Report No.:
 SEWM2203000023RG06

 Rev.:
 01

 Page:
 1 of 8

# **TEST REPORT**

Application No.:	SEWM2203000023RG
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.:	SG865W-WF
Trade Mark:	quectel
FCC ID:	XMR2022SG865WWF
Standards:	47 CFR Part 2.1091
	FCC KDB 447498 D01 v06
Date of Receipt:	2022/3/20
Date of Issue:	2022/5/26
Test Result:	PASS*

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

Authorized Signature:

anta Sun

Panta Sun Wireless Laboratory Manager



Unless otherwise agreed in writing, this document is issued by th overleaf, available on request or accessible at http://www.sgs.com/e subject to Terms and Conditions for Electronic Documents at http:/ Attention is drawn to the limitation of liability, indemnification and j advised that information contained hereon reflects the Company's client's instructions, if any. The Company's sole responsibility is transaction from exercising all their rights and obligations under t except in full, without prior written approval of the Company. Any appearance of this document is unlawful and offenders may be pros results shown in this test report refer only to the sample(s) tested and Attention; To check the authenticity of testing /inspection report or email: CM.Doccheck@sas.com	n/Terms-and-Condition /www.sgs.com/en/Ter urisdiction issues def indings at the time of to its Client and this to transaction docum unauthorized alterati ecuted to the fullest e such sample(s) are re	ns.aspx and, for electror ms-and-Conditions/Terr fined therein. Any holde f its intervention only as document does not e: nents. This document c on, forgery or falsificat xtent of the law. Unless tained for 30 days only.	nic format documents, ns-e-Document.aspx. or of this document is nd within the limits of xonerate parties to a annot be reproduced tion of the content or s otherwise stated the
South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone	215000	t (86-512) 62992980	www.sgsgroup.com.cn
中国・苏州・中国(江苏)自由贸易试验区苏州片区苏州工业园区润胜路1号的6号厂房南部 邮编:	215000	t (86-512) 62992980	sgs.china@sgs.com

 Report No.:
 SEWM2203000023RG06

 Rev.:
 01

 Page:
 2 of 8

### 1 Version

Revision Record							
Version	Chapter	Modifier	Remark				
01		2022/5/26		Original			

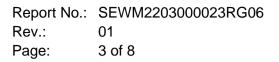
Prepared By	weller lin		
	(Weller Liu) / Test Supervisor		
Checked By	well wei		
	(Well Wei) / Reviewer		



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.gas.com/en/Terms-and-Conditions.aspx and, for electronic Documents at http://www.gas.com/en/Terms-and-Conditions.aspx and, for electronic Documents at http://www.gas.com/en/Terms-and-Conditions.aspx and.com/en/Terms-and-Conditions for Terms and Comments, advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document is unaward of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unaward of the sample(s) tested and such sample(s) are retained for 30 days only. Attention: To check the authenticity of testing inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or enail: CN.Doccheck@gs.com

sgs.china@sgs.com

t (86–512) 62992980



### Contents

1	Vers	sion	2
2	Ger	neral Information	4
		Client Information Test Facility	
	2.3	General Description of EUT	5
3	RF	Exposure Evaluation	6
	3.1	RF Exposure Compliance Requirement 1 Limits	6
		2 Test Procedure	
		3 EUT RF Exposure Evaluation	
	3.1.	4 Exposure calculations for multiple sources	8



SG

Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>http://www.sgs.com/en/Terms-and-Conditions.aspx</u> and, for electronic Documents at <u>http://www.sgs.com/en/Terms-and-Conditions</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Cilent's instructions, if any. The Company's sole responsibility is to its Cilent and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction document. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) lested and such sample(s) are retained for 30 days only. Attention: To check the authenticity of testing Inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or enail: CN.Doccheck@gs.com

Southart No. Flancescong Res. Starbur Hotstella Park, Suzhou Anea, Chine (Langsu) Pilot Free Trade Zone 215000 t (86-512) 62992980 中国・苏州・中国(江苏)自由贸易试验区苏州上区苏州工业园区洞田路1号的6号厂房南部 単编: 215000 t (86-512) 62992980

