

Report No.: FG920117F



# FCC RADIO TEST REPORT

FCC ID : J9CQGM8180X

**Equipment : Module** 

Model Name : QGM8180X

Applicant : Qualcomm Inc

5775 Morehouse Dr.San Diego, CA 92121-1714 (USA)

Manufacturer : Universal Scientific Industrial (Shanghai) Co., Ltd.

No. 1558, Zhang Dong Road, Zhangjiang Hi-Tech

Park, Shanghai, P.R. China 201203

Standard : FCC 47 CFR Part 2, and 90(S)

The product was received on Feb. 01, 2019 and testing was started from Feb. 01, 2019 and completed on Jun. 11, 2019. 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

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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

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# History of this test report

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Report No.	Version	Description	Issued Date
FG920117F	01	Initial issue of report	Jul. 15, 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 §90.635	Conducted Output Power and Effective Radiated Power	Pass	-
3.3	-	Peak-to-Average Ratio	Reporting only	-
3.4	§2.1049 §90.209	Occupied Bandwidth and 26dB Bandwidth	Reporting only	-
3.5	§2.1051 §90.691	Emission masks – In-band emissions	Pass	-
3.6	§2.1051 §90.691	Emission masks – Out of band emissions	Pass	-
3.7	§2.1055 §90.213	Frequency Stability for Temperature & Voltage	Pass	-
3.8	§2.1053 §90.691	Field Strength of Spurious Radiation	Pass	Under limit 24.23 dB at 4144.000 MHz

#### **Declaration of Conformity:**

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

#### **Comments and Explanations:**

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Wii Chang

**Report Producer: Maggie Chiang** 

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## 1 General Description

## 1.1 Feature of Equipment Under Test

WCDMA/LTE and GNSS

Product Specification subjective to this standard						
Antenna Type	WWAN: Dipole Antenna GPS/Glonass/BDS/Galileo/SBAS: Dipole Antenna					

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## 1.2 Modification of EUT

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

## 1.3 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.					
Test Site No.	TH05-HY					
Test Engineer	Aking Chang					
Temperature	<b>24~26</b> ℃					
Relative Humidity	54~56%					

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			
Test Engineer	Jack Cheng, Lance Chiang, and Chuan Chu			
Temperature	23~24°ℂ			
Relative Humidity	63~66%			

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

FCC Designation No.: TW1190 and TW0007

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## 1.4 Applied Standards

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

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- FCC 47 CFR Part 2, 90
- ANSI / TIA-603-E
- ANSI C63.26-2015
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01
- Interim Guidance for Equipment Authorization of Devices with Channel Bandwidths Combined Across Two Contiguous Service Rule Allocations OET/Lab/EACB, June 6, 2013

#### Remark:

- 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

During all testing, EUT is in link mode with base station emulator at maximum power level.

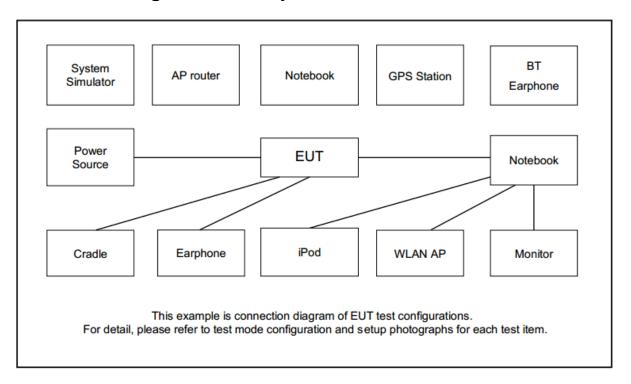
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Frequency range investigated for radiated emission is 30 MHz to 9000 MHz.

Conducted	Dand	Bandwidth (MHz)					Modulation			RB#			Test Channel			
Test Cases	Band	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	М	Н
Max. Output Power	26	V	v	٧	٧	V	ı	v	v	v	٧	v	V	V	٧	v
Peak-to-Average Ratio	26				٧		-	v	v	v	٧		v		٧	
26dB and 99% Bandwidth	26	V	V	٧	٧	V	ı	V	v	v			v	V	>	v
Emission masks In-band emissions	26	٧	٧	<b>&gt;</b>	<b>&gt;</b>	V	ı	v	v	v	>		V	V		v
Emission masks – Out of band emissions	26	V	V	v	v	v	-	v	v	v	v			v	v	v
Frequency Stability	26				V	v	-	v	v	v			v	v	v	
E.R.P.	26					v	•	v	v	v	٧			v		
Radiated Spurious Emission	26	Worst Case									V	v	v			
<ol> <li>The mark "v" means that this configuration is chosen for testing</li> <li>The mark "-" means that this bandwidth is not supported.</li> <li>LTE Band26 transmit frequency for part22 rule is 824MHz-849MHz, for part90 rule is 814MHz-824N ERP over 15MHz bandwidth complies the ERP limit line of part22 rule, therefore ERP of the partial frequency spectrum which falls within part 22 also complies.</li> </ol>					ИHz.											

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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

I	ltem	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
Ī	1.	System Simulator	Anritsu	MT8820C	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 RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level.

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

Offset = RF cable loss + attenuator factor.

The following shows an offset computation example with RF cable loss 4.2 dB and a 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 26 Channel and Frequency List								
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest				
15	Channel	26765	-	-				
15	Frequency	821.5	-	-				
10	Channel	-	26740	-				
10	Frequency	-	819	-				
5	Channel	26715	26740	26765				
5	Frequency	816.5	819	821.5				
3	Channel	26705	26740	26775				
3	Frequency	815.5	819	822.5				
1.4	Channel	26697	26740	26783				
1.4	Frequency	814.7	819	823.3				

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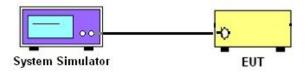
#### 3 Conducted Test Items

## 3.1 Measuring Instruments

See list of measuring instruments of this test report.

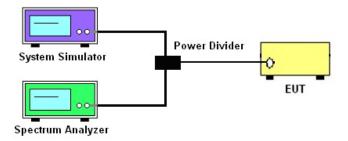
## 3.1.1 Test Setup

#### 3.1.2 Conducted Output Power

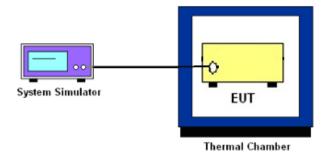


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# 3.1.3 Peak-to-Average Ratio, Occupied Bandwidth, Conducted Band-Edge, Emission Mask, Emissions Mask – Out Of Band Emissions, and Conducted Spurious Emission



## 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 ERP Measurement

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

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

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The ERP of mobile transmitters must not exceed 7 Watts for LTE Band 26.

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

#### 3.2.2 Test Procedures

- 1. The transmitter output port was connected to the system simulator.
- 2. Set EUT at maximum power through 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

Reporting only

#### 3.3.2 Test Procedures

- 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.

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- 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 99% Occupied Bandwidth and 26dB Bandwidth Measurement

#### 3.4.1 Description of (Occupied) Bandwidth Limitations Measurement

The 99% 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 emission bandwidth is defined as the width of the signal between two points, located at the 2 sides of the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

#### 3.4.2 Test Procedures

- 1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
- 2. The 26dB and 99% occupied bandwidth (BW) of the middle channel for the highest RF power with full RB sizes were measured.

