



# RF TEST REPORT

**Applicant**      Quectel Wireless Solutions Co., Ltd.  
**FCC ID**            XMR2022BG955AGL  
**Product**          LTE Cat M1/NB1/GPRS/GNSS Module  
**Brand**             Quectel  
**Model**             BG955A-GL  
**Report No.**      R2208A0765-R7V1  
**Issue Date**      November 18, 2022

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2021)/ FCC CFR 47 Part 90S (2021)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

*Prepared by: Xu Ying*

*Approved by: Xu Kai*

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**TA Technology (Shanghai) Co., Ltd.**

*Building 3, No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China*

*TEL: +86-021-50791141/2/3*

*FAX: +86-021-50791141/2/3-8000*



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Version	Revision description	Issue Date
Rev.0	Initial issue of report.	October 21, 2022
Rev.1	Update information.	November 18, 2022

Note: This revised report (Report No. R2208A0765-R7V1) supersedes and replaces the previously issued report (Report No. R2208A0765-R7). Please discard or destroy the previously issued report and dispose of it accordingly.



## Summary of measurement results

No.	Test Case	Clause in FCC rules	Verdict
1	RF Power Output and Effective Radiated Power	2.1046/90.635(b)	PASS
2	Occupied Bandwidth	2.1049/ 90.209	PASS
3	Emission Masks	2.1051 / 90.691	PASS
4	Peak-to-Average Power Ratio	KDB 971168 D01(5.7)	PASS
5	Frequency Stability	2.1055 / 90.213	PASS
6	Spurious Emissions at Antenna Terminals	2.1051 / 90.691	PASS
7	Radiated Spurious Emission	2.1053 /90.691	PASS

Date of Testing: September 8, 2022 ~ September 29, 2022

Date of Sample Received: September 6, 2022

Note: PASS: The EUT complies with the essential requirements in the standard.

FAIL: The EUT does not comply with the essential requirements in the standard.

All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.



## 1. Test Laboratory

### 1.1. Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

### 1.2. Test facility

#### **FCC (Designation number: CN1179, Test Firm Registration Number: 446626)**

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

#### **A2LA (Certificate Number: 3857.01)**

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

### 1.3. Testing Location

Company: TA Technology (Shanghai) Co., Ltd.  
Address: Building 3, No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China  
City: Shanghai  
Post code: 201201  
Country: P. R. China  
Contact: Xu Kai  
Telephone: +86-021-50791141/2/3  
Fax: +86-021-50791141/2/3-8000  
Website: <http://www.ta-shanghai.com>  
E-mail: [xukai@ta-shanghai.com](mailto:xukai@ta-shanghai.com)

## 2. General Description of Equipment under Test

### 2.3. Applicant and Manufacturer Information

Applicant	Quectel Wireless Solutions Co., Ltd.
Applicant address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China, 200233
Manufacturer	Quectel Wireless Solutions Co., Ltd.
Manufacturer address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China, 200233

### 2.4. General Information

EUT Description			
Model	BG955A-GL		
IMEI	868348060003740		
Hardware Version	R1.2		
Software Version	BG955AGLAAR02A01		
Power Supply	External power supply		
Antenna Type	External Antenna		
Antenna Gain	Mode	Frequency (MHz)	Gain (dBi)
	LTE eMTC Band 26	810	3.19
		820	2.53
		830	2.13
Test Mode(s)	LTE eMTC Band 26;		
Test Modulation	QPSK, 16QAM;		
LTE Category	M1		
Maximum E.R.P.	LTE eMTC Band 26:	24.14 dBm	
Rated Power Supply Voltage	DC 3.8V		
Operating Voltage	Minimum: 3.3 V    Maximum: 4.3 V		
Operating Temperature	Lowest: -35°C    Highest: +75°C		
Testing Temperature	Lowest: -30°C    Highest: +50°C		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	LTE eMTC Band 26	814 ~ 824	859 ~ 869
Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.			



### 3. Applied Standards

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

**Test standards:**

**FCC CFR 47 Part 90S (2021)**

**FCC CFR47 Part 2 (2021)**

**Reference standard:**

**ANSI C63.26-2015**

**KDB 971168 D01 Power Meas License Digital Systems v03r01**

## 4. Test Configuration

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes. EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (X axis, horizontal polarization) and the worst case was recorded.

All mode and data rates and positions were investigated.

The following testing in LTE eMTC is set based on the maximum RF Output Power.

Test modes are chosen as the worst case configuration below for LTE eMTC Band 26

Test items	Bandwidth (MHz)				Modulation		RB			Test Channel		
	1.4	3	5	10	QPSK	16QAM	1	50%	100%	L	M	H
RF Power Output and Effective Radiated Power	O	O	O	O	O	O	O	O	O	O	O	O
Occupied Bandwidth	O	O	O	O	O	O	-	-	O	O	O	O
Emission Mask	O	O	O	O	O	O	O	-	O	O	-	O
Peak-to-Average Power Ratio	O	O	O	O	O	O	-	-	O	O	O	O
Frequency Stability	O	O	O	O	O	O	O	-	-	-	O	-
Spurious Emissions at Antenna Terminals	O	O	O	O	O	-	O	-	-	O	O	O
Radiated Spurious Emission	O	-	O	-	O	-	O	-	-	-	O	-
Note	1. The mark "O" means that this configuration is chosen for testing. 2. The mark "-" means that this configuration is not testing.											



## 5. Test Case

### 5.1. RF Power Output and Effective Radiated Power

#### Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

#### Methods of Measurement

During the process of the testing, The EUT was connected to the Base Station Simulator with a known loss. The EUT is controlled by the Base Station Simulator test set to ensure max power transmission with proper modulation.

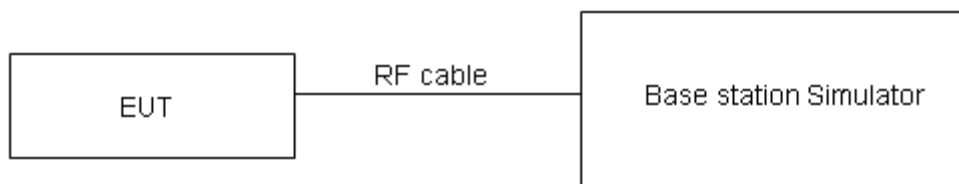
ERP can then be calculated as follows:

$$\text{EIRP (dBm)} = \text{Output Power (dBm)} + \text{Antenna Gain (dBi)}$$

where:dBd refers to gain relative to an ideal dipole.

$$\text{EIRP (dBm)} = \text{ERP (dBm)} + 2.15 \text{ (dB.)}$$

#### Test Setup



#### Limits

Part 90.635 (b) the maximum output power of the transmitter for mobile stations is 100 watts.

Rule Part 90.635(b) specifies that “The maximum output power of the transmitter for mobile stations is 100 watts”.

Limit	≤ 100 W (50 dBm)

#### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 0.4 dB for RF power output, k = 2, U= 1.19 dB for ERP.

#### Test Results

Refer to the section 6.1 of this report for test data.

## 5.2. Occupied Bandwidth

### Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

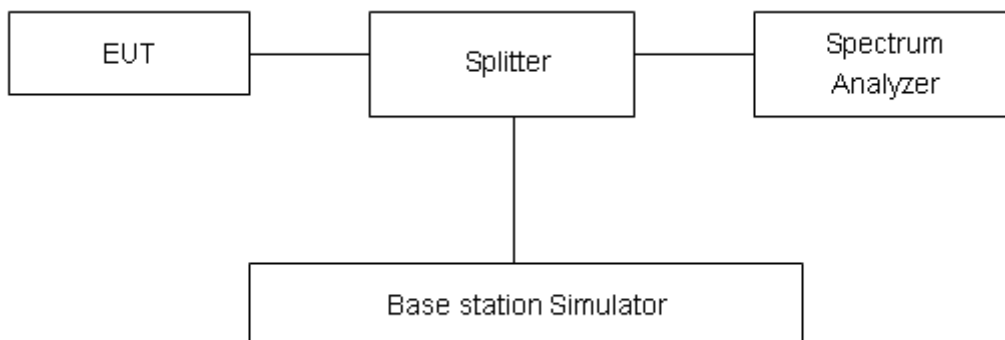
### Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The occupied bandwidth is measured using spectrum analyzer.

