



## **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)

<b>Frequency Range (MHz)</b>	<b>Electric Field Strength (V/m)</b>	<b>Magnetic Field Strength (A/m)</b>	<b>Power Density (mW/cm<sup>2</sup>)</b>	<b>Average Time</b>
<b>(A) Limits for Occupational / Control Exposures</b>				
300-1,500	--	--	F/300	6
1,500-100,000	--	--	5	6
<b>(B) Limits for General Population / Uncontrol Exposures</b>				
300-1,500	--	--	F/1500	6
1,500-100,000	--	--	1	30

### **FRIIS FORMULA**

Friis transmission formula :  $Pd = (Pout * G) / (4 * \pi * r^2)$

Where

Pd = power density in mW/cm<sup>2</sup>

Pout = 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

Pd 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.

### **EUT OPERATING CONDITION**

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

### **TEST RESULT OF RF EXPOSURE EVALUATION**

Test Item : RF Exposure Evaluation Data

Test Mode : Normal Operation



**ANTENNA GAIN**

Antenna Gain : The maximum Gain measured in fully anechoic chamber is 2dBi linear scale.

**OUTPUT POWER INTO ANTENNA & RF EXPOSURE EVALUATION DISTANCE**

Channel	Channel Frequency (MHz)	Output Power to Antenna (dBm)	Power density in mW/cm <sup>2</sup> at Friis formula when r=20cm(mW/cm <sup>2</sup> )	LIMITS
CH1	2412.00	19.02	0.0264	1
CH6	2437.00	18.82	0.0252	1
CH11	2462.00	18.98	0.0262	1

NOTE:FOR SA1 Antenna , Antenna Gain is 2.219 dBi

Channel	Channel Frequency (MHz)	Output Power to Antenna (dBm)	Power density in mW/cm <sup>2</sup> at Friis formula when r=20cm(mW/cm <sup>2</sup> )	LIMITS
CH1	2412.00	19.02	0.0264	1
CH6	2437.00	18.82	0.0252	1
CH11	2462.00	18.98	0.0262	1

NOTE:FOR SA2 Antenna , Antenna Gain is 2.219 dBi

Channel	Channel Frequency (MHz)	Output Power to Antenna (dBm)	Power density in mW/cm <sup>2</sup> at Friis formula when r=20cm(mW/cm <sup>2</sup> )	LIMITS
CH1	2412.00	19.02	0.0178	1
CH6	2437.00	18.82	0.0170	1
CH11	2462.00	18.98	0.0177	1

NOTE:FOR SA3 Antenna , Antenna Gain is 0.5132 dBi

The power density Pd (4<sup>th</sup> column) at a distance of 20cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm<sup>2</sup> . So, RF exposure limit warning or SAR test are not required.