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RF Exposure Evaluation Report

Report No.:	CQASZ20220200281E-02
Applicant:	FoShan GaoMing Cambo fashionable lighting trade company
Address of Applicant:	Room 106, No.12, lane 4, HuanCheng street, GaoMing district, Foshan city, GuangDong province
Equipment Under Test (EUT):	
EUT Name:	Bluetooth lighting module
Model No.:	BLEDIM-CB01
Test Model No.:	BLEDIM-CB01
Brand Name:	BLEDIM
FCC ID:	2A49J-CB01
Standards:	47 CFR Part 1.1307 47 CFR Part 1.1310 KDB447498D01 General RF Exposure Guidance v06
Date of Receipt:	2022-03-01
Date of Test:	2022-03-01 to 2022-03-10
Date of Issue:	2022-03-11
Test Result:	**PASS***

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

Tested By: lewis zhou

(Lewis Zhou)

Reviewed By: Rock Huang

(Rock Huang)

Approved By:

(Jack Ai)

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20220200281E-02	Rev.01	Initial report	2022-03-11

2 Contents

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3 General Information

3.1 Client Information

Applicant:	FoShan GaoMing Cambo fashionable lighting trade company
Address of Applicant:	Room 106, No.12, lane 4, HuanCheng street, GaoMing district, Foshan city, GuangDong province
Manufacturer:	FoShan GaoMing Cambo fashionable lighting trade company
Address of Manufacturer:	Room 106, No.12, lane 4, HuanCheng street, GaoMing district, Foshan city, GuangDong province
Factory:	Shenzhen Xiaoming Industrial Internet Co., LTD
Address of Factory:	Floor 2, B7, YiJing industrial park, TianLiao community, GuangMing district, ShenZhen, China

3.2 General Description of EUT

Product Name:	Bluetooth lighting module
Model No.:	BLEDIM-CB01
Test Model No.:	BLEDIM-CB01
Trade Mark:	BLEDIM
Software Version:	1.0
Hardware Version:	1.0
EUT Power Supply:	Power by computer

3.3 General Description of BLE Classic

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	Bluetooth Spec 4.2
Modulation Technique:	Non-Frequency Hopping Spread Spectrum(NFHSS)
Modulation Type:	GFSK
Number of Channel:	40
Transfer Rate:	1Mbps
Sample Type:	☒ Mobile ☐ Portable ☐ Fix Location
Antenna Type:	PCB antenna
Antenna Gain:	1dBi
Cable loss:	1.0 dB

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

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
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
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*($180/f^2$)	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

Friis Formula

Friis transmission formula: $Pd = (Pout*G)/(4* Pi * R^2)$

Where

Pd = power density in mW/cm2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

Pd id the limit of MPE, 1 mW/cm2 . If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

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 BLE Classic

Antenna Gain: 1dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.259 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	1.7	1.5±1	2.5	1.778
Middle(2440MHz)	2.34	2.0±1	3.0	1.995
Highest(2480MHz)	3.2	3.0±1	4.0	2.512

The worst case:

Maximum tune-up Power (mW)	**Antenna Gain (dBi)**	**Power Density at R = 20 cm (mW/cm^2)**	**Limit**	**Result**
2.512	1	0.0006291137	1.0	PASS

Note: 1) Refer to report No. CQASZ20220200281E-01 for EUT test Max Conducted Peak Output Power value.
2) Pd = (Pout*G)/(4* Pi * R2)=(2.512*1.259)/(4*3.1416*202)=0.0006291137
3) EUT's Bluetooth module is more than 20cm away from the human body.

*** END OF REPORT ***