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#### 3.5 Emissions Mask Measurement

#### 3.5.1 Description of Emissions Mask Measurement

Equipment used in this licensed to EA or non-EA systems shall comply with the emission mask provisions of FCC Part 90.691.(a)

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- (a) Out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:
- (1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116  $\log_{10}(f/6.1)$  decibels or 50 + 10  $\log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.
- (2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \text{Log}_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

#### 3.5.2 Test Procedures

- 1. The EUT was connected to spectrum analyzer and base station via power divider.
- 2. The emissions mask of low and high channels for the highest RF powers were measured.
- 3. Set RBW and VBW 3 times of RBW to make the measurement with the spectrum analyzer's, and according to KDB 971168 D02 Misc Rev Approve License Devices v02r01 standards, set RBW = 300 Hz to make offsets less than 37.5 kHz from a channel edge, RBW = 100 kHz to make offsets greater than 37.5 kHz, that is allowed.
- 4. The test results were shown below plots with a correction offset factor including cable loss, insertion loss of power divider.

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#### 3.6 Emissions Mask - Out Of Band Emissions Measurement

#### 3.6.1 Description of Conducted Emissions Out of band emissions measurement

The power of any emission FCC Part 90.691 (a)(2) on any frequency removed from the assigned frequency by out of the authorized bandwidth at least 43 + 10 log (P) dB. It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10<sup>th</sup> harmonic.

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#### 3.6.2 Test Procedures

- 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. For testing below 1GHz, make the measurement with the spectrum analyzer's RBW = 100 kHz, VBW = 3MHz, taking the record of maximum spurious emission.
- 6. For testing above 1GHz, make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
- The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
- 8. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)

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## 3.7 Frequency Stability Measurement

#### 3.7.1 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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### 3.7.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

#### 3.7.3 Test Procedures for Temperature Variation

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

#### 3.7.4 Test Procedures for Voltage Variation

- 1. The EUT was placed in a temperature chamber at 20±5° C and connected with the base station.
- The power supply voltage to the EUT was varied from BEP 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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## 3.8 Field Strength of Spurious Radiation Measurement

#### 3.8.1 Description of Field Strength of Spurious Radiated Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E. The power of any emission FCC Part 90.691 on any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth at least 43 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

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The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43+10log<sub>10</sub>(P[Watts]) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

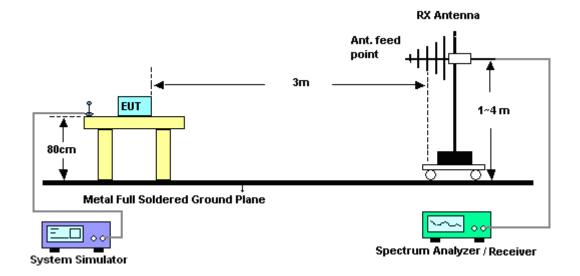
#### 3.8.2 Test Procedures

- The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
- 2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
- 3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
- 4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
- 5. For testing below 1GHz, make the measurement with the spectrum analyzer's RBW = 100 kHz, VBW = 3MHz, Sweep = 500ms, Taking the record of maximum spurious emission.
- 6. For testing above 1GHz, make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, Sweep = 500ms, 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.
- 9. Taking the record of output power at antenna port.
- 10. Repeat step 7 to step 8 for another polarization.
- 11. EIRP (dBm) = S.G. Power Tx Cable Loss + Tx Antenna Gain
- 12. ERP (dBm) = EIRP 2.15
- 13. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
- 14. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

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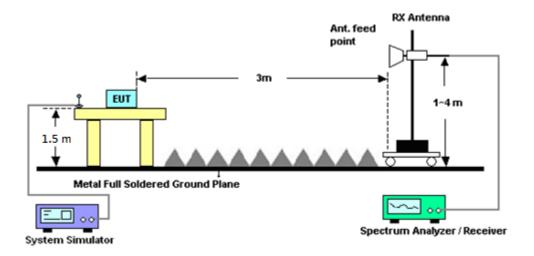
#### 3.8.3 Test Setup

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



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#### For radiated test above 1GHz



## 3.8.4 Test Result of Field Strength of Spurious Radiated

Please refer to Appendix B.

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# 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jan. 07, 2019	Jun. 09, 2019~ Jun. 11, 2019	Jan. 06, 2020	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D&00802 N1D01N-06	47020&06	30MHz to 1GHz	Oct. 13, 2018	Jun. 09, 2019~ Jun. 11, 2019	Oct. 12, 2019	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120D	9120D-1212	1GHz ~ 18GHz	Oct. 19, 2018	Jun. 09, 2019~ Jun. 11, 2019	Oct. 18, 2019	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120D	9120D-1326	1GHz ~ 18GHz	Oct. 30, 2018	Jun. 09, 2019~ Jun. 11, 2019	Oct. 29, 2019	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170584	18GHz ~ 40GHz	Dec. 05, 2018	Jun. 09, 2019~ Jun. 11, 2019	Dec. 04, 2019	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 25, 2019	Jun. 09, 2019~ Jun. 11, 2019	Mar. 24, 2020	Radiation (03CH12-HY)
Preamplifier	Agilent	8449B	3008A02375	1GHz~26.5Ghz	May 28, 2018	Jun. 09, 2019~ Jun. 11, 2019	May 26, 2020	Radiation (03CH12-HY)
Preamplifier	Jet-Power	JPA0118-55-3 03	17100018000 55007	1GHz~18GHz	Apr. 01, 2019	Jun. 09, 2019~ Jun. 11, 2019	Mar. 31, 2020	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz ~ 40GHz	Dec. 06, 2018	Jun. 09, 2019~ Jun. 11, 2019	Dec. 05, 2019	Radiation (03CH12-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100390	20Hz~26.5GHz	Dec. 26, 2018	Jun. 09, 2019~ Jun. 11, 2019	Dec. 25, 2019	Radiation (03CH12-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz~44GHz	Dec. 19, 2018	Jun. 09, 2019~ Jun. 11, 2019	Dec. 18, 2019	Radiation (03CH12-HY)
Signal Generator	Rohde & Schwarz	SMB100A	175727	100kHz~40GHz	Dec. 23, 2018	Jun. 09, 2019~ Jun. 11, 2019	Dec. 23, 2019	Radiation (03CH12-HY)
Base Station	Rohde & Schwarz	CMU200	106656	GSM/GPRS/WC DMA/CDMA	Nov. 15, 2018	Jun. 09, 2019~ Jun. 11, 2019	Nov. 14, 2020	Radiation (03CH12-HY)
Base Station	Anritsu	MT8821C	6201432816	GSM / GPRS /WCDMA / LTE FDD/TDD with 44) /LTE-3CC DLCA,2CC ULCA	May 05, 2019	Jun. 09, 2019~ Jun. 11, 2019	May 04, 2020	Radiation (03CH12-HY)
Filter	Wainwright	WLK4-1000-15 30-6000-40SS	SN11	1 GHz Lowpass	Sep. 16, 2018	Jun. 09, 2019~ Jun. 11, 2019	Sep. 15, 2019	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-1080 -1200-1500-60 SS	SN2	1.2G High Pass	Sep. 16, 2018	Jun. 09, 2019~ Jun. 11, 2019	Sep. 15, 2019	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-2700 -3000-18000-6 0ST	SN2	3GHz High Pass	Mar. 20, 2019	Jun. 09, 2019~ Jun. 11, 2019	Mar. 19, 2020	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30M-18G	Mar. 13, 2019	Jun. 09, 2019~ Jun. 11, 2019	Mar. 12, 2020	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30M~40GHz	Oct. 16, 2018	Jun. 09, 2019~ Jun. 11, 2019	Oct. 15, 2019	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30M~40GHz	Oct. 16, 2018	Jun. 09, 2019~ Jun. 11, 2019	Oct. 15, 2019	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Jun. 09, 2019~ Jun. 11, 2019	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Jun. 09, 2019~ Jun. 11, 2019	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Jun. 09, 2019~ Jun. 11, 2019	N/A	Radiation (03CH12-HY)

