

Report No.: SUHR/2021/B001106

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## **TEST REPORT**

Application No.: HR/2021/B0011

**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 Module Model No.: SC606T-NAD

Trade Mark: Quectel

FCC ID: XMR2021SC606TNAD Standards: 47 CFR Part 2.1091

FCC KDB 447498 D01 v06

 Date of Receipt:
 2021/12/29

 Date of Issue:
 2022/1/17

Test Result: PASS\*

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

Authorized Signature:

Panta Sun Wireless Laboratory Manager



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 215000
 t (86–512) 62992980
 www.sgs.group.com.

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 邮编: 215000
 t (86–512) 62992980
 sgs.china@sgs.com



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### Version

Revision Record								
Version Chapter Date Modifier Remark								
01		2022/1/17		Original				

Prepared By	weller lin		
	(Weller Liu) / Engineer		
Checked By	well wei'		
	(Well Wei) / Reviewer		



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#### Remark:

This test report (Report No.: SUHR/2021/B001101 issued on 2022/1/17) is based on the original FCC ID with ID number XMR2021SC606TNAD issued on 2022/1/16.

Review this report and original report, this report just changing the parts according to the declaration letter from client.

Therefore in this report all items do not need to retest and all test data in this report are based on the previous FCC ID with ID number XMR2021SC606TNAD issued on 2022/1/16.



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www.sgsgroup.com.cn sgs.china@sgs.com



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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

 ${\tt SGS-CSTC\ STANDARDS\ TECHNICAL\ SERVICES\ (SUZHOU)\ CO.,\ LTD.\ has\ been\ recognized\ as\ an}$ 

accredited testing laboratory. Designation Number: CN1312.

Test Firm Registration Number:0031225543





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### 2.3 General Description of EUT

EUT Description:	LTE Module							
Model No.:	SC606T-NAD							
Trade Mark:	Quectel	Quectel						
Hardware Version:	R1.0							
Software Version:	SC606TNADNAR0	9A01						
Sample Type:	☐Portable Device,	⊠Module						
Antenna Type:	⊠External, □Integ	grated						
	⊠Provided by applicant							
	LTE Band 2:	4.0dBi	LTE Band 4:	4.0dBi				
	LTE Band 5:	4.0dBi	LTE Band 7:	4.0dBi				
	LTE Band 12:	4.0dBi	LTE Band 13:	4.0dBi				
Antenna Gain*:	LTE Band 14:	4.0dBi	LTE Band 17:	4.0dBi				
	LTE Band 25:	4.0dBi	LTE Band 26:	4.0dBi				
	LTE Band 41:	4.0dBi	LTE Band 66:	4.0dBi				
	LTE Band 71:	4.0dBi	Bluetooth:	5.0dBi				
	2.4G WIFI:	5.0dBi	5G WIFI:	5.0dBi				

#### Remark:

\*Since the above data and/or information is provided by the applicant relevant results or conclusions of this report are only made for these data and/or information , SGS is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.



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## 3 RF Exposure Evaluation

### 3.1 RF Exposure Compliance Requirement

#### **3.1.1 Limits**

Frequency range (MHz)			Power density (mW/cm2)	Averaging time (minutes)					
	(A) Limits for Occup	ational/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	/	1	f/300	6					
1500-100,000	/	1	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	1	1	f/1500	30					
1500-100,000	1	1	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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<sup>\*=</sup>Plane-wave equivalent power density



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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

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.

#### 3.1.4 Exposure calculations for multiple sources

Operating Band	Frequenc y (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	1880	4.00	25.00	29.00	33.00	316.2278	0.1580	1.0000	8.00	12.01	8.00	Pass
LTE B4	1710.7	4.00	25.00	29.00	30.00	316.2278	0.1580	1.0000	5.00	12.01	5.00	Pass
LTE B5	824.70	4.00	25.00	26.85	38.45	316.2278	0.1580	0.5498	15.60	9.41	9.41	Pass
LTE B7	2502.50	4.00	25.00	29.00	33.00	316.2278	0.1580	1.0000	8.00	12.01	8.00	Pass
LTE B12	699.70	4.00	25.00	26.85	34.77	316.2278	0.1580	0.4665	11.92	8.70	8.70	Pass
LTE B13	779.50	4.00	25.00	26.85	34.77	316.2278	0.1580	0.5197	11.92	9.16	9.16	Pass
LTE B14	790.5	4.00	25.00	26.85	34.77	316.2278	0.1580	0.5270	11.92	9.23	9.23	Pass
LTE B17	706.5	4.00	25.00	26.85	34.77	316.2278	0.1580	0.4710	11.92	8.74	8.74	Pass
LTE B25	1850.7	4.00	25.00	29.00	33.00	316.2278	0.1580	1.0000	8.00	12.01	8.00	Pass
LTE B26(814-824)	814.7	4.00	25.00	26.85	50.00	316.2278	0.1580	0.5431	27.15	9.36	9.36	Pass
LTE B26(824-849)	824.7	4.00	25.00	26.85	38.45	316.2278	0.1580	0.5498	15.60	9.41	9.41	Pass
LTE B41	2498.5	4.00	25.00	29.00	33.00	316.2278	0.1580	1.0000	8.00	12.01	8.00	Pass
LTE B66	1710.7	4.00	25.00	29.00	30.00	316.2278	0.1580	1.0000	5.00	12.01	5.00	Pass
LTE B71	665.5	4.00	25.00	26.85	34.77	316.2278	0.1580	0.4437	11.92	8.48	8.48	Pass
Bluetooth	2402	5.00	11.00	16.00	30.00	12.5893	0.0079	1.0000	19.00	26.01	19.00	Pass
2.4G WIFI	2412	5.00	18.50	23.50	30.00	70.7946	0.0445	1.0000	11.50	18.51	11.50	Pass
5G WIFI	5745	5.00	15.50	20.50	30.00	35.4813	0.0223	1.0000	14.50	21.51	14.50	Pass



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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				
	LTE B71 + Bluetooth				
1	LTE B71 + WIFI 2.4G				
	LTE B71 + WIFI 5G				

No.	Mode	Power Density (mW/cm2)	Limit (mW/cm2)	Result Ratio	Total Ratio	Limit	Result
	LTE B71	0.1580	0.4437	0.3561	0.3640	1.00	Doos
	Bluetooth	0.0079	1.0000	0.0079	0.3640 1.00	1.00	Pass
1	LTE B71	0.1580	0.4437	0.3561	0.4006	1.00	Pass
1	WIFI 2.4G	0.0445	1.0000	0.0445	0.4006	1.00	F a 5 5
	LTE B71	0.1580	0.4437	0.3561	0.2704	1.00	D
	WIFI 5G	0.0223	1.0000	0.0223	0.3784	1.00	Pass

Output Power Into Antenna & RF Exposure Evaluation Distance:

Remark: Refer to report No. SUHR/2021/B001101 for EUT test Max Conducted Output Power value.

The End



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