

1 Cover Page

RF Exposure Evaluation Report

Application No.: SHEM2102001339CR
FCC ID: 2AOK9-M500
Applicant: 70mai Co., Ltd.
Address of Applicant: Room 2220, Building 2, No 588, Zixing Road Minhang District, Shanghai, China
Manufacturer: 70mai Co., Ltd.
Address of Manufacturer: Room 2220, Building 2, No 588, Zixing Road Minhang District, Shanghai, China
Factory: HUIZHOU TECHAIN ELECTRONICS TECHNOLOGY CO., LTD.
Address of Factory: Workshop 1, East of Guangming Road, Tongqiao Town, Zhongkai High-tech Zone, Huizhou City, Guangdong Province P.R.China

Equipment Under Test (EUT):
EUT Name: Dash Cam
Model No.: M500
Standard(s) : FCC Rules 47 CFR §2.1091
 KDB447498 D01 General RF Exposure Guidance v06
Date of Receipt: 2021-08-24
Date of Test: 2021-08-26 to 2021-09-23
Date of Issue: 2021-09-29

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Parlam Zhan

Parlam Zhan
E&E Section Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



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Revision Record			
Version	Description	Date	Remark
00	Original	2021-09-29	/

Authorized for issue by:			
		<i>Michael Niu</i>	

		Micheal Niu / Project Engineer	
		<i>Parlam zhan</i>	

		Parlam Zhan / Reviewer	



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3 General Information

3.1 General Description of E.U.T.

Power supply:	<p>DC 5V , 2A</p> <p>DC 3.7V by rechargeable lithium battery</p> <p>Battery information:</p> <p>Battery model: ICR 14430</p> <p>Rated voltage: 3.7V</p> <p>Rated capacity: 500mAh</p> <p>Charging limit voltage: 4.2V</p> <p>Car cigarette lighter transverter information:</p> <p>Model: Midrive CC01</p> <p>Input: 12V-24V</p> <p>Output: 5V,2.4A/1.0A(MAX 3.4A)</p>
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3.2 Technical Specifications

2.4G WiFi

Antenna Gain	3.39dBi (Provided by manufacturer)
Antenna Type	FPC Antenna
Channel Spacing	5MHz
Data Rate:	802.11b: 1/2/5.5/11Mbps, 802.11g: 6/9/12/18/24/36/48/54Mbps 802.11n: MCS 0 to 7 for HT20MHz; MCS 0 to 7 for HT40MHz
Modulation Type	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels	802.11b/g/n(HT20):11 802.11n(HT40):7
Operation Frequency	802.11b/g/n(HT20): 2412MHz to 2462MHz 802.11n(HT40): 2422MHz to 2452MHz

BT

Antenna Gain:	3.39dBi (Provided by manufacturer)
Antenna Type:	FPC Antenna



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Bluetooth Version:	V5.0 Dual mode
Channel Spacing:	1MHz
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channels:	79
Operation Frequency:	2402MHz to 2480MHz
Spectrum Spread Technology:	Frequency Hopping Spread Spectrum(FHSS)

BLE

Antenna Gain:	3.39dBi (Provided by manufacturer)
Antenna Type:	FPC Antenna
Bluetooth Version:	V5.0 Dual mode
Channel Spacing:	2MHz
Data Rate:	1Mbps
Modulation Type:	GFSK
Number of Channels:	40
Operation Frequency:	2402MHz to 2480MHz



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3.3 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

All measurement facilities used to collect the measurement data are located at

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

No tests were sub-contracted.

3.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• **CNAS (No. CNAS L4354)**

CNAS has accredited Compliance Certification Services (Kunshan) Inc. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• **A2LA (Certificate No. 2541.01)**

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

• **FCC (Designation Number: CN1172)**

Compliance Certification Services Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

• **ISED (CAB identifier: CN0072)**

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

Company Number: 2324E

• **VCCI (Member No.: 1938)**

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600,C-11707, T-11499, G-10216 respectively.



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4 Test Standards and Limits

4.1 FCC Radiofrequency radiation exposure limits:

According to §1.1310, the limit for general population/uncontrolled exposures

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
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

Note: Limit for 2.4GHz is 1.0 mW/cm²



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5 Measurement and Calculation

5.1 Maximum transmit power

The Power Data is based on the RF Test Report SHEM210200133901, SHEM210200133902, SHEM210200133903

BLE

Test Mode	Test Frequency (MHz)	Output Power (dBm)	Reading Power (mW)
BLE	2402	2.92	1.96
	2440	2.36	1.72
	2480	1.23	1.33

BT

Test Mode	Test Frequency (MHz)	Output Power (dBm)	Reading Power (mW)
GFSK	2402	2.06	1.61
	2441	2.42	1.75
	2480	1.18	1.31
Pi/4DQPSK	2402	3.30	2.14
	2441	3.65	2.32
	2480	2.46	1.76
8DPSK	2402	3.77	2.38
	2441	4.12	2.58
	2480	2.93	1.96



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2.4G WiFi

Test Mode	Test Channel	Ant	Power [dBm]	Power [mW]
11B	2412	Ant1	17.17	52.12
11B	2437	Ant1	17.54	56.75
11B	2462	Ant1	17.36	54.45
11G	2412	Ant1	17.07	50.93
11G	2437	Ant1	17.67	58.48
11G	2462	Ant1	17.56	57.02
11N20SISO	2412	Ant1	17.22	52.72
11N20SISO	2437	Ant1	17.76	59.70
11N20SISO	2462	Ant1	17.66	58.34
11N40SISO	2422	Ant1	17.39	54.83
11N40SISO	2437	Ant1	17.68	58.61
11N40SISO	2452	Ant1	17.75	59.57



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5.2 MPE Calculation

According to the formula $S=P/4\pi R^2$, we can calculate S which is MPE.

Note:

- 1) P (mW)
- 2) R = distance to the center of radiation of antenna (in meter) = 20cm
- 3) MPE limit = 1mW/cm²

For WIFI

The max. antenna gain is 3.39 dBi

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
59.7	2.183	20	0.02592	1	Pass

For BT

The max. antenna gain is 3.39 dBi

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
2.58	2.183	20	0.00112	1	Pass

For BLE

The max. antenna gain is 3.39 dBi

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
1.96	2.183	20	0.00085	1	Pass

The BT and the 2.4G WiFi modules can simultaneous transmitting at frequency 2.4GHz band. But the maximum rate of MPE is $0.026/1.0+0.001/1.0=0.027\leq 1.0$. according to the KDB447498 section 7.2 determine the device is exclusion from SAR test.

--End of the Report--



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