

## 10. RF exposure evaluation

According to FCC 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 – 1500	--	--	F/300	6
1500 - 100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300 – 1500	--	--	F/1500	6
<b><u>1500 - 100000</u></b>	--	--	<b><u>1</u></b>	<b><u>30</u></b>

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

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, 1 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.

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## 10.2 Test result of RF exposure evaluation

Test Item : RF Exposure evaluation data

Test Mode : Normal operation

### 10.2.1 Output power into antenna & RF exposure evaluation distance

Operating mode	Channel	Frequency (MHz)	Peak output power (dBm)	Antenna gain (dBi)	Power density at 20cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
GFSK	Low	2402	0.14	-0.42	0.00019	1
	Middle	2441	0.68	-0.42	0.00021	
	High	2480	1.07	-0.42	0.00023	
8DPSK	Low	2402	2.85	-0.42	0.00035	1
	Middle	2441	3.10	-0.42	0.00037	
	High	2480	2.99	-0.42	0.00036	

#### ■Note

The power density Pd (4th column) at a distance of 20cm calculated from the friis transmission formula is far below the limit of 1 mW/ cm<sup>2</sup>.

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