

RF Exposure

The equipment under test (EUT) is a module with Bluetooth and 2.4G transmitter functions. It is powered by DC 3.3V. The Bluetooth function and 2.4G transmitter can't transmit at the same time. This module is only use for battery-powered products. For more detail information pls refer to the user manual.

Standalone SAR evaluation for BT function

Bluetooth Version: 4.2 (BLE Single mode)

Antenna Type: Integral antenna.

Antenna Gain: 0dBi.

Modulation Type: GFSK

The nominal conducted output power specified: -5dBm (+/-3dB)

The nominal radiated output power (e.i.r.p) specified: -5dBm (+/- 3dB)

The maximum conducted output power for the EUT is -4.70 dBm in the frequency 2480MHz which is within the production variation.

The minimum conducted output power for the EUT is -6.21 dBm in the frequency 2402MHz 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 maximum radiated power = -2dBm = 0.631mW

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:
= $0.631\text{mW} / 4\pi R^2$
= 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 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.

INTERTEK TESTING SERVICES

Standalone SAR evaluation for 2.4G transmitter function

Antenna Type: Integral antenna.

Antenna Gain: 0dBi.

Modulation Type: GFSK

The nominal conducted output power specified: -2dBm (Tolerance: +/- 3dB)

The nominal radiated output power (e.i.r.p) specified: -2dBm (+/- 3dB)

The maximum conducted output power for the EUT is -2.82 dBm in the frequency 2450MHz 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 maximum radiated power = 1dBm = 1.26mW

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 follows:

$$= 1.26\text{mW} / 4\pi R^2$$

$$= 0.0003 \text{ mW/cm}^2$$

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

The MPE limit is 1.0 mW/cm² for general population and uncontrolled exposure in the 2.4GHz frequency band 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.

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