



# 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-R6V1  
**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 CFR47 Part 27C (2021)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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Approved by: Xu Kai

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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-R6V1) supersedes and replaces the previously issued report (Report No. R2208A0765-R6). Please discard or destroy the previously issued report and dispose of it accordingly.



## Summary of Measurement Results

Number	Test Case	Clause in FCC rules	Verdict
1	RF Power Output and Effective Isotropic Radiated Power	2.1046 /27.50(d)(4) /27.50(b)(10) /27.50(c)(10)	PASS
2	Occupied Bandwidth	2.1049	PASS
3	Band Edge Compliance	27.53(h) /27.53(g) /27.53(f) /27.53(c)	PASS
4	Peak-to-Average Power Ratio	27.50(d)/KDB971168 D01(5.7)	PASS
5	Frequency Stability	2.1055 / 27.54	PASS
6	Spurious Emissions at Antenna Terminals	2.1051 /27.53(h) /27.53(g) /27.53(f) /27.53(c)	PASS
7	Radiated Spurious Emission	2.1053 /27.53(h) /27.53(g) /27.53(f) /27.53(c)	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 measurements.

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

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

## 1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.  
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City: Shanghai  
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## 2 General Description of Equipment under Test

### 2.1 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

### 2.2 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 4	1700	1.67
		1720	1.94
		1740	2.00
		1760	1.57
	LTE eMTC Band 12	700	1.66
		710	3.26
		720	3.95
	LTE eMTC Band 13	770	3.98
		780	4.45
		790	3.63
	LTE eMTC Band 66	1700	1.67
		1720	1.94
		1740	2.00
		1760	1.57
			1780
Test Mode(s)	LTE eMTC Band 4/12/13/66;		
Test Modulation	(eMTC) QPSK, 16QAM;		
LTE Category	M1		
Maximum E.I.R.P./ E.R.P.	LTE eMTC Band 4:	25.02 dBm	
	LTE eMTC Band 12:	24.81 dBm	
	LTE eMTC Band 13:	25.53 dBm	
	LTE eMTC Band 66:	24.89 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		
Frequency Range(s)	Mode	Tx (MHz)	Rx (MHz)
	LTE eMTC Band 4	1710 ~ 1755	2110 ~ 2155
	LTE eMTC Band 12	699 ~ 716	729 ~ 746
	LTE eMTC Band 13	777 ~ 787	746 ~ 756
	LTE eMTC Band 66	1710 ~ 1780	2110 ~ 2180
Note: 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 CFR47 Part 27C (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 and RB size and modulations were investigated. Subsequently, only the worst case emissions are reported.

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

The following testing in different Bandwidth is set to detail in the following table:

Test modes are chosen to be reported as the worst case configuration below for LTE eMTC Band 4/12/13/66:

Test items	Modes	Bandwidth (MHz)						Modulation		RB			Test Channel			
		1.4	3	5	10	15	20	QPSK	16QAM	1	50%	100%	L	M	H	
RF Power Output and Effective Isotropic Radiated Power	LTE eMTC Band 4	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	LTE eMTC Band 12	○	○	○	○	-	-	○	○	○	○	○	○	○	○	○
	LTE eMTC Band 13	-	-	○	○	-	-	○	○	○	○	○	○	○	○	○
	LTE eMTC Band 66	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Occupied Bandwidth	LTE eMTC Band 4	○	○	○	○	○	○	○	○	-	-	○	○	○	○	
	LTE eMTC Band 12	○	○	○	○	-	-	○	○	-	-	○	○	○	○	
	LTE eMTC Band 13	-	-	○	○	-	-	○	○	-	-	○	○	○	○	
	LTE eMTC Band 66	○	○	○	○	○	○	○	○	-	-	○	○	○	○	
Band Edge Compliance	LTE eMTC Band 4	○	○	○	○	○	○	○	○	○	-	○	○	-	○	
	LTE eMTC Band 12	○	○	○	○	-	-	○	○	○	-	○	○	-	○	
	LTE eMTC Band 13	-	-	○	○	-	-	○	○	○	-	○	○	-	○	
	LTE eMTC Band 66	○	○	○	○	○	○	○	○	○	-	○	○	-	○	
Peak-to-Aver	LTE eMTC	○	○	○	○	○	○	○	○	-	-	○	○	○	○	



Age Power Ratio	Band 4														
	LTE eMTC Band 12	○	○	○	○	-	-	○	○	-	-	○	○	○	○
	LTE eMTC Band 13	-	-	○	○	-	-	○	○	-	-	○	○	○	○
	LTE eMTC Band 66	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Frequency Stability	LTE eMTC Band 4	○	○	○	○	○	○	○	○	○	-	-	-	○	-
	LTE eMTC Band 12	○	○	○	○	-	-	○	○	○	-	-	-	○	-
	LTE eMTC Band 13	-	-	○	○	-	-	○	○	○	-	-	-	○	-
	LTE eMTC Band 66	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Spurious Emissions at Antenna Terminals	LTE eMTC Band 4	○	○	○	○	○	○	○	-	○	-	-	○	○	○
	LTE eMTC Band 12	○	○	○	○	-	-	○	-	○	-	-	○	○	○
	LTE eMTC Band 13	-	-	○	○	-	-	○	-	○	-	-	○	○	○
	LTE eMTC Band 66	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Radiated Spurious Emission	LTE eMTC Band 4	○	-	○	-	-	○	○	-	○	-	-	-	○	-
	LTE eMTC Band 12	○	-	○	○	-	-	○	-	○	-	-	-	○	-
	LTE eMTC Band 13	-	-	○	○	-	-	○	-	○	-	-	-	○	-
	LTE eMTC Band 66	○	○	○	○	○	○	○	○	○	○	○	○	○	○
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 Isotropic Radiated Power

#### Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### 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.

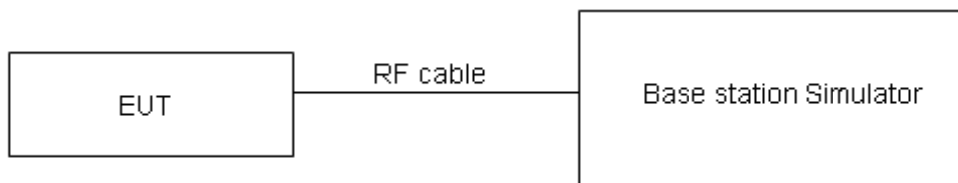
ERP can then be calculated as follows:

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

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

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

#### Test Setup



#### Limits

No specific RF power output requirements in part 2.1046.

Rule Part 27.50(b) (10) specifies that “Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP”

Rule Part 27.50(c) (10) specifies that “Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP”

Rule Part 27.50(d) (4) specifies that “Fixed, mobile and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP”

Part 27.50(b)(10)Limit	≤ 3 W (34.77 dBm)
Part 27.50(c)(10)Limit	≤ 3 W (34.77 dBm)
Part 27.50(d)(4)Limit	≤ 1 W (30 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/EIRP.

### Test Results

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

## 5.2 Occupied Bandwidth

### Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

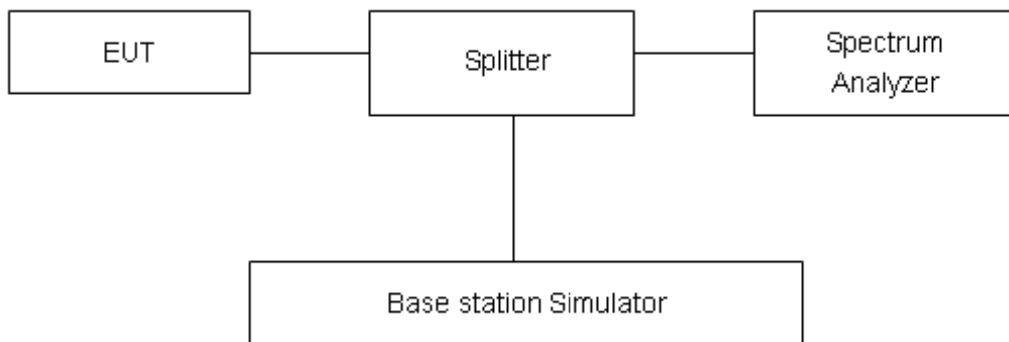
### Method of Measurement

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.

### 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 Band Edge Compliance

#### Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### 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 testing follows KDB 971168 D01 v03r01 Section 6.0

The EUT was connected to spectrum analyzer and system simulator via a power divider.

The band edges of low and high channels for the highest RF powers were measured.

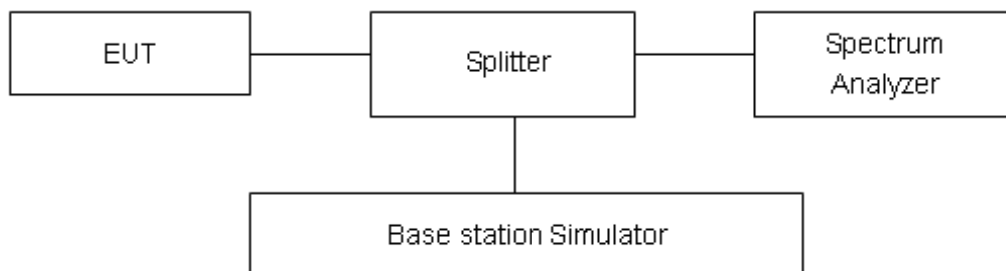
RBW is set to  $\geq 1\%EBW$ , VBW is set to 3x RBW on spectrum analyzer.

Set spectrum analyzer with RMS detector.

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

Checked that all the results comply with the emission limit line.

#### Test Setup



#### Limits

Rule Part 27.53(h) specifies that “ for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10} (P)$  dB”

Rule Part 27.53(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.



Rule Part 27.53(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to  $-70$  dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and  $-80$  dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

Rule Part 27.53 (c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power ( $P$ ) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power ( $P$ ) by at least  $43 + 10 \log (P)$  dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power ( $P$ ) by at least  $43 + 10 \log (P)$  dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $76 + 10 \log (P)$  dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $65 + 10 \log (P)$  dB in a 6.25 kHz band segment, for mobile and portable stations;
- (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

### Measurement Uncertainty

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

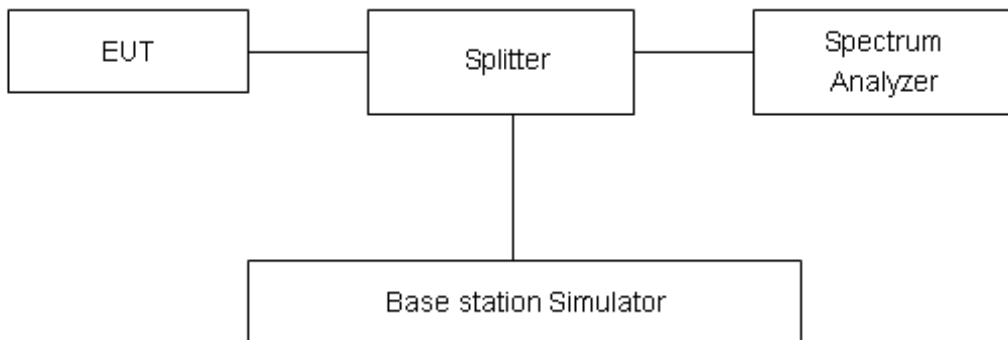
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### Methods of Measurement

Measure the total peak power and record as PPk. And measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

$$PAPR (dB) = PPk (dBm) - PAvg (dBm).$$

#### Test Setup



#### Limits

Rule Part 27.50(d)(5) Equipment employed must be authorized in accordance with the provisions of 24.51. Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. 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.

#### 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	Pressure
23°C ~25°C	45%~50%	101.5kPa

### Method of Measurement

#### 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 -10°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.

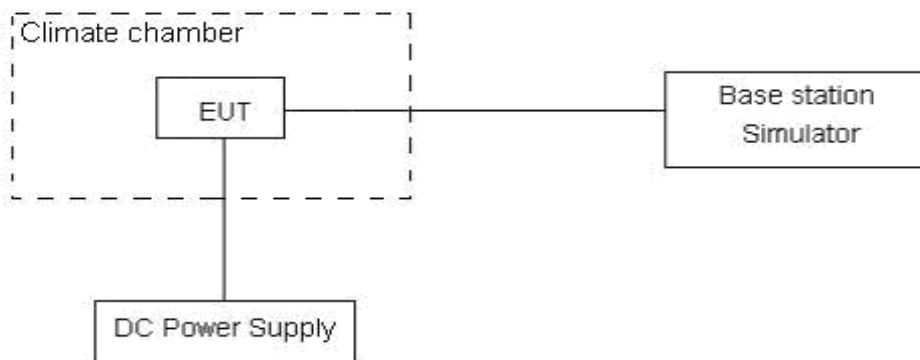
#### Frequency Stability (Voltage Variation)

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

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

### Measurement Uncertainty

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

### 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	Pressure
23°C ~25°C	45%~50%	101.5kPa

### 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 9kHz 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)

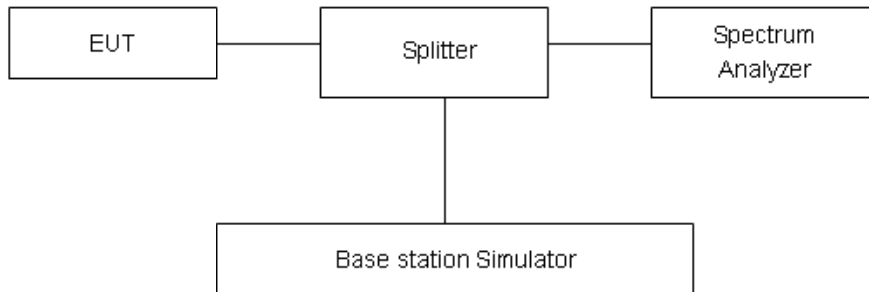
RBW is set to 1000 kHz (above 1000MHz)

Sweep is set to ATUO.

Of those disturbances below (limit – 20 dB), the mark is not required for the EUT.

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

### Test setup



### Limits

Rule Part 27.53(h) specifies that “for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.”

Rule Part 27.53 (g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log(P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

Rule Part 27.53(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands,



emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation. Part 27.53 (c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $76 + 10 \log (P)$  dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $65 + 10 \log (P)$  dB in a 6.25 kHz band segment, for mobile and portable stations;
- (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

Part 27.53(h)/(g) Limit		-13 dBm
Part 27.53(f) Limit	Limit out of the band 1559-1610 MHz	-13 dBm
	Limit in the band 1559-1610 MHz	-40 dBm

**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	Pressure
23°C ~25°C	45%~50%	101.5kPa

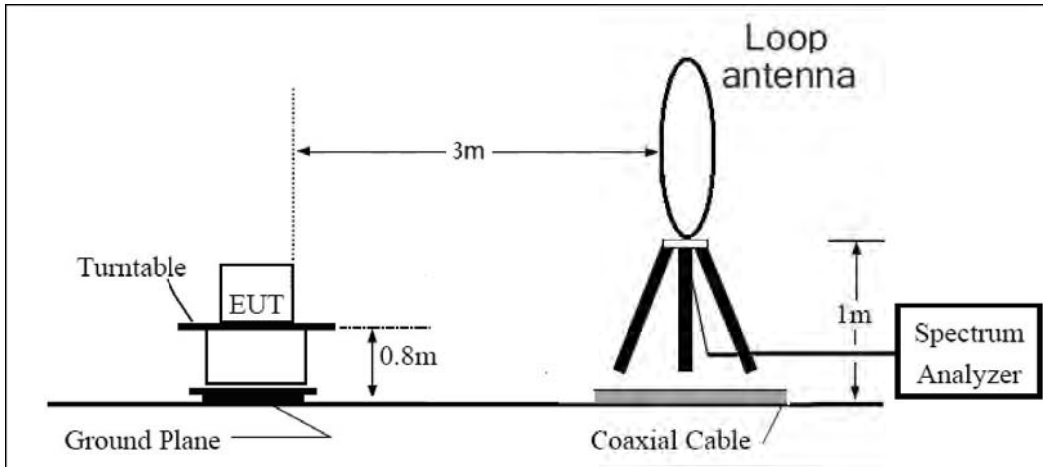
### Method of Measurement

- The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI C63.26-2015.
- 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).
- 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.
- 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 for 30MHz to 1GHz and RBW=1MHz, VBW=3MHz for above 1GHz, and the maximum value of the receiver should be recorded as (Pr).
- 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.
- 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.
- The measurement results are obtained as described below:  
 $Power(EIRP)=PMea- PAg - Pcl + Ga$   
 The measurement results are amend as described below:  
 $Power(EIRP)=PMea- Pcl + Ga$
- This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dB) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $ERP = EIRP-2.15dB$ .

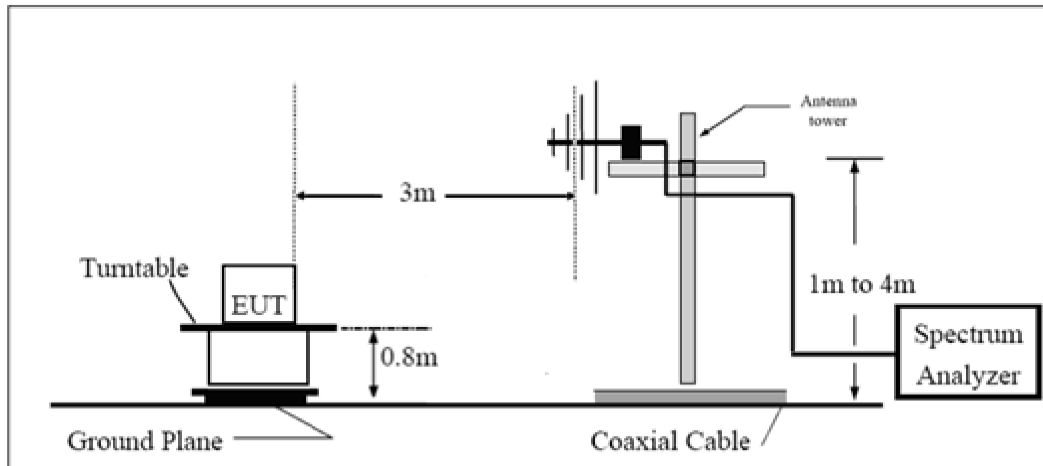
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

**Test setup**

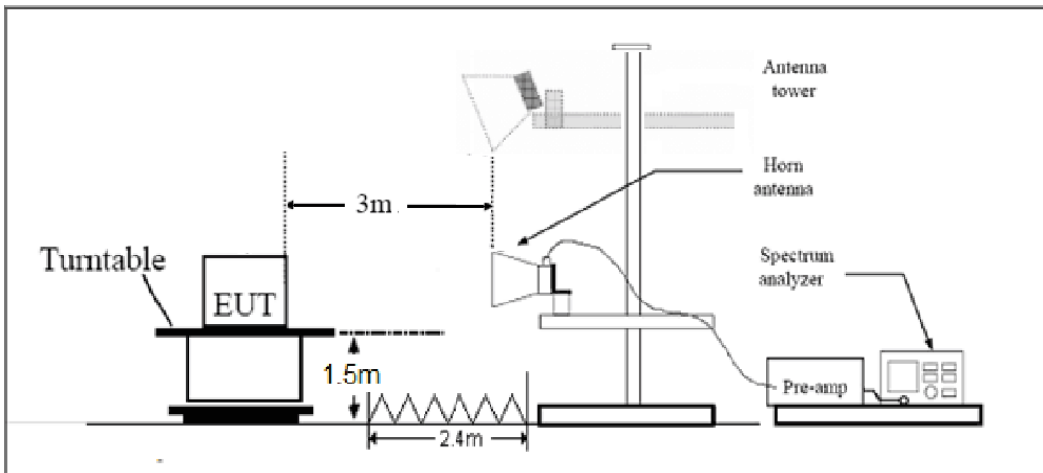
**9KHz~ 30MHz**



**30MHz~ 1GHz**



**Above 1GHz**



Note: Area side:2.4mX3.6m

**Limits**

Rule Part 27.53(h) specifies that “for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.”

Rule Part 27.53 (g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log(P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

Rule Part 27.53(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to  $-70$  dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and  $-80$  dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

Part 27.53 (c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $76 + 10 \log(P)$  dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $65 + 10 \log(P)$  dB in a 6.25 kHz band segment, for mobile and portable stations;
- (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

Part 27.53 (h)/(g) Limit		-13 dBm
Part 27.53(f) Limit	Limit out of the band 1559-1610 MHz	-13 dBm
	Limit in the band 1559-1610 MHz	-40 dBm

**Measurement Uncertainty**

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = \pm 1.96$ ,  $U = \pm 3.55$  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 Isotropic Radiated Power

LTE eMTC Band 4	Channel/ Frequency(MHz)	Index	RB#	RB#	Maximum Output Power (dBm)		EIRP (dBm)	
			RBstart	RBstart	QPSK	16QAM	QPSK	16QAM
			QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
1.4MHz	19957 1710.7	0	1#0	1#0	22.12	20.89	24.06	22.83
		0	6#0	5#0	20.79	20.52	22.73	22.46
	20175/1732.5	0	1#0	1#0	22.23	21.08	24.23	23.08
		0	6#0	5#0	20.92	20.58	22.92	22.58
	20393/1754.3	0	1#5	1#5	22.48	21.24	24.05	22.81
		0	6#0	5#0	20.94	20.61	22.51	22.18
3MHz	19965/1711.5	0	1#0	1#0	22.18	21.06	24.12	23.00
		0	6#0	5#0	20.82	20.24	22.76	22.18
	20175/1732.5	0	1#0	1#0	22.84	22.00	24.84	24.00
		0	6#0	5#0	20.69	20.67	22.69	22.67
	20385/1753.5	1	1#5	1#5	22.58	21.35	24.15	22.92
		1	6#0	5#0	21.02	20.48	22.59	22.05
5MHz	19975/1712.5	3	1#0	1#0	23.06	23.04	25.00	24.98
		0	6#0	5#0	21.50	20.30	23.44	22.24
	20175/1732.5	0	1#0	1#0	22.42	22.23	24.42	24.23
		0	6#0	5#0	21.79	20.16	23.79	22.16
	20375/1752.5	0	1#5	1#5	22.48	22.28	24.05	23.85
		3	6#0	5#0	21.90	20.19	23.47	21.76
10MHz	20000/1715	3	1#0	1#0	22.26	22.05	24.20	23.99
		0	4#0	4#0	22.21	20.81	24.15	22.75
	20175/1732.5	0	1#0	1#0	23.02	22.94	25.02	24.94
		0	4#0	4#0	22.83	21.26	24.83	23.26
	20350/1750	4	1#5	1#5	22.47	22.33	24.04	23.90
		7	4#2	4#2	22.04	19.98	23.61	21.55
15MHz	20025/1717.5	3	1#0	1#0	22.35	22.13	24.29	24.07
		0	6#0	5#0	22.67	22.03	24.61	23.97
	20175/1732.5	0	1#0	1#0	22.38	22.25	24.38	24.25
		0	6#0	5#0	22.75	22.13	24.75	24.13
	20325/1747.5	8	1#5	1#5	22.53	22.34	24.53	24.34
		11	6#0	5#0	22.87	22.18	24.87	24.18
20MHz	20050/1720	3	1#0	1#0	22.31	22.17	24.25	24.11
		0	6#0	5#0	22.68	21.98	24.62	23.92
	20175/1732.5	0	1#0	1#0	22.35	22.11	24.35	24.11
		0	6#0	5#0	22.74	22.04	24.74	24.04



20300/1745	12	1#5	1#5	22.58	22.37	24.58	24.37
	15	6#0	5#0	22.85	22.19	24.85	24.19

LTE eMTC Band 12	Channel/ Frequency(MHz)	Index	RB#	RB#	Maximum Output Power (dBm)		ERP (dBm)	
			RBstart	RBstart	QPSK	16QAM	QPSK	16QAM
1.4MHz	23017/699.7	0	1#0	1#0	22.60	21.37	22.11	20.88
		0	6#0	5#0	21.25	20.91	20.76	20.42
	23095/707.5	0	1#0	1#0	23.30	23.00	24.41	24.11
		0	6#0	5#0	21.58	21.57	22.69	22.68
	23173/715.3	0	1#5	1#5	23.01	21.36	24.81	23.16
		0	6#0	5#0	21.46	21.12	23.26	22.92
3MHz	23025/700.5	0	1#0	1#0	22.71	21.55	22.22	21.06
		0	6#0	5#0	21.31	20.69	20.82	20.20
	23095/707.5	0	1#0	1#0	22.80	21.65	23.91	22.76
		0	6#0	5#0	21.40	20.80	22.51	21.91
	23165/714.5	1	1#5	1#5	23.02	21.79	24.13	22.90
		1	6#0	5#0	21.51	20.89	22.62	22.00
5MHz	23035/701.5	3	1#0	1#0	23.45	23.53	22.96	23.04
		0	6#0	5#0	21.81	20.78	21.32	20.29
	23095/707.5	0	1#0	1#0	22.90	22.68	24.01	23.79
		0	6#0	5#0	22.25	20.59	23.36	21.70
	23155/713.5	0	1#5	1#5	23.06	22.85	24.17	23.96
		3	6#0	5#0	22.35	20.71	23.46	21.82
10MHz	23060/704	3	1#0	1#0	22.85	22.71	22.36	22.22
		0	4#0	4#0	22.93	21.38	22.44	20.89
	23095/707.5	0	1#0	1#0	22.89	22.75	24.00	23.86
		0	4#0	4#0	22.73	21.46	23.84	22.57
	23130/711	4	1#5	1#5	23.08	22.88	24.19	23.99
		7	4#2	4#2	22.53	20.48	23.64	21.59

LTE eMTC Band 13	Channel/ Frequency(MHz)	Index	RB#	RB#	Maximum Output Power (dBm)		ERP (dBm)	
			RBstart	RBstart	QPSK	16QAM	QPSK	16QAM
5MHz	23205/779.5	3	1#0	1#0	22.91	22.94	25.21	25.24
		0	6#0	5#0	22.03	20.90	24.33	23.20
	23230/782	0	1#0	1#0	23.13	23.19	25.43	25.49
		0	6#0	5#0	22.05	21.10	24.35	23.40
	23255/784.5	0	1#5	1#5	23.03	22.95	25.33	25.25
		3	6#0	5#0	22.22	20.97	24.52	23.27
10MHz	23230/782	0	1#0	1#0	22.92	22.99	25.22	25.29
		0	4#0	4#0	23.23	21.98	25.53	24.28





