

FCC ID: 2AZNP-XMM3104

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

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

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

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.

BT:

Measurement Result

Operation Frequency: 2402MHz~2480MHz

Power density limited: 1mW/ cm²

Antenna Type: FPC antenna

Antenna gain:2.8dBi;

R=20cm

mW=10^{^(dBi/10)}

antenna gain Numeric=10^{^(dBi/10)}= 10^{^(2.8/10)}=1.91

Channel Freq. (MHz)	modulation	conducted pow er	Tune-up power (dBm)	Max		Antenna		Evaluation result	Power density Limits
		(dBm)		tune-up pow er		Gain			
				(dBm)	(mW)	(dBi)	Numeric	(mW/cm2)	(mW/cm2)
2402	GFSK	7.06	7±1	8	6.310	2.80	1.91	0.0024	1
2441		6.55	7±1	8	6.310	2.80	1.91	0.0024	1
2480		6.21	7±1	8	6.310	2.80	1.91	0.0024	1
2402	π/4-DQPSK	7.01	6.5±1	7.5	5.623	2.80	1.91	0.0021	1
2441		6.46	6.5±1	7.5	5.623	2.80	1.91	0.0021	1
2480		5.8	6.5±1	7.5	5.623	2.80	1.91	0.0021	1
2402	8-DPSK	7.14	7±1	8	6.310	2.80	1.91	0.0024	1
2441		6.68	7±1	8	6.310	2.80	1.91	0.0024	1
2480		6.29	7±1	8	6.310	2.80	1.91	0.0024	1

BLE:

Measurement Result

Operation Frequency: 2402MHz~2480MHz

Power density limited: 1mW/ cm²

Antenna Type: FPC antenna

Antenna gain:2.80dBi;

R=20cm

mW=10^{^(dBi/10)}

antenna gain Numeric=10^{^(dBi/10)}= 10^{^(2.80/10)}=1.91

Channel Freq. (MHz)	modulation	conducted pow er	Tune-up power (dBm)	Max		Antenna		Evaluation result	Power density Limits
		(dBm)		tune-up pow er		Gain			
				(dBm)	(mW)	(dBi)	Numeric	(mW/cm2)	(mW/cm2)
2402	BLE 1M	2.78	2±1	3	1.995	2.27	1.69	0.0007	1
2440		2.46	2±1	3	1.995	2.27	1.69	0.0007	1
2480		1.67	2±1	3	1.995	2.27	1.69	0.0007	1
2402	BLE 2M	2.64	2±1	3	1.995	2.27	1.69	0.0007	1
2440		2.11	2±1	3	1.995	2.27	1.69	0.0007	1
2480		1.82	2±1	3	1.995	2.27	1.69	0.0007	1

2.4GWIFI:

Measurement Result

Operation Frequency: 2412MHz~2462MHz (20M)
2422MHz~2452MHz (40M)

Power density limited: 1mW/ cm²

Antenna Type: FPC antenna

Antenna gain 1:2.22dBi;Antenna gain 2:2.22dBi;

R=20cm

mW=10^{^(dBi/10)}

Antenna 1 gain Numeric=10^{^(dBi/10)}= 10^{^(2.22/10)}=1.67

Antenna 2 gain Numeric=10^{^(dBi/10)}= 10^{^(2.75/10)}=1.88

SISO

Channel Freq. (MHz)	modulation	conducted pow er	Tune-up pow er (dBm)	Max		Antenna		Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
		(dBm)		tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
2412	11b ant1	16.19	16±1	17	50.119	2.22	1.67	0.0166	1
2437		16.41	16±1	17	50.119	2.22	1.67	0.0166	1
2462		16.46	16±1	17	50.119	2.22	1.67	0.0166	1
2412	11b ant2	16.31	16±1	17	50.119	2.75	1.88	0.0188	1
2437		16.69	16±1	17	50.119	2.75	1.88	0.0188	1
2462		16.58	16±1	17	50.119	2.75	1.88	0.0188	1
2412	11g ant1	14.38	14±1	14	25.119	2.22	1.67	0.0083	1
2437		14.68	14±1	14	25.119	2.22	1.67	0.0083	1
2462		14.67	14±1	14	25.119	2.22	1.67	0.0083	1
2422	11g ant2	14.7	14±1	14	25.119	2.75	1.88	0.0094	1
2437		14.8	14±1	14	25.119	2.75	1.88	0.0094	1
2452		14.95	14±1	14	25.119	2.75	1.88	0.0094	1
2412	11n20 ant1	12.94	13±1	14	25.119	2.22	1.67	0.0083	1
2437		13.14	13±1	14	25.119	2.22	1.67	0.0083	1
2462		13.37	13±1	14	25.119	2.22	1.67	0.0083	1
2412	11n20 ant2	13.15	13±1	14	25.119	2.75	1.88	0.0094	1
2437		13.26	13±1	14	25.119	2.75	1.88	0.0094	1
2462		13.38	13±1	14	25.119	2.75	1.88	0.0094	1
2422	11n40 ant1	11.83	12±1	13	19.953	2.22	1.67	0.0066	1
2437		12.01	12±1	13	19.953	2.22	1.67	0.0066	1
2452		12.04	12±1	13	19.953	2.22	1.67	0.0066	1
2422	11n40 ant2	12.15	12±1	13	19.953	2.75	1.88	0.0075	1
2437		12.13	12±1	13	19.953	2.75	1.88	0.0075	1
2452		12.26	12±1	13	19.953	2.75	1.88	0.0075	1

