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# INTERTEK TESTING SERVICES

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## RF Exposure Report

The equipment under test (EUT) is a TRIM II PRO with WIFI function operating in 2412-2462MHz and 5745~5825MHZ. The EUT is equipped with two antennas, they can't transmit at the same time. The 2.4G transmitter and 5G transmitter can't transmit at the same time. The EUT is powered by 10-30VAC 50/60Hz, 0.5A Max or 12VDC, 0.5-1.0A. For more detail information pls. refer to the user manual.

### 2.4G WIFI Function:

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

Antenna Type: Internal antenna

Antenna Gain:

Antenna 1: 1.0dBi

Antenna 2: 0.2dBi

The nominal conducted output power specified: 21.0dBm (Tolerance:  $\pm 4.5$ dB)

The maximum conducted output power for the EUT is 25.5 dBm in the frequency 2.462GHz 802.11g mode(Antenna 1) which is within the production variation.

The minimum conducted output power for the EUT is 16.7 dBm in the frequency 2.462GHz 802.11b mode(Antenna 2) 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:

For Maximum Permissible Exposure (MPE) evaluation of the product, the maximum power density at 20 cm from this transmitter shall be less than the General Population / Uncontrolled MPE limit in OET Bulletin 65.

The maximum E.I.R.P = 25.5dBm+1dBi=26.5dBm=446.7mW

The source-based time averaged maximum radiated power = 446.7mW x Duty Cycle = 446.7mW

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

$$= 446.7\text{mW} / 4\pi R^2$$

$$= 0.089 \text{ mW/cm}^2$$

The MPE limit is 1.0 mW/cm<sup>2</sup> for general population and uncontrolled exposure in the Wi-Fi 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

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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.

### Transmitter Duty Cycle Calculation

The EUT transmit continuously during the test, the duty cycle is 1.

### 5G WIFI Function:

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

Antenna Type: Internal antenna

Antenna Gain:

Antenna 1: 1.0dBi

Antenna 2: 0.2dBi

The nominal conducted output power specified: 18dBm (Tolerance:  $\pm 3$ dB)

The maximum conducted output power for the EUT is 20.65 dBm in the frequency 5.785GHz 802.11a-HT20 mode(Antenna 1) which is within the production variation.

The minimum conducted output power for the EUT is 15.23 dBm in the frequency 5.785GHz 802.11ac-VHT20 mode(Antenna 2) 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:

For Maximum Permissible Exposure (MPE) evaluation of the product, the maximum power density at 20 cm from this transmitter shall be less than the General Population / Uncontrolled MPE limit in OET Bulletin 65.

The maximum E.I.R.P = 21.0dBm+1dBi=22.0dBm=158.5mW

The source-based time averaged maximum radiated power = 158.5mW x Duty Cycle  
= 158.5mW

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

$$\begin{aligned} &= 158.5\text{mW} / 4\pi R^2 \\ &= 0.032 \text{ mW/cm}^2 \end{aligned}$$

The MPE limit is 1.0 mW/cm<sup>2</sup> for general population and uncontrolled exposure in the Wi-Fi 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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Transmitter Duty Cycle Calculation

The EUT transmit continuously during the test, the duty cycle is 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.”**