LTE eMTC Band 66	Channel/ Frequency(MHz)	Index	RB#	RB#	Maximum Output Power (dBm)		EIRP (dBm)	
			RBstart	RBstart	QPSK	16QAM	QPSK	16QAM
			QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
1.4MHz	131979/1710.7	0	1#0	1#0	22.27	20.76	24.21	22.70
		0	6#0	5#0	21.00	20.70	22.94	22.64
	132322/1745	0	1#0	1#0	22.46	20.60	24.46	22.60
		0	6#0	5#0	21.19	20.87	23.19	22.87
	132665/1779.3	0	1#5	1#5	23.77	22.05	24.74	23.02
		0	6#0	5#0	20.91	20.52	21.88	21.49
3MHz	131987/1711.5	0	1#0	1#0	22.48	21.10	24.42	23.04
		0	6#0	5#0	20.98	20.50	22.92	22.44
	132322/1745	0	1#0	1#0	22.62	21.22	24.62	23.22
		0	6#0	5#0	21.09	20.65	23.09	22.65
	132657/1778.5	1	1#5	1#5	22.79	21.46	23.76	22.43
		1	6#0	5#0	21.25	20.80	22.22	21.77
5MHz	131997/1712.5	3	1#0	1#0	22.48	22.05	24.42	23.99
		0	6#0	5#0	20.20	21.81	22.14	23.75
	132322/1745	0	1#0	1#0	22.55	22.19	24.55	24.19
		0	6#0	5#0	21.92	20.32	23.92	22.32
	132647/1777.5	0	1#5	1#5	22.74	22.43	23.71	23.40
		3	6#0	5#0	22.13	20.46	23.10	21.43
10MHz	132022/1715	3	1#0	1#0	22.40	22.04	24.34	23.98
		0	4#0	4#0	22.35	21.07	24.29	23.01
	132322/1745	0	1#0	1#0	22.50	22.03	24.50	24.03
		0	4#0	4#0	22.58	21.12	24.58	23.12
	132622/1775	4	1#5	1#5	22.70	22.53	23.67	23.50
		7	4#2	4#2	22.23	20.28	23.20	21.25
15MHz	132047/1717.5	3	1#0	1#0	22.44	22.04	24.38	23.98
		0	6#0	5#0	22.51	22.15	24.45	24.09
	132322/1745	0	1#0	1#0	22.48	22.01	24.48	24.01
		0	6#0	5#0	22.89	22.22	24.89	24.22
	132597/1772.5	8	1#5	1#5	22.73	22.46	23.70	23.43
		11	6#0	5#0	23.16	22.40	24.13	23.37
20MHz	132072/1720	3	1#0	1#0	22.52	22.70	24.46	24.64
		0	6#0	5#0	22.67	21.98	24.61	23.92
	132322/1745	0	1#0	1#0	22.45	22.03	24.45	24.03
		0	6#0	5#0	22.89	22.23	24.89	24.23
	132572/1770	12	1#5	1#5	22.75	22.53	23.72	23.50
		15	6#0	5#0	23.07	22.41	24.04	23.38

## 6.2 Occupied Bandwidth

Mode	Bandwidth	Modulation	Channel/ Frequency(MHz)	RB	Index	Bandwidth(MHz)	
						99% Power	-26dBc
LTE eMTC Band 4	1.4MHz	QPSK	20175/1732.5	6#0	0	1.10620	1.380
		16QAM	20175/1732.5	5#0	0	0.97134	1.357
	3MHz	QPSK	20175/1732.5	6#0	0	1.11470	1.331
		16QAM	20175/1732.5	5#0	0	0.96916	1.296
	5MHz	QPSK	20175/1732.5	6#0	0	1.10230	1.331
		16QAM	20175/1732.5	5#0	0	0.98167	1.364
	10MHz	QPSK	20175/1732.5	6#0	0	1.10570	1.338
		16QAM	20175/1732.5	5#0	0	0.99909	1.332
	15MHz	QPSK	20175/1732.5	6#0	0	1.11920	1.356
		16QAM	20175/1732.5	5#0	0	0.98957	1.381
	20MHz	QPSK	20175/1732.5	6#0	0	1.12420	1.367
		16QAM	20175/1732.5	5#0	0	0.96879	1.302

Mode	Bandwidth	Modulation	Channel/ Frequency(MHz)	RB	Index	Bandwidth(MHz)	
						99% Power	-26dBc
LTE eMTC Band 12	1.4MHz	QPSK	23095/707.5	6#0	0	1.11320	1.331
		16QAM	23095/707.5	5#0	0	0.95960	1.298
	3MHz	QPSK	23095/707.5	6#0	0	1.09970	1.330
		16QAM	23095/707.5	5#0	0	0.96250	1.309
	5MHz	QPSK	23095/707.5	6#0	0	1.09510	1.336
		16QAM	23095/707.5	5#0	0	0.98105	1.308
	10MHz	QPSK	23095/707.5	6#0	0	1.10790	1.335
		16QAM	23095/707.5	5#0	0	0.99563	1.310

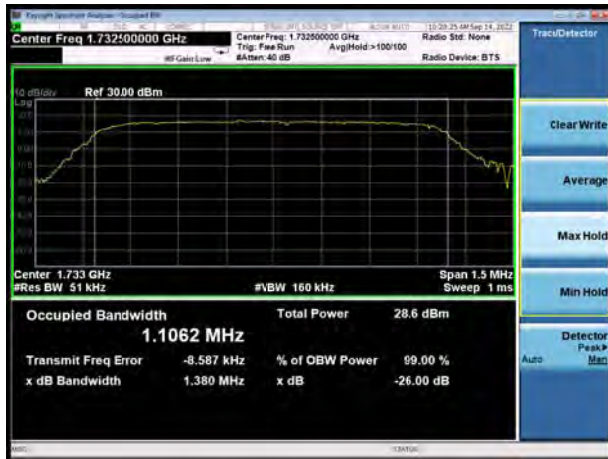
Mode	Bandwidth	Modulation	Channel/ Frequency(MHz)	RB	Index	Bandwidth(MHz)	
						99% Power	-26dBc
LTE eMTC Band13	5MHz	QPSK	23230/782	6#0	0	1.10190	1.338
		16QAM	23230/782	5#0	0	0.98469	1.316
	10MHz	QPSK	23230/782	6#0	0	1.10940	1.328
		16QAM	23230/782	5#0	0	0.98486	1.313



Mode	Bandwidth	Modulation	Channel/ Frequency(MHz)	RB	Index	Bandwidth(MHz)	
						99% Power	-26dBc
LTE eMTC Band 66	1.4MHz	QPSK	132322/1745	6#0	0	1.11280	1.333
		16QAM	132322/1745	5#0	0	0.95833	1.303
	3MHz	QPSK	132322/1745	6#0	0	1.11270	1.345
		16QAM	132322/1745	5#0	0	0.96068	1.291
	5MHz	QPSK	132322/1745	6#0	0	1.10110	1.333
		16QAM	132322/1745	5#0	0	0.97263	1.347
	10MHz	QPSK	132322/1745	6#0	0	1.10220	1.340
		16QAM	132322/1745	5#0	0	1.01450	1.410
	15MHz	QPSK	132322/1745	6#0	0	1.11130	1.357
		16QAM	132322/1745	5#0	0	0.98169	1.321
	20MHz	QPSK	132322/1745	6#0	0	1.11340	1.358
		16QAM	132322/1745	5#0	0	1.01050	1.328



LTE eMTC Band 4 QPSK 1.4MHz CH-Middle



LTE eMTC Band 4 QPSK 3MHz CH-Middle



LTE eMTC Band 4 QPSK 5MHz CH-Middle



LTE eMTC Band 4 QPSK 10MHz CH-Middle



LTE eMTC Band 4 QPSK 15MHz CH-Middle



LTE eMTC Band 4 QPSK 20MHz CH-Middle





LTE eMTC Band 4 16QAM 1.4MHz CH-Middle



LTE eMTC Band 4 16QAM 3MHz CH-Middle



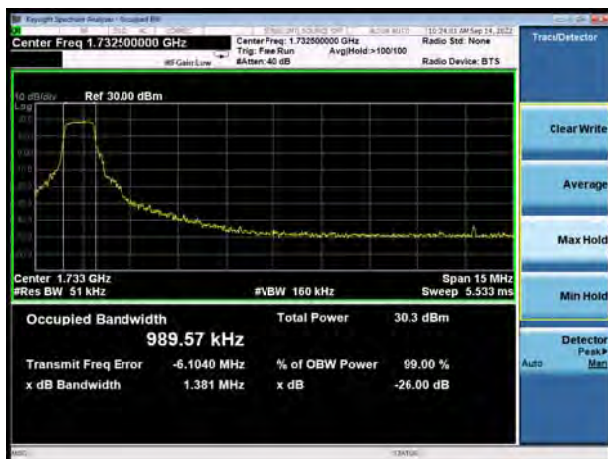
LTE eMTC Band 4 16QAM 5MHz CH-Middle



LTE eMTC Band 4 16QAM 10MHz CH-Middle



LTE eMTC Band 4 16QAM 15MHz CH-Middle



LTE eMTC Band 4 16QAM 20MHz CH-Middle





LTE eMTC Band 12 QPSK 1.4MHz CH-Middle



LTE eMTC Band 12 QPSK 3MHz CH-Middle



LTE eMTC Band 12 QPSK 5MHz CH-Middle



LTE eMTC Band 12 QPSK 10MHz CH-Middle





LTE eMTC Band 12 16QAM 1.4MHz CH-Middle



LTE eMTC Band 12 16QAM 3MHz CH-Middle



LTE eMTC Band 12 16QAM 5MHz CH-Middle



LTE eMTC Band 12 16QAM 10MHz CH-Middle





LTE eMTC Band 13 QPSK 5MHz CH-Middle



LTE eMTC Band 13 QPSK 10MHz CH-Middle



LTE eMTC Band 13 16QAM 5MHz CH-Middle



LTE eMTC Band 13 16QAM 10MHz CH-Middle







LTE eMTC Band 66 QPSK 1.4MHz CH-Middle



LTE eMTC Band 66 QPSK 3MHz CH-Middle



LTE eMTC Band 66 QPSK 5MHz CH-Middle



LTE eMTC Band 66 QPSK 10MHz CH-Middle



LTE eMTC Band 66 QPSK 15MHz CH-Middle



LTE eMTC Band 66 QPSK 20MHz CH-Middle





LTE eMTC Band 66 16QAM 1.4MHz CH-Middle



LTE eMTC Band 66 16QAM 3MHz CH-Middle



LTE eMTC Band 66 16QAM 5MHz CH-Middle



LTE eMTC Band 66 16QAM 10MHz CH-Middle



LTE eMTC Band 66 16QAM 15MHz CH-Middle



LTE eMTC Band 66 16QAM 20MHz CH-Middle



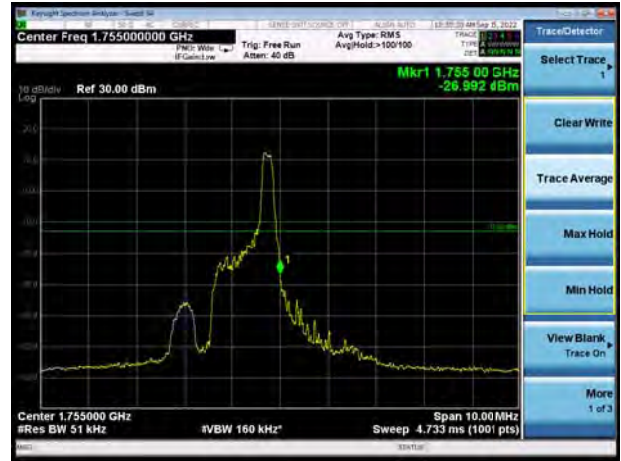
### 6.3 Band Edge Compliance

All the test traces in the plots shows the test results clearly.

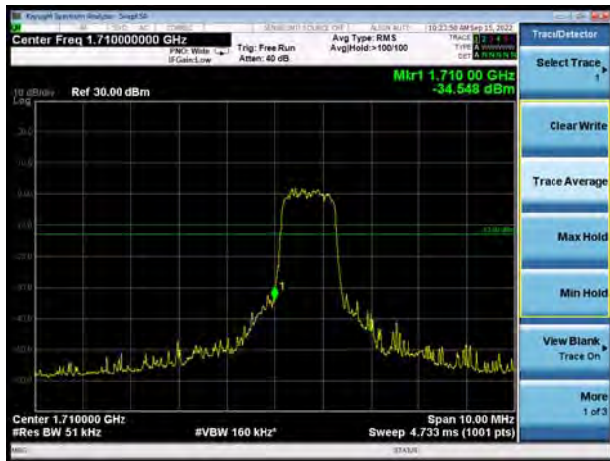
LTE eMTC Band 4 QPSK 1.4MHz CH-Low, 1 RB



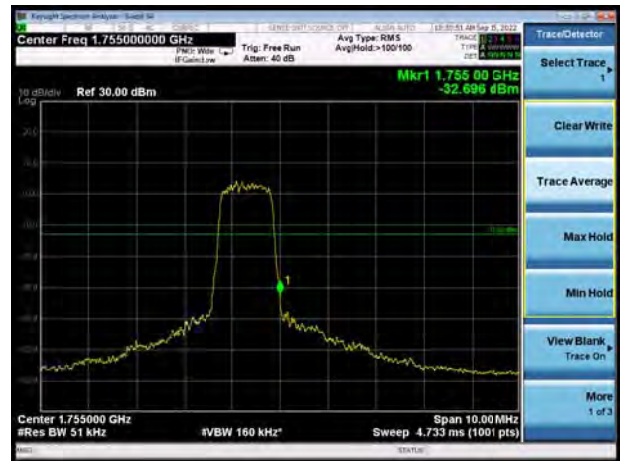
LTE eMTC Band 4 QPSK 1.4MHz CH-High, 1 RB



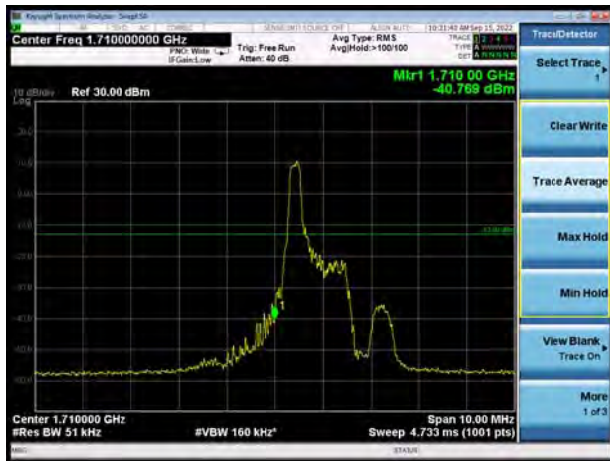
LTE eMTC Band 4 QPSK 1.4MHz CH-Low, 100%RB



LTE eMTC Band 4 QPSK 1.4MHz CH-High, 100%RB



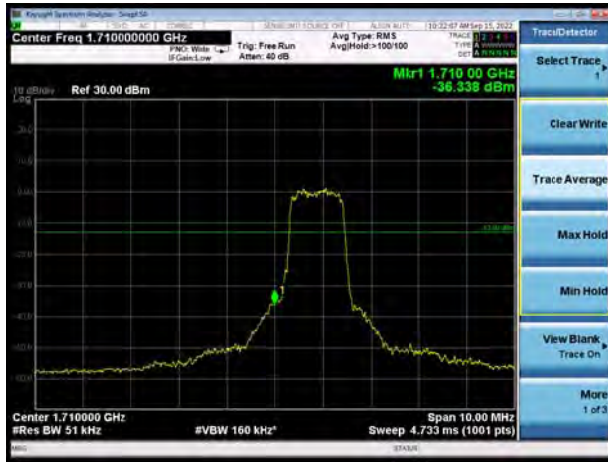
LTE eMTC Band 4 QPSK 3MHz CH-Low, 1 RB



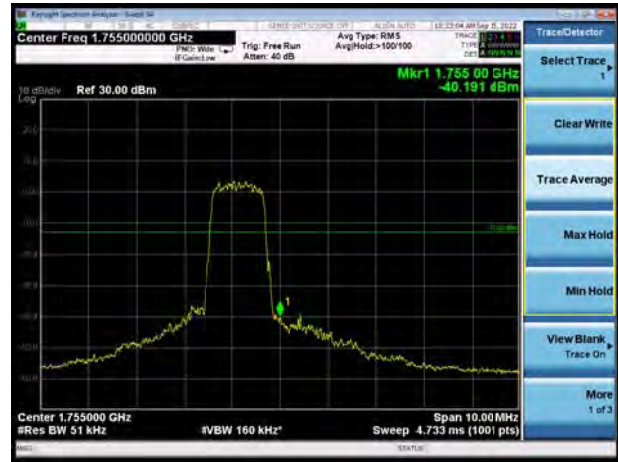
LTE eMTC Band 4 QPSK 3MHz CH-High, 1 RB



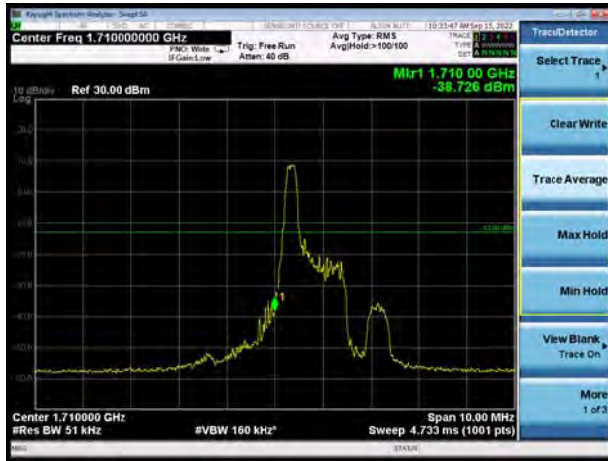
LTE eMTC Band 4 QPSK 3MHz CH-Low, 100%RB



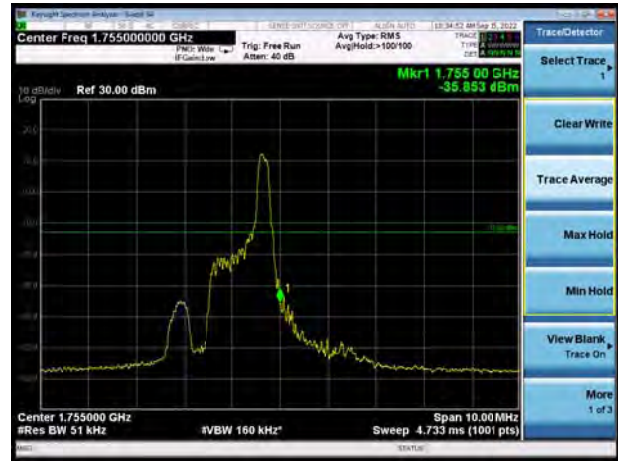
LTE eMTC Band 4 QPSK 3MHz CH-High, 100%RB



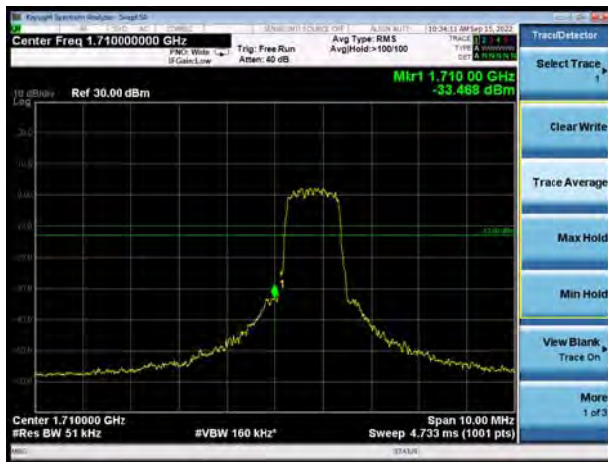
LTE eMTC Band 4 QPSK 5MHz CH-Low, 1 RB



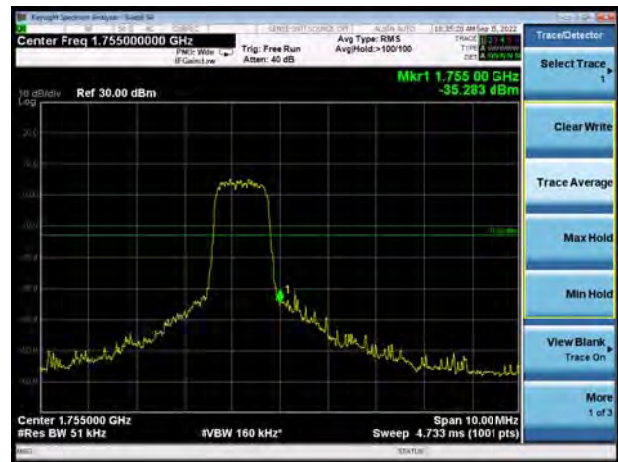
LTE eMTC Band 4 QPSK 5MHz CH-High, 1 RB



LTE eMTC Band 4 QPSK 5MHz CH-Low, 100%RB



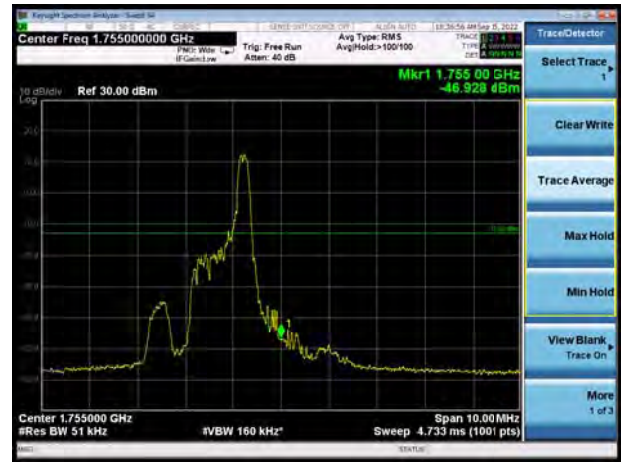
LTE eMTC Band 4 QPSK 5MHz CH-High, 100%RB



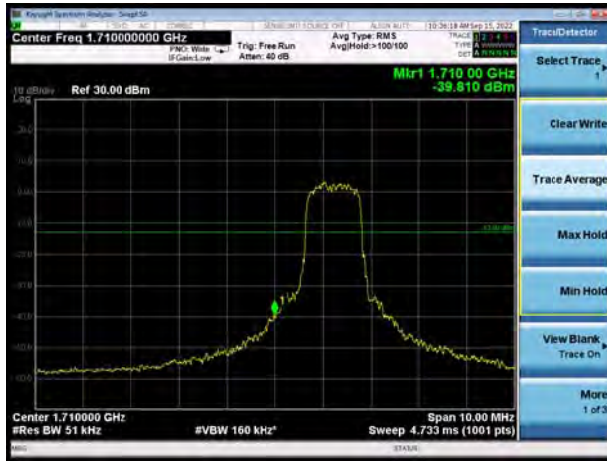
LTE eMTC Band 4 QPSK 10MHz CH-Low, 1 RB



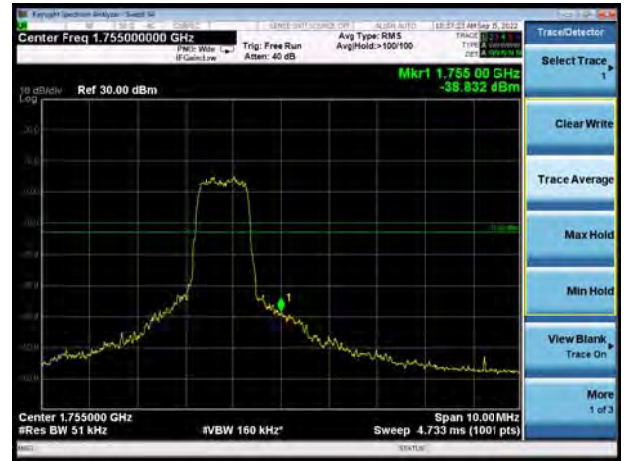
LTE eMTC Band 4 QPSK 10MHz CH-High, 1 RB



LTE eMTC Band 4 QPSK 10MHz CH-Low, 100%RB



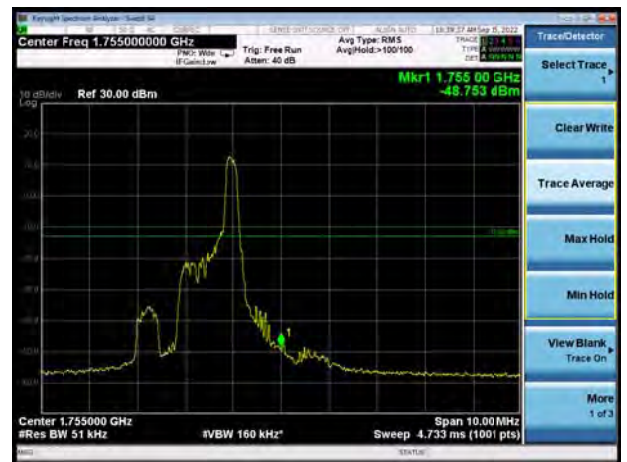
LTE eMTC Band 4 QPSK 10MHz CH-High, 100%RB



