHz rious Emissions purious Emissions urious Emission Range Low 2.292 GHz 2.296 GHz 2.300 GHz 2.309 GHz 2.310 GHz 2.315 GHz 2.316 GHz 2.320 GHz 2.324 GHz 2.29396 GHz 2.29774 GHz 2.30124 GHz 2.30500 GHz -13.29 dB -15.57 dB -22.21 dB -14.11 dB -11.64 dB -44.31 dB -28.85 dB -20.40 dB -14.43 dB 2.296 GHz 2.300 GHz 2.304 GHz 2.305 GHz 2.310 GHz .296 GHz -27.11 dBm 18.36 dBm -57.31 dBm -41.85 dBm 50.000 kHz 100.000 kHz 2.305 GH 2.30532 GHz 2.310 GHz 2.311 GHz 2.320 GHz 2.324 GHz 2.328 GHz 50.000 kHz 1.000 MHz 1.000 MHz 2.310 GHz 2.311 GHz 2.31001 GHz 2.31271 GHz te: 26.NOV.2018 17:20:29 ate: 26.NOV.2018 17:25:00 Lowest Band Edge / Full RB **Highest Band Edge / Full RB** W Spectrum Ref Level 30.00 dBm SGL Count 100/100 Ref Level 30.00 dBm Offset 11.90 dB Mode Auto Sween Count 100/100 1 AvgPwr Limit Ch 20 d8ine _G 20 dBime 10 dBmdBm-0 dBm -10 dBm -10 dBm -20 dBm--20 dBm-LINE_ABS SPURIOUS SPURIOUS 40 dBm Start 2.292 GHz 9009 pts Stop 2.328 GHz Start 2.292 GHz Stop 2.328 GHz rious 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 Power Abs
-44.42 dBm
-42.72 dBm
-30.89 dBm
-34.30 dBm
-35.12 dBm
-30.02 dBm
-42.98 dBm
-45.43 dBm Range Up
2.296 GHz
2.300 GHz
2.304 GHz
2.305 GHz
2.310 GHz
2.311 GHz
2.311 GHz
2.320 GHz
2.324 GHz
2.328 GHz Frequency
2.29596 GHz
2.29591 GHz
2.30396 GHz
2.30500 GHz
2.30590 GHz
2.31000 GHz
2.31225 GHz
2.3203 GHz
2.32515 GHz Range Up 2.296 GHz 2.300 GHz 2.309 GHz 2.310 GHz 2.315 GHz 2.316 GHz 2.320 GHz 2.324 GHz 2.328 GHz te: 26.NOV.2018 17:21:59 ate: 26.NOV.2018 17:26:30

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LTE Band 30 / 10MHz / QPSK Lowest Band Edge / 1 RB Highest Band Edge / 1 RB Spectrum Ref Level 30.00 dBm SGL Count 100/100 Ref Level 30.00 dBm Offset 11.90 dB Mode Auto Sweep Offset 11.90 dB Mode Auto Sweep SGL Count 100/100 10 dBm dBm -10 dBm -10 dBm 20 dBm -20 dBm-PURIOUS INE_ABS 40 dBm -40 dBmmust had handed 60 dBm Start 2.292 GHz Stop 2.328 GH: Stop 2.328 GHz Start 2.292 GHz rious Emissions urious Emissions Power Abs
-43.29 dBm
-38.40 dBm
-32.98 dBm
-36.12 dBm
19.34 dBm
-54.74 dBm
-46.03 dBm
-45.42 dBm
-45.52 dBm Durious Emission
Range Low
2,292 GHz
2,296 GHz
2,300 GHz
2,304 GHz
2,305 GHz
2,315 GHz
2,315 GHz
2,316 GHz
2,320 GHz
2,324 GHz RBW 1.000 MHz 1.000 MHz 1.000 MHz 100.000 kHz 100.000 kHz 2.29599 GHz 2.29677 GHz 2.30093 GHz -12.29 dB -13.40 dB -19.98 dB -23.12 dB -10.66 dB -41.74 dB -33.03 dB -20.42 dB -14.52 dB 2.296 GHz 2.300 GHz 2.304 GHz 2.305 GHz 2.315 GHz 2.30499 GHz 2.30558 GHz 2.305 GH 2.315 GHz 2.316 GHz 2.320 GHz 2.324 GHz 2.328 GHz 2.31505 GHz 2.31505 GHz 2.31905 GHz 2.32073 GHz 2.32485 GHz 2.315 GHz 2.316 GHz 100.000 kHz te: 26.NOV.2018 17:28:00 ate: 26.NOV.2018 17:29:31 Band Edge / Full RB Ref Level 30.00 dBm Offset 11.90 dB Mode Auto Sweep SGL Count 100/100 1 AvqPwr 20 dBime SPURIOUS-LINE ADS 10 dBm-0 dBm -10 dBm -20 dBm-SPURIOUS LINE ABS -40 dBm -50 dBm -60 dBm-Start 2.292 GHz 9009 pts Stop 2.328 GHz Spurious Emissions 2.296 GHz 2.300 GHz 2.29597 GHz 2.29999 GHz Range Low Power Abs 1.000 MHz -39.26 dBm -30.06 dBm -8.26 dB -5.06 dB 2.292 GHz 2.296 GHz 1.000 MHz 2.300 GHz 2.304 GHz 1.000 MHz 2.30397 GHz -23.27 dBm -10.27 dB 2.305 GHz 100.000 kHz -31.44 dBm -27.74 dB -21.46 dB 2.26 dBm -34.46 dBm 2.305 GHz 2.315 GHz 100.000 kHz 2.30961 GHz 2.315 GHz 2.316 GHz 100.000 kHz 2.31500 GHz 2.316 GHz 2.320 GHz 1.000 MHz 2.31603 GHz -28.14 dBm -15.14 dB 2.324 GHz 1.000 MHz -35.20 dBm 2.320 GHz 2.32009 GHz -10.20 dB 2.324 GHz 2.328 GHz 1.000 MHz 2.32405 GHz -44.18 dBm -13.18 dB

