

FCC RF Exposure Requirements

General information:

FCCID: H78KPMTWEN1HL

Device category: Mobile per Part 2.1091

Environment: Controlled Exposure

Mobile devices that operate under Part 90 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. The permanently attached antenna has a gain of 0 dBi.

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

Configuration	Antenna p/n	Type	Max. Gain (dBi)
mobile	integrated	Omni	0

Operating configuration and exposure conditions:

The conducted output power is 2 Watts. Typical use qualifies for a maximum duty cycle factor of 50%. The manufacturer markets this device where the use should be classed as general exposure use.

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

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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 a general population uncontrolled exposure environment below 300 MHz is 0.2 mW/cm².

Channel frequency: 150-174 MHz
 The conducted power output is 2 watt.
 Antenna gain was taken as 0 dBi
 50% talk time in 30 minutes

Power in Watts	Duty Factor in decimal % (1=100%)	
W := 2	D := 1	for an FM device D=1
Exposure time in minutes	U := 30 (use 6 for controlled and 30 for uncontrolled)	
E := 15.		
$W_{exp} := W \cdot D \cdot \left(\frac{E}{U}\right)$	$PC := \frac{E}{U}$	percent on time
Time compensated power output	PC = 0.5	
W _{exp} = 1 Watts		
W1exp := W _{exp} · 1000		
W1exp = 1 × 10 ³	mWatts	

Antenna gain	Coax Loss	For all VHF frequencies	
dBd := -2.15	CL := 0 dB	f := 300	
G := dBd + 2.15 - CL	Net gain in dBi		
G = 0			
Gain Numeric	$S := \frac{f}{1500}$	$\frac{mW}{cm^2}$	from OET 65
$G_n := 10^{\frac{G}{10}}$	S = 0.2		
G _n = 1			
$R := \sqrt{\frac{(W1exp \cdot G_n)}{(4 \cdot \pi \cdot S)}}$		$R_{inches} := \frac{R}{2.54}$	
R = 19.947 distance in centimeters required for compliance		Rinches = 7.853	

Conclusion:

The device complies with the MPE requirements by providing a safe separation distance of 20 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%.