



# FCC RADIO TEST REPORT

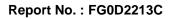
FCC ID	:	PY7-86211X
Equipment	:	GSM/WCDMA/LTE/5G Phone with BT, DTS/UNII a/b/g/n/ac/ax, GPS, WPC and NFC
Brand Name	:	Sony
Applicant	:	Sony Corporation
		1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
Manufacturer	:	Sony Corporation
		1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
Standard	:	FCC 47 CFR Part 2, and 90(S)

The product was received on Feb. 23, 2021 and testing was started from Mar. 22, 2021 and completed on Apr. 19, 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.

Louis Wu

Approved by: Louis Wu 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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Appendix B. Test Results of Radiated Test



# History of this test report

Version	Description	Issued Date
01	Initial issue of report	Apr. 28, 2021



# Summary of Test Result

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 32.89 dB at 2448.000 MHz

**Remark:** The FCC ID: PY7-07452G and FCC ID: PY7-86211X are HW identical, the difference is only SW, and each supported bands are handled by only SW. Only LTE Band 26 for Sub Antenna is added in this report.

#### **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: Vivian Hsu** 



# **1** General Description

# **1.1 Feature of Equipment Under Test**

GSM/WCDMA/LTE/5G NR, Bluetooth, DTS/UNII a/b/g/n/ac/ax, NFC, WPC/WPT, and GNSS.

Product Specification subjective to this standard						
Antenna Type Loop Antenna						
Antenna Gain	-3.60 dBi					

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

EUT Information List										
HW Version	SW Version	S/N	Performed Test Item							
	0.622	QV7200126T	Conducted Measurement							
А	0.622	QV72007L6T	ERP Test							
	0.634	QV7200HN6T	Radiated Spurious Emission							

	Accessory List					
	Model Name : XQZ-UC1					
AC Adapter S/N: 0020W51300095						
<b>F</b> amily and	Model Name : MH750					
Earphone	S/N : N/A					
	Model Name : XQZ-UB1					
USB Cable	S/N : N/A					

Note:

- 1. Above EUT list used are electrically identical per declared by manufacturer.
- 2. Above the accessories list are used to exercise the EUT during test, and the serial number of each type of accessories is listed in each section of this report.
- 3. For other wireless features of this EUT, test report will be issued separately.

# **1.2 Modification of EUT**

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



# 1.3 Emission Designator

Ľ	TE Band 26		QPSK			16QAM		64QAM			
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Conducted Power (W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Conducted Power (W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Conducted Power (W)	
1.4	814.7~823.3	1M09G7D	-	0.0634	1M09W7D	-	0.0536	1M09W7D	-	0.0415	
3	815.5~822.5	2M73G7D	-	0.0634	2M70W7D	-	0.0546	2M72W7D	-	0.0425	
5	816.5~821.5	4M49G7D	-	0.0643	4M48W7D	-	0.0562	4M48W7D	-	0.0427	
10	819.0	9M01G7D	0.0148	0.0625	8M97W7D	-	0.0547	9M01W7D	-	0.0417	
15	821.5	13M4G7D	0.0195	0.0619	13M5W7D	-	0.0524	13M4W7D	-	0.0409	
Ľ	TE Band 26		QPSK			16QAM		64QAM			
BW (MHz)	Frequency Range (MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Conducted Power (W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Conducted Power (W)	Emission Frequency Designator Tolerance (99%OBW) (ppm)		Conducted Power (W)	
1.4	824	1M09G7D	-	0.0615	1M09W7D	-	0.0500	1M09W7D	-	0.0386	
3	824	2M73G7D	-	0.0622	2M70W7D	-	0.0502	2M72W7D	-	0.0391	
5	824	4M49G7D	-	0.0610	4M48W7D	-	0.0500	4M48W7D	-	0.0390	
10	824	9M01G7D	0.0148	0.0618	8M97W7D	-	0.0504	9M01W7D	-	0.0388	
15	824	13M5G7D	-	0.0624	13M5W7D	_	0.0501	13M5W7D	-	0.0473	



# 1.4 Testing Site

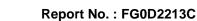
Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory					
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978					
Test Site No.	Sporton Site No.					
Test Sile NO.	TH02-HY					
Test Engineer	Luffy Lin					
Temperature	<b>23.4~26</b> ℃					
Relative Humidity	52~56%					

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

Test Site	Sporton International Inc. Wensan Laboratory		
	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist.,		
Test Site Location	Taoyuan City 333010, Taiwan (R.O.C.)		
	TEL: +886-3-327-0868		
	FAX: +886-3-327-0855		
Test Site No.	Sporton Site No.		
Test Site NO.	03CH12-HY (TAF Code: 3786)		
Test Engineer	Jack Cheng, Lance Chiang and Chuan Chu		
Temperature	<b>21.3~24.5</b> ℃		
Relative Humidity	54~65%		
Remark	The Radiated Spurious Emissions test item subcontracted to Sporton International Inc. Wensan Laboratory		

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

FCC Designation No.: TW1190 and TW3786





# 1.5 Applied Standards

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

following standards:

- 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:

- 1. All test items were verified and recorded according to the standards and without any deviation during the test.
- 2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.
- 3. The TAF code is not including all the FCC KDB listed without accreditation.

# 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 (X plane) were recorded in this report.

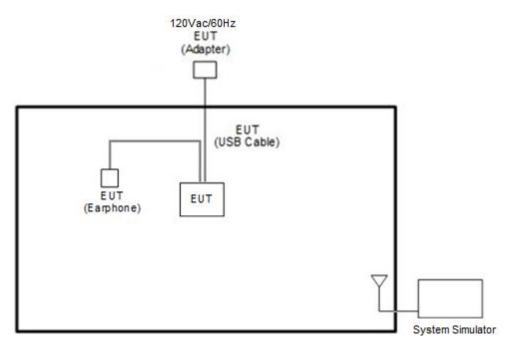
Conducted	_		Ba	andwic	lth (MH	lz)		N	/lodulatio	n		RB #		Tes	t Cha	nnel
Test Cases	Band	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	М	н
Max. Output Power	26	v	v	v	v	v	-	v	v	v	v	v	v	v	v	v
Peak-to-Average Ratio	26				v		-	v	v	v			v		v	
26dB and 99% Bandwidth	26	v	v	v	v	v	-	v	v	v			v	v	v	
Emission masks In-band emissions	26	v	v	v	v	v	-	v	v	v	v		v	v		v
Emission masks – Out of band emissions	26	v	v	v	v	v	-	v			v			v	v	v
Frequency Stability	26				v	v	-	v					v	v	v	
E.R.P.	26	v	v	v	v	v	-	v	v	v			Max	Powe	r	
Radiated Spurious Emission	26	26 Worst Case V V						v								
Remark	<ol> <li>The mark "v " means that this configuration is chosen for testing</li> <li>The mark "-" means that this bandwidth is not supported.</li> <li>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>															

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

TEL : 886-3-327-3456	Page Number	: 9 of 24
FAX : 886-3-328-4978	Issued Date	: Apr. 28, 2021
Report Template No.: BU5-FGLTE90S Version 2.4	Report Version	: 01



# 2.2 Connection Diagram of Test System



# 2.3 Support Unit used in test configuration and system

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

# 2.4 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)



# 2.5 Frequency List of Low/Middle/High Channels

	LTE Band 26 Ch	annel and Frequen	icy 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



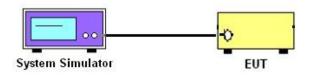
# 3 Conducted Test Items

# 3.1 Measuring Instruments

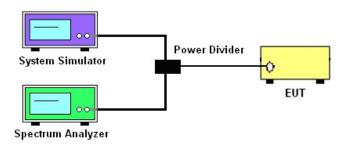
See list of measuring instruments of this test report.

### 3.1.1 Test Setup

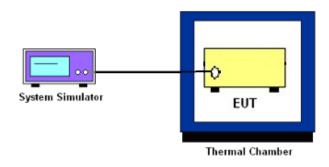
### 3.1.2 Conducted Output Power



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.



### 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.

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

 $L_{C}$  = signal attenuation in the connecting cable between the transmitter and antenna in dB

#### **3.2.2 Test Procedures**

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



# 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.
- 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.

### 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.

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.



### 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)

(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  $43 + 10 \text{Log}_{10}(\text{P})$  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.

### 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  $10^{th}$  harmonic.

### 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.
- For testing above 1GHz, make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
- 7. 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)



### 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.

#### 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.
- 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.
- 2. 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.

### 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.

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.