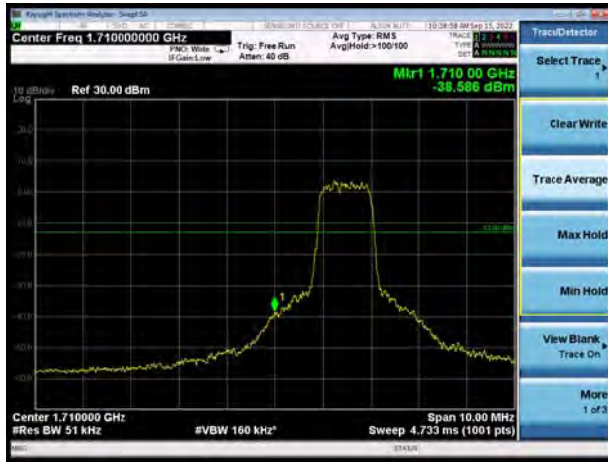
LTE eMTC Band 4 QPSK 15MHz CH-Low, 1 RB



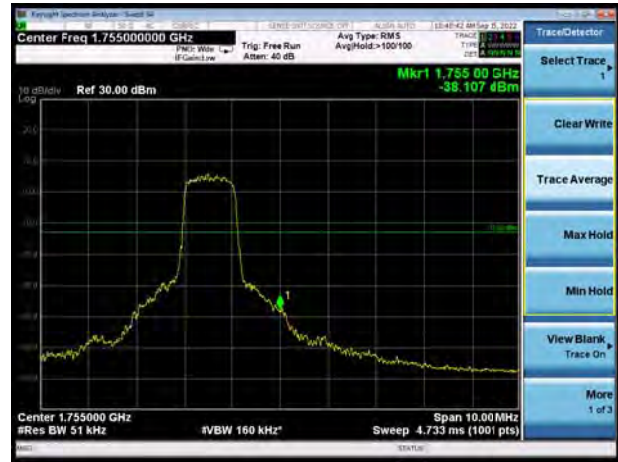
LTE eMTC Band 4 QPSK 15MHz CH-High, 1 RB



LTE eMTC Band 4 QPSK 15MHz CH-Low, 100%RB



LTE eMTC Band 4 QPSK 15MHz CH-High, 100%RB



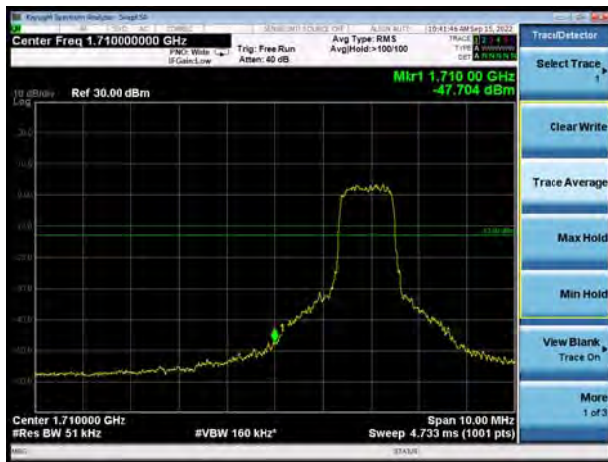
LTE eMTC Band 4 QPSK 20MHz CH-Low, 1 RB



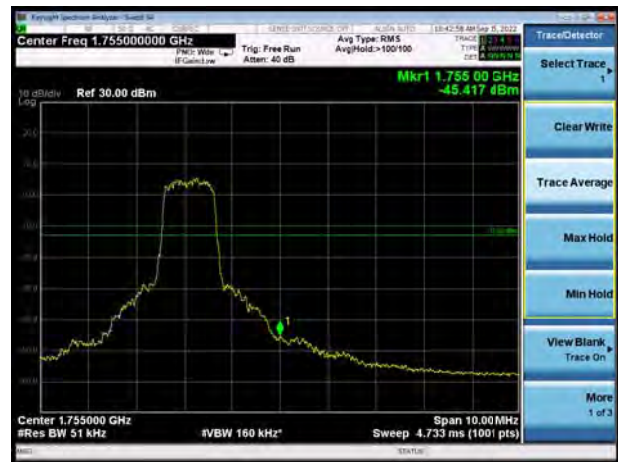
LTE eMTC Band 4 QPSK 20MHz CH-High, 1 RB



LTE eMTC Band 4 QPSK 20MHz CH-Low, 100%RB



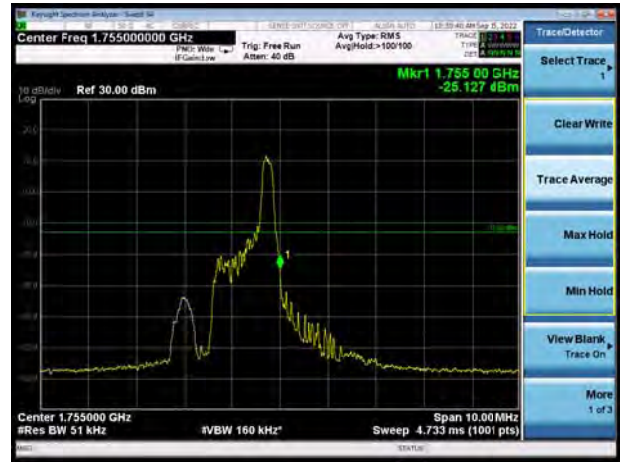
LTE eMTC Band 4 QPSK 20MHz CH-High, 100%RB



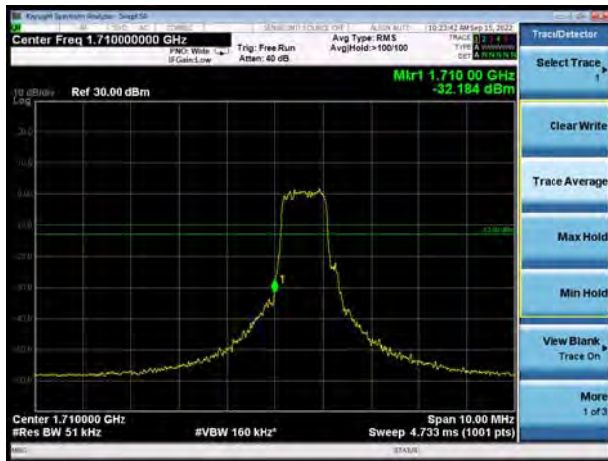
LTE eMTC Band 4 16QAM 1.4MHz CH-Low, 1 RB



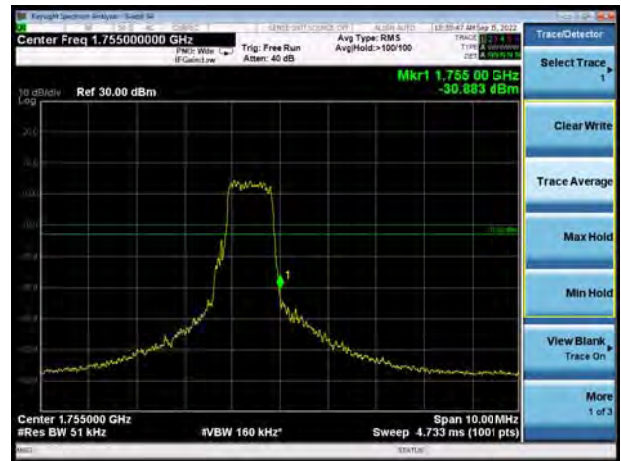
LTE eMTC Band 4 16QAM 1.4MHz CH-High, 1 RB



LTE eMTC Band 4 16QAM 1.4MHz CH-Low, 100%RB



LTE eMTC Band 4 16QAM 1.4MHz CH-High, 100%RB



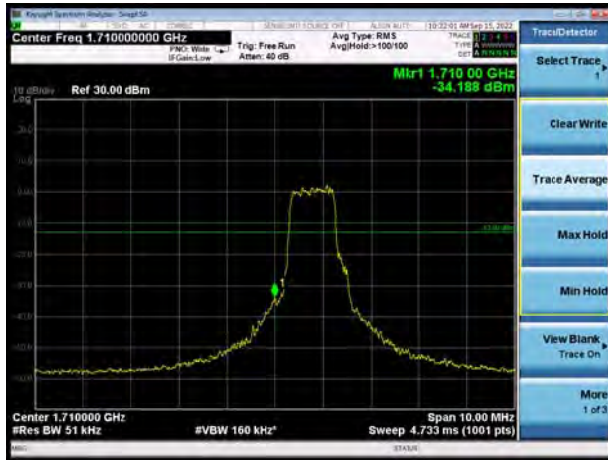
LTE eMTC Band 4 16QAM 3MHz CH-Low, 1 RB



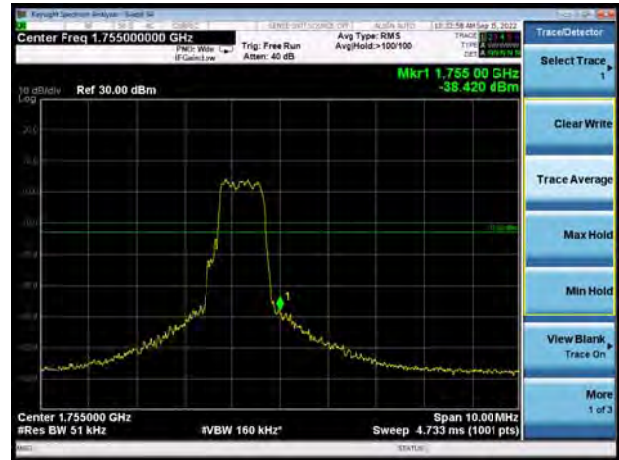
LTE eMTC Band 4 16QAM 3MHz CH-High, 1 RB



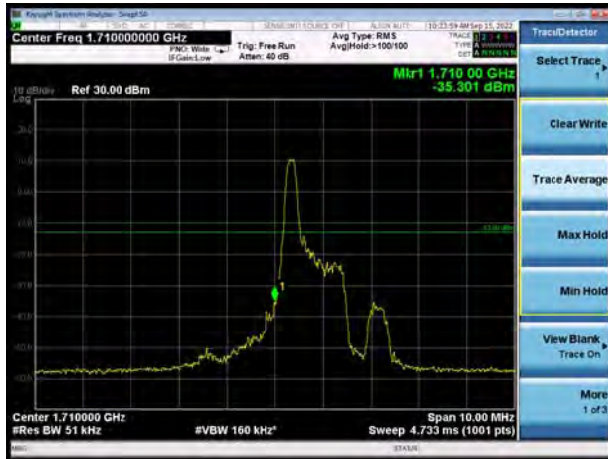
LTE eMTC Band 4 16QAM 3MHz CH-Low, 100%RB



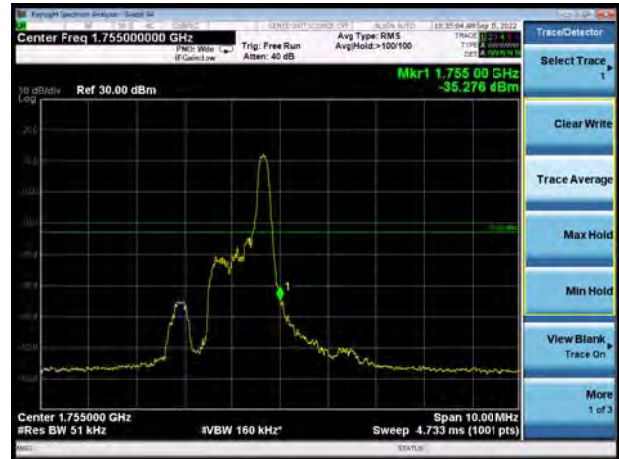
LTE eMTC Band 4 16QAM 3MHz CH-High, 100%RB



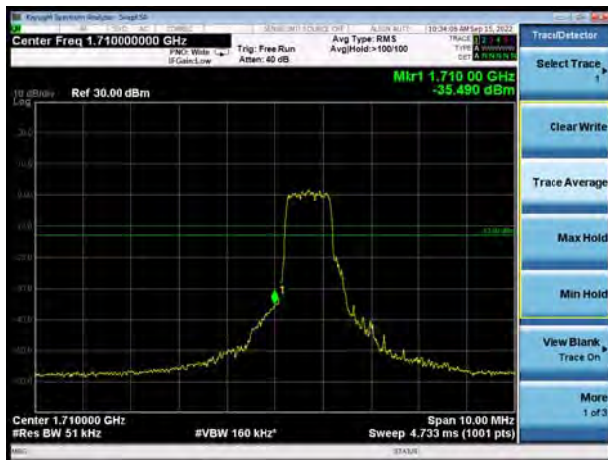
LTE eMTC Band 4 16QAM 5MHz CH-Low, 1 RB



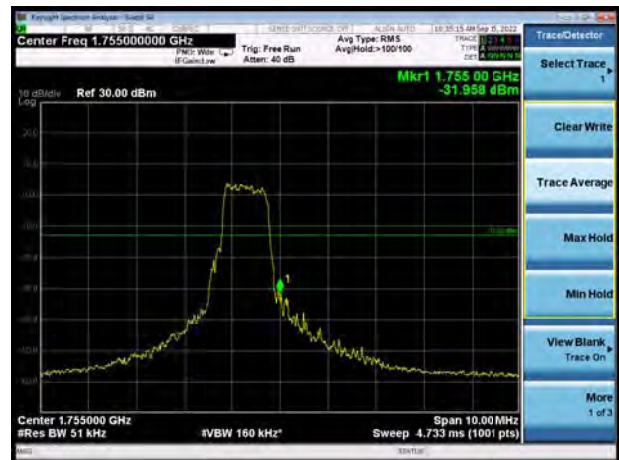
LTE eMTC Band 4 16QAM 5MHz CH-High, 1 RB



LTE eMTC Band 4 16QAM 5MHz CH-Low, 100%RB



LTE eMTC Band 4 16QAM 5MHz CH-High, 100%RB





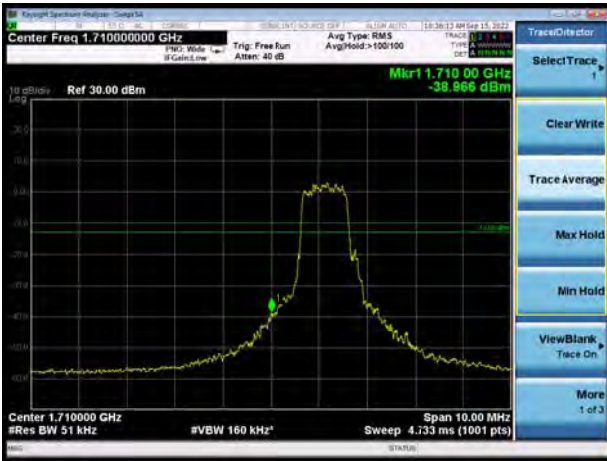
LTE eMTC Band 4 16QAM 10MHz CH-Low, 1 RB



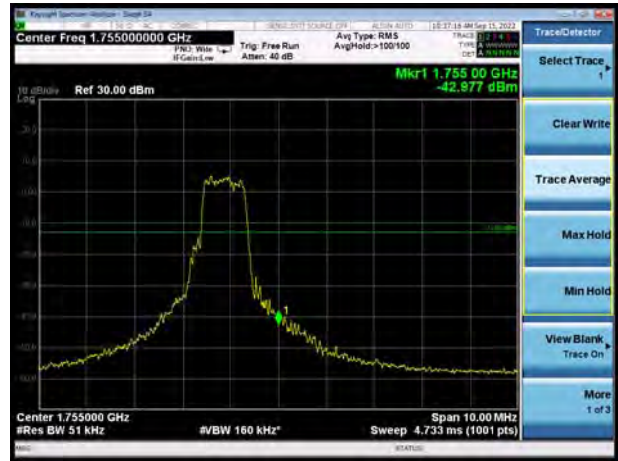
LTE eMTC Band 4 16QAM 10MHz CH-High, 1 RB



LTE eMTC Band 4 16QAM 10MHz CH-Low, 100%RB



LTE eMTC Band 4 16QAM 10MHz CH-High, 100%RB



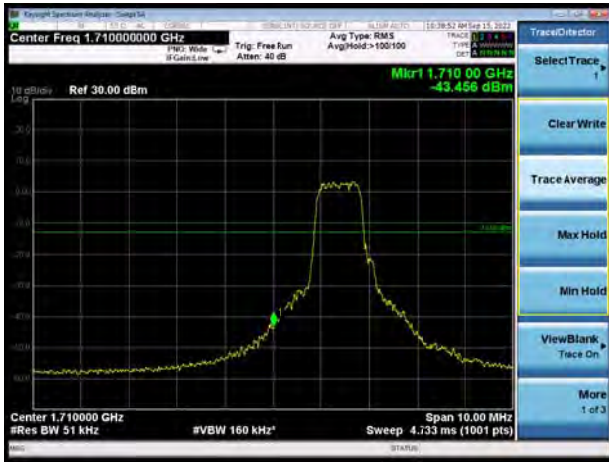
LTE eMTC Band 4 16QAM 15MHz CH-Low, 1 RB



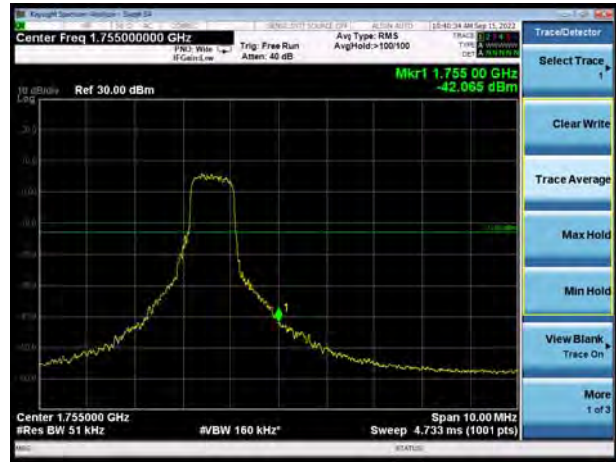
LTE eMTC Band 4 16QAM 15MHz CH-High, 1 RB



LTE eMTC Band 4 16QAM 15MHz CH-Low, 100%RB



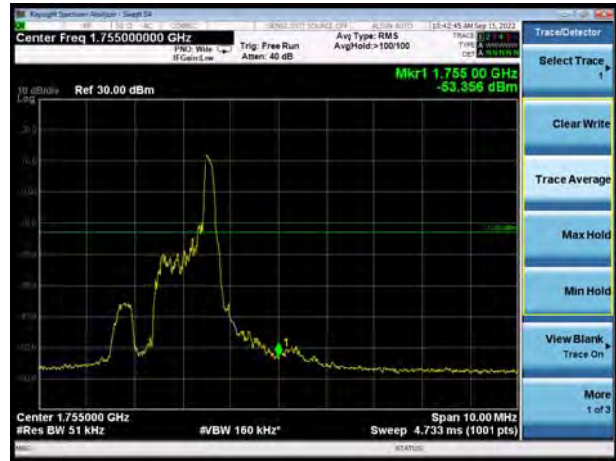
LTE eMTC Band 4 16QAM 15MHz CH-High, 100%RB



LTE eMTC Band 4 16QAM 20MHz CH-Low, 1 RB



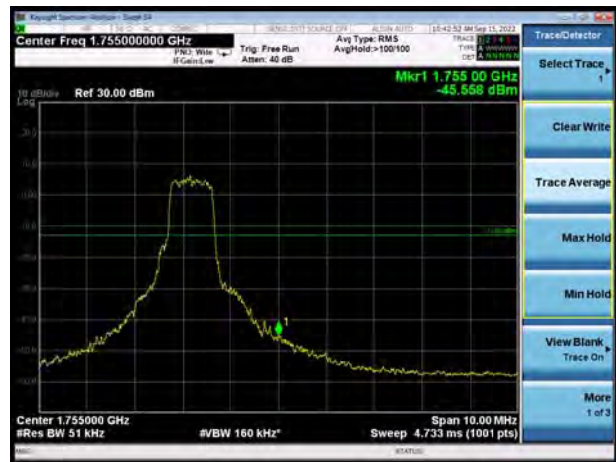
LTE eMTC Band 4 16QAM 20MHz CH-High, 1 RB



LTE eMTC Band 4 16QAM 20MHz CH-Low, 100%RB

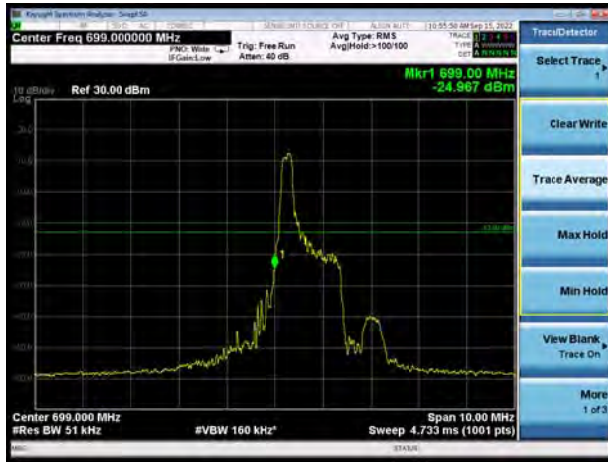


LTE eMTC Band 4 16QAM 20MHz CH-High, 100%RB

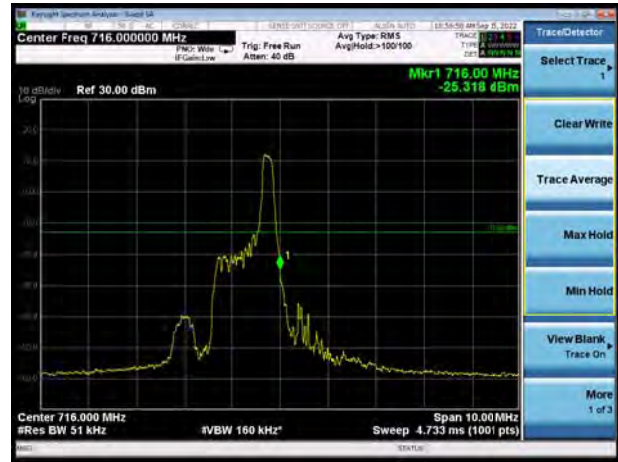




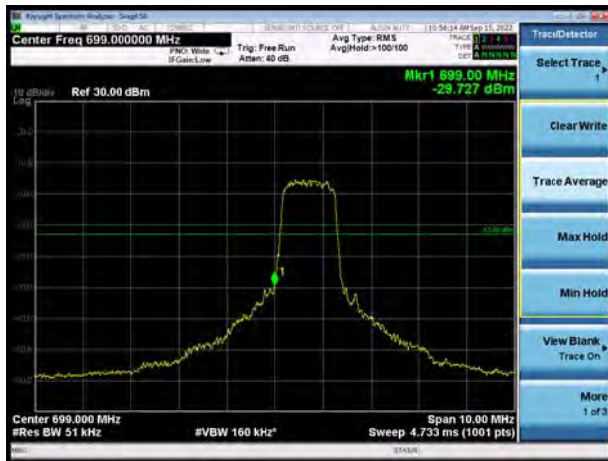
LTE eMTC Band 12 QPSK 1.4MHz CH-Low, 1 RB



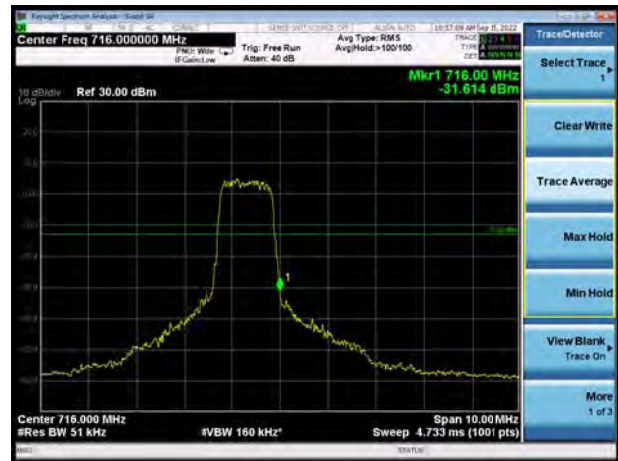
LTE eMTC Band 12 QPSK 1.4MHz CH-High, 1 RB



LTE eMTC Band 12 QPSK 1.4MHz CH-Low, 100%RB



LTE eMTC Band 12 QPSK 1.4MHz CH-High, 100%RB



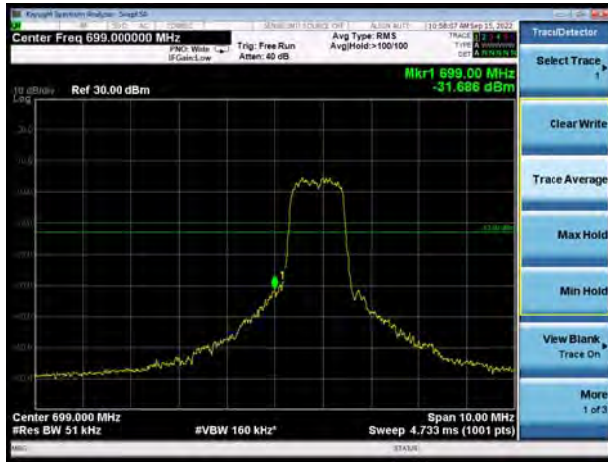
LTE eMTC Band 12 QPSK 3MHz CH-Low, 1 RB



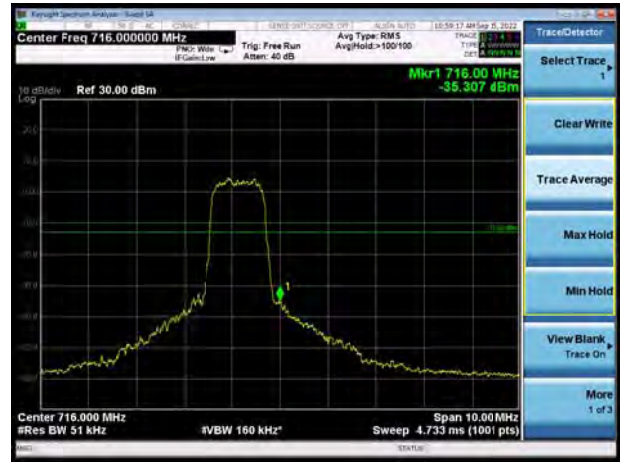
LTE eMTC Band 12 QPSK 3MHz CH-High, 1 RB



