

Report No.: SEWA2304000051RG02

Rev.: 01

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TEST REPORT

Application No.: SEWA2304000051RG
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, China 200233
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, China 200233
EUT Description: LTE-A Cat 6 M.2 Module
Model No.: EM060K-NA
Trade Mark: Quectel
FCC ID: XMR202307EM060KNA
Standards: 47 CFR Part 2.1091
FCC KDB 447498 D01 v06
Date of Receipt: 2023/05/12
Date of Issue: 2023/08/30

Test Result:**PASS***

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

Authorized Signature:

Well Wei

Well Wei
Wireless Laboratory Manager

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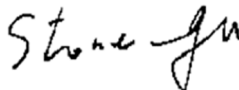
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1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2023/08/30		Original

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



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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, China 200233
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, China 200233

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



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2.3 General Description of EUT

EUT Description:	LTE-A Cat 6 M.2 Module			
Model No.:	EM060K-NA			
Trade Mark:	Quectel			
Hardware Version:	R1.0			
Software Version:	EM060KNAAAR01A02M2G			
Power Supply:	3.8V(DC Supply)			
Antenna Type:	<input checked="" type="checkbox"/> External, <input type="checkbox"/> Integrated			
Antenna Gain:	LTE Band 2:	0.06dBi	LTE Band 4:	1.47dBi
	LTE Band 5:	2.26dBi	LTE Band 7:	0.55dBi
	LTE Band 12:	-0.33dBi	LTE Band 13:	0.08dBi
	LTE Band 14:	1.54dBi	LTE Band 17:	-0.33dBi
	LTE Band 25:	0.09dBi	LTE Band 26:	2.26dBi
	LTE Band 30:	-5.7dBi	LTE Band 41:	-0.71dBi
	LTE Band 42:	-2.00dBi	LTE Band 43:	-2.00dBi
	LTE Band 48:	-2.00dBi	LTE Band 66:	0.95dBi
	LTE Band 71:	0.43dBi		
	Note: The antenna gain are derived from the gain information report provided by the manufacturer.			
RF Cable:	4.2dB(Below 1GHz)	4.5dB(1.0~2.4GHz)	4.8dB(2.4~3.4GHz)	
Remark: As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.				

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/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	f/300	6
1500-100,000	/	/	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	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
 *=Plane-wave equivalent power density
 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: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

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

P_d is 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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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/cm ²)	Limit (mW/cm ²)	Gain according to EIRP(ERP) (dBi)	Gain according to Pd (dBi)	Max Gain Allowed (dBi)	conclusion
LTE B2	1850.7	0.06	25.00	25.06	33.00	0.0638	1.0000	8.00	12.01	8.00	Pass
LTE B4	1710.7	1.47	25.00	26.47	30.00	0.0883	1.0000	5.00	12.01	5.00	Pass
LTE B5	824.7	2.26	25.00	25.11	38.45	0.1059	0.5498	15.60	9.41	9.41	Pass
LTE B7	2502.5	0.55	25.00	25.55	33.00	0.0714	1.0000	8.00	12.01	8.00	Pass
LTE B12	699.7	-0.33	25.00	22.52	34.77	0.0583	0.4665	11.92	8.70	8.70	Pass
LTE B13	779.5	0.08	25.00	22.93	34.77	0.0641	0.5197	11.92	9.16	9.16	Pass
LTE B14	790.5	1.54	25.00	24.39	34.77	0.0897	0.5270	11.92	9.23	9.23	Pass
LTE B17	706.5	-0.33	25.00	22.52	34.77	0.0583	0.4710	11.92	8.74	8.74	Pass
LTE B25	1850.7	0.09	25.00	25.09	33.00	0.0642	1.0000	8.00	12.01	8.00	Pass
LTE B26 (814-824)	814.7	2.26	25.00	25.11	NA	0.1059	0.5431	NA	9.36	9.36	Pass
LTE B26 (824-849)	824.7	2.26	25.00	25.11	38.45	0.1059	0.5498	15.60	9.41	9.41	Pass
LTE B30	2307.5	-5.70	25.00	19.30	23.98	0.0169	1.0000	-1.02	12.01	-1.02	Pass
LTE B41	2498.5	-0.71	25.00	24.29	33.00	0.0534	1.0000	8.00	12.01	8.00	Pass
LTE B42 (3450-3550)	3452.5	-2.00	25.00	23.00	30.00	0.0397	1.0000	5.00	12.01	5.00	Pass
LTE B42 (3550-3600)	3552.5	-2.00	25.00	23.00	23.00	0.0397	1.0000	-2.00	12.01	-2.00	Pass
LTE B43 (3600-3700)	3602.5	-2.00	25.00	23.00	23.00	0.0397	1.0000	-2.00	12.01	-2.00	Pass
LTE B48	3552.5	-2.00	25.00	23.00	23.00	0.0397	1.0000	-2.00	12.01	-2.00	Pass
LTE B66	1710.7	0.95	25.00	25.95	30.00	0.0783	1.0000	5.00	12.01	5.00	Pass
LTE B71	665.5	0.43	25.00	23.28	34.77	0.0695	0.4437	11.92	8.48	8.48	Pass

---End of Report---