

FCC RF Exposure Requirements

General information:

FCC ID: H4JVT-3A130-F
Device category: Mobile per Part 2.1091
Environment: Controlled Exposure

Fixed devices that operate under Part 87 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 not specify any antenna to be used with this device.

This device has provisions for operation in a fixed location.

Configuration	Antenna p/n	Type	Max. Gain (dBi)
Fixed	Any	omni	9

Operating configuration and exposure conditions:

The conducted output power is 3 watts. Typical use qualifies for a maximum duty cycle factor of 50%. The manufacturer also markets this device only for occupation use. But because of a fixed structure and not being able to control exposure in all cases we have used the uncontrolled expose limit.

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

- Fixed Operation: The maximum antenna gain that can be used is 9 dBi. 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:

$$E(V/m) = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power density: } P_d(mW/cm^2) = \frac{E^2}{3770}$$

The limit for uncontrolled exposure environment below 300 MHz is fixed at 0.2 mW/cm².

Channel frequency: 118 to 137 MHz
The conducted power output is 3 watt.

The coax loss was taken as 1 dB.

Antenna gain was taken as 9 dBi

50% talk time in 30 minutes which reduces the power to 1.5 Watts in the formula below.
The value for S is fixed at 0.2 mW/cm² which in the formulas below is shown as 300/1500.

Po := 1500 mWatts dBd := 6.85 antenna gain f := 300 Frequency in MHz

G := dBd + 2.15 - 1

G = 8 gain in dBi

$$S := \frac{f}{1500}$$

1500 for uncontrolled exposure

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

Gn = 6.31

S = 0.2 $\frac{\text{mW}}{\text{cm}^2}$

$$R := \sqrt{\frac{(P_o \cdot G_n)}{(4 \cdot \pi \cdot S)}}$$

Rinches := $\frac{R}{2.54}$

R = 61.366 distance in centimeters
required for compliance

Rinches = 24.16

Conclusion:

The device complies with the MPE requirements by providing a safe separation distance of 62 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%.

Antenna Installation:

- Antennas used for this transmitter must not exceed an antenna gain of 9 dBi with a minimum cable loss of 1dB.
- Failure to observe these restrictions will result in exceeding the FCC RF exposure limits.