RF Exposure

The equipment under test (EUT) is a iUVC1 UVC Smart Lamp with Wi-Fi function operating at 2412-2462MHz for 802.11b/g/n-HT20, 11 channels with 5MHz channel spacing and 5.8G microwave inductor operating at 5800 MHz. The EUT is powered by AC120V/60Hz. For more detail information pls. refer to the user manual.

Standalone SAR evaluation for 5.8G Transmitter

Antenna Type: Integral antenna.
Antenna Gain: 0.0dBi.
The nominal conducted output power specified: -4.0dBm (±1dB)
The nominal radiated output power (e.i.r.p) specified: -4.0dBm (±1dB)

The maximum peak radiated emission for the EUT is 91.8dBμV/m at 3m
The EIRP = [(FS*D) ^2 / 30] mW = -3.43dBm
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:

The source-based time averaged maximum radiated power = -3.0dBm = 0.5mW

From above data, the exposed power density at a distance (R) of 20cm from the center of radiation of the antenna for 5.8GHz band can be calculated according to OET 65 as follow:
= 0.5mW/ 4πR^2
= 0.0001 mW/cm^2
<1mW/cm^2

The MPE limit is 1.0 mW/cm^2 for general population and uncontrolled exposure in the 5.8GHz 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 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.

Standalone SAR evaluation for WIFI function

2.4GHz WIFI:
Antenna Type: Integral Antenna.
Antenna Gain: 2.0dBi.
Modulation Type: BPSK, QPSK, 16QAM, 64QAM, CCK, DQPSK, DBPSK.
The nominal conducted output power specified: 21dBm (Tolerance: ±2dB).

The maximun conducted output power for the EUT is 22.80dBm in the frequency 2412MHz(IEEE 802.11n-HT20) which is within the production variation.

The minimum conducted output power for the EUT is 19.25dBm in the frequency 2462MHz(IEEE 802.11b) 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:

The source-based time averaged maximum radiated power = 21dBm+2dB+2dBi= 25dBm = 316.2mW

From above data, the exposed power density at a distance (R) of 20cm from the center of radiation of the antenna for 2.4GHz WIFI band can be calculated according to OET 65 as follow:
= 316.2mW/ 4πR^2
= 0.063 mW/cm^2
<1mW/cm^2

The MPE limit is 1.0 mW/cm^2 for general population and uncontrolled exposure in the 2.4GHz 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 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.

Simultaneous Transmission SAR Evaluation

For Simultaneous transmitting of 2.4GHz WIFI and 5.8G Transmitter, According to 865664D02 2.2 d) 1):

The sum of the ratios of the spatially averaged results to the applicable frequency dependent MPE limits = 0.063/1 + 0.0001/1 = 0.0631 < 1

Since the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in the device is $\leqslant$ 1.0, the EUT is considered to satisfy MPE compliance for simultaneous transmission operations.

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.”