



REPORT No. : SZ18120224S01

RF EXPOSURE EVALUATION REPORT

APPLICANT : Shenzhen Jimi IOT Co.,Ltd
PRODUCT NAME : Telematics Dashcam
MODEL NAME : JC200,TD-200,C18
BRAND NAME : Jimi
FCC ID : 2AMLFJC200
STANDARD(S) : 47CFR 2.1091
: KDB 447498
RECEIPT DATE : 2018-12-20
TEST DATE : 2019-01-02 to 2019-01-15
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MORLAB

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Change history		
Version	Date	Reason of changed
1.0	2019-01-16	Original



1. Technical Information

Note: Provide by applicant.

1.1 Applicant and Manufacturer Information

Applicant:	Shenzhen Jimi IOT Co.,Ltd
Applicant Address:	4/F, Building C, Gaoxinqi Industrial Park, Liuxian 1st Road, No.67 Xin'an Street, Bao'an District, Shenzhen, China
Manufacturer:	Shenzhen Jimi IOT Co.,Ltd
Manufacturer Address:	4/F, Building C, Gaoxinqi Industrial Park, Liuxian 1st Road, No.67 Xin'an Street, Bao'an District, Shenzhen, China

1.2 Equipment under Test (EUT) Description

EUT Type:	Telematics Dashcam
Hardware Version:	KM8216_MAIN_V4.0
Software Version:	KM8216_EN_USB_V1.2_20181218
Frequency Bands:	GSM 850: 824.2 MHz ~ 848.8 MHz GSM 1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WLAN 2.4GHz: 2412 MHz ~ 2462 MHz
Modulation Mode:	GSM: GMSK WCDMA: QPSK 802.11b: DSSS 802.11g/n-HT20: OFDM
Antenna Type:	WWAN: FPC Antenna WLAN: Ceramic Antenna
Antenna Gain:	0dBi

Note: According to the designer, the model JC200, TD-200 and C18 are accordant in both hardware and software, these three models only differ in model name.

1.3 Photographs of the EUT

1. EUT Front View



2. EUT Back View





1.4 Identification of all used EUT

The EUT identity consists of numerical and letter characters, the letter character indicates the test sample, and the following two numerical characters indicate the software version of the test sample.

EUT Identity	Hardware Version	Software Version
1#	KM8216_MAIN_V4.0	KM8216_EN_USB_V1.2_20181218

1.5 Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	47 CFR§2.1091	Radiofrequency Radiation Exposure Evaluation: mobile devices
2	KDB 447498 D01v06	General RF Exposure Guidance



2. Device Category and RF Exposure Limit

Per user manual, Based on 47CFR 2.1091, this device belongs to mobile device category with General Population/Uncontrolled exposure.

Mobile Devices:

47CFR 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. In this context, the term "fixed location" means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

GENERAL POPULATION / UNCONTROLLED EXPOSURE

The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.

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)
(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* = Plane-wave equivalent power density



3. RF Output Power

<GSM>

GSM850	Burst Average Power (dBm)			Tune-up	Frame-Average Power (dBm)			Tune-up
TX Channel	128	190	251	Limit	128	190	251	Limit
Frequency (MHz)	824.2	836.6	848.8	(dBm)	824.2	836.6	848.8	(dBm)
GSM 1 Tx slot	33.60	32.96	33.20	34.00	24.60	23.96	24.20	25.00
GPRS 1 Tx slot	33.67	33.01	33.26	34.00	24.67	24.01	24.26	25.00
GPRS 2 Tx slots	32.95	32.27	32.55	33.00	26.95	26.27	26.55	27.00
GPRS 3 Tx slots	31.46	30.76	31.06	31.50	27.20	26.50	26.80	27.24
GPRS 4 Tx slots	30.57	29.87	30.18	31.00	27.57	26.87	27.18	28.00

GSM1900	Burst Average Power (dBm)			Tune-up	Frame-Average Power (dBm)			Tune-up
TX Channel	512	661	810	Limit	512	661	810	Limit
Frequency (MHz)	1850.2	1880	1909.8	(dBm)	1850.2	1880	1909.8	(dBm)
GSM 1 Tx slot	30.30	29.61	29.29	30.50	21.30	20.61	20.29	21.50
GPRS 1 Tx slot	30.37	29.70	29.36	30.50	21.37	20.70	20.36	21.50
GPRS 2 Tx slots	29.59	28.89	28.50	30.00	23.59	22.89	22.50	24.00
GPRS 3 Tx slots	28.18	27.57	27.21	28.50	23.92	23.31	22.95	24.24
GPRS 4 Tx slots	27.29	26.68	26.42	27.50	24.29	23.68	23.42	24.50

