FCC RF Exposure Requirements

General information

FCC ID: K6630483X3D
Device category: Mobile per Part 2.1091
Environment: Uncontrolled Exposure

Mobile devices that operate under Part 80 of this chapter are subject to routine environmental evaluation for RF exposure prior to equipment authorization or use if they operate at frequencies of 1.5 GHz or below and their effective radiated power (ERP) is 1.5 watts or more. However, compliance with the power density limits of 1.1310 is not required.

Antenna

The manufacturer does specify an antenna with a gain of 3 dBi to be used with this device.

This device has provisions for operation in a vehicle, or a fixed location.

Configuration	Antenna p/n	Type	Max. Gain (dBi)
Boat	Any	omni	3

Operating configuration and exposure conditions

The conducted output power is 25 Watts. Typical use qualifies for a maximum duty cycle factor of 50%.

- Part 2.1091 states that devices are excluded from routine evaluation if the EIRP is less than 2.46Watt (or 1.5WERP).

- Vehicle Operation: The maximum antenna gain that can be used is 3dBi. A coaxial cable of the type RG 58 has a loss of 1dB for a length of 15 feet.

MPE Calculation:

The minimum separation distance is calculated as follows:

The limit for general uncontrolled exposure environment below 300 MHz is 0.2 mW/cm^2 .

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Channel frequency: 156.025-157.425 MHz
The conducted power output is 25 watt.
The coax loss was taken as 1 dB.
Antenna gain was taken as 3 dBi
50% talk time in 30 minutes

$W := 25$ power in Watts

$D := 1$ Duty Factor in decimal % (1=100%)

1 for FM

$E := 15$ exposure time in minutes

$U := 30$ (use 6 for controlled and 30 for uncontrolled

$Wexp := W \cdot D \cdot \left(\dfrac{E}{U} \right)$

$PC := \left(\dfrac{E}{U} \right) \cdot 100$

$Wexp = 12.5$ Watts

$PC = 50$ % on time

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$Po := 12500$ mWatts

$f := 300$ Frequency in MHz

$dBd := .85$ antenna gain in dBd

$S := \dfrac{f}{1500}$ power density limit for uncontrolled exposure

$G1 := dBd + 2.15$ gain in dBi

$G1 = 3$ dBi

$S = 0.2$

$CL := 1$ dB coax loss

$G := G1 - CL$

$Gn := 10^{\frac{G}{10}}$ gain numeric

$Gn = 1.585$ dB

$R := \sqrt{\dfrac{(Po \cdot Gn)}{4 \cdot \pi \cdot S}}$

$R = 38.784$ distance in centimeters required for compliance

$inches := \dfrac{R}{2.54}$

$inches = 34.954$

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Conclusion

The device complies with the MPE requirements by providing a safe separation distance of 89 cm between the antenna, including any radiating structure, and any persons when normally operated.

Proposed RF exposure safety information to include in User's Manual

"FCC RF Exposure Requirements:

CAUTION:
The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This device is approved with emissions having a source-based time-averaging duty factor not exceeding 50%. Maintain a minimum of 89 cm (35 inches) distance between the antenna and any person.

Failure to observe these restrictions will result in exceeding the FCC RF exposure limits.