LTE eMTC Band 12 QPSK 3MHz CH-Low, 100%RB



LTE eMTC Band 12 QPSK 3MHz CH-High, 100%RB



LTE eMTC Band 12 QPSK 5MHz CH-Low, 1 RB



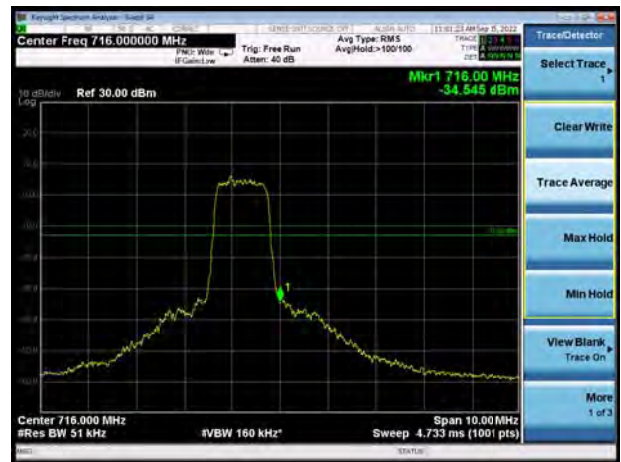
LTE eMTC Band 12 QPSK 5MHz CH-High, 1 RB



LTE eMTC Band 12 QPSK 5MHz CH-Low, 100%RB

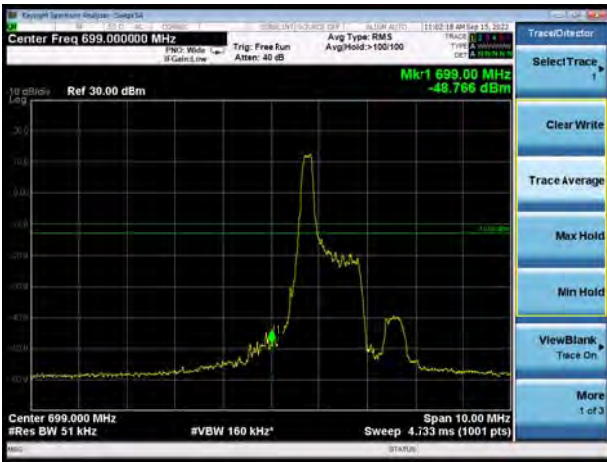


LTE eMTC Band 12 QPSK 5MHz CH-High, 100%RB

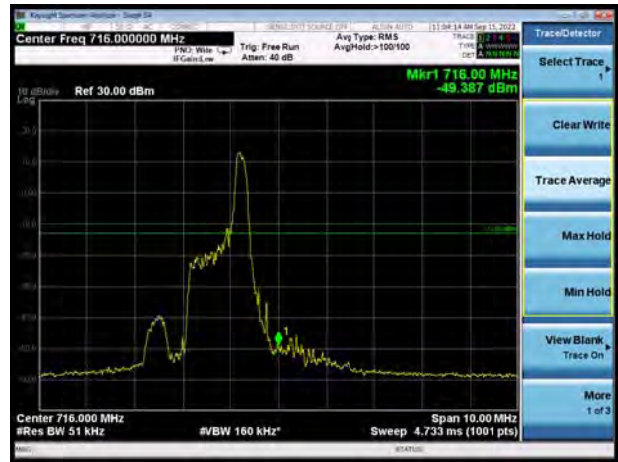




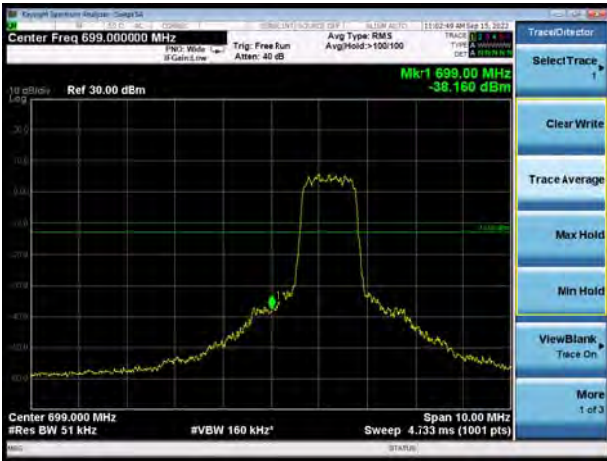
LTE eMTC Band 12 QPSK 10MHz CH-Low, 1 RB



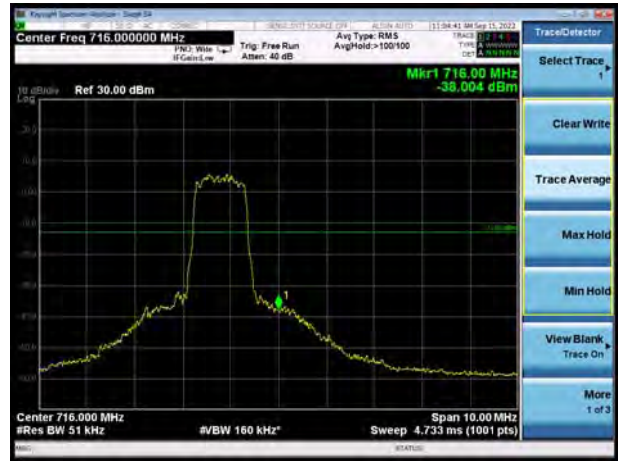
LTE eMTC Band 12 QPSK 10MHz CH-High, 1 RB



LTE eMTC Band 12 QPSK 10MHz CH-Low, 100%RB



LTE eMTC Band 12 QPSK 10MHz CH-High, 100%RB



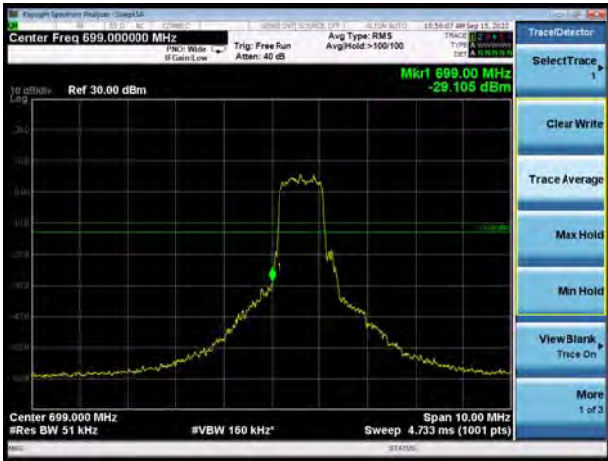
LTE eMTC Band 12 16QAM 1.4MHz CH-Low, 1 RB



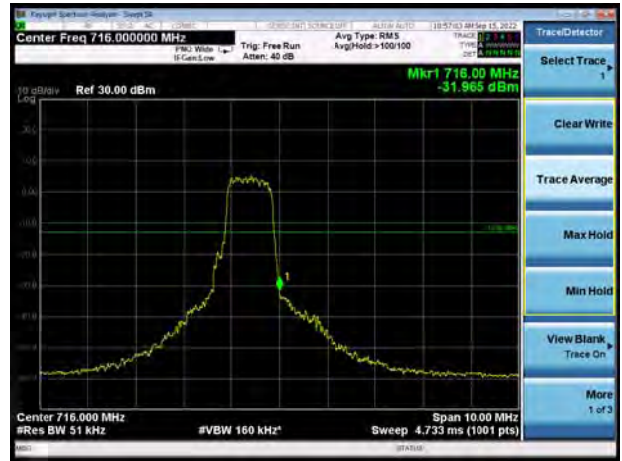
LTE eMTC Band 12 16QAM 1.4MHz CH-High, 1 RB



LTE eMTC Band 12 16QAM 1.4MHz CH-Low, 100%RB



LTE eMTC Band 12 16QAM 1.4MHz CH-High, 100%RB



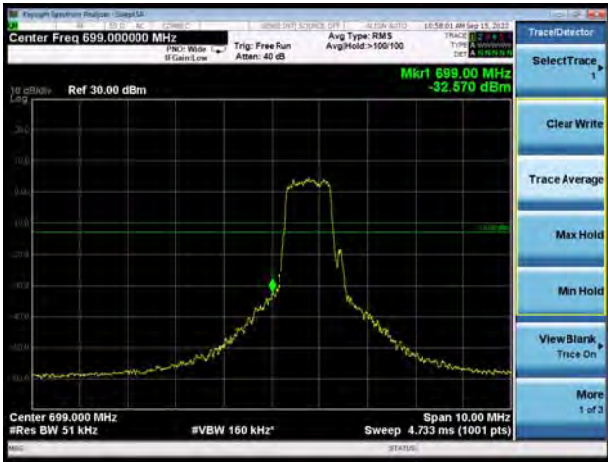
LTE eMTC Band 12 16QAM 3MHz CH-Low, 1 RB



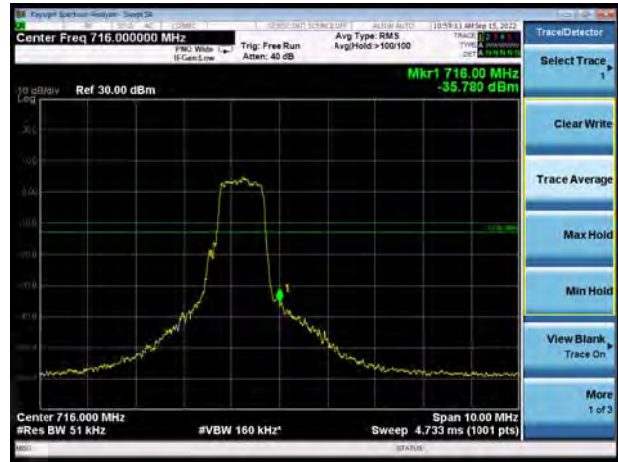
LTE eMTC Band 12 16QAM 3MHz CH-High, 1 RB



LTE eMTC Band 12 16QAM 3MHz CH-Low, 100%RB



LTE eMTC Band 12 16QAM 3MHz CH-High, 100%RB



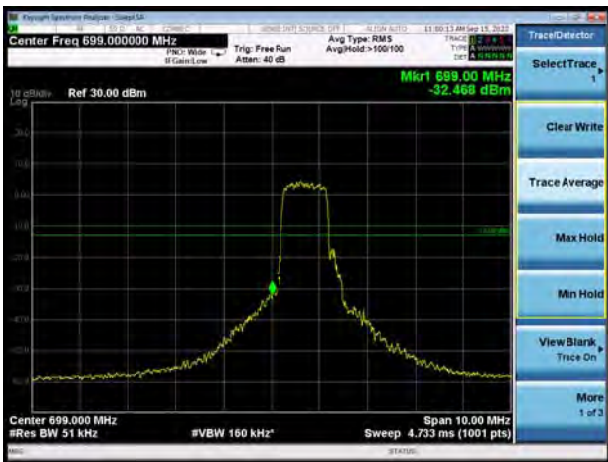
LTE eMTC Band 12 16QAM 5MHz CH-Low, 1 RB



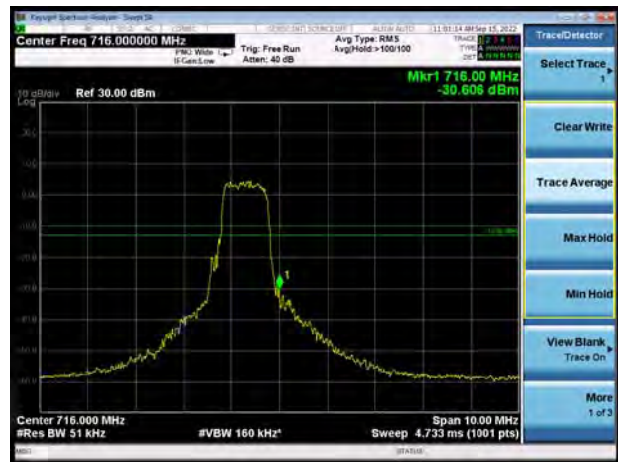
LTE eMTC Band 12 16QAM 5MHz CH-High, 1 RB



LTE eMTC Band 12 16QAM 5MHz CH-Low, 100%RB



LTE eMTC Band 12 16QAM 5MHz CH-High, 100%RB

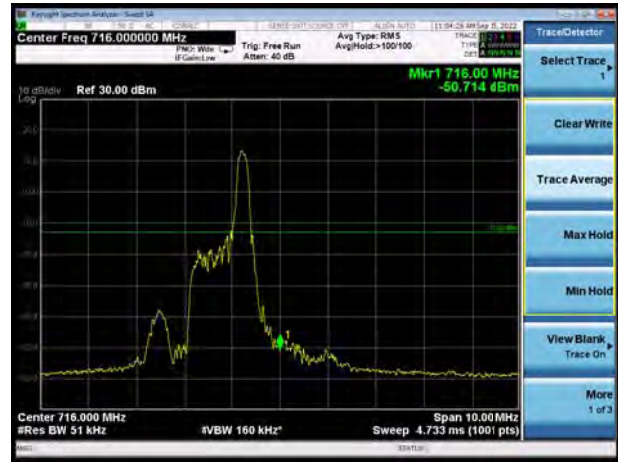




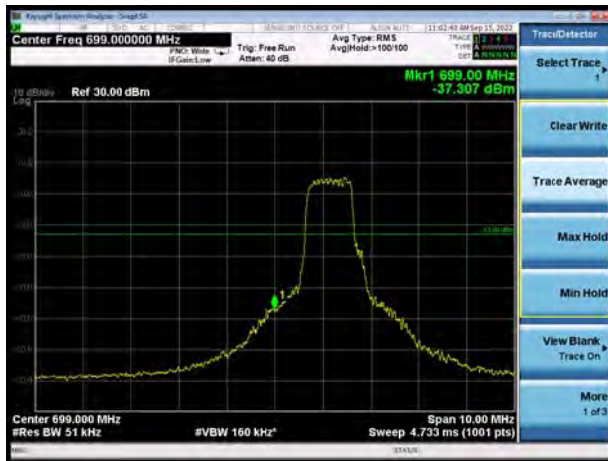
LTE eMTC Band 12 16QAM 10MHz CH-Low, 1 RB



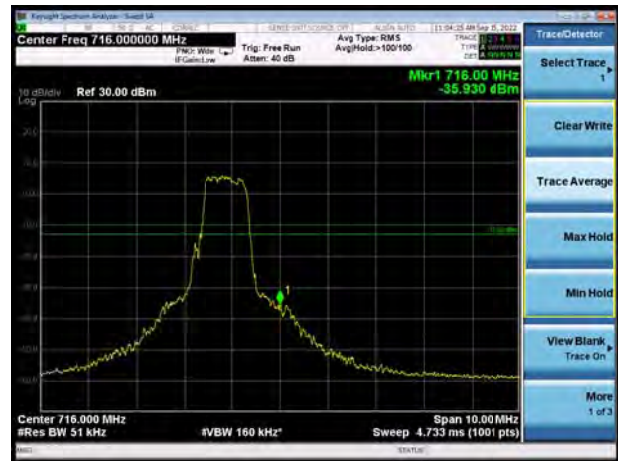
LTE eMTC Band 12 16QAM 10MHz CH-High, 1 RB



LTE eMTC Band 12 16QAM 10MHz CH-Low, 100%RB



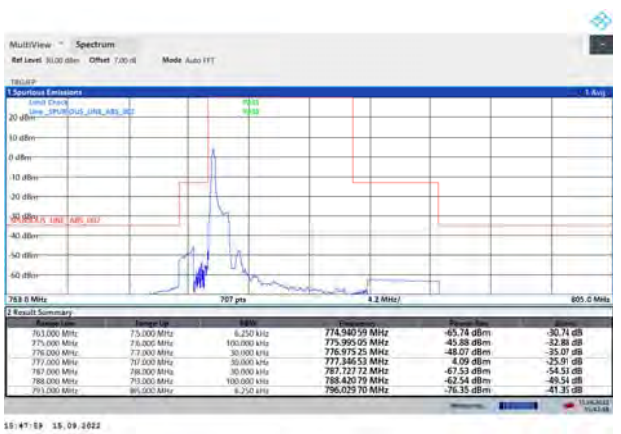
LTE eMTC Band 12 16QAM 10MHz CH-High, 100%RB







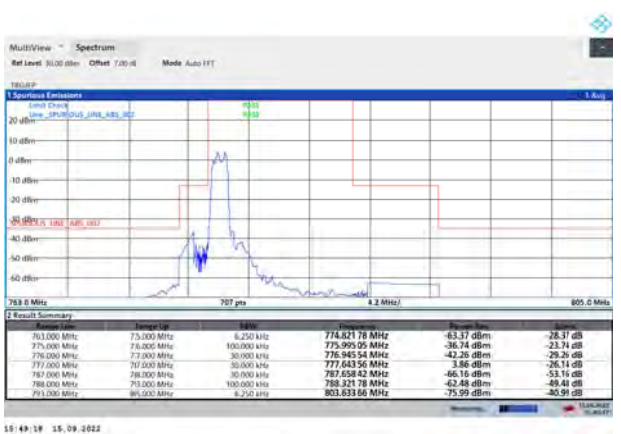
LTE eMTC Band 13 QPSK 5MHz CH-Low, 1 RB



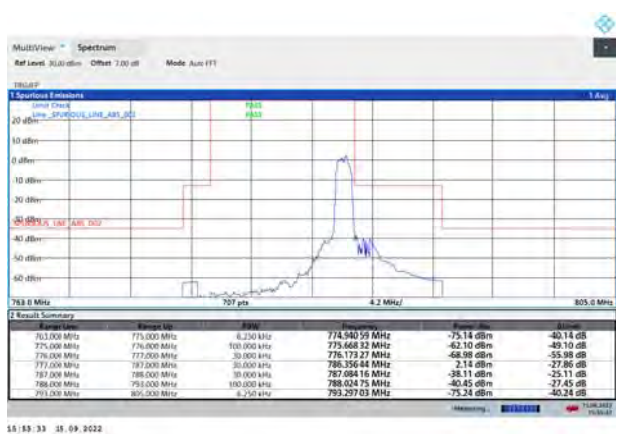
LTE eMTC Band 13 QPSK 5MHz CH-High, 1 RB



LTE eMTC Band 13 QPSK 5MHz CH-Low, 100%RB



LTE eMTC Band 13 QPSK 5MHz CH-High, 100%RB



LTE eMTC Band 13 QPSK 10MHz CH-Low, 1 RB



LTE eMTC Band 13 QPSK 10MHz CH-High, 1 RB

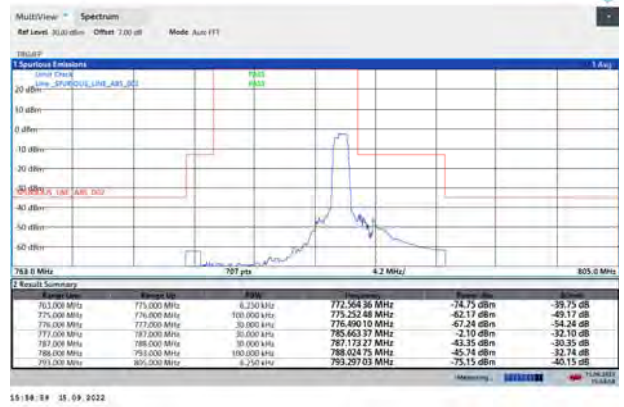




LTE eMTC Band 13 QPSK 10MHz CH-Low, 100%RB



LTE eMTC Band 13 QPSK 10MHz CH-High, 100%RB



LTE eMTC Band 13 16QAM 5MHz CH-Low, 1 RB



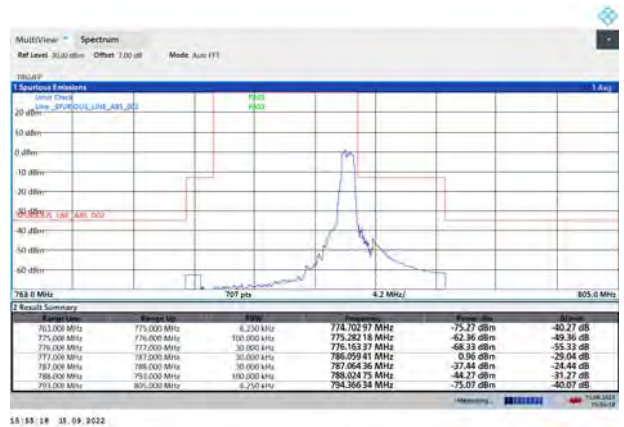
LTE eMTC Band 13 16QAM 5MHz CH-High, 1 RB



LTE eMTC Band 13 16QAM 5MHz CH-Low, 100%RB

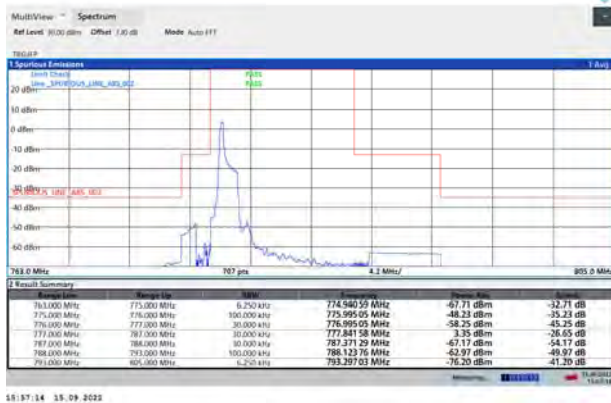


LTE eMTC Band 13 16QAM 5MHz CH-High, 100%RB



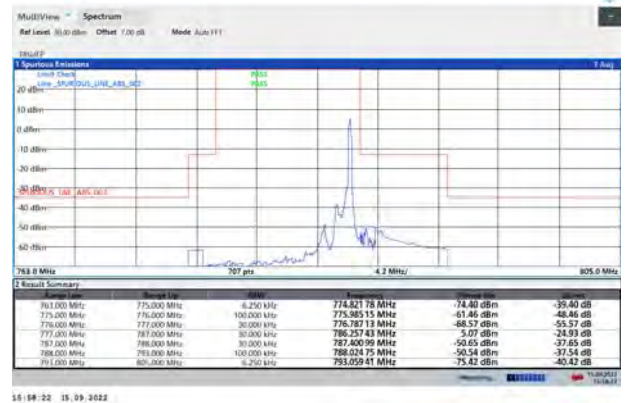


### LTE eMTC Band 13 16QAM 10MHz CH-Low, 1 RB



15:37:14 15-09-2022

### LTE eMTC Band 13 16QAM 10MHz CH-High, 1 RB



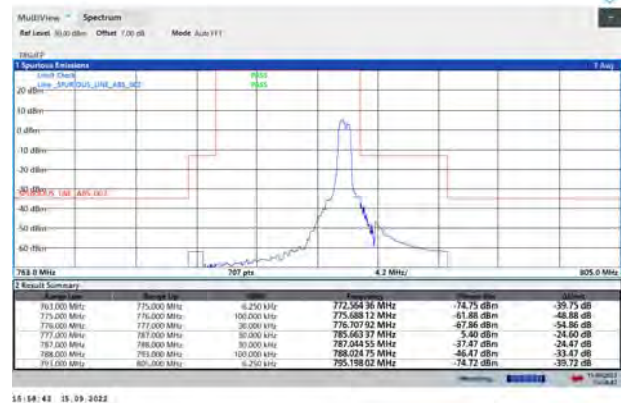
15:38:22 15-09-2022

### LTE eMTC Band 13 16QAM 10MHz CH-Low, 100%RB



15:37:29 15-09-2022

### LTE eMTC Band 13 16QAM 10MHz CH-High, 100%RB

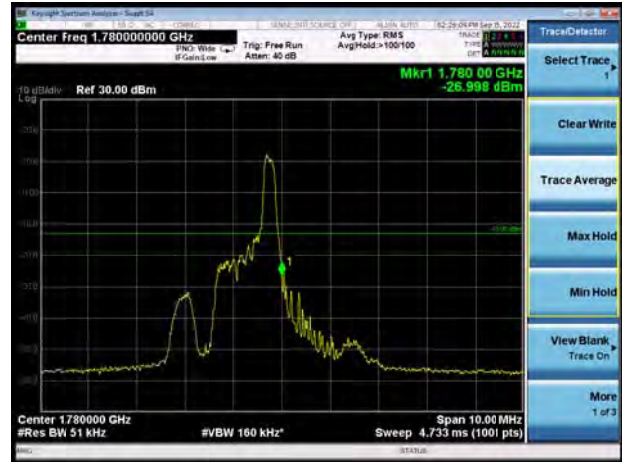


15:38:42 15-09-2022

LTE eMTC Band 66 QPSK 1.4MHz CH-Low, 1 RB



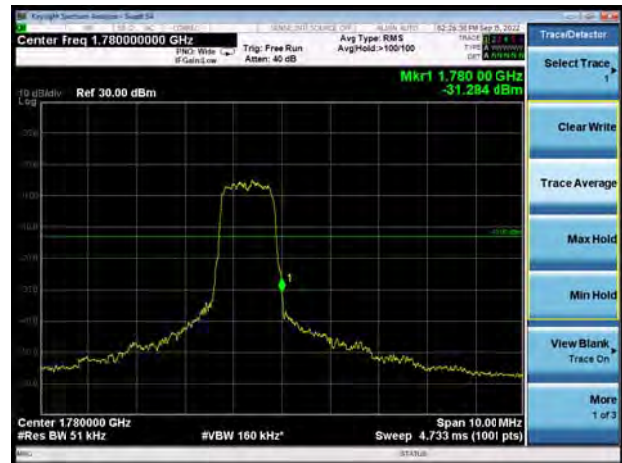
LTE eMTC Band 66 QPSK 1.4MHz CH-High, 1 RB



