



## 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				
300-1,500	--	--	F/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Population / Uncontrol Exposures				
300-1,500	--	--	F/1500	6
1,500-100,000	--	--	1	30

### 10.1 Friis Formula

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

$P_d$  is 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 “r” where the MPE limit is reached.

### 10.2 EUT Operating Condition

A software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.



## 10.3 Test Result of RF Exposure Evaluation

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

### 10.3.1 Antenna Gain

Antenna Gain : The maximum Gain measured in fully anechoic chamber is 5dBi linear scale.

### 10.3.2 Output Power into Antenna & RF Exposure Evaluation Distance

For normal 802.11a mode(6Mbps)

Channel	Channel Frequency (MHz)	Output Power to Antenna (dBm)	Power Density at 20cm (mW/cm <sup>2</sup> )	LIMITS (mW/cm <sup>2</sup> )
Low	5745	19.90	0.061479	1
Middle	5785	19.73	0.059119	1
High	5825	19.53	0.056459	1

For 802.11b mode(11Mbps)

Channel	Channel Frequency (MHz)	Output Power to Antenna (dBm)	Power Density at 20cm (mW/cm <sup>2</sup> )	LIMITS (mW/cm <sup>2</sup> )
1	2412	19.50	0.056070	1
6	2437	22.07	0.101328	1
11	2462	19.48	0.055812	1

For normal 802.11g mode(6Mbps)

Channel	Channel Frequency (MHz)	Output Power to Antenna (dBm)	Power Density at 20cm (mW/cm <sup>2</sup> )	LIMITS (mW/cm <sup>2</sup> )
1	2412	17.03	0.031749	1
6	2437	20.22	0.052569	1
11	2462	17.99	0.039603	1



For Super A mode(108Mbps)

Channel	Channel Frequency (MHz)	Output Power to Antenna (dBm)	Power Density at 20cm (mW/cm <sup>2</sup> )	LIMITS (mW/cm <sup>2</sup> )
Low	5760	19.63	0.057774	1
High	5800	19.31	0.053670	1

For Super G mode (108Mbps)

Channel	Channel Frequency (MHz)	Output Power to Antenna (dBm)	Power Density at 20cm (mW/cm <sup>2</sup> )	LIMITS (mW/cm <sup>2</sup> )
6	2437	20.61	0.072399	1

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> . The EUT is classified as mobile product. So, RF exposure limit warning or SAR test are not required.