



Shenzhen Global Test Service Co.,Ltd.

No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

RF Exposure evaluation

Report Reference No..... : GTS20191018017-1-8

FCC ID..... : 2AV3I-MP130

Compiled by

(position+printed name+signature): File administrators Tracy Hu

Tracy Hu

Supervised by

(position+printed name+signature): Test Engineer Moon Tan

Moon Tan

Approved by

(position+printed name+signature): Manager Simon Hu



Date of issue..... : Jun. 01, 2020

Representative Laboratory Name: **Shenzhen Global Test Service Co.,Ltd.**

Address..... : No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

Applicant's name..... : **Guangzhou Chengzhi Intelligent Machinery Technology Co., Ltd.**

Address : No. 500 Guangshan Road, Tianhe District, Guangzhou City, Guangdong Province, China

Test specification :

47CFR §1.1310

Standard : 47CFR §2.1091

KDB447498 v06

TRF Originator..... : Shenzhen Global Test Service Co.,Ltd.

Master TRF..... : Dated 2014-12

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Test item description : **digital voice broadcasting system**

Trade Mark



Manufacturer : Guangzhou Chengzhi Intelligent Machinery Technology Co., Ltd.

Model/Type reference..... : MP130

Listed Models : MP140,MP140 LTE,MP130 LTE,MP120,MP120 LTE,MP118, MP118 LTE

Modulation Type : QPSK, 16QAM

Operation Frequency..... : WCDMA:band 2, 4, 5
LTE:band 2, 4, 5, 7, 12, 17

Rating : Input: 12V== 2.1A

Result..... : **PASS**

TEST REPORT

Test Report No. :	GTS20191018017-1-8	Jun. 01, 2020
		Date of issue

Equipment under Test : digital voice broadcasting system

Model /Type : MP130

Listed model : MP140,MP140 LTE,MP130 LTE,MP120,MP120 LTE,MP118, MP118 LTE

Applicant : **Guangzhou Chengzhi Intelligent Machinery Technology Co., Ltd.**

Address : No. 500 Guangshan Road, Tianhe District, Guangzhou City, Guangdong Province, China

Manufacturer : **Guangzhou Chengzhi Intelligent Machinery Technology Co., Ltd.**

Address : No. 500 Guangshan Road, Tianhe District, Guangzhou City, Guangdong Province, China

Test Result:	PASS
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. SUMMARY

1.1. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

● /	Length (m) :	/
	Shield :	/
	Detachable :	/

1.2. Product Description

Product Name	digital voice broadcasting system
Trade Mark	
Model/Type reference	MP130
List Model	MP140,MP140 LTE,MP130 LTE,MP120,MP120 LTE,MP118, MP118 LTE
Model Declaration	PCB board, structure and internal of these model(s) are the same, So no additional models were tested.
Hardware version	V1.0
Software version	V1.0
Power supply:	Input: 12V== 2.1A
Sample ID	GTS20191018017-1-1#
3G	
UMTS Operation Frequency Band	UMTS FDD Band 2, 4, 5
WCDMA Release Version	R6
HSDPA Release Version	Release 6
HSUPA Release Version	Release 6
Modulation Type	QPSK for UMTS
Antenna Description	FPC Antenna; 3.0dBi (max.) For WCDMA Band 2, 4; 0.8dBi (max.) For WCDMA Band 5
LTE	
LTE Operation Frequency Band	LTE Band 2, 4, 5, 7, 12, 17
LTE Release Version	R9
Type Of Modulation	QPSK/16QAM
Antenna Description	FPC Antenna; 3.0dBi (max.) For WCDMA Band 2, 4, 7; 0.8dBi (max.) For WCDMA Band 5, 12, 17

2. TEST ENVIRONMENT

2.1. Address of the test laboratory

Shenzhen Global Test Service Co.,Ltd.

No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

2.2. Test Facility

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

CNAS (No. CNAS L8169)

Shenzhen Global Test Service Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA (Certificate No. 4758.01)

Shenzhen Global Test Service Co., Ltd. has been assessed by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4758.01.

2.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

2.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the Shenzhen Global Test Service Co.,Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen GTS laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. METHOD OF MEASUREMENT

3.1. Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

KDB447498 v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies

3.2. Requirement

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0 . The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

3.3. Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
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 – 1500	/	/	f/300	6
1500 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100)*	30
3.0 – 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

3.4. MPE Calculation Method

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

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

Where: S=power density

P=power input to antenna

G=power gain of the antenna in the direction of interest relative to an isotropic radiator

R=distance to the center of radiation of the antenna

As declared by the Applicant, the EUT transmits with the maximum soure-baed Duty Cycle of 100%-see the User manual, and the EUT is a wireless device used in a mobile application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum mobile separation distance, r =20cm, and the power drift from Turn-up Procedure provide by manufacturer as following states, the RF power density can be obtained..