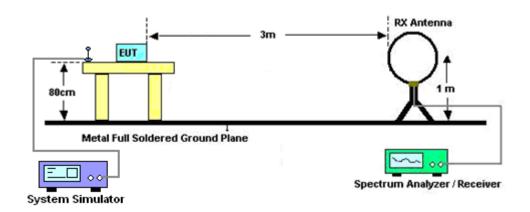
#### 3.8.2 Test Procedures

- 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)

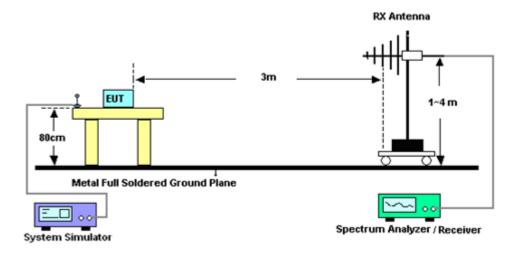


### 3.8.3 Test Setup

For radiated test below 30MHz

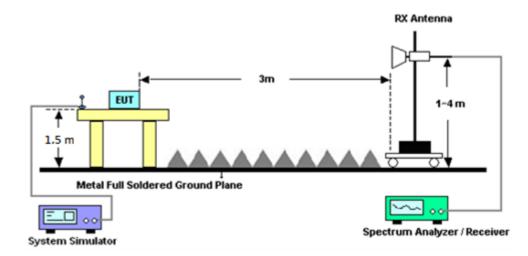


#### For radiated test from 30MHz to 1GHz





#### For radiated test above 1GHz



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



# 4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jan. 04, 2021	Mar. 23, 2021~ Mar. 30, 2021	Jan. 03, 2022	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	40103 & 07	30MHz~1GHz	Apr. 29, 2020	Mar. 23, 2021~ Mar. 30, 2021	Apr. 28, 2021	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-1328	1GHz~18GHz	Nov. 23, 2020	Mar. 23, 2021~ Mar. 30, 2021	Nov. 22, 2021	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-1212	1GHz~18GHz	May 20, 2020	Mar. 23, 2021~ Mar. 30, 2021	May 19, 2021	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 25, 2020	Mar. 23, 2021	Mar. 24, 2021	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 24, 2021	Mar. 24, 2021~ Mar. 30, 2021	Mar. 23, 2022	Radiation (03CH12-HY)
Preamplifier	Keysight	83017A	MY57280120	1GHz~26.5GHz	Jul. 20, 2020	Mar. 23, 2021~ Mar. 30, 2021	Jul. 19, 2021	Radiation (03CH12-HY)
Preamplifier	E-INSTRUME NT TECH LTD.	ERA-100M-18 G-56-01-A70	EC1900249	1GHz-18GHz	Dec. 05, 2020	Mar. 23, 2021~ Mar. 30, 2021	Dec. 04, 2021	Radiation (03CH12-HY)
Spectrum Analyzer	Agilent	N9010A	MY53470118	10Hz~44GHz	Jan. 15, 2021	Mar. 23, 2021~ Mar. 30, 2021	Jan. 14, 2022	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz~30MHz	Mar. 11, 2021	Mar. 23, 2021~ Mar. 30, 2021	Mar. 10, 2022	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30MHz~18GHz	Dec. 11, 2020	Mar. 23, 2021~ Mar. 30, 2021	Dec. 10, 2021	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz~40GHz	Feb. 22, 2021	Mar. 23, 2021~ Mar. 30, 2021	Feb. 21, 2022	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz~40GHz	Feb. 22, 2021	Mar. 23, 2021~ Mar. 30, 2021	Feb. 21, 2022	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Mar. 23, 2021~ Mar. 30, 2021	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Mar. 23, 2021~ Mar. 30, 2021	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Mar. 23, 2021~ Mar. 30, 2021	N/A	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-12 SS	SN2	1.2GHz Low Pass Filter	Mar. 17, 2021	Mar. 23, 2021~ Mar. 30, 2021	Mar. 16, 2022	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-2700 -3000-18000-6 0ST	SN2	3GHz High Pass Filter	Jul. 14, 2020	Mar. 23, 2021~ Mar. 30, 2021	Jul. 13, 2021	Radiation (03CH12-HY)
Filter	Wainwright	WHKX8-5872. 5-6750-18000- 40ST	SN2	6.75GHz High Pass Filter	Mar. 17, 2021	Mar. 23, 2021~ Mar. 30, 2021	Mar. 16, 2022	Radiation (03CH12-HY)



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Base Station (Measure)	Anritsu	MT8821C	6262025341	N/A	Oct. 06, 2020	Mar. 22, 2021~ Apr. 19, 2021	Oct. 05, 2021	Conducted (TH02-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101397	10Hz~40GHz	Nov. 27, 2020	Mar. 22, 2021~ Apr. 19, 2021	Nov. 26, 2021	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D3SP	TBN-930701	N/A	Aug. 05, 2020	Mar. 22, 2021~ Apr. 19, 2021	Aug. 04, 2021	Conducted (TH02-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890094	1V~20V 0.5A~5A	Oct. 05, 2020	Mar. 22, 2021~ Apr. 19, 2021	Oct. 04, 2021	Conducted (TH02-HY)
Coupler	Warison	20dB 25W SMA Directional Coupler	#B	1-18GHz	Jan. 09, 2021	Mar. 22, 2021~ Apr. 19, 2021	Jan. 08, 2022	Conducted (TH02-HY)



# 5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of	3.07
Confidence of 95% (U = 2Uc(y))	3.07

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

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



# Appendix A. Test Results of Conducted Test

# Conducted Output Power(Average power)

	LTE	Band 26 M	laximum A	verage Po	wer [dBm]	(GT - LC =	= -3.6 dB)	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
15	1	0		23.67	-	-		
15	1	37		23.54	-	-		
15	1	74		23.62	-	-		
15	36	0	QPSK	22.86	-	-	17.92	0.0619
15	36	20		22.76	-	-		
15	36	39		22.73	-	-		
15	75	0		22.63	-	-		
15	1	0		22.94	-	-		
15	1	37		22.78	-	-		
15	1	74		22.76	-	-	17.19	0.0524
15	36	0	16-QAM	21.78	-	-		
15	36	20		21.76	-	-		
15	36	39		21.80	-	-		
15	75	0		21.64	-	-		
15	1	0		21.78	-	-		
15	1	37		21.87	-	-		
15	1	74		21.68	-	-		
15	36	0	64-QAM	20.72	-	-	16.12	0.0409
15	36	20		20.80	-	-		
15	36	39	-	20.72	-	-		
15	75	0		20.62	-	-	1	
Limit	E	RP < 100V	V		Result		Pa	ISS



	LTE	Band 26 M	laximum A	verage Po	wer [dBm]	(GT - LC =	-3.6 dB)	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
10	1	0		-	23.71	-		
10	1	25		-	23.55	-		
10	1	49		-	23.60	-		
10	25	0	QPSK	-	22.65	-	17.96	0.0625
10	25	12		-	22.67	-		
10	25	25		-	22.76	-		
10	50	0		-	22.83	-		
10	1	0		-	23.13	-		
10	1	25		-	23.01	-		
10	1	49		-	22.81	-		
10	25	0	16-QAM	-	21.57	-	17.38	0.0547
10	25	12		-	21.57	-		
10	25	25		-	21.67	-		
10	50	0		-	21.66	-		
10	1	0		-	21.84	-		
10	1	25		-	21.88	-		
10	1	49		-	21.95	-		
10	25	0	64-QAM	-	20.75	-	16.2	0.0417
10	25	12		-	20.57	-		
10	25	25	-	-	20.64	-		
10	50	0		-	20.87	-	1	
Limit	E	ERP < 100V	V		Result		Pa	ISS



	LTE	Band 26 M	laximum A	verage Po	wer [dBm]	(GT - LC =	= -3.6 dB)	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
5	1	0		23.83	23.75	23.75		
5	1	12		23.82	23.81	23.72		
5	1	24		23.73	23.78	23.67		
5	12	0	QPSK	22.98	22.88	22.86	18.08	0.0643
5	12	7		22.95	22.92	22.82		
5	12	13		22.87	22.83	22.77		
5	25	0		22.92	22.86	22.80		
5	1	0		23.25	23.06	23.08		
5	1	12		23.17	23.09	22.99		
5	1	24		23.06	23.10	23.00		
5	12	0	16-QAM	22.02	21.87	21.87	17.5	0.0562
5	12	7		21.99	21.93	21.83		
5	12	13		21.89	21.87	21.77		
5	25	0		21.94	21.90	21.80		
5	1	0		22.05	22.02	22.03		
5	1	12		21.92	22.05	21.78		
5	1	24		21.74	21.97	21.75		
5	12	0	64-QAM	20.94	20.63	20.83	16.3	0.0427
5	12	7		20.89	20.77	20.68		
5	12	13	-	20.78	20.83	20.74		
5	25	0		20.82	20.93	20.77	1	
Limit	E	ERP < 100V	V		Result		Pa	ISS



