

FCC ID: 2BXGA-EC14

Maximum Permissible Exposure (MPE)

According to FCC 2.1091, FCC 1.1310 and KDB447498 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 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

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

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

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.

Measurement Result

BR,EDR:

Antenna gain: 0.8dBi;

R=20cm

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		
2402	1DH5	2.51	2±1	3	1.995	0.80	1.20	0.0005	1
2441		2.15	2±1	3	1.995	0.80	1.20	0.0005	1
2480		2.47	2±1	3	1.995	0.80	1.20	0.0005	1
2402	2DH5	2.1	2±1	3	1.995	0.80	1.20	0.0005	1
2441		1.79	1±1	2	1.585	0.80	1.20	0.0004	1
2480		2.08	2±1	3	1.995	0.80	1.20	0.0005	1
2402	3DH5	2.1	2±1	3	1.995	0.80	1.20	0.0005	1
2441		1.79	1±1	2	1.585	0.80	1.20	0.0004	1
2480		2.08	2±1	3	1.995	0.80	1.20	0.0005	1

BLE:

Antenna gain: 0.8dBi;

R=20cm

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		
2402	BLE 1M	2.67	2±1	3	1.995	0.80	1.20	0.0005	1
2440		2.39	2±1	3	1.995	0.80	1.20	0.0005	1
2480		2.67	2±1	3	1.995	0.80	1.20	0.0005	1
2402	BLE 2M	2.59	2±1	3	1.995	0.80	1.20	0.0005	1
2440		2.28	2±1	3	1.995	0.80	1.20	0.0005	1
2480		2.53	2±1	3	1.995	0.80	1.20	0.0005	1

2.4GWIFI:

Antenna gain ANT1: -0.12dBi

R=20cm

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm2)	Power density (mW/cm2)
		(dBm)		tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
2412	11b	14.52	14±1	15	31.623	-0.12	0.97	0.0061	1
2437		13.09	13±1	14	25.119	-0.12	0.97	0.0049	1
2462		13.93	13±1	14	25.119	-0.12	0.97	0.0049	1
2412	11g	11.1	11±1	12	15.849	-0.12	0.97	0.0031	1
2437		11.14	10±1	11	12.589	-0.12	0.97	0.0024	1
2462		10.37	10±1	11	12.589	-0.12	0.97	0.0024	1
2412	11n20	12.24	12±1	13	19.953	-0.12	0.97	0.0039	1
2437		11.47	11±1	12	15.849	-0.12	0.97	0.0031	1
2462		10.38	10±1	11	12.589	-0.12	0.97	0.0024	1
2422	11n40	10.69	10±1	11	12.589	-0.12	0.97	0.0024	1
2437		11.45	11±1	12	15.849	-0.12	0.97	0.0031	1
2452		10.65	10±1	11	12.589	-0.12	0.97	0.0024	1
2412	11ax20	12.24	12±1	13	19.953	-0.12	0.97	0.0039	1
2437		12.27	12±1	13	19.953	-0.12	0.97	0.0039	1
2462		11.12	11±1	12	15.849	-0.12	0.97	0.0031	1
2422	11ax40	11.75	11±1	12	15.849	-0.12	0.97	0.0031	1
2437		12.28	12±1	13	19.953	-0.12	0.97	0.0039	1
2452		11.7	11±1	12	15.849	-0.12	0.97	0.0031	1