3.5. Antenna Information

MP130 can only use antennas certificated as follows provided by manufacturer;

Internal Identification	Antenna Identification in Internal photos	Antenna type and antenna number	Operate frequency band	Maximum antenna gain
Antenna 0	3G &4G	FPC antenna	WCDMA:band 2, 4 LTE:band 2, 4, 7; WCDMA:band 5 LTE:band 5, 12, 17	3.0dBi(Max); 0.8dBi(Max)

4. Conducted Power

<WCDMA Max Conducted Power>

Test Mode		Channel	Frequency (MHz)	Max Conducted Power (dBm)
WCDMA	Band II	LCH	1852.4	22.13
		MCH	1880.0	22.38
		HCH	1907.6	22.24

Test Mode		Channel	Frequency (MHz)	Max Conducted Power (dBm)
WCDMA	Band IV	LCH	1712.4	22.53
		MCH	1732.6	22.60
		HCH	1752.6	22.70

Test Mode		Channel	Frequency (MHz)	Max Conducted Power (dBm)
WCDMA	Band V	LCH	826.4	22.34
		MCH	836.6	22.81
		HCH	846.6	22.62

<LTE Max Conducted Power>

Test Mode		Channel	Frequency (MHz)	Max Conducted Power (dBm)
LTE	Band 2	LCH	1850.7	22.47
		MCH	1880.0	22.55
		HCH	1909.3	22.56
	Band 4	LCH	1710.7	22.70
		MCH	1732.5	22.80
		HCH	1754.3	22.60
	Band 5	LCH	824.7	22.73
		MCH	836.5	22.80
		HCH	848.3	22.76
	Band 7	LCH	2502.5	22.54
		MCH	2535.0	22.74
		HCH	2567.5	22.43
	Band 12	LCH	699.7	22.66
		MCH	707.5	22.76
		HCH	715.3	22.61
	Band 17	LCH	706.5	22.54
		MCH	710.0	22.54
		HCH	713.5	22.45

5. Manufacturing Tolerance

WCDMA

Test Mode		Channel	Max Conducted Power (dBm)	ANT Max. Tune Up Power (dBm)
WCDMA	Band II	LCH	22.13	22.0±1.0
		MCH	22.38	22.0±1.0
		HCH	22.24	22.0±1.0
WCDMA	Band IV	LCH	22.53	22.0±1.0
		MCH	22.60	22.0±1.0
		HCH	22.70	22.0±1.0
WCDMA	Band V	LCH	22.34	22.0±1.0
		MCH	22.81	22.0±1.0
		HCH	22.62	22.0±1.0

LTE

Test Mode		Channel	Max Conducted Power (dBm)	ANT Max. Tune Up Power (dBm)
LTE	Band 2	LCH	22.47	22.0±1.0
		MCH	22.55	22.0±1.0
		HCH	22.56	22.0±1.0
	Band 4	LCH	22.70	22.0±1.0
		MCH	22.80	22.0±1.0
		HCH	22.60	22.0±1.0
	Band 5	LCH	22.73	22.0±1.0
		MCH	22.80	22.0±1.0
		HCH	22.76	22.0±1.0
	Band 7	LCH	22.54	22.0±1.0
		MCH	22.74	22.0±1.0
		HCH	22.43	22.0±1.0
	Band 12	LCH	22.66	22.0±1.0
		MCH	22.76	22.0±1.0
		HCH	22.61	22.0±1.0
	Band 17	LCH	22.54	22.0±1.0
		MCH	22.54	22.0±1.0
		HCH	22.45	22.0±1.0

6. EVALUATION RESULT

6.1. Standalone MPE

WCDMA&LTE

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm2)	MPE Limits (mW/cm2)
	dBm	mW				
WCDMA Band II	23.00	199.5262	3.00	1.9953	0.0792	1.0000
WCDMA Band IV	23.00	199.5262	3.00	1.9953	0.0792	1.0000
WCDMA Band V	23.00	199.5262	0.80	1.2023	0.0477	0.5493
LTE Band 2	23.00	199.5262	3.00	1.9953	0.0792	1.0000
LTE Band 4	23.00	199.5262	3.00	1.9953	0.0792	1.0000
LTE Band 5	23.00	199.5262	0.80	1.2023	0.0477	0.5493
LTE Band 7	23.00	199.5262	3.00	1.9953	0.0792	1.0000
LTE Band 12	23.00	199.5262	0.80	1.2023	0.0477	0.4660
LTE Band 17	23.00	199.5262	0.80	1.2023	0.0477	0.4693

6.2. Simultaneous transmission MPE Considerations

According to KDB447498 :For mobile exposure host platform to qualify for simultaneous transmission MPE test exclusion, all transmitters and antennas in the host must be either evaluated for MPE compliance, by measurement or computational modeling, or qualify for the standalone MPE test exclusion in section 7.1. Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0 .

This means that:

$$\sum \text{ of MPE ratios} \leq 1.0$$

Not Applicable

7. CONCLUSION

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

.....End of Report.....