LTE eMTC Band 66 QPSK 1.4MHz CH-Low, 100%RB



LTE eMTC Band 66 QPSK 1.4MHz CH-High, 100%RB



LTE eMTC Band 66 QPSK 3MHz CH-Low, 1 RB

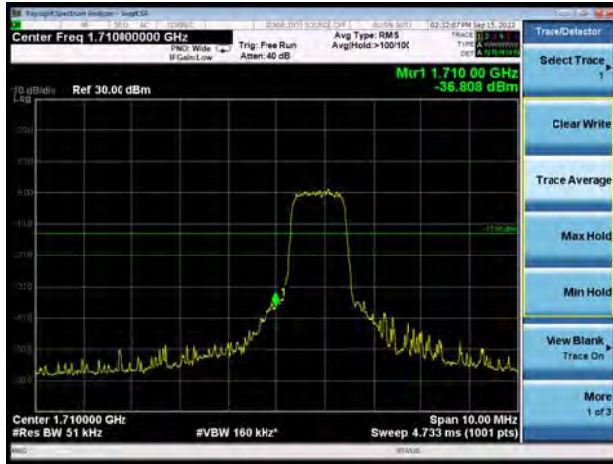


LTE eMTC Band 66 QPSK 3MHz CH-High, 1 RB

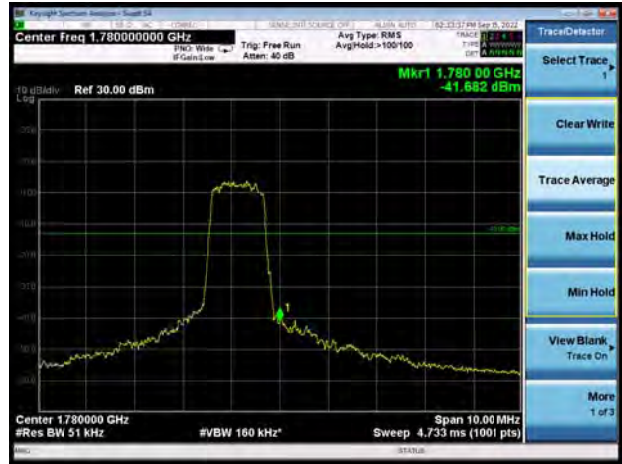




LTE eMTC Band 66 QPSK 3MHz CH-Low, 100%RB



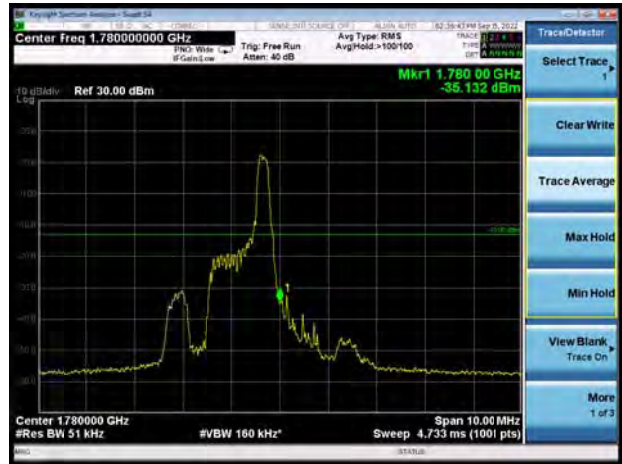
LTE eMTC Band 66 QPSK 3MHz CH-High, 100%RB



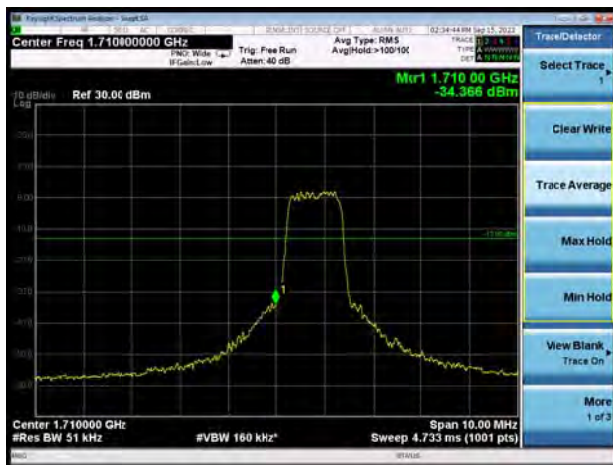
LTE eMTC Band 66 QPSK 5MHz CH-Low, 1 RB



LTE eMTC Band 66 QPSK 5MHz CH-High, 1 RB



LTE eMTC Band 66 QPSK 5MHz CH-Low, 100%RB



LTE eMTC Band 66 QPSK 5MHz CH-High, 100%RB





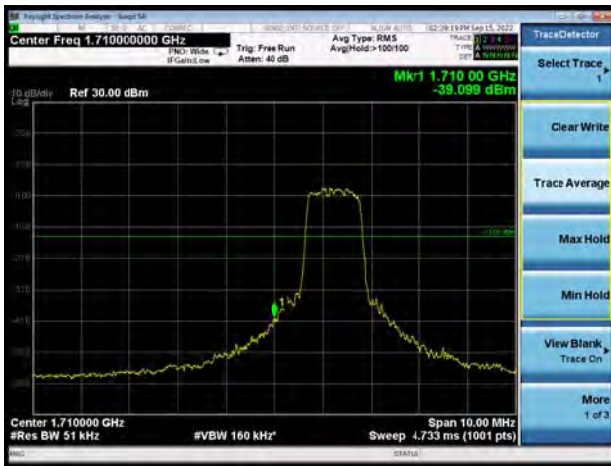
LTE eMTC Band 66 QPSK 10MHz CH-Low, 1 RB



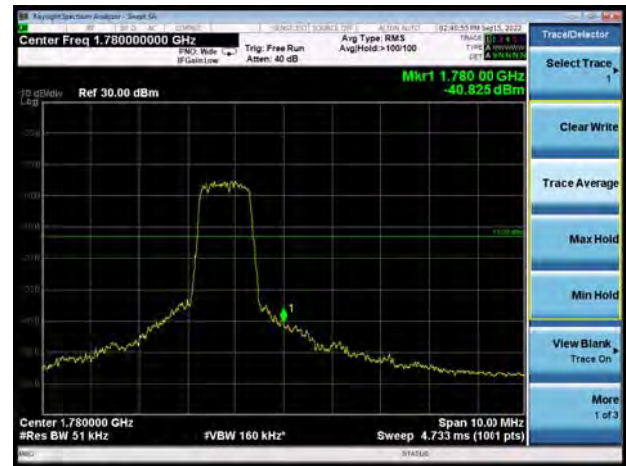
LTE eMTC Band 66 QPSK 10MHz CH-High, 1 RB



LTE eMTC Band 66 QPSK 10MHz CH-Low, 100%RB



LTE eMTC Band 66 QPSK 10MHz CH-High, 100%RB



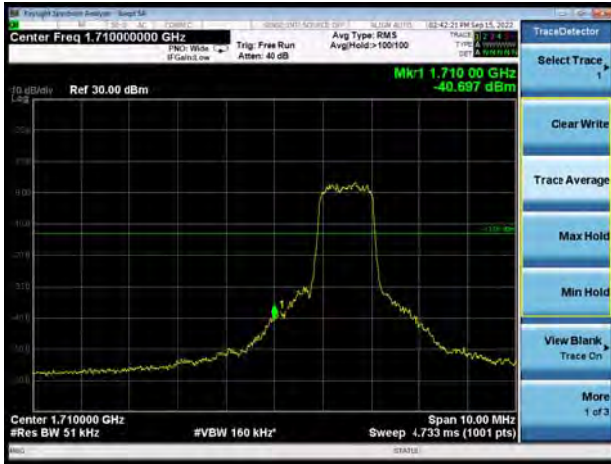
LTE eMTC Band 66 QPSK 15MHz CH-Low, 1 RB



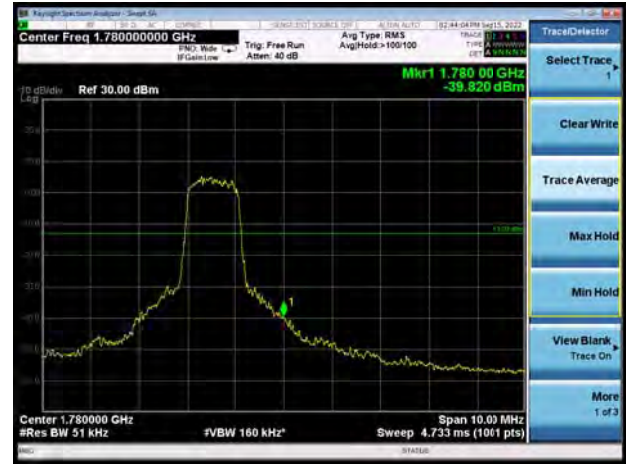
LTE eMTC Band 66 QPSK 15MHz CH-High, 1 RB



LTE eMTC Band 66 QPSK 15MHz CH-Low, 100%RB



LTE eMTC Band 66 QPSK 15MHz CH-High, 100%RB



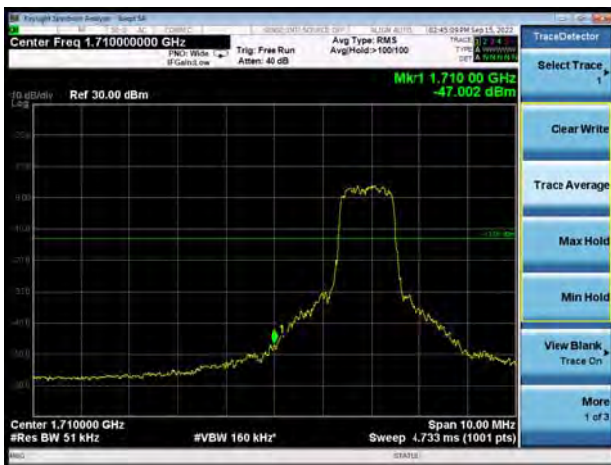
LTE eMTC Band 66 QPSK 20MHz CH-Low, 1 RB



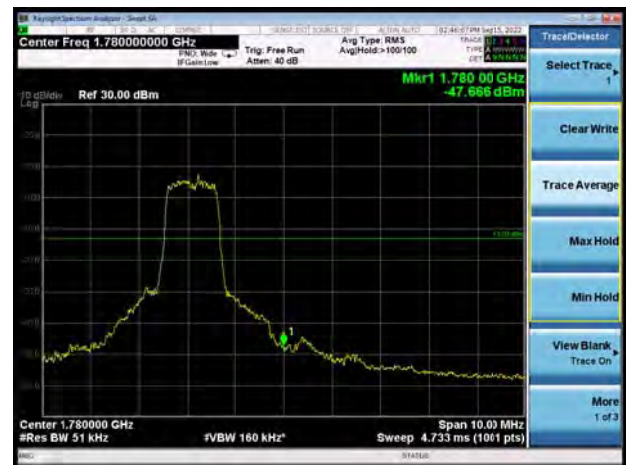
LTE eMTC Band 66 QPSK 20MHz CH-High, 1 RB



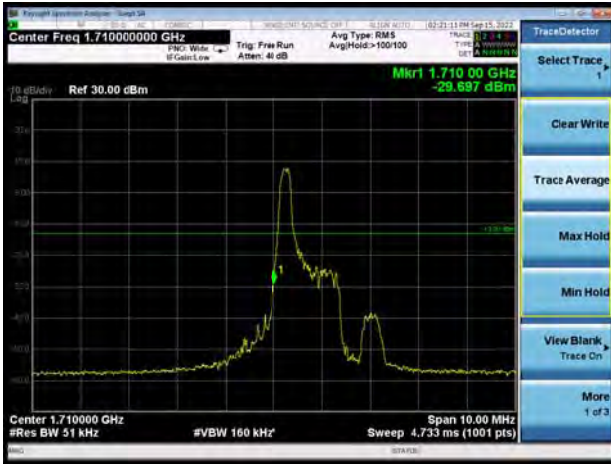
LTE eMTC Band 66 QPSK 20MHz CH-Low, 100%RB



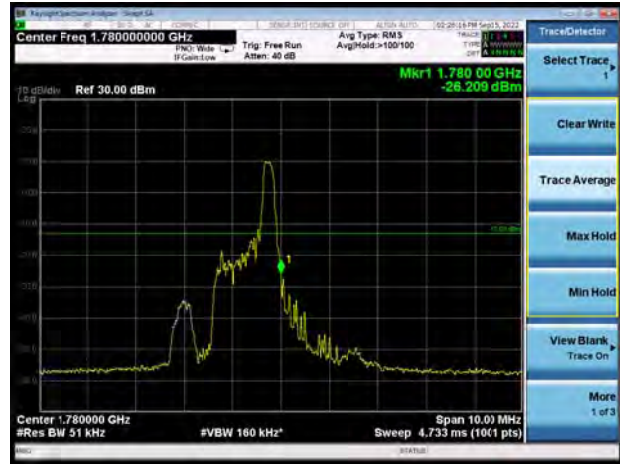
LTE eMTC Band 66 QPSK 20MHz CH-High, 100%RB



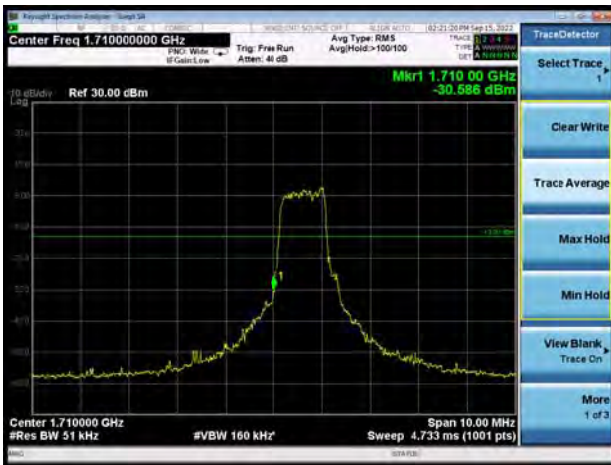
LTE eMTC Band 66 16QAM 1.4MHz CH-Low, 1 RB



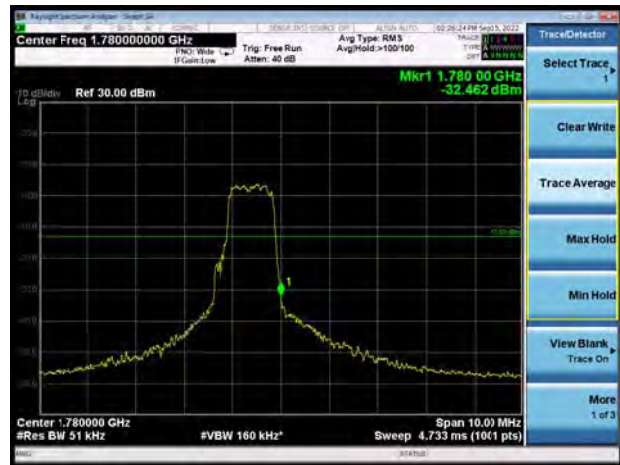
LTE eMTC Band 66 16QAM 1.4MHz CH-High, 1 RB



LTE eMTC Band 66 16QAM 1.4MHz CH-Low, 100%RB



LTE eMTC Band 66 16QAM 1.4MHz CH-High, 100%RB



LTE eMTC Band 66 16QAM 3MHz CH-Low, 1 RB

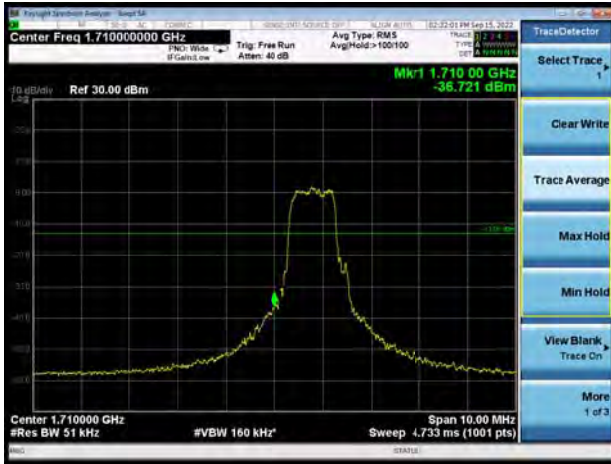


LTE eMTC Band 66 16QAM 3MHz CH-High, 1 RB

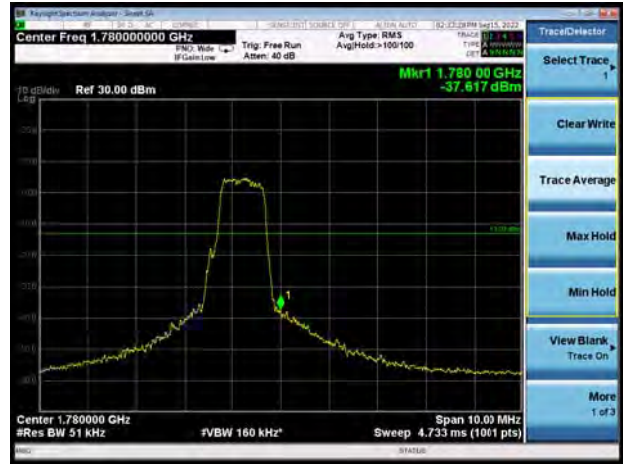




LTE eMTC Band 66 16QAM 3MHz CH-Low, 100%RB



LTE eMTC Band 66 16QAM 3MHz CH-High, 100%RB



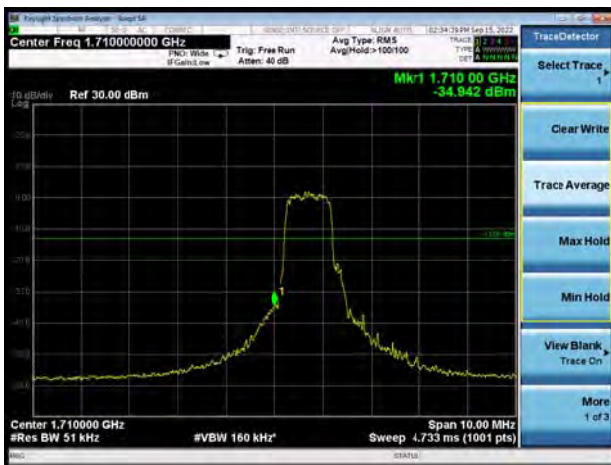
LTE eMTC Band 66 16QAM 5MHz CH-Low, 1 RB



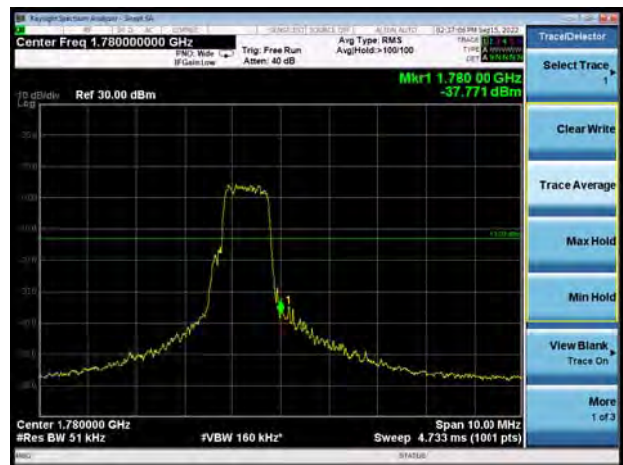
LTE eMTC Band 66 16QAM 5MHz CH-High, 1 RB



LTE eMTC Band 66 16QAM 5MHz CH-Low, 100%RB



LTE eMTC Band 66 16QAM 5MHz CH-High, 100%RB

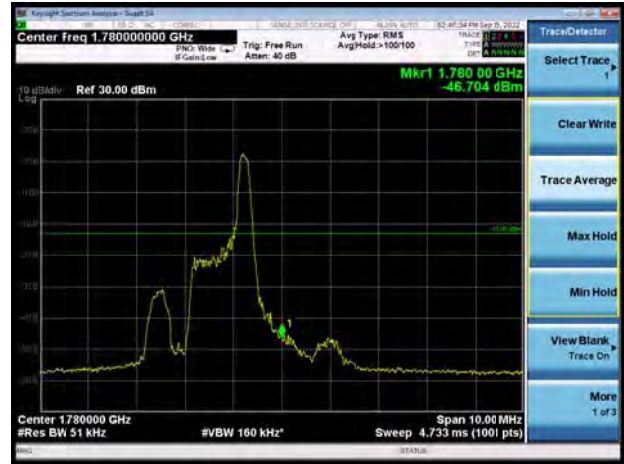




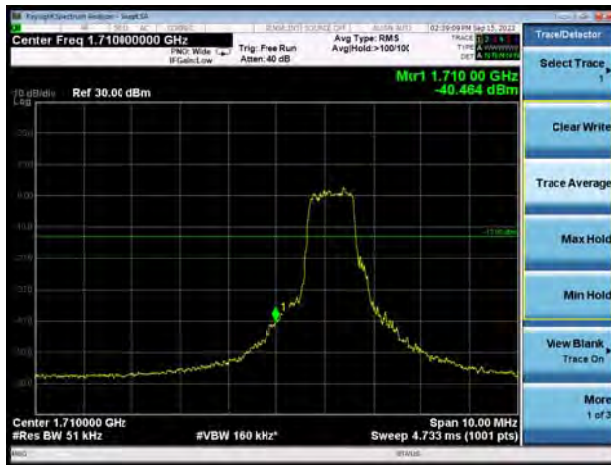
LTE eMTC Band 66 16QAM 10MHz CH-Low, 1 RB



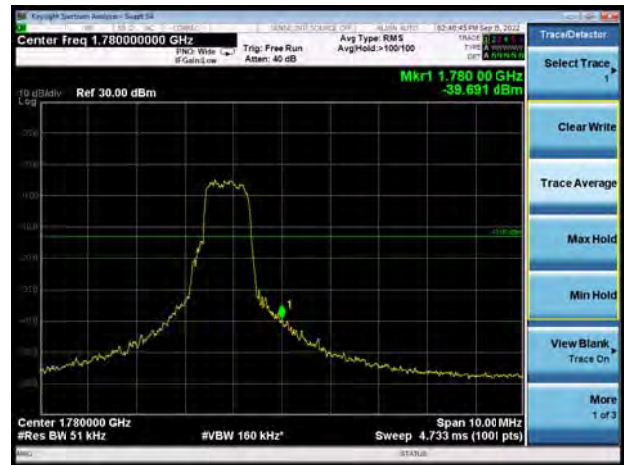
LTE eMTC Band 66 16QAM 10MHz CH-High, 1 RB



LTE eMTC Band 66 16QAM 10MHz CH-Low, 100%RB



LTE eMTC Band 66 16QAM 10MHz CH-High, 100%RB



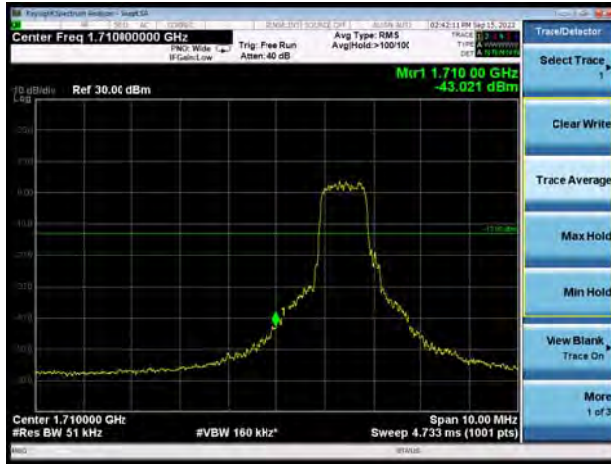
LTE eMTC Band 66 16QAM 15MHz CH-Low, 1 RB



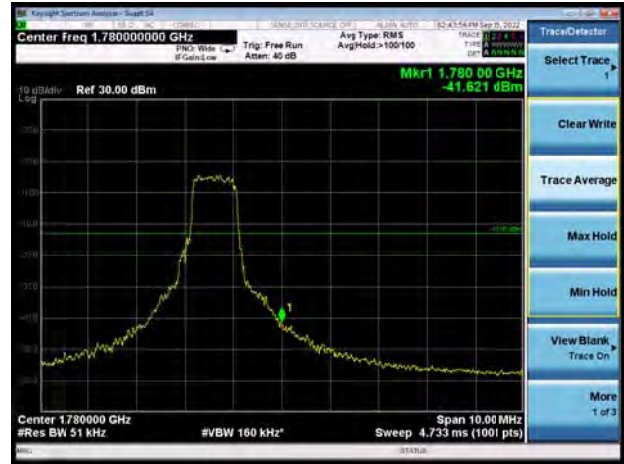
LTE eMTC Band 66 16QAM 15MHz CH-High, 1 RB



LTE eMTC Band 66 16QAM 15MHz CH-Low, 100%RB



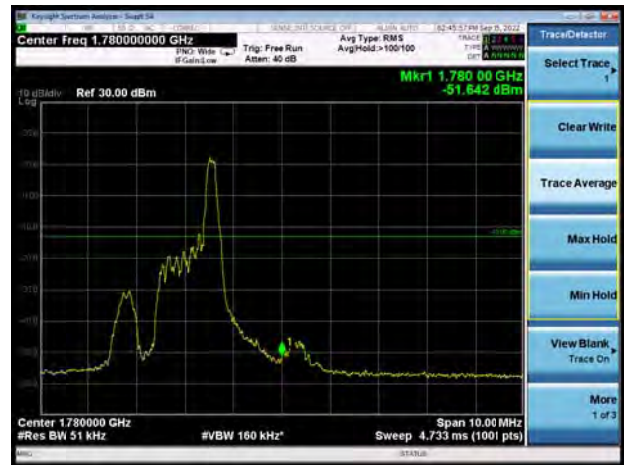
LTE eMTC Band 66 16QAM 15MHz CH-High, 100%RB



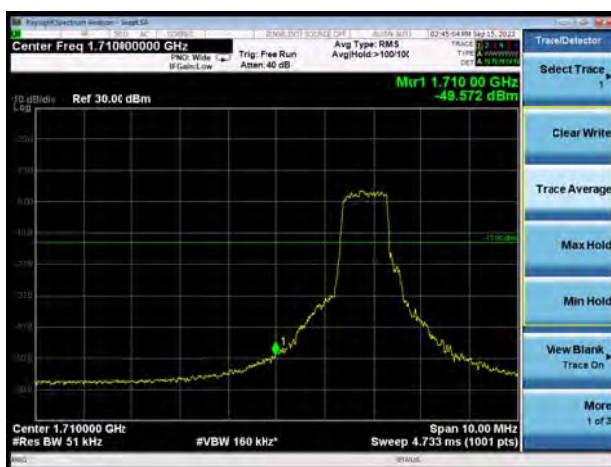
LTE eMTC Band 66 16QAM 20MHz CH-Low, 1 RB



