TEST REPORT

Applicant:	Queclink Wireless Solutions Co., Ltd.
Address:	No.30, Lane 500, Xinlong Road, Minhang District, Shanghai, China 201101
Equipment Type:	GNSS Tracker
Model Name:	GV50CG
Brand Name:	Queclink
FCC ID:	YQD-GV50CG
Test Standard:	47 CFR Part 2.1091 KDB 447498 D01 v06
Sample Arrival Date:	Dec. 08, 2023
Test Date:	Dec. 08, 2023 - Dec. 18, 2023
Date of Issue:	Dec. 21, 2023

ISSUED BY:

Kunshan Balun Communications Technology Co., Ltd.

Tested by: Yang Wenting **Checked by:** Huang Chengkun **Approved by:** Zhang Yanqing (Laboratory Manager)

Revision History

Version	Issue Date	Revisions Content
Rev. 01	Dec. 21, 2023	Initial Issue

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Kunshan Balun Communications Technology Co., Ltd.
Address	Room 101, Building 5, No. 1689, Zizhu Road, Yushan, Kunshan,Jiangsu, China

1.2 Test Location

Name	Kunshan Balun Communications Technology Co., Ltd.
Location	Room 101, Building 5, No. 1689, Zizhu Road, Yushan, Kunshan,Jiangsu, China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as an accredited testing laboratory. The designation number is CN1352.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Queclink Wireless Solutions Co., Ltd.
Address	No.30, Lane 500, Xinlong Road, Minhang District, Shanghai, China 201101

2.2 Manufacturer Information

Manufacturer	Queclink Wireless Solutions Co., Ltd.
Address	No.30, Lane 500, Xinlong Road, Minhang District, Shanghai, China 201101

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	GNSS Tracker
Model Name Under Test	GV50CG
Series Model Name	N/A
Description of Model name differentiation	N/A
Sample No.	SC-EC23C0133-S01
Hardware Version	V1.02
Software Version	N/A
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Ancillary Equipment

Note: Not Applicable

2.6 Technical Information

Network and Wireless connectivity	WWAN

The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	LTE		
Frequency Range	GSM850	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	GSM1900	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	LTE B2	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	LTE B4	TX: 1710 ~ 1755 MHz	RX: 2110 ~ 2155 MHz
	LTE B5	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	LTE B7	TX: 2500 ~ 2570 MHz	RX: 2620 ~ 2690 MHz
Antenna Type	PIFA		
Exposure Category	General Population/Uncontrolled Exposure		
EUT Stage	Mobile Device		

3 SUMMARY OF TEST RESULT

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 2.1091	Radiofrequency radiation exposure evaluation: mobile devices
2	KDB 447498 D01 v06	447498 D01 General RF Exposure Guidance D01 v06

4 DEVICE CATEGORY AND LEVELS LIMITS

Mobile Derives:

CFR Title 47 §2.1091(b)

(b) For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.

FCC KDB 447498 D01 General RF Exposure Guidance v06 Limit

Devices operating in standalone mobile exposure conditions may contain a single transmitter or multiple transmitters that do not transmit simultaneously. A minimum test separation distance ≥ 20 cm is required between the antenna and radiating structures of the device and nearby persons to apply mobile device exposure limits. The distance must be fully supported by the operating and installation configurations of the transmitter and its antenna(s), according to the source-based time-averaged maximum power requirements of § 2.1091(d)(2). In cases where cable losses or other attenuations are applied to determine compliance, the most conservative operating configurations and exposure conditions must be evaluated. The minimum test separation distance required for a device to comply with mobile exposure conditions must be clearly identified in the installation and operating instructions, for all installation and exposure conditions, to enable users and installers to comply with RF exposure requirements. For mobile devices that have the potential to operate in portable device exposure conditions, similar to the configurations described in § 2.1091(d)(4), a KDB inquiry is required to determine the SAR test requirements for demonstrating compliance.

When the categorical exclusion provision of § 2.1091(c) applies, the minimum test separation distance may be estimated, when applicable, by simple calculations according to plane-wave equivalent conditions, to ensure the transmitter and its antenna(s) can operate in manners that meet or exceed the estimated distance. The source-based time-averaged maximum radiated power, according to the maximum antenna gain, must be applied to calculate the field strength and power density required to establish the minimum test separation distance. When the estimated test separation distance becomes overly conservative and does not support compliance, MPE measurement or computational modeling may be used to determine the required minimum separation distance.

According to FCC Part 1.1307, systems operating under the provisions of this section shall be operated in a manner the ensures that the public is not exposed to radio frequency energy level in excess of the commission's guidelines.

Limits for General Population/ Uncontrolled Exposure			
Frequency Range (MHz)	Electric Field Strength(E)(V/m)	Magnetic Field Strength (H)(A/m)	Power Density (S)(mW/cm^2)
0.3-1.34	614	1.63	(100)*
1.34-30	824/f	2.19/f	(180/f2)*
30-300	27.5	0.073	0.2
300-1500			f/1500
1500-100,000			1.0

MPE calculation formula

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = power density

P = output power (mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Separation distance between radiator and human body (cm)

6 ASSESSMENT RESULT

6.1 Output Power

BLE				
Mode	Band 2	Band 4	Band 5	Band 7
Conductor Power (dBm)	26.47	25.84	24.79	26.11
Antenna Gain (dBi)	1.2	2.8	1.18	2.81
EIRP/ERP (dBm)	27.67	28.64	23.82	28.92
Note: This report listed the worst case conductor power value was provided by the customer.				

GSM		
Mode	GPRS 850	GPRS 1900
Conductor Power (dBm)	33.20	31.72
Antenna Gain (dBi)	1.18	1.2
EIRP/ERP (dBm)	32.23	32.92
Note: This report listed the worst case conductor power value was provided by the customer.		

6.2 Turn-up power

Mode		Conducted Power Range (dBm)
GSM	GPRS 850	30.5-33.5
	GPRS 1900	28.8-31.8
LTE	Band 2	24.0-27.0
	Band 4	23.0-26.0
	Band 5	22.0-25.0
	Band 7	23.5-26.5

6.3 RF Exposure Evaluation Result

Evolution mode	Maximum power (dBm)	Maximum power (mw)	Distance (mm)	Power Density (mW/cm²)	Limit of Power Density (mW/cm²)	Verdict
GPRS 850	33.5	1790.61	200	0.356	0.549	Pass
GPRS 1900	31.8	1995.26	200	0.397	1.000	Pass
Band 2	27.0	660.69	200	0.132	1.000	Pass
Band 4	26.0	758.58	200	0.151	1.000	Pass
Band 5	25.0	252.93	200	0.050	0.549	Pass
Band 7	26.5	853.10	200	0.170	1.000	Pass

Note: More power list please refer to RF test report.

6.4 Conclusion

This EUT is deemed to comply with the reference level limits , therefore the basic restrictions are compliant with human exposure limits.

Statement

1. The laboratory guarantees the scientificity, accuracy and impartiality of the test, and is responsible for all the information in the report, except the information provided by the customer. The customer is responsible for the impact of the information provided on the validity of the results.
2. The report without China inspection body and laboratory Mandatory Approval (CMA) mark has no effect of proving to the society.
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--END OF REPORT--