RBW is set to  $\geq 1\%$ EBW, VBW is set to 3x RBW.

99% power and -26dBc occupied bandwidths are recorded. Spectrum analyzer plots are included on the following pages.

### Test Setup



### Limits

No specific occupied bandwidth requirements in part 2.1049.

Part 90.209 (a) Each authorization issued to a station licensed under this part will show an emission designator representing the class of emission authorized. The designator will be prefixed by a specified necessary bandwidth. This number does not necessarily indicate the bandwidth occupied by the emission at any instant. In those cases where part 2.202 of this chapter does not provide a formula for the computation of necessary bandwidth, the occupied bandwidth, as defined in part 2 of this chapter, may be used in lieu of the necessary bandwidth.

### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 624\text{Hz}$ .

### Test Results

Refer to the section 6.2 of this report for test data.

### 5.3. Emission Mask

#### Ambient condition

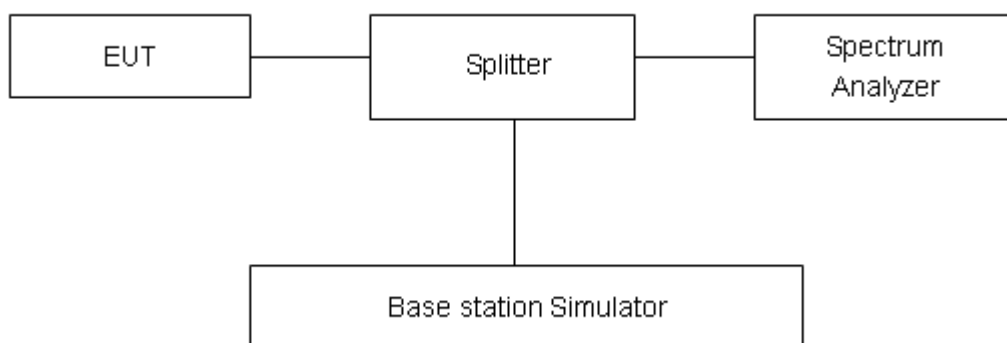
Temperature	Relative humidity
21°C ~25°C	40%~60%

#### Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The band edge of the lowest and highest channels were measured. The average detector is used. For Section 90.691(a) compliance testing, use RBW = 300 Hz for offsets less than 37.5 kHz from a channel edge; RBW = 100 kHz for offsets greater than 37.5 kHz is allowed.

Spectrum analyzer plots are included on the following pages.

#### Test Setup



#### Limits

Rule Part 90.691(a) specifies that “ 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  $116 \text{ Log}_{10}(f/6.1)$  decibels or  $50 + 10 \text{ Log}_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.”

#### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ ,  $U=0.684\text{dB}$ .

#### Test Results

Refer to the section 6.3 of this report for test data.

### 5.4. Peak-to-Average Power Ratio (PAPR)

#### Ambient condition

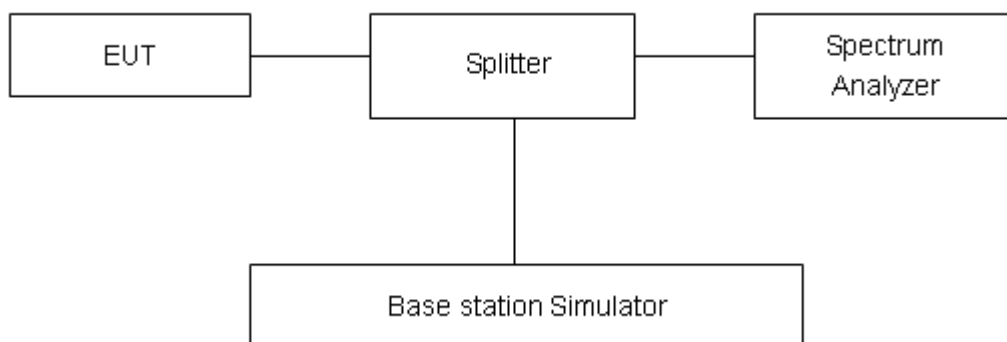
Temperature	Relative humidity
21°C ~25°C	40%~60%

#### Methods of Measurement

Measure the total peak power and record as P<sub>Pk</sub>. And measure the total average power and record as P<sub>Avg</sub>. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

$$PAPR (dB) = P_{Pk} (dBm) - P_{Avg} (dBm).$$

#### Test Setup



#### Limits

In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB in 24.232(d).

#### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 0.4$  dB.

#### Test Results

Refer to the section 6.4 of this report for test data.

### 5.5. Frequency Stability

#### Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

#### Method of Measurement

1. Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -30°C to +50°C in 10°C step size,

(1) With all power removed, the temperature was decreased to 0°C and permitted to stabilize for three hours.

(2) Measure the carrier frequency with the test equipment in a “call mode”. These measurements should be made within 1 minute of powering up the mobile station, to prevent significant self warming.

(3) Repeat the above measurements at 10°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

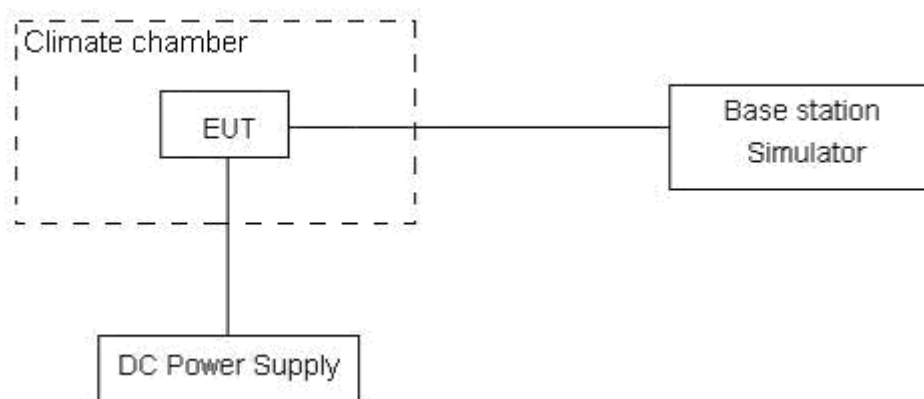
2. Frequency Stability (Voltage Variation)

The frequency stability shall be measured with variation of primary supply voltage as follows:

**Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

This transceiver is specified to operate with an input voltage of between 3.3 V and 4.3 V, with a nominal voltage of 3.8V.

#### Test setup



## Limits

According to the Sec. 90.213.(a) Unless noted elsewhere, transmitters used in the services governed by this part must have a minimum frequency stability as specified in the following table.

Minimum Frequency Stability

[Parts per million (ppm)]

Frequency range (MHz)	Fixed and base stations	Mobile stations	
		Over 2 watts output power	2 watts or less output power
814 ~ 824	1.5	2.5	2.5

## Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor  $k = 3$ ,  $U = 0.01$  ppm.

## Test Results

Refer to the section 6.5 of this report for test data.

## 5.6. Spurious Emissions at Antenna Terminals

### Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

### Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 30MHz to the 10th harmonic of the carrier. The peak detector is used.

