

	FCC 47 CFR MPE Report	FCC ID:2BMMP-V3
--	----------------------------------	-----------------

RF Exposure Report

FCC 47 CFR MPE

Maximum Permissible Exposure

1. Maximum Permissible Exposure Applicable Standards

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

1.1. Limits for Maximum Permissible Exposure (MPE)

(a) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-10000			5	6

(b) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-10000			1.0	30

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

	FCC 47 CFR MPE Report	FCC ID:2BMMP-V3
--	------------------------------	-----------------

1.2. Maximum Permissible Exposure Calculation Method

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

E = Electric Field (V/m)

P = Peak 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

$$P_d = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak 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

2. Conducted Power Result

BT							
Mode/Type	Frequency	Output Power	Output Power	Max Tune-up Power		Antenna gain	
	(MHz)	(dBm)	(mW)	(dBm)		(dBi)	(Linear)
GFSK	2402	5.94	3.926	6	± 1	2.38	1.730
	2441	5.71	3.724	6	± 1	2.38	1.730
	2480	5.56	3.597	6	± 1	2.38	1.730
π/4-DQPSK	2402	6.67	4.645	7	± 1	2.38	1.730
	2441	6.45	4.416	6	± 1	2.38	1.730
	2480	6.40	4.365	6	± 1	2.38	1.730
8-DPSK	2402	7.22	5.272	7	± 1	2.38	1.730
	2441	7.04	5.058	7	± 1	2.38	1.730
	2480	7.00	5.012	7	± 1	2.38	1.730

Remark: The Peak Output Power data is derived from the RF test report number mentioned in the title of this document.

	FCC 47 CFR MPE Report	FCC ID:2BMMP-V3
--	------------------------------	-----------------

2.4G Wi-Fi							
Mode/Type	Frequency	Output Power	Output Power	Max Tune-up Power		Antenna Gain	
	(MHz)	(dBm)	(mW)	(dBm)		(dBi)	(Linear)
IEEE 802.11b	2412	15.10	32.359	15	± 1	3.5	2.239
	2437	15.80	38.019	16	± 1	3.5	2.239
	2462	15.71	37.239	16	± 1	3.5	2.239
IEEE 802.11g	2412	11.33	13.583	11	± 1	3.5	2.239
	2437	12.40	17.378	12	± 1	3.5	2.239
	2462	12.27	16.866	12	± 1	3.5	2.239
IEEE 802.11n HT20	2412	11.31	13.521	11	± 1	3.5	2.239
	2437	12.40	17.378	12	± 1	3.5	2.239
	2462	12.22	16.672	12	± 1	3.5	2.239
IEEE 802.11n HT40	2412	11.77	15.031	12	± 1	3.5	2.239
	2437	12.38	17.298	12	± 1	3.5	2.239
	2462	12.22	16.672	12	± 1	3.5	2.239

Remark: The Peak Output Power data is derived from the RF test report number mentioned in the title of this document.

	FCC 47 CFR MPE Report	FCC ID:2BMMP-V3
--	------------------------------	-----------------

5.2G Wi-Fi (U-NII-1)							
Mode/Type	Frequency	Output Power	Output Power	Max Tune-up Power		Antenna Gain	
	(MHz)	(dBm)	(mW)	(dBm)	dB	(dBi)	(Linear)
IEEE 802.11a	CH36 5180	8.34	6.824	8	± 1	3.2	2.089
	CH42 5220	9.51	8.934	10	± 1	3.2	2.089
	CH48 5240	9.17	8.260	9	± 1	3.2	2.089
IEEE 802.11n HT20	CH36 5180	8.36	6.855	8	± 1	3.2	2.089
	CH42 5220	9.53	8.974	10	± 1	3.2	2.089
	CH48 5240	9.21	8.340	9	± 1	3.2	2.089
IEEE 802.11n HT40	CH38 5190	12.09	16.183	12	± 1	3.2	2.089
	CH46 5230	12.32	17.063	12	± 1	3.2	2.089
IEEE 802.11ac VHT20	CH36 5180	8.40	6.918	8	± 1	3.2	2.089
	CH42 5220	9.58	9.078	10	± 1	3.2	2.089
	CH48 5240	9.15	8.222	9	± 1	3.2	2.089
IEEE 802.11ac VHT40	CH38 5190	8.46	7.014	8	± 1	3.2	2.089
	CH46 5230	8.54	7.143	9	± 1	3.2	2.089
IEEE 802.11ax VHT20	CH36 5180	9.42	8.747	9	± 1	3.2	2.089
	CH42 5220	10.58	11.430	11	± 1	3.2	2.089
	CH48 5240	10.20	10.471	10	± 1	3.2	2.089
IEEE 802.11ax VHT40	CH38 5190	9.37	8.648	9	± 1	3.2	2.089
	CH46 5230	9.55	9.016	10	± 1	3.2	2.089

