


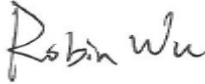


# SPOT CHECK REPORT

## FCC PART 2 & 22 & 24 & 27

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**FCC ID:** XMR2021EM121RGL  
**Application:** Quectel Wireless Solutions Company Limited  
**Application Type:** Certification  
**Product:** LTE-A Cat 12 M.2 Module  
**Model No.:** EM121R-GL  
**Brand Name:** Quectel  
**FCC Rule Part(s):** Part 2, 22 (H), 24 (E), 27  
**Test Procedure(s):** ANSI C63.26: 2015  
**Test Date:** April 28, 2021 ~ May 18, 2021

**Reviewed By:**   
Sunny Sun  
**Approved By:**   
Robin Wu



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.26-2015. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

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## Revision History

Report No.	Version	Description	Issue Date	Note
2104RSU063-U2	Rev. 01	Initial Report	05-30-2021	Valid

Note: This application for certification is leveraging the data reuse procedures from KDB 484596 based on reference FCC ID: XMR2020EM120RGL to cover variant FCC ID: XMR2021EM121RGL.

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## CONTENTS

Description	Page
<b>1. GENERAL INFORMATION .....</b>	<b>4</b>
1.1. Applicant .....	4
1.2. Manufacturer .....	4
1.3. Testing Facility .....	4
1.4. Product Information .....	5
1.5. Radio Specification under Test .....	5
1.6. Description of Available Antennas.....	6
1.7. Test Methodology .....	6
1.8. Device Capabilities .....	7
1.9. EMI Suppression Device(s)/Modifications.....	7
1.10. Configuration of Tested System.....	8
1.11. Test Environment Condition.....	8
<b>2. TEST EQUIPMENT CALIBRATION DATE.....</b>	<b>9</b>
<b>3. MEASUREMENT UNCERTAINTY .....</b>	<b>10</b>
<b>4. TEST RESULT .....</b>	<b>11</b>
4.1. Summary.....	11
4.2. Equivalent Isotropically Radiated Power Measurement .....	12
4.2.1. Test Limit .....	12
4.2.2. Test Procedures Used .....	12
4.2.3. Test Setting.....	12
4.2.4. Test Setup .....	13
4.2.5. Test Result.....	14
4.3. Conducted Spurious Emissions.....	32
4.3.1. Test Limit .....	32
4.3.2. Test Procedure Used .....	32
4.3.3. Test Setting.....	32
4.3.4. Test Setup .....	33
4.3.5. Test Result.....	34
<b>5. CONCLUSION .....</b>	<b>41</b>
<b>Appendix A - Test Setup Photograph .....</b>	<b>42</b>
<b>Appendix B - EUT Photograph.....</b>	<b>43</b>
<b>Appendix C - Reference Test Report .....</b>	<b>44</b>



#### 1.4. Product Information

Product Name:	LTE-A Cat 12 M.2 Module
Model No.:	EM121R-GL
Brand Name:	Quectel
IMEI:	862718050001670
Operating Temperature:	-25 ~ 75 °C
Power Type:	3.1 ~ 4.4Vdc, typical 3.7Vdc
UMTS Specification	
Single Band:	Band 2, 4, 5
Modulation:	Uplink up to 16QAM, Downlink up to 64QAM
E-UTRA Specification	
Single Band:	Band 2, 4, 5, 7, 12, 13, 14, 25, 26, 30, 38, 41, 48, 66
Uplink CA Band:	Intra-Band CA_41C
Modulation:	Uplink up to 64QAM, Downlink up to 256QAM

#### 1.5. Radio Specification under Test

FDD T <sub>x</sub> Frequency Range:	Band 2: 1850 ~ 1910 MHz; Band 4: 1710 ~ 1755 MHz Band 5: 824 ~ 849 MHz; Band 7: 2500 ~ 2570 MHz Band 12: 699 ~ 716 MHz; Band 13: 777 ~ 787 MHz Band 25: 1850 ~ 1915 MHz; Band 26: 824 ~ 849 MHz; Band 66: 1710 ~ 1780 MHz
FDD R <sub>x</sub> Frequency Range:	Band 2: 1930 ~ 1990 MHz; Band 4: 2110 ~ 2155 MHz Band 5: 869 ~ 894 MHz; Band 7: 2620 ~ 2690 MHz Band 12: 729 ~ 746 MHz; Band 13: 746 ~ 756 MHz Band 25: 1930 ~ 1995 MHz; Band 26: 869 ~ 894 MHz; Band 66: 2110 ~ 2200 MHz
TDD T <sub>x</sub> & R <sub>x</sub> Frequency Range:	Band 38: 2570 ~ 2620 MHz; Band 41: 2496 ~ 2690 MHz;

Note 1: For other features of this EUT, test report will be issued separately.

Note 2: The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Note 3: LTE band 26 transmit frequency for part 90 rule is 814 ~ 824MHz and part 22 rule is 824 ~ 849MHz. ERP over 15MHz bandwidth complies the ERP limit line of part 22 rule, therefore ERP of the partial frequency spectrum which falls within part 22 also complies.

## 1.6. Description of Available Antennas

Technology	Frequency Range (MHz)	Antenna Type	Max Peak Gain (dBi)
LTE Band 2	1850 ~ 1910	Dipole	1.15
LTE Band 4	1710 ~ 1755		-0.50
LTE Band 5	824 ~ 849		1.85
LTE Band 7	2500 ~ 2570		1.32
LTE Band 12	699 ~ 716		-2.43
LTE Band 13	777 ~ 787		-0.10
LTE Band 14	788 ~ 798		2.40
LTE Band 25	1850 ~ 1915		1.15
LTE Band 26	814 ~ 849		1.85
LTE Band 30	2305 ~ 2315		-3.64
LTE Band 38	2570 ~ 2620		0.93
LTE Band 41	2496 ~ 2690		0.93
LTE Band 48	3550 ~ 3700		-3.37
LTE Band 66	1710 ~ 1780		-0.50

Note: All antenna information (Antenna type and Peak Gain) is provided by the manufacturer.

## 1.7. Test Methodology

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

- ANSI C63.26:2015
- FCC CFR 47 Part 2, Part 22, Part 24, Part 27
- FCC KDB 971168 D01 v03r01: Power Meas License Digital Systems
- FCC KDB 971168 D02 v02r01: Misc Rev Approv License Devices

## 1.8. Device Capabilities

This device contains the following capabilities:

Working on LTE Band 2, 4, 5, 7, 12, 13, 14, 25, 26, 30, 38, 41, 66;

LTE Band 66 (1710 ~ 1780 MHz) overlaps the entire frequency range of LTE Band 4 (1710 ~ 1755 MHz). Therefore, test data provided in this report covers Band 4 as well as Band 66.

LTE Band 25 (1850 ~ 1915 MHz) overlaps the entire frequency range of LTE Band 2 (1850 ~ 1910 MHz). Therefore, test data provided in this report covers Band 2 as well as Band 25.

