

Report No.: SEWM2304000133RG11

Rev.: 01 Page: 1 of 9

TEST REPORT

Application No.: SEWM2304000133RG

Quectel Wireless Solutions Co., Ltd. Applicant:

Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin **Address of Applicant:**

Road, Minhang District, Shanghai 200233, China

Manufacturer: Quectel Wireless Solutions Co., Ltd.

Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Address of Manufacturer:

Road, Minhang District, Shanghai 200233, China

EUT Description: LTE-A Module Model No.: EM061K-GL Trade Mark: QUECTEL

FCC ID: XMR2023EM061KGL3 Standards: 47 CFR Part 2.1091

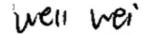
FCC KDB 447498 D01 v06

Date of Receipt: 2023/04/25 Date of Issue: 2023/07/06

Test Result: PASS*

In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Well Wei Wireless Laboratory Manager



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Report No.: SEWM2304000133RG11

Rev.: Page: 2 of 9

Version

Revision Record							
Version	Remark						
01		2023/07/06		Original			

Prepared By	(Nick Hu) / Test Engineer		
Checked By	Stone Ju (Stone Gu) / Reviewer		



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Report No.: SEWM2304000133RG11

Rev.: 01 Page: 3 of 9

Remark:

This test report (Report No.: SEWM2304000133RG11 issue on 2023/07/06) is based on the original test report (Report No.: SEWM2304000133RG02 issue on 2023/06/21).

Review this report and original report, this report just changing ID.

Therefore in this report all items do not need to recalculated and all test data in this report are based on the previous report with report number SEWM2304000133RG02 issue on 2023/06/21.



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Report No.: SEWM2304000133RG11

Rev.: 01 Page: 4 of 9

Contents

1	Ver	rsion	2
		eneral Information	
		Client Information Test Facility	
		General Description of EUT	
3	RF	Exposure Evaluation	7
	3.1	RF Exposure Compliance Requirement	7
		l.1 Limits	
		1.2 Test Procedure	
		1.4 Exposure calculations for multiple sources	



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Report No.: SEWM2304000133RG11

Rev.: 01 Page: 5 of 9

2 General Information

2.1 Client Information

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

2.2 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

A2LA (Certificate No. 6336.01)

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

Innovation, Science and Economic Development Canada

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

• FCC –Designation Number: CN1312

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an

accredited testing laboratory. Designation Number: CN1312.

Test Firm Registration Number: 717327





Report No.: SEWM2304000133RG11

Rev.: 01 Page: 6 of 9

2.3 General Description of EUT

EUT Description:	LTE-A Module							
Model No.:	EM061K-GL							
Trade Mark:	QUECTEL							
Hardware Version:	R1.0	R1.0						
Software Version:	EM061KGLAAR01	A02M2G						
Antenna Type:	⊠ External, ☐ Inte	egrated						
	WCDMA Band II:	0.25dBi	WCDMA Band IV:	1.47dBi				
	WCDMA Band V:	2.68dBi						
	LTE Band 2:	0.25dBi	LTE Band 4:	1.47dBi				
	LTE Band 5:	2.68dBi	LTE Band 7:	0.55dBi				
	LTE Band 12:	-0.2dBi	LTE Band 13:	1.54dBi				
	LTE Band 14:	2.42dBi	LTE Band 17:	-0.2dBi				
Antenna Gain:	LTE Band 25:	0.25dBi	LTE Band 26:	2.87dBi				
	LTE Band 30:	-5.7dBi	LTE Band 38:	-0.18dBi				
	LTE Band 41:	0.78dBi	LTE Band 66:	1.47dBi				
	LTE Band 71:	1.22dBi						
	Note:							
	The antenna gain a manufacturer.	are derived from the	gain information report	provided by the				
Remark:								

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Report No.: SEWM2304000133RG11

Rev.: 7 of 9 Page:

3 RF Exposure Evaluation

3.1 RF Exposure Compliance Requirement

3.1.1 Limits

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm2)	Averaging time (minutes)	
	(A) Limits for Occup	oational/Controlled Expo	sures		
0.3-3.0	614	1.63	*(100)	6	
3.0-30	1842/f	4.89/f	*(900/f2)	6	
30-300	61.4	0.163	1.0	6	
300-1500	/	/	f/300	6	
1500-100,000	/	/	5	6	
	(B) Limits for General P	opulation/Uncontrolled	Exposure		
0.3-1.34	614	1.63	*(100)	30	
1.34-30	824/f	2.19/f	*(180/f2)	30	
30-300	27.5	0.073	0.2	30	
300-1500	/	/	f/1500	30	
1500-100,000	/	/	1.0	30	

F=frequency in MHz

RF exposure compliance will need to be determined with respect to 1.1307(c) and (d) of the FCC rules. The emissions should be within the limits at 300kHz in Table 1 of 1.1310(use the 300kHz limits for 150kHz:614V/m,1.63A/m).

Friis Formula

Friis transmission formula: $Pd = (Pout*G)/(4*Pi*R^2)$

Where

Pd = power density in mW/cm2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

Pd id the limit of MPE, 1 mW/cm2. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.



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⁼Plane-wave equivalent power density



Report No.: SEWM2304000133RG02

Rev.: 01 Page: 8 of 9

3.1.2 Test Procedure

Software provided by client enabled the EUT to transmit data at lowest, middle and highest channel individually

3.1.3 EUT RF Exposure Evaluation

Output Power Into Antenna & RF Exposure Evaluation Distance:

This confirmed that the device comply with MPE limit.