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Date: 26.NOV.2018 17:31:01

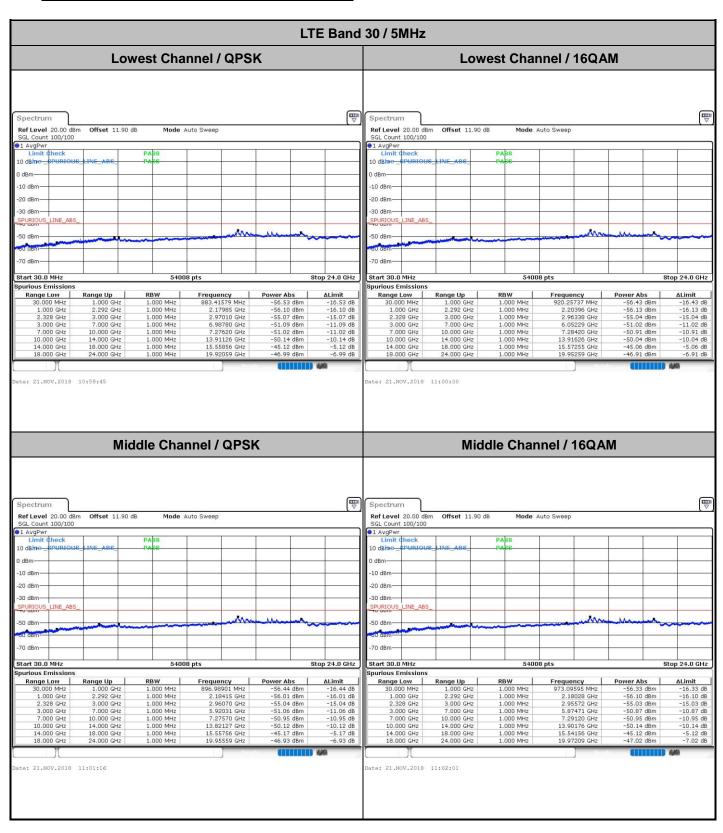
Report No.: FG890633D LTE Band 30 / 10MHz / 16QAM Lowest Band Edge / 1 RB Highest Band Edge / 1 RB Spectrum Ref Level 30.00 dBm SGL Count 100/100 Ref Level 30.00 dBm Offset 11.90 dB Mode Auto Sweep Offset 11.90 dB Mode Auto Sweep SGL Count 100/100 10 dBm dBm -10 dBm -10 dBm 20 dBm -20 dBm-PURIOUS INE_ABS 40 dBm Made Later Comme -40 dBm-Mahamus Sandalla Ma 60 dBm Start 2.292 GHz Stop 2.328 GH: Stop 2.328 GHz Start 2.292 GHz rious Emissions urious Emissions Durious Emission
Range Low
2,292 GHz
2,296 GHz
2,300 GHz
2,304 GHz
2,305 GHz
2,315 GHz
2,315 GHz
2,316 GHz
2,320 GHz
2,324 GHz ALimit
-12.76 dB
-14.25 dB
-20.64 dB
-22.38 dB
-11.65 dB
-40.59 dB
-30.71 dB
-19.87 dB
-14.56 dB RBW 1.000 MHz 1.000 MHz 1.000 MHz 100.000 kHz 100.000 kHz 2.29599 GHz 2.29672 GHz 2.30086 GHz 2.296 GHz 2.300 GHz 2.304 GHz 2.305 GHz 2.315 GHz 2.292 GHz 2.296 GHz 2.300 GHz 2.30499 GHz 2.30559 GHz 2.305 GH 2.315 GHz 2.316 GHz 2.320 GHz 2.324 GHz 2.328 GHz 2.315 GHz 2.316 GHz 100.000 kHz 2.31502 GHz 2.31764 GHz te: 26.NOV.2018 17:28:46 ate: 26.NOV.2018 17:30:16 Band Edge / Full RB Ref Level 30.00 dBm Offset 11.90 dB Mode Auto Sweep SGL Count 100/100 1 AvqPwr 20 dBime SPURIOUS-LINE ADS 10 dBm-0 dBm -10 dBm--20 dBm-SPURIOUS LINE_ABS 40 dBm -50 dBm--60 dBm-Start 2.292 GHz 9009 pts Stop 2.328 GHz Spurious Emissions 2.296 GHz 2.300 GHz Range Low Power Abs Frequency 2.29569 GHz 2.29987 GHz 1.000 MHz -9.26 dB -5.59 dB 2.292 GHz 2.296 GHz -40.26 dBm 1.000 MHz -30.59 dBm 2.300 GHz 2.304 GHz 1.000 MHz 2.30385 GHz -25.40 dBm -12.40 dB 2.305 GHz 100.000 kHz -33.17 dBm 2.305 GHz 2.315 GHz 100.000 kHz 2.30897 GHz 1.68 dBm -28.32 dB 2.315 GHz 2.316 GHz 100.000 kHz 2.31501 GHz -35.24 dBm -22.24 dB 2.316 GHz 2.320 GHz 1.000 MHz 2.31615 GHz -28.97 dBm -15.97 dB 2.324 GHz 1.000 MHz 2.320 GHz 2.32021 GHz -34.99 dBm -9.99 dB 2.324 GHz 2.328 GHz 1.000 MHz 2.32407 GHz -43.82 dBm -12.82 dB