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Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
LTE Base Station	Anritsu	MT8820C	6201341951	GSM/GPRS /WCDMA/LTE	Mar. 21, 2018	Feb. 01, 2019~ Jun. 06, 2019	Mar. 20, 2020	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101397	10Hz~40GHz	Nov. 13, 2018	Feb. 01, 2019~ Jun. 06, 2019	Nov. 12, 2019	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SH-641	92013720	-30°℃~70°ℂ	Aug. 29, 2018	Feb. 01, 2019~ Jun. 06, 2019	Aug. 28, 2019	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890001	1V~20V 0.5A~5A	Oct. 02, 2018	Feb. 01, 2019~ Jun. 06, 2019	Oct. 01, 2019	Conducted (TH05-HY)
Coupler	Warison	1-18GHz 20dB 25WSMA Directional Coupler	#B	1G~18GHz	Jan. 14, 2019	Feb. 01, 2019~ Jun. 06, 2019	Jan. 13, 2020	Conducted (TH05-HY)

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# 5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of	3.36
Confidence of 95% (U = 2Uc(y))	3.30

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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

#### <u>Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)</u>

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

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

## Conducted Output Power(Average power)

LTE Band 26 Maximum Average Power [dBm]									
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest			
15	1	0		22.87	-	-			
15	1	37		22.92	-	-			
15	1	74		23.01	-	-			
15	36	0	QPSK	21.97	-	-			
15	36	20		22.10	-	-			
15	36	39		22.13	-	-			
15	75	0		22.04	-	-			
15	1	0		22.18	-	-			
15	1	37		22.30	-	-			
15	1	74		22.37	-	-			
15	36	0	16-QAM	20.99	-	-			
15	36	20		21.11	-	-			
15	36	39		21.12	-	-			
15	75	0		21.08	-	-			
15	1	0		21.12	-	-			
15	1	37		21.22	-	-			
15	1	74		21.27	-	-			
15	36	0	64-QAM	20.04	-	-			
15	36	20		20.16	-	-			
15	36	39		20.15	-	-			
15	75	0		20.09	-	-			
10	1	0		-	22.94	-			
10	1	25		-	22.95	-			
10	1	49		-	22.98	-			
10	25	0	QPSK	-	22.17	-			
10	25	12		-	22.10	-			
10	25	25		-	22.07	-			
10	50	0		-	22.07	-			
10	1	0		-	22.21	-			
10	1	25		-	22.20	-			
10	1	49		-	22.33	-			
10	25	0	16-QAM	-	21.07	-			
10	25	12		-	21.11	-			
10	25	25		-	21.09	-			
10	50	0		-	21.08	-			
10	1	0		-	21.22	-			
10	1	25		-	21.17	-			
10	1	49		-	21.41	-			
10	25	0	64-QAM	-	20.07	-			
10	25	12		-	20.10	-			
10	25	25		-	20.09	-			
10	50	0		-	20.09	-			



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	LTE Band 26 Maximum Average Power [dBm]									
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest				
5	1	0		22.66	22.83	23.01				
5	1	12		22.77	22.96	23.12				
5	1	24		22.83	23.02	22.88				
5	12	0	QPSK	21.82	22.03	22.20				
5	12	7		21.93	22.11	22.27				
5	12	13		21.92	22.10	22.20				
5	25	0		21.91	22.06	22.17				
5	1	0		21.97	22.10	22.31				
5	1	12		22.10	22.27	22.41				
5	1	24		22.15	22.31	22.16				
5	12	0	16-QAM	20.86	21.04	21.22				
5	12	7		20.94	21.14	21.27				
5	12	13		20.96	21.10	21.31				
5	25	0		20.91	21.10	21.19				
5	1	0		20.95	21.14	21.18				
5	1	12		21.07	21.24	21.29				
5	1	24		21.13	21.33	21.15				
5	12	0	64-QAM	19.89	20.09	20.25				
5	12	7		19.97	20.17	20.33				
5	12	13		19.95	20.15	20.28				
5	25	0		19.93	20.09	20.21				
3	1	0		22.70	22.88	23.06				
3	1	8		22.87	23.04	23.17				
3	1	14		22.77	22.93	22.82				
3	8	0	QPSK	21.82	22.02	22.23				
3	8	4		21.90	22.13	22.22				
3	8	7		21.88	22.08	22.17				
3	15	0		21.90	22.07	22.24				
3	1	0		21.99	22.17	22.35				
3	1	8		22.16	22.36	22.50				
3	1	14		22.05	22.27	22.08				
3	8	0	16-QAM	20.90	21.08	21.29				
3	8	4		20.98	21.18	21.30				
3	8	7		20.97	21.13	21.24				
3	15	0		20.91	21.10	21.24				
3	1	0		20.96	21.11	21.21				
3	1	8		21.12	21.30	21.47				
3	1	14		21.07	21.19	21.06				
3	8	0	64-QAM	19.92	20.09	19.95				
3	8	4		20.01	20.18	20.31				
3	8	7		19.98	20.12	20.24				
3	15	0		19.88	20.10	20.02				

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		LTE	Band 26 Ma	ximum Average Po	ower [dBm]	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
1.4	1	0		22.65	22.87	23.01
1.4	1	3		22.79	22.97	23.10
1.4	1	5		22.70	22.91	22.74
1.4	3	0	QPSK	22.73	22.90	23.04
1.4	3	1		22.75	22.95	23.11
1.4	3	3		22.73	22.94	22.90
1.4	6	0		21.82	22.03	22.19
1.4	1	0	16-QAM	21.91	22.15	22.34
1.4	1	3		22.06	22.31	22.37
1.4	1	5		21.93	22.23	22.00
1.4	3	0		21.82	21.95	22.14
1.4	3	1		21.85	21.96	22.16
1.4	3	3		21.80	21.99	21.94
1.4	6	0		20.92	21.13	21.23
1.4	1	0		20.88	21.09	21.27
1.4	1	3		21.01	21.21	21.25
1.4	1	5	64-QAM	20.98	21.18	20.96
1.4	3	0		20.96	21.10	21.24
1.4	3	1		21.02	21.15	21.27
1.4	3	3		20.98	21.19	21.10
1.4	6	0		19.87	20.06	20.16

