FCC ID:2BENR-DH-313

RF Exposure Evaluation

Limits

According to KDB 447498 D01 General RF Exposure Guidance v06 and part 2.1091

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.

$EIRP = E_{Meas} + 20\log(d_{Meas}) - 104.7$

EIRP   is the equivalent isotropically radiated power, in dBm

E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m

d_{Meas} is the measurement distance, in m

EIRP= 78.88 - 95.2= -16.32 dBm

Test Result of RF Exposure Evaluation

	Modulation	Frequency (MHz)	Output power to antenna (dBm)	Output power to antenna (mW)	Power Density at R=20cm (mW/cm^2)	Limit (mW/cm^2)	Result
Wifi2.4g	802.11b	2412	11.73	14.8936	0.004062	1.0	PASS
		2437	9.14	8.2035	0.002237	1.0	PASS
		2462	13.06	20.2302	0.005517	1.0	PASS
	802.11g	2412	15.04	31.9154	0.008704	1.0	PASS
		2437	12.85	19.2752	0.005257	1.0	PASS
		2462	16.50	44.6684	0.012182	1.0	PASS
	802.11n20	2412	14.80	30.1995	0.008236	1.0	PASS
		2437	12.65	18.4077	0.005020	1.0	PASS
		2462	16.32	42.8549	0.011688	1.0	PASS
	802.11 n40	2422	14.86	30.6196	0.008351	1.0	PASS
		2437	13.59	22.8560	0.006233	1.0	PASS
		2452	14.17	26.1216	0.007124	1.0	PASS
BLE	GFSK	2402	-2.75	0.5309	0.000145	1.0	PASS
		2440	0.17	1.0399	0.000284	1.0	PASS
		2480	-1.10	0.7762	0.000212	1.0	PASS
SRD		433.92	-16.32	0.023335	0.00000003	0.28928	PASS

Remark：BT/WIFI Antenna gain is 1.37 dBi . SRD 433.92MHz Antenna gain is -12.31 dBi

In the case of simultaneous launches for wifi and BT and SRD:

Calc. Thresholds : 0.012182 + 0.000284 + (0.00000003/0.28928)=0.012466104 < 1.0

So a SAR test is not required