

Report No.: FG133040-02D



### FCC RADIO TEST REPORT

FCC ID : GKRRMLN1

**Equipment** : 5G LGA Module

**Brand Name** : COMPAL : RML-N1 **Model Name** 

: 5G LGA Module Marketing Name

**Applicant** : Compal Electronics, Inc.

No.581 & 581-1, Ruiguang Rd., Neihu District,

Taipei, (114) Taiwan

Manufacturer : Compal Electronics, Inc.

No.581 & 581-1, Ruiguang Rd., Neihu District,

Taipei, (114) Taiwan

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

The product was received on Mar. 31, 2021 and testing was started from Apr. 01, 2021 and completed on Jun. 16, 2021. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

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

Approved by: Louis Wu

Louis Win

Sporton International Inc. EMC & Wireless Communications Laboratory

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

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### History of this test report

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Report No.	Version	Description	Issued Date
FG133040-02D	01	Initial issue of report	Jul. 01, 2021
FG133040-02D	02	<ol> <li>Revise Product Feature of Equipment Under Test, Support Unit used in test configuration and system, and List of Measuring Equipment</li> <li>Revise note for Frequency Stability</li> <li>Add Frequency List</li> </ol>	Jul. 09, 2021

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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 18.26 dB at 2456.000 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: Keven Cheng Report Producer: Ruby Zou

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### 1 General Description

### 1.1 Feature of Equipment Under Test

#### LTE/5G NR/GNSS

Product Sp	Product Specification subjective to this standard					
Test Antenna Type	Test Antenna Type Monopole Antenna					
Test Antenna Gain	<ant. 0=""></ant.>					
Test Antenna Galli	<b>LTE Band 26:</b> 0.9 dBi					

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**Remark:** The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.

#### 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. EMC & Wireless Communications Laboratory					
Test Site Location  No.52, Huaya 1st Rd., Guishan Dist.,  Taoyuan City 333, Taiwan (R.O.C.)  TEL: +886-3-327-3456  FAX: +886-3-328-4978						
Test Site No.	Sporton	Site No.				
	TH03-HY	03CH07-HY				
Test Engineer	George Chen	Jesse Wang, Stan Hsieh and Ken Wu				
Temperature	23~26°ℂ 19~27°ℂ					
Relative Humidity	52~58%	48~63%				

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

FCC Designation No.: TW1190

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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
- FCC KDB 414788 D01 Radiated Test Site 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.
- 3. The TAF code is not including all the FCC KDB listed without accreditation.

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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.

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

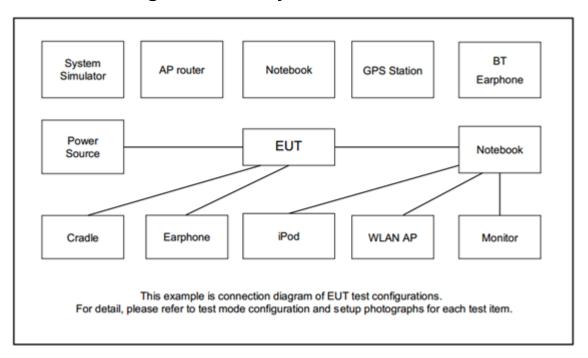
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Frequency range investigated for radiated emission is 30 MHz to 9000 MHz.

Conducted	Band		Bai	ndwid	lth (M	Hz)			Modulation			RB#			Test Channel		
Test Cases		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	Н
Max. Output Power	26	>	v	v	v	v	-	v	v	v	٧	v	٧	<b>~</b>	v	٧	٧
Peak-to-Average Ratio	26				v		-	v	v	v	v			٧		v	
26dB and 99% Bandwidth	26	v	v	v	v	v	-	v	v	v	v			v	٧	>	
Emission masks In-band emissions	26	>	v	٧	v	٧	1	v	v	v	v	v		<b>v</b>	>		>
Emission masks  - Out of band emissions	26	<b>&gt;</b>	v	v	v	v	-	v				v			v	v	v
Frequency Stability	26	-	=		v	v	-	v						v	٧	>	
E.R.P.	26	٧	v	v	v	v	-	v	v	v	v		ı	Max.	Powe	er	
Radiated Spurious Emission	26 Worst Case						٧	>	٧								
Remark	<ol> <li>The mark "v" means that this configuration is chosen for testing</li> <li>The mark "-" means that this bandwidth is not supported.</li> <li>LTE Band26 transmit frequency for part22 rule is 824MHz-849MHz, for part90 rule is 814MHz-824MHz. 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>					Hz.											

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#### 2.2 Connection Diagram of Test System



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

Item	Equipment	Brand Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m
2.	Fixture	Compal	ZM52	N/A	N/A	N/A

### 2.4 Measurement Results Explanation Example

#### For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between 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	-	-						
40	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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	LTE Band 26 Channel and Frequency List									
BW [MHz]	Channel/Frequency(MHz)	-	cross-rule channels	-						
15	Channel	-	26790	-						
15	Frequency	-	824	-						
40	Channel	-	26790	-						
10	Frequency	-	824	-						
5	Channel	-	26790	-						
5	Frequency	-	824	-						
3	Channel	-	26790	-						
3	Frequency	-	824	-						
1.4	Channel	-	26790	-						
1.4	Frequency	-	824	-						

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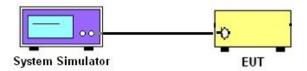
#### 3 Conducted Test Items

#### 3.1 Measuring Instruments

See list of measuring instruments of this test report.

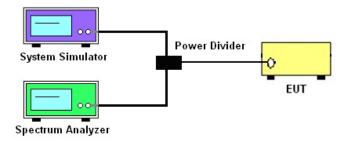
#### 3.1.1 Test Setup

#### 3.1.2 Conducted Output Power

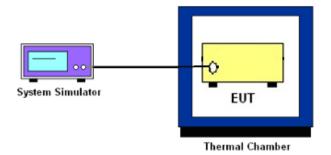


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# 3.1.3 Peak-to-Average Ratio, Occupied Bandwidth, Conducted Band-Edge, Emission Mask, Emissions Mask – Out Of Band Emissions, and Conducted Spurious Emission



#### 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 100 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 +  $10Log_{10}(P)$  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.

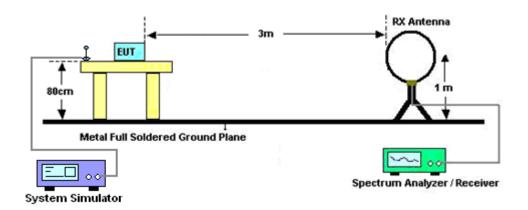
#### 3.8.2 Test Procedures

- 1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
- 2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
- 3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
- 4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
- 5. 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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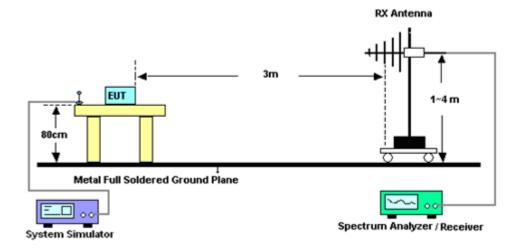
#### 3.8.3 Test Setup

#### For radiated test below 30MHz



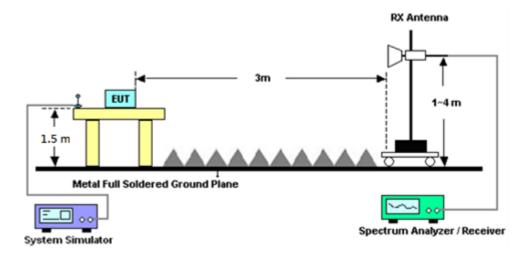
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#### For radiated test from 30MHz to 1GHz



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#### For radiated test above 1GHz



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#### 3.8.4 Test Result of Field Strength of Spurious Radiated

Please refer to Appendix B.

