

TEST REPORT

Applicant: Queclink Wireless Solutions Co., Ltd.
Address: No.30, Lane 500, Xinlong Road, Minhang District, Shanghai, China
Equipment Type: Intelligent 4G Dash Camera with Full Featured Telematics
Model Name: CV200XEU
Brand Name: QUECLINK
FCC ID: YQD-CV200XEU
Test Standard: 47 CFR Part 2.1091
KDB 447498 D04 v01
Sample Arrival Date: Aug. 29, 2024
Test Date: Sep. 05, 2024 - Oct. 22, 2024
Date of Issue: Nov. 01, 2024


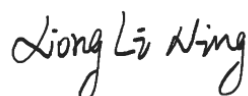
ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Xiong Lining

Checked by: Xu Rui

Approved by: Tolan Tu
(Testing Director)



Revision History

<u>Version</u>	<u>Issue Date</u>	<u>Revisions Content</u>
<u>Rev. 01</u>	<u>Nov. 01, 2024</u>	<u>Initial Issue</u>

TABLE OF CONTENTS

1	GENERAL INFORMATION	3
1.1	Test Laboratory	3
1.2	Test Location	3
2	PRODUCT INFORMATION	4
2.1	Applicant Information	4
2.2	Manufacturer Information	4
2.3	General Description for Equipment under Test (EUT)	4
2.4	Technical Information	5
3	SUMMARY OF TEST RESULT	6
3.1	Test Standards	6
3.2	Limit Standards	6
4	DEVICE CATEGORY AND LEVELS LIMITS	7
5	ASSESSMENT RESULT	9
5.1	Output Power	9
5.2	Tune-up power	9
5.3	RF Exposure Evaluation Result	10
5.4	Collocated Power Calculation	10
5.5	Conclusion	10

1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	<input type="checkbox"/> Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	<input checked="" type="checkbox"/> 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.

2 PRODUCT INFORMATION

2.1 Applicant Information

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

2.2 Manufacturer Information

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

2.3 General Description for Equipment under Test (EUT)

EUT Name	Intelligent 4G Dash Camera with Full Featured Telematics
Model Name Under Test	CV200XEU
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	N/A
Software Version	N/A
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.4 Technical Information

Network and Wireless connectivity	4G Network FDD LTE Band 2/4/5/7 Bluetooth (BR+EDR+BLE) WIFI 802.11a, 802.11b, 802.11g, 802.11n and 802.11ac GPS, GLONASS, BDS
-----------------------------------	--

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

Operating Mode	LTE, 2.4G WIFI, 5G WIFI, Bluetooth		
Frequency Range	LTE Band 2	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	LTE Band 4	TX: 1710 ~ 1755 MHz	RX: 2110 ~ 2155 MHz
	LTE Band 5	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	LTE Band 7	TX: 2500 ~ 2570 MHz	RX: 2620 ~ 2690 MHz
	802.11b/g	2412 ~ 2462 MHz	
	802.11n(HT20/HT40)	2412 ~ 2462 MHz	
	802.11a	5150 ~ 5250 MHz	
		5250 ~ 5350 MHz	
		5470 ~ 5725 MHz	
		5725 ~ 5850 MHz	
	802.11n(HT20/HT40)	5150 ~ 5250 MHz	
		5250 ~ 5350 MHz	
		5470 ~ 5725 MHz	
		5725 ~ 5850 MHz	
	802.11ac(VHT20/ VHT40/VHT80)	5150 ~ 5250 MHz	
		5250 ~ 5350 MHz	
		5470 ~ 5725 MHz	
		5725 ~ 5850 MHz	
	Bluetooth	2402 ~ 2480 MHz	
Antenna Type	WWAN	FPC Antenna	
	WIFI	FPC Antenna	
	Bluetooth	FPC Antenna	
Exposure Category	General Population/Uncontrolled Exposure		
Product Type	Mobile Device		

3 SUMMARY OF TEST RESULT

3.1 Test Standards

No.	Identity	Document Title
1	KDB 447498 D04 v01	447498 D04 Interim General RF Exposure Guidance v01

3.2 Limit Standards

No.	Identity	Document Title
1	47 CFR Part 2.1091	Radiofrequency radiation exposure evaluation: mobile devices

4 DEVICE CATEGORY AND LEVELS LIMITS

Mobile Devices:

CFR Title 47 §2.1091(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 D04 General RF Exposure Guidance v01 Limit

Evaluation of compliance with the exposure limits in § 1.1310 is necessary if the ERP of the device is greater than ERP_{20cm} in Formula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i. e., without consideration of ERP only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole.

SAR-based exemptions are constant at separation distances between 20 cm and 40 cm to avoid discontinuities in the threshold when transitioning between SAR-based and MPE-based exemption criteria at 40 cm, considering the importance of reflections.

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P_{th} (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by Formula (B.2).

$$P_{\text{th}} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad (\text{B. 2})$$

where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

and f is in GHz, d is the separation distance (cm), and $ERP_{20 \text{ cm}}$ is per Formula (B.1). The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance (mm)										
		5	10	15	20	25	30	35	40	45	50
300		39	65	88	110	129	148	166	184	201	217
450		22	44	67	89	112	135	158	180	203	226
835		9	25	44	66	90	116	145	175	207	240
1900		3	12	26	44	66	92	122	157	195	236
2450		3	10	22	38	59	83	111	143	179	219
3600		2	8	18	32	49	71	96	125	158	195
5800		1	6	14	25	40	58	80	106	136	169

5 ASSESSMENT RESULT

5.1 Output Power

Mode	LTE Band 2	LTE Band 4	LTE Band 5	LTE Band 7
Conducted Power (dBm)	22.88	22.64	22.76	22.30
Antenna Gain (dBi)	1.8	1.8	0.4	0
EIRP/ERP (dBm)	24.68	24.44	21.01	22.30
Note: This report listed the worst case conducted power value, please refer to BL-SZ2480538-501 report for more details.				

