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RF Exposure Evaluation Report

Report No.: CQASZ20250300536E-03
Applicant: Shenzhen guard dragon Electronics Co., LTD
Address of Applicant: Room 302, No. 437, Hengkeng Hedong Village, Guancheng Community, Guanlan Street, Longhua District, Shenzhen
Equipment Under Test (EUT):
Product: Car player
Model No.: B5300, B5303, B500A, B600A, B5306, B5314
Test Model No.: B5300, B5303, B5306, B5314
Brand Name: BQCC
FCC ID: 2A4S3-B5303
Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
KDB447498 D01 General RF Exposure Guidance v06
Date of Receipt: 2025-03-14
Date of Test: 2025-03-14 to 2025-04-11
Date of Issue: 2025-04-22
Test Result: **PASS***

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

Tested By: Lewis Zhou
(Lewis Zhou)

Reviewed By: Timo Lei
(Timo Lei)

Approved By: Jack Ai
(Jack Ai)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20250300536E-03	Rev.01	Initial report	2025-04-22

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3 General Information

3.1 Client Information

Applicant:	Shenzhen guard dragon Electronics Co., LTD
Address of Applicant:	Room 302, No. 437, Hengkeng Hedong Village, Guancheng Community, Guanlan Street, Longhua District, Shenzhen
Manufacturer:	Shenzhen guard dragon Electronics Co., LTD
Address of Manufacturer:	Room 302, No. 437, Hengkeng Hedong Village, Guancheng Community, Guanlan Street, Longhua District, Shenzhen
Factory:	Shenzhen guard dragon Electronics Co., LTD
Address of Factory:	Room 302, No. 437, Hengkeng Hedong Village, Guancheng Community, Guanlan Street, Longhua District, Shenzhen

3.2 General Description of EUT

Product Name:	Car player
Model No.:	B5300, B5303, B500A, B600A, B5306, B5314
Test Model No.:	B5300, B5303, B5306, B5314
Trade Mark:	BQCC
Software Version:	V1.0
Hardware Version:	V1.0
EUT Power Supply:	Power supply DC 5V form Type-c

3.3 General Description of BT

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	Bluetooth Spec 5.0
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channel:	79
Transfer Rate:	1Mbps/2Mbps/3Mbps
Sample Type:	☒ Mobile ☐ Portable
Antenna Type:	PCB antenna
Antenna Gain:	-0.76dBi

3.4 General Description of 2.4G WIFI Classic

Operation Frequency:	2412MHz~2462MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20) : OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channel:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels
Channel Separation:	5MHz
Transfer Rate:	IEEE for 802.11b: 1Mbps/2Mbps/5.5Mbps/11Mbps IEEE for 802.11g : 6Mbps/9Mbps/12Mbps/18Mbps/24Mbps/36Mbps/48Mbps/54Mbps IEEE for 802.11n(HT20) : 6.5Mbps/13Mbps/19.5Mbps/26Mbps/39Mbps/52Mbps/58.5Mbps/65Mbps
Sample Type:	☒ Mobile ☐ Portable
Antenna Type:	PCB antenna
Antenna Gain:	3.29dBi

4 RF Exposure Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is 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.

Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is ≤ 1.0 , according to calculated/estimated, numerically modeled, or measured field strengths or power density. The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to the MPE limit at the test frequency.⁶⁹ Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging should not be applied when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required for all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

4.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

4.2 1.1.3 EUT RF Exposure Evaluation

1) For BT

Antenna Gain: -0.76dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 0.84 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	6.10	6.5±1	7.5	5.62
Middle(2440MHz)	5.95	6.0±1	7.0	5.01
Highest(2480MHz)	6.69	7.0±1	8.0	6.31

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
6.31	-0.76	0.0009391374	1.0	PASS

Note: 1) Refer to report No. CQASZ20250300536E-01 for EUT test Max Conducted Peak Output Power value.

$$2) P_d = (P_{out} * G) / (4 * \pi * R^2) = (6.31 * 0.84) / (4 * 3.1416 * 20^2) = 0.0009391374$$

2) For 2.4G WIFI

Antenna Gain: 3.29dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.13 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

11B mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	15.19	15.5±1	16.5	44.67
Middle(2437MHz)	14.51	15.0±1	16.0	39.81
Highest(2462MHz)	13.45	13.5±1	14.5	28.18

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
44.67	3.29	0.0189552331	1.0	PASS

Note: 1) Refer to report No. CQASZ20250300536E-02 for EUT test Max Conducted AV Output Power value.

2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (22.387 * 1.63) / (4 * 3.1416 * 20^2) = 0.0072565322$

Simultaneous transmission:

2.4G WIFI (MPE ratios)+BT(MPE ratios)=0.0189552331/1+0.0009391374/1=0.019894371≤1