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MPE Calculation For Symbol Hydra Wireless LAN

The Symbol Hydra device consists of a 2.4GHz and a 5GHz transmitter. The far field regions below are calculated for both the 2.4GHz and 5GHz frequencies. To establish the worst-case scenario, it is assumed that there is an additive effect of the 2.4GHz and 5GHz powers.

Firstly, the worst-case distance to be in the far field is established for both frequencies:

5GHz

The wavelength of the equipment is:

$$\frac{3\text{x}10^8}{5805\ \text{x}10^6} = 0.05\text{m}$$

Thus, the far field region is defined as being:

$$\frac{\lambda}{2p} = \frac{0.05}{6.283} = 0.008\text{m or } 8\text{mm}$$

2.4GHz

The wavelength of the equipment is:

$$\frac{3\text{x}10^8}{2462\ \text{x}10^6} = 0.12\text{m}$$

Thus, the far field region is defined as being:

$$\frac{\lambda}{2p} = \frac{0.12}{6.283} = 0.019\text{m or } 19\text{mm}$$

So, taking both maximum power readings and combining:

50.7mW + 69.18mW = 119.88mW

Therefore, the formula below is applicable for distances that are in the far field. Thus, predicting the worst case RF Power Density at 20cm from the antenna would be:

$$S = \frac{P \times G}{4pR^2} = \frac{119.88 \times 1.58}{12.57 \times 20^2} = 0.038\text{mW/cm}^2$$

where:

P	=	power measured in mW
G	=	antenna gain as numeric gain, (1.58 numeric / 2.0dBi)
R	=	distance in cm

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MPE Calculation For Symbol Hydra Wireless LAN - continued

MPE for Occupational/Controlled Exposure at 2462MHz is 5mW/cm^2

MPE for General Population/Uncontrolled Exposure at 2462MHz is 1mW/cm^2

MPE for Occupational/Controlled Exposure at 5280MHz is 5mW/cm^2

MPE for General Population/Uncontrolled Exposure at 5280MHz is 1mW/cm^2

Therefore, the unit under test has a power density, which is less than both the General Population and Occupational exposure limits whilst both transmitters are operating. This is deemed the worst-case configuration for the equipment under test.