MIMO

modulation	Antenna	Channel Freq. (MHz)	conducted power	Tune-up power (dBm)	Max		Directional gain		Evaluation result
			(dBm)		tune-up power	(mW/cm ²)			
					(dBm)		(mW)	(dBi)	Numeric
802.11n20	Ant1	2412	9	9±1	10	10.000	5.50	3.55	0.0071
	Ant2	2412	10.27	10±1	11	12.589	5.50	3.55	0.0089
	Sum	2412	12.69	12±1	13	19.953	5.50	3.55	0.0141
	Ant1	2437	9.22	9±1	10	10.000	5.50	3.55	0.0071
	Ant2	2437	10.3	10±1	11	12.589	5.50	3.55	0.0089
	Sum	2437	12.8	12±1	13	19.953	5.50	3.55	0.0141
	Ant1	2462	8.77	8±1	9	7.943	5.50	3.55	0.0056
	Ant2	2462	10.39	10±1	11	12.589	5.50	3.55	0.0089
802.11n40	Sum	2462	12.67	12±1	13	19.953	5.50	3.55	0.0141
	Ant1	2422	6.82	6±1	7	5.012	5.50	3.55	0.0035
	Ant2	2422	8.17	8±1	9	7.943	5.50	3.55	0.0056
	Sum	2422	10.56	10±1	11	12.589	5.50	3.55	0.0089
	Ant1	2437	6.62	6±1	7	5.012	5.50	3.55	0.0035
	Ant2	2437	8.21	8±1	9	7.943	5.50	3.55	0.0056
	Sum	2437	10.5	10±1	11	12.589	5.50	3.55	0.0089
	Ant1	2452	6.95	6±1	7	5.012	5.50	3.55	0.0035
	Ant2	2452	8.24	8±1	9	7.943	5.50	3.55	0.0056
	Sum	2452	10.65	10±1	11	12.589	5.50	3.55	0.0089

5G WIFI:

Operation Frequency: WIFI 802.11a/n/ac(HT20): 5180-5320MHz;5500-5700MHz,5745-5825MHz;

WIFI 802.11n/ac (HT40): 5190-5310MHz; 5510-5670MHz,5755-5795MHz;