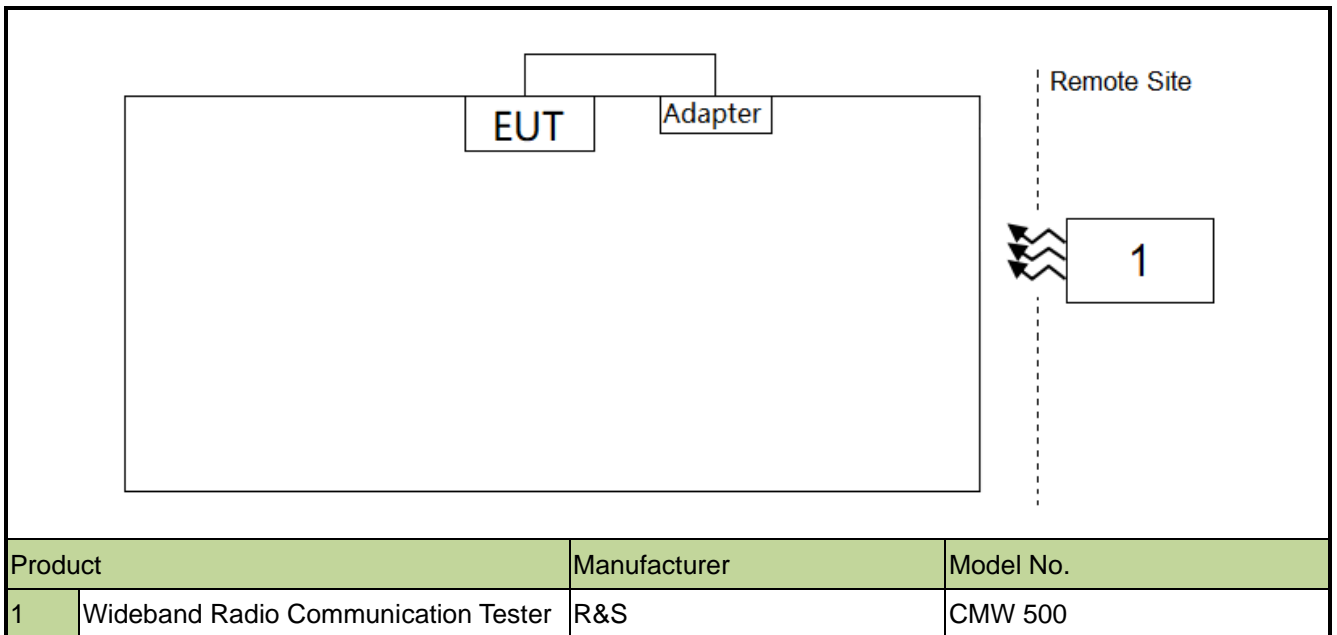
LTE Band 26 (814 ~ 849 MHz) overlaps the entire frequency range of LTE Band 5 (824 ~ 849 MHz). Therefore, test data provided in this report covers Band 5 as well as Band 26.

LTE Band 41 (2496 ~ 2690 MHz) overlaps the entire frequency range of LTE Band 38 (2570 ~ 2620 MHz). Therefore, test data provided in this report covers Band 38 as well as Band 41.

## 1.9. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

### 1.10. Configuration of Tested System



### 1.11. Test Environment Condition

Ambient Temperature	15 ~ 35°C
Relative Humidity	20% ~ 75%RH



## 2. TEST EQUIPMENT CALIBRATION DATE

Conducted Test Equipment (WZ-SR6, WZ-TR3)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2022/04/13
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06452	1 year	2021/07/11
Signal Analyzer	R&S	FSV40	MRTSUE06218	1 year	2022/04/13
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2021/11/07
Power Meter	Agilent	U2021XA	MRTSUE06030	1 year	2021/11/18
DC Power Supply	GWINSTEK	DPS-3303C	MRTSUE06064	N/A	N/A
True RMS Clamp Meter	Fluke	319	MRTSUE06080	1 year	2022/05/05
Directional Coupler	Agilent	87301D	MRTSUE06082	1 year	2022/03/08
Dual Directional Coupler	Agilent	7778D	MRTSUE06083	1 year	2022/03/24
Attenuator	MVE	6dB	MRTSUE06534	1 year	2021/12/12
Attenuator	MVE	10dB	MRTSUE06543	1 year	2021/12/12
Temperature & Humidity Chamber	BAOYT	BYH-150CL	MRTSUE06051	1 year	2021/11/07
Thermohygrometer	testo	608-H1	MRTSUE06401	1 year	2021/08/08

### 3. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k = 2$ .

<b>Conducted Spurious Emissions</b>
Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 0.78dB
<b>Output Power</b>
Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 1.13dB

## 4. TEST RESULT

### 4.1. Summary

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
22.913(a)(5)	Equivalent Radiated Power (Band 5/26)	< 7 Watts Max ERP	Conducted	Pass	Section 4.2
27.50(b)(9) 27.50(c)(9)	Equivalent Radiated Power (Band 12, 13)	< 30 Watts Max ERP			
24.232(c) 27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 2/25, 7, 38/41)	< 2 Watts Max EIRP			
27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4/66)	< 1 Watts Max EIRP			
2.1051, 22.917(a) 24.238(a), 27.53(c), (g), (h), (m)	Spurious Emission	Refer to Section 4.3		Pass	Section 4.3

**Notes:**

- 1) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- 2) The difference compared with the original report is only different GNSS Bands. Output power and conducted spurious emissions verification worst test refer to original report.

## 4.2. Equivalent Isotropically Radiated Power Measurement

### 4.2.1. Test Limit

#### Band 5/26:

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

#### Band 12, 13

Control stations and mobile stations transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 30 watts ERP.

Control and mobile stations in the 698-746 MHz band are limited to 30 watts ERP.

Fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

#### Band 2/25, 7, 38/41:

Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

#### Band 4/66:

Fixed, mobile stations operating in the 1710-1755 MHz band and mobile in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

### 4.2.2. Test Procedures Used

ANSI C63.26-2015 - Section 5.2

### 4.2.3. Test Setting

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation (1) as follows:

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_T$$

where

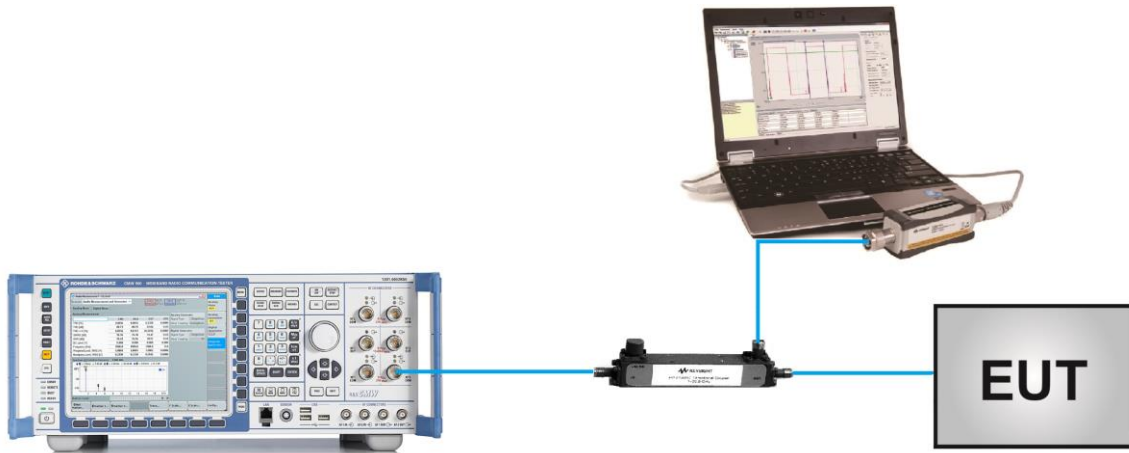
ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as  $P_{\text{Meas}}$ , e.g., dBm or dBW)

$P_{\text{Meas}}$  measured transmitter output power or PSD, in dBm or dBW

$G_T$  gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

ERP = EIRP -2.15

#### 4.2.4. Test Setup



#### 4.2.5. Test Result

Product	LTE-A Cat 12 M.2 Module	Test Site	WZ-SR6
Test Engineer	Cloud Guo	Test Date	2021/04/28
Test Band	LTE Band 2/25		

