FCC ID: 2A8DC-AMS-R2W

Maximum Permissible Exposure (MPE)

According to FCC 1.1310: 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 Exposure				
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
300-1,500			f/300	6
1,500-100,000			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
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

MPE Calculation Method

$$E\ (V/m) = \frac{\sqrt{30 * P * G}}{d}$$

Power Density: *Pd* (W/m^2) = $\frac{E^2}{377}$

E = Electric field (V/m)

P = Average RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 * P * G}{377 * D^2}$$

From the EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained.

BT:

Measurement Result

Operation Frequency: 2402MHz~2480MHz

Power density limited: 1mW/ cm^2

Antenna Type: PIFA antenna

antenna gain: 3.46 dBi;

R=20cm

mW=10^(dBm/10)

antenna gain Numeric=10^(dBi/10)= 10^(3.46/10)=2.22

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm2)	Power density (mW/cm2)
				tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
2402	GFSK(1M)	1.13	2±1	3	1.995	3.46	2.22	0.0009	1
2440		3.129	2.5±1	3.5	2.239	3.46	2.22	0.0010	1
2480		3.094	2.5±1	3.5	2.239	3.46	2.22	0.0010	1

WIFI:

Operation Frequency: 2.4g WIFI 802.11b/g/n HT20: 2412-2462MHz,
5.2gWIFI 802.11a/n/ac(HT20): 5180-5240MHz
WIFI 802.11n/ac(HT40): 5190-5230MHz
WIFI 802.11ac(HT80): 5210MHz
5.8gWIFI 802.11a/n/ac(HT20): 5745-5825 MHz
WIFI 802.11n/ac(HT40): 5755-5795MHz
WIFI 802.11ac(HT80): 5775MHz

Power density limited: 1mW/ cm^2
Antenna Type: PIFA Antenna
Antenna gain: 2.4G:3.46dBi; 5G:4.52dBi
R=20cm
mW=10^(dBm/10)
antenna gain Numeric=10^(dBi/10)

2.4g WIFI

Antenna	Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result	Power density
			(dBm)		tune-up power		Gain		(mW/cm2)	(mW/cm2)
					(dBm)	(mW)	(dBi)	Numeric		
Ant 1	2412	802.11b	14.25	15±1	16	39.811	3.46	2.22	0.0176	1
Ant 1	2437		14.26	15±1	16	39.811	3.46	2.22	0.0176	1
Ant 1	2462		15.06	15±1	16	39.811	3.46	2.22	0.0176	1
Ant 1	2412	802.11g	13.24	13±1	14	25.119	3.46	2.22	0.0111	1
Ant 1	2437		13.18	13±1	14	25.119	3.46	2.22	0.0111	1
Ant 1	2456		13.69	13±1	14	25.119	3.46	2.22	0.0111	1
Ant 1	2412	802.11n H20	12.91	13±1	14	25.119	3.46	2.22	0.0111	1
Ant 1	2437		12.54	13±1	14	25.119	3.46	2.22	0.0111	1
Ant 1	2462		13.27	13±1	14	25.119	3.46	2.22	0.0111	1

5.2g WIFI

Antenna	Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result	Power density
			(dBm)		tune-up power		Gain		(mW/cm2)	(mW/cm2)
					(dBm)	(mW)	(dBi)	Numeric		
Ant 1	5180	802.11a	11.869	11±1	12	15.849	4.52	2.83	0.0089	1
Ant 1	5200		11.884	11±1	12	15.849	4.52	2.83	0.0089	1
Ant 1	5240		11.435	11±1	12	15.849	4.52	2.83	0.0089	1
Ant 1	5180	802.ac20	11.493	11±1	12	15.849	4.52	2.83	0.0089	1
Ant 1	5200		11.527	11±1	12	15.849	4.52	2.83	0.0089	1
Ant 1	5240		11.101	11±1	12	15.849	4.52	2.83	0.0089	1
Ant 1	5190	802.11ac40	11.264	11±1	12	15.849	4.52	2.83	0.0089	1
Ant 1	5230		11.026	11±1	12	15.849	4.52	2.83	0.0089	1
Ant 1	5210	802.11ac80	11.152	11±1	12	15.849	4.52	2.83	0.0089	1
Ant 1	5180	802.11n H20	11.583	11±1	12	15.849	4.52	2.83	0.0089	1
Ant 1	5200		11.397	11±1	12	15.849	4.52	2.83	0.0089	1
Ant 1	5240		11.063	11±1	12	15.849	4.52	2.83	0.0089	1
Ant 1	5190	802.11n H40	11.32	11±1	12	15.849	4.52	2.83	0.0089	1
Ant 1	5230		11.055	11±1	12	15.849	4.52	2.83	0.0089	1

5.8G WIFI:

Antenna	Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm2)	Power density (mW/cm2)
					tune-up power		Gain			
					(dBm)	(mW)	(dBi)	Numeric		
Ant 1	5745	802.11a	11.099	11±1	12	15.849	4.52	2.83	0.0089	1
Ant 1	5785		11.082	11±1	12	15.849	4.52	2.83	0.0089	1
Ant 1	5825		10.726	11±1	12	15.849	4.52	2.83	0.0089	1
Ant 1	5745	802.ac20	10.626	10±1	11	12.589	4.52	2.83	0.0071	1
Ant 1	5785		10.573	10±1	11	12.589	4.52	2.83	0.0071	1
Ant 1	5825		10.32	10±1	11	12.589	4.52	2.83	0.0071	1
Ant 1	5755	802.11ac40	10.671	10±1	11	12.589	4.52	2.83	0.0071	1
Ant 1	5795		10.589	10±1	11	12.589	4.52	2.83	0.0071	1
Ant 1	5775	802.11ac80	10.786	10±1	11	12.589	4.52	2.83	0.0071	1
Ant 1	5745	802.11n H20	10.614	10±1	11	12.589	4.52	2.83	0.0071	1
Ant 1	5785		10.453	10±1	11	12.589	4.52	2.83	0.0071	1
Ant 1	5825		10.164	10±1	11	12.589	4.52	2.83	0.0071	1
Ant 1	5755	802.11n H40	10.602	10±1	11	12.589	4.52	2.83	0.0071	1
Ant 1	5795		10.511	10±1	11	12.589	4.52	2.83	0.0071	1

Note: This product does not support simultaneous transmission.

The conclusion should be 0.0176＜1 for Max Power Density, Compliance the RF Exposure requirement.

Signature:
Date: 2023-01-11

Alex

NAME AND TITLE (Please print or type): alex li/Manager

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