#### Note:

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

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

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### 4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Bilog Antenna	Schaffner	CBL 6111C & N-6-06	2725 & AT-N0601	30MHz~1GHz	Jan. 08, 2021	Apr. 21, 2021~ Jun. 16, 2021	Jan. 07, 2022	Radiation (03CH07-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01 N-06	35419 & 03	30MHz~1GHz	Apr. 29, 2020	Apr. 21, 2021~ Apr. 27, 2021	Apr. 28, 2021	Radiation (03CH07-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01 N-06	35419 & 03	30MHz~1GHz	Apr. 28, 2021	Apr. 28, 2021~ Jun. 16, 2021	Apr. 27, 2022	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Dec. 01, 2020	Apr. 21, 2021~ Jun. 16, 2021	Nov. 30, 2021	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jan. 04, 2021	Apr. 21, 2021~ Jun. 16, 2021	Jan. 03, 2022	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590075	1GHz~18GHz	Apr. 23, 2020	Apr. 21, 2021	Apr. 22, 2021	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590075	1GHz~18GHz	Apr. 22, 2021	Apr. 22, 2021~ Jun. 16, 2021	Apr. 21, 2022	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	May 19, 2020	Apr. 21, 2021~ May 17, 2021	May 18, 2021	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	May 18, 2021	May 18, 2021~ Jun. 16, 2021	May 17, 2022	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A023 62	1GHz~26.5GHz	Oct. 31, 2020	Apr. 21, 2021~ Jun. 16, 2021	Oct. 30, 2021	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9030A	MY523502 76	3Hz~44GHz	Jun. 09, 2020	Apr. 21, 2021~ Jun. 07, 2021	Jun. 08, 2021	Radiation (03CH07-HY)
Spectrum Analyzer	Keysight	N9010A	MY542004 86	10Hz~44GHz	Oct. 23, 2020	Jun. 08, 2021~ Jun. 16, 2021	Oct. 22, 2021	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY15682- 4	30MHz to 18GHz	Feb. 24, 2021	Apr. 21, 2021~ Jun. 16, 2021	Feb. 23, 2022	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24971- 4	9kHz to 18GHz	Feb. 24, 2021	Apr. 21, 2021~ Jun. 16, 2021	Feb. 23, 2022	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655- 4	9kHz to 18GHz	Feb. 24, 2021	Apr. 21, 2021~ Jun. 16, 2021	Feb. 23, 2022	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126	532078/12 6E	30MHz~18GHz	Sep. 18, 2020	Apr. 21, 2021~ Jun. 16, 2021	Sep. 17, 2021	Radiation (03CH07-HY)
Controller	EMEC	EM1000	N/A	Control Ant Mast	N/A	Apr. 21, 2021~ Jun. 16, 2021	N/A	Radiation (03CH07-HY)
Controller	MF	MF-7802	N/A	Control Turn table	N/A	Apr. 21, 2021~ Jun. 16, 2021	N/A	Radiation (03CH07-HY)
Antenna Mast	EMEC	AM-BS-4500E	N/A	Boresight mast 1M~4M	N/A	Apr. 21, 2021~ Jun. 16, 2021	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Apr. 21, 2021~ Jun. 16, 2021	N/A	Radiation (03CH07-HY)
Software	Audix	E3 6.2009-8-24	N/A	N/A	N/A	Apr. 21, 2021~ Jun. 16, 2021	N/A	Radiation (03CH07-HY)
USB Data Logger	TECPEL	TR-32	HE17XB24 95	N/A	N/A	Apr. 21, 2021~ Jun. 16, 2021	N/A	Radiation (03CH07-HY)
Horn Antenna	EMCO	3117	00143261	1GHz~18GHz	Jan. 26, 2021	Apr. 21, 2021~ Jun. 16, 2021	Jan. 25, 2022	Radiation (03CH07-HY)

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Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Radio Communication Analyzer	Anritsu	MT8821C	626202534 1	LTE FDD/TDD LTE-2CC ULCA/DLCA	Oct. 05, 2020	Apr. 01, 2021~ Jun. 16, 2021	Oct. 04, 2021	Conducted (TH03-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101397	10Hz~40GHz	Nov. 27, 2020	Apr. 01, 2021~ Jun. 16, 2021	Nov. 26, 2021	Conducted (TH03-HY)
Thermal Chamber	Ten Billion	TTH-D3SP	TBN-9307 01	N/A	Aug. 05, 2020	Apr. 01, 2021~ Jun. 16, 2021	Aug. 04, 2021	Conducted (TH03-HY)
Programmable	GW Instek	PSS-2005	EL890094	1V~20V	Oct. 05, 2020	Apr. 01, 2021~	Oct. 04, 2021	Conducted
Power Supply	OW INSIGN	1 00 2000	LL00000	0.5A~5A	001. 00, 2020	Jun. 16, 2021	001. 04, 2021	(TH03-HY)
Coupler	Warison	20dB 25W S MA Direction al Coupler	#B	1-18GHz	Jan. 09, 2021	Apr. 01, 2021~ Jun. 16, 2021	Jan. 08, 2022	Conducted (TH03-HY)

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### 5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of	3.35 dB
Confidence of 95% (U = 2Uc(y))	3.33 ub

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

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

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

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

	LTE	Band 26 N	Maximum A	verage Po	wer [dBm	(GT - LC :	= 0.9 dB)	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
15	1	0		23.94	-	-		
15	1	37		24.02	-	-		
15	1	74		23.90	-	-		
15	36	0	QPSK	23.09	-	-	22.77	0.1892
15	36	20		22.94	-	-		
15	36	39		22.96	-	-		
15	75	0		23.11	-	-		
15	1	0		23.38	-	-		
15	1	37		23.32	-	-		
15	1	74		23.19	-	-		
15	36	0	16-QAM	22.01	-	-	22.13	0.1633
15	36	20		21.92	-	-		
15	36	39		21.85	-	-		
15	75	0		21.95	-	-		
15	1	0		22.05	-	-		
15	1	37		22.04	-	-		
15	1	74		22.07	-	-		
15	36	0	64-QAM	21.15	-	-	20.82	0.1208
15	36	20		21.04	-	-		
15	36	39		20.85	-	-		
15	75	0		20.96	-	-		
15	1	0		18.90	-	-		
15	1	37		19.20	-	-		
15	1	74		19.02	-	-		
15	36	0	256-QAM	19.06	-	-	17.95	0.0624
15	36	20		18.96	-	-		
15	36	39		19.06	-	-	1	
15	75	0		18.92	-	-		
Limit	E	RP < 100V	V		Result		Pa	SS



	LTE	Band 26 M	/laximum A	verage Po	wer [dBm	] (GT - LC :	= 0.9 dB)	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
10	1	0		-	23.89	-		
10	1	25		-	23.90	-		
10	1	49		-	23.91	-		
10	25	0	QPSK	-	22.77	-	22.66	0.1845
10	25	12		-	22.78	1		
10	25	25	_	-	22.80	-		
10	50	0		-	22.67	-		
10	1	0		-	23.29	-		
10	1	25		-	22.99	-		
10	1	49		-	23.13	1		
10	25	0	16-QAM	-	21.88	-	22.04	0.1600
10	25	12		-	21.68	-		
10	25	25		-	21.87	-		
10	50	0		-	21.79	-		
10	1	0		-	22.06	-		
10	1	25		-	21.84	-		
10	1	49		-	21.89	-		
10	25	0	64-QAM	-	21.01	-	20.81	0.1205
10	25	12		-	20.81	-		
10	25	25		-	20.89	-		
10	50	0		-	20.99	-		
10	1	0		-	18.73	-		
10	1	25		-	18.83	-		
10	1	49		-	18.86	-		
10	25	0	256-QAM	-	19.04	-	17.79	0.0601
10	25	12		-	18.96	-		
10	25	25		-	18.79	-	_	
10	50	0		-	18.73	-		
Limit	E	RP < 100V	V		Result		Pa	ISS



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	LTE	Band 26 M	Maximum A	verage Po	wer [dBm	] (GT - LC :	= 0.9 dB)	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
5	1	0		24.03	23.81	23.56		
5	1	12		23.76	23.92	23.51		
5	1	24		23.85	23.83	23.53		
5	12	0	QPSK	23.12	22.83	22.87	22.78	0.1897
5	12	7		22.79	22.74	22.83		
5	12	13		22.95	22.53	22.87		
5	25	0		23.00	22.73	22.68		
5	1	0		23.46	23.05	22.96		
5	1	12		23.11	22.95	22.85		
5	1	24		23.21	23.01	22.85		
5	12	0	16-QAM	21.78	21.76	21.81	22.21	0.1663
5	12	7		21.78	21.50	21.60		
5	12	13		21.74	21.68	21.61		
5	25	0		21.87	21.79	21.77		
5	1	0		21.91	21.74	21.82		
5	1	12		21.89	21.83	21.85		0.1202
5	1	24		21.90	21.78	22.05		
5	12	0	64-QAM	20.82	20.80	20.78	20.8	
5	12	7		20.86	20.92	20.87		
5	12	13		20.83	20.72	20.85		
5	25	0		20.85	20.72	20.75		
5	1	0		19.08	18.88	18.67		
5	1	12		18.92	18.90	19.10		
5	1	24		18.91	18.76	18.70		
5	12	0	256-QAM	19.05	19.08	18.97	17.87	0.0612
5	12	7		18.96	18.81	18.77		
5	12	13		18.77	18.86	18.94	_	
5	25	0		19.12	18.70	18.75		
Limit	E	ERP < 100V	V		Result		Pa	ISS



