8. 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^2)	Average Time
(A) Limits for Occupational /Control Exposures				
300 – 1 500	--	--	F/300	6
1 500 – 100 000	-- --		5 6	
(B) Limits for General Population/Uncontrol Exposures				
300 – 1 500	--	--	F/1 500	6
1500 – 100 000	-- --		1 30	

8.1 Friis transmission formula : Pd = (Pout*G)/(4*pi*R^2)

Where

Pd = power density in ㎽/cm^2

Pout = output power to antenna in ㎽

G = gain of antenna in linear scale

Pi = 3.1416

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

Pd the limit of MPE, 1 mW/cm^2. 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.

8.2 Test Result of RF Exposure Evaluation

Test Item : RF Exposure Evaluation Data
Test Mode : Normal Operation

8.2.1 Output Power into Antenna & RF Exposure Evaluation Distance

Antenna: 5.839 dBi (Whip Antenna)

- 5 MHz Bandwidth

Test Mode: QPSK 1/2

Channel	Frequency (MHz)	Peak output power (dBm)	Antenna gain (dBi)	Power density at 20cm (mW/cm²)	Limit (mW/cm²)
Low	2 505.25	25.17	5.839	0.250 97	1
Middle	2 627.25	24.79	5.839	0.229 95	
High	2 686.75	24.92	5.839	0.236 94	

- 10 MHz Bandwidth

Test Mode: QPSK 1/2

Channel	Frequency (MHz)	Peak output power (dBm)	Antenna gain (dBi)	Power density at 20cm (mW/cm²)	Limit (mW/cm²)
Low	2 508.5	25.21	5.839	0.253 30	1
Middle	2 630.5	25.13	5.839	0.248 67	
High	2 683.5	24.95	5.839	0.238 58	