

1.1. RF EXPOSURE REQUIREMENTS [§§ 1.1310 & 2.1091][RSS-102]

1.1.1. Limits

§ 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b).

Limits for Maximum Permissible Exposure (MPE)

| Frequency range (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm ²) | Averaging time (minutes) |
|--|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| (A) Limits for Occupational/Controlled Exposures | | | | |
| 0.3-3.0 | 614 | 1.63 | *(100) | 6 |
| 3.0-30 | 1842/f | 4.89/f | *(900/f ²) | 6 |
| 30-300 | 61.4 | 0.163 | 1.0 | 6 |
| 300-1500 | | | f/300 | 6 |
| 1500-100,000 | | | 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 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

* = Plane-wave equivalent power density

RSS-102.:The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in RSS-102.

Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)

| Frequency Range (MHz) | Electric Field (V/m rms) | Magnetic Field (A/m rms) | Power Density (W/m ²) | Reference Period (minutes) |
|-----------------------|--------------------------|--------------------------|-----------------------------------|----------------------------|
| 300-6000 | $3.142 f^{0.3417}$ | $0.008335 f^{0.3417}$ | $0.02619 f^{0.6834}$ | 6 |

Note: f is frequency in MHz.

Table 6: RF Field Strength Limits for Controlled Use Devices (Controlled Environment)

| Frequency Range (MHz) | Electric Field (V/m rms) | Magnetic Field (A/m rms) | Power Density (W/m ²) | Reference Period (minutes) |
|-----------------------|--------------------------|--------------------------|-----------------------------------|----------------------------|
| 100-6000 | $15.60 f^{0.25}$ | $0.04138 f^{0.25}$ | $0.6455 f^{0.5}$ | 6 |

Note: f is frequency in MHz.

Note 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure

and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

Note 2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

1.1.2. Method of Measurements

Calculation Method of RF Safety Distance:

$$S = \frac{PG}{4\pi \cdot r^2} = \frac{EIRP}{4\pi \cdot r^2}$$

Where,

- P: power input to the antenna in mW
- EIRP: Equivalent (effective) isotropic radiated power.
- S: power density mW/cm²
- G: numeric gain of antenna relative to isotropic radiator
- r: distance to centre of radiation in cm

$$r = \sqrt{\frac{PG}{4\pi \cdot S}} = \sqrt{\frac{EIRP}{4\pi \cdot S}}$$

FCC radio frequency exposure limits may be exceeded at distances closer than r cm from the antenna of this device.

1.1.3. Evaluation of RF Exposure Compliance Requirements

. This mobile radio also contains a **Bluetooth Module** which may transmit simultaneously with Tx output power of 0.00204 Watts which is very low and category excluded for mobile application where minimum 20cm user separation distance from the radio is always maintained

1.1.3.1. FCC Evaluation

| | |
|---|-----------|
| Maximum RF Power conducted, $P_{\text{conducted}}$ [W]: | 35.0 |
| Maximum Antenna Gain, G [dBi]: | 0 |
| Maximum EIRP, P_{EIRP} [W]: | 35.0 |
| User-based time-average for PTT | 50% |
| | |
| MPE Limit for Occupational/Controlled Exposure, $S_{\text{controlled}}$ [mW/cm ²]: | 2.56 |
| MPE Limit for General Population/Uncontrolled Exposure, $S_{\text{uncontrolled}}$ [mW/cm ²] | 0.512 |
| | |
| Min Calculated RF Safety Distance for Occupational/Controlled Exposure, $r_{\text{safety controlled}}$ [cm]: | 24 |
| Min Calculated RF Safety Distance for General Population/Uncontrolled Exposure, $r_{\text{safety uncontrolled}}$ [cm] | 53 |