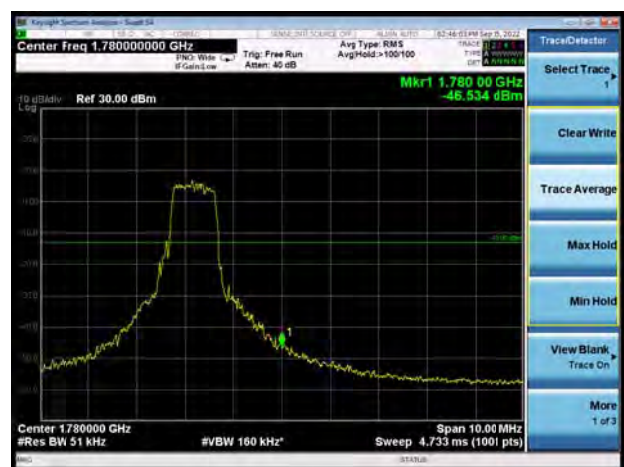
LTE eMTC Band 66 16QAM 20MHz CH-High, 1 RB



LTE eMTC Band 66 16QAM 20MHz CH-Low, 100%RB



LTE eMTC Band 66 16QAM 20MHz CH-High, 100%RB



### 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 4	1.4MHz	QPSK	20175/1732.5	27.58	17.41	10.17
		16QAM	20175/1732.5	28.18	17.11	11.07
	3MHz	QPSK	20175/1732.5	27.58	17.66	9.92
		16QAM	20175/1732.5	28.09	17.60	10.49
	5MHz	QPSK	20175/1732.5	28.26	18.53	9.73
		16QAM	20175/1732.5	27.83	17.10	10.73
	10MHz	QPSK	20175/1732.5	28.15	18.46	9.69
		16QAM	20175/1732.5	28.23	16.72	11.51
	15MHz	QPSK	20175/1732.5	28.66	19.18	9.48
		16QAM	20175/1732.5	28.84	18.56	10.28
	20MHz	QPSK	20175/1732.5	29.15	20.23	8.92
		16QAM	20175/1732.5	28.75	19.02	9.73

Mode	Bandwidth	Modulation	Channel/ Frequency(MHz)	Peak-to-Average Power Ratio (PAPR)		
				Peak(dBm)	Avg(dBm)	PAPR(dB)
LTE eMTC Band 12	1.4MHz	QPSK	23095/707.5	27.18	17.07	10.11
		16QAM	23095/707.5	27.81	16.93	10.88
	3MHz	QPSK	23095/707.5	27.18	17.14	10.04
		16QAM	23095/707.5	27.59	15.82	11.77
	5MHz	QPSK	23095/707.5	27.93	18.13	9.80
		16QAM	23095/707.5	27.59	16.69	10.90
	10MHz	QPSK	23095/707.5	27.96	18.12	9.84
		16QAM	23095/707.5	28.21	17.08	11.13

Mode	Bandwidth	Modulation	Channel/ Frequency(MHz)	Peak-to-Average Power Ratio (PAPR)		
				Peak(dBm)	Avg(dBm)	PAPR(dB)
LTE eMTC Band 13	5MHz	QPSK	23230/782	28.29	18.23	10.06
		16QAM	23230/782	28.17	16.68	11.49
	10MHz	QPSK	23230/782	28.36	18.42	9.94
		16QAM	23230/782	28.77	18.08	10.69



Mode	Bandwidth	Modulation	Channel/ Frequency(MHz)	Peak-to-Average Power Ratio (PAPR)		
				Peak(dBm)	Avg(dBm)	PAPR(dB)
LTE eMTC Band 66	1.4MHz	QPSK	132322/1745	27.89	17.90	9.99
		16QAM	132322/1745	28.53	16.70	11.83
	3MHz	QPSK	132322/1745	27.93	18.57	9.36
		16QAM	132322/1745	28.41	17.86	10.55
	5MHz	QPSK	132322/1745	28.59	18.89	9.70
		16QAM	132322/1745	28.26	17.43	10.83
	10MHz	QPSK	132322/1745	28.61	19.21	9.40
		16QAM	132322/1745	28.97	18.79	10.18
	15MHz	QPSK	132322/1745	29.21	20.06	9.15
		16QAM	132322/1745	29.46	19.53	9.93
	20MHz	QPSK	132322/1745	29.17	20.41	8.76
		16QAM	132322/1745	29.28	19.88	9.40



## 6.5 Frequency Stability

LTE eMTC Band 4	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	3.65	1.27	0.00194	0.00068	PASS	
	Extreme (50°C)		1.21	5.40	0.00064	0.00287	PASS	
	Extreme (40°C)		8.55	11.07	0.00455	0.00589	PASS	
	Extreme (30°C)		17.74	10.91	0.00944	0.00580	PASS	
	Extreme (20°C)		14.58	8.05	0.00775	0.00428	PASS	
	Extreme (10°C)		4.27	13.60	0.00227	0.00723	PASS	
	Extreme (0°C)		11.39	4.66	0.00606	0.00248	PASS	
	Extreme (-10°C)		5.77	15.48	0.00307	0.00823	PASS	
	Extreme (-20°C)		17.80	6.72	0.00947	0.00357	PASS	
	Extreme (-30°C)		16.26	14.55	0.00865	0.00774	PASS	
	25°C		LV	16.56	3.03	0.00881	0.00161	PASS
			HV	16.84	7.27	0.00896	0.00387	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	17.50	3.32	0.00931	0.00176	PASS	
	Extreme (50°C)		10.74	15.53	0.00571	0.00826	PASS	
	Extreme (40°C)		10.84	15.53	0.00577	0.00826	PASS	
	Extreme (30°C)		7.55	6.51	0.00402	0.00346	PASS	
	Extreme (20°C)		16.33	4.83	0.00868	0.00257	PASS	
	Extreme (10°C)		13.58	9.81	0.00723	0.00522	PASS	
Extreme (0°C)	15.32		1.46	0.00815	0.00078	PASS		
Extreme (-10°C)	3.60		2.16	0.00192	0.00115	PASS		
Extreme (-20°C)	13.65		3.89	0.00726	0.00207	PASS		
Extreme (-30°C)	4.52		6.80	0.00241	0.00362	PASS		
25°C	LV		16.40	15.28	0.00872	0.00813	PASS	
	HV		5.64	11.23	0.00300	0.00597	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	6.03	14.06	0.00321	0.00748	PASS		
Extreme (50°C)		16.96	11.90	0.00902	0.00633	PASS		
Extreme (40°C)		16.54	15.68	0.00880	0.00834	PASS		
Extreme (30°C)		7.12	14.43	0.00379	0.00768	PASS		



Extreme (20°C)			17.94	15.75	0.00954	0.00838	PASS	
Extreme (10°C)			2.46	2.77	0.00131	0.00147	PASS	
Extreme (0°C)			2.82	12.69	0.00150	0.00675	PASS	
Extreme (-10°C)			11.42	5.16	0.00607	0.00275	PASS	
Extreme (-20°C)			2.18	4.98	0.00116	0.00265	PASS	
Extreme (-30°C)			17.43	14.00	0.00927	0.00745	PASS	
25°C	LV		8.45	3.72	0.00449	0.00198	PASS	
	HV		11.78	16.53	0.00627	0.00879	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	5.47	11.36	0.00291	0.00604	PASS	
Extreme (50°C)			9.26	1.25	0.00492	0.00066	PASS	
Extreme (40°C)			3.13	6.01	0.00166	0.00320	PASS	
Extreme (30°C)			5.87	3.28	0.00312	0.00174	PASS	
Extreme (20°C)			15.72	8.35	0.00836	0.00444	PASS	
Extreme (10°C)			9.95	12.12	0.00529	0.00645	PASS	
Extreme (0°C)			10.95	8.54	0.00583	0.00454	PASS	
Extreme (-10°C)			12.79	13.02	0.00680	0.00693	PASS	
Extreme (-20°C)			2.12	11.96	0.00113	0.00636	PASS	
Extreme (-30°C)			8.83	6.49	0.00469	0.00345	PASS	
25°C	LV			12.61	16.55	0.00671	0.00880	PASS
	HV			15.82	3.12	0.00842	0.00166	PASS
Condition			Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability(ppm)	Frequency Stability(ppm)	Verdict	
BANDWIDTH	15MHz							
Temperature	Voltage	16QAM	QPSK	16QAM	QPSK			
Normal (25°C)		Normal	12.46	13.22	0.00663	0.00703	PASS	
Extreme (50°C)			8.18	15.71	0.00435	0.00836	PASS	
Extreme (40°C)			1.03	5.27	0.00055	0.00280	PASS	
Extreme (30°C)			12.26	16.64	0.00652	0.00885	PASS	
Extreme (20°C)			16.29	16.36	0.00867	0.00870	PASS	
Extreme (10°C)			15.69	3.47	0.00834	0.00185	PASS	
Extreme (0°C)			10.78	17.17	0.00574	0.00913	PASS	
Extreme (-10°C)			3.46	8.31	0.00184	0.00442	PASS	
Extreme (-20°C)			15.14	12.99	0.00806	0.00691	PASS	
Extreme (-30°C)			14.59	9.64	0.00776	0.00513	PASS	
25°C	LV			17.33	16.15	0.00922	0.00859	PASS
	HV			6.94	13.79	0.00369	0.00734	PASS
Condition			Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability(ppm)	Frequency Stability(ppm)	Verdict	
BANDWIDTH	20MHz							



	Temperature		Voltage	16QAM	QPSK	16QAM	QPSK		
	Normal (25°C)		Normal	11.99	16.50	0.00638	0.00878		PASS
	Extreme (50°C)			3.51	2.30	0.00187	0.00122		PASS
	Extreme (40°C)			9.94	11.17	0.00529	0.00594		PASS
	Extreme (30°C)			3.26	5.43	0.00173	0.00289		PASS
	Extreme (20°C)			14.85	16.91	0.00790	0.00900		PASS
	Extreme (10°C)			12.92	15.73	0.00687	0.00837		PASS
	Extreme (0°C)			6.59	3.54	0.00351	0.00188		PASS
	Extreme (-10°C)			14.02	13.07	0.00746	0.00695		PASS
	Extreme (-20°C)			4.09	11.84	0.00218	0.00630		PASS
	Extreme (-30°C)			8.19	16.45	0.00435	0.00875		PASS
	25°C			LV	15.11	1.84	0.00804		0.00098
			HV	12.75	10.12	0.00678	0.00539		PASS

LTE eMTC Band 12	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	7.93	2.00	0.00422	0.00107		PASS
	Extreme (50°C)			6.61	4.34	0.00352	0.00231		PASS
	Extreme (40°C)			11.75	17.56	0.00625	0.00934		PASS
	Extreme (30°C)			4.96	4.17	0.00264	0.00222		PASS
	Extreme (20°C)			7.23	2.76	0.00385	0.00147		PASS
	Extreme (10°C)			13.80	13.77	0.00734	0.00733		PASS
	Extreme (0°C)			8.75	13.37	0.00465	0.00711		PASS
	Extreme (-10°C)			11.70	1.30	0.00622	0.00069		PASS
	Extreme (-20°C)			5.97	9.99	0.00318	0.00531		PASS
	Extreme (-30°C)			14.04	1.80	0.00747	0.00096		PASS
	25°C			LV	2.12	12.58	0.00113		0.00669
			HV	6.68	2.40	0.00355	0.00128		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	8.74	5.99	0.00465	0.00318	PASS		
Extreme (50°C)			14.16	15.97	0.00753	0.00849	PASS		
Extreme (40°C)			4.09	4.92	0.00218	0.00262	PASS		
Extreme (30°C)			16.21	13.53	0.00862	0.00720	PASS		
Extreme (20°C)			2.04	3.71	0.00109	0.00197	PASS		
Extreme (10°C)			15.69	1.42	0.00835	0.00075	PASS		
Extreme (0°C)			13.95	9.77	0.00742	0.00520	PASS		
Extreme (-10°C)			11.04	7.76	0.00587	0.00413	PASS		





Extreme (-20°C)		16.90	8.91	0.00899	0.00474	PASS	
Extreme (-30°C)		8.38	10.98	0.00445	0.00584	PASS	
25°C	LV	15.69	15.43	0.00835	0.00821	PASS	
	HV	4.49	17.70	0.00239	0.00941	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	16.25	1.94	0.00865	0.00103	PASS	
Extreme (50°C)		2.49	10.11	0.00132	0.00538	PASS	
Extreme (40°C)		3.78	8.69	0.00201	0.00462	PASS	
Extreme (30°C)		1.25	9.73	0.00066	0.00518	PASS	
Extreme (20°C)		9.04	3.43	0.00481	0.00182	PASS	
Extreme (10°C)		5.84	1.57	0.00311	0.00083	PASS	
Extreme (0°C)		16.34	6.25	0.00869	0.00333	PASS	
Extreme (-10°C)		6.14	14.03	0.00326	0.00746	PASS	
Extreme (-20°C)		17.00	13.52	0.00904	0.00719	PASS	
Extreme (-30°C)		17.74	12.38	0.00944	0.00659	PASS	
25°C		LV	8.19	17.11	0.00436	0.00910	PASS
		HV	1.15	2.38	0.00061	0.00126	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	6.07	3.36	0.00323	0.00179	PASS	
Extreme (50°C)		14.08	7.11	0.00749	0.00378	PASS	
Extreme (40°C)		9.89	15.05	0.00526	0.00800	PASS	
Extreme (30°C)		11.18	10.19	0.00595	0.00542	PASS	
Extreme (20°C)		11.79	4.08	0.00627	0.00217	PASS	
Extreme (10°C)		16.82	17.37	0.00895	0.00924	PASS	
Extreme (0°C)		9.64	14.69	0.00513	0.00782	PASS	
Extreme (-10°C)		15.99	3.74	0.00851	0.00199	PASS	
Extreme (-20°C)		8.34	6.59	0.00444	0.00350	PASS	
Extreme (-30°C)		6.85	6.78	0.00364	0.00360	PASS	
25°C		LV	14.68	5.27	0.00781	0.00280	PASS
		HV	16.02	10.28	0.00852	0.00547	PASS



LTE eMTC Band 13	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	2.73	11.07	0.00145	0.00589	PASS	
	Extreme (50°C)		6.40	10.42	0.00340	0.00554	PASS	
	Extreme (40°C)		2.50	16.60	0.00133	0.00883	PASS	
	Extreme (30°C)		11.52	10.29	0.00613	0.00547	PASS	
	Extreme (20°C)		4.02	11.96	0.00214	0.00636	PASS	
	Extreme (10°C)		6.50	4.43	0.00346	0.00236	PASS	
	Extreme (0°C)		1.99	1.69	0.00106	0.00090	PASS	
	Extreme (-10°C)		15.40	8.20	0.00819	0.00436	PASS	
	Extreme (-20°C)		4.03	17.93	0.00215	0.00954	PASS	
	Extreme (-30°C)		7.96	4.02	0.00423	0.00214	PASS	
	25°C		LV	16.63	3.75	0.00885	0.00199	PASS
			HV	14.62	11.64	0.00778	0.00619	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	12.69	2.96	0.00675	0.00158	PASS	
	Extreme (50°C)		6.20	14.93	0.00330	0.00794	PASS	
	Extreme (40°C)		9.56	12.78	0.00508	0.00680	PASS	
	Extreme (30°C)		10.86	17.90	0.00578	0.00952	PASS	
	Extreme (20°C)		7.01	17.97	0.00373	0.00956	PASS	
	Extreme (10°C)		17.31	13.98	0.00921	0.00744	PASS	
Extreme (0°C)	17.29		6.37	0.00920	0.00339	PASS		
Extreme (-10°C)	12.50		8.71	0.00665	0.00463	PASS		
Extreme (-20°C)	16.25		2.84	0.00864	0.00151	PASS		
Extreme (-30°C)	1.77		13.73	0.00094	0.00730	PASS		
25°C	LV		12.83	8.16	0.00683	0.00434	PASS	
	HV		6.82	2.76	0.00363	0.00147	PASS	



LTE eMTC Band 66	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	10.87	1.90	0.00578	0.00101	PASS	
	Extreme (50°C)		14.71	14.86	0.00782	0.00790	PASS	
	Extreme (40°C)		16.98	6.96	0.00903	0.00370	PASS	
	Extreme (30°C)		12.61	15.30	0.00671	0.00814	PASS	
	Extreme (20°C)		8.32	7.67	0.00443	0.00408	PASS	
	Extreme (10°C)		8.84	14.78	0.00470	0.00786	PASS	
	Extreme (0°C)		7.76	8.64	0.00413	0.00460	PASS	
	Extreme (-10°C)		12.81	10.16	0.00681	0.00541	PASS	
	Extreme (-20°C)		10.04	4.06	0.00534	0.00216	PASS	
	Extreme (-30°C)		13.66	3.77	0.00727	0.00201	PASS	
	25°C		LV	3.54	11.78	0.00188	0.00626	PASS
			HV	7.13	7.49	0.00379	0.00398	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	11.85	3.55	0.00631	0.00189	PASS	
	Extreme (50°C)		15.98	10.05	0.00850	0.00535	PASS	
	Extreme (40°C)		17.72	2.97	0.00943	0.00158	PASS	
	Extreme (30°C)		2.84	17.44	0.00151	0.00928	PASS	
	Extreme (20°C)		12.88	10.57	0.00685	0.00562	PASS	
	Extreme (10°C)		17.89	10.65	0.00952	0.00567	PASS	
	Extreme (0°C)		10.05	8.88	0.00535	0.00472	PASS	
	Extreme (-10°C)		12.53	15.88	0.00666	0.00845	PASS	
	Extreme (-20°C)		4.57	17.31	0.00243	0.00920	PASS	
Extreme (-30°C)	8.30		16.62	0.00441	0.00884	PASS		
25°C	LV		14.05	2.86	0.00747	0.00152	PASS	
	HV		8.15	6.31	0.00433	0.00335	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	17.86	4.90	0.00950	0.00261	PASS		
Extreme (50°C)		17.26	10.32	0.00918	0.00549	PASS		
Extreme (40°C)		2.56	6.77	0.00136	0.00360	PASS		
Extreme (30°C)		1.31	15.53	0.00070	0.00826	PASS		
Extreme (20°C)		6.83	8.12	0.00364	0.00432	PASS		
Extreme (10°C)		1.08	10.58	0.00058	0.00563	PASS		



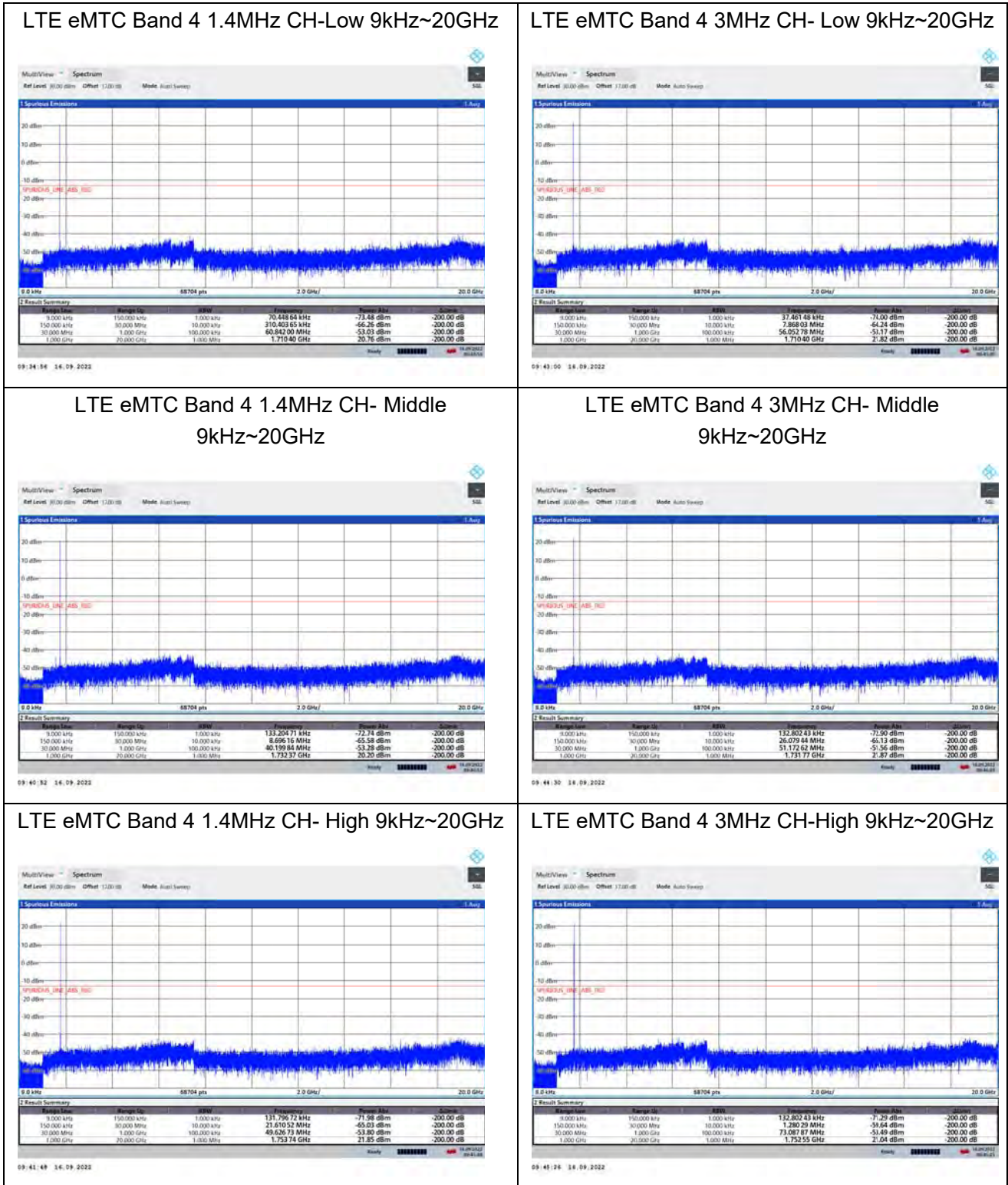
Extreme (0°C)			6.51	13.22	0.00347	0.00703	PASS	
Extreme (-10°C)			10.00	7.80	0.00532	0.00415	PASS	
Extreme (-20°C)			8.54	2.06	0.00454	0.00109	PASS	
Extreme (-30°C)			5.79	3.04	0.00308	0.00162	PASS	
25°C	LV		17.78	15.88	0.00946	0.00845	PASS	
	HV		14.71	9.17	0.00782	0.00488	PASS	
Condition			Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability(ppm)	Frequency Stability(ppm)	Verdict	
BANDWIDTH	10MHz							
Temperature	Voltage		16QAM	QPSK	16QAM	QPSK		
Normal (25°C)		Normal	14.58	5.35	0.00775	0.00284	PASS	
Extreme (50°C)			6.76	3.58	0.00360	0.00190	PASS	
Extreme (40°C)			17.70	16.33	0.00941	0.00869	PASS	
Extreme (30°C)			12.35	15.44	0.00657	0.00821	PASS	
Extreme (20°C)			10.84	12.18	0.00577	0.00648	PASS	
Extreme (10°C)			13.48	12.77	0.00717	0.00679	PASS	
Extreme (0°C)			13.68	5.94	0.00727	0.00316	PASS	
Extreme (-10°C)			2.66	9.78	0.00142	0.00520	PASS	
Extreme (-20°C)			10.08	13.62	0.00536	0.00725	PASS	
Extreme (-30°C)			16.71	17.26	0.00889	0.00918	PASS	
25°C	LV			17.47	9.72	0.00929	0.00517	PASS
	HV			4.56	8.23	0.00242	0.00438	PASS
Condition				Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability(ppm)	Frequency Stability(ppm)	Verdict
BANDWIDTH	15MHz							
Temperature	Voltage		16QAM	QPSK	16QAM	QPSK		
Normal (25°C)		Normal	6.85	13.93	0.00365	0.00741	PASS	
Extreme (50°C)			12.71	15.42	0.00676	0.00820	PASS	
Extreme (40°C)			16.59	17.35	0.00882	0.00923	PASS	
Extreme (30°C)			4.90	4.02	0.00260	0.00214	PASS	
Extreme (20°C)			12.73	16.21	0.00677	0.00862	PASS	
Extreme (10°C)			5.42	14.83	0.00288	0.00789	PASS	
Extreme (0°C)			3.94	11.73	0.00210	0.00624	PASS	
Extreme (-10°C)			17.61	12.82	0.00937	0.00682	PASS	
Extreme (-20°C)			1.33	11.40	0.00071	0.00606	PASS	
Extreme (-30°C)			10.51	4.27	0.00559	0.00227	PASS	
25°C	LV			15.28	13.39	0.00813	0.00712	PASS
	HV		11.08	5.21	0.00589	0.00277	PASS	
Condition			Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability(ppm)	Frequency Stability(ppm)	Verdict	
BANDWIDTH	20MHz							
Temperature	Voltage		16QAM	QPSK	16QAM	QPSK		
Normal (25°C)		Normal	1.19	6.69	0.00063	0.00356	PASS	



	Extreme (50°C)		1.62	17.79	0.00086	0.00946	PASS
	Extreme (40°C)		9.65	13.44	0.00513	0.00715	PASS
	Extreme (30°C)		11.16	7.08	0.00594	0.00376	PASS
	Extreme (20°C)		5.64	17.57	0.00300	0.00935	PASS
	Extreme (10°C)		15.04	6.57	0.00800	0.00350	PASS
	Extreme (0°C)		13.90	6.17	0.00739	0.00328	PASS
	Extreme (-10°C)		7.13	4.22	0.00380	0.00224	PASS
	Extreme (-20°C)		9.17	16.08	0.00488	0.00856	PASS
	Extreme (-30°C)		6.97	15.08	0.00371	0.00802	PASS
	25°C		LV	6.41	14.12	0.00341	0.00751
	HV	13.57	8.38	0.00722	0.00446	PASS	

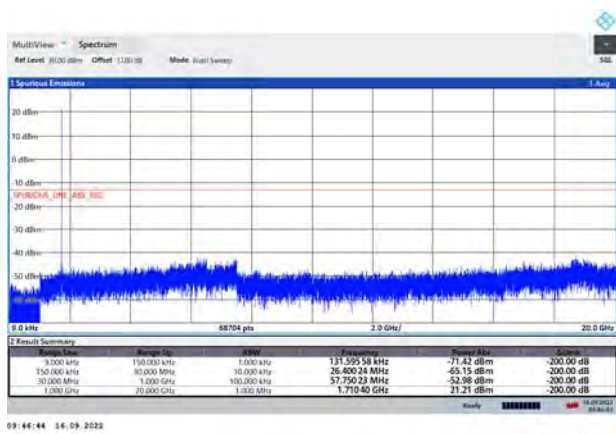
### 6.6 Spurious Emissions at Antenna Terminals

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported. The signal beyond the limit is carrier.

