

RF Exposure Evaluation Report

Report Reference No...... : **MTEB23060135-H**

FCC ID..... : **2AB2Q-M450ST-W1T**

Compiled by

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



Supervised by

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Approved by

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Date of issue.....: June 12,2023

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

Address.....: No.5, 2nd Langshan Road, North District, Hi-tech Industrial Park,
Nanshan, Shenzhen, Guangdong, China.

Applicant's name.....: **LEEDARSON LIGHTING CO., LTD.**

Address.....: Xingda Road, Xingtai Industrial Zone, Changtai County,
Zhangzhou, Fujian, China

Test specification/ Standard.....: **47 CFR Part 1.1307**

47 CFR Part 2.1093

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

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Test item description.....: Smart LED Lamp

Trade Mark: LEEDARSON

Manufacturer.....: 1:LEEDARSON LIGHTING CO., LTD.

2:LEEDARSON IOT TECHNOLOGY (THAILAND) CO., LTD.

Model/Type reference.....: 12MR161050RGB01

Listed Models: 13aSy-M450ST-W1T-xx, 12MR161050RGBxx

(Where "y" may be "A" to "Z", which designates for different enclosure pattern design; "xx" may be "00" to "99", which designates for different beam angle, color of eyelet contact, different package of style and CCT.)

Modulation Type.....: GFSK

Operation Frequency.....: From 2402MHz to 2480MHz

Hardware Version.....: wifi 2.4G+ble 4.2

Software Version.....: Hubspace

Rating.....: 120V, 60Hz, 78mA, 5.5W

Result.....: PASS

TEST REPORT

Equipment under Test : Smart LED Lamp

Model /Type : 12MR161050RGB01

Listed Models 13aSy-M450ST-W1T-xx, 12MR161050RGBxx
(Where “y” may be “A” to “Z”, which designates for different enclosure pattern design; “xx” may be “00” to “99”, which designates for different beam angle, color of eyelet contact, different package of style and CCT.)

Remark Their electrical circuit design,layout components used and internal wiring are identical,Only the beam angle, color of eyelet contact, package of style and CCT are different.

Applicant : LEEDARSON LIGHTING CO., LTD.

Address : Xingda Road, Xingtai Industrial Zone, Changtai County, Zhangzhou, Fujian, China

Manufacturer(1) : LEEDARSON LIGHTING CO., LTD.

Address(1) : Xingtai Industrial Zone, Economic Development Zone, Changtai County, Zhangzhou City, Fujian Province, P.R.China

Manufacturer(2) : LEEDARSON IOT TECHNOLOGY (THAILAND) CO., LTD.

Address(2) : 71, Moo5,Wellgrow Industrial Estate. Bang Samak, Bang Pakong District, Chachoengsao 24130

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	2023.06.12	Initial Issue	Alisa Luo

2. SAR Evaluation

2.1 RF Exposure Compliance Requirement

2.1.1 Standard Requirement

According to §1.1307(e)(1), systems operating under the provisions of this 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.

According to §1.1310 and §2.1091 RF exposure is calculated.

KDB447498 D01: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

2.1.2 Limits

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

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

Measurement Data

BLE

GFSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402MHz)	7.521	7.521 ± 1	8.521
Middle(2441MHz)	8.723	8.723 ± 1	9.723
Highest(2480MHz)	8.124	8.124 ± 1	9.124

Worst case: GFSK						
Channel	Maximum Peak Conducted Output Power (dBm)	Maximum Peak Conducted Output Power (MW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
Highest(2441 MHz)	9.723	9.38	-1.36	0.0014	1.0	Pass

Note: 1) Refer to report **MTEB23060135-R1** for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (9.38 \cdot 0.73) / (4 \cdot 3.1416 \cdot 20^2) = 0.0014$

Note: 3) EUT's Bluetooth module is more than 20cm away from the human body.

WIFI 2.4G

Antenna Gain: -1.75dBi

IEEE for 802.11b mode			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	18.03	18.03±1	19.03
Middle(2437MHz)	18.06	18.06±1	19.06
Highest(2462MHz)	18.55	18.55±1	19.55

IEEE for 802.11g mode			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	14.79	14.79±1	15.79
Middle(2437MHz)	14.95	14.95±1	15.95
Highest(2462MHz)	15.33	15.33±1	16.33

IEEE for 802.11n(HT20) mode			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	13.43	13.43±1	14.43
Middle(2437MHz)	13.78	13.78±1	14.78
Highest(2462MHz)	13.98	13.98±1	14.98

IEEE for 802.11n(HT40) mode			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	13.07	13.07±1	14.07
Middle(2437MHz)	12.99	12.99±1	13.99
Highest(2452MHz)	13.05	13.05±1	14.05

Worst case: 802.11b mode						
Channel	Maximum Peak Conducted Output Power (dBm)	Maximum Peak Conducted Output Power (MW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
Highest(2462MHz)	19.55	90.15	-1.36	0.013	1.0	Pass

Note: 1) Refer to report **MTEB23060135-R2** for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (90.15 \cdot 0.73) / (4 \cdot 3.1416 \cdot 20^2) = 0.013$ Note:

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

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