

# FCC ID: 2AQ9Y-OPI800

## 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 <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposure</b>				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f <sup>2</sup>	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f <sup>2</sup>	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

$$E \text{ (V/m)} = \frac{\sqrt{30 * P * G}}{d} \qquad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

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/ cm<sup>2</sup>

Antenna Type: FPC antenna

Antenna gain: 3dBi;

R=20cm

mW=10<sup>^(dBm/10)</sup>

antenna gain Numeric=10<sup>^(dBi/10)</sup>= 10<sup>^(3/10)</sup>=2

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm <sup>2</sup> )	Power density (mW/cm <sup>2</sup> )
		(dBm)		tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
2402	GFSK (1M)	4.232	4±1	5	3.162	3.00	2.00	0.0013	1
2440		4.768	4±1	5	3.162	3.00	2.00	0.0013	1
2480		3.757	4±1	5	3.162	3.00	2.00	0.0013	1
2402	GFSK (2M)	4.104	4±1	5	3.162	3.00	2.00	0.0013	1
2440		4.661	4±1	5	3.162	3.00	2.00	0.0013	1
2480		3.611	4±1	5	3.162	3.00	2.00	0.0013	1

## 2.4G WIFI:

Operation Frequency: WIFI 802.11b/g/n HT20: 2412-2462MHz,  
 WIFI 802.11n HT40:2422-2452MHz  
 Power density limited: 1mW/ cm<sup>2</sup>

Antenna Type: FPC antenna

Antenna gain: 3dBi;

R=20cm

$mW=10^{(dBm/10)}$

antenna gain Numeric= $10^{(dBi/10)}=10^{(3/10)}=2$

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm <sup>2</sup> )	Power density (mW/cm <sup>2</sup> )
				tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
2412	802.11b	12.75	12±1	13	19.953	3.00	2.00	0.0079	1
2437		10.77	11±1	12	15.849	3.00	2.00	0.0063	1
2462		11.14	11±1	12	15.849	3.00	2.00	0.0063	1
2412	802.11g	14.45	14±1	15	31.623	3.00	2.00	0.0126	1
2437		12.61	13±1	14	25.119	3.00	2.00	0.0100	1
2462		13.06	13±1	14	25.119	3.00	2.00	0.0100	1
2412	802.11n H20	13.96	13±1	14	25.119	3.00	2.00	0.0100	1
2437		12.17	13±1	14	25.119	3.00	2.00	0.0100	1
2462		12.62	13±1	14	25.119	3.00	2.00	0.0100	1
2422	802.11n(H T40)	12.7	12±1	13	19.953	3.00	2.00	0.0079	1
2437		12.29	12±1	13	19.953	3.00	2.00	0.0079	1
2452		12.54	12±1	13	19.953	3.00	2.00	0.0079	1

## 5G WIFI:

Operation Frequency: WIFI 802.11a/ac/n(HT20): 5180-5240MHz;5745-5825MHz;WIFI 802.11ac/n(HT40): 5190-5230MHz; 5755-5795MHz;  
 802.11ac80:5210-5210MHz; 5775-5775MHz

Power density limited: 1mW/cm

Antenna Type: FPC antenna

Antenna gain:3dBi;

R=20cm

$mW=10^{(dBm/10)}$

antenna gain Numeric= $10^{(dBi/10)}=10^{(3/10)}=2$

## 5.2G

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm <sup>2</sup> )	Power density (mW/cm <sup>2</sup> )
				tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
5180	802.11a	14.03	14±1	15	31.623	3.00	2.00	0.0126	1
5200		13.06	14±1	15	31.623	3.00	2.00	0.0126	1
5240		14.43	14±1	15	31.623	3.00	2.00	0.0126	1
5180	802.11ac20	14.29	14±1	15	31.623	3.00	2.00	0.0126	1
5200		13.33	14±1	15	31.623	3.00	2.00	0.0126	1
5240		14.72	14±1	15	31.623	3.00	2.00	0.0126	1
5190	802.11ac40	14.34	14±1	15	31.623	3.00	2.00	0.0126	1
5230		14.8	14±1	15	31.623	3.00	2.00	0.0126	1
5210	802.11ac80	9.64	9±1	10	10.000	3.00	2.00	0.0040	1
5180	802.11n H20	14.08	14±1	15	31.623	3.00	2.00	0.0126	1
5200		13.07	14±1	15	31.623	3.00	2.00	0.0126	1
5240		14.54	14±1	15	31.623	3.00	2.00	0.0126	1
5190	802.11n H40	14.1	14±1	15	31.623	3.00	2.00	0.0126	1
5230		14.54	14±1	15	31.623	3.00	2.00	0.0126	1

5.8G

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm <sup>2</sup> )	Power density (mW/cm <sup>2</sup> )
		(dBm)		tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
5745	802.11a	14.56	15±1	16	39.811	3.00	2.00	0.0158	1
5785		15.48	15±1	16	39.811	3.00	2.00	0.0158	1
5825		13.56	13±1	14	25.119	3.00	2.00	0.0100	1
5745	802.11ac20	14.79	15±1	16	39.811	3.00	2.00	0.0158	1
5785		15.73	15±1	16	39.811	3.00	2.00	0.0158	1
5825		13.77	13±1	14	25.119	3.00	2.00	0.0100	1
5755	802.11ac40	15.65	15±1	16	39.811	3.00	2.00	0.0158	1
5795		15.41	15±1	16	39.811	3.00	2.00	0.0158	1
5775	802.11ac80	15.43	15±1	16	39.811	3.00	2.00	0.0158	1
5745	802.11n H20	14.55	15±1	16	39.811	3.00	2.00	0.0158	1
5785		15.49	15±1	16	39.811	3.00	2.00	0.0158	1
5825		13.59	13±1	14	25.119	3.00	2.00	0.0100	1
5755	802.11n H40	15.39	15±1	16	39.811	3.00	2.00	0.0158	1
5795		15.19	15±1	16	39.811	3.00	2.00	0.0158	1

**Signature:**  
**Date:** 2022-10-19



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