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FAX: 886-3-328-4978

Date: 26.NOV.2018 17:31:46

Conducted Spurious Emission



Report No.: FG890633D

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te: 21.NOV.2018 11:04:17

FAX: 886-3-328-4978

Report No.: FG890633D LTE Band 30 / 5MHz **Highest Channel / QPSK Highest Channel / 16QAM** Spectrum Spectrum Ref Level 20.00 dBm Offset 11.90 dB Mode Auto Sweep Ref Level 20.00 dBm Offset 11.90 dB Mode Auto Sweep SGL Count 100/100

1 AvgPwr
Limit Check Count 100/100 1 AvgPwr Limit Check dBm 0 dBm 10 dBm -10 dBm 20 dBm -20 dBm -30 dBm 30 dBm LINE_ABS PURIOUS 70 dBm 70 dBm Start 30.0 MHz Stop 24.0 GHz Start 30.0 MHz Stop 24.0 GHz rious Emissio Spurious Emissions RBW 1.000 MHz Range Low
30.000 MHz
1.000 GHz
2.328 GHz
3.000 GHz
7.000 GHz
10.000 GHz
14.000 GHz 1.000 MHz 1.000 GHz 2.292 GHz 3.000 GHz 7.000 GHz 10.000 GHz 14.000 GHz 18.000 GHz Range Low 30,000 MHz Range Up 30.000 MHz 1.000 GHz 2.328 GHz 3.000 GHz 7.000 GHz 10.000 GHz 14.000 GHz 1.000 GHz 2.292 GHz 3.000 GHz 7.000 GHz 10.000 GHz 14.000 GHz 18.000 GHz 24.000 GHz 19.94659 GHz e: 21.NOV.2018 11:02:46 te: 21.NOV.2018 11:03:31 LTE Band 30 / 10MHz Middle Channel / QPSK Middle Channel / 16QAM Spectrum Spectrum Offset 11.90 dB Ref Level 20.00 dBm Offset 11.90 dB Mode Auto Sweep Ref Level 20.00 dBm Mode Auto Sweep SGL Count 100/100 SGL Count 100/100 ●1 AvgPwr Limit ¢heck 1 AvgPwr Limit Check 0 dBm dBm -10 dBm -10 dBm 20 dBm -20 dBm 30 dBm -30 dBm LINE_ABS SPURIOUS LINE_ABS 50 dBm 70 dBm Start 30.0 MHz 54008 Stop 24.0 GHz Start 30.0 MHz 54008 Stop 24.0 GHz ırious Emissions Spurious Emissions 1.000 MHz RBW

