

UHP FCC Maximum Personal Exposure (MPE) Calculations

Reference: FCC document 'Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields '

From herein this document will be referred to as the 'FCC Guideline to MPE' document.

1.1 UHP Intentional Radiators

The UHP comprises the following RF interfaces

1.1.1 WiFi

Radio : Ubiquiti Networks SR71 802.11n MIMI mini-PCI Module

Antenna: MobileMark OD6-2400MOD2-BLK-SP-35.

Refer documents 'SR71a_datasheet.pdf', 'antenna-spec-140-od-2400.pdf' and 'OD6-2400-pat.pdf' for further information.

1.2 MPE Calculations

1.2.1 MPE Formula

The FCC Guide to MPE document section 3 'Methods of Predicting Human Exposure' page 17, advises to use the following formula

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

$$\Rightarrow R = (P \cdot G / 4 \cdot \pi \cdot S)^{0.5}$$

Where

S = Power Density (MPE) mW/cm²

P = Power input to antenna (power output from radio) (mW)

G = Power gain of antenna relative to isotropic radiator (dBi)

R = Distance from antenna (cm)

1.2.2 WiFi MPE Calculations

Referring to The FCC Guide to MPE document, Appendix A, Table 1 (B) Limits for General Population/Uncontrolled exposure (1.5GHz to 100GHz).

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

$$P = 24\text{dB} = 251.2\text{mW (ref SR71 data sheet)}$$

$$G = 6\text{dBi (ref RFI CD2405 data sheet)}$$

$$\Rightarrow R = (P \cdot G / 4 \cdot \pi \cdot S)^{0.5}$$

$$\Rightarrow R = (251.2 \times 6 / 4 \cdot \pi \cdot 1)^{0.5}$$

$$\Rightarrow R = 11 \text{ cm}$$

- when it has to be **right**



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When it has to be right.

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