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^2)	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^2)	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^2)	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: **Pd = (Pout*G)/(4*pi*r^2)**

Where

Pd = power density in mW/cm^2, **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 id 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 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

Mode	Frequency (MHz)	Peak Output Power (dBm)	Peak Output Power (mW)	Antenna Gain (dBi)	Power Density at R=20cm (mW/cm^2)	Limit (mW/cm^2)	Result
SISO ANT A							
802.11 b	2412	16.640	46.13	2.75	0.017286	1.0	PASS
802.11 g	2437	15.128	32.57	2.75	0.012205	1.0	PASS
802.11 n20	2412	14.068	25.52	2.75	0.009563	1.0	PASS
802.11 n40	2422	13.647	23.16	2.75	0.008678	1.0	PASS
SISO ANT B							
802.11 b	2412	16.565	45.34	2.75	0.016990	1.0	PASS
802.11 g	2437	15.137	32.64	2.75	0.012230	1.0	PASS
802.11 n20	2412	14.093	25.66	2.75	0.009616	1.0	PASS
802.11 n40	2452	14.971	31.41	2.75	0.011771	1.0	PASS
MIMO ANT A+B							
802.11 n20	2412	17.091	51.18	5.76	0.038355	1.0	PASS
802.11 n40	2452	17.980	62.81	5.76	0.047068	1.0	PASS