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	EIRP (dBm)	Limit (dBm)
<b>QPSK</b>							
26047	1850.70	1.4	1	0	23.31	24.46	< 33.01
26365	1882.50				23.37	24.52	< 33.01
26683	1914.30				23.16	24.31	< 33.01
26047	1850.70	1.4	1	2	23.41	24.56	< 33.01
26365	1882.50				23.43	24.58	< 33.01
26683	1914.30				23.25	24.40	< 33.01
26047	1850.70	1.4	1	6	23.38	24.53	< 33.01
26365	1882.50				23.36	24.51	< 33.01
26683	1914.30				23.15	24.30	< 33.01
26047	1850.70	1.4	6	0	22.43	23.58	< 33.01
26365	1882.50				22.44	23.59	< 33.01
26683	1914.30				22.22	23.37	< 33.01
26055	1851.50	3	1	0	23.42	24.57	< 33.01
26365	1882.50				23.36	24.51	< 33.01
26675	1913.50				23.20	24.35	< 33.01
26055	1851.50	3	1	7	23.50	24.65	< 33.01
26365	1882.50				23.52	24.67	< 33.01
26675	1913.50				23.39	24.54	< 33.01
26055	1851.50	3	1	14	23.39	24.54	< 33.01
26365	1882.50				23.41	24.56	< 33.01
26675	1913.50				23.28	24.43	< 33.01
26055	1851.50	3	15	0	22.51	23.66	< 33.01
26365	1882.50				22.38	23.53	< 33.01
26675	1913.50				22.35	23.50	< 33.01

Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	EIRP (dBm)	Limit (dBm)
<b>QPSK</b>							
26065	1852.50	5	1	0	23.27	24.42	< 33.01
26365	1882.50				23.19	24.34	< 33.01
26665	1912.50				23.24	24.39	< 33.01
26065	1852.50	5	1	12	23.48	24.63	< 33.01
26365	1882.50				23.48	24.63	< 33.01
26665	1912.50				23.42	24.57	< 33.01
26065	1852.50	5	1	24	23.18	24.33	< 33.01
26365	1882.50				23.12	24.27	< 33.01
26665	1912.50				23.29	24.44	< 33.01
26065	1852.50	5	25	0	22.47	23.62	< 33.01
26365	1882.50				22.46	23.61	< 33.01
26665	1912.50				22.26	23.41	< 33.01
16390	1855.00	10	1	0	22.88	24.03	< 33.01
26365	1882.50				22.70	23.85	< 33.01
26640	1910.00				23.19	24.34	< 33.01
16390	1855.00	10	1	24	23.51	24.66	< 33.01
26365	1882.50				23.47	24.62	< 33.01
26640	1910.00				23.34	24.49	< 33.01
16390	1855.00	10	1	49	22.69	23.84	< 33.01
26365	1882.50				22.32	23.47	< 33.01
26640	1910.00				23.10	24.25	< 33.01
16390	1855.00	10	50	0	22.20	23.35	< 33.01
26365	1882.50				22.21	23.36	< 33.01
26640	1910.00				22.08	23.23	< 33.01
Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)							

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	EIRP (dBm)	Limit (dBm)
<b>QPSK</b>							
26115	1857.50	15	1	0	23.20	24.35	< 33.01
26365	1882.50				23.73	24.88	< 33.01
26615	1907.50				23.41	24.56	< 33.01
26115	1857.50	15	1	37	23.43	24.58	< 33.01
26365	1882.50				23.58	24.73	< 33.01
26615	1907.50				23.38	24.53	< 33.01
26115	1857.50	15	1	74	23.04	24.19	< 33.01
26365	1882.50				23.42	24.57	< 33.01
26615	1907.50				23.23	24.38	< 33.01
26115	1857.50	15	75	0	22.48	23.63	< 33.01
26365	1882.50				22.41	23.56	< 33.01
26615	1907.50				22.39	23.54	< 33.01
26140	1860.00	20	1	0	23.50	24.65	< 33.01
26365	1882.50				23.49	24.64	< 33.01
26590	1905.00				23.49	24.64	< 33.01
26140	1860.00	20	1	49	23.44	24.59	< 33.01
26365	1882.50				23.33	24.48	< 33.01
26590	1905.00				23.39	24.54	< 33.01
26140	1860.00	20	1	99	24.42	25.57	< 33.01
26365	1882.50				23.27	24.42	< 33.01
26590	1905.00				23.27	24.42	< 33.01
26140	1860.00	20	100	0	23.29	24.44	< 33.01
26365	1882.50				22.25	23.40	< 33.01
26590	1905.00				22.28	23.43	< 33.01
Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)							



Product	LTE-A Cat 12 M.2 Module	Test Site	WZ-SR6
Test Engineer	Cloud Guo	Test Date	2021/04/28
Test Band	LTE Band 4/66		

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	EIRP (dBm)	Limit (dBm)
QPSK							
131979	1710.70	1.4	1	0	22.93	22.43	< 30.00
132322	1745.00				23.19	22.69	< 30.00
132665	1779.30				23.10	22.60	< 30.00
131979	1710.70	1.4	1	2	23.04	22.54	< 30.00
132322	1745.00				23.21	22.71	< 30.00
132665	1779.30				23.23	22.73	< 30.00
131979	1710.70	1.4	1	6	22.95	22.45	< 30.00
132322	1745.00				23.15	22.65	< 30.00
132665	1779.30				23.17	22.67	< 30.00
131979	1710.70	1.4	6	0	22.13	21.63	< 30.00
132322	1745.00				22.27	21.77	< 30.00
132665	1779.30				22.22	21.72	< 30.00
131987	1711.50	3	1	0	23.01	22.51	< 30.00
132322	1745.00				23.18	22.68	< 30.00
132657	1778.50				23.13	22.63	< 30.00
131987	1711.50	3	1	7	23.08	22.58	< 30.00
132322	1745.00				23.33	22.83	< 30.00
132657	1778.50				23.34	22.84	< 30.00
131987	1711.50	3	1	14	22.95	22.45	< 30.00
132322	1745.00				23.20	22.70	< 30.00
132657	1778.50				23.20	22.70	< 30.00
131987	1711.50	3	15	0	22.16	21.66	< 30.00
132322	1745.00				22.26	21.76	< 30.00
132657	1778.50				22.26	21.76	< 30.00

Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	EIRP (dBm)	Limit (dBm)
<b>QPSK</b>							
131997	1712.50	5	1	0	22.78	22.28	< 30.00
132322	1745.00				22.97	22.47	< 30.00
132647	1777.50				22.99	22.49	< 30.00
131997	1712.50	5	1	12	23.10	22.60	< 30.00
132322	1745.00				23.27	22.77	< 30.00
132647	1777.50				23.31	22.81	< 30.00
131997	1712.50	5	1	24	22.89	22.39	< 30.00
132322	1745.00				22.95	22.45	< 30.00
132647	1777.50				22.96	22.46	< 30.00
131997	1712.50	5	25	0	22.09	21.59	< 30.00
132322	1745.00				22.17	21.67	< 30.00
132647	1777.50				22.28	21.78	< 30.00
132022	1715.00	10	1	0	22.21	21.71	< 30.00
132322	1745.00				23.01	22.51	< 30.00
132622	1775.00				22.10	21.60	< 30.00
132022	1715.00	10	1	24	22.48	21.98	< 30.00
132322	1745.00				22.93	22.43	< 30.00
132622	1775.00				23.02	22.52	< 30.00
132022	1715.00	10	1	49	23.17	22.67	< 30.00
132322	1745.00				22.24	21.74	< 30.00
132622	1775.00				22.29	21.79	< 30.00
132022	1715.00	10	50	0	21.83	21.33	< 30.00
132322	1745.00				22.03	21.53	< 30.00
132622	1775.00				21.97	21.47	< 30.00
Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)							

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	EIRP (dBm)	Limit (dBm)
<b>QPSK</b>							
132047	1717.50	15	1	0	23.08	22.58	< 30.00
132322	1745.00				23.21	22.71	< 30.00
132597	1772.50				23.40	22.90	< 30.00
132047	1717.50	15	1	37	23.36	22.86	< 30.00
132322	1745.00				23.40	22.90	< 30.00
132597	1772.50				22.33	21.83	< 30.00
132047	1717.50	15	1	74	23.03	22.53	< 30.00
132322	1745.00				23.06	22.56	< 30.00
132597	1772.50				23.39	22.89	< 30.00
132047	1717.50	15	75	0	22.24	21.74	< 30.00
132322	1745.00				22.44	21.94	< 30.00
132597	1772.50				22.26	21.76	< 30.00
132072	1720.00	20	1	0	22.64	22.14	< 30.00
132322	1745.00				22.73	22.23	< 30.00
132572	1770.00				23.44	22.94	< 30.00
132072	1720.00	20	1	49	23.13	22.63	< 30.00
132322	1745.00				23.36	22.86	< 30.00
132572	1770.00				23.44	22.94	< 30.00
132072	1720.00	20	1	99	22.19	21.69	< 30.00
132322	1745.00				22.63	22.13	< 30.00
132572	1770.00				23.37	22.87	< 30.00
132072	1720.00	20	100	0	22.11	21.61	< 30.00
132322	1745.00				22.25	21.75	< 30.00
132572	1770.00				22.31	21.81	< 30.00
Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)							

