

RF Exposure distance calculation

The antenna of a Canopy 900 MHz module must be installed to provide a separation distance of at least 60 cm (approx 24 inches) from all persons. When so installed, the module's RF field is within Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's website <http://www.hc-sc.gc.ca/rpb>. Per Health Canada Safety Code 6, the installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population. Currently certified 900 MHz antennas have an antenna gain of 10 dBi, which means they are limited to a maximum RMS power of 0.4 W (26 dBm) to remain within the regulatory limit of 4 W (36 dBm) for the 900 MHz frequency band. The applicable power density exposure limit for radios operating in the 900 MHz frequency band is 6 Watt/m², according to the FCC OET Bulletin 65, the ICNIRP guidelines, and the Health Canada Safety Code 6. The corresponding compliance distances referenced above have been determined by assuming worst-case scenarios. The peak power density (S) in the far-field of a radio-frequency source with rms transmit power P and antenna gain G at a distance d is

$$S = P \cdot G / 4\pi d^2$$

In the case of a 900 MHz Canopy SM or AP with an antenna gain of 10 dBi (a factor of 10) and correctly entered in the user interface as a 10 dBi antenna, the peak power density equals the exposure limit at a distance of 23 cm. A power compliance margin of nearly 7 times is artificially introduced by setting the distance to 60 cm. The compliance distance is greatly overestimated in these cases because the far-field equation neglects the physical dimension of the antenna, which is modeled as a point-source.