WIFI 802.11ac (HT80):5210-5290MHz; 5530-5610MHz,5775-5775MHz

Power density limited: 1mW/cm

Antenna Type: FPC antenna

Antenna gain 1:2.87dBi,Antenna gain 2:2.71dBi,

SISO-5.2G

modulation	Antenna	Channel Freq. (MHz)	conducted pow er	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm2)	Power density Limits
			(dBm)		tune-up pow er	Gain		(mW/cm2)		
					(dBm)	(mW)	(dBi)		Numeric	
802.11a	Ant 1	5180	11.24	11±1	12.00	15.849	2.87	1.94	0.0061	1
	Ant 1	5200	10.50	10±1	11.00	12.589	2.87	1.94	0.0048	1
	Ant 1	5240	10.75	10±1	11.00	12.589	2.87	1.94	0.0048	1
	Ant 2	5180	11.04	11±1	12.00	15.849	2.71	1.87	0.0059	1
	Ant 2	5200	11.15	11±1	12.00	15.849	2.71	1.87	0.0059	1
	Ant 2	5240	11.22	11±1	12.00	15.849	2.71	1.87	0.0059	1
802.11n20	Ant 1	5180	9.81	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5200	9.74	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5240	9.74	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 2	5180	9.70	9±1	10.00	10.000	2.71	1.87	0.0037	1
	Ant 2	5200	10.08	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5240	10.15	10±1	11.00	12.589	2.71	1.87	0.0047	1
802.11n40	Ant 1	5190	9.65	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5230	9.72	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 2	5190	9.87	9±1	10.00	10.000	2.71	1.87	0.0037	1
	Ant 2	5230	10.03	10±1	11.00	12.589	2.71	1.87	0.0047	1
802.11ac20	Ant 1	5180	9.69	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5200	9.78	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5240	9.94	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 2	5180	9.79	9±1	10.00	10.000	2.71	1.87	0.0037	1
	Ant 2	5200	10.03	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5240	10.09	10±1	11.00	12.589	2.71	1.87	0.0047	1
802.11ac40	Ant 1	5190	9.80	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5230	9.80	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 2	5190	9.96	9±1	10.00	10.000	2.71	1.87	0.0037	1
	Ant 2	5230	10.06	10±1	11.00	12.589	2.71	1.87	0.0047	1
802.11ac80	Ant 1	5210	9.58	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 2	5210	10.00	9±1	10.00	10.000	2.71	1.87	0.0037	1

MIMO-5.2G

modulation	Antenna	Channel Freq. (MHz)	conducted power	Tune-up power (dBm)	Max		Directional Antenna Gain		Evaluation result	Power density Limits
			(dBm)		tune-up power				(mW/cm ²)	(mW/cm ²)
					(dBm)	(mW)	(dBi)	Numeric		
802.11ac20	Ant1	5180	9.84	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5180	9.75	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Sum	5180	12.81	12±1	13.00	19.953	5.80	3.80	0.0151	1
	Ant1	5200	9.59	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5200	10.01	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5200	12.82	12±1	13.00	19.953	5.80	3.80	0.0151	1
	Ant1	5240	9.88	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5240	10.08	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5240	12.99	12±1	13.00	19.953	5.80	3.80	0.0151	1
802.11ac40	Ant1	5190	9.58	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5190	9.90	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Sum	5190	12.75	12±1	13.00	19.953	5.80	3.80	0.0151	1
	Ant1	5230	9.65	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5230	10.05	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5230	12.86	12±1	13.00	19.953	5.80	3.80	0.0151	1
802.11ac80	Ant1	5210	9.50	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5210	10.00	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Sum	5210	12.77	12±1	13.00	19.953	5.80	3.80	0.0151	1
802.11n20	Ant1	5180	9.79	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5180	9.83	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Sum	5180	12.82	12±1	13.00	19.953	5.80	3.80	0.0151	1
	Ant1	5200	9.74	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5200	10.01	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5200	12.89	12±1	13.00	19.953	5.80	3.80	0.0151	1
	Ant1	5240	9.89	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5240	10.08	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5240	13.00	12±1	13.00	19.953	5.80	3.80	0.0151	1
802.11n40	Ant1	5190	9.64	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5190	9.89	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Sum	5190	12.78	12±1	13.00	19.953	5.80	3.80	0.0151	1
	Ant1	5230	9.82	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5230	10.03	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5230	12.94	12±1	13.00	19.953	5.80	3.80	0.0151	1

SISO-5.3G

modulation	Antenna	Channel Freq. (MHz)	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result	Pow er density Limits
			(dBm)		tune-up power		Gain			
					(dBm)	(mW)	(dBi)	Numeric	(mW/cm2)	(mW/cm2)
802.11a	Ant 1	5260	11.08	11±1	12.00	15.849	2.87	1.94	0.0061	1
	Ant 1	5280	10.76	10±1	11.00	12.589	2.87	1.94	0.0048	1
	Ant 1	5320	11.36	11±1	12.00	15.849	2.87	1.94	0.0061	1
	Ant 2	5260	11.35	11±1	12.00	15.849	2.71	1.87	0.0059	1
	Ant 2	5280	11.47	11±1	12.00	15.849	2.71	1.87	0.0059	1
	Ant 2	5320	11.50	11±1	12.00	15.849	2.71	1.87	0.0059	1
802.11n20	Ant 1	5260	10.08	10±1	11.00	12.589	2.87	1.94	0.0048	1
	Ant 1	5280	9.88	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5320	10.50	10±1	11.00	12.589	2.87	1.94	0.0048	1
	Ant 2	5260	10.13	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5280	10.35	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5320	10.49	10±1	11.00	12.589	2.71	1.87	0.0047	1
802.11n40	Ant 1	5270	9.79	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5310	10.23	10±1	11.00	12.589	2.87	1.94	0.0048	1
	Ant 2	5270	10.20	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5310	10.38	10±1	11.00	12.589	2.71	1.87	0.0047	1
802.11ac20	Ant 1	5260	10.10	10±1	11.00	12.589	2.87	1.94	0.0048	1
	Ant 1	5280	10.12	10±1	11.00	12.589	2.87	1.94	0.0048	1
	Ant 1	5320	10.22	10±1	11.00	12.589	2.87	1.94	0.0048	1
	Ant 2	5260	10.20	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5280	10.34	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5320	10.44	10±1	11.00	12.589	2.71	1.87	0.0047	1
802.11ac40	Ant 1	5270	9.92	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5310	10.26	10±1	11.00	12.589	2.87	1.94	0.0048	1
	Ant 2	5270	10.22	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5310	10.39	10±1	11.00	12.589	2.71	1.87	0.0047	1
802.11ac80	Ant 1	5290	10.00	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 2	5290	10.23	10±1	11.00	12.589	2.71	1.87	0.0047	1

