RF Exposure Evaluation

Limits

According to KDB 447498 D01 General RF Exposure Guidance v06

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

	Modulation	Frequency MHz	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	18.39	69.023980	0.019397	1.0	PASS
		2437	18.09	64.416927	0.018102	1.0	PASS
		2462	18.79	75.683290	0.021268	1.0	PASS
	802.11g	2412	17.44	55.462571	0.015586	1.0	PASS
		2437	17.42	55.207744	0.015514	1.0	PASS
		2462	17.69	58.748935	0.016509	1.0	PASS
	802.11n(20)	2412	15.69	37.068072	0.010417	1.0	PASS
		2437	15.48	35.318317	0.009925	1.0	PASS
		2462	15.04	31.915379	0.008969	1.0	PASS
	802.11n(40)	2422	15.47	35.237087	0.009902	1.0	PASS
		2437	14.92	31.045596	0.008724	1.0	PASS
		2452	14.56	28.575905	0.008030	1.0	PASS

The Anttenna gain is 1.50 dBi
So a SAR test is not required