Product	LTE-A Cat 12 M.2 Module	Test Site	WZ-SR6
Test Engineer	Cloud Guo	Test Date	2021/04/28
Test Band	LTE Band 5/26		

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	ERP (dBm)	Limit (dBm)
QPSK							
26797	824.70	1.4	1	0	23.32	23.02	< 38.45
26915	836.50				23.33	23.03	< 38.45
27033	848.30				23.08	22.78	< 38.45
26797	824.70	1.4	1	2	23.30	23.00	< 38.45
26915	836.50				23.25	22.95	< 38.45
27033	848.30				23.20	22.90	< 38.45
26797	824.70	1.4	1	6	23.30	23.00	< 38.45
26915	836.50				23.36	23.06	< 38.45
27033	848.30				23.07	22.77	< 38.45
26797	824.70	1.4	6	0	22.54	22.24	< 38.45
26915	836.50				22.47	22.17	< 38.45
27033	848.30				22.28	21.98	< 38.45
26805	825.50	3	1	0	23.26	22.96	< 38.45
26915	836.50				23.42	23.12	< 38.45
27015	846.50				23.28	22.98	< 38.45
26805	825.50	3	1	7	23.51	23.21	< 38.45
26915	836.50				23.53	23.23	< 38.45
27015	846.50				23.29	22.99	< 38.45
26805	825.50	3	1	14	23.33	23.03	< 38.45
26915	836.50				23.41	23.11	< 38.45
27015	846.50				23.21	22.91	< 38.45
26805	825.50	3	15	0	22.65	22.35	< 38.45
26915	836.50				22.65	22.35	< 38.45
27015	846.50				22.38	22.08	< 38.45

Note: The ERP (dBm) = Output Power (dBm) + Antenna Gain (dBi) - 2.15

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	ERP (dBm)	Limit (dBm)
<b>QPSK</b>							
26815	826.50	5	1	0	23.43	23.13	< 38.45
26915	836.50				23.56	23.26	< 38.45
27015	846.50				23.23	22.93	< 38.45
26815	826.50	5	1	12	23.49	23.19	< 38.45
26915	836.50				23.50	23.20	< 38.45
27015	846.50				23.33	23.03	< 38.45
26815	826.50	5	1	24	23.29	22.99	< 38.45
26915	836.50				23.43	23.13	< 38.45
27015	846.50				23.14	22.84	< 38.45
26815	826.50	5	25	0	22.30	22.00	< 38.45
26915	836.50				22.22	21.92	< 38.45
27015	846.50				22.29	21.99	< 38.45
26840	829.00	10	1	0	23.60	23.30	< 38.45
26915	836.50				23.63	23.33	< 38.45
26990	844.00				23.55	23.25	< 38.45
26840	829.00	10	1	24	23.38	23.08	< 38.45
26915	836.50				23.37	23.07	< 38.45
26990	844.00				23.38	23.08	< 38.45
26840	829.00	10	1	49	23.21	22.91	< 38.45
26915	836.50				23.37	23.07	< 38.45
26990	844.00				23.22	22.92	< 38.45
26840	829.00	10	50	0	22.31	22.01	< 38.45
26915	836.50				22.26	21.96	< 38.45
26990	844.00				22.11	21.81	< 38.45
Note: The ERP (dBm) = Output Power (dBm) + Antenna Gain (dBi) - 2.15							

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	ERP (dBm)	Limit (dBm)
QPSK							
26765	821.50	15	1	0	23.69	23.39	< 38.45
26915	836.50				23.56	23.26	< 38.45
26965	841.50				23.70	23.40	< 38.45
26765	821.50	15	1	37	23.63	23.33	< 38.45
26915	836.50				23.34	23.04	< 38.45
26965	841.50				23.51	23.21	< 38.45
26765	821.50	15	1	74	23.56	23.26	< 38.45
26915	836.50				23.27	22.97	< 38.45
26965	841.50				23.43	23.13	< 38.45
26765	821.50	15	75	0	22.81	22.51	< 38.45
26915	836.50				22.51	22.21	< 38.45
26965	841.50				22.44	22.14	< 38.45
Note: The ERP (dBm) = Output Power (dBm) + Antenna Gain (dBi) - 2.15							

Product	LTE-A Cat 12 M.2 Module	Test Site	WZ-SR6
Test Engineer	Cloud Guo	Test Date	2021/04/28
Test Band	LTE Band 7		

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	EIRP (dBm)	Limit (dBm)
QPSK							
20775	2502.50	5	1	0	23.28	24.60	< 33.01
21100	2535.00				23.39	24.71	< 33.01
21425	2567.50				23.41	24.73	< 33.01
20775	2502.50	5	1	12	23.37	24.69	< 33.01
21100	2535.00				23.48	24.80	< 33.01
21425	2567.50				23.61	24.93	< 33.01
20775	2502.50	5	1	24	23.30	24.62	< 33.01
21100	2535.00				23.24	24.56	< 33.01
21425	2567.50				23.54	24.86	< 33.01
20775	2502.50	5	25	0	22.36	23.68	< 33.01
21100	2535.00				22.35	23.67	< 33.01
21425	2567.50				22.46	23.78	< 33.01
20800	2505.00	10	1	0	23.15	24.47	< 33.01
21100	2535.00				23.36	24.68	< 33.01
21400	2565.00				23.12	24.44	< 33.01
20800	2505.00	10	1	24	23.18	24.50	< 33.01
21100	2535.00				23.36	24.68	< 33.01
21400	2565.00				23.30	24.62	< 33.01
20800	2505.00	10	1	49	23.16	24.48	< 33.01
21100	2535.00				23.40	24.72	< 33.01
21400	2565.00				23.28	24.60	< 33.01
20800	2505.00	10	50	0	22.09	23.41	< 33.01
21100	2535.00				22.28	23.60	< 33.01
21400	2565.00				22.24	23.56	< 33.01

Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	EIRP (dBm)	Limit (dBm)
<b>QPSK</b>							
20825	2507.50	15	1	0	23.48	24.80	< 33.01
21100	2535.00				23.56	24.88	< 33.01
21375	2562.50				23.13	24.45	< 33.01
20825	2507.50	15	1	37	23.40	24.72	< 33.01
21100	2535.00				23.58	24.90	< 33.01
21375	2562.50				23.36	24.68	< 33.01
20825	2507.50	15	1	74	23.46	24.78	< 33.01
21100	2535.00				23.41	24.73	< 33.01
21375	2562.50				23.65	24.97	< 33.01
20825	2507.50	15	75	0	22.77	24.09	< 33.01
21100	2535.00				22.57	23.89	< 33.01
21375	2562.50				22.55	23.87	< 33.01
20850	2510.00	20	1	0	23.40	24.72	< 33.01
21100	2535.00				23.47	24.79	< 33.01
21350	2560.00				23.44	24.76	< 33.01
20850	2510.00	20	1	49	23.43	24.75	< 33.01
21100	2535.00				23.42	24.74	< 33.01
21350	2560.00				23.54	24.86	< 33.01
20850	2510.00	20	1	99	23.45	24.77	< 33.01
21100	2535.00				23.25	24.57	< 33.01
21350	2560.00				23.54	24.86	< 33.01
20850	2510.00	20	100	0	22.31	23.63	< 33.01
21100	2535.00				22.37	23.69	< 33.01
21350	2560.00				22.36	23.68	< 33.01
Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)							