	LTE	Band 26 M	laximum A	verage Po	wer [dBm]	(GT - LC =	= -3.6 dB)	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
3	1	0		23.52	23.69	23.47		
3	1	8		23.77	23.62	23.69		
3	1	14		23.46	23.54	23.59		
3	8	0	QPSK	22.94	22.61	22.72	18.02	0.0634
3	8	4		22.78	22.58	22.50		
3	8	7		22.64	22.63	22.49		
3	15	0		22.81	22.75	22.67		
3	1	0		23.00	22.85	22.83		
3	1	8		23.12	22.87	22.88		
3	1	14		22.98	22.87	22.69		
3	8	0	16-QAM	22.04	21.63	21.80	17.37	0.0546
3	8	4		21.87	21.80	21.60		
3	8	7		21.86	21.55	21.67		
3	15	0		21.86	21.72	21.63		
3	1	0		21.96	21.86	21.64		
3	1	8		21.81	22.00	21.74		
3	1	14		21.83	22.03	21.65		
3	8	0	64-QAM	20.76	20.77	20.46	16.28	0.0425
3	8	4		20.79	20.82	20.59		
3	8	7	-	20.85	20.67	20.63		
3	15	0		20.71	20.70	20.60		
Limit	E	RP < 100V	V		Result		Pa	ISS



	LTE	Band 26 M	laximum A	verage Po	wer [dBm]	(GT - LC =	-3.6 dB)	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
1.4	1	0		23.70	23.36	23.43		
1.4	1	3		23.64	23.48	23.45		
1.4	1	5		23.49	23.44	23.50		
1.4	3	0	QPSK	23.67	23.60	23.54	18.02	0.0634
1.4	3	1		23.64	23.67	23.56		
1.4	3	3		23.77	23.46	23.56		
1.4	6	0		22.82	22.66	22.39		
1.4	1	0		22.97	22.77	22.82		
1.4	1	3		23.04	22.96	22.88		
1.4	1	5		22.97	22.68	22.77		
1.4	3	0	16-QAM	22.79	22.73	22.47	17.29	0.0536
1.4	3	1		22.63	22.63	22.45		
1.4	3	3		22.67	22.58	22.43		
1.4	6	0		21.70	21.77	21.63		
1.4	1	0		21.83	21.60	21.56		
1.4	1	3		21.93	21.85	21.87		
1.4	1	5		21.74	21.68	21.71		
1.4	3	0	64-QAM	21.64	21.77	21.68	16.18	0.0415
1.4	3	1		21.70	21.60	21.75		
1.4	3	3	-	21.69	21.76	21.62		
1.4	6	0		20.62	20.72	20.46		
Limit	E	RP < 100V	V		Result		Pa	ISS

	LTE	Band 26 M	laximum A	verage Po	wer [dBm]	(GT - LC =	-3.6 dB)	
BW [MHz]	RB Size	RB Offset	Mod	-	824	-	ERP (dBm)	ERP (W)
15	1	0		-	23.70	-		
15	1	37		-	23.63	-		
15	1	74		-	23.52	-		
15	36	0	QPSK	-	22.80	-	17.95	0.0624
15	36	20		-	22.82	-		
15	36	39		-	22.78	-		
15	75	0		-	22.82	-		
15	1	0		-	22.75	-		
15	1	37		-	22.64	-		
15	1	74		-	22.56	-		
15	36	0	16-QAM	-	21.47	-	17	0.0501
15	36	20		-	21.49	-		
15	36	39		-	21.44	-		
15	75	0		-	21.50	-		
15	1	0		-	22.50	-		
15	1	37		-	22.44	-		
15	1	74		-	22.40	-		
15	36	0	64-QAM	-	21.47	-	16.75	0.0473
15	36	20		-	21.50	-		
15	36	39	-	-	21.46	-		
15	75	0		-	21.50	-	1	
Limit	E	RP < 100V	V		Result		Pa	ISS



LTE Band 26 Maximum Average Power [dBm] (GT - LC = -3.6 dB)										
BW [MHz]	RB Size	RB Offset	Mod	-	824	-	ERP (dBm)	ERP (W)		
10	1	0		-	23.66	-				
10	1	25		-	23.66	-				
10	1	49		-	23.57	-				
10	25	0	QPSK	-	22.75	-	17.91	0.0618		
10	25	12		-	22.82	-				
10	25	25		-	22.76	-				
10	50	0		-	22.81	-				
10	1	0		-	22.77	-		0.0504		
10	1	25	16-QAM	-	22.71	-	17.02			
10	1	49		-	22.68	-				
10	25	0		-	21.48	-				
10	25	12		-	21.54	-				
10	25	25		-	21.47	-				
10	50	0		-	21.52	-				
10	1	0		-	21.64	-				
10	1	25		-	21.58	-				
10	1	49		-	21.59	-				
10	25	0	64-QAM	-	20.51	-	15.89	0.0388		
10	25	12	· · · · ·	-	20.57	-				
10	25	25		-	20.49	-				
10	50	0		-	20.54	-				
Limit	E	ERP < 100V	V		Result		Pa	ISS		



LTE Band 26 Maximum Average Power [dBm] (GT - LC = -3.6 dB)										
BW [MHz]	RB Size	RB Offset	Mod	-	824	-	ERP (dBm)	ERP (W)		
5	1	0		-	23.60	-				
5	1	12		-	23.59	-				
5	1	24		-	23.58	-				
5	12	0	QPSK	-	22.72	-	17.85	0.0610		
5	12	7	-	-	22.80	-				
5	12	13		-	22.70	-				
5	25	0		-	22.74	-				
5	1	0		-	22.66	-		0.0500		
5	1	12		-	22.57	-	16.99			
5	1	24		-	22.74	-				
5	12	0	16-QAM	-	21.47	-				
5	12	7		-	21.53	-				
5	12	13		-	21.43	-				
5	25	0		-	21.51	-				
5	1	0		-	21.66	-				
5	1	12		-	21.59	-				
5	1	24		-	21.62	-				
5	12	0	64-QAM	-	20.51	-	15.91	0.0390		
5	12	7		-	20.57	-		1		
5	12	13		-	20.48	-				
5	25	0		-	20.49	-				
Limit	E	ERP < 100V	V		Result		Pa	ISS		



LTE Band 26 Maximum Average Power [dBm] (GT - LC = -3.6 dB)										
BW [MHz]	RB Size	RB Offset	Mod	-	824	-	ERP (dBm)	ERP (W)		
3	1	0		-	23.67	-				
3	1	8		-	23.69	-				
3	1	14		-	23.64	-				
3	8	0	QPSK	-	22.71	-	17.94	0.0622		
3	8	4	-	-	22.80	-				
3	8	7		-	22.71	-	1			
3	15	0		-	22.76	-				
3	1	0		-	22.72	-	17.01	0.0502		
3	1	8		-	22.76	-				
3	1	14		-	22.69	-				
3	8	0	16-QAM	-	21.44	-				
3	8	4		-	21.61	-				
3	8	7		-	21.47	-				
3	15	0		-	21.53	-				
3	1	0		-	21.61	-				
3	1	8		-	21.67	-				
3	1	14		-	21.67	-				
3	8	0	64-QAM	-	20.50	-	15.92	0.0391		
3	8	4		-	20.57	-				
3	8	7		-	20.52	-				
3	15	0		-	20.53	-				
Limit	E	RP < 100V	V		Result		Pa	ISS		



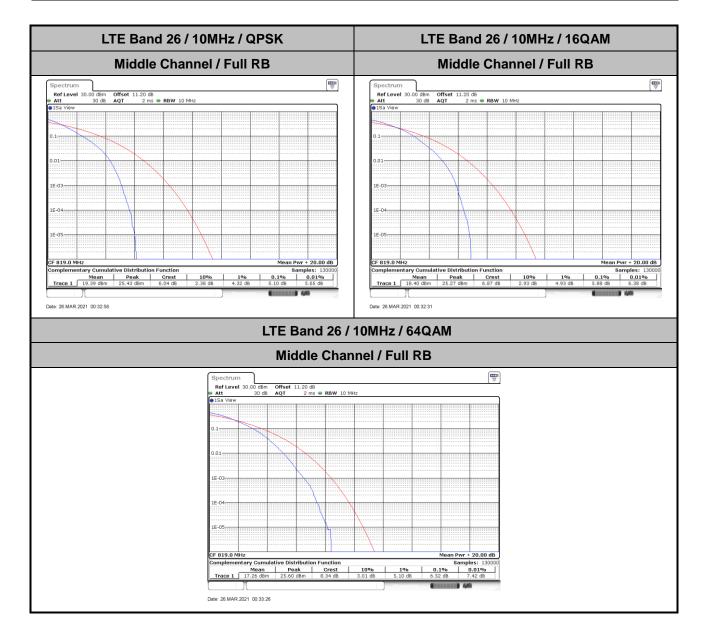
LTE Band 26 Maximum Average Power [dBm] (GT - LC = -3.6 dB)										
BW [MHz]	RB Size	RB Offset	Mod	-	824	-	ERP (dBm)	ERP (W)		
1.4	1	0		-	23.60	-				
1.4	1	3		-	23.64	-				
1.4	1	5		-	23.55	-				
1.4	3	0	QPSK	-	23.53	-	17.89	0.0615		
1.4	3	1		-	23.63	-				
1.4	3	3		-	23.57	-				
1.4	6	0		-	22.72	-				
1.4	1	0		-	22.59	-		0.0500		
1.4	1	3		-	22.74	-	16.99			
1.4	1	5		-	22.60	-				
1.4	3	0	16-QAM	-	22.46	-				
1.4	3	1		-	22.47	-				
1.4	3	3		-	22.43	-				
1.4	6	0		-	21.45	-				
1.4	1	0		-	21.49	-				
1.4	1	3		-	21.55	-				
1.4	1	5		-	21.56	-				
1.4	3	0	64-QAM	-	21.57	-	15.87	0.0386		
1.4	3	1		-	21.62	-				
1.4	3	3		-	21.58	-				
1.4	6	0		-	20.45	-				
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	5.10	5.88	6.52	-	PASS