1.1.3.2. ISED Evaluation

| | |
|---|------|
| Maximum RF Power conducted, $P_{\text{conducted}}$ [W]: | 35 |
| Maximum Antenna Gain, G [dBi]: | 0 |
| Maximum EIRP, P_{EIRP} [W]: | 35 |
| User-based time-average for PTT | 50 % |

| MPE Environment | Power Density limit, S (mW/m ²) | Minimum Distance (Cm) | Distance In user's manual (Cm) | Power Density at user's manual distance, S (mW/m ²) | Power Density at user's manual distance, S (W/m ²) |
|---|---|-----------------------|--------------------------------|---|--|
| Occupational/Controlled Exposure | 1.79 | 28 | 31 (0.31m) | 1.44 | 14.4 |
| General Population/Uncontrolled Exposure | 0.24 | 77 | 82 (0.82m) | 0.21 | 2.1 |

SAFETY TRAINING INFORMATION



WARNING

Your Icom radio generates RF electromagnetic energy during transmit mode. This radio is designed for and classified as "Occupational Use Only", meaning it must be used only during the course of employment by individuals aware of the hazards, and the ways to minimize such hazards. This radio is NOT intended for use by the "General Population" in an uncontrolled environment.

- For compliance with FCC and IC RF Exposure Requirements, the transmitter antenna installation shall comply with the following three conditions:
 1. The transmitter antenna gain shall not exceed 0 dBi.
 2. IC-F7510:

The antenna is required to be located outside of a vehicle and kept at a distance of 57 centimeters (23 inches) or more between the transmitting antenna of this device and any persons during operation. For small vehicle as worst case, the antenna shall be located on the roof top at any place on the center line along the vehicle in order to achieve 57 centimeters (23 inches) separation distance. In order to ensure this distance is met, the installation of the antenna must be mounted at least 57 centimeters (23 inches) away from the nearest edge of the vehicle in order to protect against exposure to bystanders.
 2. IC-F7520:

The antenna is required to be located outside of a vehicle and kept at a distance of 42 centimeters (17 inches) or more between the transmitting antenna of this device and any persons during operation. For small vehicle as worst case, the antenna shall be located on the roof top at any place on the center line along the vehicle in order to achieve 42 centimeters (17 inches) separation distance. In order to ensure this distance is met, the installation of the antenna must be mounted at least 42 centimeters (17 inches) away from the nearest edge of the vehicle in order to protect against exposure to bystanders.
 2. IC-F7540:

The antenna is required to be located outside of a vehicle and kept at a distance of 31 centimeters (12 inches) or more between the transmitting antenna of this device and any persons during operation. For small vehicle as worst case, the antenna shall be located on the roof top at any place on the center line along the vehicle in order to achieve 31 centimeters (12 inches) separation distance. In order to ensure this distance is met, the installation of the antenna must be mounted at least 31 centimeters (12 inches) away from the nearest edge of the vehicle in order to protect against exposure to bystanders.

3. IC-F7540:

Transmit only when people outside the vehicle are at least the recommended minimum distance of 82 centimeters (32 inches) away from the properly installed antenna. This separation distance will ensure that there is sufficient distance from a properly installed externally-mounted antenna to satisfy the RF exposure requirements in the applicable RF exposure compliance standards.



CAUTION

To ensure that your exposure to RF electromagnetic energy is within the FCC and IC allowable limits for occupational use, always adhere to the following guidelines:

- **DO NOT** operate the radio without a proper antenna attached, as this may damage the radio and may also cause you to exceed FCC and IC RF exposure limits. A proper antenna is the antenna supplied with this radio by the manufacturer or an antenna specifically authorized by the manufacturer for use with this radio.
- **DO NOT** transmit for more than 50% of total radio use time ("50% duty cycle"). Transmitting more than 50% of the time can cause FCC and IC RF exposure compliance requirements to be exceeded. The radio is transmitting when the status indicator lights red. You can cause the radio to transmit by pressing the "PTT" switch.

Electromagnetic Interference/Compatibility

During transmissions, your Icom radio generates RF energy that can possibly cause interference with other devices or systems. To avoid such interference, turn off the radio in areas where signs are posted to do so. DO NOT operate the transmitter in areas that are sensitive to electromagnetic radiation such as hospitals, aircraft, and blasting sites.