RBW is set to 1 kHz (0.009MHz~ 0.15 MHz),

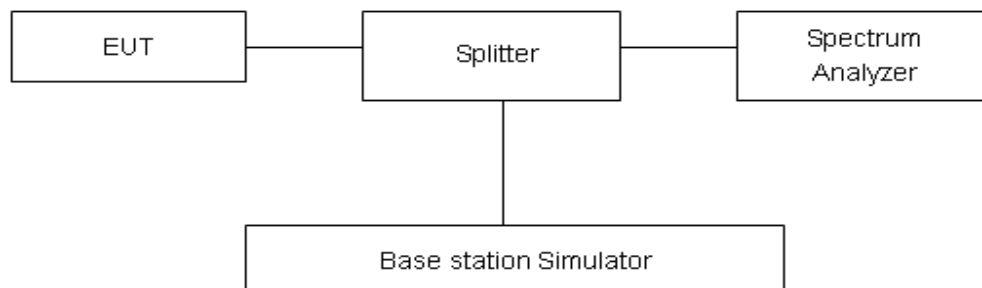
RBW is set to 10 kHz (0.15 MHz~ 30 MHz)

RBW is set to 100 kHz (30MHz~1000 MHz)

RBW is set to 1000 kHz (above 1000MHz)

Sweep is set to ATUO.

### Test setup



### Limits

Rule Part 90.691 specifies that “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.”

Limit	-13 dBm
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### Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ .

Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-20GHz	1.407 dB

### Test Results

Refer to the section 6.6 of this report for test data.

## 5.7. Radiated Spurious Emission

### Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

### Method of Measurement

1. The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26-2015.
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H). Above 1GHz: (Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
3. A loop antenna, A log-periodic antenna or horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
4. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=100kHz, VBW=300kHz, and the maximum value of the receiver should be recorded as (Pr).
5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
7. The measurement results are obtained as described below:  
$$\text{Power(EIRP)} = \text{PMea} - \text{PAg} - \text{Pcl} + \text{Ga}$$
  
The measurement results are amend as described below:  
$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP

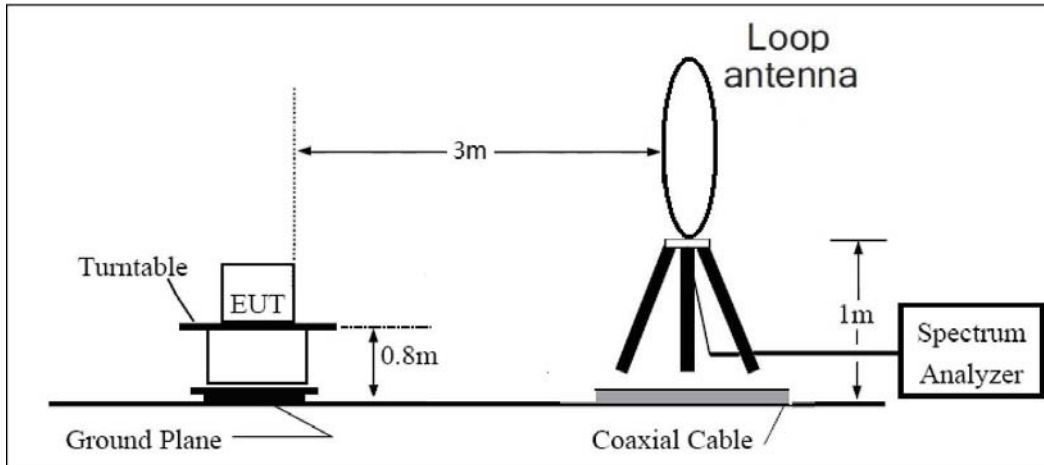


= EIRP-2.15dBi.

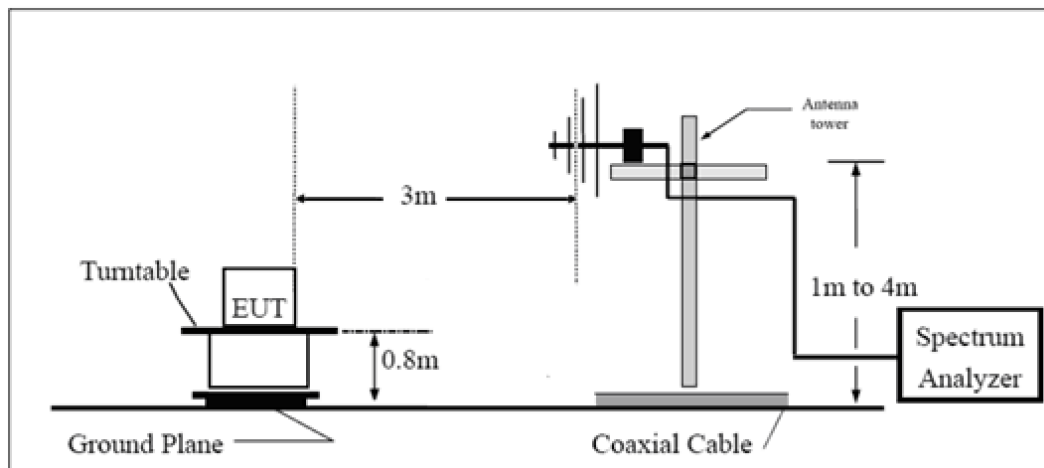
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

**Test setup**

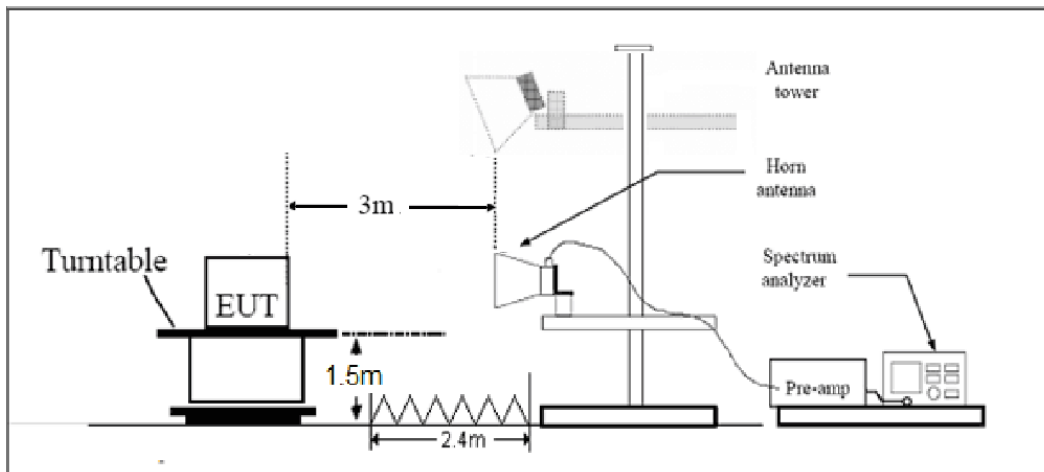
**9KHz~ 30MHz**



**30MHz~ 1GHz**



**Above 1GHz**



Note: Area side:2.4mX3.6m



### Limits

Rule Part 90.691 specifies that “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.”

Limit	-13 dBm
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### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ ,  $U = 3.55$  dB.

### Test Results

Refer to the section 6.7 of this report for test data.