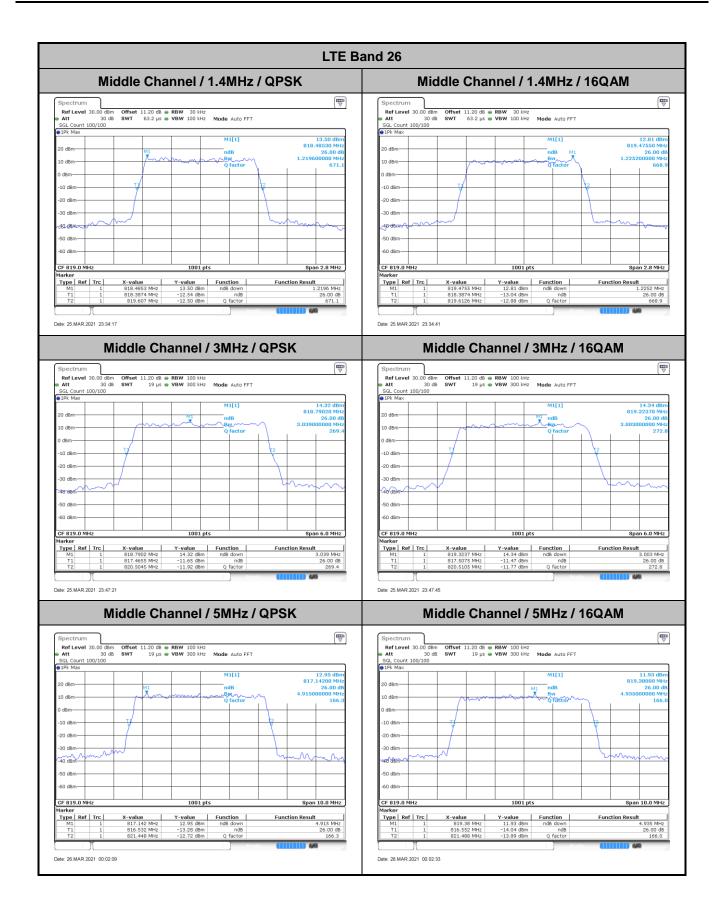


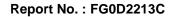


# 26dB Bandwidth

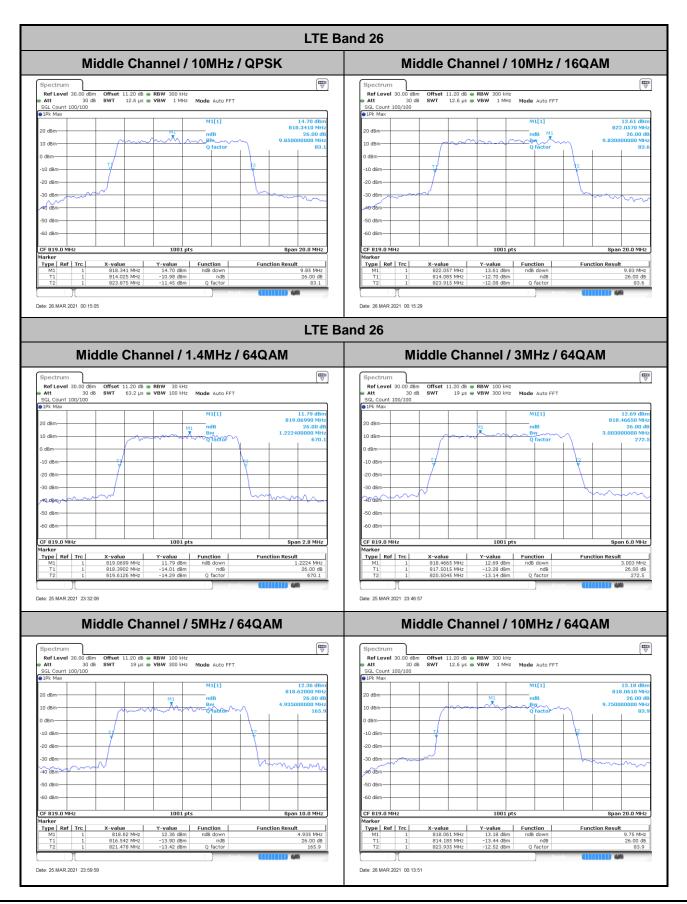
Mode	LTE Band 26 : 26dB BW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Low CH	-	-	-	-	-	-	-	-	14.48	14.51	-	-
Middle CH	1.22	1.23	3.04	3.00	4.92	4.94	9.85	9.83	-	-	-	-
Mode					LTE Ba	and 26 :	26dB BV	V(MHz)				
BW	1.4	MHz	31	lHz	5M	Hz	10	/IHz	15N	ИHz	20MHz	
Mod.	64QAM	256 QAM	64QAM	256 QAM	64QAM	256 QAM	64QAM	256 QAM	64QAM	256 QAM	64QAM	256 QAM
Low CH	-	-	-	-	-	-	-	-	14.45	-	-	-
Middle CH	1.22	-	3.00	-	4.94	-	9.75	-	-	-	-	-



