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MPE Calculation For Symbol Hydra Wireless LAN

A 5GHz Spread Spectrum device has a measured output power of 69.18mW with a worst-case antenna gain of 2.5dBi. The equipment can operate in the bands listed in the table below. The equipment is proposed as meeting the OET65 requirements for use at 20cm.

The wavelength of the equipment is:

$$\frac{3x10^8}{5805\ x10^6} = 0.05m$$

Thus, the far field region is defined as being:

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

Therefore, the formula below is applicable as any distance greater than 8mm is in the far field. Thus, predicting the worst case RF Power Density at 20cm from the antenna would be:

$$S = \frac{P \times G}{4p R^2} = \frac{40.74x\ 1.78}{12.57 \times 20^2} = 0.014mW/cm^2$$

where:

P = power measured in mW
G = antenna gain as numeric gain, (1.78 numeric / 2.5dBi)
R = distance in cm

MPE for Occupational/Controlled Exposure at 5805MHz is $5mW/cm^2$

MPE for General Population/Uncontrolled Exposure at 5805MHz 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. This is the case for the equipment under test in all conditions of operation. The table below shows the Power Density result for each channel and antenna configuration.

Frequency (MHz)	Measured Conducted Power (mW)	Antenna Gain		Power Density (mW/cm^2)
		dBi	Numeric	
5180	46.24	2.5	1.78	0.016
5180	46.24	2	1.58	0.015
5220	48.02	2.5	1.78	0.017
5220	48.02	2	1.58	0.015
5240	48.08	2.5	1.78	0.017
5240	48.08	2	1.58	0.015

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MPE Calculation For Symbol Hydra Wireless LAN - continued

Frequency (MHz)	Measured Conducted Power (mW)	Antenna Gain		Power Density (mW/cm^2)
		dBi	Numeric	
5260	68.39	2.5	1.78	0.024
5260	68.39	2	1.58	0.021
5280	69.18	2.5	1.78	0.024
5280	69.18	2	1.58	0.022
5320	60.26	2.5	1.78	0.021
5320	60.26	2	1.58	0.019

Frequency (MHz)	Measured Conducted Power (mW)	Antenna Gain		Power Density (mW/cm^2)
		dBi	Numeric	
5745	46.24	2.5	1.78	0.016
5745	46.24	2	1.58	0.015
5805	40.74	2.5	1.78	0.014
5805	40.74	2	1.58	0.013