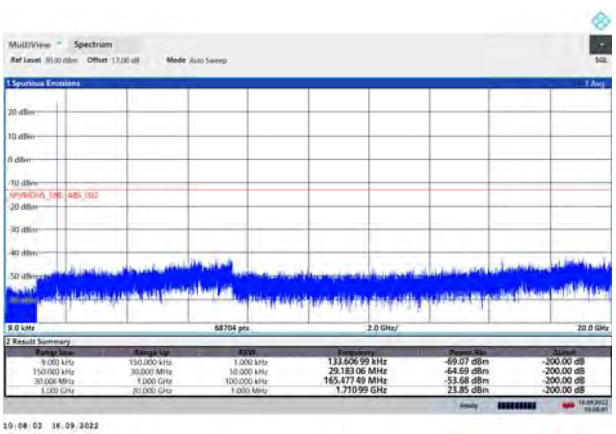




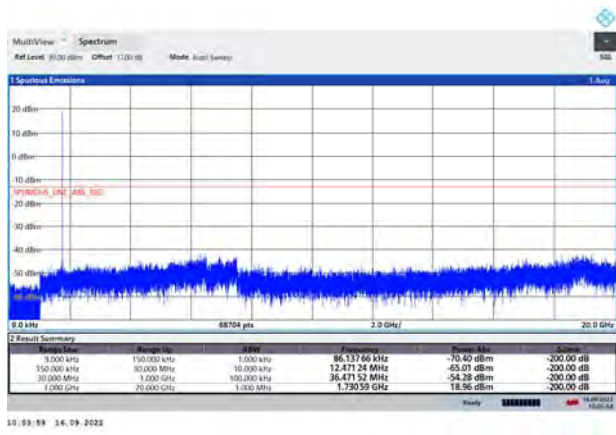
LTE eMTC Band 4 5MHz CH- Low 9kHz~20GHz



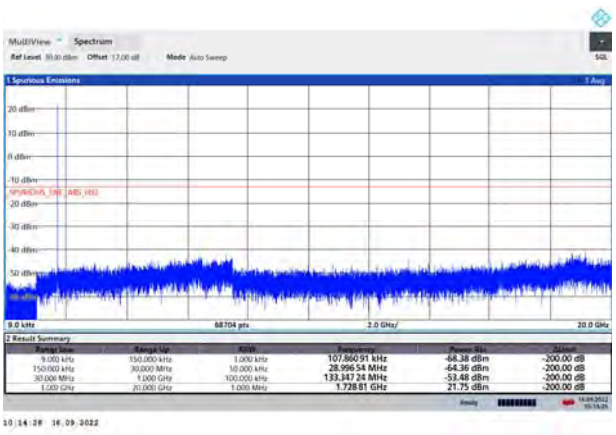
LTE eMTC Band 4 10MHz CH-Low 9kHz~20GHz



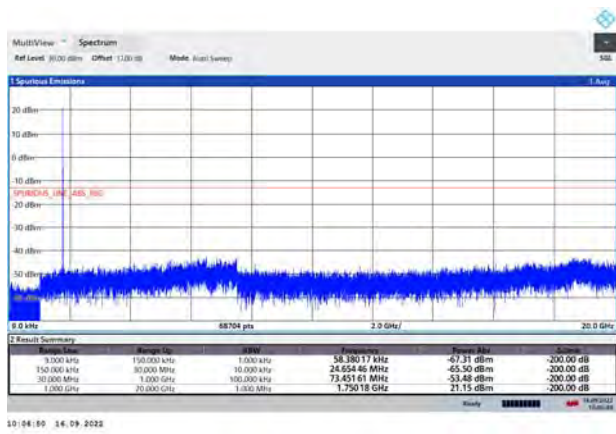
LTE eMTC Band 4 5MHz CH- Middle 9kHz~20GHz



LTE eMTC Band 4 10MHz CH- Middle 9kHz~20GHz



LTE eMTC Band 4 5MHz CH-High 9kHz~20GHz

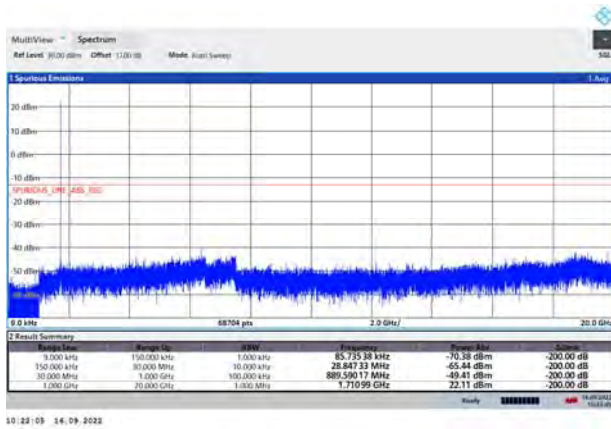


LTE eMTC Band 4 10MHz CH- High 9kHz~20GHz



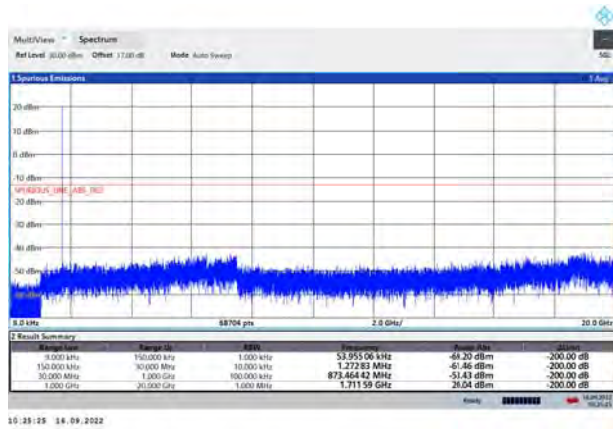


LTE eMTC Band 4 15MHz CH- Low 9kHz~20GHz



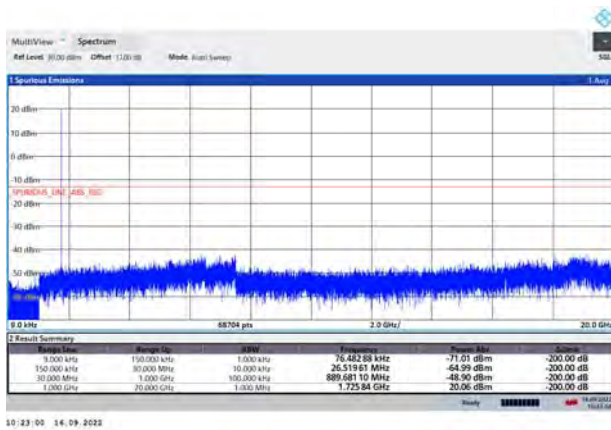
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LTE eMTC Band 4 20MHz CH-Low 9kHz~20GHz



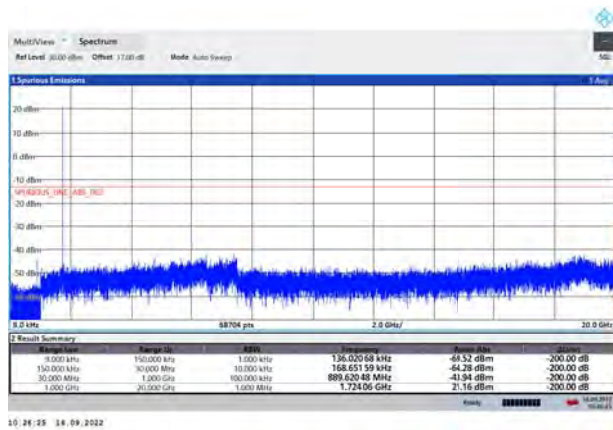
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LTE eMTC Band 4 15MHz CH- Middle 9kHz~20GHz



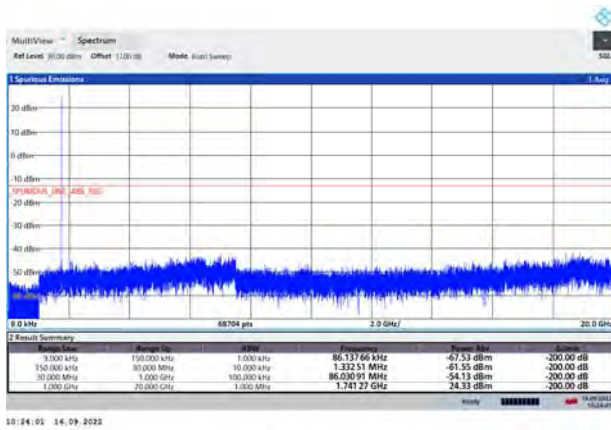
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LTE eMTC Band 4 20MHz CH- Middle 9kHz~20GHz



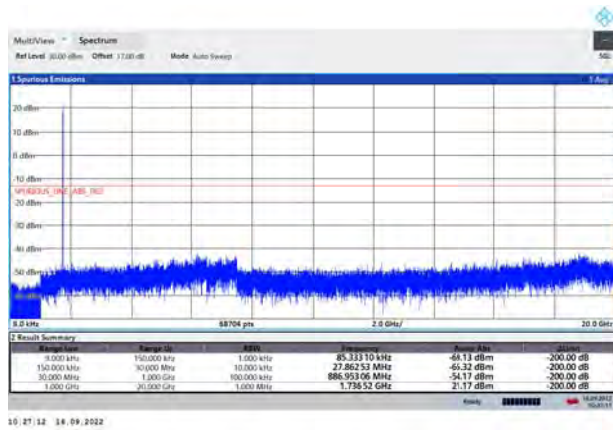
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LTE eMTC Band 4 15MHz CH-High 9kHz~20GHz



10:24:05 14.09.2022

LTE eMTC Band 4 20MHz CH- High 9kHz~20GHz

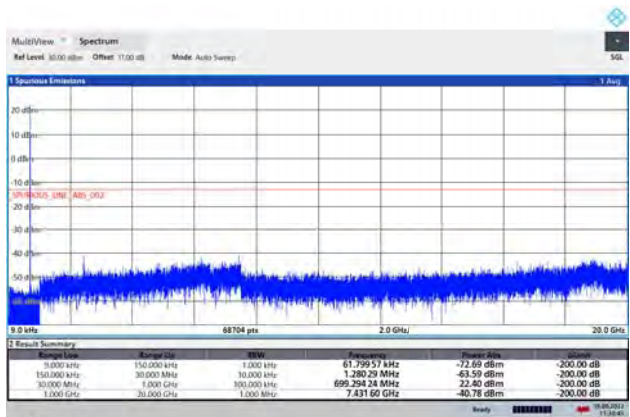


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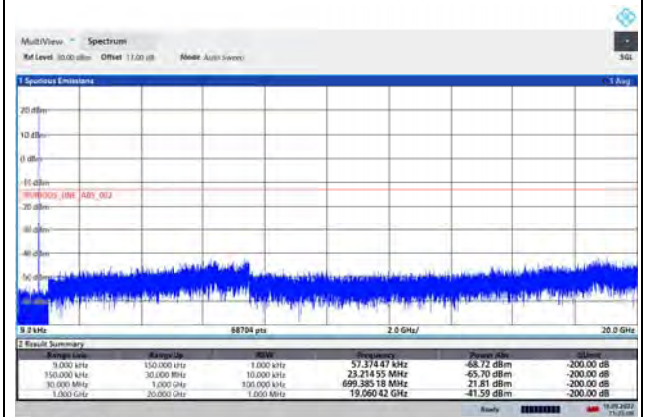


LTE eMTC Band 12 1.4MHz CH-Low 9kHz ~10GHz



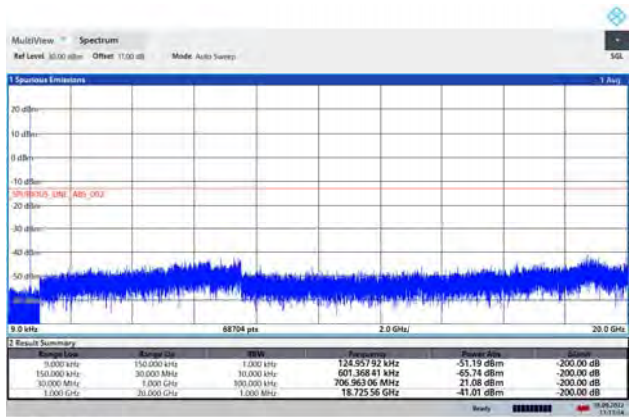
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LTE eMTC Band 12 3MHz CH-Low 9kHz ~10GHz



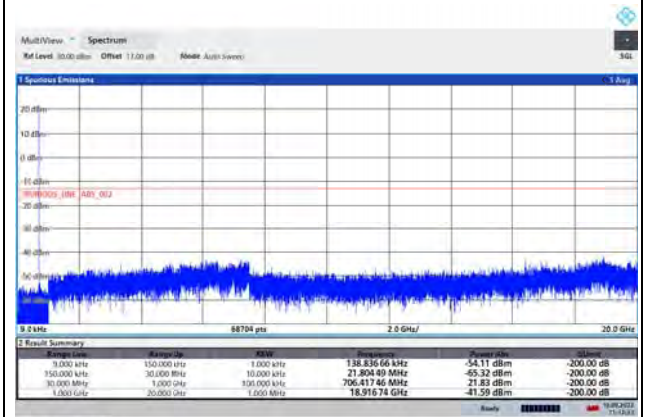
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LTE eMTC Band 12 1.4MHz CH- Middle 9kHz ~10GHz



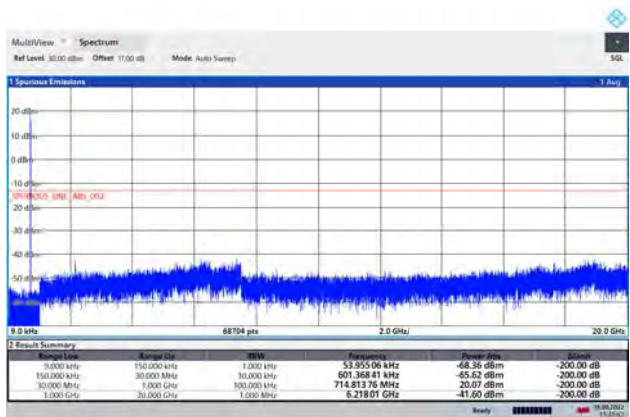
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LTE eMTC Band 12 3MHz CH- Middle 9kHz ~10GHz



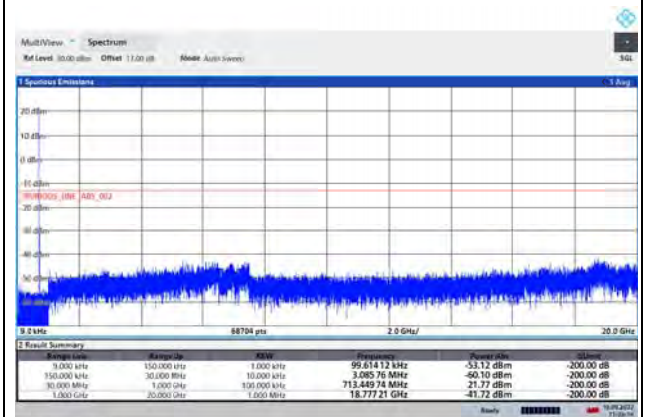
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LTE eMTC Band 12 1.4MHz CH-High 9kHz ~10GHz



11:21:57 16.09.2022

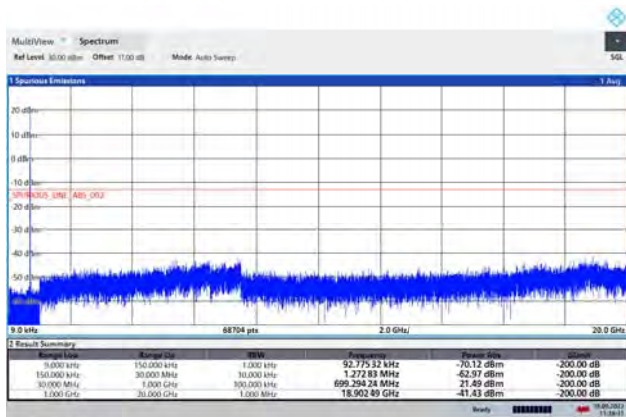
LTE eMTC Band 12 3MHz CH-High 9kHz ~10GHz



11:16:17 16.09.2022

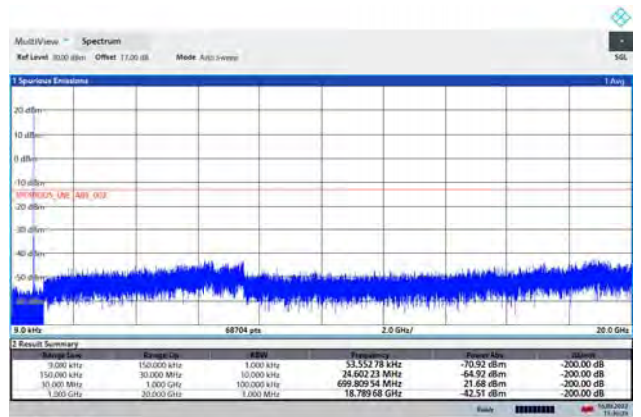


LTE eMTC Band 12 5MHz CH-Low 9kHz ~10GHz



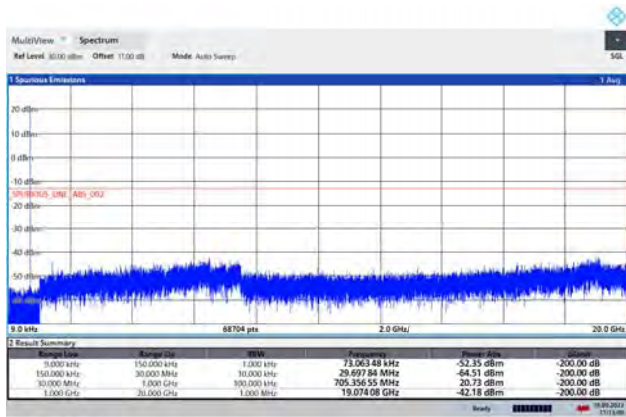
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LTE eMTC Band 12 10MHz CH-Low 9kHz ~10GHz



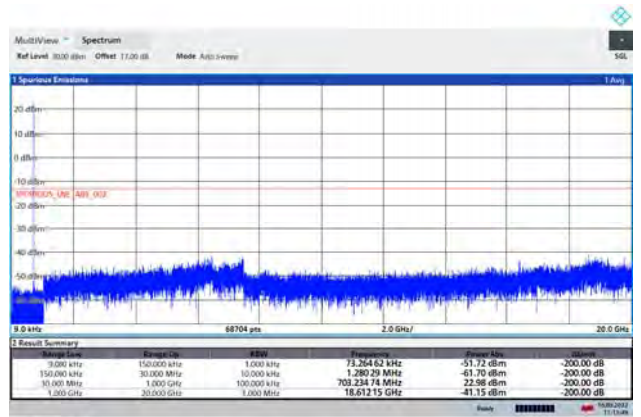
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LTE eMTC Band 12 5MHz CH- Middle 9kHz ~10GHz



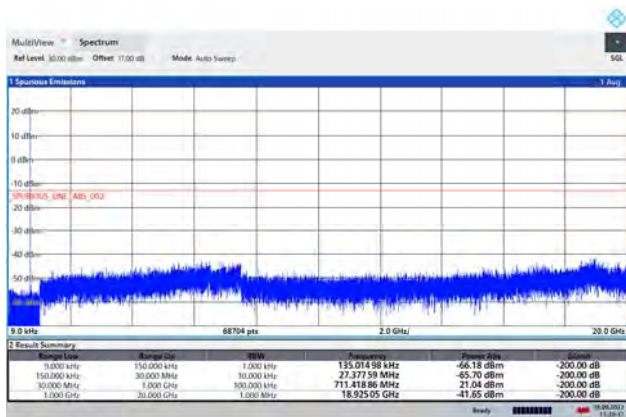
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LTE eMTC Band 12 10MHz CH- Middle 9kHz ~10GHz



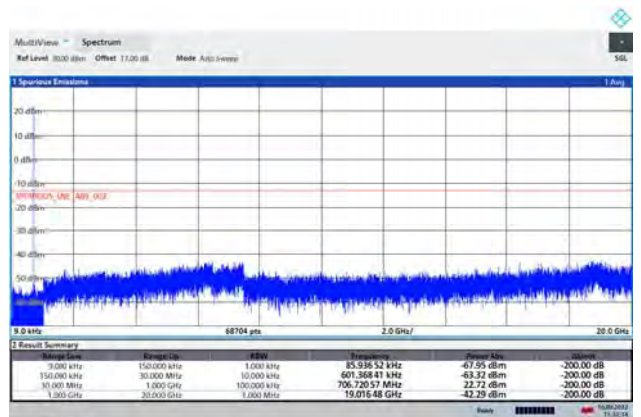
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LTE eMTC Band 12 5MHz CH-High 9kHz ~10GHz



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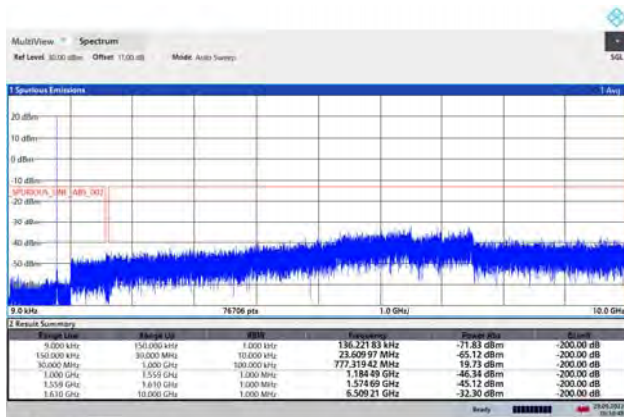
LTE eMTC Band 12 10MHz CH-High 9kHz ~10GHz



11:32:14 16.09.2022

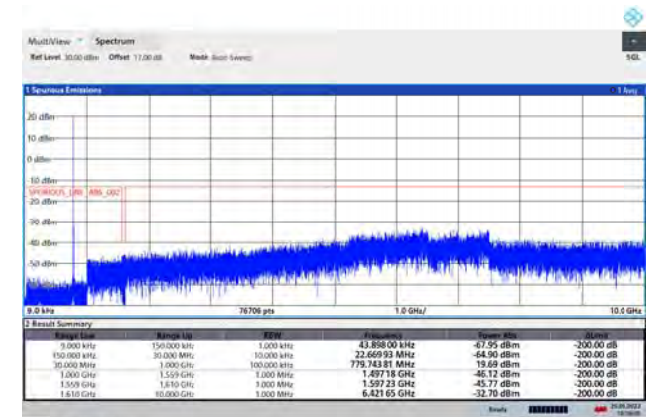


LTE eMTC Band 13 5MHz CH-Low 9kHz ~10GHz



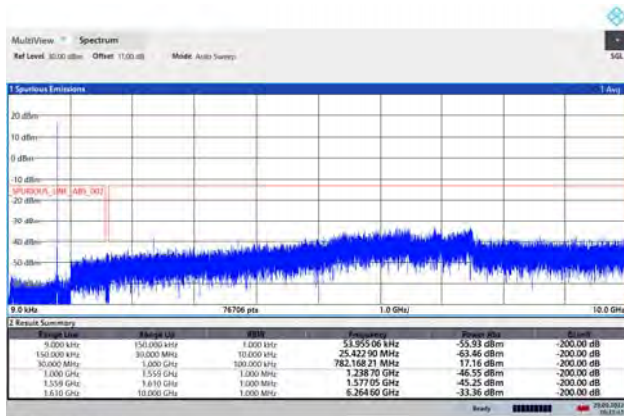
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LTE eMTC Band 13 5MHz CH-Middle 9kHz ~10GHz



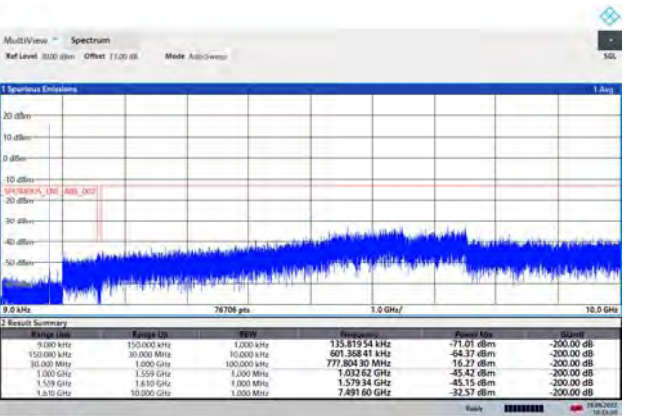
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LTE eMTC Band 13 5MHz CH-High 9kHz ~10GHz



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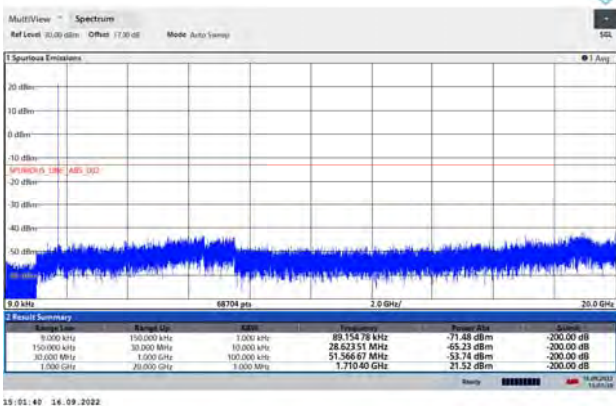
LTE eMTC Band 13 10MHz CH-Middle 9kHz ~10GHz



