

RF Exposure

The Equipment Under Test (EUT) is a Robotic Mower with Bluetooth and Wi-Fi function operating at 2402-2480 and 2412-2462MHz&5150-5250MHz&5725-5850MHz. The EUT is powered by DC 30V from battery. For more detailed features description, please refer to the user's manual.

EUT can not transmit simultaneously.

Bluetooth(BLE) function

Antenna Type: FPC Antenna

Antenna Gain: 5.99dBi

Modulation Type: GFSK

The normal conducted output power is: 4dBm (tolerance: +/-1dB).

The maximum conducted output power for the EUT is 4.62dBm in the frequency 2402MHz which is within the production variation.

The minimum conducted output power for the EUT is 3.58dBm in the frequency 2480MHz 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:

The source-based time averaged maximum radiated power = 4dBm + 1dB + 5.99dBi = 10.99dBm = 12.56mW

The maximum ERP = 10.99dBm – 2.15dB = 8.84dBm = 7.66mW

At the distance (R) of 20cm to 40cm and in 0.3 GHz to 6 GHz, MPE Exclusion Threshold Level:

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

The ERP Threshold is 3060mW for general population and uncontrolled exposure in the 2.4GHz frequency range according to FCC Part 1.1307. As the measured power density at 20cm from the transmitter is lower than the ERP Threshold, the compliance to the ERP Threshold can be ensured by indicating the minimum 20cm separation between the transmitter's radiating structure and body of the user or nearby persons.

2.4G Wi-Fi function:

Antenna Type: FPC Antenna

Antenna Gain: 5.99dBi

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

The normal conducted output power is 22.5dBm (tolerance: +/-1dB).

The maximum conducted output power for the EUT is 23.2dBm in the frequency 2.412GHz 802.11B mode which is within the production variation.

The minimum conducted output power for the EUT is 21.6dBm in the frequency 2.437GHz 802.11G mode 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:

The source-based time averaged maximum radiated power = 22.5dBm + 1dB + 5.99dBi = 29.49dBm = 889.20mW

The maximum ERP = 29.49dBm – 2.15dB = 27.34dBm = 542.00mW

At the distance (R) of 20cm to 40cm and in 0.3 GHz to 6 GHz, MPE Exclusion Threshold Level:

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

The ERP Threshold is 3060mW for general population and uncontrolled exposure in the 2.4GHz frequency range according to FCC Part 1.1307. As the measured power density at 20cm from the transmitter is lower than the ERP Threshold, the compliance to the ERP Threshold can be ensured by indicating the minimum 20cm separation between the transmitter's radiating structure and body of the user or nearby persons.

5G Wi-Fi function

Antenna Type: FPC Antenna

Antenna Gain: 4.96dBi

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

The nominal conducted output power specified: 15.25dBm (Tolerance: +/-1dB).

The maximum conducted output power for the EUT is 16.24dBm in the frequency 5240MHz(IEEE 802.11 N20) which is within the production variation.

The minimum conducted output power for the EUT is 14.26dBm in the frequency 5825MHz (IEEE 802.11 N20) 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 = 15.25dBm + 1dB + 4.96dBi = 21.21dBm = 132.13mW

The maximum ERP = 21.21dBm – 2.15dB = 19.06dBm = 80.54mW

At the distance (R) of 20cm to 40cm and in 0.3 GHz to 6 GHz, MPE Exclusion Threshold Level:

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

The ERP Threshold is 3060mW for general population and uncontrolled exposure in the 2.4GHz frequency range according to FCC Part 1.1307. As the measured power density at 20cm from the transmitter is lower than the ERP Threshold, the compliance to the ERP Threshold can be ensured by indicating the minimum 20cm separation between the transmitter's radiating structure and body of the user or nearby persons.