



RF Test Report

Applicant: Quectel Wireless Solutions Co., Ltd.
Address: Building 5, Shanghai Business Park Phase III (Area B), No.1016
Tianlin Road, Minhang District, Shanghai, China, 200233
Product: Smart Module
Model No.: SG560D-WF
Brand Name: QUECTEL
FCC ID: XMR2023SG560DWF
Standards: FCC CFR47 Part 2.1091
Report No.: PD20230213RF05
Issue Date: 2024/01/15
Test Result: PASS *

* The above equipment has been tested and compliance with the requirement of the relative standards by Hefei Panwin Technology Co., Ltd.

Reviewed By: Charlie Wang

Approved By: Alec Yang

Hefei Panwin Technology Co., Ltd.

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Test Report

Report No.: PD20230213RF05
Report Version: 01

Revision History

Report No.	Version	Description	Issue Date	Note
PD20230213RF05	01	Initial Report	2024/01/15	Valid

Remark:

We, Hefei Panwin Technology Co., Ltd., would like to declare that the tested sample has been evaluated in accordance with the procedures given in FCC CFR47 Part 2.1091 and shown compliance with the applicable technical standards. The evaluation related to FCC CFR47 Part 2 is not within the scope of A2LA accreditation.

CONTENTS

1 Test Laboratory	4
1.1 Notes of the Test Report	4
1.2 Test Facility	4
1.3 Testing Laboratory	4
2 General Description of Equipment under Test	5
2.1 Details of Application	5
2.2 Details of EUT	5
3 Test Condition	6
3.1 Laboratory Environment	6
4 Maximum Permissible Exposure (EMF)	7
Appendix A – Test Results	8
Appendix B – The EUT Appearance	9

1 Test Laboratory

1.1 Notes of the Test Report

This report is invalid without signature of auditor and approver or with any alterations. The report shall not be partially reproduced without written approval of the testing company. Entrusted test results are only responsible for incoming samples. If there is any objection to the testing report, it shall be raised to the testing company within 15 days from the date of receiving the report. In the test results, "NA" means "not applicable", and the test items marked with "Δ" are subcontracted projects.

1.2 Test Facility

FCC (Designation number: CN1361, Test Firm Registration Number: 473156)

Hefei Panwin Technology Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

A2LA (Certificate Number: 6849.01)

Hefei Panwin Technology Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform measurement.

1.3 Testing Laboratory

Company Name	Hefei Panwin Technology Co., Ltd.
Address	Floor 1, Zone E, Plant 2#, Mingzhu Industrial Park, No.106 Chuangxin Avenue, High-tech Zone, Hefei City, Anhui Province, China
Telephone	+86-0551-63811775
Post Code	230031

2 General Description of Equipment under Test

2.1 Details of Application

Applicant	Quectel Wireless Solutions Co., Ltd.
Applicant Address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China, 200233
Manufacturer	Quectel Wireless Solutions Co., Ltd.
Manufacturer Address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China, 200233

2.2 Details of EUT

Model	SG560D-WF
HW Version	R1.1
SW Version	SG560DWFPAR02A04
Antenna Type	External Antenna
Mode of Operation	Bluetooth Bluetooth LE Wi-Fi 2.4G Wi-Fi 5G Wi-Fi 6E
Max Tune Up Power	Bluetooth: 10.00dBm Wi-Fi 2.4G: 20.50dBm Wi-Fi 5G: 19.50dBm Wi-Fi 6E: 20.00dBm
Max Gain	Bluetooth & Bluetooth LE & Wi-Fi 2.4G: 0.47dBi Wi-Fi 5G: 1.28dBi Wi-Fi 6E: 3.76dBi
Beamforming Gain	NA
Operating temperature range	-35 °C to 75 °C
Rated Power Supply Voltage	Typical 4.0V
Note : The declared of product specification for EUT and/or Antenna presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.	

3 Test Condition

3.1 Laboratory Environment

Temperature	Min.= 18℃, Max.=25℃
Relative Humidity	Min.= 30%, Max.=70%
Ground System Resistance	< 1 Ω
- Ambient noise is checked and found very low and in compliance with requirement of standards. - Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

4 Maximum Permissible Exposure (EMF)

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

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

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = PG / 4\pi R^2$$

Where:

S = Power density (in appropriate units, e.g. mW/cm²)

P = Time-average maximum tune up procedure (in appropriate units, e.g., mW)

G = The numeric gain of the antenna

R = Distance to the center of radiation of the antenna (20 cm = limit for MPE)

Appendix A – Test Results

A.1 Maximum Measured Conducted Output Power and Antenna Gain

Band	TX Freq. (MHz)	Max Tune Up Power (dBm)	Antenna Gain (dBi)
Bluetooth	2402 to 2480	10.00	0.47
Wi-Fi 2.4G	2412 to 2462	20.50	0.47
Wi-Fi 5G	5150 to 5850	19.50	1.28
Wi-Fi 6E	5925 to 7125	20.00	3.76

A.2 Test Results of Maximum Permissible Exposure

Band	Max Tune Up Power (dBm)		Antenna Gain (dBi)	Maximum EIRP(dBm)	PG (mW)	Test Result (mW/cm ²)	Limit Value (mW/cm ²)
	(dBm)	(mW)					
Bluetooth	10.00	10.00	0.47	10.47	11.14	0.002	1.000
Wi-Fi 2.4G	20.50	112.20	0.47	20.97	125.03	0.025	1.000
Wi-Fi 5G	19.50	89.13	1.28	20.78	119.67	0.024	1.000
Wi-Fi 6E	20.00	100.00	3.76	23.76	237.68	0.047	1.000

Note: For mobile or fixed location transmitters, minimum separation distance is 20cm, even if calculations indicate EMF distance is less.

Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.

Appendix B – The EUT Appearance

Refer to “Attachment 1: External Photograph” and “ Attachment 2: Internal Photograph” file.

***** End of the Report *****