

RF exposure instructions

Pursuant to 47 CFR § 25.200(d) of the FCC Rules and Regulations, this equipment is subject to the radio frequency radiation exposure requirements specified in § 1.1307(b), § 2.1091 and § 2.1093, as appropriate. The Telit car kit adapter is intended to provide a means of using a handset in a cradle for the purpose of communicating with a satellite from inside an automobile. The car kit system is an rf amplifier unit, trunk mounted, with a cradle that accepts the handset unit that is normally used by the individual for communicating via the satellite with other ground based users of the telecom network. RF signals from the handset are routed by the cradle to the RF amplifier unit, which uses a roof top magnetic mount antenna (this is the antenna supplied by Telit) for transmission and reception.

The device transmits in the 1610 to 1626.5 MHz band and receives in the 2483.5 to 2500 MHz band and uses the external magnetic mount antenna for roof top mounting. Telit certifies that it has determined that the rf amplifier unit with car top antenna complies with the RF hazard requirements applicable to this equipment operating under the authority of 47 CFR Part 25 of the FCC Rules and Regulations. This determination is dependent upon installation, operation and use of the equipment in accordance with all instructions provided.

The Telit system configured with the car kit external amplifier is defined by the FCC Rules as a mobile device which according to FCC definitions means that the device is designed to be used in other than fixed locations and generally in such a way that a separation distance of at least 20 cm (8 inches) is normally maintained between the transmitter's antenna and the body of the user or nearby persons. The car kit amplifier is not designed for or intended to be used in portable applications (within 20 cm of the body of the user) and such uses are strictly prohibited. To ensure that the car kit complies with current FCC regulations limiting both maximum RF output power and human exposure to radio frequency radiation, a separation distance of at least 20 cm must be maintained between the unit's antenna and the body of the user and any nearby persons at all times and in all applications and uses. Further, when installed as directed with the magnetic roof mount antenna, there will be additional shielding of the radiation by the metallic roof of the vehicle in which the car kit is installed. In addition, the antenna pattern from the roof mount antenna is directed upward towards the nominal satellite position overhead away from anyone inside the automobile.

MPE calculated energy level: Using 7.5 Watts EIRP, 20 cm separation distance, the calculated power density computed by dividing the EIRP by the surface area of a sphere of 20 cm diameter is 1.49 mW/cm². From the above, there is an intervening metallic plate to reduce the electric field by virtue of the magnetic base in the antenna and further, the antenna design is such to radiate the energy upward away from the passenger compartment of an automobile.

Based on the above, Telit certifies that the FCC requirements for mobile MPE limits for RF Exposure are met by their product.

RF EXPOSURE ISSUES AND CALCULATION

Joe, the calculation is to be based on the following analysis. The test report lists an EIRP level of 7.5 dBW based on a measured conducted power of 33 dBm with an antenna gain of 4.5 dB. 7.5 dBW EIRP is equivalent to a power level of 5.62 watts EIRP.

Substituting in the equation, $P \text{ (watts)}/A \text{ (surface area of a sphere with radius 20 cm)}$, yields a power density of 1.12 mW/cm^2 in the direction of maximum antenna gain at a distance of 20 cm. However, this power density only occurs in the direction of maximum gain, which for a mobile antenna used in a mobile to satellite communication system would be in the vertical direction skyward away from the operator in the vehicle. Twenty centimeters was used in the above calculation because this is the minimum distance that defines a mobile device.

For any normal installation there would be more than 20 cm (8 inches) separating the operator or the public from the roof mounted antenna, (see the user manual, Page 16). This figure shows a typical installation with the antenna approximately mid point mounted on the roof of the car. A metallic roof is required since the antenna would not hold on any other surface. As previously explained the antenna pattern is directed upward away from the operator or any pedestrian along side the car. With a mid point roof mount, the distance to the edge of the car would be approximately 24 inches or greater. With a magnetic mount antenna on the roof of a car, the main lobe of the antenna directed vertically into the sky, and a metallic plate between the operator and the antenna, it is reasonable to conclude that an operator in the car could not under any circumstances be subjected to a field that approached the 1 mW/cm^2 limit. As for a pedestrian adjacent to the car, with the antenna mounted on the roof at its mid point as shown, the distance would between the antenna and a pedestrian would be at least of the order of 25 cm or 10 inches. Recalculating for a separation distance of 25 cm, we get a power density of 0.715 mW/cm^2 at 25 cm. At 61 cm (24 inches) the power density will be much lower or 0.12 mW/cm^2 . Based on the above, it is reasonable to conclude that a pedestrian adjacent to the car will not be exposed to fields exceeding the MPE limit of 1 mW/cm^2 .

A statement will be added to the instruction manual as follows: "The roof mount antenna should be mounted near the center of the roof of the vehicle, but in no instance closer than 25 cm (approximately 10 inches) from the edge of the roof."