

# INTERTEK TESTING SERVICES

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## RF Exposure

The equipment under test (EUT) is a 3D Printer with 2.4G and 5G/5.8G WLAN capabilities operating in 2400-2483.5MHz/5150-5350MHz/5725-5850MHz. The EUT is powered by AC 100-120V. For more detail information pls. refer to the user manual.

2.4GHz WiFi:

Antenna Type: FPC Antenna.

Antenna Gain: 6.5dBi

Modulation Type: BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, CCK, DQPSK, DBPSK and DSSS.

The nominal conducted output power specified: 17.5dBm (Tolerance: +/-5dB).

The maximum conducted output power for the EUT is 21.4 dBm in the frequency 2422MHz(IEEE 802.11N20) which is within the production variation.

The minimum conducted output power for the EUT is 12.9 dBm in the frequency 2437MHz(IEEE 802.11B ) 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 V06 and OET 65, the simple calculation as below:

The source-based time averaged maximum radiated power = 22.5dBm +6.5dBi = 29dBm = 794.33mW

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:

$$= 794.33\text{mW} / 4\pi R^2$$

$$= 0.158 \text{ mW/cm}^2$$

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

The MPE limit is 1.0 mW/cm<sup>2</sup> 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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5GHz WiFi:

Antenna Type: FPC Antenna.

Antenna Gain: 5.6dBi.

Modulation Type: OFDM and OFDMA.

The nominal conducted output power specified: 6dBm (Tolerance: +/-7dB).

The maximum conducted output power for the EUT is 12.74dBm in the frequency 5745MHz(IEEE 802.11 N20) which is within the production variation.

The minimum conducted output power for the EUT is 0.35 dBm in the frequency 5240MHz(IEEE 802.11 A) 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 V06 and OET 65, the simple calculation as below:

The source-based time averaged maximum radiated power = 13.0dBm +5.6dBi = 18.60dBm =72.44mW

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:

$$= 72.44\text{mW} / 4\pi R^2$$

$$= 0.0144\text{mW}/\text{cm}^2$$

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

The MPE limit is 1.0 mW/cm<sup>2</sup> 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.

## **INTERTEK TESTING SERVICES**

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Not support Simultaneous transmitting in 2.4GHz WiFi and 5GHz WiFi.

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.”

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