	LTE	Band 26 N	Maximum A	verage Po	wer [dBm	] (GT - LC :	= 0.9 dB)	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
3	1	0		23.79	23.66	23.69		
3	1	8		23.67	23.72	23.52		
3	1	14		23.93	23.75	23.38		
3	8	0	QPSK	22.79	22.72	22.69	22.68	0.1854
3	8	4		22.82	22.74	22.71		
3	8	7		22.78	22.56	22.79		
3	15	0		22.99	22.78	22.88		
3	1	0		23.23	23.00	22.82		
3	1	8		23.15	22.87	22.85		
3	1	14		22.95	22.84	22.92		
3	8	0	16-QAM	21.93	21.63	21.50	21.98	0.1578
3	8	4		21.93	21.69	21.50		
3	8	7		21.93	21.79	21.47		
3	15	0		21.81	21.82	21.63		
3	1	0		21.91	22.08	21.73		
3	1	8		22.09	21.97	21.99		
3	1	14		21.94	21.93	21.78		
3	8	0	64-QAM	21.03	21.07	20.83	20.84	0.1213
3	8	4		20.94	20.86	20.76		
3	8	7		20.90	20.87	20.74		
3	15	0		21.04	20.77	20.84		
3	1	0		18.97	18.73	18.58		
3	1	8		19.13	19.03	19.03		
3	1	14		18.96	18.84	18.78		
3	8	0	256-QAM	18.93	18.93	18.73	17.88	0.0614
3	8	4		19.12	18.76	18.74		
3	8	7		18.91	18.83	18.70		
3	15	0		18.97	18.84	18.97		
Limit	E	RP < 100V	V		Result		Pa	ISS



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	LTE	Band 26 N	Maximum A	verage Po	wer [dBm	(GT - LC :	= 0.9 dB)	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
1.4	1	0		23.73	23.72	23.84		
1.4	1	3		23.95	23.78	23.81		
1.4	1	5		23.79	23.83	23.76		
1.4	3	0	QPSK	23.90	23.84	23.77	22.7	0.1862
1.4	3	1		23.85	23.85	23.53		
1.4	3	3		23.71	23.91	23.68		
1.4	6	0		23.86	23.86	23.60		
1.4	1	0		23.03	22.84	22.83		
1.4	1	3		23.39	23.20	23.04		
1.4	1	5		23.12	23.15	23.11		
1.4	3	0	16-QAM	23.03	22.88	22.73	22.14	0.1637
1.4	3	1		23.30	23.04	22.98		
1.4	3	3		22.93	22.99	22.91		
1.4	6	0		22.06	21.65	21.73		
1.4	1	0		21.87	21.65	21.88		
1.4	1	3		22.22	21.98	21.82		0.1253
1.4	1	5		22.12	21.91	21.90		
1.4	3	0	64-QAM	21.83	21.82	21.82	20.98	
1.4	3	1		22.23	22.08	22.08		
1.4	3	3		21.87	21.91	21.80		
1.4	6	0		21.15	20.98	20.76		
1.4	1	0		18.95	18.85	18.60		
1.4	1	3		19.21	18.89	18.75		
1.4	1	5		18.97	18.98	18.76		
1.4	3	0	256-QAM	18.89	18.73	18.75	17.96	0.0625
1.4	3	1		18.92	18.88	19.05		
1.4	3	3		19.09	18.70	18.69	<b>]</b>	
1.4	6	0		18.92	18.62	18.78		
Limit	E	RP < 100V	V		Result		Pa	ISS



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	LTE	Band 26 N	/laximum A	Average Po	wer [dBm	] (GT - LC :	= 0.9 dB)	
BW [MHz]	RB Size	RB Offset	Mod	-	824MHz	-	ERP (dBm)	ERP (W)
15	1	0		-	23.81	-		
15	1	37		-	23.86	-		
15	1	74		-	23.78	-		
15	36	0	QPSK	-	23.05	-	22.61	0.1824
15	36	20		-	22.82	-		
15	36	39		-	22.92	-		
15	75	0		-	22.97	-		
15	1	0		-	23.25	-		
15	1	37		-	23.31	-		
15	1	74		-	23.16	-		
15	36	0	16-QAM	-	21.96	-	22.06	0.1607
15	36	20		-	21.86	-		
15	36	39		-	21.84	-		
15	75	0		-	21.80	-		
15	1	0		-	22.04	-		
15	1	37		-	21.92	-		
15	1	74		-	21.92	-		
15	36	0	64-QAM	-	21.03	-	20.79	0.1199
15	36	20		1	20.93	-		
15	36	39		-	20.73	-		
15	75	0		-	20.90	-		
15	1	0		-	18.85	-		
15	1	37		-	19.03	-		
15	1	74		-	18.83	-		
15	36	0	256-QAM	-	19.04	-	17.79	0.0601
15	36	20		-	18.76	-		
15	36	39		-	19.02	-	1	
15	75	0		-	18.85	-		
Limit	E	RP < 100V	V		Result	<u> </u>	Pa	ISS



	LTE	Band 26 M	laximum A	verage Po	wer [dBm	] (GT - LC :	= 0.9 dB)	
BW [MHz]	RB Size	RB Offset	Mod	-	824MHz	-	ERP (dBm)	ERP (W)
10	1	0		-	23.86	-		
10	1	25		-	23.76	-		
10	1	49		-	23.85	-		
10	25	0	QPSK	-	22.71	-	22.61	0.1824
10	25	12		-	22.64	-		
10	25	25		-	22.62	-		
10	50	0		-	22.59	-		
10	1	0		1	23.19	-		
10	1	25		-	22.81	-		
10	1	49		-	22.99	-		
10	25	0	16-QAM	-	21.76	-	21.94	0.1563
10	25	12		-	21.57	-		
10	25	25		-	21.77	-		
10	50	0		-	21.77	-		
10	1	0		-	21.92	-		
10	1	25		-	21.67	-		
10	1	49		-	21.84	-		
10	25	0	64-QAM	-	20.93	-	20.67	0.1167
10	25	12		-	20.68	-		
10	25	25		-	20.75	-		
10	50	0		-	20.87	-		
10	1	0		-	18.53	-		
10	1	25		-	18.68	-		
10	1	49		-	18.70	-		
10	25	0	256-QAM	-	19.03	-	17.78	0.0600
10	25	12		-	18.96	-		
10	25	25		-	18.74	-		
10	50	0		-	18.71	-		
Limit	Е	RP < 100V	V		Result		Pa	iss



	LTE	Band 26 N	Maximum A	verage Power [d	Bm] (GT - LC	= 0.9 dB)	
BW [MHz]	RB Size	RB Offset	Mod	- 824Mi	łz -	ERP (dBm)	ERP (W)
5	1	0		23.7	8		
5	1	12		23.8	8		
5	1	24		23.7	6		
5	12	0	QPSK	22.8	0	22.63	0.1832
5	12	7		22.6	3		
5	12	13		22.4	3		
5	25	0		22.5	3		
5	1	0		22.9	8		
5	1	12		22.8	9		
5	1	24		22.8	6		
5	12	0	16-QAM	21.7	5	21.73	0.1489
5	12	7		21.4	7		
5	12	13		21.6	6		
5	25	0		21.7	1		
5	1	0		21.6	4		
5	1	12		21.7	5		
5	1	24		21.6	6		
5	12	0	64-QAM	20.7	1	20.5	0.1122
5	12	7		20.8	1		
5	12	13		20.7	2		
5	25	0		20.5	4		
5	1	0		18.8	4		
5	1	12		18.8	3		
5	1	24		18.6	8		
5	12	0	256-QAM	18.9	4	17.69	0.0587
5	12	7		18.7	0		
5	12	13		18.7	7		
5	25	0		18.6	7		
Limit	E	RP < 100V	V	Resu	lt .	Pa	iss



	LTE	Band 26 N	/laximum /	Average Power [dBm] (GT - LC	= 0.9 dB)	
BW [MHz]	RB Size	RB Offset	Mod	- 824MHz -	ERP (dBm)	ERP (W)
3	1	0		23.62		
3	1	8		23.60		
3	1	14		23.65		
3	8	0	QPSK	22.63	22.4	0.1738
3	8	4		22.60		
3	8	7		22.36		
3	15	0		22.58		
3	1	0		22.87		
3	1	8		22.70		
3	1	14		22.83		
3	8	0	16-QAM	21.51	21.62	0.1452
3	8	4		21.55		
3	8	7		21.77		
3	15	0		21.62		
3	1	0		21.90		
3	1	8		21.97		0.1180
3	1	14		21.79		
3	8	0	64-QAM	21.06	20.72	
3	8	4		20.73		
3	8	7		20.68		
3	15	0		20.68		
3	1	0		18.56		
3	1	8		18.88		
3	1	14		18.66		
3	8	0	256-QAM	18.76	17.63	0.0579
3	8	4		18.60		
3	8	7		18.63		
3	15	0		18.82		
Limit	E	RP < 100V	V	Result	Pa	SS