Mode	Bluetooth	2.4G WIFI	5.2G WIFI	5.3G WIFI	5.6G WIFI	5.8G WIFI
Conducted Power (dBm)	8.62	11.67	11.81	11.85	11.86	11.68
Antenna Gain (dBi)	-1.5	-1.5	2.6	2.6	2.6	2.6
EIRP (dBm)	7.12	10.17	14.41	14.45	14.46	14.28
Note: This report listed the worst case conducted power value, please refer to BL-SZ2480538-601, BL-SZ2480538-602, BL-SZ2480538-603, BL-SZ2480538-604 report for more details.						

5.2 Tune-up power

Mode	Conducted Power Range (dBm)	EIRP Range (dBm)	ERP Range (dBm)
LTE Band 2	[21.00, 23.00]	[22.80, 24.80]	[20.65, 22.65]
LTE Band 4	[21.00, 23.00]	[22.80, 24.80]	[20.65, 22.65]
LTE Band 5	[21.00, 23.00]	/	[19.25, 21.25]
LTE Band 7	[20.50, 22.50]	[20.50, 22.50]	[18.35, 20.35]
Bluetooth	[7.00, 9.00]	[5.50, 7.50]	[3.35, 5.35]
2.4G WIFI	[10.00, 12.00]	[8.50, 10.50]	[6.35, 8.35]
5.2G WIFI	[10.00, 12.00]	[12.60, 14.60]	[10.45, 12.45]
5.3G WIFI	[10.00, 12.00]	[12.60, 14.60]	[10.45, 12.45]
5.6G WIFI	[10.00, 12.00]	[12.60, 14.60]	[10.45, 12.45]
5.8G WIFI	[10.00, 12.00]	[12.60, 14.60]	[10.45, 12.45]
Note1: ERP= EIRP -2.15dB.			
Note2: According KDB 447498 D04, used the greater of maximum conducted power and ERP to compare with the threshold value Pth.			

5.3 RF Exposure Evaluation Result

Evolution mode	Frequency (GHz)	Maximum power (dBm)	Maximum power (mw)	Distance (mm)	Threshold Power (mW)	Power / Limit	Verdict
LTE Band 2	1.850	23.00	199.53	200	3060.00	0.065	Pass
LTE Band 4	1.710	23.00	199.53	200	3060.00	0.065	Pass
LTE Band 5	0.824	23.00	199.53	200	1680.96	0.119	Pass
LTE Band 7	2.500	22.50	177.83	200	3060.00	0.058	Pass
Bluetooth	2.402	9.00	7.94	200	3060.00	0.003	Pass
2.4G WIFI	2.412	12.00	15.85	200	3060.00	0.005	Pass
5.2G WIFI	5.150	12.45	17.58	200	3060.00	0.006	Pass
5.3G WIFI	5.250	12.45	17.58	200	3060.00	0.006	Pass
5.6G WIFI	5.470	12.45	17.58	200	3060.00	0.006	Pass
5.8G WIFI	5.725	12.45	17.58	200	3060.00	0.006	Pass

5.4 Collocated Power Calculation

Evolution mode	Frequency (GHz)	Power /Limit	$\Sigma(\text{Power / Limit})$ of LTE Band 5 + Bluetooth	Verdict
LTE Band 5	0.824	0.119	0.122	Pass
Bluetooth	2.402	0.003		
Evolution mode	Frequency (GHz)	Power /Limit	$\Sigma(\text{Power / Limit})$ of LTE Band 5 + 5G WIFI	Verdict
LTE Band 5	0.824	0.119	0.125	Pass
5G WIFI	5.150	0.006		

Note:

- $\Sigma(\text{Power / Limit})$: This is a summation of [(power for each transmitter/ antenna included in the simultaneous transmission)/ (corresponding Power limit)], for LTE Band 5 + 5G WIFI.
- Both of the 0.824GHz/5.150GHz can transmit simultaneously, the formula of calculated the Power is $CP1 / LP1 + CP2 / LP2 + \dots \text{etc.} < 1$
 CP = Calculation power
 LP = Limit of power
- The worst-case situation is 0.125, which is less than "1". This confirmed that the device comply with FCC KDB 447498 D04 Power limit.
- The DUT work frequency range used is 824 MHz ~ 849 MHz, 5150 MHz~ 5250 MHz the result close to the limit by the above formula, so we select worst case power to calculate the exclusion power threshold.

5.5 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.
3. For the report with CNAS mark or A2LA mark, the items marked with "☆" are not within the accredited scope.
4. This report is invalid if it is altered, without the signature of the testing and approval personnel, or without the "inspection and testing dedicated stamp" or test report stamp.
5. The test data and results are only valid for the tested samples provided by the customer.
6. This report shall not be partially reproduced without the written permission of the laboratory.
7. Any objection shall be raised to the laboratory within 30 days after receiving the report.

--END OF REPORT--