

INTERTEK TESTING SERVICES

RF Exposure report FCC ID: 2AHVHLG8864

The EUT is a WiFi Module with 4 Antennas. 4 antennas can be used for WiFi 5GHz band and 2.4GHz band. When product operates on SISO mode 802.11a/n/ac mode (5.2/5.8G band), only one antenna(Ant1) is used for transmitting according the rationale that the receiver sensitivity has meet internal limit valve. When product operates on MIMO mode (4Tx), Ant1 to Ant4 will transmit simultaneously. For more detailed features description, please refer to the user's manual.

Antenna Type: Integral antenna.

Antenna Gain: Maximum -3.5dBi for each antenna;

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

The nominal conducted average output power specified:

SISO Mode:

802.11b/g/n: 20 dBm \pm 4 dB (2.4GHz Band)

802.11a/n/ac: 17 dBm \pm 3dB(5GHz Band)

MIMO Mode:

802.11n: 25 dBm \pm 3 dB (2.4GHz Band)

802.11n/ac: 23 dBm \pm 3dB (5GHz Band)

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 2.4GHz Band

The source-based time averaged maximum radiated power in MIMO mode = 25+3-3.5=
24.5dBm = 281.8mW

For 5GHz Band

The source-based time averaged maximum radiated power in MIMO mode = 23+3-3.5=
22.5dBm = 177.8mW

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:

$$= 281.8 / 4\pi R^2 \\ = 0.056 \text{ mW/cm}^2$$

From above data, the exposed power density at a distance (R) of 20cm from the center of radiation of the antenna for 5GHz band can be calculated according to OET 65 as follow:

$$= 177.8 / 4\pi R^2 \\ = 0.035 \text{ mW/cm}^2$$

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 2.4GHz and 5GHz Band:

According to 865664D02 2.2 d) 1):

The sum of the ratios of the spatially averaged results to the applicable frequency dependent MPE limits = $0.056/1 + 0.035/1 = 0.091 < 1$

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.”