

RF EXPOSURE REPORT

FOR

Applicant	:	MOTREX CO., LTD.
Address	:	Seoyoung Bldg. 25, Hwangsaеul-ro 258beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, South Korea
Equipment under Test	:	Equipo de Audio y Video para Vehiculo
Model No.	:	MTXMO430LAI3PE, MTXMO400LBDmFL, MTXMO400LSCPE, MTXMO400LSP2i, MTXMO400LSU2i, MTXMO400LSK3, MTXMO400LMQ4a, MTXMO420LBR2PE
Trade Mark	:	HYUNDAI/KIA
FCC ID	:	BP9-MO430LAI3PE
Manufacturer	:	Skypine Electronics(Shenzhen) Co.,Ltd
Address	:	3rd Floor of Building B, Jingang Technology Park, Qiaotou Village, Fuhai Sub-District, Baoan, Shenzhen, China

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

Add.: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park,
Dongguan City, Guangdong Province, China, 523808

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REPORT

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Test Report Declare

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Standard Used: KDB447498 D01 General RF Exposure Guidance v06

We Declare:

The equipment described above is assessed by Dongguan Dongdian Testing Service Co., Ltd. and in the configuration assessed the equipment complied with the standards specified above.

The assessed results are contained in this report and Dongguan Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these assess.

After evaluation, our opinion is that the equipment In Accordance with above standard.

Report No:	DDT-R22092815-4E04		
Date of Receipt:	Oct. 18, 2022	Date of Test:	Oct. 18, 2022 ~ Nov. 29, 2022

Prepared By:

Johnny Wang

Johnny Wang/Engineer

Approved By:



Damon Hu/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	Nov. 29, 2022	

1. General Information

1.1. Description of equipment

EUT* Name	: Equipo de Audio y Video para Vehiculo
Model Number	: MTXMO430LAI3PE, MTXMO400LBDmFL, MTXMO400LSCPE, MTXMO400LSP2i, MTXMO400LSU2i, MTXMO400LSK3, MTXMO400LMQ4a, MTXMO420LBR2PE
Difference of models	: Their head unit electrical circuit design, layout, components used and internal wiring are identical, the shape and the material are also identical. Only the frontpanel and the packaging material size are different, but the frontpanel circuit design and principle are the same. Therefore the test performed on the model MTXMO430LAI3PE and record in this report.
EUT Function Description	: Please reference user manual of this device
Power Supply	: DC 12V
Radio Specification	: Bluetooth V5.0, IEEE 802.11b/g/n, IEEE 802.11a/n/ac
Operation Frequency	: BT: 2402 MHz - 2480 MHz IEEE 802.11b: 2412MHz—2462MHz IEEE 802.11g: 2412MHz—2462MHz IEEE 802.11n HT20: 2412MHz—2462MHz IEEE 802.11n HT40: 2422MHz—2452MHz IEEE 802.11a: 5180MHz-5240MHz, 5745MHz-5825MHz IEEE 802.11n HT20: 5180MHz-5240MHz, 5745MHz-5825MHz IEEE 802.11n HT40: 5190MHz-5230MHz, 5755MHz-5755MHz IEEE 802.11ac HT20: 5180MHz-5240MHz, 5745MHz-5825MHz IEEE 802.11ac HT40: 5190MHz-5230MHz, 5755MHz-5755MHz IEEE 802.11ac HT80: 5210 MHz, 5775 MHz
Modulation	: BT: GFSK, $\pi/4$ -DQPSK, 8DPSK IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK)
Data Rate	: BT: 1 Mbps, 2 Mbps, 3 Mbps IEEE 802.11b: 1, 2, 5.5, 11 Mbps IEEE 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps IEEE 802.11n HT20: up to 72.2 Mbps IEEE 802.11n HT40: up to 150 Mbps IEEE 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps IEEE 802.11n HT20: 7.2, 21.7, 43.3, 72.2 Mbps IEEE 802.11n HT40: 15, 45, 90, 150 Mbps IEEE 802.11ac HT20: up to 86.6 Mbps IEEE 802.11ac HT40: up to 200 Mbps IEEE 802.11ac HT80: up to 433.3 Mbps
Antenna Gain	: BT: 4.52 dBi 2.4G WIFI: 4.52 dBi 5G WIFI: 4.83 dBi
Sample Type	: Series production
Sample Number	: S22092815-05

1.2. Assess laboratory

Dongguan Dongdian Testing Service Co., Ltd.

Add.: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City,
Guangdong Province, China, 523808.

Tel.: +86-0769-38826678, <http://www.dgddt.com>, Email: ddt@dgddt.com.

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20155, G-20118

2. RF Exposure Evaluation

2.1. 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 0.2 m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

Limits for General Population/Uncontrolled Exposure

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.2. Calculation method

$$E(\text{V/m}) = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } S(\text{mW/cm}^2) = \frac{E^2}{377}$$

E = Electric field (V/m)

P = Peak RF output power (mW)

G = EUT Antenna numeric gain (numeric)=

d = Separation distance between radiator and human body (m)

The formula can be changed to

We can change the formula to:

$$S = \frac{30 \times P \times G}{377 \times d^2} \quad \text{or, } d = \sqrt{\frac{30 \times P \times G}{377 \times S}}$$

From the peak EUT RF output power, the minimum mobile separation distance, d= 0.2 m, as well as the gain of the used antenna, the RF power density can be obtained.

2.3. Estimation result

Mode	PK Output power (dBm)	Output power (mW)	tune up power (dBm)	Antenna Gain (dBi)	Antenna Gain (linear)	MPE Values (mW/cm ²)	MPE Limit (mW/cm ²)
BT	9.97	9.93	10	4.52	2.83	0.00564	1
2.4G WIFI	15.59	36.22	16	4.52	2.83	0.02244	1
5G WIFI	11.39	13.77	12	4.83	3.04	0.00959	1

Note: The estimation distance is 20 cm

Conclusion: The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

END OF REPORT