

6 Safety Human Exposure

6.1 Radio Frequency Exposure Compliance

6.1.1 Electromagnetic Fields

RESULT:**Pass****Test Specification**

Test standard	:	CFR47 FCC Part 2: Section 2.1091
		CFR47 FCC Part 1: Section 1.1310
		FCC KDB Publication 447498 v06
		FCC KDB Publication 865664 D02 v01r02
		OET Bulletin 65 (Edition 97-01)
		RSS-102 Issue 5 March 2019

FCC requirement: Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 20cm normally can be maintained between the user and the device.

MPE Calculation Method according to OET Bulletin 65Power Density: $S_{(\text{mW/cm}^2)} = PG/4\pi R^2$ or $EIRP/4\pi R^2$

Where:

 S = power density (mW/cm^2) P = power input to the antenna (mW) G = power gain of the antenna in the direction of interest relative to an isotropic radiator R = distance to the center of radiation of the antenna (cm)**The nominal maximum conducted output power specified:**

802.11b/g/n: 22.00 dBm

Bluetooth Low Energy: 9.00 dBm

From the peak RF output power, the minimum mobile separation distance, $d=20$ cm, as well as the antenna gain (4.0 dBi 802.11b/g/n and Bluetooth Low Energy), the RF power density can be calculated as below:

For 802.11b/g/n: $S_{(\text{mW/cm}^2)} = PG/4\pi R^2 = 0.079 \text{ mW/cm}^2$ For BLuetoth Low Energy: $S_{(\text{mW/cm}^2)} = PG/4\pi R^2 = 0.004 \text{ mW/cm}^2$ **Limits for Maximum Permissible Exposure (MPE) according to FCC Part 1.1310:** 1.0 mW/cm^2

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➤ **IC requirements:** The EUT shall comply with the requirement of RSS-102 section 2.5.2.

Exemption from Routine Evaluation Limits – RF Exposure Evaluation

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;

- RF exposure evaluation exempted power for 2.4G DTS: 2.676 W

The nominal maximum conducted output power specified:

802.11b/g/n: 22.00 dBm

BLuetooth Low Energy: 9.00 dBm

Antenna Gain: 4.0 dBi 802.11b/g/n and Bluetooth Low Energy

The Max. e.i.r.p. for 802.11b/g/n: 26.0dBm = 0.398 W

The Max. e.i.r.p. for BLuetooth Low Energy: 13.0dBm = 0.020 W

Both e.i.r.p. for the 802.11b/g/n and BLuetooth Low Energy are less than the RF exposure evaluation exempted power. So RF exposure evaluation is not required.

“RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons.”