

## 5 §1.1307(b) (1), §2.1091 - RF EXPOSURE

According to §15.247(e)(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

### Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minute)
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
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

\* = Plane-wave equivalent power density

### 5.1 MPE Prediction (Tyco Antenna)

Predication of MPE limit at a given distance

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

$$S = PG/4\pi R^2$$

Where: S = power density

P = power input to antenna

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

R = distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal: 0.864 (dBm)

Maximum peak output power at antenna input terminal: 1.22 (mW)

Predication distance: 20 (cm)

Predication frequency: 2441 (MHz)

Antenna Gain (typical): 4.0 (dBi)

antenna gain: 2.51 (numeric)

Power density at predication frequency at 20 cm: 0.0006095 (mW/cm<sup>2</sup>)

MPE limit for uncontrolled exposure at prediction frequency: 1.0 (mW/cm<sup>2</sup>)

#### 5.1.1 Test Result

The EUT is a mobile device. The power density level at 20 cm is 0.0006095mW/cm<sup>2</sup>, which is below the uncontrolled exposure limit of 1.0mW/cm<sup>2</sup> at 2441 MHz.

## 5.2 MPE Prediction (Murata Antenna)

Predication of MPE limit at a given distance

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

$$S = PG/4\pi R^2$$

Where: S = power density

P = power input to antenna

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

R = distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal: 0.864 (dBm)

Maximum peak output power at antenna input terminal: 1.22 (mW)

Prediction distance: 20 (cm)

Predication frequency: 2441(MHz)

Antenna Gain (typical): 0.0 (dBi)

antenna gain: 1 (numeric)

Power density at predication frequency at 20 cm: 0.0002428 (mW/cm<sup>2</sup>)

MPE limit for uncontrolled exposure at prediction frequency: 1.0 (mW/cm<sup>2</sup>)

### 5.2.1 Test Result

The EUT is a mobile device. The power density level at 20 cm is 0.0002428mW/cm<sup>2</sup>, which is below the uncontrolled exposure limit of 1.0mW/cm<sup>2</sup> at 2441 MHz.