Product	LTE-A Cat 12 M.2 Module	Test Site	WZ-SR6
Test Engineer	Cloud Guo	Test Date	2021/04/28
Test Band	LTE Band 12		

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	ERP (dBm)	Limit (dBm)
QPSK							
23017	699.7	1.4	1	0	22.81	18.23	< 34.77
23095	707.5				23.07	18.49	< 34.77
23173	715.3				23.07	18.49	< 34.77
23017	699.7	1.4	1	2	22.89	18.31	< 34.77
23095	707.5				23.12	18.54	< 34.77
23173	715.3				23.20	18.62	< 34.77
23017	699.7	1.4	1	6	22.87	18.29	< 34.77
23095	707.5				23.10	18.52	< 34.77
23173	715.3				23.18	18.60	< 34.77
23017	699.7	1.4	6	0	22.02	17.44	< 34.77
23095	707.5				22.22	17.64	< 34.77
23173	715.3				22.23	17.65	< 34.77
23025	700.5	3	1	0	22.94	18.36	< 34.77
23095	707.5				23.03	18.45	< 34.77
23165	714.5				23.16	18.58	< 34.77
23025	700.5	3	1	7	22.10	17.52	< 34.77
23095	707.5				23.28	18.70	< 34.77
23165	714.5				23.24	18.66	< 34.77
23025	700.5	3	1	14	22.04	17.46	< 34.77
23095	707.5				23.15	18.57	< 34.77
23165	714.5				23.17	18.59	< 34.77
23025	700.5	3	15	0	22.10	17.52	< 34.77
23095	707.5				22.56	17.98	< 34.77
23165	714.5				22.51	17.93	< 34.77

Note: The ERP (dBm) = Output Power (dBm) + Antenna Gain (dBi) - 2.15

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	ERP (dBm)	Limit (dBm)
<b>QPSK</b>							
23035	701.5	5	1	0	22.76	18.18	< 34.77
23095	707.5				22.89	18.31	< 34.77
23155	713.5				23.15	18.57	< 34.77
23035	701.5	5	1	12	23.17	18.59	< 34.77
23095	707.5				23.25	18.67	< 34.77
23155	713.5				2.26	-2.32	< 34.77
23035	701.5	5	1	24	22.91	18.33	< 34.77
23095	707.5				23.01	18.43	< 34.77
23155	713.5				23.15	18.57	< 34.77
23035	701.5	5	25	0	22.07	17.49	< 34.77
23095	707.5				22.22	17.64	< 34.77
23155	713.5				22.28	17.70	< 34.77
23060	704.0	10	1	0	23.12	18.54	< 34.77
23095	707.5				23.03	18.45	< 34.77
23130	711.0				23.18	18.60	< 34.77
23060	704.0	10	1	24	23.11	18.53	< 34.77
23095	707.5				23.07	18.49	< 34.77
23130	711.0				23.14	18.56	< 34.77
23060	704.0	10	1	49	23.12	18.54	< 34.77
23095	707.5				23.11	18.53	< 34.77
23130	711.0				23.19	18.61	< 34.77
23060	704.0	10	50	0	21.83	17.25	< 34.77
23095	707.5				22.09	17.51	< 34.77
23130	711.0				22.06	17.48	< 34.77
Note: The ERP (dBm) = Output Power (dBm) + Antenna Gain (dBi) - 2.15							

Product	LTE-A Cat 12 M.2 Module	Test Site	WZ-SR6
Test Engineer	Cloud Guo	Test Date	2021/04/28
Test Band	LTE Band 13		

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	ERP (dBm)	Limit (dBm)
QPSK							
23205	779.5	5	1	0	22.06	19.81	< 34.77
23230	782.0				23.10	20.85	< 34.77
23255	784.5				23.17	20.92	< 34.77
23205	779.5	5	1	12	23.18	20.93	< 34.77
23230	782.0				23.21	20.96	< 34.77
23255	784.5				23.25	21.00	< 34.77
23205	779.5	5	1	24	23.15	20.90	< 34.77
23230	782.0				23.12	20.87	< 34.77
23255	784.5				23.18	20.93	< 34.77
23205	779.5	5	25	0	22.36	20.11	< 34.77
23230	782.0				23.33	21.08	< 34.77
23255	784.5				22.24	19.99	< 34.77
23230	782.0	10	1	0	23.05	20.80	< 34.77
23230	782.0		1	24	23.01	20.76	< 34.77
23230	782.0		1	49	23.03	20.78	< 34.77
23230	782.0		50	0	21.98	19.73	< 34.77

Note: The ERP (dBm) = Output Power (dBm) + Antenna Gain (dBi) - 2.15

Product	LTE-A Cat 12 M.2 Module	Test Site	WZ-SR6
Test Engineer	Cloud Guo	Test Date	2021/04/28
Test Band	LTE Band 38/41		

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	EIRP (dBm)	Limit (dBm)
QPSK							
39675	2498.50	5	1	0	22.77	23.70	< 33.01
40620	2593.00				22.39	23.32	< 33.01
40565	2687.50				22.39	23.32	< 33.01
39675	2498.50	5	1	12	22.74	23.67	< 33.01
40620	2593.00				22.75	23.68	< 33.01
40565	2687.50				22.33	23.26	< 33.01
39675	2498.50	5	1	24	22.72	23.65	< 33.01
40620	2593.00				22.46	23.39	< 33.01
40565	2687.50				22.31	23.24	< 33.01
39675	2498.50	5	25	0	21.88	22.81	< 33.01
40620	2593.00				21.78	22.71	< 33.01
40565	2687.50				21.89	22.82	< 33.01
39700	2501.00	10	1	0	22.68	23.61	< 33.01
40620	2593.00				21.96	22.89	< 33.01
41540	2685.00				22.09	23.02	< 33.01
39700	2501.00	10	1	24	22.67	23.60	< 33.01
40620	2593.00				22.54	23.47	< 33.01
41540	2685.00				22.22	23.15	< 33.01
39700	2501.00	10	1	49	22.60	23.53	< 33.01
40620	2593.00				21.98	22.91	< 33.01
41540	2685.00				22.45	23.38	< 33.01
39700	2501.00	10	50	0	21.59	22.52	< 33.01
40620	2593.00				21.85	22.78	< 33.01
41540	2685.00				21.68	22.61	< 33.01

Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	EIRP (dBm)	Limit (dBm)
<b>QPSK</b>							
39725	2503.50	15	1	0	22.91	23.84	< 33.01
40620	2593.00				22.67	23.60	< 33.01
41515	2682.50				22.76	23.69	< 33.01
39725	2503.50	15	1	37	22.88	23.81	< 33.01
40620	2593.00				22.71	23.64	< 33.01
41515	2682.50				22.40	23.33	< 33.01
39725	2503.50	15	1	74	22.93	23.86	< 33.01
40620	2593.00				22.56	23.49	< 33.01
41515	2682.50				22.21	23.14	< 33.01
39725	2503.50	15	75	0	21.85	22.78	< 33.01
40620	2593.00				22.22	23.15	< 33.01
41515	2682.50				21.78	22.71	< 33.01
39750	2506.00	20	1	0	22.88	23.81	< 33.01
40620	2593.00				22.20	23.13	< 33.01
41490	2680.00				22.58	23.51	< 33.01
39750	2506.00	20	1	49	23.01	23.94	< 33.01
40620	2593.00				22.73	23.66	< 33.01
41490	2680.00				22.08	23.01	< 33.01
39750	2506.00	20	1	99	23.01	23.94	< 33.01
40620	2593.00				22.19	23.12	< 33.01
41490	2680.00				22.12	23.05	< 33.01
39750	2506.00	20	100	0	21.78	22.71	< 33.01
40620	2593.00				22.30	23.23	< 33.01
41490	2680.00				21.79	22.72	< 33.01
Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)							

