

Report No.: SEWM2307000274RG02

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## **TEST REPORT**

Application No.: SEWM2307000274RG

**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:** Bluetooth Module

Model No.: HLM311Z
Trade Mark: Quectel

FCC ID: XMR2023HLM311Z Standards: 47 CFR Part 2.1091

FCC KDB 447498 D01 v06

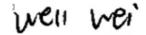
 Date of Receipt:
 2023/07/17

 Date of Issue:
 2023/08/04

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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### **Version**

Revision Record							
Version	Chapter	Date	Modifier Remark				
01		2023/08/04		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:	Bluetooth Module				
Model No.:	LM311Z				
Trade Mark:	uectel				
Hardware Version:	R1.0				
Software Version: HLM311ZAAR01A02					
Antenna Type:	☑ External, ☐ Integrated				
	BLE: -1.47dBi(Ant0)				
Antenna Gain:	Note:				
, and ma	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.					



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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 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		6					
300-1500	1		f/300	6					
1500-100,000	1	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	0.073 0.2						
300-1500	1	1	f/1500	30					
1500-100,000	/	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

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 Power (dBm)	EIRP(ERP) (dBm)	EIRP(ERP) Limit (dBm)	Power Density at R = 20 cm (mW/cm2)		Gain according to EIRP(ERP) (dBi)	according to	Max Gain Allowed (dBi)	conclusion
Bluetooth	2402.0	-1.47	10.00	8.53	30.00	0.0014	1.0000	20.00	27.01	20.00	Pass

---End of Report---



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