

RF Exposure Evaluation

According to KDB 447498 D01 General RF Exposure Guidance v06 and part 2.1091, Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition(s), listed below, is (are) satisfied.

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: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

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.

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

FCC RF Exposure Evaluation

modulation	Channel Freq. (MHz)	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
802.11b	2412	21.12	±1	22.12	2.70	0.087444	1
	2437	21.8	±1	22.80	2.70	0.102265	1
	2462	22.14	±1	23.14	2.70	0.110593	1
802.11g	2412	24.37	±1	25.37	2.70	0.184812	1
	2437	24.98	±1	25.98	2.70	0.212681	1
	2462	25.29	±1	26.29	2.70	0.228417	1
802.11n20	2412	23.7	±1	24.70	2.70	0.158390	1
	2437	23.96	±1	24.96	2.70	0.168162	1
	2462	24.26	±1	25.26	2.70	0.180189	1
802.11n40	2422	23.49	±1	24.49	2.70	0.150914	1
	2437	23.81	±1	24.81	2.70	0.162454	1
	2452	24.35	±1	25.35	2.70	0.183962	1

Remark: Wifi 2.4G antenna gain=4.31dBi

This confirmed that the device comply with FCC 1.1310 MPE limit.