Maximum Permissible Exposure

Applicable Standard

According to §1.1307(b), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

Remark: 1)

MIMO MPE:

For 2.4G WIFI: The maximum output power for antenna 0 is 24.88dBm (307.61mW) at 2412MHz, 7dBi antenna gain(with 5.01 numeric antenna gain.)
The maximum output power for antenna 1 is 25.89dBm (388.15mW) at 2412MHz, 7dBi antenna gain(with 5.01 numeric antenna gain.)

For Band 1: The maximum output power for antenna 0 is 18.94dBm (78.34mW) at 5200MHz, 5dBi antenna gain(with 3.16 numeric antenna gain.)
The maximum output power for antenna 1 is 18.95dBm (78.52mW) at 5180MHz, 5dBi antenna gain(with 3.16 numeric antenna gain.)

For Band 2A: The maximum output power for antenna 0 is 18.95dBm (78.52mW) at 5300MHz, 5dBi antenna gain(with 3.16 numeric antenna gain.)
The maximum output power for antenna 1 is 18.98dBm (79.07mW) at 5300MHz, 5dBi antenna gain(with 3.16 numeric antenna gain.)

For Band 2C: The maximum output power for antenna 0 is 18.98dBm (79.07mW) at 5500MHz, 5dBi antenna gain(with 3.16 numeric antenna gain.)
The maximum output power for antenna 1 is 18.90dBm (77.62mW) at 5600MHz, 5dBi antenna gain(with 3.16 numeric antenna gain.)

For Band 3: The maximum output power for antenna 0 is 18.95dBm (78.52mW) at 5745MHz, 5dBi antenna gain(with 3.16 numeric antenna gain.)
The maximum output power for antenna 1 is 18.85dBm (76.74mW) at 5785MHz, 5dBi antenna gain(with 3.16 numeric antenna gain.)

2) For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20cm, even if the calculation indicate that the MPE distance would be lesser.

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$

Where E = *Field Strength in Volts / meter*
P = *Power in Watts*
G=*Numeric antenna gain*
d=*Distance in meters*
S=*Power Density in milliwatts / square centimeter*

Substituting the MPE safe distance using d=20cm into above equation.

Yields: $S=0.000199*P*G$

MPE 0:

Mode	Power(mW)	numeric antenna gain	Power density (mW/cm2)
2.4G WIFI	307.61	5.01	0.306684
Band 1	78.34	3.16	0.049263
Band 2A	78.52	3.16	0.049377
Band 2C	79.07	3.16	0.049722
Band 3	78.52	3.16	0.049377

MPE 1:

Mode	Power(mW)	numeric antenna gain	Power density (mW/cm2)
2.4G WIFI	388.15	5.01	0.386982
Band 1	78.52	3.16	0.049377
Band 2A	79.07	3.16	0.049722
Band 2C	77.62	3.16	0.048811
Band 3	76.74	3.16	0.048257

Total MPE:

Maximum Emissions Level					
Mode	**MPE 0**	**MPE 1**	**Total MPE**	**Limit (mW/cm2)**	**Result**
2.4G WIFI	0.306684	0.386982	0.693666	1.0	PASS
Band 1	0.049263	0.049377	0.09864		
Band 2A	0.049377	0.049722	0.099099		
Band 2C	0.049722	0.048811	0.098533		
Band 3	0.049377	0.048257	0.097634		