1.000 MHz

1.000 MHz Frequency 978.42829 MHz 2.15014 GHz 2.96191 GHz 5.89391 GHz 7.28970 GHz 13.88226 GHz 15.55256 GHz 19.93809 GHz ALimit
-16.56 dB
-16.30 dB
-15.00 dB
-10.89 dB
-11.16 dB
-10.21 dB
-5.08 dB
-6.90 dB Power Abs
-56.43 dBm
-56.14 dBm
-55.17 dBm
-51.12 dBm
-50.85 dBm
-49.89 dBm
-45.15 dBm
-47.07 dBm Range Up 1.000 GHz 2.292 GHz 3.000 GHz 1.000 GHz 2.292 GHz 3.000 GHz -56.56 dBm -56.30 dBm -55.00 dBm Frequency 884.38531 MHz 2.18760 GHz 2.50329 GHz ALimit
-16.43 dB
-16.14 dB
-15.17 dB
-11.12 dB
-10.85 dB
-9.89 dB
-5.15 dB
-7.07 dB 30.000 MHz 1.000 GHz 2.328 GHz 3.000 GHz 7.000 GHz 10.000 GHz 14.000 GHz 1.000 GHz 2.328 GHz 3.000 GHz 7.000 GHz 10.000 GHz 14.000 GHz 7.000 GHz 10.000 GHz 14.000 GHz 18.000 GHz -50.89 dBm -51.16 dBm -50.21 dBm -45.08 dBm 7.000 GHz 10.000 GHz 14.000 GHz 18.000 GHz 5.89831 GHz 7.28670 GHz 13.91676 GHz 15.54856 GHz

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ate: 21.NOV.2018 11:05:02

Frequency Stability

Test (Conditions	LTE Band 30 (QPSK) / Middle Channel	Limit
- ,	V V	BW 10MHz	Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0003	
40	Normal Voltage	0.0075	
30	Normal Voltage	0.0003	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0004	
0	Normal Voltage	0.0007	
-10	Normal Voltage	0.0065	PASS
-20	Normal Voltage	0.0001	
-30	Normal Voltage	0.0068	
20	Maximum Voltage	0.0000	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0066	

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Note:

- 1. Normal Voltage =6.8 V.; Battery End Point (BEP) =7.6 V.; Maximum Voltage =8.7 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

<Reporting Only>

LTE Band 30 / 5MHz (Average) (GT - LC = 2 dB)									
Channel	Mode	RB		Cond	lucted	EIRP			
		Size	Offset	Power (dBm)	Power (Watts)	EIRP(dBm)	EIRP(W)		
Lowest	QPSK	1	0	23.34	0.2158	25.34	0.3420		
Middle		1	0	23.43	0.2203	25.43	0.3491		
Highest		1	0	23.41	0.2193	25.41	0.3475		
Lowest		1	0	22.62	0.1828	24.62	0.2897		
Middle	16QAM	1	0	22.67	0.1849	24.67	0.2931		
Highest		1	0	22.63	0.1832	24.63	0.2904		
Limit	EIRP < 0.25W			Result		PASS			

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LTE Band 30 / 10MHz (Average) (GT - LC = 2 dB)									
Channel	Mode	RB		Conducted		EIRP			
		Size	Offset	Power (dBm)	Power (Watts)	EIRP(dBm)	EIRP(W)		
Lowest	QPSK	-	-	-	-	-	-		
Middle		1	0	23.57	0.2275	25.57	0.3606		
Highest		-	-	-	-	-	-		
Lowest		-	-	-	-	-	-		
Middle	16QAM	1	0	22.86	0.1932	24.86	0.3062		
Highest		-	-	-	-	-	-		
Limit	EIRP < 0.25W			Result		PASS			

