TEST REPORT

Application No.:	SEWA2210000060RG
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
EUT Description:	Smart Module
Model No.:	SC262R-NA
Trade Mark:	QUECTEL
FCC ID:	XMR2022SC262RNA
Standards:	47 CFR Part 2.1091 FCC KDB 447498 D01 v06
Date of Receipt:	2022/10/16
Date of Issue:	2022/11/21
Test Result:	**PASS***

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

Authorized Signature:

Panta Sun

Panta Sun
Wireless Laboratory Manager

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1 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2022/11/21		Original

Prepared By		Weller Liu **(Weller Liu) / Test Engineer**
Checked By		Well Wei **(Well Wei) / 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 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

2.3 General Description of EUT

EUT Description:	Smart Module			
Model No.:	SC262R-NA			
Trade Mark:	QUECTEL			
Hardware Version:	R1.0			
Software Version:	SC262RNANAR60A03			
Antenna Type:	External Antenna			
Antenna Gain:	LTE Band 2:	1.59dBi (Ant0)	LTE Band 4:	2.00dBi (Ant0)
	LTE Band 5:	2.13dBi (Ant0)	LTE Band 7:	3.00dBi (Ant0)
	LTE Band 12:	3.26dBi (Ant0)	LTE Band 13:	4.45dBi (Ant0)
	LTE Band 14:	3.63dBi (Ant0)	LTE Band 17:	3.26dBi (Ant0)
	LTE Band 25:	1.59dBi (Ant0)	LTE Band 26:	2.53dBi (Ant0)
	LTE Band 41:	3.00dBi (Ant0)	LTE Band 66:	2.00dBi (Ant0)
	LTE Band 71:	1.66dBi (Ant0)		
	BT/BLE:	0.47dBi (Ant0)	2.4G WIFI:	0.47dBi (Ant0)
	5150MHz to 5250MHz:	-0.67dBi (Ant0)	5250MHz to 5350MHz:	-0.19dBi (Ant0)
	5470MHz to 5725MHz:	1.28dBi (Ant0)	5725MHz to 5850MHz:	1.10dBi (Ant0)
	Note: The antenna gain are derived from the gain information report provided by the manufacturer.			
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/cm2)	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/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 Population/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
*=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: $Pd = (Pout*G)/(4* Pi * R^2)$

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.

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

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.0 / 2.0 in linear scale.
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)	Output Power to Antenna (dBm)	EIRP(ERP) Limit (dBm)	Output Power to Antenna (mw)	Power Density at R = 20 cm (mW/cm2)	Limit (mW/cm2)	Gain according to EIRP (dBi)	Gain according to Pd (dBi)	Max Gain Allowed (dBi)	conclusion
LTE B2	1850.7	1.59	25.00	26.59	33.00	316.2278	0.0907	1.0000	8.00	12.01	8.00	Pass
LTE B4	1710.7	2.00	25.00	27.00	30.00	316.2278	0.0997	1.0000	5.00	12.01	5.00	Pass
LTE B5	824.7	2.13	25.00	27.13	38.45	316.2278	0.1027	0.5498	13.45	9.41	9.41	Pass
LTE B7	2502.5	3.00	25.00	28.00	33.00	316.2278	0.1255	1.0000	8.00	12.01	8.00	Pass
LTE B12	699.7	3.26	25.00	28.26	34.77	316.2278	0.1333	0.4665	9.77	8.70	8.70	Pass
LTE B13	779.5	4.45	25.00	29.45	34.77	316.2278	0.1753	0.5197	9.77	9.16	9.16	Pass
LTE B14	790.5	3.63	25.00	28.63	34.77	316.2278	0.1451	0.5270	9.77	9.23	9.23	Pass
LTE B17	706.5	3.26	25.00	28.26	34.77	316.2278	0.1333	0.4710	9.77	8.74	8.74	Pass
LTE B25	1850.7	1.59	25.00	26.59	33.00	316.2278	0.0907	1.0000	8.00	12.01	8.00	Pass
LTE B26(814-824)	814.7	2.53	25.00	27.53	NA	316.2278	0.1126	0.5431	NA	9.36	9.36	Pass
LTE B26(824-849)	824.7	2.53	25.00	27.53	38.45	316.2278	0.1126	0.5498	13.45	9.41	9.41	Pass
LTE B41	2498.5	3.00	25.00	28.00	33.00	316.2278	0.1255	1.0000	8.00	12.01	8.00	Pass
LTE B66	1710.7	2.00	25.00	27.00	30.00	316.2278	0.0997	1.0000	5.00	12.01	5.00	Pass
LTE B71	665.5	1.66	25.00	26.66	34.77	316.2278	0.0922	0.4437	9.77	8.48	8.48	Pass
BT	2402.0	0.47	8.50	8.97	30.00	7.0795	0.0016	1.0000	NA			Pass
2.4GWIFI	2412.0	0.47	18.50	18.97	30.00	70.7946	0.0157	1.0000				Pass
5GWIFI	5320.0	1.28	17.50	18.78	30.00	56.2341	0.0150	1.0000				Pass

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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

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

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

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

No.	Mode	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)	Result Ratio	Total Ratio	Limit	Result
1	LTE Band 12	0.1333	0.4665	0.2857	0.3180	1.00	Pass
	Bluetooth	0.0016	1.0000	0.0016			
	2.4G WIFI	0.0157	1.0000	0.0157			
	5G WIFI	0.0150	1.0000	0.0150			

---End of Report---

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