Operating Band	Frequency (MHz)	Antenna Gain (dBi)	Max Conducted Average Output Power (dBm)	EIRP(ERP) (dBm)	EIRP(ERP) Limit (dBm)	Power Density at R = 20 cm (mW/cm2)	Limit (mW/cm2)	Gain according to EIRP(ERP) (dBi)	Gain according to Pd (dBi)	Max Gain Allowed (dBi)	conclusion
WCDMA Band II	1852.4	0.25	25.00	25.25	33.00	0.0666	1.0000	8.00	12.01	8.00	Pass
WCDMA Band VI	1712.4	1.47	25.00	26.47	30.00	0.0883	1.0000	5.00	12.01	5.00	Pass
WCDMA Band V	828.4	2.68	25.00	25.53	38.50	0.1166	0.5523	15.65	9.43	9.43	Pass
LTE Band 2	1850.7	0.25	24.50	24.75	33.00	0.0594	1.0000	8.50	12.51	8.50	Pass
LTE Band 4	1710.7	1.47	24.50	25.97	30.00	0.0787	1.0000	5.50	12.51	5.50	Pass
LTE Band 5	824.7	2.68	24.50	25.03	38.45	0.1039	0.5498	16.10	9.91	9.91	Pass
LTE Band 7	2502.5	0.55	24.00	24.55	33.00	0.0567	1.0000	9.00	13.01	9.00	Pass
LTE Band 12	699.7	-0.20	24.50	22.15	34.77	0.0535	0.4665	12.42	9.20	9.20	Pass
LTE Band 13	779.5	1.54	24.50	23.89	34.77	0.0799	0.5197	12.42	9.66	9.66	Pass
LTE Band 14	790.5	2.42	24.50	24.77	34.77	0.0979	0.5270	12.42	9.73	9.73	Pass
LTE Band 17	706.5	-0.20	24.50	22.15	34.77	0.0535	0.4710	12.42	9.24	9.24	Pass
LTE Band 25	1850.7	0.25	24.50	24.75	33.00	0.0594	1.0000	8.50	12.51	8.50	Pass
LTE Band 26 (814-824)	814.7	2.87	24.50	25.22	NA	0.1086	0.5431	NA	9.86	9.86	Pass
LTE Band 26 (824-849)	824.7	2.87	24.50	25.22	38.45	0.1086	0.5498	16.10	9.91	9.91	Pass
LTE Band 30	2307.5	-5.70	23.00	17.30	23.98	0.0107	1.0000	0.98	14.01	0.98	Pass
LTE Band 38	2572.5	-0.18	24.00	23.82	33.00	0.0479	1.0000	9.00	13.01	9.00	Pass
LTE Band 41	2498.5	0.78	24.00	24.78	33.00	0.0598	1.0000	9.00	13.01	9.00	Pass
LTE Band 66	1710.7	1.47	24.50	25.97	30.00	0.0787	1.0000	5.50	12.51	5.50	Pass
LTE Band 71	665.5	1.22	24.50	23.57	34.77	0.0743	0.4437	12.42	8.98	8.98	Pass
Bluetooth	2402.0	5.00	23.00	28.00		0.1255	1.0000				
WLAN2.4GHz	2412.0	5.00	23.00	28.00		0.1255	1.0000				
WLAN5GHz	5180.0	5.00	23.00	28.00		0.1255	1.0000				

Note:

- 1. This MPE analysis is applicable to any collocated transmitters with transmit power for WLAN is less than or equal to 28dBm and for Bluetooth is less than or equal to 28dBm.
- 2. A maximum antenna gain of 5dBi for WLAN/BT has been assumed for all collocated antennas.



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Report No.: SEWM2304000133RG11

Rev.: 01 Page: 9 of 9

3.1.4 Exposure calculations for multiple sources

When a number of sources at different frequencies, and/or broadband sources, contribute to the total exposure, it becomes necessary to weigh each contribution relative to the MPE in accordance with the provisions of Table(A) and Table(B). To comply with the MPE, the fraction of the MPE in terms of E2, H2 (or power density) incurred within each frequency interval should be determined and the sum of all such fractions should not exceed unity.

In order to ensure compliance with the MPE for a controlled environment, the sum of the ratios of the power density to the corresponding MPE should not exceed unity. That is

$$\sum_{i=1}^{n} \frac{S_i}{MPE_i} \le 1$$

The product also has multiple transmitters The Simultaneous Transmission Possibilities are as below:

Simultaneous Tx Combination	Configuration	
1	WWAN + WiFi 2.4G + WiFi 5G + Bluetooth	

No.	Mode	Power Density (mW/cm²)	MPE Limit (mW/cm²)	Result Ratio	Total Ratio	Limit	Result
	WCDMA Band V	0.1166	0.5523	0.2111			Pass
1	Bluetooth	0.1255	1.0000	0.1255	0.5876 1.000	1 0000	
	WiFi 2.4G	0.1255	1.0000	0.1255		1.0000	
	WiFi 5G	0.1255	1.0000	0.1255			

Note: Considering the WWAN module collocation with the WLAN and Bluetooth transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 3 collocated transmitters is compliant.

---End of Report---



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