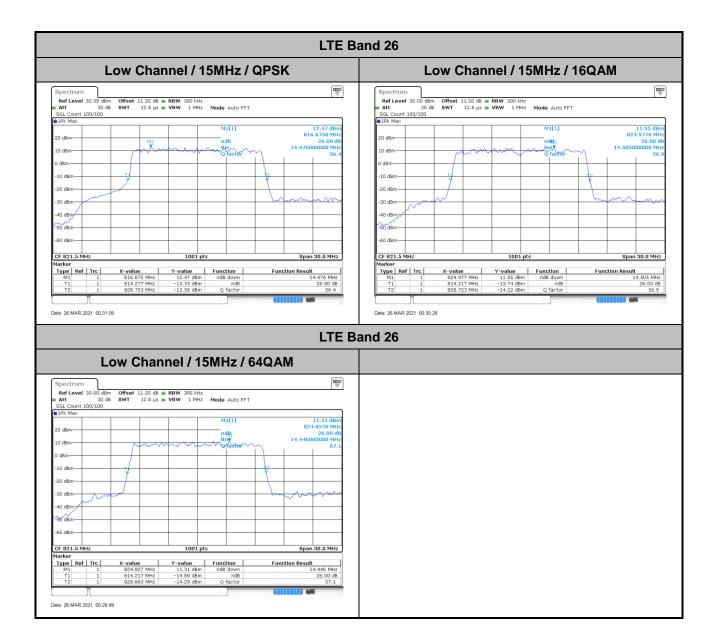










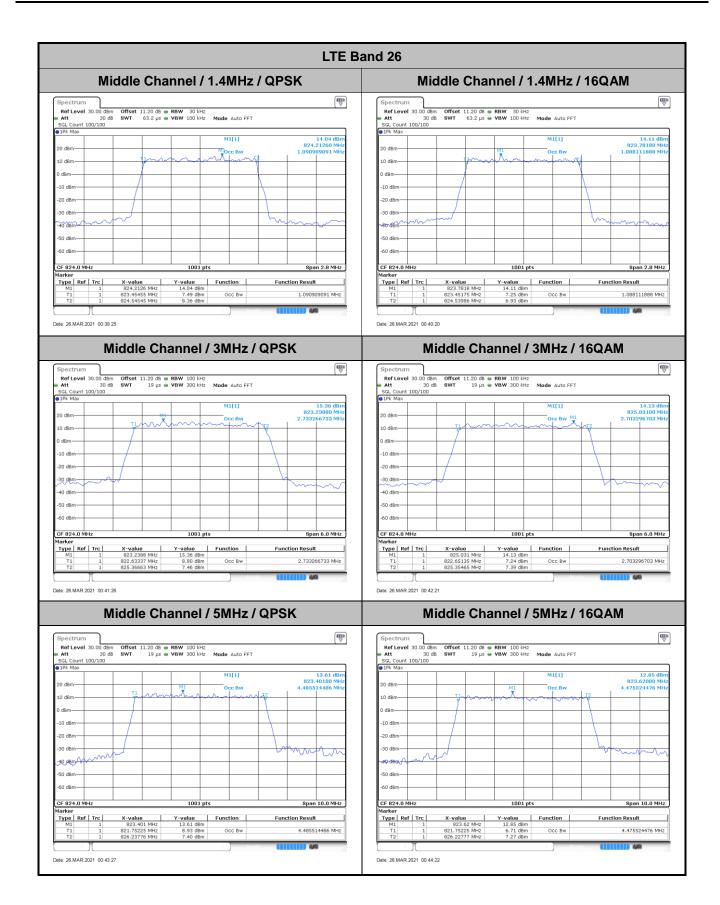




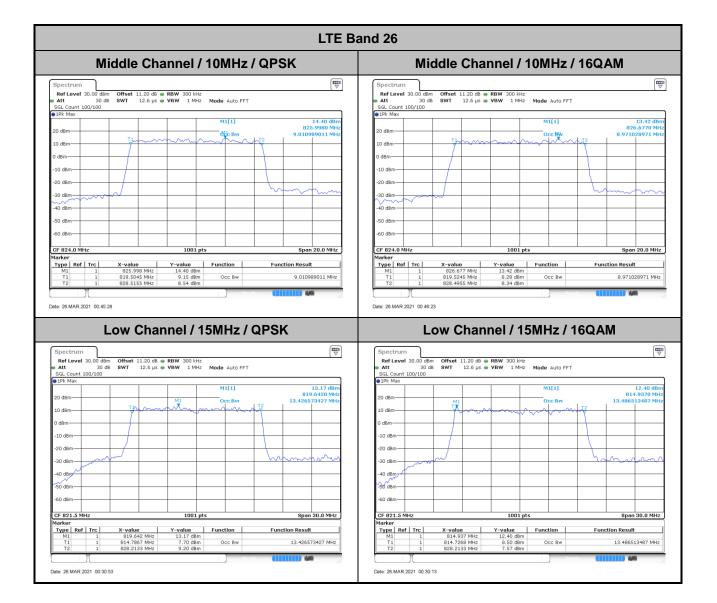
## **Occupied Bandwidth**

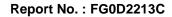
Mode	LTE Band 26 : 99%OBW(MHz)											
BW	1.4MHz		3MHz		5MHz		10MHz		15MHz		20MHz	
Mod.	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Low CH	-	-	-	-	-	-	-	-	13.43	13.49	-	-
Middle CH	1.09	1.09	2.73	2.70	4.49	4.48	9.01	8.97	-	-	-	-
Mode	LTE Band 26 : 99%OBW(MHz)											
BW	1.4MHz		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	-	-	-
Middle CH	1.09	-	2.72	-	4.48	-	9.01	-	-	-	-	-