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# LTE Band 26\_Part 90S

# Peak-to-Average Ratio

Mode										
Mod.	QP	SK	16	Limit: 13dB						
RB Size	1RB Full RB		1RB	Full RB	Result					
Lowest CH	-	-	-	-						
Middle CH	4.09	4.93	3.94	5.91	PASS					
Highest CH	-	-	-	-						
Mode		LTE Band 26 / 10MHz								
Mod.	64C	AM			Limit: 13dB					
RB Size	1RB Full RB				Result					
Lowest CH	-	-	-	-						
Middle CH	5.13	6.41	-	-	PASS					
Highest CH	-	-	-	-						

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LTE Band 26 / 10MHz / QPSK Middle Channel / 1RB Middle Channel / Full RB Offset 10.80 dB AQT 2 ms - RBW 10 MH: Offset 10.80 dB AQT 2 ms • RBW 10 M Date: 28.FEB.2019 00:44:05 Date: 28.FEB.2019 00:43:35 LTE Band 26 / 10MHz / 16QAM Middle Channel / 1RB Middle Channel / Full RB Date: 28.FEB.2019 00:43:45 LTE Band 26 / 10MHz / 64QAM Middle Channel / 1RB Middle Channel / Full RB Ref Level 30.00 Att Ref Level 30. Date: 28.FEB.2019 00:44:15 Date: 28.FEB.2019 00:44:25

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# 26dB Bandwidth

Mode		LTE Band 26 : 26dB BW(MHz)										
BW	1.4	ИНz	3M	lHz	5MHz 10MHz			15MHz		20MHz		
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Lowest CH	1.23	1.22	3.01	3.01	4.81	4.92	-	-	14.48	14.33	-	-
Middle CH	1.24	1.22	3.00	3.00	4.86	4.97	9.75	9.61	-	-	-	-
Highest CH	1.23	1.22	3.02	3.02	4.83	4.91	-	-	-	-	-	-
Mode					LTE Ba	and 26 :	26dB BV	V(MHz)				
BW	1.4	ИНz	3M	lHz	5N	lHz	101	ЛHz	15MHz		20MHz	
Mod.	64QAM		64QAM		64QAM		64QAM		64QAM		64QAM	
Lowest CH	1.23	-	3.04	-	4.91	-	-	-	14.42	-	-	-
Middle CH	1.22	-	3.02	-	4.88	-	9.83	-	-	-	-	-
Highest CH	1.21	-	3.04	-	4.89	-	-	-	-	-	-	-

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LTE Band 26 Lowest Channel / 1.4MHz / QPSK Lowest Channel / 1.4MHz / 16QAM 14.77 dBr. 814.84550 MH 26.00 dE 1.216800000 MH 14.83 dBi 814.86220 MF 26.00 d 1.225200000 MF 10 dBm 665 -10 dBn -10 dBm -20 dBm 30 dBm 40 dBm Span 2.8 MHz CF 814.7 MHz 2.8 MHz Type Ref Trc -11.41 dBm -11.55 dBm Date: 28 FEB 2019 00:36:03 Middle Channel / 1.4MHz / QPSK Middle Channel / 1.4MHz / 16QAM 10.80 dB • RBW 30 kHz 63.2 µs • VBW 100 kHz Mode Auto FFT 10.80 dB • RBW 30 kHz 63.2 µs • VBW 100 kHz Mode Auto FFT 15.04 dBn 818.99160 MH 26.00 df 1.239200000 MH 14.38 dBn 818.68950 \*\*\* 26.00 di 40 dBm 50 d8m 50 d8m Function Result 1.2224 MHz 26.00 dB 669.8 Function Result 1.2392 MH Type | Ref | Trc | 
 X-value
 Y-value
 Function

 818.9916 MHz
 15.04 dBm
 nd8 down

 918.3762 MHz
 -11.42 dBm
 nd8

 819.6154 MHz
 -11.20 dBm
 Q factor
 Type | Ref | Trc | Date: 28.FEB.2019 00:38.43 Date: 28.FEB.2019 00:50:58 Highest Channel / 1.4MHz / QPSK Highest Channel / 1.4MHz / 16QAM Offset 10.80 dB • RBW 30 kHz SWT 63.2 µs • VBW 100 kHz Mode Auto FFT Att 30 dB
 SGL Count 100/100
 1Pk Max M1[1] 14.03 dBr 822.99230 MH 14.98 dB 823.25520 MH 30 d8A Function Result 1.2252 MHz Type | Ref | Trc | 
 X-value
 Y-value
 Function

 823.2552 MHz
 14.98 dBm
 ndB down
 Type | Ref | Trc | 
 X-value
 Y-value
 Function

 822.9923 MHz
 14.03 dBm
 ndB down

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LTE Band 26 Lowest Channel / 3MHz / QPSK Lowest Channel / 3MHz / 16QAM Ref Level 30.00 dBm
Att 30 dB
SGL Count 100/100 15.52 dBn 814.51700 MH; 26.00 dE 3.009000000 MH; 15.89 dBi 815.97950 MF 26.00 d 3.009000000 MF 271 270 -10 dBm -20 dBm -40 dBm 40 dBm Span 6.0 MHz CF 815.5 MHz 6.0 MHz Type Ref Trc Type | Ref | Trc | -10.08 dBm -10.35 dBm Date: 28.FEB.2019 00:12:56 Middle Channel / 3MHz / QPSK Middle Channel / 3MHz / 16QAM .80 dB • RBW 100 kHz 19 µs • VBW 300 kHz Mode Auto FFT Offset 10.80 dB • RBW 100 kHz SWT 19 µs • VBW 300 kHz Mode Auto FFT 15.76 dBn 820.04900 \*\*\* 16.14 dBr 819.01800 MH 26.00 di 0000 MH 273. Function Result 2.997 MHz 26.00 dB 273.3 Function Result 2.997 MHz 26.00 dB 273.6 Type | Ref | Trc | 
 X-value
 Y-value
 Function

 819,018 MHz
 16.14 dBm
 ndB down

 817,5075 MHz
 -9.50 dBm
 ndB

 820,5045 MHz
 -9.68 dBm
 Q factor
 Type Ref Trc Function n ndB down Date: 28.FEB.2019 00:15:14 Date: 28.FEB.2019 00:15:25 Highest Channel / 3MHz / QPSK Highest Channel / 3MHz / 16QAM 10.80 dB • RBW 100 kHz 19 µs • VBW 300 kHz Mode Auto FFT 16.04 dBn 822.82970 MH: 26.00 df 3.015000000 MH: 15.34 dBn 822.51800 MH: 26.00 dE 3.021000000 MH: MILII MILLI -10 dBm -60 dBm--60 dBm Marker Type | Ref | Trc | Type | Ref | Trc |

