FCC ID: 2AH4J-HUB422

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

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	Output power to antenna (dBm)	Output power to antenna (mW)	Power Density at R=20cm (mW/cm^2)	Limit (mW/cm^2)	Result
BLE	4.23	2.65	0.0103	1.0	PASS
BLE	-1.31	0.74	0.0029	1.0	PASS
BT	5.17	3.29	0.0128	1.0	PASS
2.4GWIFI	12.04	16.00	0.0062	1.0	PASS
5GWIFI	13.37	21.73	0.1012	1.0	PASS
Zwave	-4.55	0.35	0.0009	0.61	PASS
LTE	/	273	0.5431	1.0	PASS

Note: The power of the LTE is derived from the FCC ID: XMR2023EG915QNA report

EIRP=90.65– 95.2= -4.55dBm

The device could support transmission with WIFI and BT and BLE and Zwave or LTE and BT and BLE and Zwave simultaneously

Power Density at R=20cm (mW/cm2):

WIFI and BT and BLE and Zwave: 0.0128/1+0.5431/1+0.0009/0.61+0.0103/1=0.568〈1.0 Limit (mW/cm2),

Zwave or LTE and BT and BLE and Zwave:

0.0062/1+0.0128/1+0.0103/1+0.0029/1+0.0009/0.61=0.034〈1.0 Limit (mW/cm2), So a SAR test is not required.

No RF Exposure Evaluation/SAR test is required.

Zwave: 1dBi

BLE: 3.01dB

BLE&BT&2.4GWIFI:2.89dBi

5GWIFI: 3.7dBi