

RF EXPOSURE Test Report

Product: Wireless carplay adapter

Trade Mark: N/A

Model Number: KY-4101

FCC ID: 2BHX8-KY-4101

Prepared for

JinKaiyue (Dongguan) Technology Co., Ltd
Room 602, Building 4, No.9 Yuhu Road, Fenggang Town, Dongguan City,
Guangdong Province

Prepared by

Shenzhen HongBiao Certification& Testing Co., Ltd
Room 102, 201, Building 2, Yuanwanggu RFID Industrial Park, Tongguan
Road, Tianliao Community, Yutang Street, Guangming District, Shenzhen,
China
Tel.: +86-755-2998 9321 Fax.: +86-755-2998 5110
Website: <http://www.sz-hongbiao.com>

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 RF EXPOSURE..... 8

3.1 STANDALONE SAR TEST EXCLUSION CONSIDERATIONS..... 8

4.1.1. Limit 8

4.1.2. Test Result 8

TEST RESULT CERTIFICATION

Applicant's Name..... : JinKaiyue (Dongguan) Technology Co., Ltd
Address : Room 602, Building 4, No.9 Yuhu Road, Fenggang Town,
Dongguan City, Guangdong Province
Manufacturer's Name : JinKaiyue (Dongguan) Technology Co., Ltd
Address : Room 602, Building 4, No.9 Yuhu Road, Fenggang Town,
Dongguan City, Guangdong Province

Product description

Product name : Wireless carplay adapter
Model Number : KY-4101

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..... : Jul. 22, 2024~ Aug. 12, 2024

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

Testing Engineer :


(Z o e S u)

Technical Manager :


(Mark Chen)

Authorized Signatory :


(L e o S u)

[illegible]

1 General Description

1.1 Description of EUT

Product name:	Wireless carplay adapter
Model name:	KY-4101
Series Model:	KY-4103, KY-4105, KY-4107, KY-4109, KY-4111, KY-4113, KY-4115, KY-4117, KY-4119, KY-4121, KY-4123, KY-4125, KY-4127, KY-4129, KY-4131, KY-347, KY-348, KY-643
Different of series model:	Except for the model, appearance color, appearance shape, appearance materials, electronic accessories, all models have the same circuits and modules.
Operation frequency:	BT: 2402-2480MHz 2.4G WiFi: IEEE 802.11b/g/n20/ax20: 2412~2462 MHz IEEE 802.11n40/ax40: 2422~2452 MHz 5G WiFi: U-NII-1: 5180 MHz to 5240 MHz U-NII-2A: 5260 MHz to 5320 MHz U-NII-2C: 5500 MHz to 5700 MHz U-NII-3: 5745 MHz to 5825 MHz
Modulation type:	BT: GFSK, $\pi/4$ -DQPSK, 8DPSK 2.4G WiFi: IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK) 5G WiFi: IEEE 802.11a/n: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM(256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDMA(1024QAM, 256QAM, 64QAM, 16QAM QPSK, BPSK)
Bit Rate of transmitter:	BT: 1Mbps, 2Mbps, 3Mbps 2.4G WiFi: IEEE 802.11b: Up to 11 Mbps IEEE 802.11g: Up to 54 Mbps IEEE 802.11n-HT20/HT40: Up to MCS15 IEEE 802.11ax-HE20/ HE40: Up to MCS11 5G WiFi: IEEE 802.11a: Up to 54 Mbps IEEE 802.11n-HT20/40: Up to MCS7 IEEE 802.11ac-VHT20/40: Up to MCS9 IEEE 802.11ax-HE20/HE40: Up to MCS11
Antenna type:	PCB antenna
Antenna gain:	BT: -12.46dBi 2.4G WiFi: -12.46dBi 5GWiFi: U-NII-1: -3.98dBi U-NII-2A: -3.13dBi U-NII-2C: -0.25dBi U-NII-3: -1.51dBi

Max. output power:	BT: 7.24dBm 2.4G WiFi: 17.92dBm 5G WiFi: 13.36dBm
Hardware version:	V0.3
Software version:	202407041001C
Battery:	N/A
Power supply:	DC 5V from adapter AC 120V/60Hz
Adapter information:	N/A

1.2 Test Mode

Pretest Test Mode	Description of Mode
1	TX
2	/
3	/

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 %.

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
Conducted test system	MWRF-test	MTS 8310	2.0.0.0

3 RF Exposure

3.1 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: PCB antenna;

BT antenna gain: -12.46dBi

Power density limited: 1mW/ cm²

2.4GWiFi:

Operation Frequency: IEEE 802.11b/g/n20/ax20: 2412~2462MHz,

IEEE 802.11n40/ax40: 2422~2452MHz,

Antenna Type: PCB antenna;

2.4G WiFi antenna gain: -12.46dBi

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,

U-NII-2A: 5250 MHz to 5350 MHz,

U-NII-2C: 5470 MHz to 5725 MHz,

U-NII-3: 5725 MHz to 5850 MHz

Antenna Type: PCB antenna;

WIFI antenna gain:

U-NII-1: -3.98dBi

U-NII-2A: -3.13dBi

U-NII-2C: -0.25dBi

U-NII-3: -1.51dBi

R=20cm

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

BT: Antenna gain Numeric= $10^{(dBi/10)}=10^{(-12.46/10)}=0.06$

2.4GWiFi: Antenna gain Numeric= $10^{(dBi/10)}=10^{(-12.46/10)}=0.06$

5GWiFi:

U-NII-1: Antenna gain Numeric= $10^{(dBi/10)}=10^{(-3.98/10)}=0.4$

U-NII-2A: Antenna gain Numeric= $10^{(dBi/10)}=10^{(-3.13/10)}=0.49$

U-NII-2C: Antenna gain Numeric= $10^{(dBi/10)}=10^{(-0.25/10)}=0.94$

U-NII-3: Antenna gain Numeric= $10^{(dBi/10)}=10^{(-1.51/10)}=0.71$

BR+EDR:(Worst)

Chann el Freq. (MHz)	modulati on	conducted power	Tune-u p power (dBm)	Max		Antenna		Evaluation result	Power density Limits
		(dBm)		tune-up power		Gain		(mW/cm2)	(mW/cm2)
				(dBm)	(mW)	(dBi)	Num eric		
2402	GFSK	7.24	7±1	8	6.31	-12.46	0.06	0.00007	1

2.4G WiFi: (Worst)

Channel Freq. (MHz)	modulation	conducted power	Tune-up power	Max		Antenna		Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain		Power density(mW/cm2)	(mW/cm2)
				(dBm)	(mW)	(dBi)	Numeric		
2412	ax20	17.92	17±1	18	63.096	-12.46	0.06	0.00071	1

5G WiFi: (Worst)

Frequency (MHz)	Modulation	conducted power	Tune-up power	Max		Antenna		Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain		Power density(mW/cm ²)	(mW/cm ²)
				(dBm)	(mW)	(dBi)	Numeric		
5825	a	13.36	13±1	14	25.119	-1.51	0.71	0.00353	1

Conclusion:

NO	Maximum MPE Value			Limits (mW/cm ²)
	BT (mW/cm ²)	2.4GWiFi (mW/cm ²)	5GWiFi: (mW/cm ²)	
1	0.00007	0.00071	0.00353	1

Simultaneous transmit:

NO	Configurations	Maximum MPE Value			Limits
		BT	5GWiFi	Transmit simultaneou sly	
1	BT+5G	0.00007	0.00353	0.0036	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: $0.0036 \leq 1.0$ SAR, No SAR is required.

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