MPE TEST REPORT

Applicant	iSmartWays Technology Inc.
FCC ID	2AQQ3IM2RSE
Product	Road Side Equipment
Brand	Mokar
Model	I-Master
Report No.	R1808A0352-M1V3
Issue Date	October 18, 2018

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC 47 CFR Part 1 1.1310**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Performed by: Jiangpeng Lan *Approved by: Kai Xu*

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1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.**The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2 Test facility

CNAS (accreditation number:L2264)

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

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1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.

Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China

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1.4 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

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2 Description of Equipment under Test

Client Information

Applicant	iSmartWays Technology Inc.
Applicant address	1-500, 10230 Jasper Ave Edmonton
Manufacturer	iSmartWays Technology Inc.
Manufacturer address	B101,Building B1,Chuanggu,18 Shenlong Ave,Wuhan Economic Development Zone,Wuhan,Hubei,China

General Technologies

Model	I-Master
IMEI:	861107033430761
Hardware Version	V1.0
Software Version	V3.8
Date of Testing:	July 18, 2018 ~ August 15, 2018

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3 Maximum conducted output power (measured) and antenna Gain

The numeric gain (G) of the antenna with a gain specified in dB is determined by
Numeric gain (G)=10^(antenna gain/10)

Band		Maximum Conducted Output Power		Antenna Gain (dBi)	Numeric gain
		(dBm)	(mW)		
WCDMA Band II		23.50	223.87	2.50	1.78
WCDMA Band IV		23.50	223.87	2.50	1.78
WCDMA Band V		23.50	223.87	2.50	1.78
LTE Band 2		24.00	251.19	2.50	1.78
LTE Band 4		24.00	251.19	2.50	1.78
LTE Band 12		24.00	251.19	2.50	1.78
Wi-Fi 2.4G		16.00	39.81	2.00	1.58
DSRC	CH172	22.00	158.49	5.00	3.16
	CH178	22.00	158.49	5.00	3.16
	CH180	10.00	10.00	5.00	3.16
	CH182	10.00	10.00	5.00	3.16
	CH184	22.00	158.49	5.00	3.16

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According to section 1.1310 of FCC 47 CFR Part 1, limits for maximum permissible exposure (MPE) are as following

TABLE 1 – LIMITS FOR MAXIMUN PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm2)	Averaging Time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0 ……	614	1.63	*(100)	6
3-30 ……	1842/f	4.89/f	*(900/f2)	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/f2)	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

Note1. Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational / controlled limits apply provided he or she is made aware of the potential for exposure.

Note2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

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The maximum permissible exposure for 300~1500 MHz is f/1500, for 1500~100,000MHz is 1.0.So

Band	The maximum permissible exposure
WCDMA II	1.0mW/cm^2
WCDMA IV	1.0mW/cm^2
WCDMA V	0.55mW/cm^2
LTE Band 2	1.0mW/cm^2
LTE Band 4	1.0mW/cm^2
LTE Band 12	0.47mW/cm^2
Wi-Fi 2.4G	1.0mW/cm^2
DSRC	1.0mW/cm^2

IMPORTANT NOTE: To comply with the FCC RF exposure compliance requirements, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. No change to the antenna or the device is permitted. Any change to the antenna or the device could result in the device exceeding the RF exposure requirements and void user's authority to operate the device.

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RF Exposure Calculations:

The following information provides the minimum separation distance for the highest gain antenna provided. This calculation is based on the conducted power, considering maximum power and antenna gain. The formula shown in KDB 447498 D01 is used in the calculation.

Equation from KDB 447498 D01 General RF Exposure Guidance v06 (10/23/2015) is:

$$S = PG / 4\Pi R^2$$

Where: S = power density (in appropriate units, e.g. Mw/cm^2)

P = Time-average maximum tune up procedure (in appropriate units, e.g., Mw)

G = the numeric gain of the antenna

R = distance to the center of radiation of the antenna (20 cm = limit for MPE)

Band		PG (Mw)	Test Result (Mw/cm^2)	Limit Value (Mw/cm^2)	The MPE ratio	Conclusion
WCDMA II		398.11	0.08	1.00	0.08	Pass
WCDMA IV		398.11	0.08	1.00	0.08	Pass
WCDMA V		398.11	0.08	0.55	0.14	Pass
LTE Band 2		446.68	0.09	1.00	0.09	Pass
LTE Band 4		446.68	0.09	1.00	0.09	Pass
LTE Band 12		446.68	0.09	0.47	0.19	Pass
Wi-Fi 2.4G		63.10	0.01	1.00	0.01	Pass
DSRC	CH172	501.19	0.10	1.00	0.10	Pass
	CH178	501.19	0.10	1.00	0.10	Pass
	CH180	31.62	0.01	1.00	0.01	Pass
	CH182	31.62	0.01	1.00	0.01	Pass
	CH184	501.19	0.10	1.00	0.10	Pass
Note: **R** = 20cm ∏= 3.1416 The MPE ratio = Mac Test Result÷Limit Value						

So the simultaneous transmitting antenna pairs as below:

∑of MPE ratios=WiFi 2.4G + Main-antenna + DSRC =0.01+0.19+0.10=0.30 <1

Note: For transmitters, minimum separation distance is 20cm, even if calculations indicate MPE distance is less.

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