Product	LTE-A Cat 12 M.2 Module	Test Site	WZ-SR6
Test Engineer	Cloud Guo	Test Date	2021/04/28
Test Band	Band 38/41_HPUE		

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	EIRP (dBm)	Limit (dBm)
QPSK							
39675	2498.50	5	1	0	25.24	26.17	< 33.01
40620	2593.00				25.01	25.94	< 33.01
40565	2687.50				24.75	25.68	< 33.01
39675	2498.50	5	1	12	25.34	26.27	< 33.01
40620	2593.00				25.32	26.25	< 33.01
40565	2687.50				24.51	25.44	< 33.01
39675	2498.50	5	1	24	25.25	26.18	< 33.01
40620	2593.00				25.06	25.99	< 33.01
40565	2687.50				24.13	25.06	< 33.01
39675	2498.50	5	25	0	24.83	25.76	< 33.01
40620	2593.00				24.78	25.71	< 33.01
40565	2687.50				23.85	24.78	< 33.01
39700	2501.00	10	1	0	25.26	26.19	< 33.01
40620	2593.00				24.44	25.37	< 33.01
41540	2685.00				24.69	25.62	< 33.01
39700	2501.00	10	1	24	25.30	26.23	< 33.01
40620	2593.00				25.06	25.99	< 33.01
41540	2685.00				25.01	25.94	< 33.01
39700	2501.00	10	1	49	25.22	26.15	< 33.01
40620	2593.00				24.35	25.28	< 33.01
41540	2685.00				24.39	25.32	< 33.01
39700	2501.00	10	50	0	24.61	25.54	< 33.01
40620	2593.00				24.51	25.44	< 33.01
41540	2685.00				24.39	25.32	< 33.01

Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	EIRP (dBm)	Limit (dBm)
<b>QPSK</b>							
39725	2503.50	15	1	0	25.40	26.33	< 33.01
40620	2593.00				24.87	25.80	< 33.01
41515	2682.50				25.15	26.08	< 33.01
39725	2503.50	15	1	37	25.48	26.41	< 33.01
40620	2593.00				25.28	26.21	< 33.01
41515	2682.50				25.12	26.05	< 33.01
39725	2503.50	15	1	74	25.52	26.45	< 33.01
40620	2593.00				24.93	25.86	< 33.01
41515	2682.50				24.57	25.50	< 33.01
39725	2503.50	15	75	0	24.88	25.81	< 33.01
40620	2593.00				25.02	25.95	< 33.01
41515	2682.50				24.26	25.19	< 33.01
39750	2506.00	20	1	0	25.20	26.13	< 33.01
40620	2593.00				24.68	25.61	< 33.01
41490	2680.00				25.06	25.99	< 33.01
39750	2506.00	20	1	49	25.53	26.46	< 33.01
40620	2593.00				25.27	26.20	< 33.01
41490	2680.00				24.43	25.36	< 33.01
39750	2506.00	20	1	99	25.51	26.44	< 33.01
40620	2593.00				24.82	25.75	< 33.01
41490	2680.00				24.69	25.62	< 33.01
39750	2506.00	20	100	0	24.77	25.70	< 33.01
40620	2593.00				24.86	25.79	< 33.01
41490	2680.00				24.65	25.58	< 33.01
Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)							

### **4.3. Conducted Spurious Emissions**

#### **4.3.1. Test Limit**

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10<sup>th</sup> harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst-case configuration. All modes of operation were investigated and the worst-case configuration results are reported in this section.

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

For Band 7, 38/41 the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $55 + 10 \log(P)$  dB.

#### **4.3.2. Test Procedure Used**

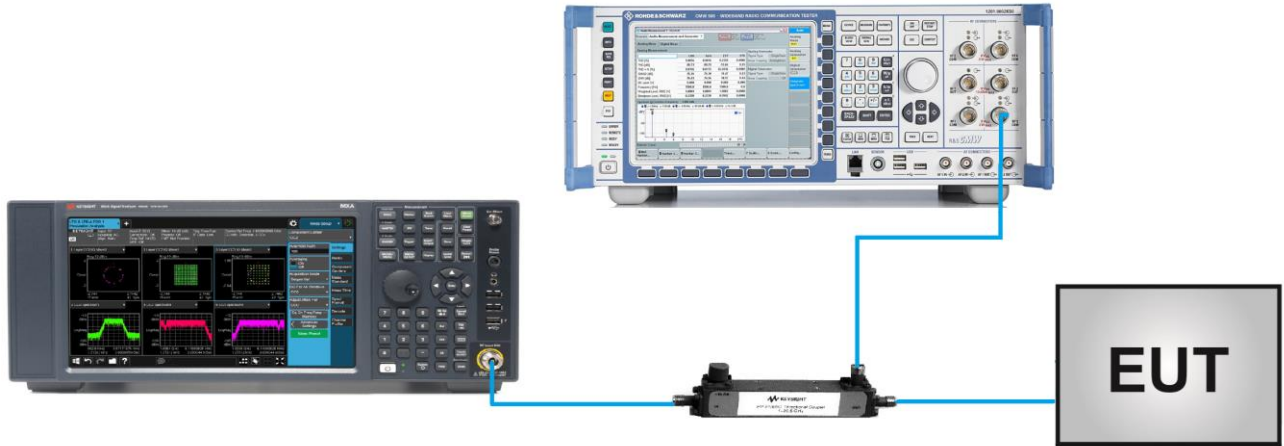
ANSI C63.26-2015 - Section 5.7

#### **4.3.3. Test Setting**

1. Set the analyzer frequency to low, mid, high channel.
2. RBW = 1MHz
3. VBW  $\geq 3 \cdot$ RBW
4. Sweep time = auto
5. Detector = power averaging (rms)
6. Set sweep trigger to "free run."
7. User gate triggered such that the analyzer only sweeps when the device is transmitting at full power.
8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over the on and off time of the transmitter, it can be necessary to increase the number of traces to be averaged above 100, or if using a manually configured sweep time, increase the sweep time.



