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) **For BT:** The maximum output power for antenna is 8.34dBm (6.82mW) at 2480MHz, 1.5dBi antenna gain(with 1.41 numeric antenna gain.)

For BLE: The maximum output power for antenna is 3.21dBm (2.09mW) at 2480MHz, 1.5dBi antenna gain(with 1.41 numeric antenna gain.)

For 802.11b: The maximum output power for antenna is 14.86dBm (30.62mW) at 2462MHz, 3dBi antenna gain(with 2.00 numeric antenna gain.)

For 802.11g: The maximum output power for antenna is 12.96dBm (19.77mW) at 2437MHz, 3dBi antenna gain(with 2.00 numeric antenna gain.)

For 802.11n20(HT20) ANT0: The maximum output power for antenna is 12.86dBm (19.32mW) at 2437MHz, 3dBi antenna gain(with 2.00 numeric antenna gain.)

For 802.11n20(HT20) ANT1: The maximum output power for antenna is 12.80dBm (19.05mW) at 2437MHz, 3dBi antenna gain(with 2.00 numeric antenna gain.)

For 802.11n40(HT40) ANT0: The maximum output power for antenna is 12.61dBm (18.24mW) at 2452MHz, 3dBi antenna gain(with 2.00 numeric antenna gain.)

For 802.11n40(HT40) ANT1: The maximum output power for antenna is 12.68dBm (18.54mW) at 2452MHz, 3dBi antenna gain(with 2.00 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 $E = \dfrac{\sqrt{30 \times P \times G}}{d}$ & $S = \dfrac{E^2}{3770}$

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*

Maximum Emissions Level					
Mode	**Power(*mW*)**	**numeric antenna gain**	**Power density (*mW/cm²*)**	**Limit (*mW/cm²*)**	**Result**
BT	6.82	1.41	0.001914	1.0	PASS
BLE	2.09	1.41	0.000586		
802.11b	30.62	2.00	0.012187		
802.11g	19.77	2.00	0.007868		

802.11n(HT20) ANT0	19.32	2.00	0.007689		
802.11n(HT20) ANT1	19.05	2.00	0.007582		
802.11n(HT40) ANT0	18.24	2.00	0.007260		
802.11n(HT40) ANT0	18.54	2.00	0.007379		

For MIMO mode,

Maximum Emissions Level					
Mode	**Power density (mW/cm^2) ANT0**	**Power density (mW/cm^2) ANT1**	**Power density (mW/cm^2)**	**Limit (mW/cm^2)**	**Result**
802.11n(HT20)	0.007689	0.007582	0.015271	1.0	PASS
802.11n(HT40)	0.007260	0.007379	0.014639		