

RF Exposure Evaluation Report

Report Reference No...... : **MTEB25010036-H**
FCC ID..... : **2BDTU-TUYA**
Compiled by

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Date of issue..... : **Jan.07,2025**
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..... : **Zhongshan Shengda Optoelectronic Technology Co., Ltd.**
Address..... : Floor 6, No. 4, Nan Er Lane, Huasheng East Road, Caosan
Industrial Zone, Guzhen Town ,Zhongshan,Guangdong,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.....: ceiling light

Trade Mark.....: FXPOT

Model/Type reference.....: TUYA-CEILING-24W

Listed Models: TUYA-CEILING-24W-2,TY-BP-SL-24W,
TY-WP-SL-24W,TUYA-XDD-1,TUYA-XDD-2,SDCL-24W

Modulation Type.....: GFSK

b: DSSS ,CCK

g/n: BPSK,QPSK,QAM

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

From 2412MHz~2462MHz

Hardware Version..... V1.0

Software Version..... V1.0

Rating.....: AC 85-265V 50/60Hz

Result.....: **PASS**

TEST REPORT

Equipment under Test : ceiling light

Model /Type : TUYA-CEILING-24W

Listed Models : TUYA-CEILING-24W-2,TY-BP-SL-24W,TY-WP-SL-24W,
TUYA-XDD-1,TUYA-XDD-2,SDCL-24W

Remark : Only the model “TUYA-CEILING-24W” was tested, Their electrical circuit design, layout, components used and internal wiring are identical, Only the model name and Appearance is different.

Applicant : Zhongshan Shengda Optoelectronic Technology Co., Ltd.

Address : Floor 6, No. 4, Nan Er Lane, Huasheng East Road, Caosan Industrial Zone, Guzhen Town ,Zhongshan,Guangdong,China

Manufacturer : Zhongshan Shengda Optoelectronic Technology Co., Ltd.

Address : Floor 6, No. 4, Nan Er Lane, Huasheng East Road, Caosan Industrial Zone, Guzhen Town ,Zhongshan,Guangdong,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	2025.01.07	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**BLE**

GFSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402 MHz)	0.898	0.898 ± 1	1.898
Middle(2440MHz)	0.418	0.418 ± 1	1.418
Highest(2480MHz)	-0.773	-0.773 ± 1	0.227

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
Lowest(2402 MHz)	1.898	1.55	-0.68dBi	0.00027	1.0	Pass

Note: 1) Refer to report MTEB25010036-R1 for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (1.55 * 0.86) / (4 * 3.1416 * 20^2) = 0.00027$

WIFI 2.4G

802.11b			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	9.35	9.35 ± 1	10.35
Middle(2437MHz)	11.91	11.91 ± 1	12.91
Highest(2462MHz)	11.51	11.51 ± 1	12.51

802.11g			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	13.70	13.70 ± 1	14.7
Middle(2437MHz)	13.10	13.10 ± 1	14.1
Highest(2462MHz)	12.64	12.64 ± 1	13.64

802.11n(H20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	12.15	12.15 ± 1	13.15
Middle(2437MHz)	12.35	12.35 ± 1	13.35
Highest(2462MHz)	12.00	12.00 ± 1	13

WIFI 2.4G

Worst case: 802.11g						
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
Lowest(2412MHz)	14.7	29.51	-0.68dBi	0.00505	1.0	Pass

Note: 1) Refer to report MTEB25010036-R2 for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (29.51 * 0.86) / (4 * 3.1416 * 20^2) = 0.00505$

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