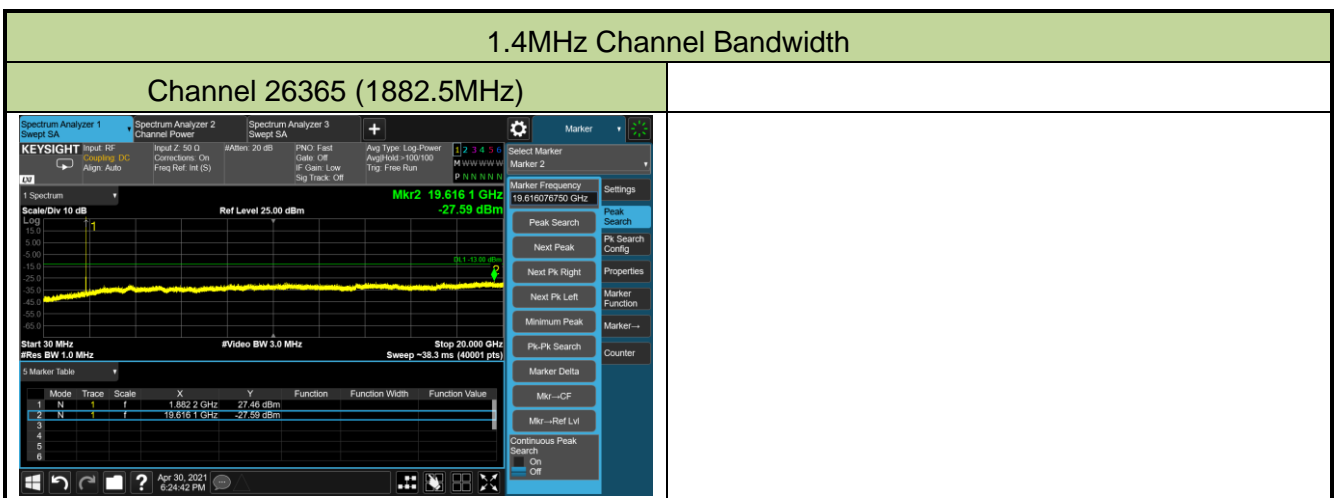
### 4.3.4. Test Setup



### 4.3.5. Test Result

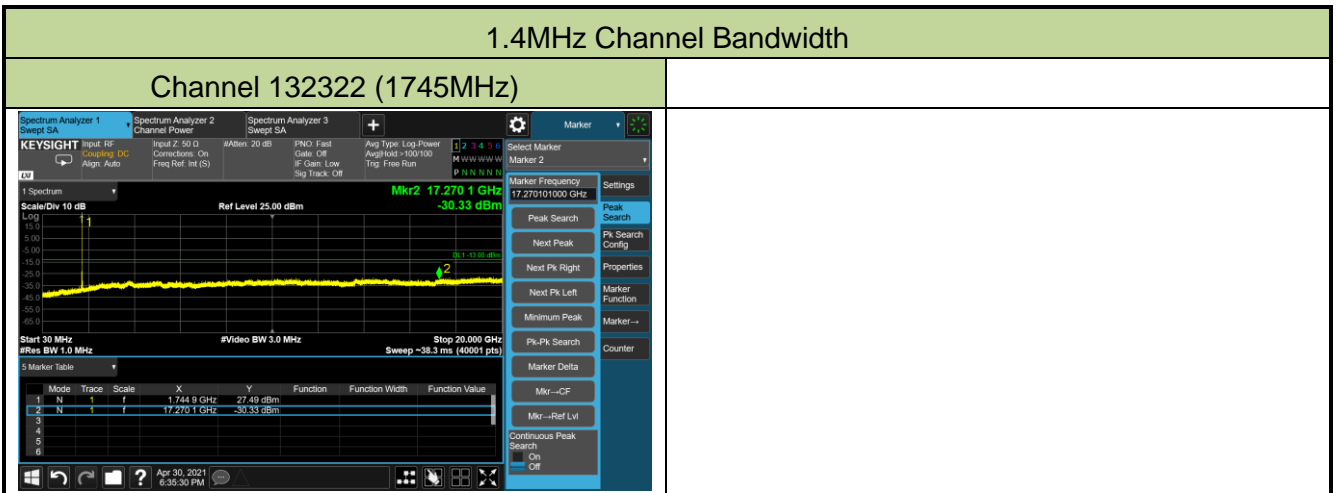
Product	LTE-A Cat 12 M.2 Module	Test Site	WZ-SR6
Test Engineer	Edgar Ma	Test Date	2021/04/30
Test Band	LTE Band 2/25, 1RB, QPSK		

Channel	Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm)	Limit (dBm)	Result
26365	1882.5	1.4	30 ~ 20000	-27.59	≤ -13.00	Pass



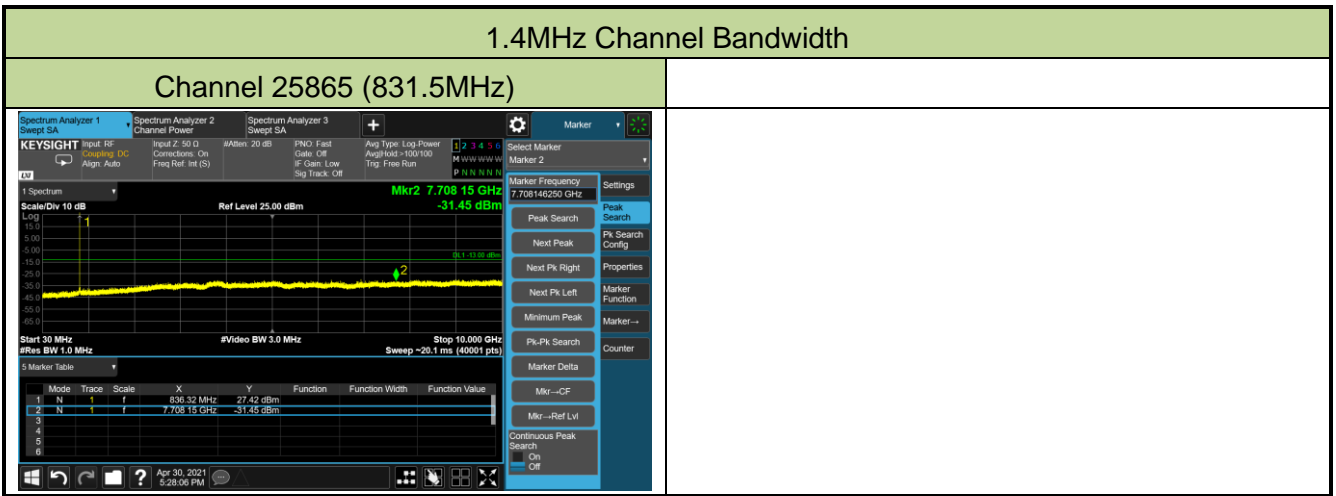
Product	LTE-A Cat 12 M.2 Module	Test Site	WZ-SR6
Test Engineer	Edgar Ma	Test Date	2021/04/30
Test Band	LTE Band 4/66, 1RB, QPSK		

Channel	Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm)	Limit (dBm)	Result
132322	1745.0	1.4	30 ~ 20000	-30.33	≤ -13.00	Pass



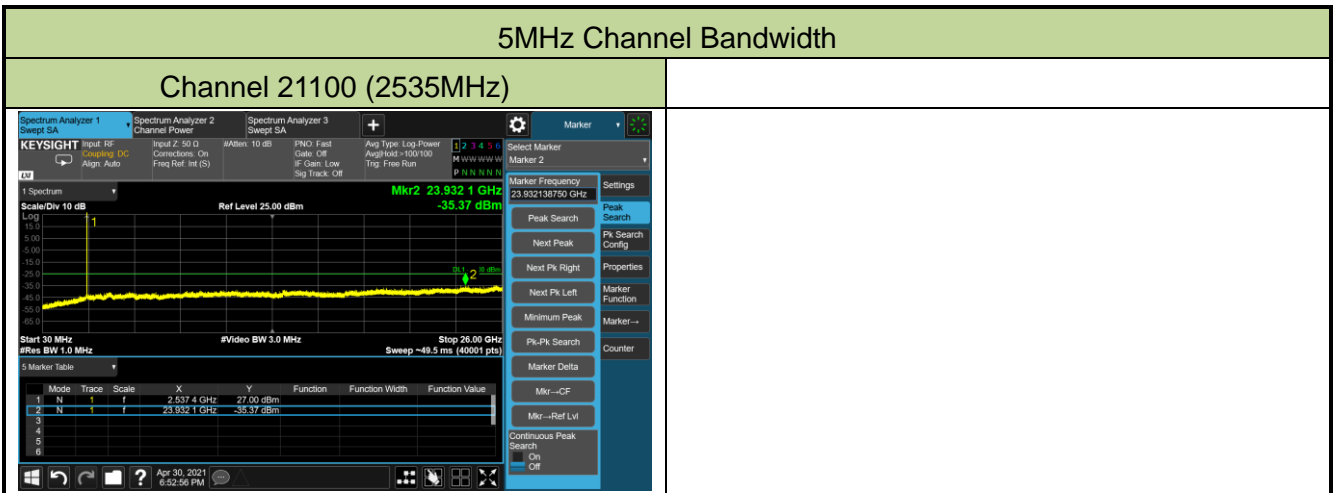
Product	LTE-A Cat 12 M.2 Module	Test Site	WZ-SR6
Test Engineer	Edgar Ma	Test Date	2021/04/30
Test Band	LTE Band 5/26, 1RB, QPSK		

Channel	Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm)	Limit (dBm)	Result
26915	836.5	1.4	30 ~ 10000	-31.45	≤ -13.00	Pass