MIMO-5.3G

modulation	Antenna	Channel Freq. (MHz)	conducted power	Tune-up power (dBm)	Max		Directional Antenna Gain		Evaluation result	Power density Limits
			(dBm)		tune-up power				(mW/cm2)	(mW/cm2)
					(dBm)	(mW)	(dBi)	Numeric		
802.11ac20	Ant1	5260	9.84	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5260	10.22	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5260	13.04	13±1	14.00	25.119	5.80	3.80	0.0190	1
	Ant1	5280	9.76	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5280	10.33	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5280	13.06	13±1	14.00	25.119	5.80	3.80	0.0190	1
	Ant1	5320	10.33	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Ant2	5320	10.54	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5320	13.45	13±1	14.00	25.119	5.80	3.80	0.0190	1
802.11ac40	Ant1	5270	9.72	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5270	10.34	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5270	13.05	13±1	14.00	25.119	5.80	3.80	0.0190	1
	Ant1	5310	10.03	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Ant2	5310	10.43	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5310	13.24	13±1	14.00	25.119	5.80	3.80	0.0190	1
802.11ac80	Ant1	5290	9.92	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5290	10.29	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5290	13.12	13±1	14.00	25.119	5.80	3.80	0.0190	1
802.11n20	Ant1	5260	10.04	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Ant2	5260	10.33	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5260	13.20	13±1	14.00	25.119	5.80	3.80	0.0190	1
	Ant1	5280	10.07	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Ant2	5280	10.37	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5280	13.23	13±1	14.00	25.119	5.80	3.80	0.0190	1
	Ant1	5320	10.25	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Ant2	5320	10.47	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5320	13.37	13±1	14.00	25.119	5.80	3.80	0.0190	1
802.11n40	Ant1	5270	9.72	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5270	10.18	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5270	12.97	12±1	13.00	19.953	5.80	3.80	0.0151	1
	Ant1	5310	10.07	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Ant2	5310	10.39	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5310	13.24	13±1	14.00	25.119	5.80	3.80	0.0190	1

SISO-5.6G

modulation	Antenna	Channel Freq. (MHz)	conducted pow er	Tune-up power (dBm)	Max		Antenna		Evaluation result	Power density Limits
			(dBm)		tune-up power		Gain		(mW/cm2)	(mW/cm2)
					(dBm)	(mW)	(dBi)	Numeric		
802.11a	Ant 1	5500	11.69	11±1	12.00	15.849	2.87	1.94	0.0061	1
	Ant 1	5600	10.75	10±1	11.00	12.589	2.87	1.94	0.0048	1
	Ant 1	5700	10.88	10±1	11.00	12.589	2.87	1.94	0.0048	1
	Ant 2	5500	11.78	11±1	12.00	15.849	2.71	1.87	0.0059	1
	Ant 2	5600	11.27	11±1	12.00	15.849	2.71	1.87	0.0059	1
	Ant 2	5700	11.01	11±1	12.00	15.849	2.71	1.87	0.0059	1
802.11n20	Ant 1	5500	10.43	10±1	11.00	12.589	2.87	1.94	0.0048	1
	Ant 1	5600	9.80	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5700	9.65	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 2	5500	10.65	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5600	10.23	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5700	9.99	9±1	10.00	10.000	2.71	1.87	0.0037	1
802.11n40	Ant 1	5510	10.33	10±1	11.00	12.589	2.87	1.94	0.0048	1
	Ant 1	5590	9.63	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5670	9.60	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 2	5510	10.56	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5590	10.06	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5670	9.97	9±1	10.00	10.000	2.71	1.87	0.0037	1
802.11ac20	Ant 1	5500	10.50	10±1	11.00	12.589	2.87	1.94	0.0048	1
	Ant 1	5600	9.66	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5700	9.80	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 2	5500	10.67	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5600	10.18	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5700	10.00	9±1	10.00	10.000	2.71	1.87	0.0037	1
802.11ac40	Ant 1	5510	10.35	10±1	11.00	12.589	2.87	1.94	0.0048	1
	Ant 1	5590	9.75	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5670	9.65	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 2	5510	10.51	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5590	10.09	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5670	10.04	10±1	11.00	12.589	2.71	1.87	0.0047	1
802.11ac80	Ant 1	5530	10.00	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5610	9.35	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 2	5530	10.34	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5610	10.01	10±1	11.00	12.589	2.71	1.87	0.0047	1