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LTE Band 26 Lowest Channel / 5MHz / QPSK Lowest Channel / 5MHz / 16QAM Ref Level 30.00 dBm
Att 30 dB
SGL Count 100/100 14.32 dBi 817.58900 MF 26.00 d 4.805000000 MF 12.59 dBn 816.11000 MH 26.00 di 4.915000000 MH 170 166 -10 dBm -20 dBm -40 dBm Span 10.0 MHz CF 816.5 MHz Span 10.0 MHz Type Ref Trc Type | Ref | Trc | Date: 28.FEB.2019 00:20:23 Middle Channel / 5MHz / QPSK Middle Channel / 5MHz / 16QAM .80 dB • RBW 100 kHz 19 µs • VBW 300 kHz Mode Auto FFT .80 dB **RBW** 100 kHz 19 µs **WBW** 300 kHz **Mode** Auto FFT 14.09 dBm 819.92900 MHz 26.00 dE 4.855000000 MH. 13.26 dBn 819.36000 M1[1] 26.00 di 50 d8m Function Result 4.855 MHz 26.00 dB 168.9 Function Result 4.965 MHz 26.00 dB 165.0 Type | Ref | Trc | 
 X-value
 Y-value
 Function

 819,929 MHz
 14,09 dBm
 ndB down

 916.552 MHz
 -11.89 dBm
 ndB

 821.408 MHz
 -11.80 dBm
 Q factor
 Type Ref Trc Date: 28.FEB.2019 00:51:41 Date: 28.FEB.2019 00:22:52 Highest Channel / 5MHz / QPSK Highest Channel / 5MHz / 16QAM Offset 10.80 dB • RBW 100 kHz SWT 19 µs • VBW 300 kHz Mode Auto FFT Att 30 dB
 SGL Count 100/100
 1Pk Max M1[1] M1[1] 12.47 dBr 821.40000 MH 13.91 dB 820.89100 MH Function Result
4.825 MHz 
 X-value
 Y-value
 Function

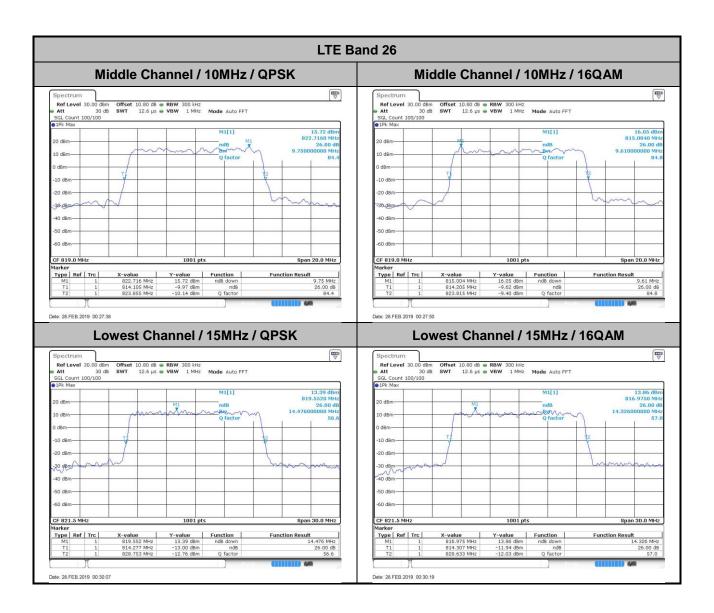
 820.891 MHz
 13.91 dBm
 ndB down

 819.082 MHz
 -11.70 dBm
 ndB

 823.908 MHz
 -12.04 dBm
 Q factor
 Type | Ref | Trc | Type | Ref | Trc | X-value Y-value Function 821.4 MHz 12.47 dBm ndB down

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LTE Band 26 Lowest Channel / 1.4MHz / 64QAM Lowest Channel / 3MHz / 64QAM Ref Level 30.00 dBm

Att 30 dB

SGL Count 100/100

1Pk Max 13.00 dBi 814.93780 MF 26.00 d 1.230800000 MF 662 -10 dBm -20 dBm 40 dBm Span 2.8 MHz CF 815.5 MHz Type Ref Trc Middle Channel / 1.4MHz / 64QAM Middle Channel / 3MHz / 64QAM 10.80 dB **© RBW** 30 kHz 63.2 μs **© VBW** 100 kHz **Mode** Auto FFT Mode Auto FFT 14.18 dBn 819.70730 12.68 dBr 818.63360 MH 818.63360 MH 26.00 d 1.222400000 MH 669. 26.00 MH 26.00 MH 271. Function Result 1.2224 MH Type | Ref | Trc | Type | Ref | Trc | **Function Result** Date: 28.FEB.2019 00:50:35 Date: 27.FEB.2019 23:58:26 Highest Channel / 1.4MHz / 64QAM Highest Channel / 3MHz / 64QAM Offset 10.80 dB • RBW 100 kHz SWT 19 µs • VBW 300 kHz Mode Auto FFT Att 30 dB
 SGL Count 100/100
 1Pk Max M1[1] 13.57 dBr 821.64890 MH 13.36 dB 823.61610 MH Function Result Type | Ref | Trc | 
 X-value
 Y-value
 Function

 821.6489 MHz
 13.57 dBm
 ndB down
 Type | Ref | Trc | 
 X-value
 Y-value
 Function

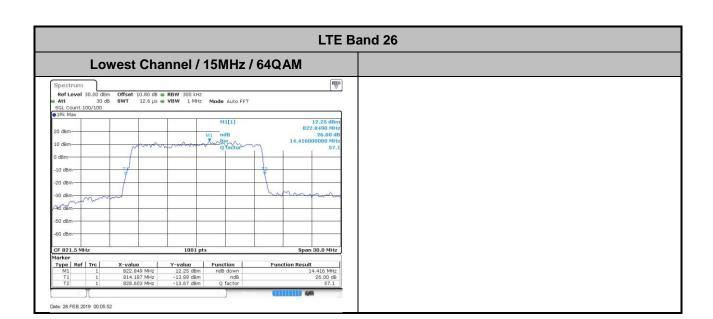
 823.6161 MHz
 13.36 dBm
 ndB down
 820.9715 MHz 824.0165 MHz

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LTE Band 26 Lowest Channel / 5MHz / 64QAM M1[1] 30,d8m -40 dBm Span 10.0 MHz Middle Channel / 5MHz / 64QAM Middle Channel / 10MHz / 64QAM .80 dB • RBW 100 kHz 19 µs • VBW 300 kHz Mode Auto FFT Offset 10.80 dB ● RBW 300 kHz SWT 12.6 µs ● VBW 1 MHz Mode Auto FFT 12.68 dBi 820.75800 MH ANT ARM Function Result 4.875 MHz 26.00 dB 168.4 Type | Ref | Trc | Type | Ref | Trc | **Function Result** Date: 28.FEB.2019 00:51:21 Date: 28.FEB.2019 00:04:38 Highest Channel / 5MHz / 64QAM 13.23 dBr 819.67200 MH 26.00 d 4.895000000 MH M1[1] Marker Type | Ref | Trc |

