

# 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:  $S_{(mW/cm^2)} = PG/4\pi R^2$  or  $EIRP/4\pi R^2$

Where:

S = power density (mW/cm<sup>2</sup>)

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:  $S_{(mW/cm^2)} = PG/4\pi R^2 = 0.014$  mW/cm<sup>2</sup>

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

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

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

1.0 mW/cm<sup>2</sup>

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.”**