MIMO-5.6G

modulation	Antenna	Channel Freq. (MHz)	conducted power	Tune-up power (dBm)	Max		Directional Antenna Gain		Evaluation result	Power density Limits
			(dBm)		tune-up power				(mW/cm2)	(mW/cm2)
					(dBm)	(mW)	(dBi)	Numeric		
802.11ac20	Ant1	5500	10.72	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Ant2	5500	10.63	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5500	13.69	13±1	14.00	25.119	5.80	3.80	0.0190	1
	Ant1	5600	9.80	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5600	10.20	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5600	13.01	13±1	14.00	25.119	5.80	3.80	0.0190	1
	Ant1	5700	9.89	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5700	10.02	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5700	12.97	12±1	13.00	19.953	5.80	3.80	0.0151	1
802.11ac40	Ant1	5510	10.22	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Ant2	5510	10.55	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5510	13.40	13±1	14.00	25.119	5.80	3.80	0.0190	1
	Ant1	5590	9.78	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5590	10.10	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5590	12.95	12±1	13.00	19.953	5.80	3.80	0.0151	1
	Ant1	5670	9.94	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5670	10.02	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5670	12.99	12±1	13.00	19.953	5.80	3.80	0.0151	1
802.11ac80	Ant1	5530	10.40	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Ant2	5530	10.37	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5530	13.40	13±1	14.00	25.119	5.80	3.80	0.0190	1
	Ant1	5610	9.45	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5610	9.95	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Sum	5610	12.72	12±1	13.00	19.953	5.80	3.80	0.0151	1
802.11n20	Ant1	5500	10.53	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Ant2	5500	10.64	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5500	13.60	13±1	14.00	25.119	5.80	3.80	0.0190	1
	Ant1	5600	9.58	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5600	10.15	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5600	12.88	12±1	13.00	19.953	5.80	3.80	0.0151	1
	Ant1	5700	9.85	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5700	10.01	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5700	12.94	12±1	13.00	19.953	5.80	3.80	0.0151	1
802.11n40	Ant1	5510	10.17	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Ant2	5510	10.58	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5510	13.39	13±1	14.00	25.119	5.80	3.80	0.0190	1
	Ant1	5590	9.63	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5590	10.04	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5590	12.85	12±1	13.00	19.953	5.80	3.80	0.0151	1
	Ant1	5670	9.54	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5670	9.95	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Sum	5670	12.76	12±1	13.00	19.953	5.80	3.80	0.0151	1

