

1 Safety Human Exposure

1.1 Radio Frequency Exposure Compliance

1.1.1 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)

FCC ID: 2AB2Q6AAGWZBH0

➤ FCC requirements

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 65

Power 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:

802.11 b/g/n: 16.00 dBm

ZigBee: 10.00 dBm

Z-Wave: 5.50 dBm

From the RF output power, the minimum mobile separation distance, d=20 cm, as well as the antenna gain (Max. 2.5 dBi for 802.11 b/g/n and 1.0 dBi ZigBee and 1.0 dBi Z-Wave), the RF power density can be calculated as below:

For 802.11 b/g/n: $S_{(\text{mW/cm}^2)} = PG/4\pi R^2 = 0.014 \text{ mW/cm}^2$

For ZigBee: $S_{(\text{mW/cm}^2)} = PG/4\pi R^2 = 0.002 \text{ mW/cm}^2$

For Z-Wave: $S_{(\text{mW/cm}^2)} = PG/4\pi R^2 = 0.001 \text{ mW/cm}^2$

Limits for Maximum Permissible Exposure (MPE) according to FCC Part 1.1310:

1.0 mW/cm²

For Simultaneous transmitting of 802.11 b/g/n, ZigBee and Z-Wave:

According to 865664D02 2.2 d) 1):

The sum of the ratios of the spatially averaged results to the applicable frequency dependent MPE limits =
 $0.014/1 + 0.002/1 + 0.001/1 = 0.017 < 1$

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