03/09/2018

RF Exposure and Transmitter Power Considerations for the Virgilio Module

FCC ID: U4FBT-VRG-STD

The FCC requires that the calculated MPE be equal to or less than a given limit dependent on frequency at a distance of 20 cm from a device to the body of a user.

The following FCC Rule Parts and procedures are applicable:

Part 1.1310 – Radiofrequency radiation exposure limits

Part 2.1091 – Radiofrequency radiation exposure evaluation: mobile devices

KDB447498 D01 v06

Mobile and Portable Devices RF Exposure Procedures and Equipment Authorisation Policies

MPE CALCULATIONS

The MPE calculation used to calculate the safe operating distance for the user.

$$S = EIRP/4 \pi R^2$$

Where S = Power density

EIRP = Effective Isotropic Radiated Power (EIRP = P x G)

P = Conducted Transmitter Power

G = Antenna Gain (relative to an isotropic radiator)

R = distance to the centre of radiation of the antenna (safe operating distance)

Values:

Transmitter frequency range = 2402-2480MHz

Conducted Power (max.) = 9.9dBm

Antenna Gain = +2.3dBi

$EIRP_{max}$ = 12.2dBm = 16.6mW

Power Density Requirement

From table 1 (b) - Limits for General Population/ Uncontrolled Exposure of FCC Rule Part 1.1310 for 2400MHz

$S = 1.0\ mW/cm^2$

Calculation:

$S = EIRP / 4\ \pi\ R^2$

$S = 16.6/(12.56 \times 20^2)$

$S = 16.6/(5024)$

$S = 0.003\ mW/\ cm^2$ ($<1.0\ mW/cm^2$)

This equates to a safe operating distance of 1.15 cm at the power density limit of 1.0 mW/cm^2

Yours faithfully,

Alberto Gamberini

Quality Regulatory Manager