 Report No.:
 SEWM2203000023RG06

 Rev.:
 01

 Page:
 4 of 8

## 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 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



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.gos.com/en/Terms-and-Conditions.aspx and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.gos.com/en/Terms-and-Conditions/Terms-e-Document.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) lested and such sample(s) are retained for 30 days only. Attention: To check the authenticity of testing inspection report & certificate, please contact us at telephone: (86-755) 8307 1443,

South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Plot Free Trade Zone 215000 中国 • 苏州 • 中国(江苏)自由贸易试验区苏州片区苏州工业园区润脏路1号的6号厂房南部 邮编: 215000

 Report No.:
 SEWM2203000023RG06

 Rev.:
 01

 Page:
 5 of 8

### 2.3 General Description of EUT

EUT Description:	Smart Module	Smart Module					
Model No.:	SG865W-WF	SG865W-WF					
Trade Mark:	quectel						
Hardware Version:	R1.0						
Software Version:	SG865WWFPAR01	SG865WWFPAR01A05					
Antenna Type:	🛛 External, 🗌 Inte	🖾 External, 🗌 Integrated					
	⊠Provided by client						
Antenna Gain*:	BT/BLE	0dBi					
Antenna Gam .	2.4GWIFI: 0dBi (Ant1) 0dBi (Ant2)						
	5GWIFI: 0dBi (Ant1) 0dBi (Ant2)						
			e client relevant results or conclusions of this ot responsible for the authenticity, integrity				

and results of the data and information and/or the validity of the conclusion. 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.



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/en/Terms-and-Conditions.aspx and, for electronic Coruments, subject to Terms and Conditions for Terms-and-Conditions, for electronic Cocuments at http://www.sgs.com/en/Terms-and-Conditions.aspx and, for electronic Cocuments at http://www.sgs.com/en/Terms-and-Conditions.aspx and, for electronic Cocuments, at the ilmitation of liability, indemnification and juriadiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or rappearance of this document is unaawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only. Attention: To check the authenticity of testing Inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or enail: CN.Doccheck@sgs.com

 South of No. 6 Plant, No. 1, Runsheng Read, Suzhou Industrial Plant, Suzhou Area, Chine (Jaingsu) Pliot Fiee Trade Zone
 215000
 t (86-512) 62992980

 中国 - 苏州 - 中国 (江苏) 自由贸易试验区苏州上区苏州工业园区调胜路1号的6号厂房南都
 邮编: 215000
 t (86-512) 62992980

 Report No.:
 SEWM2203000023RG06

 Rev.:
 01

 Page:
 6 of 8

# 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	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 P	opulation/Uncontrolled I	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	f/1500	30				
1500-100,000	1	1	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.

全型 全型 全型 全型 全型 全型 全型 全型 全型 全型	Unless otherwise agreed in writing, this document is issued by th overleaf, available on request or accessible at http://www.sgs.com/e subject to Terms and Conditions for Electronic Documents at http:/ Attention is drawn to the limitation of liability, indemnification and J advised that information contained hereon reflects the Company's f Client's instructions, if any. The Company's sole responsibility is verse if information contained hereon reflects the Company's fuence if information prevention of the Company's sole responsibility is result shown in this test report refer only to the sample(s) tested and Attention: To check the authenticity of testing /inspection report or email: CA. Doccheck@ags.com Somd No. SPart, No. 1, Rushang Road, Subul Motatia Pat, Subu-Area, China (Jangua) Pixt Free Trade Zone 中国 - 苏州 - 中国 (江东) 自由贸易试验区苏州片区苏州工业园民建造已资料后的局景 能源:	n/Terms-and-Conditio //www.sgs.com/en/Ter jurisdiction issues del findings at the time of to its Cilent and this he transaction docum unauthorized alterati ecuted to the fulleste such sample(s) are re & certificate, please	ns.aspx and, for electron ms-and-Conditions/Term fined therein. Any holde f its intervention only ar document does not ex- enents. This document cr on, forgery or falsificat ixtent of the law. Unless stained for 30 days only. contact us at telephon t (86–512) 62992980	hic format documents, ns-e-Document.aspx. r of this document is hid within the limits of conerate parties to a annot be reproduced ion of the content or otherwise stated the
家職务 (苏州)	overleaf, available on request or accessible at http://www.sgs.com/er	n/Terms-and-Conditio	ns.aspx and, for electron	nic format documents,
A A A A A A A A A A A A A A A A A A A	Attention is drawn to the limitation of liability, indemnification and in	urisdiction issues def	fined therein. Any holde	r of this document is
	Client's instructions, if any. The Company's sole responsibility is	to its Client and this	document does not ex	conerate parties to a
四日	except in full, without prior written approval of the Company. Any	unauthorized alterati	on, forgery or falsificati	ion of the content or
1回りの1回ります。 の Inspection & Testing Services ミ	results shown in this test report refer only to the sample(s) tested and	such sample(s) are re	etained for 30 days only.	
STA SS		& certificate, please	contact us at telephon	e: (86-755) 8307 1443,
SGS-CSTC Services Technical Services (Service) Co., Ltd.		215000	t (86-512) 62992980	www.sgsgroup.com.cn
Wireless Laboration / Achnical Service	中国 • 苏州 • 中国(江苏)自由贸易试验区苏州片区苏州工业园区润胜路1号的6号厂房南部 邮编:	215000	t (86–512) 62992980	sgs.china@sgs.com

