

## **MPE TEST REPORT**

**Applicant** Quectel Wireless Solutions Co., Ltd.

FCC ID XMR202103FG50V

**Product** Wi-Fi & BT Module

**Brand** Quectel

Model FG50V

**Report No.** R2102A0150-M1

Issue Date May 25, 2021

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC 47 CFR Part 1 1.1310**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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Approved by: Guangchang Fan

Guangchang Fan

# TA Technology (Shanghai) Co., Ltd.

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## **Table of Contents**

1	Tes	t Laboratory	. 3
		Notes of the Test Report	
		Test facility	
		Testing Location	
	1.4	Laboratory Environment	. 3
2	Des	scription of Equipment under Test	. 5
3	Max	ximum conducted output power (measured) and antenna Gain	. 6
4	Tes	t Result	. 7
Α	NNEX	A: The EUT Appearance	Ç

Report No.: R2102A0150-M1



### 1 Test Laboratory

#### 1.1 Notes of the Test Report

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#### 1.2. Test facility

#### FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

#### 1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.

Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China

City: Shanghai

Post code: 201201

Country: P. R. China

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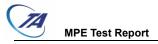
E-mail: fanguangchang@ta-shanghai.com

#### 1.4 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C
Temperature	WIII 10 0, Wax 23 0



Relative humidity	Min. = 30%, Max. = 70%		
Ground system resistance	< 0.5 Ω		
Ambient noise is checked and found very low and in compliance with requirement of standa			



### 2 Description of Equipment under Test

#### **Client Information**

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		

#### **General Technologies**

Model	FG50V
SN	P1Q20LJ4C000067
Hardware Version	R1.0
Software Version	FG50VAAMD
Date of Testing	March 1, 2021 ~ March 19, 2021
Date of Sample Received	February 24, 2021

Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.

2. All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.

Report No.: R2102A0150-M1



### 3 Maximum conducted output power (measured) and antenna Gain

The numeric gain (G) of the antenna with a gain specified in dB is determined by Numeric gain (G)=10^(antenna gain/10)

Band		nducted Output r (dBm)	Antenna Gain	Numeric gain	
	(dBm)	(mW)	(dBi)		
Wi-Fi 2.4G	22.50	177.828	5.38	3.451	
Wi-Fi 5G	20.50	112.202	5.05	3.199	
Bluetooth (Low Energy)	15.00	31.623	5.38	3.451	



#### 4 Test Result

According to section 1.1310 of FCC 47 CFR Part 1, limits for maximum permissible exposure (MPE) are as following

TABLE 1 - LIMITS FOR MAXIMUN PERMISSIBLE EXPOSURE (MPE)

Frequency Range	Electric Field	Magnetic Field	Power Density	Averaging Time					
(MHz)	Strength Strength			120					
A-5-000	(V/m)	(A/m)	(mW/cm2)	(minutes)					
(A) Limits for Occupational/Controlled Exposures									
0.3-3.0	614	1.63	*(100)	6					
3-30	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/Uncont	rolled 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

Note1. Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational / controlled limits apply provided he or she is made aware of the potential for exposure.

Note2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

The maximum permissible exposure for 1500~100,000MHz is 1.0.So

Band	The maximum permissible exposure (mW/cm²)
Wi-Fi 2.4GHz	1.000
Wi-Fi 5GHz	1.000
Bluetooth	1.000

<sup>\* =</sup> Plane-wave equivalent power density



#### **RF Exposure Calculations:**

The following information provides the minimum separation distance for the highest gain antenna provided. This calculation is based on the conducted power, considering maximum power and antenna gain. The formula shown in KDB 447498 D01 is used in the calculation.

Equation from KDB 447498 D01 General RF Exposure Guidance v06 (10/23/2015) is:

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

Where: S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)

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)

Band	Antenna Gain (dBi)	Maximum Power (dBm)	PG (mW)	Test Result (mW/cm <sup>2</sup> )	Limit Value (mW/cm²)	The MPE ratio
Wi-Fi 2.4GHz	5.38	22.50	613.762	0.122	1.000	0.122
Wi-Fi 5GHz	5.05	20.50	358.922	0.071	1.000	0.071
Bluetooth	5.38	15.00	109.144	0.022	1.000	0.022

Note: **R** = 20cm

 $\pi$ = 3.1416

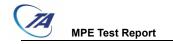
The MPE ratio = Mac Test Result+Limit Value

So the simultaneous transmitting antenna pairs as below:

∑of MPE ratios= Wi-Fi 2.4GHz + Wi-Fi 5GHz =0.122 + 0.071 = 0.193 <1

Note: For transmitters, minimum separation distance is 20cm, even if calculations indicate MPE distance is less.

\*\*\*\*\*\*END OF REPORT \*\*\*\*\*\*



### **ANNEX A: The EUT Appearance**

The EUT Appearance are submitted separately.

Report No.: R2102A0150-M1