

INTERTEK TESTING SERVICES

RF Exposure report

The Equipment Under Test (EUT) is a R/C Helicopter, Model: QR-X350 Premium with 2.4GHz wireless transmission function operating in 2405-2479MHz. The EUT was powered by rechargeable battery 29.6Vdc, 3000mA. For more detailed features description, please refer to the user's manual.

The EUT have two 2.4GHz wireless modules which are RX-X350FCC and BT-2401A, and the two modules cannot transmit simultaneously.

Each module has two antennas but operates on SISO mode only, if the receiver sensitivity has meet the internal limit value, the antenna of EUT will auto transfer to the other antenna.

Modulation Type: DSSS

Antenna Type: Integral antenna

Antenna Gain: 3dBi for 2.4GHz wireless module RX-X350FCC and BT-2401A

The nominal conducted output power specified: 19.0dBm (Tolerance: +/- 3dB) for 2.4GHz wireless module RX-X350FCC and BT-2401A

The maximum conducted output power for the EUT is 17.86dBm in the frequency 2.441GHz 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 FCC Part 1.1310.

The maximum E.I.R.P= $19+3+3=25\text{dBm}=316.2\text{mW}$

The source-based time averaged maximum radiated power = $316.2 \times \text{Duty Cycle} = 316.2\text{mW}$

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:

$$= 316.2 / 4\pi R^2$$
$$= 0.0629 \text{ mW/cm}^2$$

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The MPE limit is 1.0 mWcm⁻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.

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.”