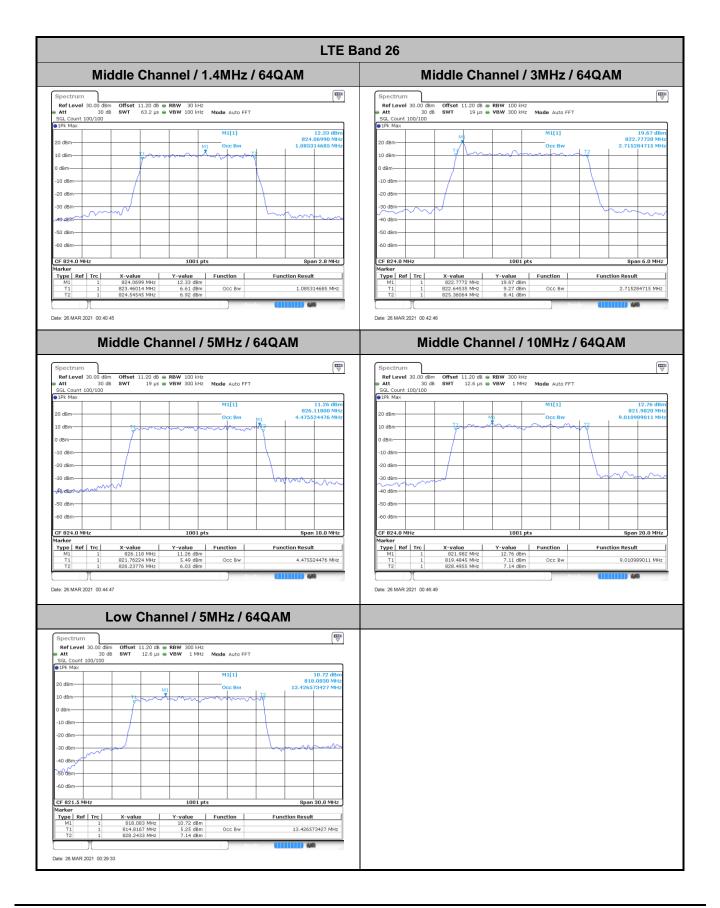






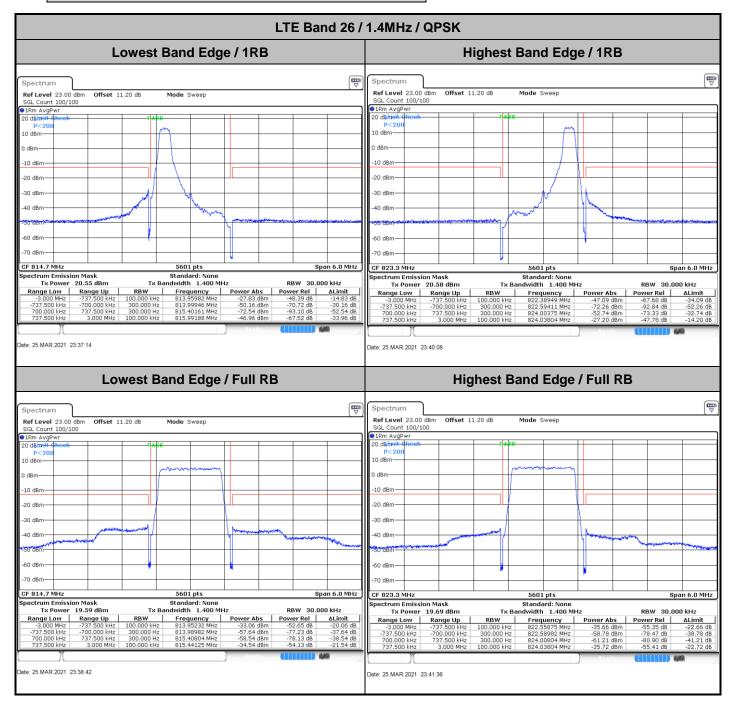


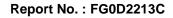




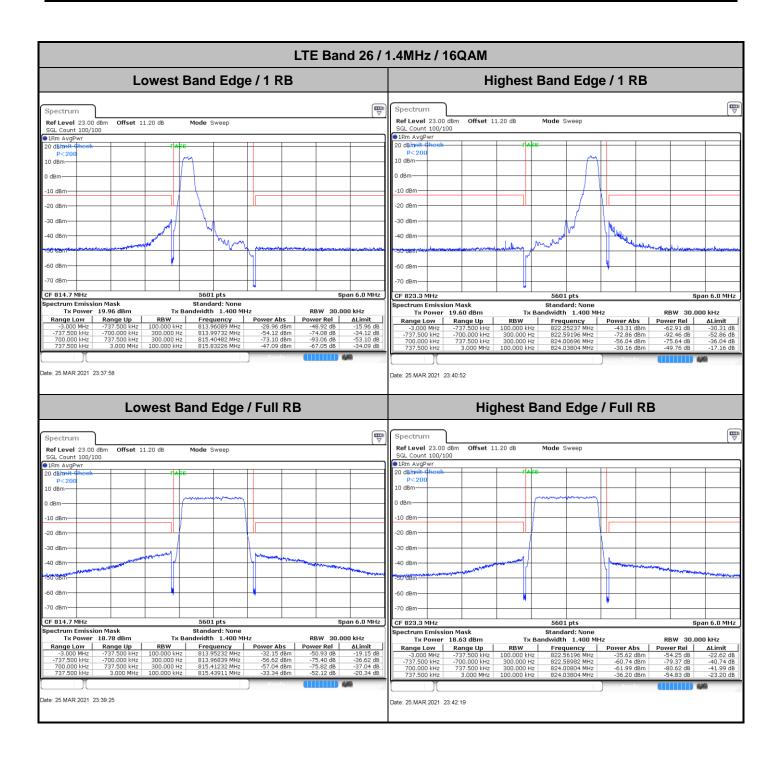


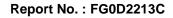
## Emission masks – In-band emissions



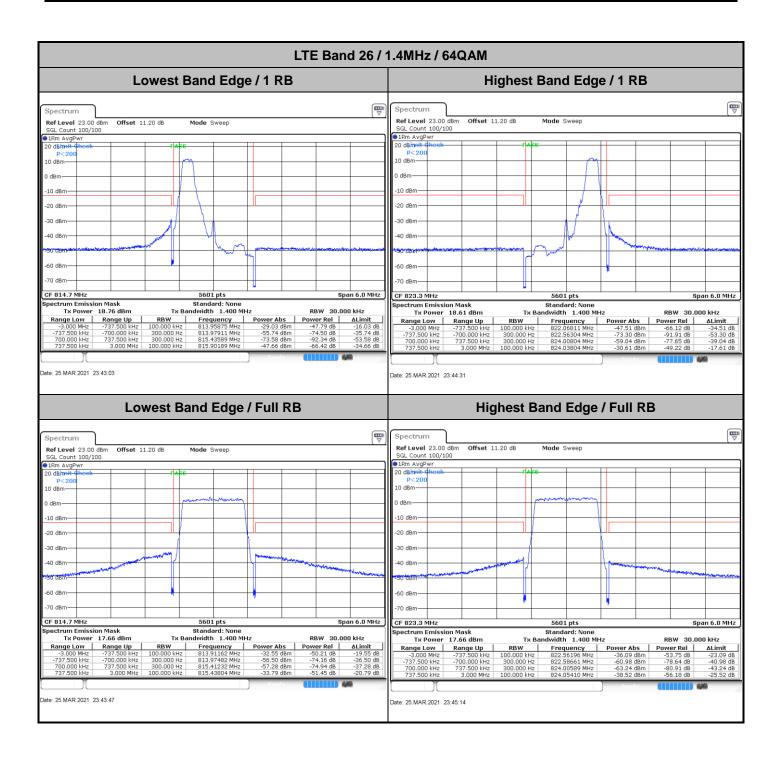


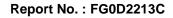




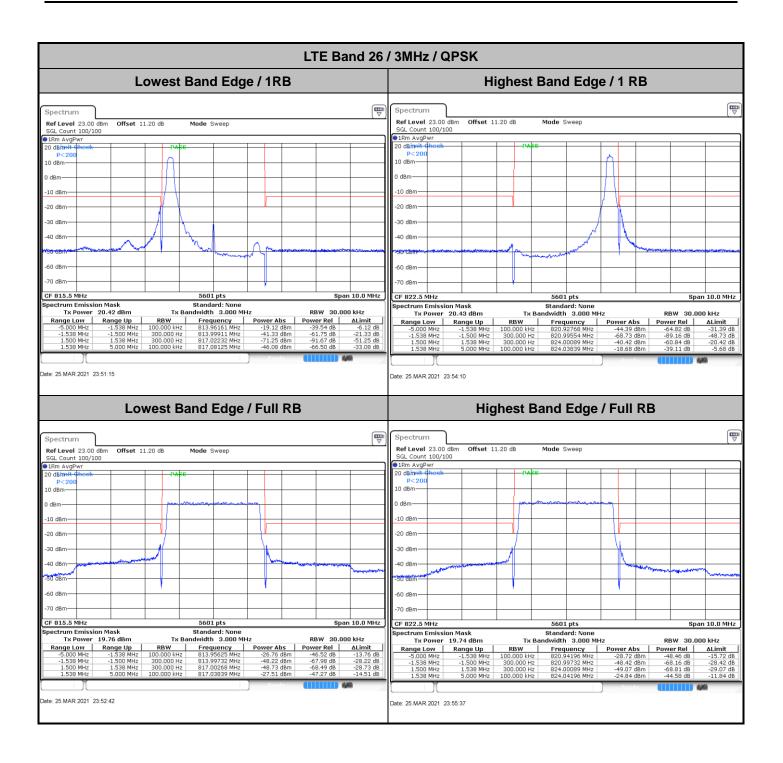






