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RF Exposure Report

The equipment under test (EUT) is a SMART LED BULB with 2.4G WIFI function operating in 2412-2462MHz. The EUT is powered by AC100-240V, 50/60Hz. The WIFI module controls the output of R, G, B, W and CW beads by outputting PWM signals to realize color conversion and brightness adjustment. For more detail information pls. refer to the user manual.

WIFI Function:

Modulation Type: CCK, BPSK, QPSK, 16QAM, 64QAM, DQPSK, DBPSK

Antenna Type: Internal antenna

Antenna Gain: 2.5 dBi

The nominal peak conducted output power specified: 20dBm (Tolerance: +/- 3dB)

The maximum conducted output power for the EUT is 21.22 dBm in the frequency 2.412GHz 802.11n20 mode which is within the production variation.

The minimum conducted output power for the EUT is 17.13 dBm in the frequency 2.462GHz 802.11b mode which is within the production variation.

According to FCC Part 2.1091, this unlicensed transmitting devices is categorically excluded from routine environmental evaluation for RF exposure prior to equipment authorization or use,

According to the KDB 447498 and OET 65, the simple calculation as below:

For Maximum Permissible Exposure (MPE) evaluation of the product, the maximum power density at 20 cm from this transmitter shall be less than the General Population / Uncontrolled MPE limit in OET Bulletin 65.

The maximum E.I.R.P = 20dBm+3dB+2.5dBi=25.5dBm=354.81mW

The source-based time averaged maximum radiated power = 354.81mW x Duty Cycle
= 354.81mW

From above data, the exposed power density at a distance (R) of 20cm from the center of radiation of the antenna can be calculated according to OET Bulletin 65 as follow:

$$\begin{aligned} &= 354.81\text{mW} / 4\pi R^2 \\ &= 0.071 \text{ mW/cm}^2 \end{aligned}$$

The MPE limit is 1.0 mW/cm² for general population and uncontrolled exposure in the Wi-Fi frequency range according to FCC Part 1.1310. As the measured power density at 20cm from the transmitter is lower than the MPE limit, the compliance to the

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MPE limit can be ensured by indicating the minimum 20cm separation between the transmitter's radiating structure and body of the user or nearby persons.

Transmitter Duty Cycle Calculation

The EUT transmit continuously during the test, the duty cycle is 1.

The following RF exposure statement or similar sentence is proposed to be included in the user manual:

“FCC RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons.”