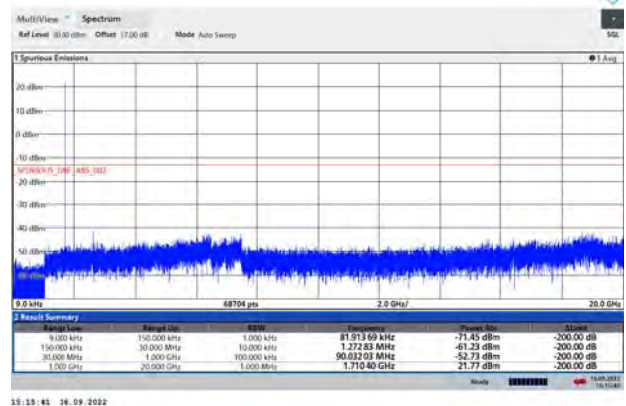
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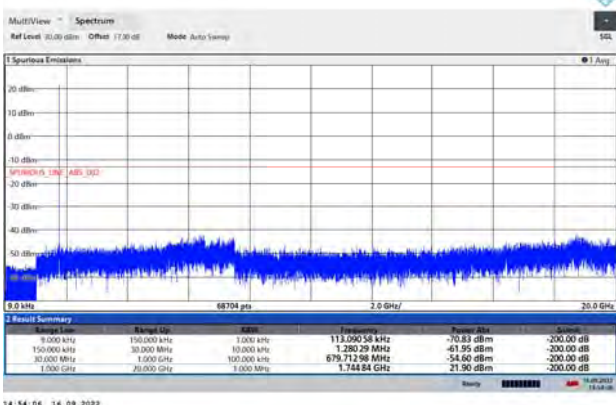
### LTE eMTC Band 66 1.4MHz CH-Low 9kHz ~20GHz



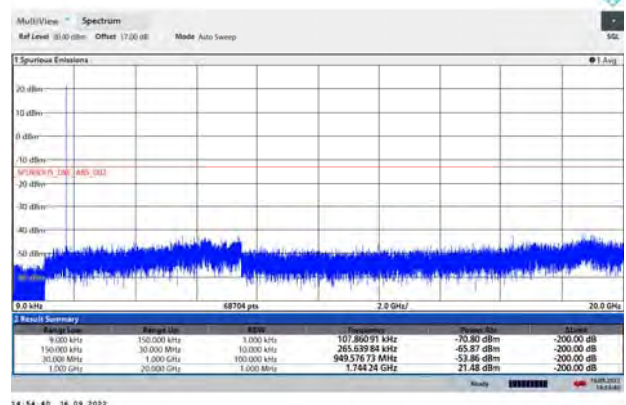
### LTE eMTC Band 66 3MHz CH-Low 9kHz ~20GHz



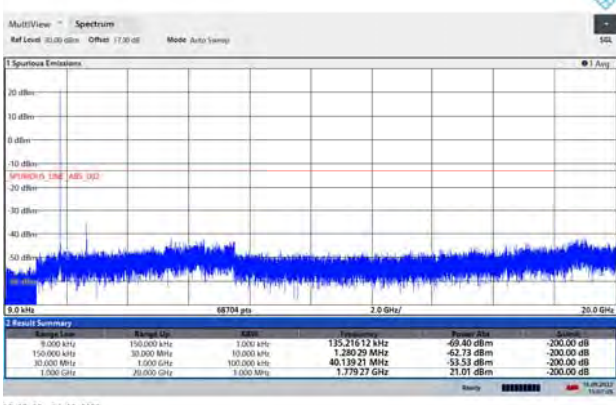
### LTE eMTC Band 66 1.4MHz CH-Middle 9kHz ~20GHz



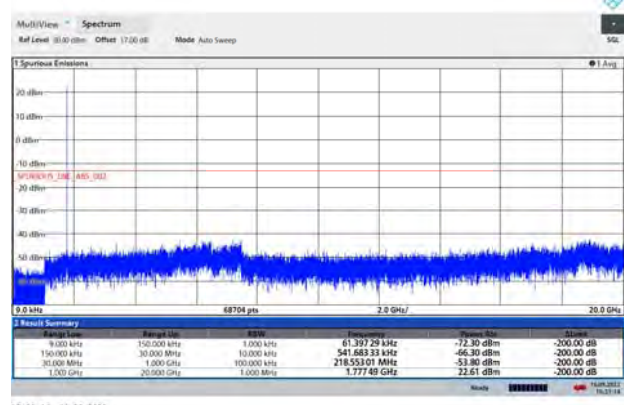
### LTE eMTC Band 66 3MHz CH-Middle 9kHz ~20GHz



### LTE eMTC Band 66 1.4MHz CH-High 9kHz ~20GHz

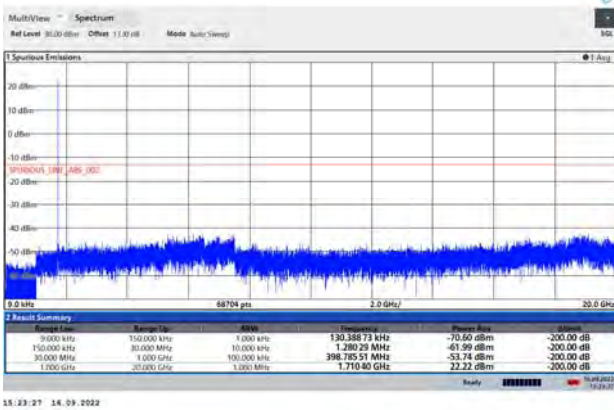


### LTE eMTC Band 66 3MHz CH-High 9kHz ~20GHz

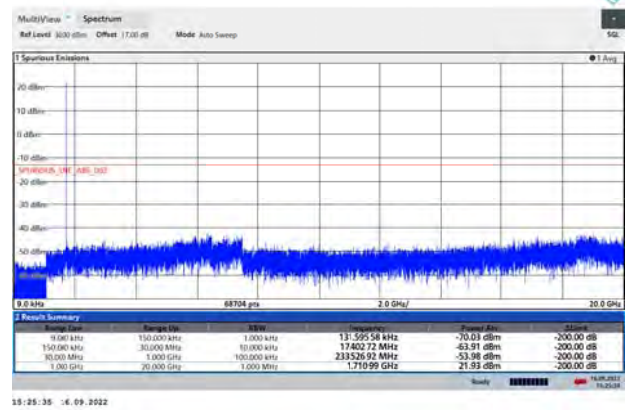




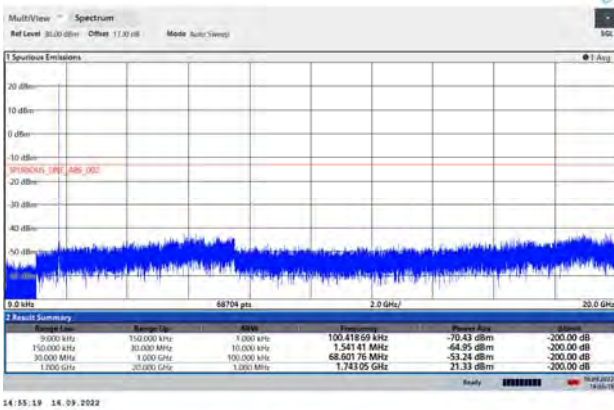
### LTE eMTC Band 66 5MHz CH-Low 9kHz ~20GHz



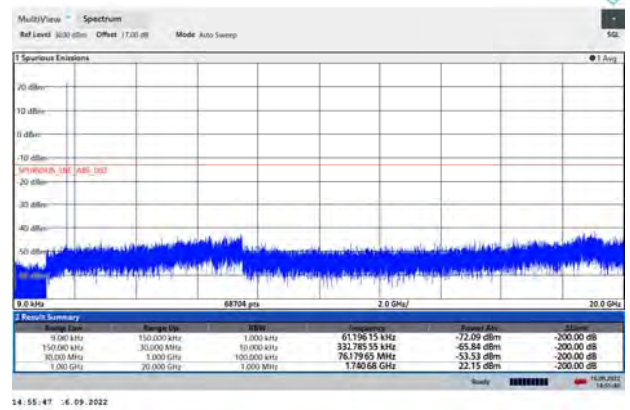
### LTE eMTC Band 66 10MHz CH-Low 9kHz ~20GHz



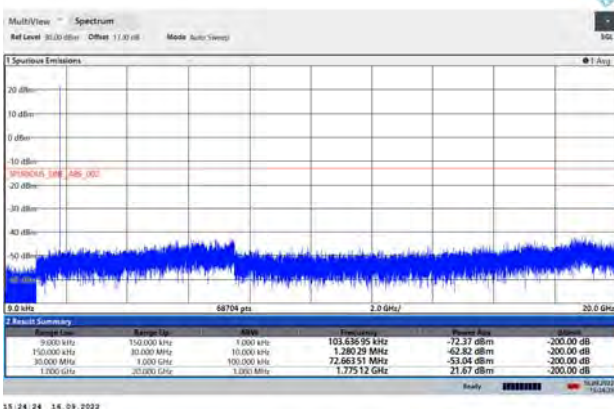
### LTE eMTC Band 66 5MHz CH-Middle 9kHz ~20GHz



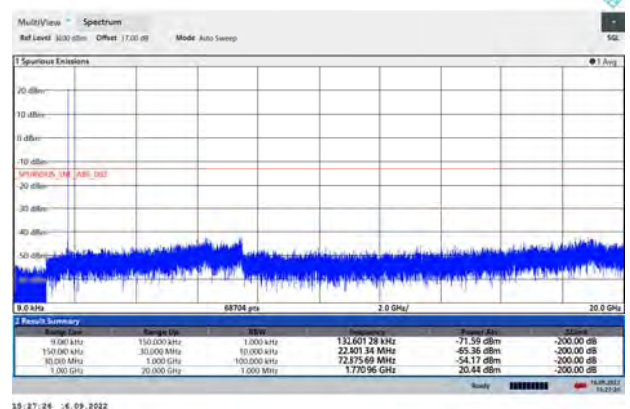
### LTE eMTC Band 66 10MHz CH-Middle 9kHz ~20GHz



### LTE eMTC Band 66 5MHz CH-High 9kHz ~20GHz

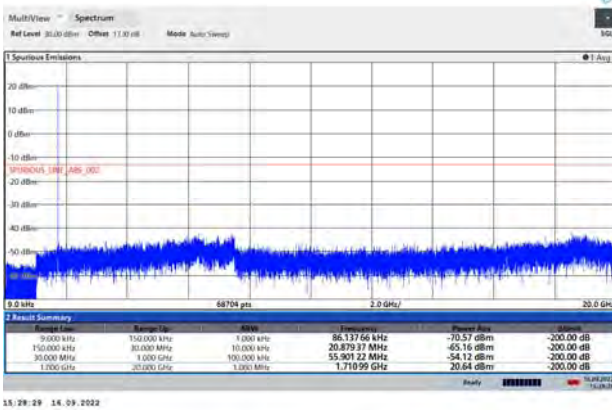


### LTE eMTC Band 66 10MHz CH-High 9kHz ~20GHz



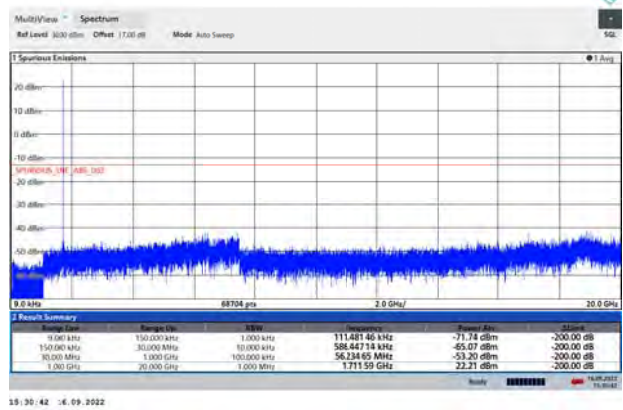


### LTE eMTC Band 66 15MHz CH-Low 9kHz ~20GHz



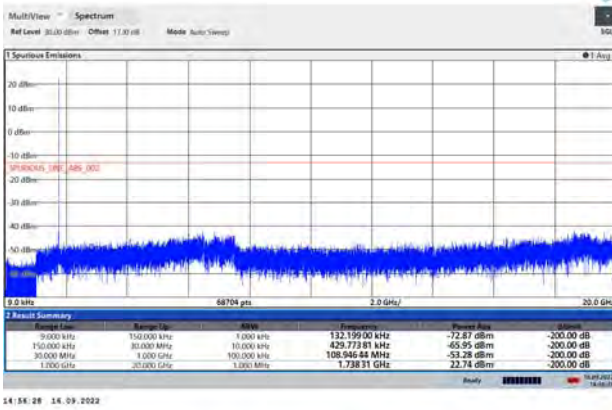
15:29:29 14.09.2022

### LTE eMTC Band 66 20MHz CH-Low 9kHz ~20GHz



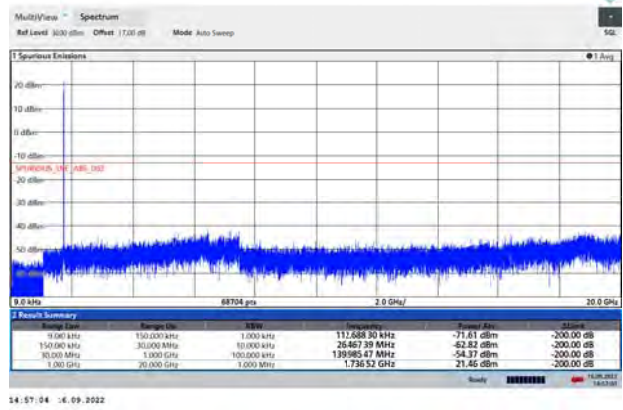
15:30:42 14.09.2022

### LTE eMTC Band 66 15MHz CH-Middle 9kHz ~20GHz



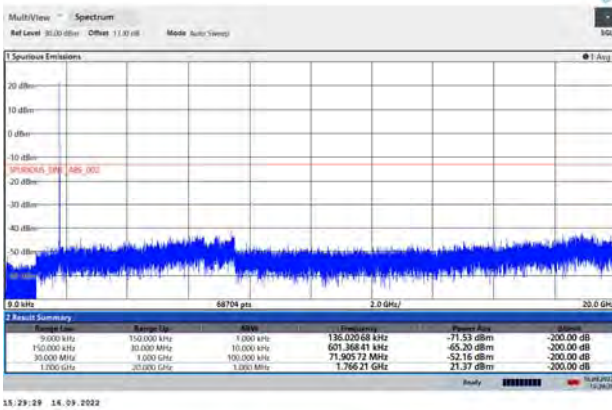
14:58:28 14.09.2022

### LTE eMTC Band 66 20MHz CH-Middle 9kHz ~20GHz



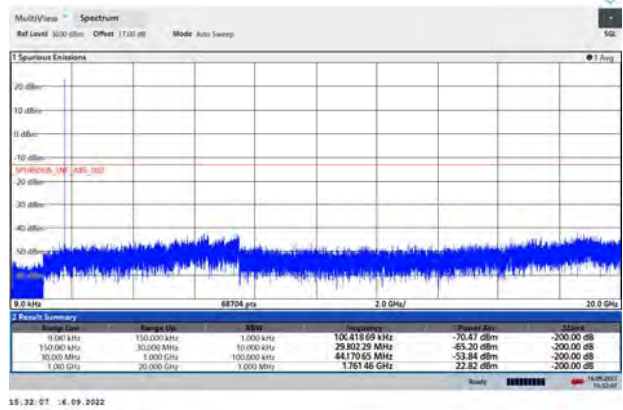
14:57:04 14.09.2022

### LTE eMTC Band 66 15MHz CH-High 9kHz ~20GHz



15:29:29 14.09.2022

### LTE eMTC Band 66 20MHz CH-High 9kHz ~20GHz



15:32:07 14.09.2022



## 6.7 Radiated Spurious Emission

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions below the noise floor will not be recorded in the report.

LTE eMTC Band 4 QPSK 1.4MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3464.25	-60.87	2.70	12.70	Horizontal	-50.87	-13.00	37.87	225
3	5197.50	-65.27	3.20	12.50	Horizontal	-55.97	-13.00	42.97	90
4	6930.00	-61.11	4.20	11.80	Horizontal	-53.51	-13.00	40.51	0
5	8662.50	-56.08	4.40	12.50	Horizontal	-47.98	-13.00	34.98	0
6	10395.00	-52.36	4.70	11.30	Horizontal	-45.76	-13.00	32.76	45
7	12127.50	-54.24	5.20	13.80	Horizontal	-45.64	-13.00	32.64	225
8	13860.00	-47.56	5.70	11.30	Horizontal	-41.96	-13.00	28.96	90
9	15592.50	-55.86	6.10	16.80	Horizontal	-45.16	-13.00	32.16	45
10	17325.00	-51.03	6.10	14.20	Horizontal	-42.93	-13.00	29.93	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 4 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3460.50	-55.18	2.70	12.70	Horizontal	-45.18	-13.00	32.18	225
3	5191.50	-63.66	3.20	12.50	Horizontal	-54.36	-13.00	41.36	90
4	6930.00	-61.82	4.20	11.80	Horizontal	-54.22	-13.00	41.22	45
5	8662.50	-55.35	4.40	12.50	Horizontal	-47.25	-13.00	34.25	315
6	10380.00	-51.50	4.70	11.30	Horizontal	-44.90	-13.00	31.90	0
7	12110.00	-53.22	5.20	13.80	Horizontal	-44.62	-13.00	31.62	225
8	13840.00	-47.89	5.70	11.30	Horizontal	-42.29	-13.00	29.29	90
9	15570.00	-57.32	6.10	16.80	Horizontal	-46.62	-13.00	33.62	45
10	17300.00	-50.39	6.10	14.20	Horizontal	-42.29	-13.00	29.29	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 4 QPSK 20MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3447.75	-56.62	2.70	12.70	Horizontal	-46.62	-13.00	33.62	45
3	5170.88	-61.63	3.20	12.50	Horizontal	-52.33	-13.00	39.33	225
4	6930.00	-61.98	4.20	11.80	Horizontal	-54.38	-13.00	41.38	90
5	8662.50	-56.45	4.40	12.50	Horizontal	-48.35	-13.00	35.35	0
6	10395.00	-51.71	4.70	11.30	Horizontal	-45.11	-13.00	32.11	45
7	12127.50	-54.19	5.20	13.80	Horizontal	-45.59	-13.00	32.59	315
8	13860.00	-48.23	5.70	11.30	Horizontal	-42.63	-13.00	29.63	90
9	15592.50	-56.71	6.10	16.80	Horizontal	-46.01	-13.00	33.01	45
10	17325.00	-51.93	6.10	14.20	Horizontal	-43.83	-13.00	30.83	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.

## LTE eMTC Band 12 QPSK 1.4MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1413.60	-54.88	1.70	8.70	Horizontal	-50.03	-13.00	37.03	45
3	2120.40	-52.90	2.10	11.10	Horizontal	-46.05	-13.00	33.05	225
4	2827.20	-62.35	2.30	13.10	Horizontal	-53.70	-13.00	40.70	135
5	3537.50	-65.87	2.60	12.70	Horizontal	-57.92	-13.00	44.92	45
6	4245.00	-63.67	3.30	12.50	Horizontal	-56.62	-13.00	43.62	225
7	4952.50	-61.45	3.40	12.50	Horizontal	-54.50	-13.00	41.50	90
8	5660.00	-62.89	3.30	12.50	Horizontal	-55.84	-13.00	42.84	45
9	6367.50	-58.67	3.80	11.50	Horizontal	-53.12	-13.00	40.12	135
10	7075.00	-56.93	4.20	11.80	Horizontal	-51.48	-13.00	38.48	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 12 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1410.60	-53.56	1.70	8.70	Horizontal	-48.71	-13.00	35.71	90
3	2115.90	-53.94	2.10	11.10	Horizontal	-47.09	-13.00	34.09	45
4	2820.00	-63.77	2.30	13.10	Horizontal	-55.12	-13.00	42.12	135
5	3525.00	-65.29	2.60	12.70	Horizontal	-57.34	-13.00	44.34	45
6	4230.00	-63.44	3.30	12.50	Horizontal	-56.39	-13.00	43.39	315
7	4935.00	-62.59	3.40	12.50	Horizontal	-55.64	-13.00	42.64	45
8	5640.00	-61.04	3.30	12.50	Horizontal	-53.99	-13.00	40.99	135
9	6345.00	-58.77	3.80	11.50	Horizontal	-53.22	-13.00	40.22	180
10	7050.00	-56.41	4.20	11.80	Horizontal	-50.96	-13.00	37.96	225

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 12 QPSK 10MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1405.00	-53.17	1.70	8.70	Horizontal	-48.32	-13.00	35.32	45
3	2107.50	-57.76	2.10	11.10	Horizontal	-50.91	-13.00	37.91	135
4	2810.00	-62.35	2.30	13.10	Horizontal	-53.70	-13.00	40.70	180
5	3512.50	-65.59	2.60	12.70	Horizontal	-57.64	-13.00	44.64	90
6	4215.00	-63.99	3.30	12.50	Horizontal	-56.94	-13.00	43.94	90
7	4917.50	-61.91	3.40	12.50	Horizontal	-54.96	-13.00	41.96	0
8	5620.00	-61.97	3.30	12.50	Horizontal	-54.92	-13.00	41.92	0
9	6322.50	-60.16	3.80	11.50	Horizontal	-54.61	-13.00	41.61	45
10	7025.00	-56.63	4.20	11.80	Horizontal	-51.18	-13.00	38.18	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 13 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1559.55	-53.97	1.70	8.70	Horizontal	-49.12	-40.00	9.12	180
3	2338.50	-49.29	2.10	12.00	Horizontal	-41.54	-13.00	28.54	315
4	3118.00	-65.06	2.30	13.10	Horizontal	-56.41	-13.00	43.41	270
5	3897.50	-63.25	2.90	12.50	Horizontal	-55.80	-13.00	42.80	315
6	4677.00	-60.27	3.10	12.50	Horizontal	-53.02	-13.00	40.02	90
7	5456.50	-62.38	3.30	12.50	Horizontal	-55.33	-13.00	42.33	225
8	6236.00	-60.36	3.50	12.80	Horizontal	-53.21	-13.00	40.21	0
9	7015.50	-56.33	4.20	11.80	Horizontal	-50.88	-13.00	37.88	45
10	7795.00	-55.96	4.40	12.30	Horizontal	-50.21	-13.00	37.21	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 Vertical position.



LTE eMTC Band 13 QPSK 10MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1554.00	-51.90	1.70	8.70	Horizontal	-47.05	-13.00	34.05	90
3	2331.00	-46.52	2.10	12.00	Horizontal	-38.77	-13.00	25.77	225
4	3108.00	-66.45	2.30	13.10	Horizontal	-57.80	-13.00	44.80	90
5	3885.00	-63.96	2.90	12.50	Horizontal	-56.51	-13.00	43.51	0
6	4662.00	-62.39	3.10	12.50	Horizontal	-55.14	-13.00	42.14	45
7	5439.00	-61.92	3.30	12.50	Horizontal	-54.87	-13.00	41.87	315
8	6216.00	-60.58	3.50	12.80	Horizontal	-53.43	-13.00	40.43	0
9	6993.00	-60.09	4.20	11.80	Horizontal	-54.64	-13.00	41.64	45
10	7770.00	-55.86	4.40	12.30	Horizontal	-50.11	-13.00	37.11	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 66 QPSK 1.4MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3509.25	-57.69	2.70	12.70	Horizontal	-47.69	-13.00	34.69	45
3	5262.50	-65.56	3.20	12.50	Horizontal	-56.26	-13.00	43.26	315
4	7018.00	-58.64	4.20	11.80	Horizontal	-51.04	-13.00	38.04	270
5	8772.50	-55.40	4.40	12.50	Horizontal	-47.30	-13.00	34.30	90
6	10527.00	-51.38	4.70	11.80	Horizontal	-44.28	-13.00	31.28	0
7	12281.50	-51.12	5.20	13.80	Horizontal	-42.52	-13.00	29.52	45
8	14036.00	-48.44	5.70	13.20	Horizontal	-40.94	-13.00	27.94	315
9	15790.50	-56.45	6.10	16.80	Horizontal	-45.75	-13.00	32.75	0
10	17545.00	-51.50	6.10	14.20	Horizontal	-43.40	-13.00	30.40	45

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 66 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3486.00	-54.19	2.70	12.70	Horizontal	-44.19	-13.00	31.19	270
3	5229.00	-61.94	3.20	12.50	Horizontal	-52.64	-13.00	39.64	90
4	6972.00	-62.22	4.20	11.80	Horizontal	-54.62	-13.00	41.62	0
5	8715.00	-55.75	4.40	12.50	Horizontal	-47.65	-13.00	34.65	0
6	10458.00	-52.70	4.70	11.80	Horizontal	-45.60	-13.00	32.60	45
7	12201.00	-53.06	5.20	13.80	Horizontal	-44.46	-13.00	31.46	315
8	13944.00	-49.29	5.70	13.20	Horizontal	-41.79	-13.00	28.79	90
9	15687.00	-56.77	6.10	16.80	Horizontal	-46.07	-13.00	33.07	0
10	17430.00	-50.80	6.10	14.20	Horizontal	-42.70	-13.00	29.70	45

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 66 QPSK 20MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3472.88	-57.64	2.70	12.70	Horizontal	-47.64	-13.00	34.64	135
3	5209.00	-65.04	3.20	12.50	Horizontal	-55.74	-13.00	42.74	90
4	6945.75	-61.55	4.20	11.80	Horizontal	-53.95	-13.00	40.95	0
5	8682.00	-55.90	4.40	12.50	Horizontal	-47.80	-13.00	34.80	45
6	10418.63	-52.28	4.70	11.80	Horizontal	-45.18	-13.00	32.18	315
7	12455.00	-55.23	5.20	13.80	Horizontal	-46.63	-13.00	33.63	90
8	13891.50	-49.32	5.70	13.20	Horizontal	-41.82	-13.00	28.82	0
9	15627.00	-56.93	6.10	16.80	Horizontal	-46.23	-13.00	33.23	45
10	17364.38	-50.70	6.10	14.20	Horizontal	-42.60	-13.00	29.60	225

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 are submitted separately.



## ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.