

RF Exposure Evaluation Report

Report Reference No......: **MTEB23060251-H**

FCC ID.....: **2A3NQ-ECO-KD100**

Compiled by

(position+printed name+signature)..: File administrators Alisa Luo



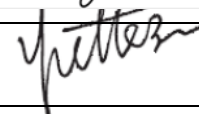
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Date of issue.....: **Jun.26,2023**

Representative Laboratory Name .: **Shenzhen Most Technology Service Co., Ltd.**

Address: East A, 1 floor of New Aolin Factory building, Langshan Erlu, North District, Hi-tech Industry Park, Nanshan, Shenzhen, Guangdong, China

Applicant's name.....: **Ecobene Technology Limited**

Address: 7th Floor, Building A1, Huaxing Industrial Park, Shangxue Road, Bantian Street, Longgang District, Shenzhen City, Guangdong Province, China

Test specification/ Standard: **47 CFR Part 1.1307;47 CFR Part 1.1310**
KDB447498D01 General RF Exposure Guidance v06

TRF Originator.....: Shenzhen Most Technology Service Co., Ltd.

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Test item description: LED Auxiliary Spotlight

Trade Mark: ECOBENE

Manufacturer: Ecobene Technology Limited

Model/Type reference.....: ECO-KD100

Listed Models: ECO-KD120,KD120,ECO-KD120-01,ECO-KD120-02,KD100,
ECO-KD100-01,ECO-KD100-02,ECO-KD90,KD90,ECO-KD90-01,
ECO-KD90-02,ECO-KD80,KD80,ECO-KD80-01,ECO-KD80-02,
ECO-KD70,KD70,ECO-KD70-01,ECO-KD70-02,ECO-KD60,KD60,
ECO-KD60-01,ECO-KD60-02,ECO-KD50,KD50,ECO-KD50-01,
ECO-KD50-02,ECO-KD40,KD40,ECO-KD40-01,ECO-KD40-02,
ECO-KD35,KD35,ECO-KD35-01,ECO-KD35-02,ECO-KD30,KD30,
ECO-KD30-01,ECO-KD30-02,ECO-KD25,KD25,ECO-KD25-01,
ECO-KD25-02,ECO-KD20,KD20,ECO-KD20-01,ECO-KD20-02,
ECO-KD15,KD15,ECO-KD15-01,ECO-KD10,KD10,ECO-KD10-01,
ECO-KD168,KD168,ECO-KD168-01

Modulation Type	GFSK
Operation Frequency	From 2402MHz to 2480MHz
Hardware Version	KD100 REV01
Software Version	KD100 REV01
Rating	DC 12-15V (by DC Source)
Result	PASS

TEST REPORT

Equipment under Test	:	LED Auxiliary Spotlight
Model /Type	:	ECO-KD100
Listed Models		ECO-KD120,KD120,ECO-KD120-01,ECO-KD120-02,KD100, ECO-KD100-01,ECO-KD100-02,ECO-KD90,KD90,ECO-KD90-01, ECO-KD90-02,ECO-KD80,KD80,ECO-KD80-01,ECO-KD80-02, ECO-KD70,KD70,ECO-KD70-01,ECO-KD70-02,ECO-KD60,KD60, ECO-KD60-01,ECO-KD60-02,ECO-KD50,KD50,ECO-KD50-01, ECO-KD50-02,ECO-KD40,KD40,ECO-KD40-01,ECO-KD40-02, ECO-KD35,KD35,ECO-KD35-01,ECO-KD35-02,ECO-KD30,KD30, ECO-KD30-01,ECO-KD30-02,ECO-KD25,KD25,ECO-KD25-01, ECO-KD25-02,ECO-KD20,KD20,ECO-KD20-01,ECO-KD20-02, ECO-KD15,KD15,ECO-KD15-01,ECO-KD10,KD10,ECO-KD10-01, ECO-KD168,KD168,ECO-KD168-01
Remark		Only the model name is different, and everything else is the same.
Applicant	:	Ecobene Technology Limited
Address	:	7th Floor, Building A1, Huaxing Industrial Park, Shangxue Road, Bantian Street, Longgang District, Shenzhen City, Guangdong Province, China
Manufacturer	:	Ecobene Technology Limited
Address	:	7th Floor, Building A1, Huaxing Industrial Park, Shangxue Road, Bantian Street, Longgang District, Shenzhen 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.

1. Revision History

Revision	Issue Date	Revisions	Revised By
00	2023.06.26	Initial Issue	Alisa Luo

2. SAR Evaluation

2.1 RF Exposure Compliance Requirement

2.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

2.1.2 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: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$ Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

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

P_d is 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.

2.1.3 EUT RF Exposure

Antenna Gain: 1dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.4 in linear scale. Output Power Into Antenna & RF Exposure Evaluation Distance:

BLE

GFSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402MHz)	-1.354	-1.354±1	-0.354
Middle(2440MHz)	2.886	2.886±1	3.886
Highest(2480MHz)	-0.834	-0.834±1	0.166

BLE

Worst case: GFSK						
Channel	Maximum tune-up Power (dBm)	Maximum tune-up Power (MW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
Middle(2440MHz)	3.886	2.45	1	0.0006	1.0	Pass

Note: 1) Refer to report MTEB23060251-R for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (2.45 \cdot 1.3) / (4 \cdot 3.1416 \cdot 20^2) = 0.0006$

.....**THE END OF REPORT**.....