 Report No.:
 SEWM2203000023RG06

 Rev.:
 01

 Page:
 7 of 8

### 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	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
Bluetooth	2402	0.00	14.00	14.00	30.00	25.1189	0.0050	1.0000	16.00	23.01	16.00	Pass
2.4G WIFI(MIMO)	2412	0.00	29.50	29.50	30.00	891.2509	0.1773	1.0000	0.50	7.51	0.50	Pass
5G WIFI(MIMO)	5320	0.00	21.50	21.50	30.00	141.2538	0.0281	1.0000	8.50	15.51	8.50	Pass



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/en/Terms-and-Conditions.aspx and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com/en/Terms-and-Conditions.Terms-e-Document.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Cilent's instructions, if any. The Company's sole responsibility is to its Cilent and this document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or faisification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are testined for 30 days only. Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: (N.Doccheck@ass.com

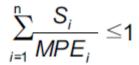
South of No. 6 Plant, No. 1, Runsleng Road, Suzhou Industrial Plant, Suzhou Area, Chine (Jangsu) Plot Free Trade Zone 215000 t (86-512) 62992980 中国・苏州・中国(江苏)自由贸易试验区苏州上区苏州工业园区调胜路1号的6号厂房用部 邮编: 215000 t (86-512) 62992980 www.sgsgroup.com.cn

Report No.: SEWM2203000023RG06 Rev.: 01 Page: 8 of 8

#### 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



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

Simultaneous Tx Combination	Configuration
1	Bluetooth + WiFi 2.4G(MIMO)
2	Bluetooth + WiFi 5G(MIMO)
3	WiFi 2.4G(MIMO)+WiFi 5G(MIMO)

No.	Mode         Power Density (mW/cm2)         MPE Limit (mW/cm2)         Result Ratio		Total Ratio	Limit	Result		
1	Bluetooth	0.0050	1.0000	0.0050	0 1000	1.00	Pass
	WiFi 2.4G(MIMO)	0.1773	1.0000	0.1773	0.1823	1.00	га55
2	Bluetooth	0.0050	1.0000	0.0050	0.0224	1 00	Pass
2	WiFi 5G(MIMO)	0.0281	1.0000	0.0281	0.0331	1.00	
2	WiFi 2.4G(MIMO)	0.1773	1.0000	0.1773	0.2054	1.00	Deee
3	WiFi 5G(MIMO)	0.0281	1.0000	0.0281	0.2004	1.00	Pass

The End



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service prir overleaf, available on request or accessible at http://www.sgs.com/en/Terms-and-Conditions.aspx and, for electronic format document subject to Terms and Conditions for Electronic Documents at http://www.sgs.com/en/Terms-and-Conditions.aspx and, for electronic format document Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limit Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties i transaction from exercising all their rights and obligations under the transaction document. This document cannot be reprodu except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the conten-t appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated results shown in this test report refer only to the sample(s) tested and such sample(s) are relatined for 30 days only. content o e: (86-755) 8307 1443 t (86-512) 62992980

South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone 215000 中国・苏州・中国(江苏)自由贸易试验区苏州片区苏州工业园区润胜路1号約6号厂房南部 邮编: 215000

t (86-512) 62992980

www.sgsgroup.com.cn