

## **Spider® AT MPE Calculation - OET Bulletin 65**

FCC ID: MIVGSM5108

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 MPE calculation as given in FCC OET Bulletin 65, page 19 is used to calculate the safe operating distance for the user.

$$S = \text{EIRP}/4 \pi R^2$$

**Where**

- S = Power density
- EIRP = Effective Isotropically 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

### **For the Spider® AT@ GSM850**

Transmitter frequency range = 824MHz to 849MHz

Measured ERP Transmitter Power = 2.88W

The device supports a maximum of 2 active time slots

Therefore source based time based average Transmitter Power  $P_{\text{ave}} = (2.88\text{W} * 2/8)$   
 $= 0.72\text{W}_{\text{ave}}$

### **Requirement**

From table 1 (b) - Limits for General Population/ Uncontrolled Exposure of FCC Rule Part 1.1310 for GSM850

$S = f/1500 \text{ mW/cm}^2$  (f = operating frequency)

**$S = 824/1500 = 0.55 \text{ mW/cm}^2$  (worst case)**

### **Calculation for GSM850 20cm safe distance**

Values:  $P_{\text{ave}} = 720\text{mW}$ ;  $R = 20\text{cm}$

$$S = \text{EIRP}/4 \pi R^2$$

$$S = 720/(12.56 \times 20^2)$$

$$= 720/ 5024$$

$$\mathbf{S = 0.14 \text{ mW/cm}^2}$$

**For the Spider® AT @ PCS1900**

Transmitter frequency range = 1850MHz to 1910MHz

Measured EIRP Transmitter Power = 1.86 W

The GSM module supports a maximum of 2 active time slots

Therefore source based time based average Transmitter Power  $P_{ave} = (1.86W * 2/8)$   
 $= 0.465 W_{ave}$

**Requirement**

From table 1 (b) - Limits for General Population/ Uncontrolled Exposure of FCC Rule Part 1.1310 for PCS1900

**S = 1.0 mW/cm<sup>2</sup> (worst case)**

**Calculation for PCS1900 20cm safe distance**

Values:  $P_{ave} = 465mW$ ;  $R = 20cm$

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

$$S = 465 / (12.56 \times 20^2)$$

$$= 465 / 5024$$

$$\mathbf{S = 0.09 mW/cm^2}$$

**Conclusion**

The MPE values of the Spider® AT at 20 cm meet the RF exposure limits.