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# Occupied Bandwidth

Mode		LTE Band 26 : 99%OBW(MHz)											
BW	1.4	ИНz	3M	lHz	5MHz		10MHz		15MHz		20MHz		
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	
Lowest CH	1.09	1.09	2.72	2.72	4.5	4.52	-	-	13.43	13.34	-	-	
Middle CH	1.09	1.09	2.71	2.73	4.49	4.5	9.03	9.03	-	-	-	-	
Highest CH	1.09	1.09	2.72	2.72	4.49	4.48	-	-	-	-	-	-	
Mode					LTE Ba	and 26 :	99%OBV	V(MHz)					
BW	1.4	ИНz	3M	lHz	5N	lHz	10MHz			15MHz		20MHz	
Mod.	64QAM		64QAM		64QAM		64QAM		64QAM		64QAM		
Lowest CH	1.09	-	2.71	-	4.49	-	-	-	13.43	-	-	-	
Middle CH	1.09	-	2.71	-	4.53	-	9.11	-	-	-	-	-	
Highest CH	1.09	-	2.73	-	4.50	-	-	-	-	-	-	-	

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LTE Band 26 Lowest Channel / 1.4MHz / QPSK Lowest Channel / 1.4MHz / 16QAM 
 Ref Level
 30.00 dBm

 Att
 30 dB

 SGL Count
 100/100
 -20 dBm- 
 X-value
 Y-value
 Function

 814.4991 MHz
 14.78 dBm
 Bm

 814.15455 MHz
 7.62 dBm
 Occ Bw

 815.24266 MHz
 8.46 dBm
 Type | Ref | Trc | 
 X-value
 Y-value
 Function

 814.5998 MHz
 14.45 dBm
 814.15734 MHz
 7.04 dBm
 Occ Bw

 815.24825 MHz
 8.74 dBm
 0cc Bw
 Type | Ref | Trc | **Function Result** 1.088111888 MHz 1.090909091 MHz Date: 28 FFR 2019 00:35:51 Middle Channel / 1.4MHz / QPSK Middle Channel / 1.4MHz / 16QAM Ref Level 30.0 Att 14.29 dBi 818.80140 MH 1.090909091 MH MILII MILII Type | Ref | Trc | 
 X-value
 Y-value
 Function

 818.8014 MHz
 14.29 dBm
 Type | Ref | Trc | **Function Result** 19.43 dBm 6.07 dBm Occ Bw 5.74 dBm 818.45734 MHz 819.54266 MHz 14.29 dBm 7.33 dBm Occ Bw 8.93 dBm 1.085314685 MHz 1.090909091 MHz Date: 28.FEB.2019 00:38:20 Highest Channel / 1.4MHz / QPSK Highest Channel / 1.4MHz / 16QAM Ref Level 30.00 dBm
Att 30 dB
SGL Count 100/100 16.09 dBi 823.37830 MH 1.088111888 MH M1[1] M1[1] 13.59 dBr 10 dBm-10 dBm--10 dBm -30 dBAy 40 dBm-60 dBm--60 dBm X-value Y-value Function
823.3783 MHz 16.09 dbm
822.76014 MHz 8.87 dbm Occ Bw
823.84825 MHz 7.60 dbm Type | Ref | Trc | Type | Ref | Trc | Date: 28.FEB.2019 00:40:38 Date: 28.FEB.2019 00:40:49

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LTE Band 26 Lowest Channel / 3MHz / QPSK Lowest Channel / 3MHz / 16QAM Ref Level 30.00 dBm

Att 30 dB

SGL Count 100/100

1Pk Max 15.57 dBi 815.32620 MF 2.715284715 MF 15.31 dBn 816.54900 MH 2.715284715 MH -10 dBm -10 dBn -20 dBm--40 dBm 40 dBm 60 dBm 1001 pts CF 815.5 MHz CF 815.5 MHz Y-value 15.57 dBm 8.73 dBm 10.48 dBm X-value 816.549 MHz 814.13936 MHz 816.85465 MHz Y-value 15.31 dBm 8.14 dBm 8.54 dBm X-value 815.3262 MHz 814.13936 MHz 816.85465 MHz Type Ref Trc Function **Function Result** Type | Ref | Trc | Date: 28.FEB.2019 00:12:33 Middle Channel / 3MHz / QPSK Middle Channel / 3MHz / 16QAM 10.80 dB • RBW 100 kHz 19 µs • VBW 300 kHz Mode Auto FFT 15.99 dBi 819.73730 MF 2.709290709 MF 14.87 dBm 819.18580 MHz 2.733266733 MHz 30 dBm 40 dBm 40 dBm 50 d8m 50 d8m CF 819.0 MHz Type Ref Trc 
 X-value
 Y-value
 Function

 819.7373 MHz
 15.99 dBm
 Occ Bw

 812.64535 MHz
 9.99 dBm
 Occ Bw

 820.35465 MHz
 10.46 dBm
 Type Ref Trc 
 X-value
 Y-value
 Function

 819.1858 MHz
 14.97 dBm
 917.62737 MHz

 817.62737 MHz
 7.71 dBm
 Occ Bw

 820.36064 MHz
 8.61 dBm
 **Function Result Function Result** 2.709290709 MHz 2.733266733 MHz Date: 28.FEB.2019 00:14:51 Date: 28.FEB.2019 00:15:02 Highest Channel / 3MHz / QPSK Highest Channel / 3MHz / 16QAM Ref Level 30.0 dBm Offset 10.80 dB RBW 100 kHz
Att 30 dB SWY 19 µs VBW 300 kHz Mode Auto FFT
SGL count 100/100 M1[1] 15.75 dBi 823.19530 MF 2.721278721 MF M1[1] 14.05 dBm 823.33320 MHz 2.721278721 MHz 20 dBm dBm--10 dBm -20 dB -30 dBm -30 dBm-50 dBm -50 dBm-Span 6.0 MHz CF 822.5 MH | X-value | Y-value | Function | | | 823.3332 MHz | 14.05 dBm Type | Ref | Trc | Type | Ref | Trc | 
 X-value
 Y-value
 Function

 823.1953 MHz
 15.75 dBm
 Function Result **Function Result** 8.64 dBm Occ Bw 9.84 dBm 2.721278721 MHz Occ Bw 2.721278721 MHz

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LTE Band 26 Lowest Channel / 5MHz / QPSK Lowest Channel / 5MHz / 16QAM **□** Ref Level 30.00 dBm

Att 30 dB

SGL Count 100/100

1Pk Max 12.54 dBn 817.23900 MH 4.515484515 MH 10 dBm -10 dBm -20 dBm-1001 pts Span 10.0 MHz CF 816.5 MHz Y-value Function

14.04 dBm

9.34 dBm Occ Bw

8.83 dBm X-value 817.239 MHz 814.23227 MHz 818.74775 MHz Y-value 2 12.54 dBm 2 8.06 dBm 2 8.69 dBm X-value 815.471 MHz 814.26224 MHz 818.75774 MHz Type | Ref | Trc | Type Ref Trc Middle Channel / 5MHz / QPSK Middle Channel / 5MHz / 16QAM SGL Count 100/100 14.26 dBi 819.93900 MH 4.485514486 MH -30 dBm/\/\/\ -40 dBm -50 d8m 50 d8m CF 819.0 MHz Type Ref Trc 
 X-value
 Y-value
 Function