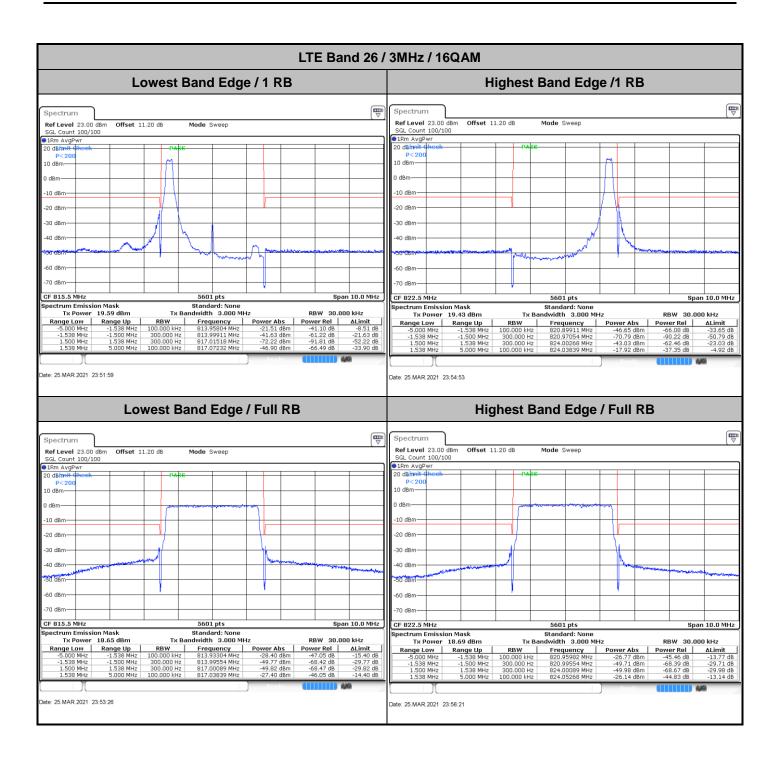






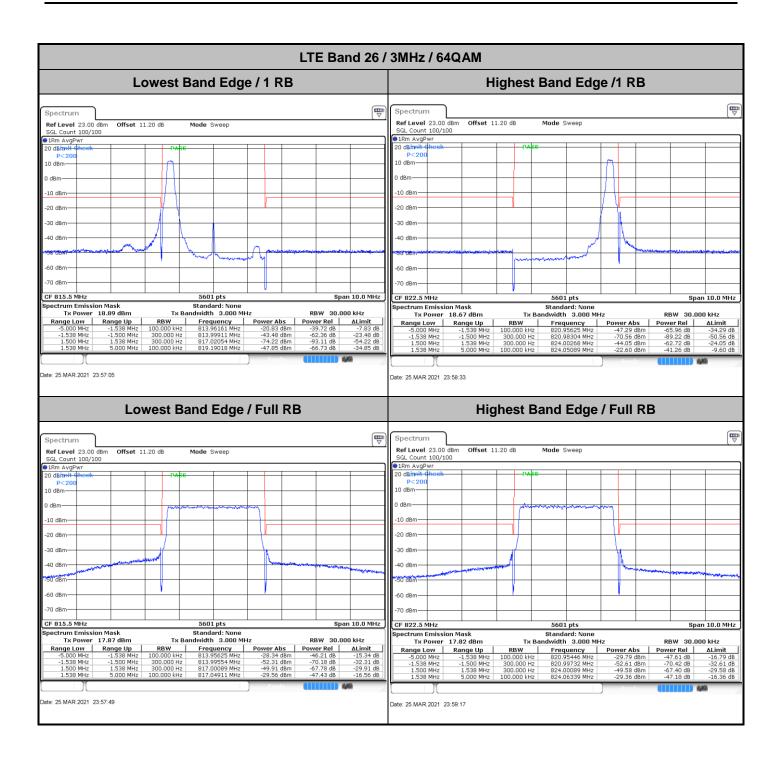


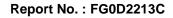




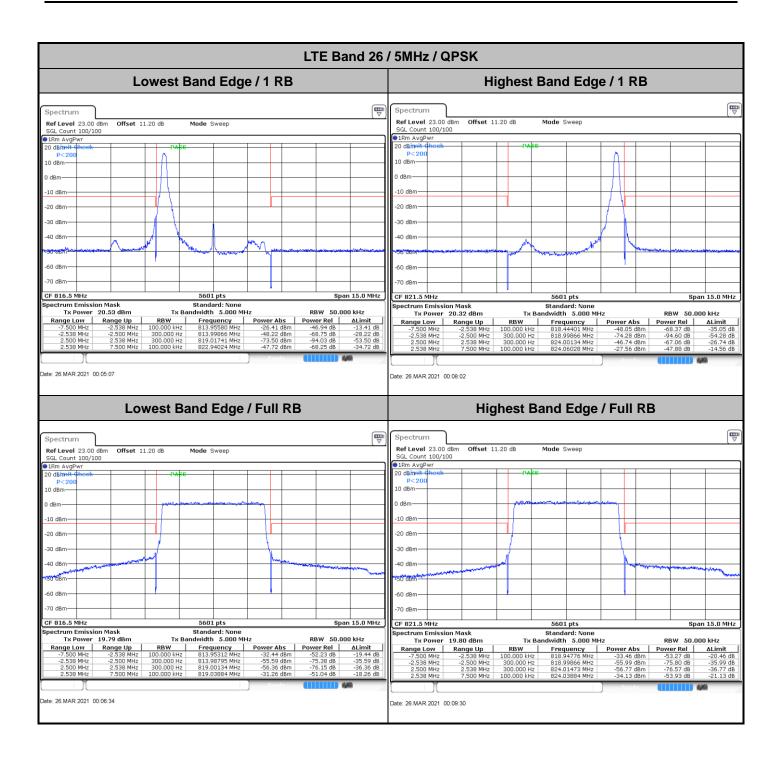






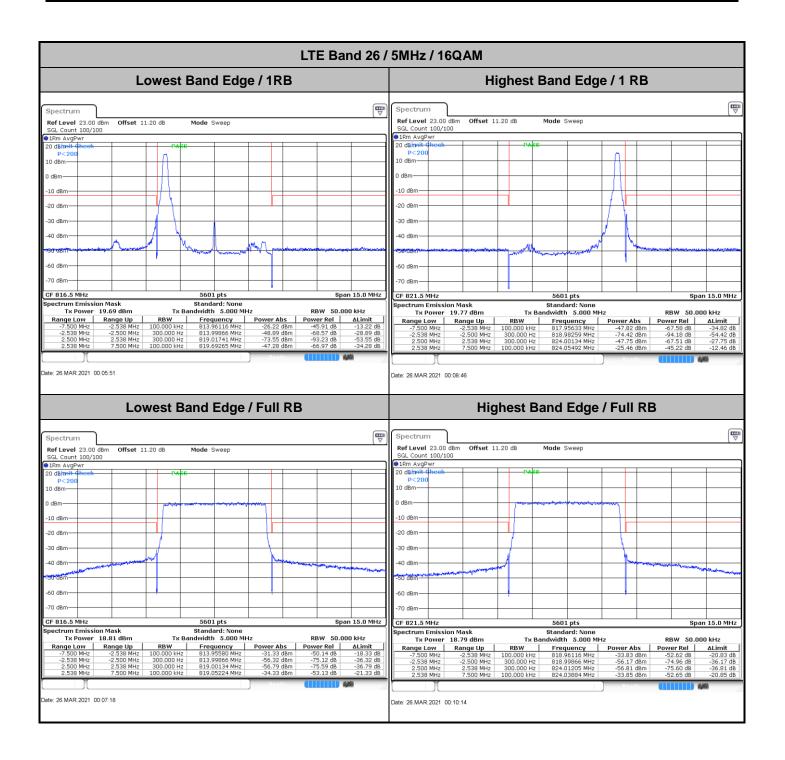


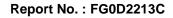




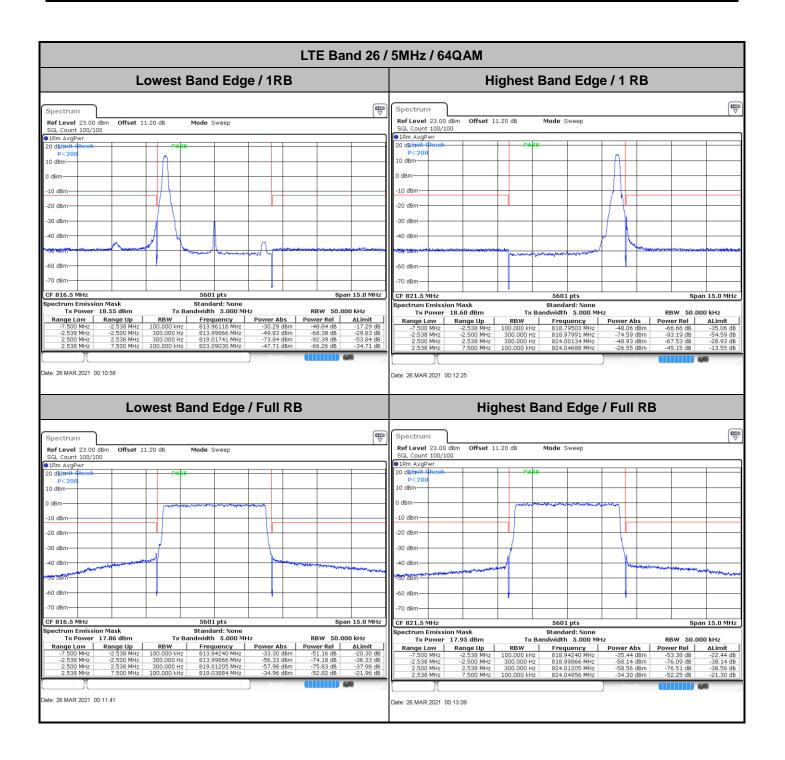




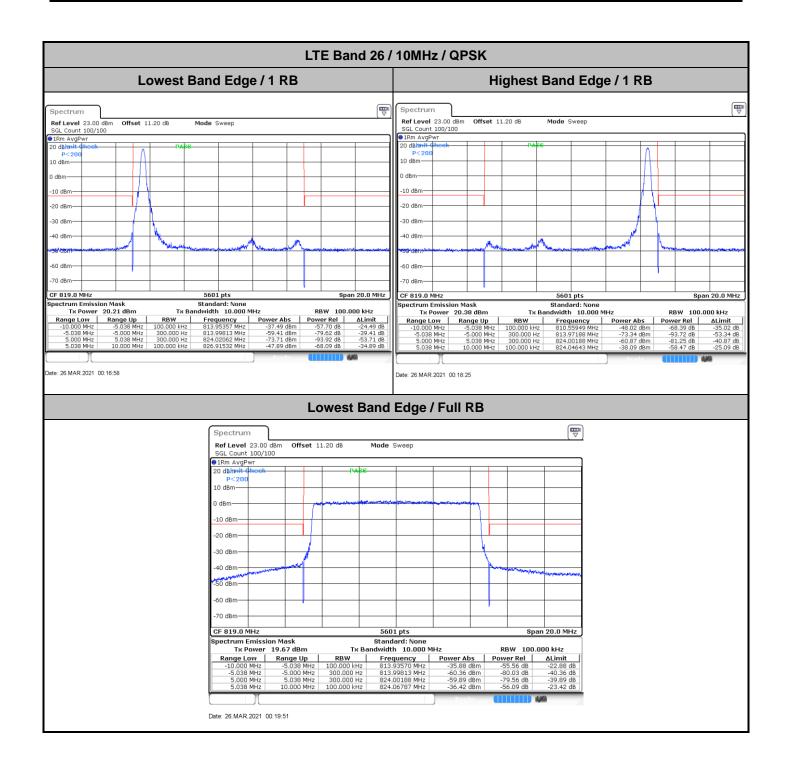




