

RF Exposure Evaluation Report

Product : Audio and Video Equipment for Vehicle
Trade mark : HYUNDAI/KIA
Model/Type reference : MTXMO420LBR2PE
Serial Number : S/N
Report Number : EED32O80607504
FCC ID : BP9-MO420LBR2PE
Date of Issue : May 27, 2022
Test Standards : 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General
RF Exposure Guidance v06
Test result : PASS

Prepared for:

MOTREX Co., LTD.

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May 27, 2022

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Version

Version No.	Date	Description
00	May 27, 2022	Original

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3 General Information

3.1 Client Information

Applicant:	MOTREX Co., LTD.
Address of Applicant:	Seoyoung Bldg. 25, Hwangsaеul-ro 258beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, South Korea
Manufacturer:	Skypine Electronics (ShenZhen)Co.,Ltd
Address of Manufacturer:	A1,A5 Building, No.6, Xinxing Industrial Park, Xinhe Village, Fuyong Town, Bao'an District, Shenzhen City,Guangdong Province,China
Factory:	Skypine Electronics (ShenZhen)Co.,Ltd
Address of Factory:	A1,A5 Building, No.6, Xinxing Industrial Park, Xinhe Village, Fuyong Town, Bao'an District, Shenzhen City,Guangdong Province,China

3.2 General Description of EUT

Product Name:	Audio and Video Equipment for Vehicle
Model No.:	MTXMO420LBR2PE
Test model:	MTXMO420LBR2PE
Trade Mark:	HYUNDAI/KIA
EUT Supports Radios application:	BT Classic,2.4G WiFi,5G WiFi:

3.3 Product Specification subjective to this standard

Frequency Range:	BT Classic:2402MHz~2480MHz 2.4G WiFi: IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz 5G WiFi: U-NII-3: 5745-5825MHz
Modulation Type:	BT Classic:GFSK, $\pi/4$ DQPSK, 8DPSK 2.4G WiFi: IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g :OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20 and HT40) : OFDM (64QAM, 16QAM,QPSK,BPSK) 5G WiFi: IEEE 802.11a: OFDM (BPSK, QPSK, 16QAM, 64QAM) IEEE 802.11n(HT20/HT40): OFDM (BPSK, QPSK, 16QAM, 64QAM) IEEE 802.11ac(VHT20/VHT40/VHT80): OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Test Power Grade:	Default
Test Software of EUT:	BT Classic:RTLBAPP.exe 2.4G WiFi:Xshell.exe 5G WiFi:Xshell.exe
Antenna Type:	BT Classic:PCB Antenna 2.4G WiFi:PCB Antenna 5G WiFi:PCB Antenna
Antenna Gain:	BT Classic:0dBi 2.4G WiFi:0dBi 5G WiFi:0dBi
Power Supply:	DC 12.0V

Test Voltage:	DC 12.0V
Max Conducted Peak Output Power:	BT Classic:11.40dBm(13.80mW) 2.4G WiFi:15.79dBm(37.93mW) 5G WiFi:12.57dBm(18.07mW) The Max Conducted Peak Output Power data refer to the report EED32O80607501,EED32O80607502,EED32O80607503.
Sample Received Date:	May. 05, 2022
Sample tested Date:	May. 11, 2022 to May. 18, 2022
Remark: N/A:the product is powered by DC12.0V. Company Name and Address shown on Report, the sample(s) and sample Information were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.	

3.4 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax: +86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

3.5 Deviation from Standards

None.

3.6 Abnormalities from Standard Conditions

None.

3.7 Other Information Requested by the Customer

None.

4 RF Exposure Evaluation

4.1 RF Exposure Compliance Requirement

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{377}$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{377 d^2}$$

Changing to units of mW and cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = d \text{ (m)} / 100$$

Yields

$$S = \frac{30 \times (P/1000) \times G}{377 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \text{Equation 1}$$

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

4.2 Maximum Permissible Exposure

Substituting the MPE safe distance using $d = 20$ cm into Equation 1:

$$S = 0.000199 \times P \times G$$

Where P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

BT Classic:

Calculated data:

Ch.	Frq. (MHz)	P (mW)	Gain (dBi)	Gain (num.)	D (cm)	Power density in mW / cm ²	Limit (mW/cm ²)
0	2402	13.80	0.00	1.0000000000	20	0.00275	1
39	2441	13.80	0.00	1.0000000000	20	0.00275	1

2.4G WiFi:

Calculated data:

Ch.	Frq. (MHz)	P (mW)	Gain (dBi)	Gain (num.)	D (cm)	Power density in mW / cm ²	Limit (mW/cm ²)
3	2422	37.93	0.00	1.0000000000	20	0.00755	1

5G WiFi:

Calculated data:

Ch.	Frq. (MHz)	P (mW)	Gain (dBi)	Gain (num.)	D (cm)	Power density in mW / cm ²	Limit (mW/cm ²)
149	5745	18.07	0.00	1.0000000000	20	0.00360	1

Note: $0.00275(\text{mW}/\text{cm}^2) < 1(\text{mW}/\text{cm}^2)$,

$0.00755(\text{mW}/\text{cm}^2) < 1(\text{mW}/\text{cm}^2)$,

$0.00360(\text{mW}/\text{cm}^2) < 1(\text{mW}/\text{cm}^2)$

Result: compliant

PHOTOGRAPHS OF EUT Constructional Details

Refer to Report No. EED32O80607501 for EUT external and internal photos.

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CTI, this report can't be reproduced except in full.

*** End of Report ***