WIFI 5.2G

Antenna gain ANT1: -1.82dBi

R=20cm

modulation	Antenna	Channel Freq. (MHz)	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm ²)	Power density (mW/cm ²)
			(dBm)		tune-up power		Gain			
					(dBm)	(mW)	(dBi)	Numeric		
802.11a	Ant 1	5180	11.38	11±1	12.00	15.849	-1.82	0.66	0.0021	1
	Ant 1	5200	10.94	10±1	11.00	12.589	-1.82	0.66	0.0016	1
	Ant 1	5240	11.02	11±1	12.00	15.849	-1.82	0.66	0.0021	1
802.11n20	Ant 1	5180	11.62	11±1	12.00	15.849	-1.82	0.66	0.0021	1
	Ant 1	5200	10.88	10±1	11.00	12.589	-1.82	0.66	0.0016	1
	Ant 1	5240	11.17	11±1	12.00	15.849	-1.82	0.66	0.0021	1
802.11n40	Ant 1	5190	11.45	11±1	12.00	15.849	-1.82	0.66	0.0021	1
	Ant 1	5230	11.41	11±1	12.00	15.849	-1.82	0.66	0.0021	1
802.11ac20	Ant 1	5180	11.22	11±1	12.00	15.849	-1.82	0.66	0.0021	1
	Ant 1	5200	10.76	10±1	11.00	12.589	-1.82	0.66	0.0016	1
	Ant 1	5240	10.74	10±1	11.00	12.589	-1.82	0.66	0.0016	1
802.11ac40	Ant 1	5190	11.17	11±1	12.00	15.849	-1.82	0.66	0.0021	1
	Ant 1	5230	11.34	11±1	12.00	15.849	-1.82	0.66	0.0021	1
802.11ax20	Ant 1	5180	11.11	11±1	12.00	15.849	-1.82	0.66	0.0021	1
	Ant 1	5200	11.01	11±1	12.00	15.849	-1.82	0.66	0.0021	1
	Ant 1	5240	11.19	11±1	12.00	15.849	-1.82	0.66	0.0021	1
802.11ax40	Ant 1	5190	11.33	11±1	12.00	15.849	-1.82	0.66	0.0021	1
	Ant 1	5230	11.32	11±1	12.00	15.849	-1.82	0.66	0.0021	1

WIFI 5.8G
 Antenna gain ANT1: -1.17dBi
 R=20cm

modulation	Antenna	Channel Freq. (MHz)	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result	Power density
			(dBm)		tune-up power		Gain			
					(dBm)	(mW)	(dBi)	Numeric	(mW/cm2)	(mW/cm2)
802.11a	Ant 1	5745	11.38	11±1	12.00	15.849	-1.17	0.76	0.0024	1
	Ant 1	5785	11.04	11±1	12.00	15.849	-1.17	0.76	0.0024	1
	Ant 1	5825	11.39	11±1	12.00	15.849	-1.17	0.76	0.0024	1
802.11n20	Ant 1	5745	11.33	11±1	12.00	15.849	-1.17	0.76	0.0024	1
	Ant 1	5785	11.56	11±1	12.00	15.849	-1.17	0.76	0.0024	1
	Ant 1	5825	11.48	11±1	12.00	15.849	-1.17	0.76	0.0024	1
802.11n40	Ant 1	5755	11.15	11±1	12.00	15.849	-1.17	0.76	0.0024	1
	Ant 1	5795	11.72	11±1	12.00	15.849	-1.17	0.76	0.0024	1
802.11ac20	Ant 1	5745	11.22	11±1	12.00	15.849	-1.17	0.76	0.0024	1
	Ant 1	5785	11.2	11±1	12.00	15.849	-1.17	0.76	0.0024	1
	Ant 1	5825	11.45	11±1	12.00	15.849	-1.17	0.76	0.0024	1
802.11ac40	Ant 1	5755	11.45	11±1	12.00	15.849	-1.17	0.76	0.0024	1
	Ant 1	5795	11.69	11±1	12.00	15.849	-1.17	0.76	0.0024	1
802.11ax20	Ant 1	5745	11.41	11±1	12.00	15.849	-1.17	0.76	0.0024	1
	Ant 1	5785	11.06	11±1	12.00	15.849	-1.17	0.76	0.0024	1
	Ant 1	5825	11.38	11±1	12.00	15.849	-1.17	0.76	0.0024	1
802.11ax40	Ant 1	5755	11.2	11±1	12.00	15.849	-1.17	0.76	0.0024	1
	Ant 1	5795	11.89	11±1	12.00	15.849	-1.17	0.76	0.0024	1

SIMULTANEOUS TRANSMISSIONS

When a number of sources at different frequencies, and/or broadband sources, contribute to the total exposure, it becomes necessary to weigh each contribution relative to the MPE. To comply with the MPE, the fraction of the MPE in terms of E^2 , H^2 (or power density) incurred within each frequency interval should be determined and the sum of all such fractions should not exceed unity. In order to ensure compliance with the MPE for a controlled environment, the sum of the ratios of the power density to the corresponding MPE should not exceed unity. That is

$$\sum_{i=1}^n \frac{S_i}{MPE_i} \leq 1$$

Worse case WIFI2.4G+BT: $0.0061/1+0.0005/1=0.0066<1$

Conclusion: pass

Signature: 

Date: 2026-08-05

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