## 6. Test Results

### 6.1. RF Power Output and Effective Radiated Power

LTE eMTC Band 26	Channel/ Frequency(MHz)	Index	RB#	RB#	Maximum Output Power (dBm)		ERP (dBm)	
			RBstart	RBstart	QPSK	16QAM	QPSK	16QAM
1.4MHz	26697/814.7	0	1#0	1#0	23.10	20.98	24.14	22.02
		0	6#0	5#0	21.74	21.45	22.78	22.49
	26740/819	0	1#0	1#0	23.07	21.57	23.45	21.95
		0	6#0	5#0	21.79	21.42	22.17	21.80
	26783/823.3	0	1#5	1#5	23.06	21.76	23.44	22.14
		0	6#0	5#0	21.79	21.45	22.17	21.83
3MHz	26705/815.5	0	1#0	1#0	23.26	21.83	23.64	22.21
		0	6#0	5#0	21.80	21.19	22.18	21.57
	26740/819	0	1#0	1#0	23.26	21.79	23.64	22.17
		0	6#0	5#0	21.77	21.17	22.15	21.55
	26775/822.5	1	1#5	1#5	23.16	21.87	23.54	22.25
		1	6#0	5#0	21.76	21.19	22.14	21.57
5MHz	26715/816.5	3	1#0	1#0	23.19	22.82	23.57	23.20
		0	6#0	5#0	22.58	20.94	22.96	21.32
	26740/819	0	1#0	1#0	23.17	22.81	23.55	23.19
		0	6#0	5#0	22.56	20.91	22.94	21.29
	26765/821.5	0	1#5	1#5	23.44	23.03	23.82	23.41
		3	6#0	5#0	22.60	20.93	22.98	21.31
10MHz	26740/819	0	1#0	1#0	23.16	22.70	23.54	23.08
		0	4#0	4#0	23.14	21.66	23.52	22.04

## 6.2. Occupied Bandwidth

Mode	Bandwidth	Modulation	Channel/ Frequency(MHz)	RB	Index	Bandwidth(MHz)	
						99% Power	-26dBc
LTE eMTC Band 26	1.4MHz	QPSK	26740/819	6#0	0	1.11800	1.328
		16QAM	26740/819	5#0	0	0.96286	1.298
	3MHz	QPSK	26740/819	6#0	0	1.10610	1.341
		16QAM	26740/819	5#0	0	0.96273	1.283
	5MHz	QPSK	26740/819	6#0	0	1.10680	1.334
		16QAM	26740/819	5#0	0	0.97168	1.317
	10MHz	QPSK	26740/819	6#0	0	1.10290	1.334
		16QAM	26740/819	5#0	0	0.99690	1.296



### LTE eMTC Band 26 QPSK 1.4MHz CH Middle



### LTE eMTC Band 26 QPSK 3MHz CH Middle

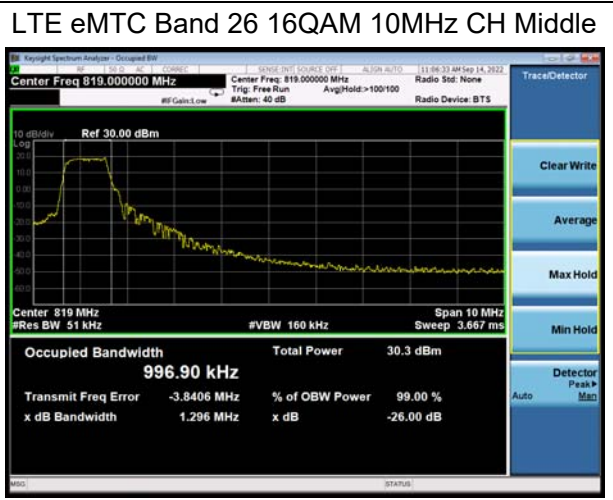
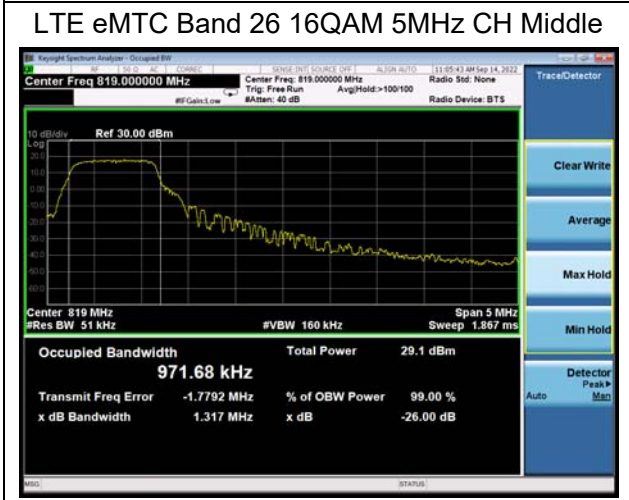
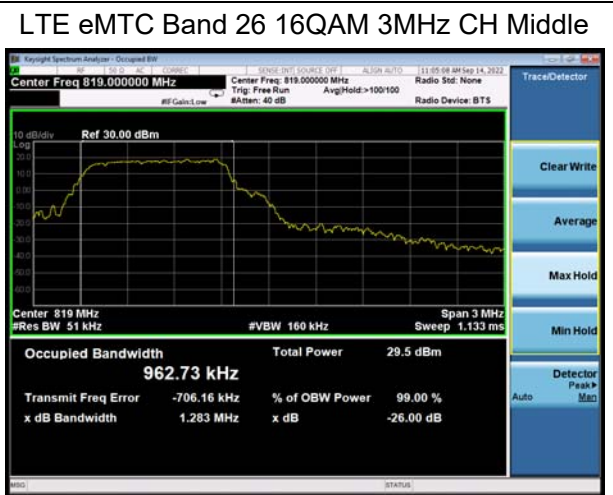
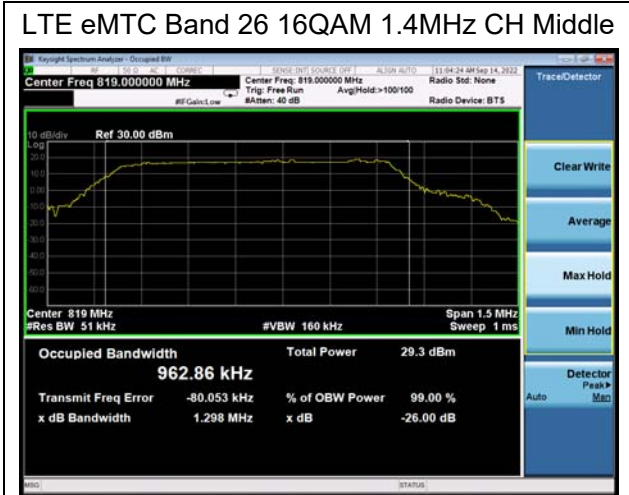