<WCDMA>

Band	WCDMA II			Tune-up	WCDMA V			Tune-up
TX Channel	9262	9400	9538	Limit	4132	4182	4233	Limit
Rx Channel	9662	9800	9938	(dBm)	4357	4407	4458	(dBm)
Frequency (MHz)	1852.4	1880	1907.6		826.4	836.4	846.6	
RMC 12.2Kbps	22.49	22.90	22.51	23.00	23.03	22.61	22.88	23.50
HSDPA Subtest-1	22.65	22.82	22.32	23.00	22.54	23.14	22.89	23.50
HSDPA Subtest-2	22.41	22.87	22.64	23.00	23.00	22.79	22.64	23.50
HSDPA Subtest-3	22.37	22.13	21.78	22.50	22.36	22.54	22.79	23.00
HSDPA Subtest-4	21.24	21.78	21.53	22.50	22.86	22.41	22.57	23.00
HSUPA Subtest-1	22.65	22.82	22.32	23.00	22.42	22.38	21.86	23.00
HSUPA Subtest-2	22.41	22.87	22.64	23.00	22.28	21.91	22.56	23.00
HSUPA Subtest-3	22.37	22.13	21.78	22.50	21.91	22.38	21.74	22.50
HSUPA Subtest-4	21.24	21.78	21.53	23.00	22.45	21.87	22.63	23.00
HSUPA Subtest-5	21.43	21.98	20.65	22.00	22.73	21.99	22.67	23.00



<WLAN 2.4GHz >

2.4GHz WLAN	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Power Setting	Duty Cycle %
	802.11b 1Mbps	CH 1	2412	15.43	15.50	20.00	97.89
		CH 6	2437	16.44	16.50	20.00	
		CH 11	2462	15.57	16.00	20.00	
	802.11g 6Mbps	CH 1	2412	11.57	12.00	20.00	89.14
		CH 6	2437	13.93	14.50	20.00	
		CH 11	2462	12.30	12.50	20.00	
	802.11n-HT20 MCS0	CH 1	2412	11.56	12.00	20.00	88.36
		CH 6	2437	13.86	14.00	20.00	
		CH 11	2462	12.26	12.50	20.00	

4. RF Exposure Evaluation

Standalone transmission evaluation:

Bands	Frequency (MHz)	Maximum Tune-up Limit (dBm)	Antenna Gain (dBi)	EIRP (mW)	Power density (mW/cm ²)	Limit for MPE (mW/cm ²)
GSM850	824.2	28.00	0	829.851	0.165	0.549
GSM1900	1850.2	24.50	0	370.681	0.074	1.000
WCDMA Band II	1880	23.00	0	199.526	0.040	1.000
WCDMA Band V	836.4	23.50	0	223.872	0.045	0.558
2.4G WLAN	2437	16.50	0	44.668	0.009	1.000

Simultaneous transmission evaluation:

Transmit Condition	Power density 1 (mW/cm ²)	Limit 1 (mW/cm ²)	Power density 2 (mW/cm ²)	Limit 2 (mW/cm ²)	Result (mW/cm ²)	Limit
GSM850+2.4G WLAN	0.165	0.549	0.009	1.000	0.310	1.000
GSM1900+2.4G WLAN	0.074	1.000	0.009	1.000	0.083	1.000
WCDMA Band II+2.4G WLAN	0.040	1.000	0.009	1.000	0.049	1.000
WCDMA Band V+2.4G WLAN	0.045	0.558	0.009	1.000	0.090	1.000

Note:

- According to KDB 447498, SAR test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.

2. MPE calculation method

$$\text{Power Density} = \text{EIRP} / 4\pi R^2$$

Where: EIRP = P+G

P = Output Power (dBm)

G = Antenna Gain (dBi)

R = Separation Distance (20cm)

- The worst condition for WWAN & WLAN will be calculated for transmitting simultaneously.

Formula: Result=Power density 1/ limit 1 + power density 2/ limit 2



Annex A General Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
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2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
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