

## RF exposure

According to FCC part 1.1310 : The criteria listed in the following table shall be used to evaluate the environment 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 <sup>2</sup> )	Average time
(A) Limits for Occupational / Control Exposures				
300 – 1 500	--	--	f/300	6
1 500 - 100000	--	--	5	6
(B) Limits for General Population / Uncontrol Exposures				
300 – 1 500	--	--	f/1500	6
1 500 – 100 000	--	--	1	30

f= frequency in MHz

Friis transmission formula:  $P_d = (P_{out} \times G) / (4 \times \pi \times R^2)$

Where,

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

R = distance between observation point and center of the radiator in cm

$P_d$  the limit of MPE, f/1500 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

## Results

Channel	Frequency (MHz)	Peak output power (dBm)	Antenna gain (dBi)	Power density at 20 cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
Low	450.3250	31.50	-2.61	0.15407	0.30
Middle	457.5750	31.50	-2.61	0.15407	0.31
High	469.9875	31.50	-2.61	0.15407	0.31



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According to RSS-Gen 3.2: the requirements in Radio Standards Specification RSS-102, Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands), shall be met.

### INDUSTRY CANADA EXEMPTION

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

At or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $1.31 \times 10^{-2} f^{0.6834}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;

### Results -

Channel	Frequency (MHz)	Conducted Average Power (dBm)	Ant Gain (dBi)	EIRP		Limit
				(dBm)	(W)	
Low	450.3250	29.86	-2.61	27.25	0.531	0.852
Middle	457.5750	29.87	-2.61	27.26	0.532	0.862
High	469.9875	30.02	-2.61	27.41	0.551	0.878