### LTE eMTC Band 26 QPSK 5MHz CH Middle

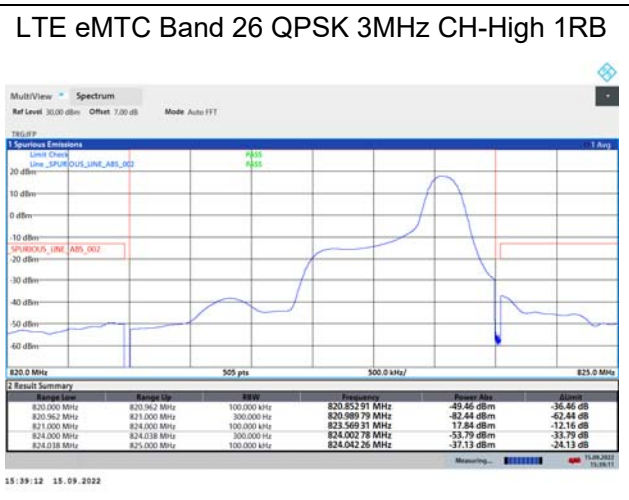
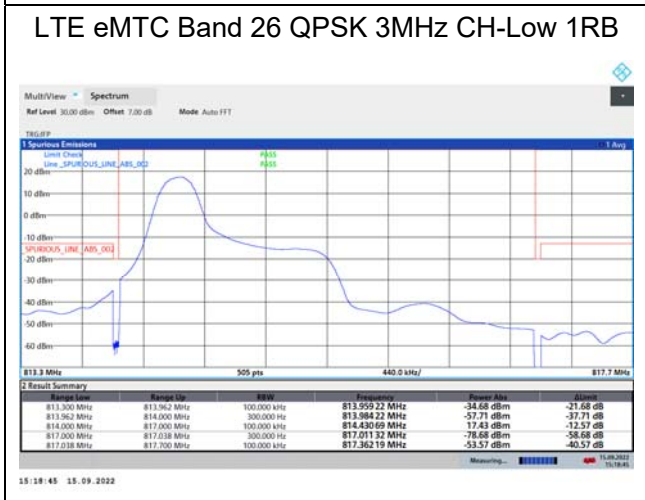
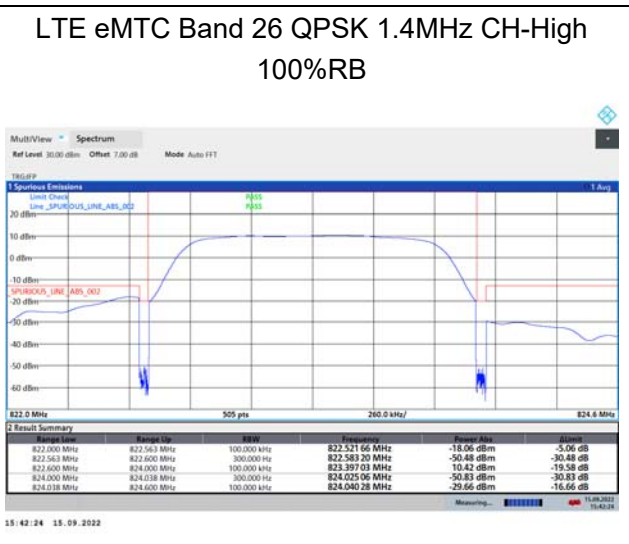
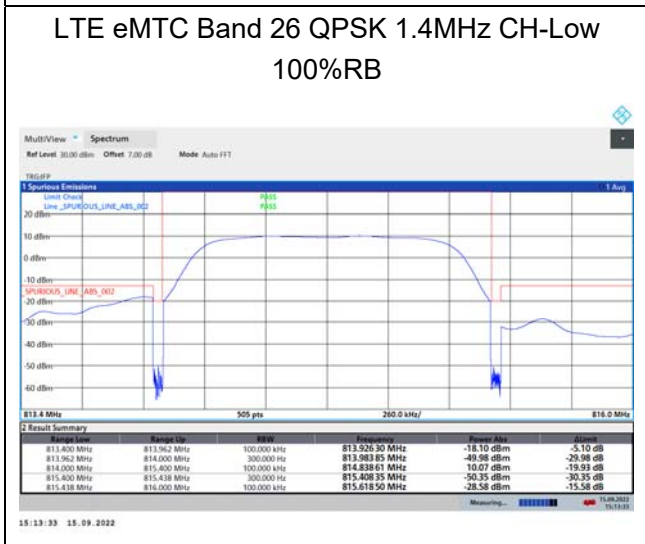
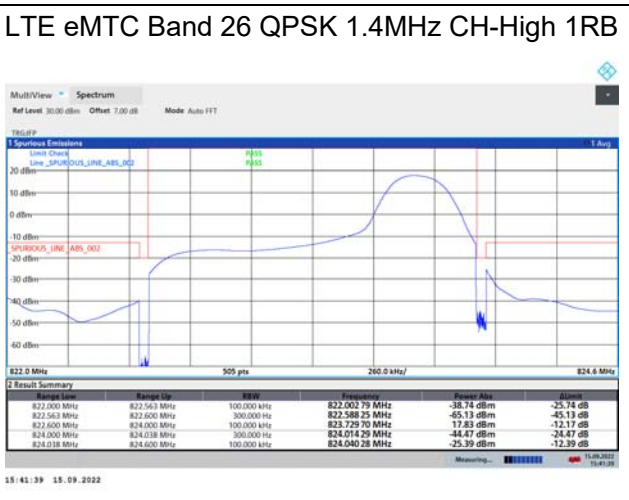
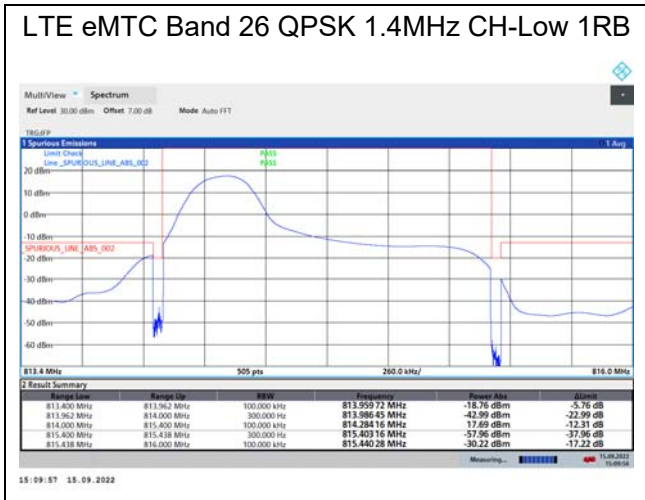


### LTE eMTC Band 26 QPSK 10MHz CH Middle



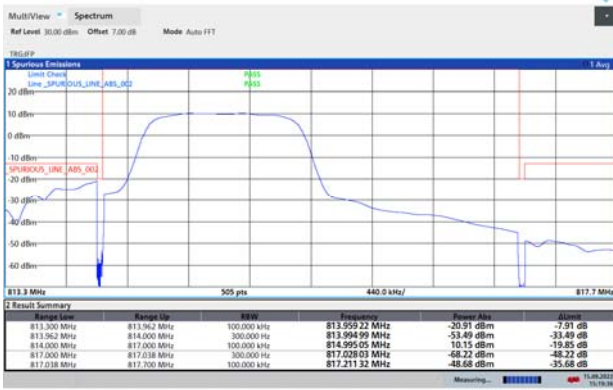


### 6.3. Emission Mask





### LTE eMTC Band 26 QPSK 3MHz CH-Low 100%RB



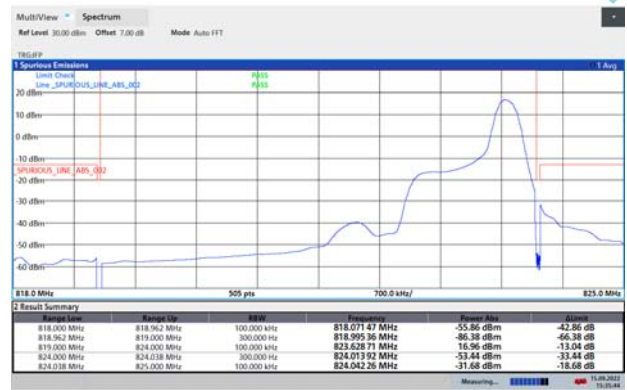
### LTE eMTC Band 26 QPSK 3MHz CH-High 100%RB



### LTE eMTC Band 26 QPSK 5MHz CH-Low 1RB



### LTE eMTC Band 26 QPSK 5MHz CH-High 1RB



### LTE eMTC Band 26 QPSK 5MHz CH-Low 100%RB



### LTE eMTC Band 26 QPSK 5MHz CH-High 100%RB







### LTE eMTC Band 26 QPSK 10MHz CH-Low 1RB



### LTE eMTC Band 26 QPSK 10MHz CH-High 1RB



### LTE eMTC Band 26 QPSK 10MHz CH-Low 100%RB



### LTE eMTC Band 26 QPSK 10MHz CH-High 100%RB





LTE eMTC Band 26 16QAM 1.4MHz CH-Low 1RB



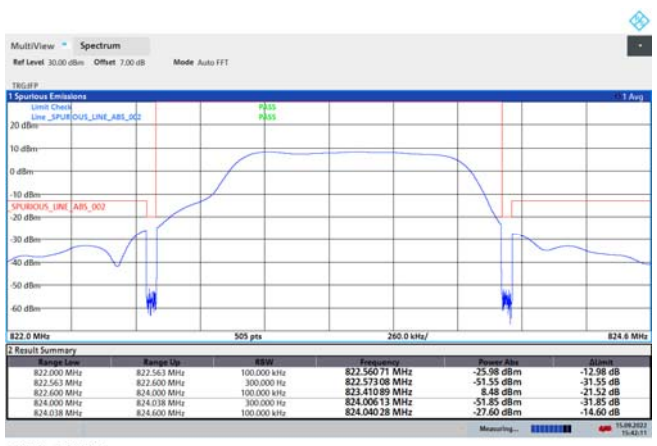
LTE eMTC Band 26 16QAM 1.4MHz CH-High 1RB