	LTE	Band 26 N	Maximum A	Average Power [dBm] (GT - LC	= 0.9 dB)	
BW [MHz]	RB Size	RB Offset	Mod	- 824MHz -	ERP (dBm)	ERP (W)
1.4	1	0		23.56		
1.4	1	3		23.70		
1.4	1	5		23.71		
1.4	3	0	QPSK	23.84	22.59	0.1816
1.4	3	1		23.74		
1.4	3	3		23.73		
1.4	6	0		23.68		
1.4	1	0		22.72		
1.4	1	3		23.16		
1.4	1	5		23.04		
1.4	3	0	16-QAM	22.83	21.91	0.1552
1.4	3	1		22.85		
1.4	3	3		22.95		
1.4	6	0		21.54		
1.4	1	0		21.64		
1.4	1	3		21.83		
1.4	1	5		21.89		
1.4	3	0	64-QAM	21.72	20.69	0.1172
1.4	3	1		21.94		
1.4	3	3		21.90		
1.4	6	0		20.94		
1.4	1	0		18.72		
1.4	1	3		18.87		
1.4	1	5		18.94		
1.4	3	0	256-QAM	18.72	17.69	0.0587
1.4	3	1		18.75	1	
1.4	3	3		18.69	1	
1.4	6	0		18.50	1	
Limit	E	RP < 100V	V	Result	Pa	ISS

### LTE Band 26

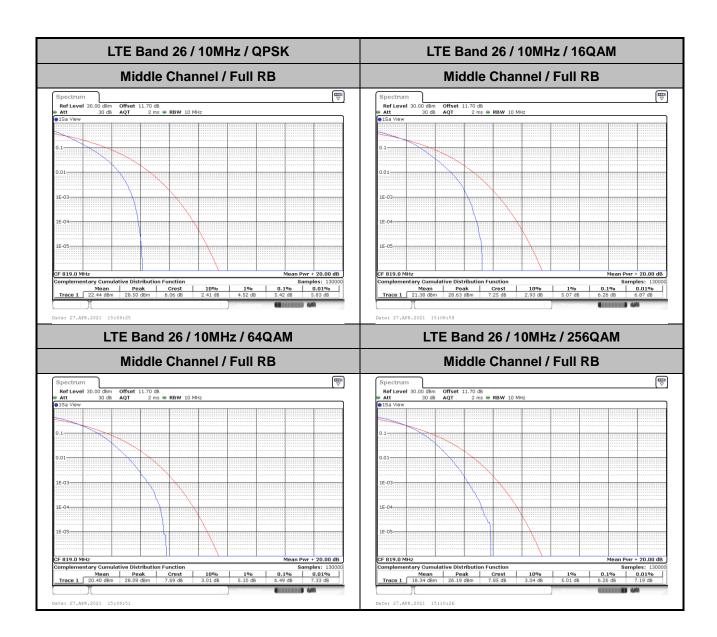
## Peak-to-Average Ratio

Mode					
Mod.	QPSK	16QAM	64QAM	256QAM	Limit: 13dB
RB Size	Full RB	Full RB	Full RB	Full RB	Result
Middle CH	5.42	6.26	6.49	6.26	PASS

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## 26dB Bandwidth

Mode	LTE Band 26 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Low CH	-	-	-	-	-	-	-	-	14.27	14.51	-	-
Middle CH	1.28	1.30	2.98	2.96	4.91	4.90	9.67	9.77	-	-	-	-
Mode	LTE Band 26 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	64QAM	256	64QAM	256	64QAM	256 QAM	64QAM	256	64QAM	256	64QAM	256
	04QAW	QAM	UHQAW	QAM				QAM		QAM		QAM
Low CH	-	-	-	-	-	-	-	-	14.33	14.39	-	-
Middle CH	1.26	1.27	2.96	2.96	4.89	4.89	9.77	9.73	-	-	-	-

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FAX: 886-3-328-4978

LTE Band 26 Middle Channel / 1.4MHz / QPSK Middle Channel / 1.4MHz / 16QAM 16.74 dB 15.80 dBr 10 dBm Q factor 642 631. -10 dBm--50 dBm- 
 X-value
 Y-value
 Function

 818.9552 MHz
 16.74 dBm
 ndB down

 818.365 MHz
 -9.09 dBm
 ndB

 819.6406 MHz
 -9.16 dBm
 Q factor

 X-value
 Y-value
 Function

 819.3273 MHz
 15.80 dBm
 nd8 down

 818.3538 MHz
 -10.15 dBm
 nd8

 819.6517 MHz
 -10.08 dBm
 Q factor
 Type Ref Trc Type Ref Trc Middle Channel / 3MHz / QPSK Middle Channel / 3MHz / 16QAM Count 100/100 18.41 dBi 819.58140 MF 26.00 d 2.979000000 MF 275. -20 dBm 40 dBm-CF 819.0 MHz Span 6.0 MHz Span 6.0 MHz Type | Ref | Trc | Function n ndB down Function ndB down Date: 27.APR.2021 14:55:53 Middle Channel / 5MHz / QPSK Middle Channel / 5MHz / 16QAM ▽ Ref Level 30.0 Att Ref Level 30.00 Offset 11.70 dB ● RBW 100 kHz SWT 19 µs ● VBW 300 kHz Mode Auto FFT Att 30 dB
SGL Count 100/100
1Pk Max 16.51 dB 819.88900 Mi 15.54 dBr 817.15200 MH dBm--10 dBm 30.d8m -50 dBm Function Result
4.895 MHz
26.00 dB
166.9 
 X-value
 Y-value
 Function

 819,889 MHz
 16.51 dBm
 nd8 down

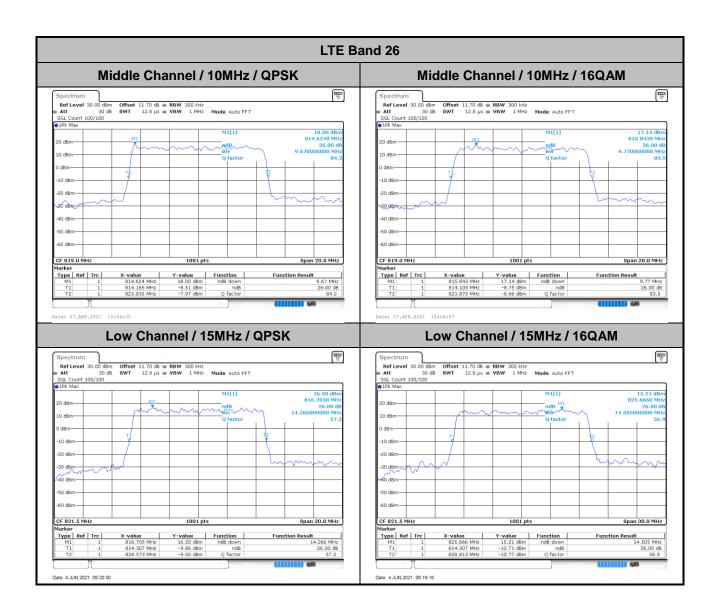
 816,512 MHz
 -9.77 dBm
 nd8

 821,418 MHz
 -9.35 dBm
 Q factor
 Function Result 4.905 MHz 
 Type
 Ref
 Trc
 X-value
 Y-value
 Function

 M1
 1
 817.152 MHz
 15.54 dBm
 ndB down
 Type | Ref | Trc |

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LTE Band 26 Middle Channel / 1.4MHz / 64QAM Middle Channel / 3MHz / 64QAM 16.44 dBr 10 dBm 650 276. -10 dBm--10 dBm -30 dBm--50 dBm- 
 X-value
 Y-value
 Function

 818.7287 MHz
 15.30 dBm
 ndB down

 818.3706 MHz
 -10.84 dBm
 ndB

 819.6294 MHz
 -10.66 dBm
 Q factor

 X-value
 Y-value
 Function

 817.7233 MHz
 16.44 dBm
 ndb down

 817.5255 MHz
 -9.13 dBm
 ndb

 820.4805 MHz
 -9.46 dBm
 Q factor
 Type Ref Trc Middle Channel / 5MHz / 64QAM Middle Channel / 10MHz / 64QAM Ref Level 30.00 dBm Att 30 dB SGL Count 100/100 Offset 11.70 dB ● RBW 300 kHz SWT 12.6 µs ● VBW 1 MHz Mode Auto FFT 13.33 dBr 819.81900 MH 26.00 d 4.885000000 MH 167. -20 dBm-40 dBm CF 819.0 MHz Span 10.0 MHz Span 20.0 MHz 
 Y-value
 Function

 13.33 dBm
 ndB down

 -12.68 dBm
 ndB

 -12.36 dBm
 Q factor
 X-value 818.141 MHz 814.045 MHz 823.815 MHz Type | Ref | Trc | Date: 27.APR.2021 14:53:09 Low Channel / 15MHz / 64QAM M1[1] 15.51 dB 824.8870 MF 
 X-value
 Y-value
 Function

 824.987 MHz
 15.51 dBm
 nd8 down

 814.427 MHz
 -11.47 dBm
 nd8

 928.753 MHz
 -10.15 dBm
 Q factor
 Type | Ref | Trc | Function Result 14.326 MHz

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LTE Band 26 Middle Channel / 1.4MHz / 256QAM Middle Channel / 3MHz / 256QAM M1[1] 14.51 dBr 10 dBm 643 276. -10 dBm--10 dBm -30°dBm-40 dBm -50 dBm--60 dBm 
 X-value
 Y-value
 Function