SISO-5.8G

modulation	Antenna	Channel Freq. (MHz)	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result	Pow er density Limits
			(dBm)		tune-up power		Gain			
					(dBm)	(mW)	(dBi)	Numeric	(mW/cm2)	(mW/cm2)
802.11a	Ant 1	5745	10.52	10±1	11.00	12.589	2.87	1.94	0.0048	1
	Ant 1	5785	10.65	10±1	11.00	12.589	2.87	1.94	0.0048	1
	Ant 1	5825	10.79	10±1	11.00	12.589	2.87	1.94	0.0048	1
	Ant 2	5745	11.12	11±1	12.00	15.849	2.71	1.87	0.0059	1
	Ant 2	5785	11.27	11±1	12.00	15.849	2.71	1.87	0.0059	1
	Ant 2	5825	11.79	11±1	12.00	15.849	2.71	1.87	0.0059	1
802.11n20	Ant 1	5745	9.46	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5785	9.63	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5825	9.80	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 2	5745	10.01	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5785	10.22	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5825	10.68	10±1	11.00	12.589	2.71	1.87	0.0047	1
802.11n40	Ant 1	5755	9.34	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5795	9.48	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 2	5755	9.95	9±1	10.00	10.000	2.71	1.87	0.0037	1
	Ant 2	5795	10.23	10±1	11.00	12.589	2.71	1.87	0.0047	1
802.11ac20	Ant 1	5745	9.46	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5785	9.61	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5825	9.58	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 2	5745	10.16	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5785	10.21	10±1	11.00	12.589	2.71	1.87	0.0047	1
	Ant 2	5825	10.62	10±1	11.00	12.589	2.71	1.87	0.0047	1
802.11ac40	Ant 1	5755	9.48	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 1	5795	9.64	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 2	5755	9.93	9±1	10.00	10.000	2.71	1.87	0.0037	1
	Ant 2	5795	10.24	10±1	11.00	12.589	2.71	1.87	0.0047	1
802.11ac80	Ant 1	5775	9.50	9±1	10.00	10.000	2.87	1.94	0.0039	1
	Ant 2	5775	10.02	10±1	11.00	12.589	2.71	1.87	0.0047	1

MIMO-5.8G

modulation	Antenna	Channel Freq. (MHz)	conducted pow er	Tune-up power (dBm)	Max		Directional Antenna Gain		Evaluation result	Power density Limits
			(dBm)		tune-up power				(mW/cm2)	(mW/cm2)
					(dBm)	(mW)	(dBi)	Numeric		
802.11ac20	Ant1	5745	9.55	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5745	10.15	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5745	12.87	12±1	13.00	19.953	5.80	3.80	0.0151	1
	Ant1	5785	9.63	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5785	10.20	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5785	12.93	12±1	13.00	19.953	5.80	3.80	0.0151	1
	Ant1	5825	9.75	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5825	10.71	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5825	13.27	13±1	14.00	25.119	5.80	3.80	0.0190	1
802.11ac40	Ant1	5755	9.25	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5755	9.89	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Sum	5755	12.59	12±1	13.00	19.953	5.80	3.80	0.0151	1
	Ant1	5795	9.47	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5795	10.27	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5795	12.90	12±1	13.00	19.953	5.80	3.80	0.0151	1
802.11ac80	Ant1	5775	9.38	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5775	10.07	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5775	12.75	12±1	13.00	19.953	5.80	3.80	0.0151	1
802.11n20	Ant1	5745	9.62	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5745	10.08	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5745	12.87	12±1	13.00	19.953	5.80	3.80	0.0151	1
	Ant1	5785	9.77	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5785	10.17	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5785	12.98	12±1	13.00	19.953	5.80	3.80	0.0151	1
	Ant1	5825	9.52	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5825	10.65	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5825	13.13	13±1	14.00	25.119	5.80	3.80	0.0190	1
802.11n40	Ant1	5755	9.34	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5755	9.92	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Sum	5755	12.65	12±1	13.00	19.953	5.80	3.80	0.0151	1
	Ant1	5795	9.58	9±1	10.00	10.000	5.80	3.80	0.0076	1
	Ant2	5795	10.13	10±1	11.00	12.589	5.80	3.80	0.0095	1
	Sum	5795	12.87	12±1	13.00	19.953	5.80	3.80	0.0151	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

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

Band	Antenna	tune-up power	Antenna	Separation distance (cm)	Standalone	Standalone	Simultaneous		Verdict
		(dBm)	Gain		Evaluation result(mW/cm2)	Power density Limits(mW/cm2)	Evaluation result	Limit	
			(dBi)				ratios		
BT	Ant1	8	2.8	20	0.002392	1	0.109884	1	PASS
Wi-Fi 2.4G	Ant1	17	2.22	20	0.016623	1			
	Ant2	17	2.75	20	0.018781	1			
Wi-Fi 5.2G 802.11ac20 MIMO	Sum	13	5.8	20	0.015091	1			
Wi-Fi 5.3G 802.11ac20 MIMO	Sum	14	5.8	20	0.018999	1			
Wi-Fi 5.6G 802.11ac20 MIMO	Sum	14	5.8	20	0.018999	1			
Wi-Fi 5.8G 802.11ac20 MIMO	Sum	14	5.8	20	0.018999	1			

Note : 5.8dBi is the directional gain value for 5G.

Conclusion:

For the max result : $0.109884 \leq 1.0$ for Max Power Density, compliance RF exposure.

Signature:

Alex

Date: 2025-08-06

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

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