

RF EXPOSURE Test Report

Product: CarPlay/Android Auto AI BOX

Trade Mark: N/A

Model Number: CP04

FCC ID: 2BAUM-CP0002

Prepared for

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Prepared by

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Table of Contents

1	GENERAL DESCRIPTION	5
1.1	DESCRIPTION OF EUT	5
1.2	TEST MODE.....	6
1.3	TEST SETUP	6
1.4	ANCILLARY EQUIPMENT	6
2	TEST FACILITIES AND ACCREDITATIONS	7
2.1	TEST LABORATORY	7
2.2	ENVIRONMENTAL CONDITIONS	7
2.3	MEASUREMENT UNCERTAINTY	7
2.4	TEST SOFTWARE	7
3	LIST OF TEST EQUIPMENT	8
4	RF EXPOSURE.....	9
4.1	STANDALONE SAR TEST EXCLUSION CONSIDERATIONS.....	9
4.1.1.	<i>Limit</i>	9
4.1.2.	<i>Test Result</i>	9

TEST RESULT CERTIFICATION

Applicant's Name..... : Shenzhen kingminson Electronic Co., Ltd.
Address : 301, No.192, jiangshi Road, shiwai Community, Martian Street,
Guangming District, Shenzhen, Guangdong, China
Manufacturer's Name : Shenzhen kingminson Electronic Co., Ltd.
Address : 301, No.192, jiangshi Road, shiwai Community, Martian Street,
Guangming District, Shenzhen, Guangdong, China

Product description

Product name : CarPlay/Android Auto AI BOX
Model Number : CP04

Standards : FCC CFR 47 PART 1 , 1.1310

Test procedure..... : KDB 447498 D01 General RF Exposure Guidance v06

This device described above has been tested by Shenzhen HongBiao Certification& Testing Co., Ltd and the test results show that the equipment under test (EUT) is in compliance with the EMC requirements. And it is applicable only to the tested sample identified in the report.

Date of Test..... :

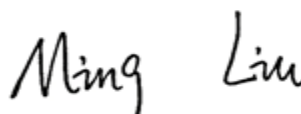
Date (s) of performance of tests..... : Feb. 28, 2025~ Apr. 11, 2025

Test Result..... : **Pass**

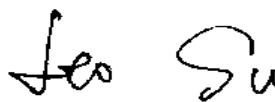
Testing Engineer :


(Z o e S u)

Technical Manager :


(M i n g L i u)

Authorized Signatory :


(L e o S u)

[illegible]

1 General Description

1.1 Description of EUT

Product name:	CarPlay/Android Auto AI BOX
Model name:	CP04
Series Model:	CP04A, CP04B, CP04C
Different of series model:	All the models are the same circuit and module, except the colour and model No..
Operation frequency:	BT: 2402-2480MHz 5G WiFi: U-NII-1: 5180 MHz to 5240 MHz
Modulation type:	BT: GFSK, $\pi/4$ -DQPSK, 8DPSK 5G WiFi: OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11a/n/ac;
Bit Rate of transmitter:	BT: 1Mbps, 2Mbps, 3Mbps 5G WiFi: 802.11a: 6,9,12,18,24,36,48,54Mbps; 802.11n(HT20/HT40): MCS0-MCS15; 802.11ac(VHT20): NSS1, MCS0-MCS8 802.11ac(VHT40):NSS1, MCS0-MCS9
Antenna type:	Onboard Antenna
Antenna gain:	BT: ANT 1(8733 Bluetooth chip): -0.03dBi ANT 2(8800 Bluetooth chip): 1.52dBi 5G WiFi: ANT 1(8733 WIFI chip): 3.26dBi ANT 2(8800 WIFI chip): 4.45dBi
Max. output power:	BT: 8733 Bluetooth chip: 3.91dBm 8800 Bluetooth chip: 7.49dBm 5G WiFi: 8733 WIFI chip: 15.53dBm 8800 WIFI chip: 10.71dBm
Hardware version:	V1.0
Software version:	V1.0
Battery:	N/A
Power supply:	Input: DC 5V/1A
Adapter information:	N/A

1.2 Test Mode

Pretest Test Mode	Description of Mode
1	TX
2	/

1.3 Test Setup

See photographs of the test setup in the report for the actual setup and connections between EUT and support equipment.

1.4 Ancillary Equipment

Equipment	Model	S/N	Manufacturer
/	/	/	/

2 Test Facilities and Accreditations

2.1 Test Laboratory

Test Site	Shenzhen HongBiao Certification& Testing Co., Ltd
Test Site Location	Room 102, 201, Building 2, Yuanwanggu RFID Industrial Park, Tongguan Road, Tianliao Community, Yutang Street, Guangming District, Shenzhen, China
Telephone:	(86-755) 2998 9321
Fax:	(86-755) 2998 5110
FCC Registration No.:	CN1341
A2LA Certificate No.:	6765.01

2.2 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15°C~35°C
Relative Humidity:	20%~75%
Air Pressure:	98kPa~101kPa

2.3 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

The data and results quoted in this document are true and accurate values, and uncertainties are not involved in the calculations.

In addition, components and mass production processes that are similar to testing equipment may introduce additional deviations, and the manufacturer is solely responsible for the continued compliance of the equipment.

