

Safety Human Exposure

1.1 Radio Frequency Exposure Compliance

1.1.1 Electromagnetic Fields

RESULT:

Pass

Test item : LED Fixed Lamp
Identification / Type No. : V2501
FCC ID : FHO-V2501
IC : 10912A-V2501
Test standard : CFR47 FCC Part 2: Section 2.1091
CFR47 FCC Part 1: Section 1.1310
FCC KDB Publication 447498 D01 V06
RSS-102 Issue 6 December 2023

➤ Product Classification

This device defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the RF source's radiating structure(s) and the body of the user or nearby persons.

Max 3.10 dBi

➤ FCC Radio Frequency Exposure Limit

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)
300-1,500	--	--	f/1500
1,500-100,000	--	--	1.0

➤ Radio Frequency Exposure Calculation Formula

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

or:

$$S = \frac{EIRP}{4\pi R^2}$$

where: EIRP = equivalent (or effective) isotropically radiated power

➤ **IC Field reference level exposure exemption limits**

Field reference level (FRL) exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm (i.e. mobile devices), except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 1 W (adjusted for tune-up tolerance)
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than $4.49/f^{0.5}W$ (adjusted for tune-up tolerance), where f is in MHz
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance)
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than $1.31 \times 10^{-2}f^{0.6834}W$ (adjusted for tune-up tolerance), where f is in MHz
- at or above 6 GHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 5 W (adjusted for tune-up tolerance)

a) EUT RF Exposure Evaluation standalone operations

FCC

Mode	*Measured RF Output Power (dBm)	EIRP (dBm)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
BLE	5.1	8.2	20	0.0013	1
Zigbee	5.8	8.9	20	0.0015	1
Thread	5.1	8.2	20	0.0013	1

IC

Mode	Frequency (MHz)	*Measured RF Output Power (dBm)	EIRP (dBm)	EIRP (W)	Limit (W)
BLE	2402	5.1	8.2	0.0066	2.6764
Zigbee	2445	5.8	8.9	0.0078	2.7091
Thread	2405	5.1	8.2	0.0066	2.6787

Note:

BLE RF Output Power: Refer CN26TPE8 001

Zigbee Output Power: Refer CN26WIY7 001

Thread Output Power: Refer CN2627BZ 001

BLE, Zigbee and Thread share one RF chip and antenna, so no need to evaluation simultaneous transmission.

➤ **Conclusion**

The distance between antenna and human is larger than 20 cm in normal use.

Therefore, the maximum calculations result of above are meet the requirement of Radio Frequency Exposure limit.