

INTERTEK TESTING SERVICES

RF Exposure

The equipment under test (EUT) is an Flood Light with Wifi Amplifier Speaker and Camera with 2.4G BT function operating 2402-2480MHz, 2.4G WIFI function operating in 2412-2462MHz and 5G WIFI function operating in 5725MHz~5850MHz. The EUT is powered by DC 12.0V by USB port. The bluetooth and WiFi cannot be transmitted at the same time, And The 2.4G Wi-Fi and 5.8G Wi-Fi cannot be transmitted at the same time. For more detail information pls. refer to the user manual.

2.4G BT(BLE):

Antenna Type: Integral antenna

Modulation Type: GFSK

Antenna Gain: -0.58dBi

Bluetooth Version: 5.3 (Single Mode BLE)

The nominal conducted output power specified: 0 dBm (± 2.0 dB)

The nominal radiated output power (e.i.r.p) specified: -0.58 dBm (± 2.0 dB)

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 = $-0.58\text{dBm} + 2.0\text{dBi} = 1.42\text{dBm} = 1.39\text{mW}$

From above data, the exposed power density at a distance (R) of 20cm from the center of radiation of the antenna for 2.4GHz band can be calculated according to OET 65 as follow:

$$= 1.39\text{mW} / 4\pi R^2$$

$$= 0.00028 \text{ mW/cm}^2$$

$$< 1\text{mW/cm}^2$$

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

2.4GHz WiFi:

Antenna Type: FPC Antenna.

Antenna Gain: 3.47dBi

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

The nominal conducted output power specified: 22.0dBm (Tolerance: ± 2.0 dB).

The nominal radiated output power (e.i.r.p) specified: 25.47dBm (Tolerance: ± 2.0 dB).

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The maximum conducted output power for the EUT is 23.76dBm in the frequency 2412MHz(IEEE 802.11B) which is within the production variation.

The minimum conducted output power for the EUT is 20.98dBm in the frequency 2452MHz(IEEE 802.11N40) which is within the production variation.

According to FCC Part 2.1091, this unlicensed transmitting device 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 = 25.47dBm +2.0dBi = 27.47dBm = 558.47mW

From above data, the exposed power density at a distance (R) of 20cm from the center of radiation of the antenna for 2.4GHz band can be calculated according to OET 65 as follow:

$$= 558.47\text{mW} / 4\pi R^2$$

$$= 0.1112 \text{ mW/cm}^2$$

$$< 1\text{mW/cm}^2$$

The MPE limit is 1.0 mW/cm² for general population and uncontrolled exposure in the WIFI 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.

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5.8GHz WiFi:

Antenna Type: FPC Antenna.

Antenna Gain: 3.41dBi.

Modulation Type: BPSK, QPSK, 16QAM, 64QAM and OFDM.

The nominal conducted output power specified: 17.0dBm (Tolerance: +/-2.0dB).

The nominal radiated output power (e.i.r.p) specified: 20.41dBm (Tolerance: +/-2.0dB).

The maximum conducted output power for the EUT is 18.74dBm in the frequency 5825MHz(IEEE 802.11 A) which is within the production variation.

The minimum conducted output power for the EUT is 16.99dBm in the frequency 5755MHz(IEEE 802.11 n-HT40) which is within the production variation.

According to FCC Part 2.1091, this unlicensed transmitting device 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 = 20.41dBm +2.0dBi = 22.41dBm =174.18mW

From above data, the exposed power density at a distance (R) of 20cm from the center of radiation of the antenna for 2.4GHz band can be calculated according to OET 65 as follow:

$$= 174.18\text{mW} / 4\pi R^2$$

$$= 0.0347 \text{ mW/cm}^2$$

$$<1\text{mW/cm}^2$$

The MPE limit is 1.0 mW/cm² for general population and uncontrolled exposure in the WIFI 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.

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.”