Radiated Spurious Emission

LTE Band 30

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LTE Band 30 / 5MHz / QPSK										
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)	
Lowest	4608	-45.94	-40	-5.94	-43.29	-57.29	0.85	12.20	Н	
	6918	-57.02	-40	-17.02	-59.95	-67.52	0.98	11.48	Н	
	9225	-59.34	-40	-19.34	-64.53	-69.94	1.37	11.97	Н	
	11529	-50.04	-40	-10.04	-54.04	-60.44	1.52	11.92	Н	
	13833	-46.62	-40	-6.62	-55.49	-57.28	1.54	12.20	Н	
	16137	-51.28	-40	-11.28	-66.28	-66.46	1.80	16.98	Н	
									Н	
	4608	-50.30	-40	-10.30	-46.86	-61.65	0.85	12.20	V	
	6918	-54.21	-40	-14.21	-56.69	-64.71	0.98	11.48	V	
	9225	-54.13	-40	-14.13	-60.33	-64.73	1.37	11.97	V	
	11529	-43.58	-40	-3.58	-47.46	-53.98	1.52	11.92	V	
	13833	-40.54	-40	-0.54	-49.74	-51.20	1.54	12.20	V	
	16137	-48.00	-40	-8.00	-63.57	-63.18	1.80	16.98	V	
									V	

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4614 -44.88 -40 -4.88-42.3-56.26 0.82 12.20 Н -54.81 -40 -14.81 -57.74 0.99 6924 -65.28 11.47 Η 9234 -59.13 -40 -19.13 -64.3 -69.70 1.38 11.94 Н 11538 -50.17 -40 -10.17 -54.18 -60.58 1.52 11.93 Н -55.74 -57.52 13851 -46.88 -40 -6.88 1.54 12.18 Η 16155 -52.53 -40 -12.53-67.54 -67.68 1.80 16.95 Η Н Middle ٧ 4614 -50.01 -40 -10.01 -46.66 -61.39 0.82 12.20 6924 -56.32 -40 -16.32 -58.8 -66.79 0.99 11.47 ٧ 9234 -53.92 -40 -13.92 -60.1 1.38 11.94 ٧ -64.49 11538 -44.96 -40 -4.96 -48.87 -55.37 1.52 11.93 ٧ -49.51 V 13851 -40.34 -40 -0.34-50.98 1.54 12.18 -40 ٧ 16155 -49.50 -9.50 -65.08 -64.65 1.80 16.95 ٧ 4620 -45.92 -59.91 0.79 12.20 Н -48.50 -40 -8.50 Н 6930 -56.77 -40 -16.77 -59.79 -67.22 1.01 11.45 -63.46 11.92 Н 9243 -58.31 -40 -18.31 -68.85 1.38 11556 -49.32 -40 -9.32 -53.31 -59.74 1.52 11.94 Н 13860 -47.01 -40 -7.01 -55.88 1.54 Η -57.63 12.17 -52.00 -40 -67.05 Н 16173 -12.00 -67.12 1.81 16.92 Н Highest ٧ 4620 -51.84 -40 -11.84 -48.49 -63.25 0.79 12.20 6930 -55.03 -40 -15.03 -57.59 -65.48 1.01 11.45 V -57.9 ٧ 9243 -51.71 -40 -11.71 -62.25 1.38 11.92 -43.04 -40 -46.97 1.52 V 11556 -3.04-53.46 11.94 13860 -40.50 -40 -49.68 -51.12 1.54 12.17 V -0.5016173 -49.88 -40 -9.88 -65.46 -65.00 1.81 16.92 V V

Report No.: FG890633D

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

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LTE Band 30 / 10MHz / QPSK Over **SPA** S.G. TX Cable **TX Antenna** Frequency **EIRP** Limit **Polarization** Channel Limit Reading **Power** Gain loss (MHz) (dBm) (dBm) (H/V) (dB) (dBm) (dBm) (dB) (dBi) 4620 -57.93 -40 -17.93 -55.35 -69.34 0.79 12.20 Н 6912 -59.72 -40 -19.72 -62.64 -70.25 0.97 11.49 Н Н 9252 -59.23 -40 -19.23 -64.36 -69.74 1.39 11.89 -40 -60.95 11556 -56.96 -16.96 -67.381.52 11.94 Η -40 -63.58 -65.33 Н 13860 -54.71 -14.71 1.54 12.17 -40 1.81 16173 -54.81 -14.81 -69.86 -69.93 16.92 Η Н Middle 4620 -60.53 -40 -20.53 -57.18 -71.94 0.79 12.20 V V 6912 -60.63 -40 -20.63 -63.1 -71.16 0.97 11.49 ٧ 9252 -40 -55.61 -15.61 -61.78 -66.12 1.39 11.89 11.94 V 11556 -53.28 -40 -13.28 -57.21 -63.70 1.52 ٧ 13860 -50.15 -40 -59.33 1.54 -10.15 -60.77 12.17 16173 -53.99 -40 -13.99 -69.57 -69.11 1.81 16.92 ٧ ٧

Report No.: FG890633D

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

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