

INTERTEK TESTING SERVICES

RF Exposure

The Equipment Under Test (EUT) is a Wireless Router has WiFi function, and WiFi operating at 2412-2462MHz for 802.11b/g/n-HT20, 11 channels with 5MHz channel spacing; 2422-2452MHz for 802.11n-HT40, 9 channels with 5MHz channel spacing; 5180 MHz - 5240 MHz & 5745MHz – 5825MHz for 802.11a/n/ac-HT20 with 9 channels; 5190 MHz ~ 5230 MHz & 5755MHz – 5795MHz for 802.11n/ac-HT40 with 4 channels and 5210 MHz & 5775MHz for 802.11ac-HT80 with 2 channel. The EUT was powered by AC100~240V, 50/60Hz. 2.4G and 5G can't operation simultaneous. Details please see user manual.

2.4GHz WiFi:

Antenna Type: Integral Antenna.

Antenna Gain (Chain 1): 3.0dBi

Antenna Gain (Chain 2): 3.0dBi

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

The nominal conducted output power specified: 14dBm (Tolerance: ±4dB).

5GHz WiFi:

Antenna Gain (Chain 1): 2.0dBi

Antenna Gain (Chain 2): 2.0dBi

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

The nominal conducted output power specified: 15dBm (Tolerance: ±5dB).

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 ANT 4 mode = $14+5+3.0= 22.0\text{dBm} = 158.49\text{mW}$

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:

$$= 158.49 / 4\pi R^2$$

$$= 0.03 \text{ mW/cm}^2$$

For 5GHz Band

The source-based time averaged maximum radiated power in MIMO mode = $15+5+2.0= 22.0\text{dBm} = 158.49\text{mW}$

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:

$$= 158.49 / 4\pi R^2$$

$$= 0.03 \text{ mW/cm}^2$$

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.

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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.”