 819,939 MHz
 14.26 dBm
 815.76224 MHz

 915.76224 MHz
 9.60 dBm
 Occ Bw

 821.24775 MHz
 9.44 dBm
 Type Ref Trc 
 X-value
 Y-value
 Function

 820.319 MHz
 12.95 dBm

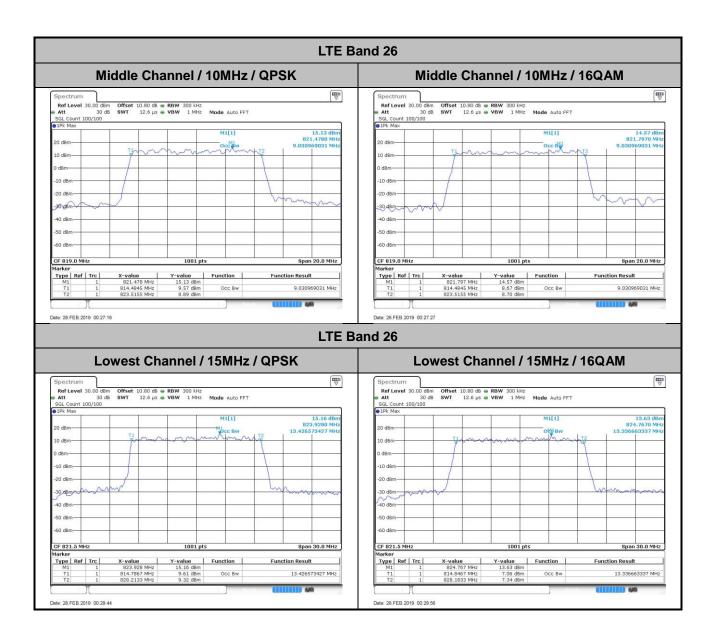
 816.76224 MHz
 6.40 dBm
 Occ Bw

 821.25774 MHz
 7.75 dBm
 **Function Result Function Result** 4.485514486 MHz 4.495504496 MHz Date: 28.FEB.2019 00:22:18 Date: 28.FEB.2019 00:22:29 Highest Channel / 5MHz / QPSK Highest Channel / 5MHz / 16QAM Ref Level 30.0 dBm Offset 10.80 dB RBW 100 kHz
Att 30 dB SWY 19 µs VBW 300 kHz Mode Auto FFT
SGL count 100/100 M1[1] M1[1] 13.59 dBn 821.15000 MH: 4.475524476 MH: 20 dBm -10 dBm -50 dBm -50 dBm-Type | Ref | Trc | 
 Type
 Ref
 Trc
 X-value
 Y-value
 Function

 M1
 1
 821.15 MHz
 13.59 dBm
 9.50 dBm Occ Bw 8.39 dBm 4.485514486 MHz Occ Bw 4.475524476 MHz

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LTE Band 26 Lowest Channel / 1.4MHz / 64QAM Lowest Channel / 3MHz / 64QAM 
 Ref Level
 30.00 dBm
 Offset

 Att
 30 dB
 SWT

 SGL Count
 100/100
 -20 dBm -20 dBm-40 dBm 40 dBm CF 815.5 MHz 
 X-value
 Y-value
 Function

 814.3336 MHz
 12.86 dBm
 814.15734 MHz

 914.15734 MHz
 7.41 dBm
 Occ Bw

 915.24545 MHz
 5.29 dBm
 Type | Ref | Trc | 
 X-value
 Y-value
 Function

 815.0864 MHz
 14.07 dBm
 914.14535 MHz
 7.02 dBm
 Occ Bw

 916.85465 MHz
 7.82 dBm
 7.82 dBm
 Occ Bw
 Type | Ref | Trc | **Function Result** 1.088111888 MHz 2.709290709 MHz Date: 27 FFB 2019 23:57:00 Middle Channel / 1.4MHz / 64QAM Middle Channel / 3MHz / 64QAM 12.23 dBr 818.72310 MH 1.093706294 MH MILII MILII Type | Ref | Trc | Type | Ref | Trc | **Function Result** 12.23 dBm 6.85 dBm Occ Bw 5.97 dBm 8.24 dBm Occ Bw 8.49 dBm 1.093706294 MHz 2.715284715 MHz Date: 28.FEB.2019 00:59:10 Highest Channel / 1.4MHz / 64QAM Highest Channel / 3MHz / 64QAM Ref Level 30.00 dBm
Att 30 dB
SGL Count 100/100 13.30 dBi 823.48740 MH 1.090909091 MH 14.10 dBn M1[1] M1[1] 10 dBm-10 dBm--10 dBm 40 dBm -60 dBm-60 dBm 
 X-value
 Y-value
 Function

 823.4874 MHz
 13.30 dbm
 828.22.75455 MHz

 523.68454 MHz
 5.39 dbm
 Occ Bw

 823.84545 MHz
 6.66 dbm
 Type | Ref | Trc | Type | Ref | Trc | 2.733266733 MHz Date: 28.FEB.2019 00:11:07 Date: 27.FEB.2019 23:59:29

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LTE Band 26 Lowest Channel / 5MHz / 64QAM M1[1] Type | Ref | Trc | Middle Channel / 5MHz / 64QAM Middle Channel / 10MHz / 64QAM 
 Spectrum
 Ref Level 30.00 dBm
 Offset 10.80 dB ● RBW 300 kHz

 att
 30 dB
 SWT
 12.6 µS ● VBW
 1 MHz
 Mode Auto FFT
 12.97 dBr 816.98200 MH 4.525474525 MH 14.24 dBm 821.2580 MHz 9.110889111 MHz 50 d8m CF 819.0 MHz 
 X-value
 Y-value
 Function

 816.992 MHz
 12.97 dbm
 816.73227 MHz
 4.99 dbm
 Occ Bw

 821.25774 MHz
 7.60 dbm
 7.60 dbm
 Occ Bw
 Type Ref Trc Type | Ref | Trc | 
 X-value
 Y-value
 Function

 821.258 MHz
 14.24 dBm

 814.4845 MHz
 7.90 dBm
 Occ Bw

 823.5954 MHz
 8.22 dBm
 **Function Result Function Result** 4.525474525 MHz 9.110889111 MHz Date: 28.FEB.2019 00:01:58 Date: 28.FEB.2019 00:04:27 Highest Channel / 5MHz / 64QAM M1[1] -50 dBm 
 Marker
 Trc
 X-value
 Y-value
 Function

