plugwise

RF Exposure Considerations for the Stealth

FCC ID: ZB9-16201

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 Stealth utilises IEEE802.15.4 RF technology

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 Calculation

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

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

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 = 2405 MHz to 2480 MHz
P = 4 mW (6.0 dBm) max.
G = 5.1 dBi (x3.23)
R = 20 cm

Power Density Requirement:
From table 1 (b) - Limits for General Population/ Uncontrolled Exposure of FCC Rule Part 1.1310 for 2.4 GHz

$$S_{req} = 1.0 \text{ mW/cm}^2$$

Calculation:

$S = 4 \times 3.23 / 4 \pi R^2$
$S = 12.94 / (12.56 \times 20^2)$
$S = 12.94 / (5024)$

$$S = 0.0026 \text{ mW/cm}^2$$

(Equivalent to 1.03 cm safe operating distance at $S=1.0\text{mW/cm}^2$)

Conclusion

The required 20 cm RF exposure limits for General Population/ Uncontrolled Exposure will not be exceeded for the Stealth using an antenna having a maximum gain of 5.1dBi.