 819.0 MHz
 12.66 dBm
 ndB down

 818.365 MHz
 -13.30 dBm
 ndB

 819.6378 MHz
 -13.26 dBm
 Q factor

 X-value
 Y-value
 Function

 818.4785 MHz
 14.51 dBm
 ndb down

 817.5075 MHz
 -11.54 dBm
 ndB

 820.4685 MHz
 -11.53 dBm
 Q factor
 Type Ref Trc Middle Channel / 5MHz / 256QAM Middle Channel / 10MHz / 256QAM 14.39 dBn 817.9810 MH 26.00 di 9.730000000 MH 84. 11.77 dBi 820.71800 MF 26.00 d 4.885000000 MF 168. -20 dBm-CF 819.0 MHz Span 10.0 MHz Span 20.0 MHz 
 X-value
 Y-value
 Function

 820.718 MHz
 11.77 dBm
 ndB down

 816.532 MHz
 -14.16 dBm
 ndB

 821.418 MHz
 -14.05 dBm
 Q factor
 X-value 817.981 MHz 814.105 MHz 823.835 MHz Y-value 14.39 dBm -11.64 dBm -11.13 dBm Type | Ref | Trc | Date: 27.APR.2021 15:11:21 Low Channel / 15MHz / 256QAM Ref Level 30.0 Att 12.60 dBr 825.7560 MH 50 dBm Type | Ref | Trc | Function Result 14.386 MHz X-value Y-value Function 825.756 MHz 12.60 dBm ndB down

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## **Occupied Bandwidth**

Mode	LTE Band 26 : 99%OBW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Low CH	-	-	-	-	-	-	-	-	13.46	13.46	-	-
Middle CH	1.09	1.10	2.70	2.71	4.51	4.50	9.11	9.03	-	-	-	-
Mode	LTE Band 26 : 99%OBW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	64QAM	256 QAM	64QAM	256 QAM	64QAM	256 QAM	64QAM	256 QAM	64QAM	256 QAM	64QAM	256 QAM
Low CH	-	_	-	-	-	-	-	-	13.43	13.40	1	-
Middle CH	1.10	1.08	2.72	2.73	4.51	4.46	9.05	9.03	-	-	1	-

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LTE Band 26 Middle Channel / 1.4MHz / QPSK Middle Channel / 1.4MHz / 16QAM Ref Level 30.00 dBm
Att 30 dB
SGL Count 100/100
Pk Max 10 dBm -10 dBm -10 dBm -20 dBm--40 dBm 40 dBm -60 dBm 1001 pts Span 2.8 MHz CF 819.0 MHz Span 2.8 MHz CF 819.0 MHz Y-value 2 17.10 dBm 2 9.98 dBm 2 10.98 dBm 
 X-value
 Y-value

 818.6 MHz
 17.53 dBm

 818.44895 MHz
 9.37 dBm

 819.54825 MHz
 7.26 dBm
 Type Ref Trc Function **Function Result** Type Ref Trc Date: 27.APR.2021 14:01:13 Middle Channel / 3MHz / QPSK Middle Channel / 3MHz / 16QAM SGL Count 100/100 18.52 dE 817.95700 M 2.703296703 M 0 dBm--20 dBm -20 dBm 40 dBm -40 dBm--50 dBm-CF 819.0 MH CF 819.0 MHz 1001 pts 1001 pts Span 6.0 MHz 
 X-value
 Y-value
 Function

 817.957 MHz
 18.52 dBm

 817.64535 MHz
 12.21 dBm
 Occ Bw

 820.34865 MHz
 12.63 dBm

 X-value
 Y-value

 819.7612 MHz
 17.84 dBm

 817.63936 MHz
 11.38 dBm

 820.34865 MHz
 11.68 dBm
 Type | Ref | Trc | Function Result Function **Function Result** 2.703296703 MHz 2.709290709 MHz Middle Channel / 5MHz / QPSK Middle Channel / 5MHz / 16QAM Ref Level 30.00 dBm Offset 11.70 dB RBW 100 kHz
Att 30 dB SWT 19 µs VBW 300 kHz Mode Auto FFT
SGL Count 100/100 17.11 dBm 819.14000 MHz 4.49550440 16.65 dBr 817.98100 MH 4.505494505 MH M1[1] M1E11 -10 dBm -30 d8m--50 dBm -60 dBm CF 819.0 MHz 
 Type
 Ref
 Trc
 X-value
 Y-value
 Function

 M1
 1
 817.981 MHz
 16.65 dBm

 Type
 Ref
 Trc
 X-value
 Y-value
 Function

 M1
 1
 819.14 MHz
 17.11 dBm
 Function Result 9.90 dBm Occ Bw 10.53 dBm 817.981 MHz 16.65 dBm 816.74226 MHz 11.47 dBm Occ Bw 821.24775 MHz 10.86 dBm 4.505494505 MHz 4.495504496 MHz 

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Date: 4.JUN.2021 09:19:38

FAX: 886-3-328-4978

LTE Band 26 Middle Channel / 10MHz / QPSK Middle Channel / 10MHz / 16QAM 16.43 dBn 815.4640 MH 9.030969031 MH 10 dBm--10 dBm--10 dBm -20 dBm--30 dBm-30 dBm-40 dBm -50 dBm--50 dBm -60 dBm -60 dBm-9.110889111 MHz Date: 27.APR.2021 15:04:12 Low Channel / 15MHz / QPSK Low Channel / 15MHz / 16QAM **□**□□□ 
 Ref Level
 30.00 dBm
 Offset
 11.70 dB ● RBW
 300 kHz

 Att
 30 dB
 SWT
 12.6 µs ● VBW
 1 MHz
 Mode
 Auto FFT
 16.11 dBr 822.3390 MH 13.456543457 MH 14.82 dBn 818.4130 MH 13.456543457 MH -10 dBm -20 dBm--50 dBm CF 821.5 MHz 1001 pts Span 30.0 MHz 1001 pts Span 30.0 MHz 
 X-value
 Y-value
 Function

 818.413 MHz
 14.92 d8m
 Occ Bw

 814.7867 MHz
 10.06 d8m
 Occ Bw

 828.2433 MHz
 11.26 d8m
 Type Ref Trc Function Result **Function Result** 13.456543457 MHz 13.456543457 MHz

Date: 4.JUN.2021 09:18:54

Report No.: FG133040-02D

LTE Band 26 Middle Channel / 1.4MHz / 64QAM Middle Channel / 3MHz / 64QAM Spectrum

Ref Level 30.00 dBm

Att 30 dB

SGL Count 100/100

1Pk Max 10 dBm -10 dBm -10 dBm -20 dBm--30 dBm--40 dBm--40 dBm--60 dBm-1001 pts 1001 pts CF 819.0 MHz Span 2.8 MHz CF 819.0 MHz X-value 819.3417 MHz 817.63337 MHz 820.35465 MHz Y-value Function
15.73 dBm
10.42 dBm Occ Bw
9.39 dBm Type Ref Trc Function Result Type Ref Trc Date: 27.APR.2021 14:51:13 Middle Channel / 5MHz / 64QAM Middle Channel / 10MHz / 64QAM 0 dBm Offset 11.70 dB • RBW 300 kHz 30 dB SWT 12.6 µs • VBW 1 MHz Mode Auto FFT SGL Count 100/100 0 dBm--20 dBm--40 dBm--40 dBm -50 dBm -50 dBm-CF 819.0 MH CF 819.0 MHz 1001 pts 1001 pts Span 20.0 MHz 
 X-value
 Y-value
 Function

 818.261 MHz
 13.89 dBm
 816.73227 MHz

 916.73227 MHz
 9.78 dBm
 Occ Bw

 821.23776 MHz
 9.08 dBm

 X-value
 Y-value

 822.077 MHz
 15.00 dBm

 814.4645 MHz
 9.55 dBm

 823.5155 MHz
 10.41 dBm
 Type | Ref | Trc | Function Function Result **Function Result** 4.505494505 MHz 9.050949051 MHz Date: 27.APR.2021 14:52:46 Low Channel / 5MHz / 64QAM Ref Level 30.0 15.51 dBr 817.9040 MH 13.426573427 MH M1[1] 40 dBn

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13.426573427 MHz

FAX: 886-3-328-4978

Type Ref Trc

LTE Band 26 Middle Channel / 1.4MHz / 256QAM Middle Channel / 3MHz / 256QAM Spectrum

Ref Level 30.00 dBm

Att 30 dB

SGL Count 100/100

1Pk Max 10 dBm -10 dBm -10 dBm -20 dBm--40 dBm--60 dBm-1001 pts Span 6.0 MHz CF 819.0 MHz Span 2.8 MHz CF 819.0 MHz Y-value Function
14.76 dBm
7.00 dBm Occ Bw
5.39 dBm 
 X-value
 Y-value