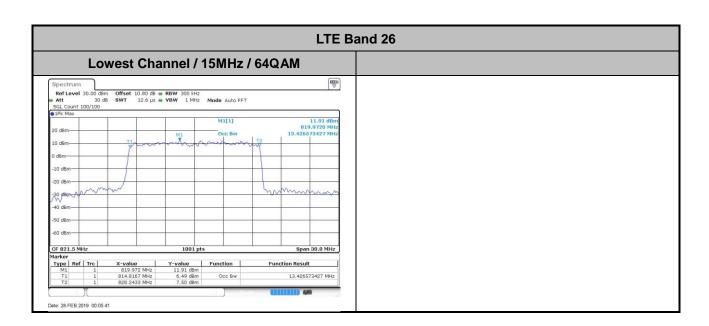
 M1
 1
 823.508 MHz
 12.11 dem

 T1
 1
 819.25225 MHz
 6.64 dem
 Occ 8w

 T2
 1
 823.74775 MHz
 5.55 dem
 Occ 8w
 4.495504496 MHz

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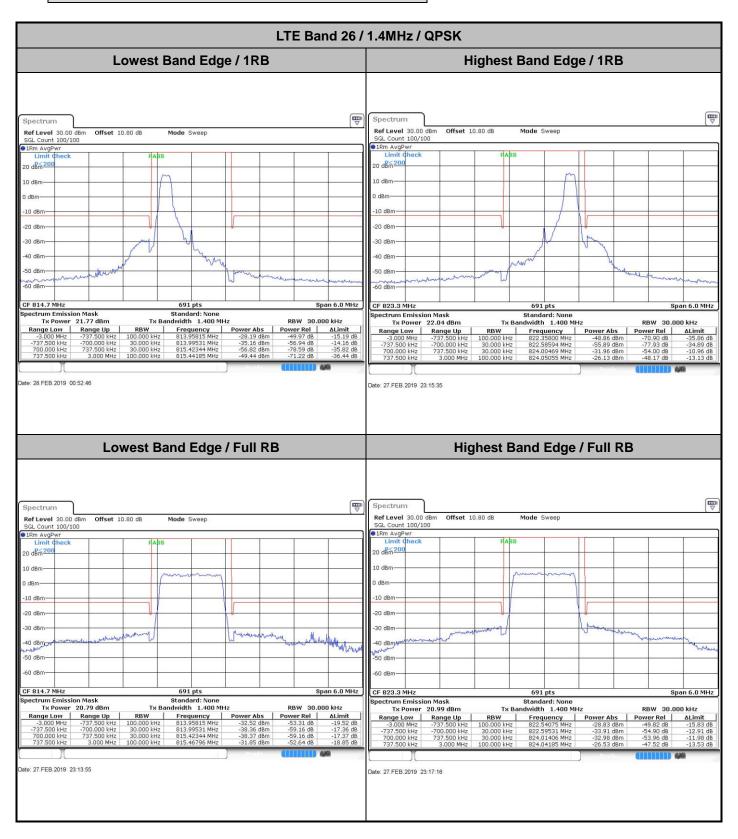
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# Emission masks – In-band emissions



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LTE Band 26 / 1.4MHz / 16QAM Lowest Band Edge / 1 RB Highest Band Edge / 1 RB Spectrum Offset 10.80 dB Mode Sweep Offset 10.80 dB Mode Sweep Ref Level 30.00 dBm SGL Count 100/100 1Rm AvgPwr GL Count 100/100 20 dBm 21 10 dBm dBm dBm -10 dBn -10 dBm 20 dBm -20 dBm 30 dBm 30 dBm 40 dBm 40 dBmmy replacement -50 dBm--50 dBm -60 dBm-CF 814.7 MHz 691 pts Span 6.0 MHz CF 823.3 MHz 691 pts pectrum Emission Mask
Tx Power 21.03 dBm
Range Low Range Up
-3.000 MHz -737.500 kH Standard: None Tx Bandwidth 1.400 MHz Standard: None ndwidth 1.400 MHz RBW 30.000 kHz 
 Power Rel
 &Limit

 -42.46 dB
 -8.44 dB

 -47.38 dB
 -5.35 dB

 -72.93 dB
 -30.90 dB

 -62.30 dB
 -28.27 dB
 RBW 100.000 kHz 30.000 kHz 30.000 kHz 100.000 kHz 
 Frequency
 Power Abs

 822.45373 MHz
 -44.72 dBm

 822.57656 MHz
 -51.17 dBm

 824.00469 MHz
 -25.06 dBm

 24.04185 MHz
 -20.83 dBm

 Power Rel
 ALimit

 -65.51 dB
 -31.72 dB

 -71.96 dB
 -30.17 dB

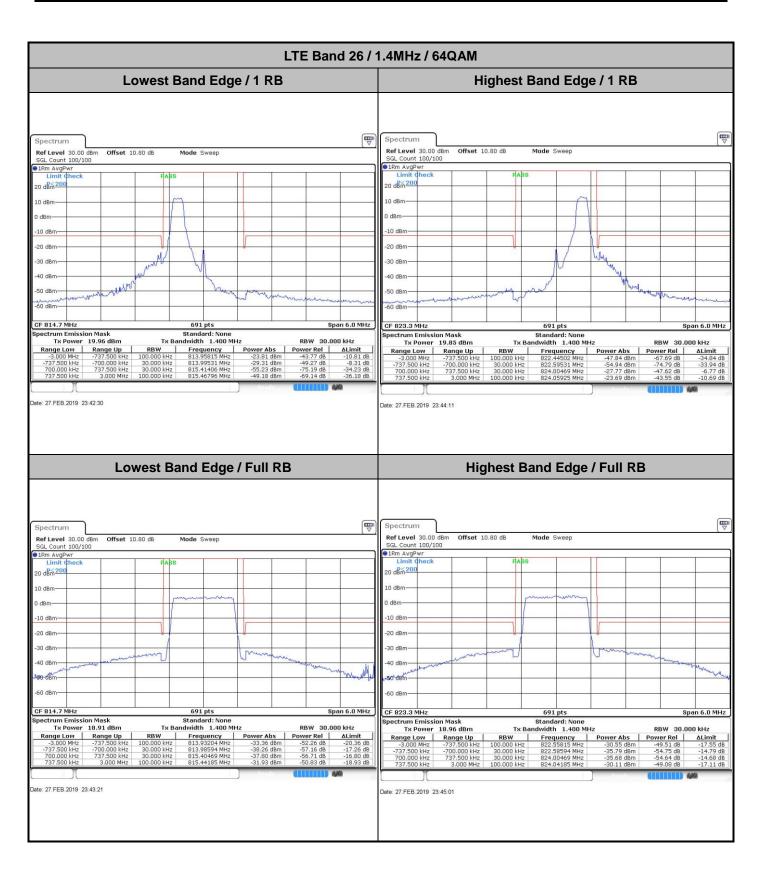
 -45.85 dB
 -4.06 dB

 -41.62 dB
 -7.83 dB
 ate: 27.FEB.2019 23:13:04 Date: 27.FEB.2019 23:16:26 Lowest Band Edge / Full RB **Highest Band Edge / Full RB** -Spectrum Spectrum Ref Level 30.00 dBm Offset 10.80 dB Mode Sweep Ref Level 30.00 dBm Offset 10.80 dB SGL Count 100/100 Mode Sweep SGL Count 100/100 ●1Rm AvgPwr Limit Check 20 dBm 200 20 dBm 20 -10 dBm 20 dBn 30 dBm 40 dBm -50 d8m-60 dBm CF 814.7 MHz 691 pts oectrum Emission Mask Tx Power 19.92 dBm Standard: None Tx Bandwidth 1.400 MHz ectrum Emission Mask Tx Power 20.09 dBm Tx Bandwidth 1,400 MHz RBW 30,000 kHz Frequency 013 94075 MHz Range Low Range Up Range Low Range Up 
 Frequency
 Power Abs

 822.54945 MHz
 -30.09 dBn
 ate: 27 FEB 2019 23:14:45 Date: 27.FEB.2019 23:18:07

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