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RF Exposure Evaluation Report

Report No.: CQASZ20231001940E-04
Applicant: eMoMo Technology Co., Ltd
Address of Applicant: 4th, Floor, Yong He Building, Tai Wan Industrial Park, Shi Yan Town, Bao'an District, Shen Zhen, Guangdong, China
Equipment Under Test (EUT):
EUT Name: Multi-function audio system
Model No.: E535
Test Model No.: E535
Brand Name: eMoMo
FCC ID: A4E-E535
Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
447498 D04 Interim General RF Exposure Guidance v01
Date of Receipt: 2023-10-27
Date of Test: 2023-10-27 to 2023-11-6
Date of Issue: 2023-11-08
Test Result: **PASS***

*In the configuration tested, the EUT complied with the standards specified above

Tested By:

Lewis Zhou

(Lewis Zhou)

Reviewed By:

Timo Lei

(Timo Lei)

Approved By:

Jack Ai

(Jack Ai)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20231001940E-04	Rev.01	Initial report	2023-11-08

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3 General Information

3.1 Client Information

Applicant:	THINKCAR TECH CO., LTD.
Address of Applicant:	2606, building 4, phase II, TiananYungu, Gangtou community, Bantian, Longgang District, Shenzhen
Manufacturer:	THINKCAR TECH CO., LTD.
Address of Manufacturer:	2606, building 4, phase II, TiananYungu, Gangtou community, Bantian, Longgang District, Shenzhen
Factory:	THINKCAR TECH CO., LTD.
Address of Factory:	2606, building 4, phase II, TiananYungu, Gangtou community, Bantian, Longgang District, Shenzhen

3.2 General Description of EUT

Product Name:	Multi-function audio system
Model No.:	E535
Test Model No.:	E535
Trade Mark:	eMoMo
Software Version:	5A
Hardware Version:	V01
EUT Power Supply:	Model:MX65W1-1205000U Input:100-240V~50-60Hz 2A Output:12V 5A

3.3 General Description of BT Classic

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V5.3
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channel:	79
Transfer Rate:	1Mbps/2Mbps/3Mbps
Hopping Channel Type:	Adaptive Frequency Hopping systems
Sample Type:	☒ Mobile ☐ Portable
Antenna Type:	Chip antenna
Antenna Gain:	1.5dBi

3.4 General Description of BLE

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V5.3
Modulation Type:	GFSK
Number of Channel:	40
Transfer Rate:	1Mbps

Sample Type:	☒ Mobile ☐ Portable
Antenna Type:	Chip antenna
Antenna Gain:	1.5dBi

Note:

The above parameters will directly affect the test results. The information is provided by the applicant.

4 MPE Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Limits

The table applies to any RF source (i.e., single fixed, mobile, and portable transmitters) and specifies power and distance criteria for each of the five frequency ranges used for the MPE limits. These criteria apply at separation distances from any part of the radiating structure of at least $\lambda/2\pi$. The thresholds are based on the general population MPE limits with a single perfect reflection, outside of the reactive near-field, and in the main beam of the radiator. For mobile devices that are not exempt per Table B.1 [Table 1 of § 1.1307(b)(1)(i)(C)] at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in § 1.1310 is necessary if the ERP of the device is greater than ERP_{20cm} in Formula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i.e., without consideration of ERP only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave Dipole.

SAR-based exemptions are constant at separation distances between 20 cm and 40 cm to avoid discontinuities in the threshold when transitioning between SAR-based and MPE-based exemption criteria at 40 cm, considering the importance of reflections.

4.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

4.1.3 EUT RF Exposure

1) For BT Classic

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

GFSK mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2402MHz)	-1.7	-3.85	-3.5±1	-2.5	0.562
Middle(2441MHz)	-0.62	-2.77	-2.5±1	-1.5	0.708
Highest(2480MHz)	-0.81	-2.96	-3±1	-2	0.631
π/4DQPSK mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2402MHz)	-1.99	-4.14	-4±1	-3	0.501
Middle(2441MHz)	-0.78	-2.93	-3±1	-2	0.631
Highest(2480MHz)	-0.95	-3.1	-3±1	-2	0.631
8DPSK mode					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2402MHz)	-1.82	-3.97	-4±1	-3	0.501
Middle(2441MHz)	-0.79	-2.94	-3±1	-2	0.631
Highest(2480MHz)	-0.7	-2.85	-2.5±1	-1.5	0.708

The ERP of this product is less than 3060mW

Note: 1) Refer to report No. CQASZ20231001940E-01 for EUT test Max Conducted Peak Output Power value.

2) EUT's module is more than 20cm away from the human body.

2) For BLE

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

GFSK mode(1Mbps)					
Test channel	EIRP (dBm)	ERP (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2402MHz)	0.47	-1.68	-1.5±1	-0.5	0.891
Middle(2440MHz)	1.64	-0.51	-0.5±1	0.5	1.122
Highest(2480MHz)	1.5	-0.65	-0.5±1	0.5	1.122

The ERP of this product is less than 3060mW

Note: 1) Refer to report No. CQASZ20231001940E-02 for EUT test Max Conducted Peak Output Power value.

2) EUT's module is more than 20cm away from the human body.

*** END OF REPORT ***