 818.5624 MHz
 13.58 dBm

 817.63936 MHz
 8.21 dBm

 820.36663 MHz
 7.87 dBm
 Type Ref Trc Function Result Type Ref Trc Date: 27.APR.2021 15:23:46 Middle Channel / 5MHz / 256QAM Middle Channel / 10MHz / 256QAM Ref Level 30.00 dBm Offset 11.70 dB ⊕ RBW 100 kHz Att 30 dB SWT 19 µs ⊕ VBW 300 kHz Mode Auto FFT 0 dBm Offset 11.70 dB • RBW 300 kHz 30 dB SWT 12.6 µs • VBW 1 MHz Mode Auto FFT SGL Count 100/100 13.12 dB 817.91100 MH 4.455544456 MH 0 dBm--20 dBm--40 dBm--50 dBm -50 dBm-CF 819.0 MHz CF 819.0 MHz 1001 pts 1001 pts Span 20.0 MHz 
 X-value
 Y-value
 Function

 817.911 MHz
 13.12 dBm
 916.77223 MHz
 7.54 dBm
 Occ Bw

 821.22777 MHz
 6.64 dBm
 Occ Bw
 Occ Bw 
 X-value
 Y-value

 819.46 MHz
 14.99 dBm

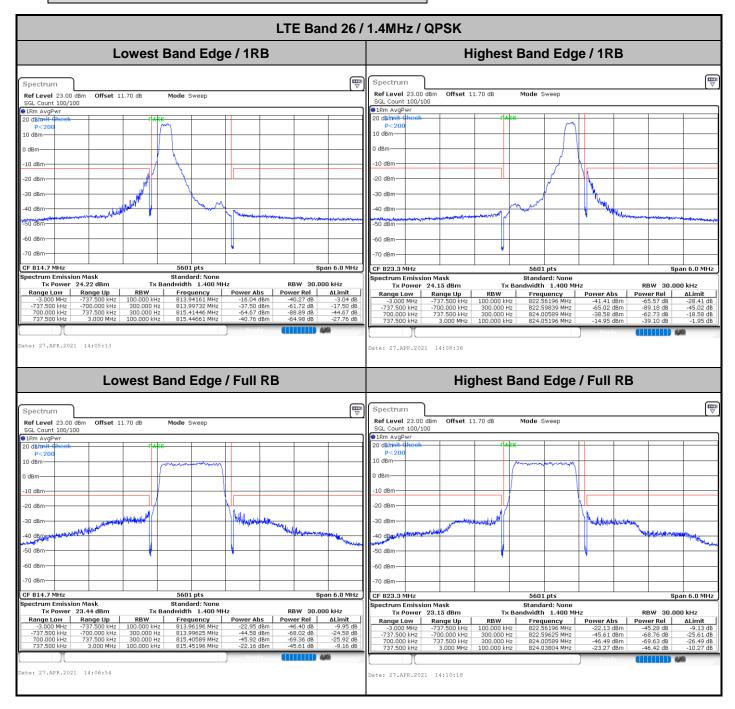
 814.4845 MHz
 7.55 dBm

 823.5155 MHz
 7.92 dBm
 Type Ref Trc Function Function Result **Function Result** 4.455544456 MHz Occ Bw 9.030969031 MHz Low Channel / 15MHz / 256QAM Ref Level 30.0 Att M1F11 -50 dBm Type Ref Trc X-value Y-value Function 820.241 MHz 12.91 dBm 820.241 MHz 12.91 dBm 814.8167 MHz 6.89 dBm Occ Bw 828.2133 MHz 7.00 dBm 13.396603397 MHz 440

Report No.: FG133040-02D

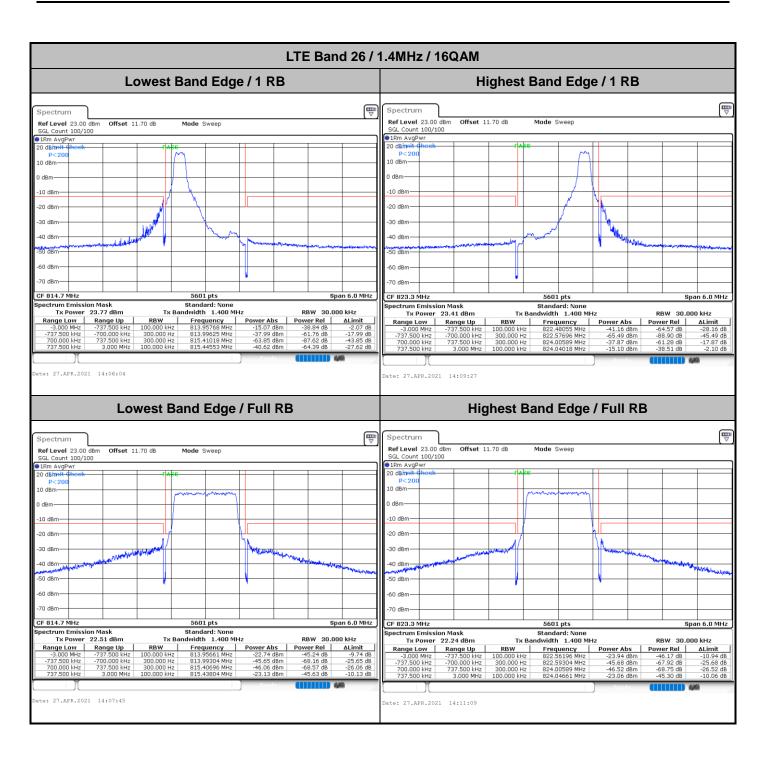
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## Emission masks - In-band emissions

