MPE TEST REPORT

Applicant	Beijing Chusudu Technology Co., Ltd.
FCC ID	2AQ5PAUTORINGA2
Product	Vehicular wireless terminal(with 4G function)
Brand	AutoRing
Model	A2
Report No.	R1807A0315-M1V1
Issue Date	October 24, 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.

Jiangpeng Lan

Performed by: Jiangpeng Lan

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
City:	Shanghai
Post code:	201201
Country:	P. R. China
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E-mail:	xukai@ta-shanghai.com

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	Beijing Chusudu Technology Co., Ltd.
Applicant address	Dongsheng Plaza A,5th Floor,8 Zhongguancun East Rd, Haidian District, Beijing, China
Manufacturer	Beijing Chusudu Technology Co., Ltd.
Manufacturer address	Dongsheng Plaza A,5th Floor,8 Zhongguancun East Rd, Haidian District, Beijing, China

General Technologies

Model	A2
IMEI	863346039069490
Hardware Version	V3.1
Software Version	RC108_D2_MT2_C1_BOM_V3.1_S20180622
Date of Testing:	July 8 ,2018 ~ August 1 ,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 (dBm)		Antenna Gain (dBi)	Numeric gain
	(dBm)	(mW)		
GSM850	33.000	1995.262	1.000	1.259
GSM1900	31.000	1258.925	-0.600	0.871
WCDMA II	24.000	251.189	-0.600	0.871
WCDMA IV	24.000	251.189	-0.600	0.871
WCDMA V	24.000	251.189	1.500	1.413
LTE Band 2	24.500	281.838	-0.600	0.871
LTE Band 4	24.000	251.189	-0.600	0.871
LTE Band 5	24.000	251.189	1.000	1.259
LTE Band 7	24.000	251.189	-0.800	0.832
LTE Band 12	24.000	251.189	0.800	1.202
LTE Band 13	22.000	158.489	0.800	1.202
LTE Band 17	24.000	251.189	0.800	1.202
LTE Band 26	24.000	251.189	1.000	1.259
LTE Band 41	24.500	281.838	-0.800	0.832
Wi-Fi 2.4G	14.580	28.708	1.000	1.259
Bluetooth (Low Energy)	7.340	5.420	1.000	1.259

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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
GSM850	0.55mW/cm^2
GSM1900	1.0mW/cm^2
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 5	0.55mW/cm^2
LTE Band 7	1.0mW/cm^2
LTE Band 12	0.47mW/cm^2
LTE Band 13	0.52mW/cm^2
LTE Band 17	0.47mW/cm^2
LTE Band 26	0.54mW/cm^2
LTE Band 41	1.0mW/cm^2
Wi-Fi 2.4G	1.0mW/cm^2
Bluetooth (Low Energy)	1.0mW/cm^2

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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)	Conclusion
GSM850	2511.886	0.500	0.550	Pass
GSM1900	1096.478	0.218	1.000	Pass
WCDMA II	218.776	0.044	1.000	Pass
WCDMA IV	218.776	0.044	1.000	Pass
WCDMA V	354.813	0.071	0.550	Pass
LTE Band 2	245.471	0.049	1.000	Pass
LTE Band 4	218.776	0.044	1.000	Pass
LTE Band 5	316.228	0.063	0.550	Pass
LTE Band 7	208.930	0.042	1.000	Pass
LTE Band 12	301.995	0.060	0.470	Pass
LTE Band 13	190.546	0.038	0.520	Pass
LTE Band 17	301.995	0.060	0.470	Pass
LTE Band 26	316.228	0.063	0.540	Pass
LTE Band 41	234.423	0.047	1.000	Pass
Wi-Fi 2.4G	36.141	0.007	1.000	Pass
Bluetooth (Low Energy)	6.823	0.001	1.000	Pass
Note: **R** = 20cm ∏= 3.1416				

BT antenna and Wi-Fi 2.4G antenna and 2/3/4G antenna can't transmit simultaneously.

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

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