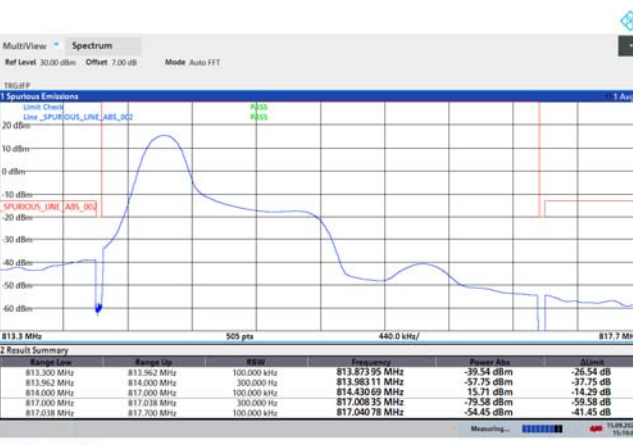
LTE eMTC Band 26 16QAM 1.4MHz CH-Low 100%RB



LTE eMTC Band 26 16QAM 1.4MHz CH-High 100%RB



LTE eMTC Band 26 16QAM 3MHz CH-Low 1RB



LTE eMTC Band 26 16QAM 3MHz CH-High 1RB





### LTE eMTC Band 26 16QAM 3MHz CH-Low 100%RB



### LTE eMTC Band 26 16QAM 3MHz CH-High 100%RB



### LTE eMTC Band 26 16QAM 5MHz CH-Low 1RB



### LTE eMTC Band 26 16QAM 5MHz CH-High 1RB



### LTE eMTC Band 26 16QAM 5MHz CH-Low 100%RB



### LTE eMTC Band 26 16QAM 5MHz CH-High 100%RB





### LTE eMTC Band 26 16QAM 10MHz CH-Low 1RB



15:28:15 15. 09. 2022

### LTE eMTC Band 26 16QAM 10MHz CH-High 1RB



15:31:35 15. 09. 2022

### LTE eMTC Band 26 16QAM 10MHz CH-Low 100%RB



15:28:32 15. 09. 2022

### LTE eMTC Band 26 16QAM 10MHz CH-High 100%RB



15:31:50 15. 09. 2022

#### 6.4. Peak-to-Average Power Ratio (PAPR)

Mode	Bandwidth	Modulation	Channel/ Frequency(MHz)	Peak-to-Average Power Ratio (PAPR)		
				Peak(dBm)	Avg(dBm)	PAPR(dB)
LTE eMTC Band 26	1.4MHz	QPSK	26740/819	27.28	17.47	9.81
		16QAM	26740/819	27.88	16.90	10.98
	3MHz	QPSK	26740/819	27.15	16.06	11.09
		16QAM	26740/819	27.65	15.99	11.66
	5MHz	QPSK	26740/819	27.89	17.87	10.02
		16QAM	26740/819	27.64	16.40	11.24
	10MHz	QPSK	26740/819	27.96	17.87	10.09
		16QAM	26740/819	28.32	18.18	10.14



## 6.5. Frequency Stability

LTE eMTC Band 26	Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability(ppm)	Frequency Stability(ppm)	Verdict	
	BANDWIDTH	1.4MHz						
	Temperature	Voltage	16QAM	QPSK	16QAM	QPSK		
	Normal (25°C)	Normal	1.12	11.23	0.00060	0.00598	PASS	
	Extreme (50°C)		7.67	12.36	0.00408	0.00657	PASS	
	Extreme (40°C)		9.42	1.15	0.00501	0.00061	PASS	
	Extreme (30°C)		10.57	17.15	0.00562	0.00912	PASS	
	Extreme (20°C)		9.26	14.42	0.00493	0.00767	PASS	
	Extreme (10°C)		7.90	8.20	0.00420	0.00436	PASS	
	Extreme (0°C)		12.62	17.77	0.00672	0.00945	PASS	
	Extreme (-10°C)		12.85	10.39	0.00683	0.00553	PASS	
	Extreme (-20°C)		4.51	11.72	0.00240	0.00623	PASS	
	Extreme (-30°C)		15.49	6.56	0.00824	0.00349	PASS	
	25°C		LV	10.85	3.13	0.00577	0.00167	PASS
			HV	13.72	12.39	0.00730	0.00659	PASS
	Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability(ppm)	Frequency Stability(ppm)	Verdict	
	BANDWIDTH	3MHz						
	Temperature	Voltage	16QAM	QPSK	16QAM	QPSK		
	Normal (25°C)	Normal	11.31	13.06	0.00602	0.00694	PASS	
	Extreme (50°C)		14.81	5.48	0.00788	0.00291	PASS	
	Extreme (40°C)		2.09	4.30	0.00111	0.00229	PASS	
	Extreme (30°C)		2.31	15.86	0.00123	0.00844	PASS	
	Extreme (20°C)		17.00	10.21	0.00904	0.00543	PASS	
	Extreme (10°C)		13.52	12.93	0.00719	0.00688	PASS	
	Extreme (0°C)		8.85	7.64	0.00471	0.00406	PASS	
Extreme (-10°C)	6.96		4.70	0.00370	0.00250	PASS		
Extreme (-20°C)	8.28		17.92	0.00440	0.00953	PASS		
Extreme (-30°C)	8.47		15.77	0.00450	0.00839	PASS		
25°C	LV		7.92	2.82	0.00421	0.00150	PASS	
	HV		11.13	9.53	0.00592	0.00507	PASS	
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability(ppm)	Frequency Stability(ppm)	Verdict		
BANDWIDTH	5MHz							
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK			
Normal (25°C)	Normal	6.32	3.02	0.00336	0.00160	PASS		
Extreme (50°C)		2.41	17.23	0.00128	0.00916	PASS		
Extreme (40°C)		10.20	10.38	0.00542	0.00552	PASS		