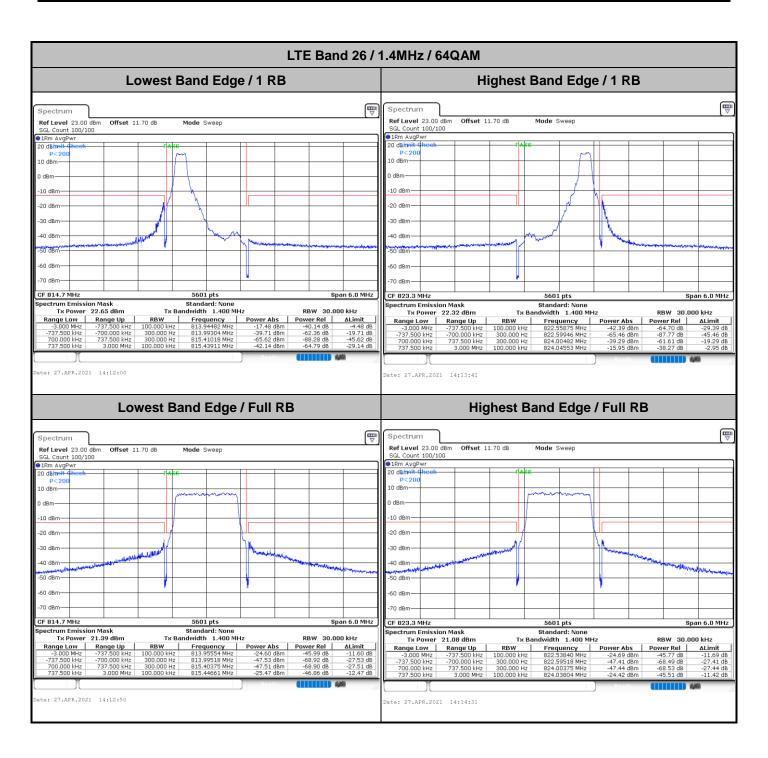


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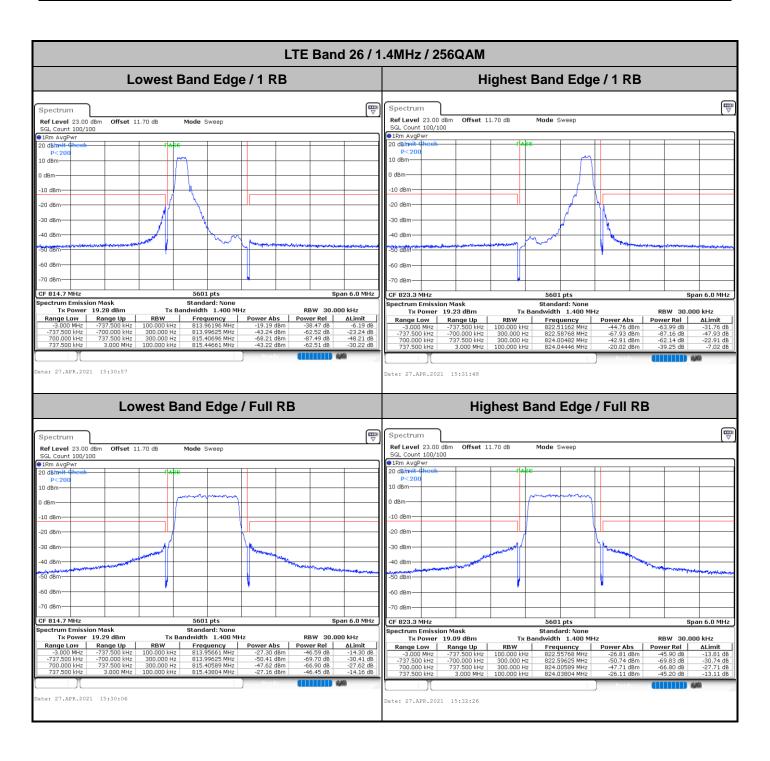
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LTE Band 26 / 3MHz / QPSK Lowest Band Edge / 1RB Highest Band Edge / 1 RB Spectrum Ref Level 23.00 dBm Offset 11.70 dB Mode Sweep Ref Level 23.00 dBm SGL Count 100/100 Offset 11.70 dB Mode Sweep SGL Count 100/100 SGL C. ●1Rm AvgPwr -10 dBm -10 dBm 20 dBr -20 dBm Span 10.0 MHz CF 815.5 MHz 5601 pts 10.0 MHz CF 822.5 MHz 5601 pts ectrum Emission Mask Tx Power 23.89 dBm Standard: None Tx Bandwidth 3.000 MHz Spectrum Emission Mask Standard: None Tx Power 24.00 dBm

nge Low Range Up

-5.000 MHz -1.538 MHz Tx Bandwidth 3.000 MHz | Range Low | Range Up | -5.000 MHz | -1.538 MHz | -1.500 MHz | 1.538 MHz | 1.538 MHz | 1.538 MHz | 5.000 MHz | 5. Frequency Power Abs
2 813.96161 MHz -16.50 dBm
813.99911 MHz -39.25 dBm
2 817.03304 MHz -67.62 dBm
2 819.26696 MHz -43.74 dBm 
 Power Rel
 ALimit

 n
 -40.39 dB
 -3.50

 n
 -63.15 dB
 -19.25

 n
 -91.51 dB
 -47.62

 n
 -67.63 dB
 -30.74
 te: 27.APR.2021 14:15:24 ate: 27.APR.2021 14:18:44 Lowest Band Edge / Full RB **Highest Band Edge / Full RB** Spectrum Offset 11.70 dB Ref Level 23.00 dBm Offset 11.70 dB Mode Sweep SGL Count 100/100 GL Count 100/100 20 dBim 10 dBm -10 dBm -10 dBm -20 dBm -20 dBm -30 dBn -30 dBm -50 dBm--50 dBm -60 dBn 5601 pts Span 10.0 MHz CF 822.5 MHz 5601 pts Span 10.0 MHz GF 822.5 MHz

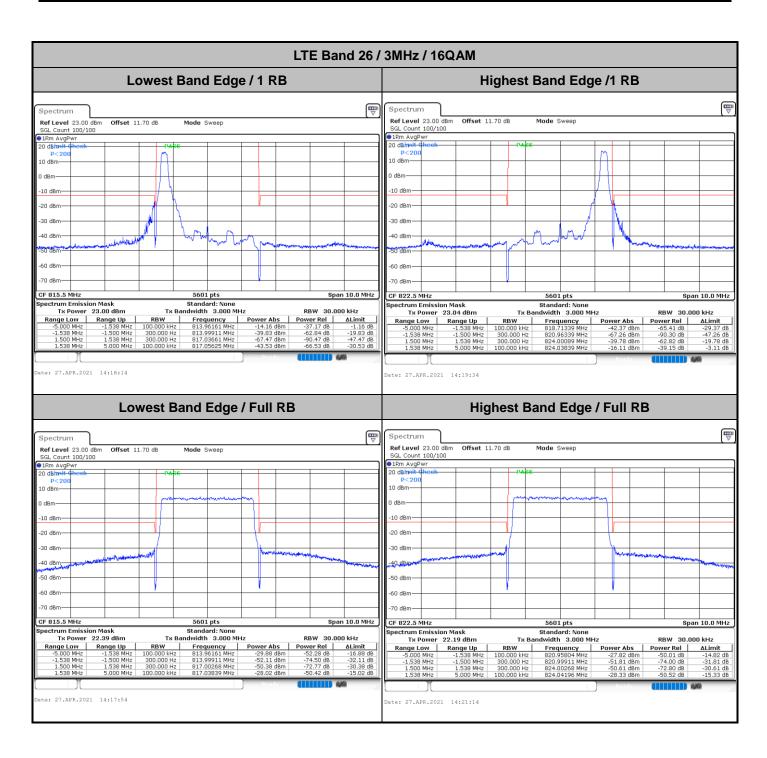
pectrum Emission Mask
Tx Power 23.17 dBm

Range Low Range Up
-5.000 MHz -1.538 MHz
-1.538 MHz -1.500 MHz
1.538 MHz -1.538 MHz
1.538 MHz 5.000 MHz ctrum Emission Mask Standard: None Tx Bandwidth 3.000 MHz Standard: None dwidth 3.000 MHz Tx Power 23.39 dBm RBW 30.000 kHz Тх Ва RBW 30.000 kHz 23.35 C. Range Up -1.538 MF RBW 100.000 kHz 300.000 Hz 300.000 Hz 100.000 kHz Frequency 813.95268 MHz 
 Frequency
 Power Abs

 820.96161 MHz
 -25.65 dB
 Power Rel | ALimit te: 27.APR.2021 14:17:04 Date: 27.APR.2021 14:20:24

Report No.: FG133040-02D

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LTE Band 26 / 3MHz / 64QAM Lowest Band Edge / 1 RB Highest Band Edge /1 RB Spectrum Ref Level 23.00 dBm Offset 11.70 dB Mode Sweep Ref Level 23.00 dBm SGL Count 100/100 Offset 11.70 dB Mode Sweep SGL Count 100/100 SGL C. ●1Rm AvgPwr -10 dBm -10 dBm 20 dBr -20 dBm Sh dem-Span 10.0 MHz CF 815.5 MHz 5601 pts 10.0 MHz CF 822.5 MHz 5601 pts ectrum Emission Mask Tx Power 21.98 dBm Standard: None Tx Bandwidth 3.000 MHz Spectrum Emission Mask Standard: None Tx Power 22.00 dBm

nge Low | Range Up

-5.000 MHz | -1.538 MHz Tx Bandwidth 3.000 MHz RBW 30.000 kHz 
 Range Low
 Range Up

 -5.000 MHz
 -1.538 MHz

 -1.538 MHz
 -1.500 MHz

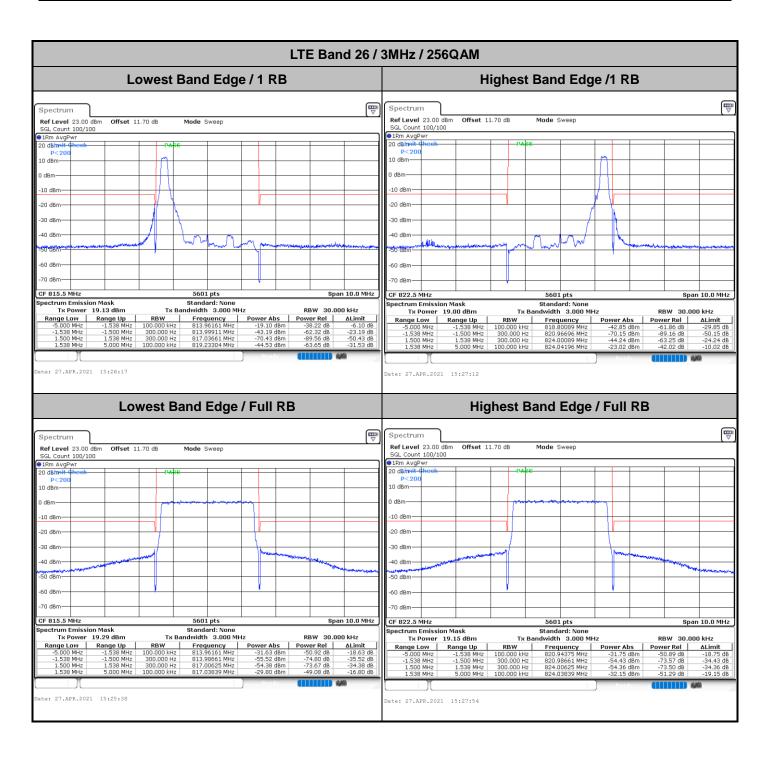
 1.500 MHz
 1.530 MHz

 1.538 MHz
 5.000 MHz
 Frequency Power Abs
2 813.96161 MHz -16.35 dBm
813.99732 MHz -40.45 dBm
2 817.03661 MHz -68.59 dBm
2 819.33661 MHz -42.05 dBm Frequency 818.66696 MHz te: 27.APR.2021 14:39:03 ate: 27.APR.2021 14:40:44 Lowest Band Edge / Full RB **Highest Band Edge / Full RB** Spectrum Offset 11.70 dB Ref Level 23.00 dBm Offset 11.70 dB Mode Sweep SGL Count 100/100 1Rm AvgPwr GL Count 100/100 20 dBim 10 dBm -10 dBm -10 dBm -20 dBm -20 dBm 30 dBm -30 dBm 40 dBm 40 dBm--50 dBm 60 dBn -60 dBm 5601 pts Span 10.0 MHz CF 822.5 MHz 5601 pts Span 10.0 MHz ctrum Emission Mask Standard: None Tx Bandwidth 3.000 MHz Standard: None dwidth 3.000 MHz Tx Power 21.50 dBm RBW 30.000 kHz Tx Ba RBW 30.000 kHz Frequency 813.96161 MHz RBW 100.000 kHz 300.000 Hz 300.000 Hz 100.000 kHz 
 Frequency
 Power Abs

