FCC ID:2AKL3-GD14K

RF EXPOSURE EVALUATION

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

2.4G WI-FI - ANT1								
Mode	Frequency (MHz)	Output power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Max tune-up power (mW)	Power Density at R=20cm (mW/cm^2)	Limit (mW/cm^2)	Result
802.11 b	2412	18.773	18±1	19	79.43	0.028689	1.0	PASS
802.11 g	2437	17.485	17±1	18	63.10	0.022789	1.0	PASS
802.11 n20	2412	16.713	16±1	17	50.12	0.018102	1.0	PASS
802.11 n40	2422	17.222	17±1	18	63.10	0.022789	1.0	PASS
Note: Antenna Gain = 2.59dBi								

5.2G WI-FI - ANT2								
Mode	Frequency (MHz)	Output power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Max tune-up power (mW)	Power Density at R=20cm (mW/cm^2)	Limit (mW/cm^2)	Result
802.11 a	5180	16.891	16±1	17	50.12	0.020265	1.0	PASS
802.11 n20	5240	15.021	15±1	16	39.81	0.016096	1.0	PASS
802.11 n40	5190	15.274	15±1	16	39.81	0.016096	1.0	PASS
802.11ac20	5180	15.188	15±1	16	39.81	0.016096	1.0	PASS
802.11ac40	5190	15.422	15±1	16	39.81	0.016096	1.0	PASS
802.11ac80	5210	14.423	14±1	15	31.62	0.012785	1.0	PASS
Note: Antenna Gain = 3.08dBi								

5.8G WI-FI - ANT2								
Mode	Frequency (MHz)	Output power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Max tune-up power (mW)	Power Density at R=20cm (mW/cm^2)	Limit (mW/cm^2)	Result
802.11 a	5745	15.187	15±1	16	39.81	0.017894	1.0	PASS
802.11 n20	5745	15.242	15±1	16	39.81	0.017895	1.0	PASS
802.11 n40	5755	15.102	15±1	16	39.81	0.017894	1.0	PASS
802.11ac20	5825	15.168	15±1	16	39.81	0.017895	1.0	PASS
802.11ac40	5755	15.118	15±1	16	39.81	0.017894	1.0	PASS
802.11ac80	5775	13.596	13±1	14	25.12	0.011291	1.0	PASS
Note: Antenna Gain = 3.54dBi								

BT - ANT3								
Mode	Frequency (MHz)	Output power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Max tune-up power (mW)	Power Density at R=20cm (mW/cm^2)	Limit (mW/cm^2)	Result
GFSK	2402	5.559	5±1	6	3.98	0.000657	1.0	PASS
π/4-DQPSK	2402	6.283	6±1	7	5.01	0.000827	1.0	PASS
8-DPSK	2402	6.250	6±1	7	5.01	0.000827	1.0	PASS
Note: Antenna Gain = -0.81dBi								

Note:

The same antenna cannot transmit at the same time, but ANT1 and ANT2 and ANT3 can transmit atthe same time, so the worst simultaneous transmntting corsideration:

The ratio = $ANT1_{MPE(MAX)}$ / limit + $ANT2_{MPE(MAX)}$ / limit + $ANT3_{MPE(MAX)}$ / limit

= 0.028689 / 1 + 0.020265 / 1 + 0.000827 / 1

= 0.049781 < 1.0