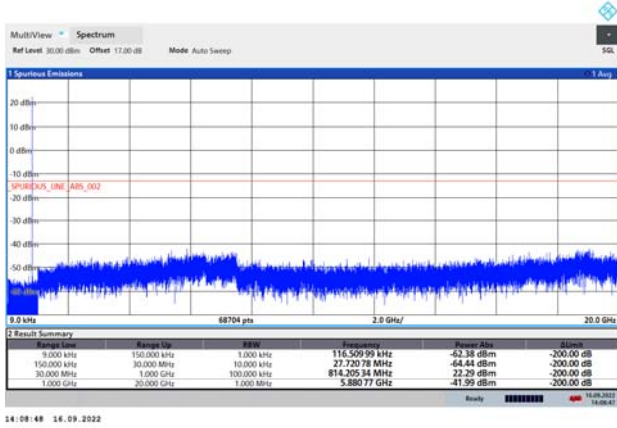
Extreme (30°C)		8.92	14.15	0.00475	0.00752	PASS
Extreme (20°C)		17.95	17.59	0.00955	0.00936	PASS
Extreme (10°C)		16.05	10.74	0.00854	0.00571	PASS
Extreme (0°C)		11.78	9.18	0.00627	0.00488	PASS
Extreme (-10°C)		2.23	5.62	0.00118	0.00299	PASS
Extreme (-20°C)		13.63	13.21	0.00725	0.00703	PASS
Extreme (-30°C)		4.68	13.07	0.00249	0.00695	PASS
25°C	LV	7.92	1.73	0.00421	0.00092	PASS
	HV	16.73	12.27	0.00890	0.00653	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability(ppm)	Frequency Stability(ppm)	Verdict
BANDWIDTH	10MHz					
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK	
Normal (25°C)	Normal	16.10	17.75	0.00856	0.00944	PASS
Extreme (50°C)		5.98	2.25	0.00318	0.00119	PASS
Extreme (40°C)		17.04	2.46	0.00907	0.00131	PASS
Extreme (30°C)		16.75	17.95	0.00891	0.00955	PASS
Extreme (20°C)		10.32	13.00	0.00549	0.00691	PASS
Extreme (10°C)		1.70	10.80	0.00090	0.00574	PASS
Extreme (0°C)		3.31	7.77	0.00176	0.00413	PASS
Extreme (-10°C)		13.44	16.47	0.00715	0.00876	PASS
Extreme (-20°C)		10.25	15.24	0.00545	0.00811	PASS
Extreme (-30°C)		12.45	2.96	0.00662	0.00157	PASS
25°C		LV	11.52	9.04	0.00613	0.00481
	HV	7.80	12.04	0.00415	0.00640	PASS



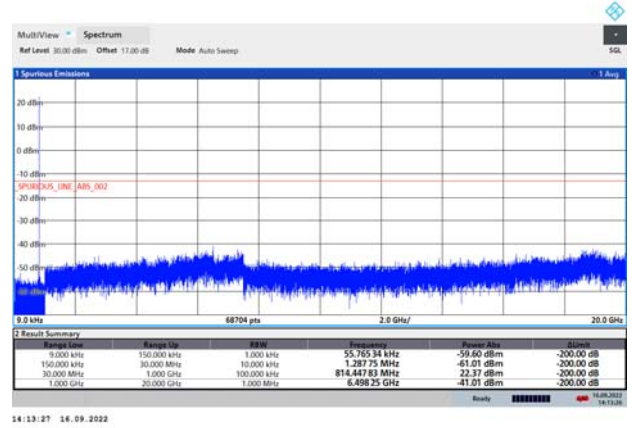
### 6.6. Spurious Emissions at Antenna Terminals

If disturbances were found more than 20dB below limit line, the mark is not required for the EUT. The signal beyond the limit is carrier.

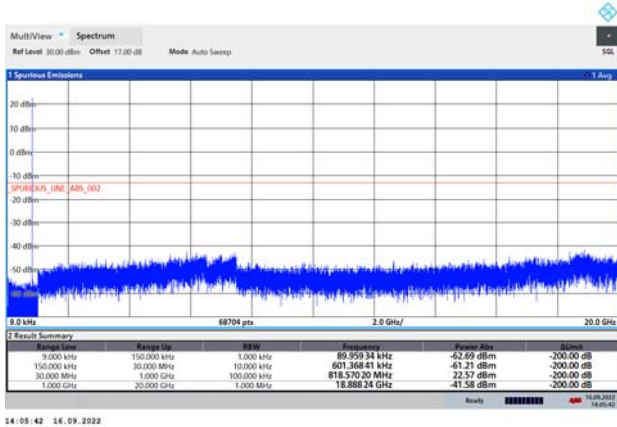
LTE eMTC Band 26 1.4MHz CH Low 9MHz~20GHz



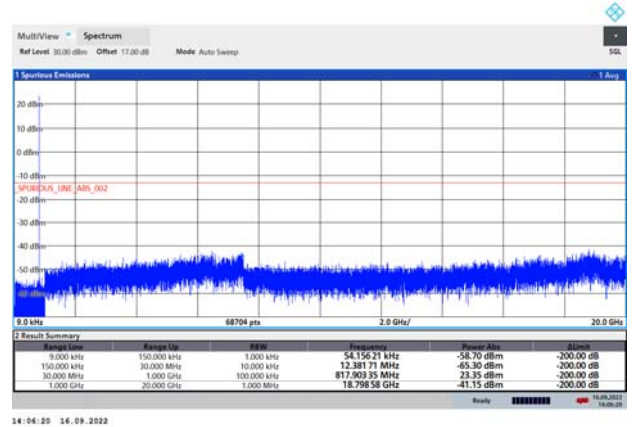
LTE eMTC Band 26 3MHz CH Low 9MHz~20GHz



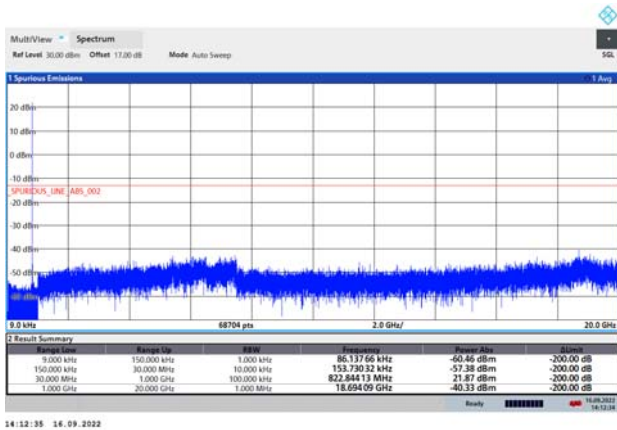
LTE eMTC Band 26 1.4MHz CH Middle 9MHz~20GHz



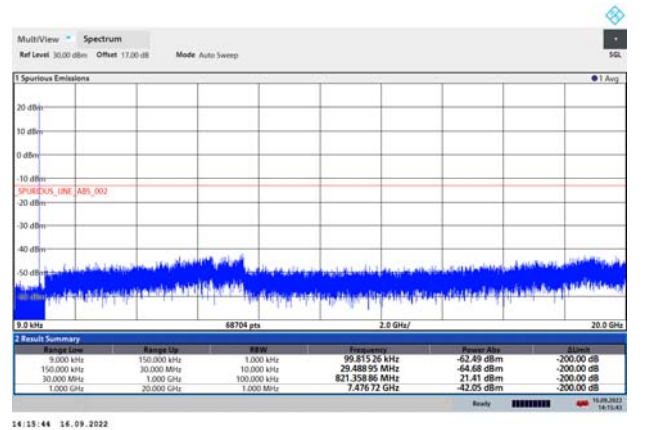
LTE eMTC Band 26 3MHz CH Middle 9MHz~20GHz



LTE eMTC Band 26 1.4MHz CH High 9MHz~20GHz



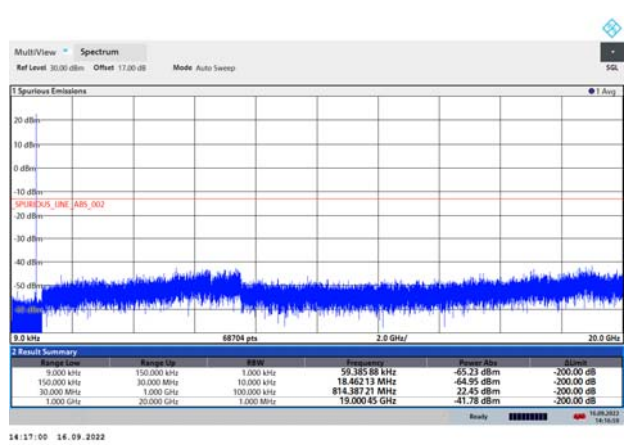
LTE eMTC Band 26 3MHz CH High 9MHz~20GHz