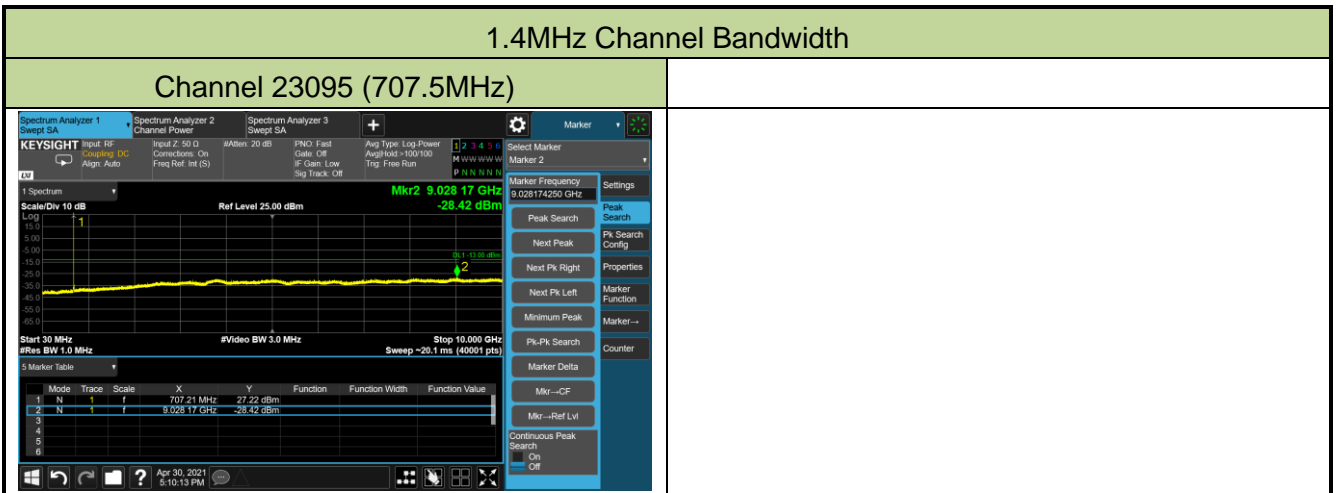
Product	LTE-A Cat 12 M.2 Module	Test Site	WZ-SR6
Test Engineer	Edgar Ma	Test Date	2021/04/30
Test Band	LTE Band 7, 1RB, QPSK		

Channel	Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm)	Limit (dBm)	Result
21100	2535.0	5	30 ~ 26000	-35.37	≤ -25.00	Pass



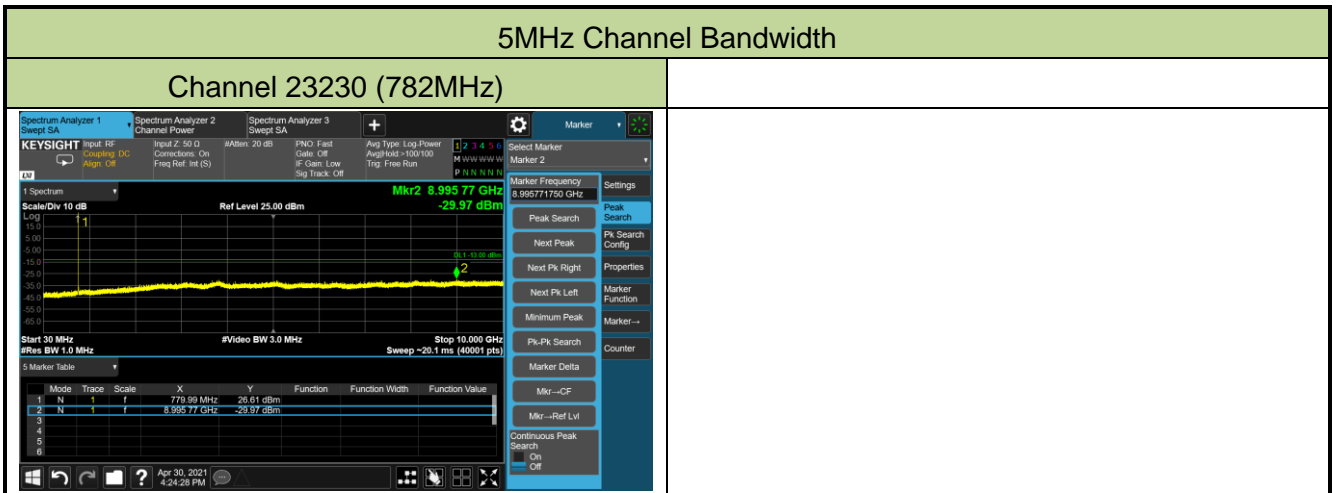
Product	LTE-A Cat 12 M.2 Module	Test Site	WZ-SR6
Test Engineer	Edgar Ma	Test Date	2021/04/30
Test Band	LTE Band 12, 1RB, QPSK		

Channel	Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm)	Limit (dBm)	Result
23095	707.5	1.4	30 ~ 10000	-28.42	≤ -13.00	Pass



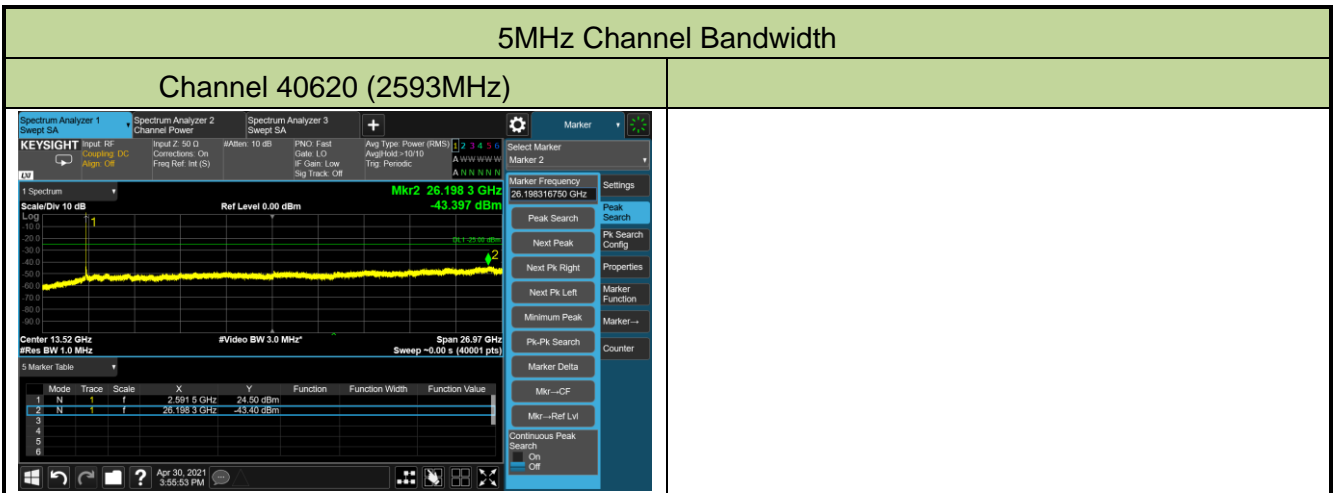
Product	LTE-A Cat 12 M.2 Module	Test Site	WZ-SR6
Test Engineer	Edgar Ma	Test Date	2021/04/30
Test Band	LTE Band 13, 1RB, QPSK		

Channel	Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm)	Limit (dBm)	Result
23230	782.0	5	30 ~ 10000	-29.97	≤ -13.00	Pass



Product	LTE-A Cat 12 M.2 Module	Test Site	WZ-SR6
Test Engineer	Edgar Ma	Test Date	2021/01/19
Test Band	LTE Band 38/41_HPUE, 1RB, QPSK		

Channel	Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm)	Limit (dBm)	Result
40620	2593.00	5	30 ~ 27000	-43.40	≤ -25.00	Pass





## 5. CONCLUSION

The data collected relate only the item(s) tested and show that unit is compliance with FCC Rules.

————— The End —————

## **Appendix A - Test Setup Photograph**

Refer to "2104RSU063-UT" file.

## **Appendix B - EUT Photograph**

Refer to "2104RSU063-UE" file.

## Appendix C - Reference Test Report