

4 FCC §15.407(f), § 2.1091 & IC RSS-102 – RF Exposure

4.1 Applicable Standard

According to FCC §15.407(f) 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.

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 (minutes) |
|---|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| 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 |

f = frequency in MHz

¹ = Plane-wave equivalent power density

Before equipment certification is granted, the procedure of IC RSS-102 must be followed concerning the exposure of humans to RF fields.

According to RSS-102 Issue 2 section 4.1, RF limits used for general public will be applied to the EUT.

| Frequency Range (MHz) | Electric Field (V/m rms) | Magnetic Field (A/m rms) | Power Density (W/m ²) | Time Averaging (min) |
|-----------------------|--------------------------|--|-----------------------------------|---------------------------|
| 0.003 - 1 | 280 | 2.19 | - | 6 |
| 1 - 10 | 280 / f | 2.19 / f | - | 6 |
| 10 - 30 | 28 | 2.19 / f | - | 6 |
| 30 - 300 | 28 | 0.073 | 2* | 6 |
| 300 - 1 500 | 1.585 f ^{0.5} | 0.0042 f ^{0.5} | f / 150 | 6 |
| 1 500 - 15 000 | 61.4 | 0.163 | 10 | 6 |
| 15 000 - 150 000 | 61.4 | 0.163 | 10 | 616000 / f ^{1.2} |
| 150 000- 300 000 | 0.158 f ^{0.5} | 4.21 x 10 ⁻⁴ f ^{0.5} | 6.67 x 10 ⁻⁵ f | 616000 / f ^{1.2} |

Note: f is frequency in MHz

¹ = Power density limit is applicable at frequencies greater than 100 MHz

4.2 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

4.3 MPE Results

5150– 5250 MHz (W52)

| | |
|---|--------------|
| <u>Maximum peak output power at antenna input terminal (dBm):</u> | <u>16.70</u> |
| <u>Maximum peak output power at antenna input terminal (mW):</u> | <u>46.77</u> |
| <u>Prediction distance (cm):</u> | <u>20</u> |
| <u>Prediction frequency (MHz):</u> | <u>5230</u> |
| <u>Maximum Antenna Gain, typical (dBi):</u> | <u>5.0</u> |
| <u>Maximum Antenna Gain (numeric):</u> | <u>3.16</u> |
| <u>Power density of prediction frequency at 20.0 cm (mW/cm²):</u> | <u>0.029</u> |
| <u>Power density of prediction frequency at 20.0 cm (W/m²):</u> | <u>0.29</u> |
| <u>MPE limit for uncontrolled exposure at prediction frequency (mW/cm²):</u> | <u>1.0</u> |
| <u>MPE limit for uncontrolled exposure at prediction frequency (W/m²):</u> | <u>10</u> |

The device is compliant with the requirement MPE limit for uncontrolled exposure. The maximum power density at the distance of 20 cm is 0.029mW/cm² (0.29W/m²).Limit is 1 mW/cm² (10W/m²).