



Human Exposure to Radiofrequency fields – calculations as defined by OET65

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1. Overview

This document shows the calculation of the compliance boundary for the Metnet 60G CPE product to meet the basic restrictions as defined in OET65 Edition 97-01.

The limit for occupational exposure according to OET65 is $5\text{mW}/\text{cm}^2$ ($50\text{W}/\text{m}^2$).

The limit for general population exposure according to OET65 is $1\text{mW}/\text{cm}^2$ ($10\text{W}/\text{m}^2$).

2. Device characteristics – Metnet 60GHz CPE

The Metnet node emits RF energy through Beamforming Phase array antenna, 16x2 element arrangement with 20dBi gain per antenna (waveguide) port.

The maximum RF power output from a node is 40 dBm (with QPSK modulation).

2.1 Calculation of compliance boundary for general public exposure

The far field (spherical) calculation method defined in equation 3 of OET65 has been used to define the compliance boundary, using the maximum gain noted above.

As mentioned in Section 2 of the OET 65, this gives a conservative result (it overestimates the field strength) for near field. Therefore the exposure at the distance calculated below will be well within safe limits.

S= Power Density – basic restriction is $10\text{W}/\text{m}^2$

P= Output Power

G= Gain (relative to isotropic)

r= compliance boundary radius

$S = (PG) / (4\pi r^2)$

PG=40dBm =10 Watts

Therefore:

$r^2 = (PG) / (S4\pi)$

$$r^2 = 10 / (10 \times 4\pi)$$

$$r = 28.2 \text{ cm}$$

(For occupational exposure, according to OET65, $r=12.6 \text{ cm}$)

3. Installation guidance to ensure general public are outside compliance boundaries

The Metnet 60G CPE is designed to be mounted on street furniture (e.g. lampposts) adjacent to small cellular base stations.

The equipment is necessarily mounted out of reach of the general public for the following reasons:

1. To avoid interference with the equipment by the general public
2. To avoid blocking of the radio signal by passing traffic e.g. double-decker buses – requires installation height greater than 5 metres

Therefore the equipment is only accessible to authorised personnel.