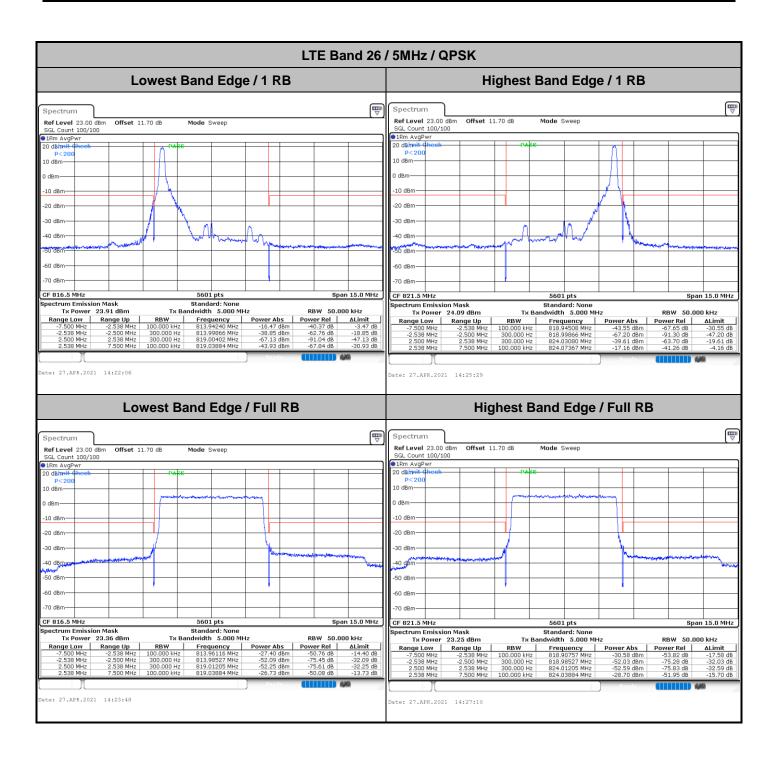
 820.95804 MHz
 -29.82 dB
 te: 27.APR.2021 14:39:53 Date: 27.APR.2021 14:41:34

Report No.: FG133040-02D

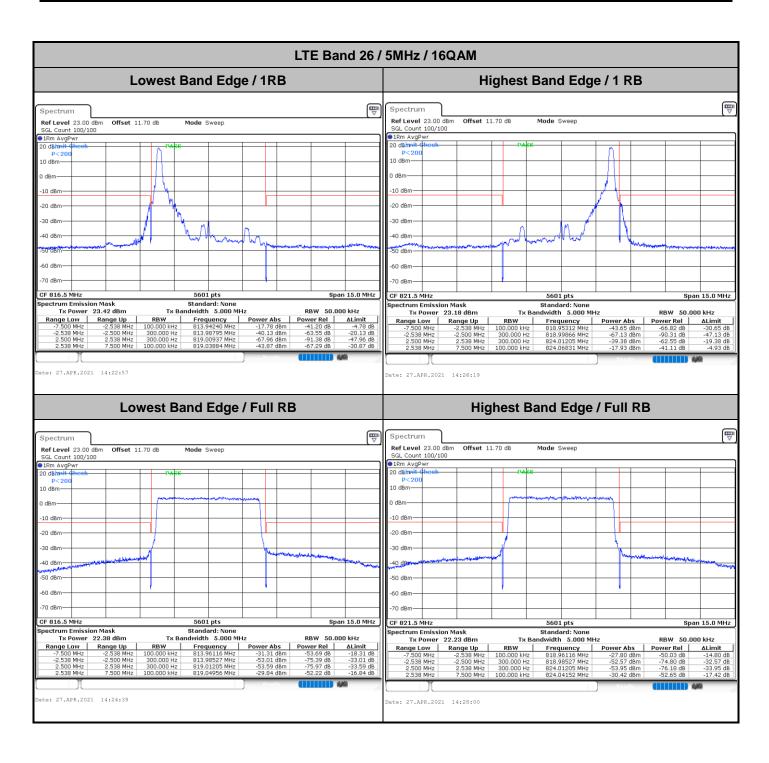
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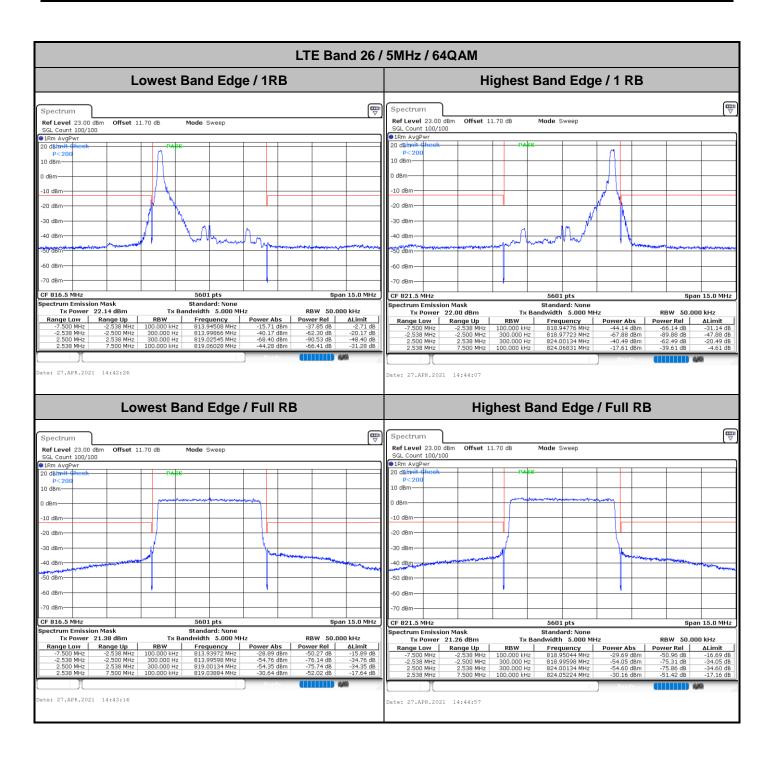
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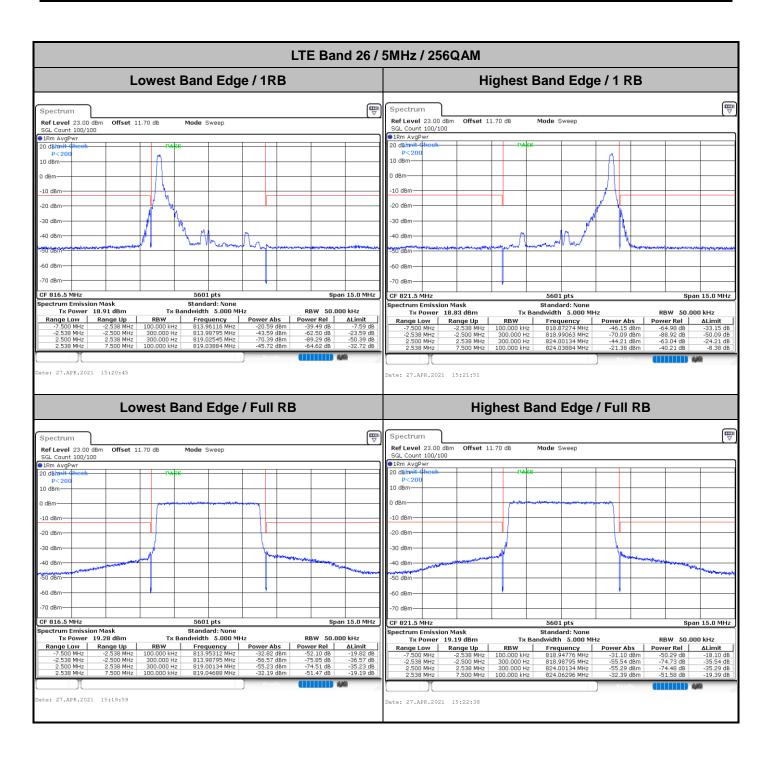
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