Measurement Frequency Range	U, (dB)	Note
RF frequency	2×10^{-5}	
RF power, conducted	± 0.57 dB	
Temperature	± 1 degree	
Humidity	± 5 %	

2.4 Test Software

Software name	Manufacturer	Model	Version
RF Test System	MWRF	MTS 8310	V2.0.0.0

3 List of Test Equipment

RF							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	HB-E041	MXG Anaio Signal Generator	Agilent	N5181A	MY47070421	2024-05-17	2025-05-16
2	HB-E042	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW500	132108	2024-05-17	2025-05-16
3	HB-E043	MXG Anaio Signal Generator	Agilent	N5182A	US46240335	2024-05-17	2025-05-16
4	HB-E044	Signal & spectrum Analyzer	R&S	FSV3044	101264	2024-05-17	2025-05-16
5	HB-E045	RF Control Box	Noyetec	NY100-R FCB	N/A	/	/
6	HB-E058	Thermometer Clock Humidity Monitor	N/A	HTC-1	N/A	/	/

Note: the calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

4 RF Exposure

4.1 Standalone SAR test exclusion considerations

4.1.1. Limit

According to FCC 1.1310: 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 §1.1307(b).

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 Exposure				
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
300-1,500			f/300	6
1,500-100,000			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
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

MPE Calculation Method

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

Where

P_d = Power density in mW/cm²

P_{out} = output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

π = 3.1415926

R = distance between observation point and center of the radiator in cm(20cm)

P_d the limit of MPE, 1mW/cm².

If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

4.1.2. Test Result

BT: Operation Frequency: 2402-2480MHz

Antenna Type: Onboard Antenna

BT antenna gain: ANT 1(8733 Bluetooth chip): -0.03dBi, ANT 2(8800 Bluetooth chip): 1.52dBi

Power density limited: 1mW/ cm²

5GWiFi:

Operation Frequency: IEEE 802.11a/n-HT20/ac-VHT20/ax-HE20: 20MHz

IEEE 802.11n-HT40/ac-VHT40/ax-HE40: 40MHz

U-NII-1: 5150 MHz to 5250 MHz

Antenna Type: Onboard Antenna

WiFi antenna gain:

ANT 1(8733 WIFI chip): 3.26dBi

ANT 2(8800 WIFI chip): 4.45dBi

R=20cm

$mW=10^{(dBm/10)}$

BT:

Antenna gain (8733 Bluetooth chip) $Numeric=10^{(dBi/10)}=10^{(-0.03/10)}=0.99$

Antenna gain (8800 Bluetooth chip) $Numeric=10^{(dBi/10)}=10^{(1.52/10)}=1.42$

5G WiFi:

U-NII-1: Antenna gain (8733 WIFI chip) $Numeric=10^{(dBi/10)}=10^{(3.26/10)}=2.12$

U-NII-1: Antenna gain (8733 WIFI chip) $Numeric=10^{(dBi/10)}=10^{(4.45/10)}=2.79$

8733 Bluetooth chip:

BR+EDR(Worst):

8733 BT chip:

Chann el Freq. (MHz)	modula tion	conduc ted power	Tune-u p power (dBm)	Max		Antenna		Evaluati on result	Power density Limits
		(dBm)		tune-up power		Gain		(mW/ cm ²)	(mW/ cm ²)
				(dBm)	(mW)	(dBi)	Numeric		
2441	GFSK	3.91	3±1	4	2.51	-0.03	0.99	0.0005	1

8800 BT chip:

Chann el Freq. (MHz)	modula tion	conduc ted power	Tune-u p power (dBm)	Max		Antenna		Evaluati on result	Power density Limits
		(dBm)		tune-up power		Gain		(mW/ cm ²)	(mW/ cm ²)
				(dBm)	(mW)	(dBi)	Numeric		
2480	GFSK	7.49	7±1	8	6.31	1.52	1.42	0.0018	1

5G WiFi(Worst):

8733 WIFI chip:

Frequency (MHz)	Modulation	conduct ed power	Tune-u p power	Max		Antenna		Evaluati on result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain		Power density (mW/ cm ²)	(mW/ cm ²)
				(dBm)	(mW)	(dBi)	Numeric		
5180	11a	15.53	15±1	16	39.81	3.26	2.12	0.0168	1

8800 WIFI chip:

Frequency (MHz)	Modulation	conduct ed power	Tune-u p power	Max		Antenna		Evaluati on result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain		Power density (mW/ cm ²)	(mW/ cm ²)
				(dBm)	(mW)	(dBi)	Numeric		
5190	11ac	10.71	10±1	11	12.59	4.45	2.79	0.0070	1

Conclusion:

NO	Maximum MPE Value				Limits (mW/cm ²)
	8733 WIFI chip	8800 WIFI chip	8733 WIFI chip	8800 WIFI chip	
	BT (mW/cm ²)	BT (mW/cm ²)	5GWiFi (mW/cm ²)	5GWiFi (mW/cm ²)	
1	0.0005	0.0018	0.0168	0.0070	1

Simultaneous transmit:

NO	Configurations	Maximum MPE Value			Limits
		BT	5GWiFi	Transmit simultaneou sly	
1	BT+5G	0.0023	0.0238	0.0261	1

Note:

According to KDB 447498 D01 General RF Exposure Guidance v06, at the transmit simultaneously calculation method is as follows:

Transmit simultaneously MPE = Σ of MPE ratios

MPE ratios = Field strengths or power density / MPE limit at the test frequency

For the max result: $0.0261 \leq 1.0$ SAR, No SAR is required.

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