

INTERTEK TESTING SERVICES

RF Exposure

The Equipment Under Test (EUT) is a Desk Sign with Wi-Fi function operating at 2412-2462MHz and NFC function operating at 13.56MHz. The EUT is powered by DC 5.0V by adapter. For more detailed features description, please refer to the user's manual.

NFC:

Antenna Type: Integral antenna

Antenna Gain: 0dBi Max

The nominal conducted output power specified: -38dBm (± 3 dB)

The nominal radiated output power (e.i.r.p) specified: -38.0dBm (± 3 dB)

According to the KDB 447498:

The maximum peak radiated emission for the EUT is 57.0dB μ V/m at 3m in the frequency 13.56MHz

The EIRP = $[(FS^*D)^2 / 30]$ mW = -38.23dBm
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 peak maximum conducted output power is -35dBm = 0.000316mW

From above data, the exposed power density at a distance (R) of 20cm from the center of radiation of the antenna for 5.0 BLE mode can be calculated according to OET 65 as follow:

$$= 0.000316mW / 4\pi R^2$$

$$= 0.00000006 mW/cm^2$$

$$<1mW/cm^2$$

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

Wi-Fi:

Antenna Type: Integral antenna

Antenna Gain: 2.0dBi Max

The nominal conducted output power specified: 5.0dBm (± 4 dB)

The nominal radiated output power (e.i.r.p) specified: 7.0dBm (± 4 dB)

According to the KDB 447498:

The maximum peak conducted output power for the EUT is 7.4dBm in the frequency 2462MHz(802.11n), which is within the production variation.

The minimum peak conducted output power for the EUT is 1.9dBm in the frequency 2462MHz(802.11b), 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 is 9.0dBm = 7.94mW

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:

$$= 7.94\text{mW} / 4\pi R^2$$

$$= 0.0016 \text{ mW/cm}^2$$

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

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

For Simultaneous transmitting of NFC and 2.4GHz Wi-Fi, According to 865664D02 2.2 d) 1):

The sum of the ratios of the spatially averaged results to the applicable frequency dependent MPE limits = $0.0000006/1 + 0.0016/1 = 0.00160006 < 1$

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