

## RF Exposure Evaluation

### Limits

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> )	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

f = frequency in MHz

Friis transmission formula:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

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.

### Test Procedure

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

	Modulation	Frequency MHz	Output power to antenna (dBm)	Target power W/tolerance (dBm)	Max Output power to antenna (dBm)	Max Output power to antenna (mW)	Power Density at R=20cm (mW/cm2)	Limit (mW/cm2)	Result
Wifi 2.4g	802.11b	2412	7.87	7±1	8	6.310	0.001900	1.0	PASS
		2437	5.59	5±1	6	3.981	0.001199	1.0	PASS
		2462	8.13	8±1	9	7.943	0.002392	1.0	PASS
	802.11g	2412	8.32	8±1	9	7.943	0.002392	1.0	PASS
		2437	8.63	8±1	9	7.943	0.002392	1.0	PASS
		2462	8.78	8±1	9	7.943	0.002392	1.0	PASS
	802.11n (HT20)	2412	8.87	8±1	9	7.943	0.002392	1.0	PASS
		2437	8.35	8±1	9	7.943	0.002392	1.0	PASS
		2462	8.38	8±1	9	7.943	0.002392	1.0	PASS
	802.11n (HT40)	2422	8.43	8±1	9	7.943	0.002392	1.0	PASS
		2437	7.96	7±1	8	6.310	0.001900	1.0	PASS
		2452	7.87	7±1	8	6.310	0.001900	1.0	PASS

So a SAR test is not required