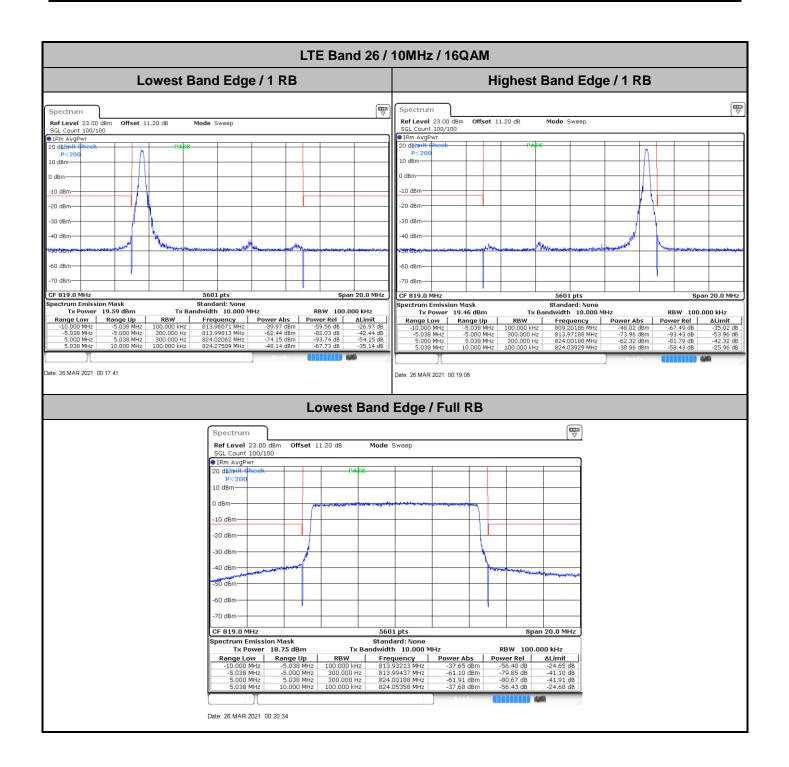


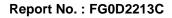




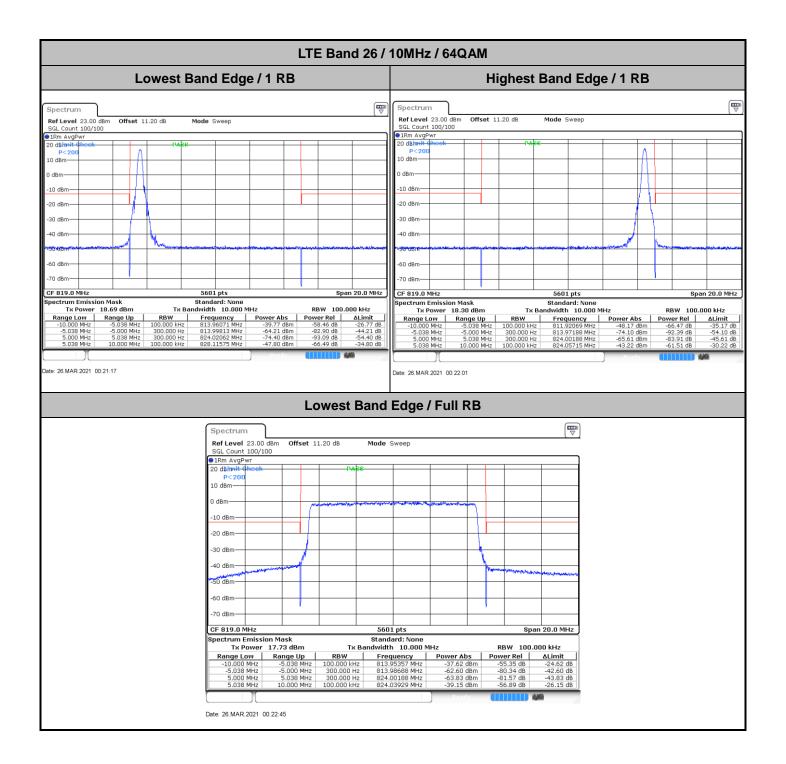




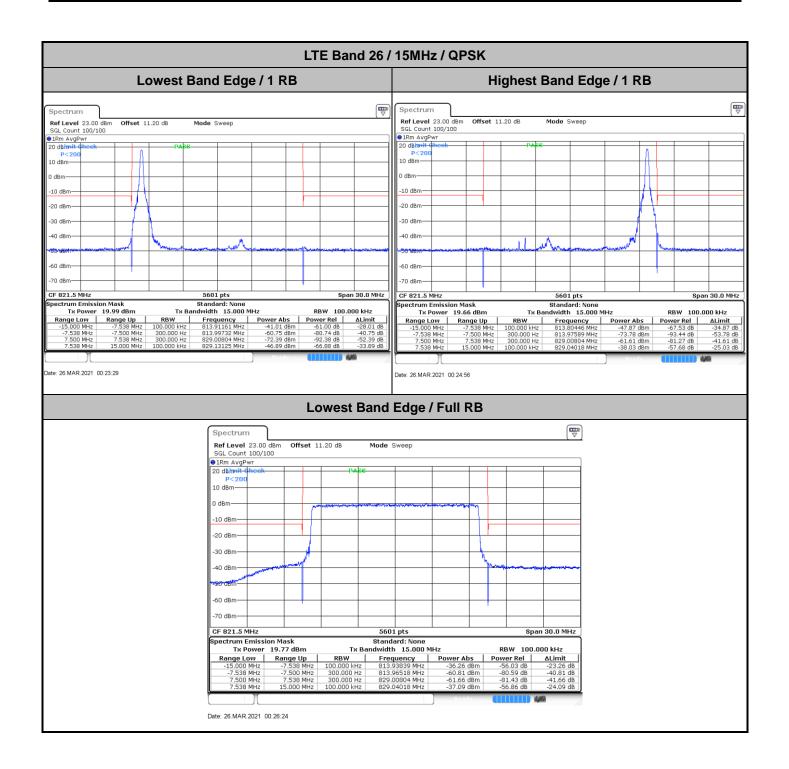




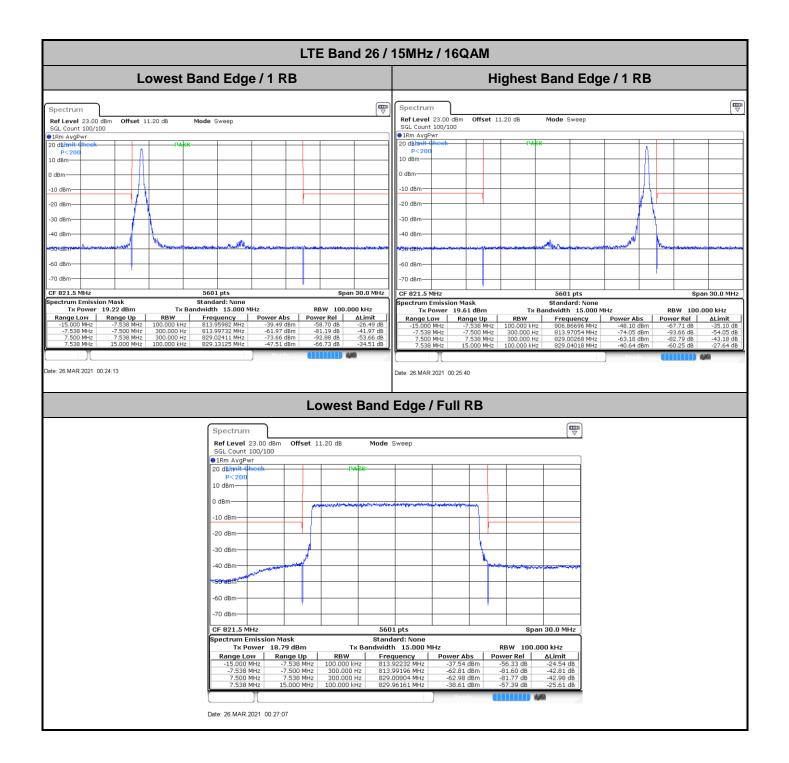


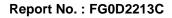




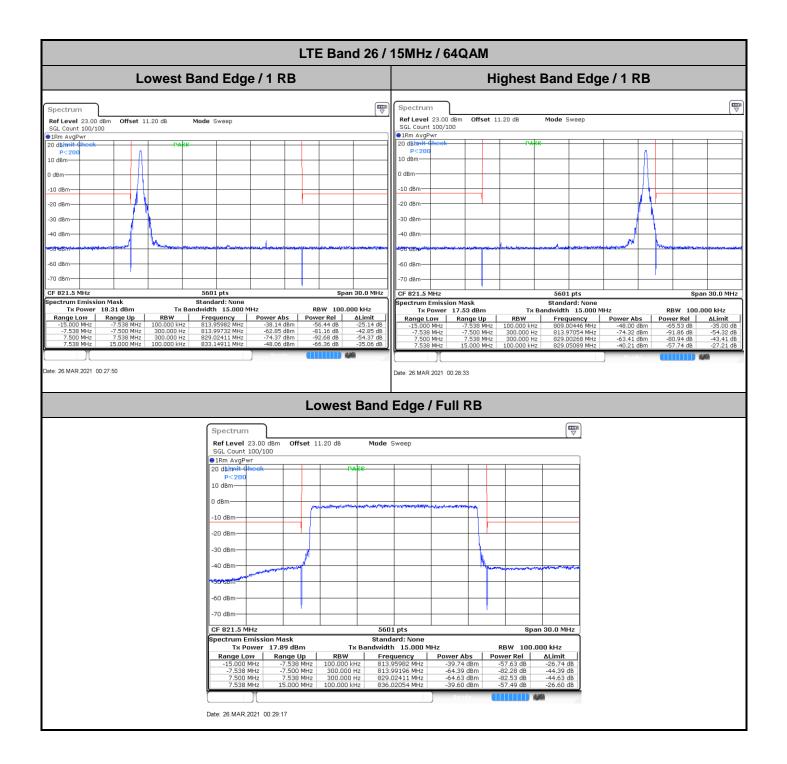














## Emission masks – Out of band emissions

