

## Prediction of MPE at a given distance

### 1. Limits

The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

| Frequency range (MHz)                                   | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm <sup>2</sup> ) | Averaging time (minutes) |
|---|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| (A) Limits for Occupational/Controlled Exposure         |                               |                               |                                     |                          |
| 0.3-3.0   | 614                           | 1.63                          | *100                                | 6                        |
| 3.0-30  | 1842/f                        | 4.89/f                        | *900/f <sup>2</sup>                 | 6                        |
| 30-300  | 61.4                          | 0.163                         | 1.0                                 | 6                        |
| 300-1,500   |                               |                               | f/300                               | 6                        |
| 1,500-100,000   |                               |                               | 5                                   | 6                        |
| (B) Limits for General Population/Uncontrolled Exposure |                               |                               |                                     |                          |
| 0.3-1.34  | 614                           | 1.63                          | *100                                | 30                       |
| 1.34-30   | 824/f                         | 2.19/f                        | *180/f <sup>2</sup>                 | 30                       |
| 30-300  | 27.5                          | 0.073                         | 0.2                                 | 30                       |
| 300-1,500   |                               |                               | f/1500                              | 30                       |
| 1,500-100,000   |                               |                               | 1.0                                 | 30                       |

### 2. Test Procedure

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{P \times G}{4 \times \pi \times R^2}$$

Where:

S = power density

P = power input to the antenna

G = numeric gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the centre of radiation of the antenna

### 3. Result

Worse case is as below:

| Mode      | Frequency (MHz) | Prediction distance (cm) | RF output power |        | MPE (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) | Result |
|-----------|-----------------|--------------------------|-----------------|--------|---------------------------|-----------------------------|--------|
|           |                 |                          | dBm             | mW     |                           |                             |        |
| EDR       | 2441            | 20                       | -5.958          | 0.254  | 0.0001                    | 1                           | Yes    |
| BLE       | 2480            | 20                       | 0.303           | 1.072  | 0.0004                    | 1                           | Yes    |
| 2.4G WIFI | 2452            | 20                       | 11.926          | 15.581 | 0.0062                    | 1                           | Yes    |
| 5G WIFI   | 5240            | 20                       | 12.39           | 17.338 | 0.0069                    | 1                           | Yes    |

*Maximum Simultaneous transmission MPE Ratios for BLE+5G WIFI:*

| Max MPE Ratio<br>BLE/Limit | Max MPE ratio<br>5G WIFI/Limit | ΣMPE<br>ratios | Limit | Result |
|----------------------------|--------------------------------|----------------|-------|--------|
| 0.0004                     | 0.0069                         | 0.0073         | 1     | PASS   |

BT&WIFI Antenna Gain: 3dBi, 2(numeric)

Conclusion: **Pass**