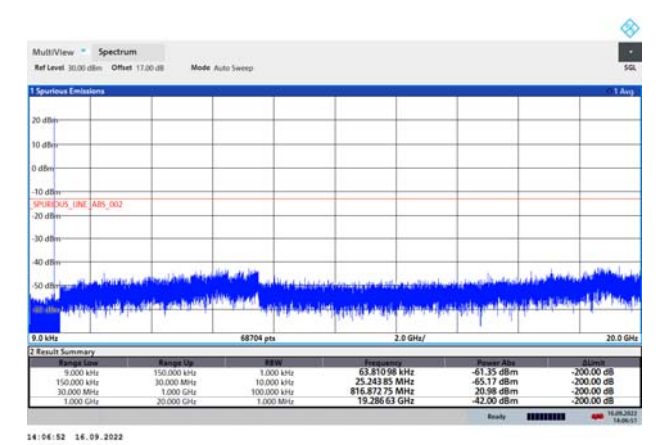




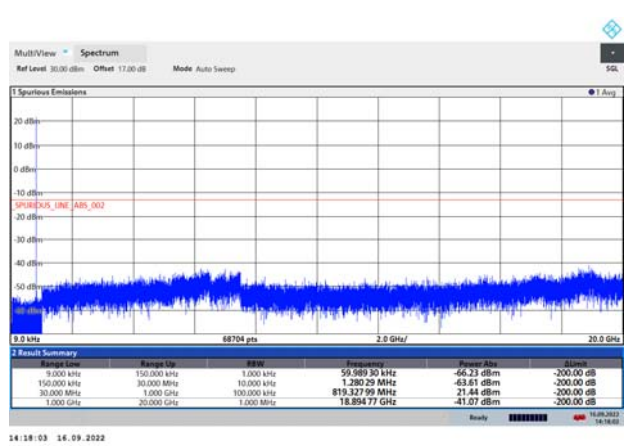
LTE eMTC Band 26 5MHz CH Low 9MHz~20GHz



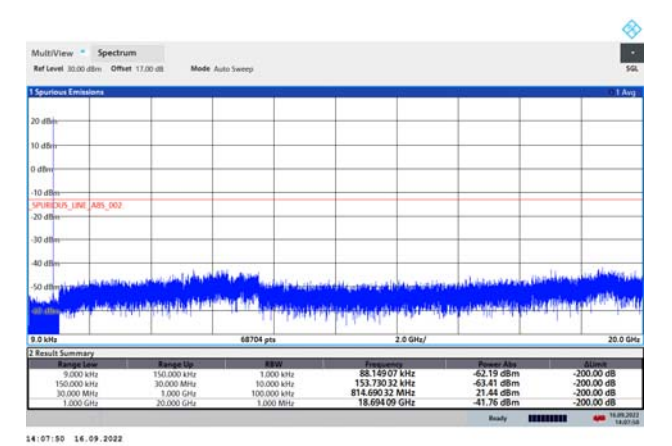
LTE eMTC Band 26 5MHz CH Middle 9MHz~20GHz



LTE eMTC Band 26 5MHz CH High 9MHz~20GHz



LTE eMTC Band 26 10MHz CH Middle 9MHz~20GHz



## 6.7. Radiated Spurious Emission

Sweep the whole frequency band through the range from 30MHz to the 10th harmonic of the carrier, the emissions below the noise floor will not be recorded in the report.

LTE eMTC Band 26 1.4MHz CH Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1636.60	-60.81	1.70	8.70	Horizontal	-55.96	-13.00	42.96	135
3	2454.90	-51.93	2.30	12.00	Horizontal	-44.38	-13.00	31.38	270
4	3273.20	-67.17	2.20	13.10	Horizontal	-58.42	-13.00	45.42	225
5	4091.50	-64.28	3.00	12.50	Horizontal	-56.93	-13.00	43.93	90
6	4909.80	-63.38	3.10	12.50	Horizontal	-56.13	-13.00	43.13	0
7	5728.10	-61.93	3.40	12.50	Horizontal	-54.98	-13.00	41.98	45
8	6546.40	-59.65	3.80	11.50	Horizontal	-54.10	-13.00	41.10	180
9	7364.70	-55.07	4.20	12.20	Horizontal	-49.22	-13.00	36.22	315
10	8183.00	-55.20	4.30	12.30	Horizontal	-49.35	-13.00	36.35	180

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2.The worst emission was found in the antenna is Horizontal position.

LTE eMTC Band 26 5MHz CH Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1633.00	-58.83	1.70	8.70	Horizontal	-53.98	-13.00	40.98	135
3	2449.50	-51.13	2.30	12.00	Horizontal	-43.58	-13.00	30.58	90
4	3266.00	-66.34	2.20	13.10	Horizontal	-57.59	-13.00	44.59	0
5	4082.50	-63.52	3.00	12.50	Horizontal	-56.17	-13.00	43.17	45
6	4899.00	-61.33	3.10	12.50	Horizontal	-54.08	-13.00	41.08	315
7	5715.50	-59.31	3.40	12.50	Horizontal	-52.36	-13.00	39.36	270
8	6532.00	-60.59	3.80	11.50	Horizontal	-55.04	-13.00	42.04	0
9	7348.50	-54.95	4.20	12.20	Horizontal	-49.10	-13.00	36.10	45
10	8165.00	-54.60	4.30	12.30	Horizontal	-48.75	-13.00	35.75	135

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2.The worst emission was found in the antenna is Horizontal position.



## LTE eMTC Band 26 10MHz CH Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1628.00	-61.93	1.70	8.70	Horizontal	-57.08	-13.00	44.08	45
3	2442.00	-51.91	2.30	12.00	Horizontal	-44.36	-13.00	31.36	180
4	3256.00	-67.59	2.20	13.10	Horizontal	-58.84	-13.00	45.84	45
5	4070.00	-64.24	3.00	12.50	Horizontal	-56.89	-13.00	43.89	225
6	4884.00	-62.67	3.10	12.50	Horizontal	-55.42	-13.00	42.42	90
7	5698.00	-62.38	3.40	12.50	Horizontal	-55.43	-13.00	42.43	0
8	6512.00	-60.98	3.80	11.50	Horizontal	-55.43	-13.00	42.43	45
9	7326.00	-55.19	4.20	12.20	Horizontal	-49.34	-13.00	36.34	135
10	8140.00	-55.05	4.30	12.30	Horizontal	-49.20	-13.00	36.20	270

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2.The worst emission was found in the antenna is Horizontal position.



## 7. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Climatic Chamber	ESPEC	SU-242	93000506	2021-12-12	2022-12-11
Comprehensive measuring instrument	R&S	CMW500	150415	2022-05-14	2023-05-13
Spectrum Analyzer	Keysight	N9020A	MY50510203	2021-12-12	2022-12-11
Universal Radio Communication Tester	Agilent	E5515C	GB44400275	2021-12-12	2022-12-11
Universal Radio Communication Tester	StarPoint	SP8315	SP8315-1225	2022-05-14	2023-05-13
Spectrum Analyzer	R&S	FSV3030	101411	2021-12-12	2022-12-11
<b>Radiated Spurious Emissions</b>					
Signal Analyzer	R&S	FSV30	100815	2021-12-12	2022-12-11
Loop antenna	SCHWARZBECK	FMZB1519	1519-047	2020-04-02	2023-04-01
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	01439	2021-06-30	2024-06-29
Horn Antenna	Schwarzbeck	BBHA 9120D	1594	2020-12-17	2023-12-16
Software	R&S	EMC32	10.35.10	/	/

\*\*\*\*\*END OF REPORT \*\*\*\*\*



## **ANNEX A: The EUT Appearance**

The EUT Appearance is submitted separately.



## **ANNEX B: Test Setup Photos**

The Test Setup Photos is submitted separately.