

## **MPE Calculation for FCC ID: TTULBWA1ZZPD**

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 the device to the body of the user. The equation for the calculation is given in OET Bulletin 65, page 19 as:

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

**Where**  $S$  = Power density

EIRP = Effective Isotropically Radiated Power

$R$  = distance to the centre of radiation of the antenna

### **For 2.4GHz band:**

**Values**  $S = 1.0 \text{ mW/cm}^2$  for General population uncontrolled exposure (FCC Part 1.1310 Radiofrequency radiation exposure limits)

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

$P_T = 23.4 \text{ dBm}$  (219mW) – measured maximum combined conducted peak power ( $P_1 + P_2$ ).

$G$  = Antenna gain (each antenna) = 1.0dBi (x1.26)

$$EIRP = P_1G + P_2G = (P_1 + P_2)G = P_T \times G$$

$R = 20 \text{ cm}$

### **Calculation:**

$$EIRP = 219 \times 1.26 = 276 \text{ mW}$$

$$S = 276/12.56 \times (20)^2$$

$$S = 276/5024$$

$$S = 0.055 \text{ mW}^2$$

**For 5GHz band:**

**Values**  $S = 1.0 \text{ mW/cm}^2$  for General population uncontrolled exposure (FCC Part 1.1310 Radiofrequency radiation exposure limits)

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

$P_T = 21.4 \text{ dBm (138mW)}$  - measured maximum combined conducted peak power ( $P_1 + P_2$ ).

$G = \text{Antenna gain (each antenna)} = 2.0 \text{ dBi (x1.58)}$

$$\text{EIRP} = P_1G + P_2G = (P_1 + P_2)G = P_T \times G$$

$R = 20 \text{ cm}$

**Calculation:**

$$\text{EIRP} = 138 \times 1.58 = 218 \text{ mW}$$

$$S = 218 / 12.56 \times (20)^2$$

$$S = 218 / 5024$$

$$\mathbf{S = 0.043 \text{ mW}^2}$$

**Conclusion**

This confirms compliance to the required FCC Part 1.1310 Radiofrequency radiation exposure limit of  $1.0 \text{ mW/cm}^2$  at 20cm operation.