

RF Exposure Evaluation

According to KDB 447498 D01 General RF Exposure Guidance v06 and part 2.1091(C), 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

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

Where

Pd = power density in mW/cm², **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/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

Test mode	Freq. (MHz)	Output power (dBm)	Max Output power (mW)	Power Density at R=60cm (mW/cm2)	Limit (mW/cm2)	Result
EDR	2402	2.82	1.91	0.0001	1.0	PASS
802.11b	2412	13.56	22.70	0.0008	1.0	PASS

Test mode	Freq. (MHz)	Output power (dBm)	Max Output power (mW)	Power Density at R=60cm (mW/cm2)	Limit (mW/cm2)	Result
Radio	462.55	36.865	4858.48	0.2767	0.3084	PASS

Remark:

Test Band	Freq. (MHz)	Output power (dBm)	Max Output power (mW)	Power Density at R=60cm (mW/cm2)	Limit (mW/cm2)	Result
LTE B12	699.70	25.00	316.23	0.00163	0.4665	PASS

1.EUT contain FCC ID: XMR201903EG25G, 2/3/4G Max Conducted Average Output Power: 25dBm, ANT gain is -6.32dBi in LTE B12.

2. UHF, EDR, 2.4G WIFI ANT and 2/3/4G ANT can simultaneously transmitting:
 $0.2767/0.3084 + 0.0001/1.0 + 0.0008/1.0 + 0.00163/0.4665 = 0.9016 < 1$.

3.UHF ANT gain: 4.11dBi, EDR and 2.4GWIFI ANT gain: 1.95dBi.

Meet MPE requirements, RF Exposure evaluation is not required.