

10 FCC §2.1091 – RF Exposure Information

10.1 Applicable Standard

According to FCC §2.1091 (Mobile Devices) 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 ²) | 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 ²) | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1500 | / | / | f/1500 | 30 |
| 1500-100,000 | / | / | 1.0 | 30 |

Note: f = frequency in MHz

* = Plane-wave equivalent power density

10.2 MPE Prediction

Predication of MPE limit at a given distance, Equation from 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

700 MHz Upper C Band, Downlink:

Maximum peak output power at antenna input terminal (dBm): 32.99

Maximum peak output power at antenna input terminal (mW): 1990.67

Prediction distance (cm): 20

Prediction frequency (MHz): 756

Antenna Gain, typical (dBi): 2.0

Cable Loss (dB): 1.0

Power density at predication frequency and distance (mW/cm²): 0.499

MPE limit for uncontrolled exposure at predication frequency (mW/cm²): 0.504

700 MHz Upper C Band, Uplink:

| | |
|-------------------------------------------------------------------------------------|----------------|
| Maximum peak output power at antenna input terminal (dBm): | <u>32.99</u> |
| Maximum peak output power at antenna input terminal (mW): | <u>1990.67</u> |
| Prediction distance (cm): | <u>60</u> |
| Prediction frequency (MHz): | <u>782</u> |
| Antenna Gain, typical (dBi): | <u>10</u> |
| Cable Loss (dB): | <u>1.0</u> |
| Power density at predication frequency and distance (mW/cm ²): | <u>0.35</u> |
| MPE limit for uncontrolled exposure at predication frequency (mW/cm ²): | <u>0.521</u> |

Note: Based on the manufacturer's declaration, the outdoor antenna (Yagi type or similar directional antenna if off air donor signal used) must be installed so as to provide a minimum separation distance of 0.3 meters (60 cm) between the antenna and persons within the area. (This assumes a typical antenna with gain of [10.1 dBi, VSWR \leq 1.5:1, Z_o = 50 ohms, and a cable attenuation between 1-10 dB). The indoor antenna (Omni directional or leaky cable) must be installed so as to provide a minimum separation distance of at least 8 inches (20 cm) between the indoor antenna connected to the RF booster and the human user's body within the area. (This assumes a typical wide-beam type antenna with gain of 0-2 dBi, VSWR \leq 2:1, Z_o = 50 ohms, and a cable attenuation of between 1-10 dB).

Results

For Uplink, the highest power density level at 60 cm is below the MPE uncontrolled exposure limit. For Downlink; the highest power density level at 20 cm is below the MPE uncontrolled exposure limit.