



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 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/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/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

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

P_d is the limit of MPE, 1 mW/cm². 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 ²)	LIMITS (mW/cm ²)
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 ²)	LIMITS (mW/cm ²)
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 ²)	LIMITS (mW/cm ²)
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 ²)	LIMITS (mW/cm ²)
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 ²)	LIMITS (mW/cm ²)
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/cm² . The EUT is classified as mobile product. So, RF exposure limit warning or SAR test are not required.