Remark: The Peak Output Power data is derived from the RF test report number mentioned in the title of this document.

	FCC 47 CFR MPE Report	FCC ID:2BMMP-V3
--	------------------------------	-----------------

5.8G Wi-Fi (U-NII-3)							
Mode/Type	Frequency	Peak Output Power	Peak Output Power	Max Tune-up Power		Antenna Gain	
	(MHz)	(dBm)	(mW)	(dBm)	dB	(dBi)	(Linear)
IEEE 802.11a	CH149 5745	14.74	29.781	15	± 1	2.7	1.862
	CH157 5785	14.89	30.832	15	± 1	2.7	1.862
	CH165 5825	13.51	22.440	14	± 1	2.7	1.862
IEEE 802.11n HT20	CH149 5745	14.85	30.549	15	± 1	2.7	1.862
	CH157 5785	14.75	29.853	15	± 1	2.7	1.862
	CH165 5825	13.61	22.959	14	± 1	2.7	1.862
IEEE 802.11n HT40	CH151 5755	14.51	28.248	15	± 1	2.7	1.862
	CH159 5795	14.55	28.510	15	± 1	2.7	1.862
IEEE 802.11ac VHT20	CH149 5745	14.82	30.339	15	± 1	2.7	1.862
	CH157 5785	14.78	30.058	15	± 1	2.7	1.862
	CH165 5825	13.58	22.801	14	± 1	2.7	1.862
IEEE 802.11ac VHT40	CH151 5755	14.54	28.444	15	± 1	2.7	1.862
	CH159 5795	15.06	32.063	15	± 1	2.7	1.862
IEEE 802.11ax VHT20	CH149 5745	15.88	38.722	16	± 1	2.7	1.862
	CH157 5785	15.94	39.264	16	± 1	2.7	1.862
	CH165 5825	14.61	28.908	15	± 1	2.7	1.862
IEEE 802.11ax VHT40	CH151 5755	15.43	34.914	15	± 1	2.7	1.862
	CH159 5795	15.24	33.420	15	± 1	2.7	1.862

Remark: The Peak Output Power data is derived from the RF test report number mentioned in the title of this document.

	FCC 47 CFR MPE Report	FCC ID:2BMMP-V3
--	------------------------------	-----------------

3. Calculated Result and Limit

Single-Transmitter MPE Calculation Results						
Mode/Type	Max Tune-up Power	Antenna Gain		Power Density	Limited of Power Density	Result
	(dBm)	(dBi)	(Linear)	(S) (mW/cm ²)	(S) (mW/cm ²)	
BT: 8-DPSK	8	2.38	1.730	0.00217	1.0	Complies
2.4G Wi-Fi	17	3.5	2.239	0.02232	1.0	Complies
5.2G Wi-Fi (U-NII-1)	13	3.2	2.089	0.00829	1.0	Complies
5.8G Wi-Fi (U-NII-3)	17	2.7	1.862	0.01856	1.0	Complies

Simultaneous Transmission Assessment				
Mode/Type	Max Tune-up Power Calculation	Σ (S _i /Limit _i)	Limited of Power Density	Result
	(dBm)		(S) (mW/cm ²)	
BT + 2.4G Wi-Fi (Worst case)	0.00217/1+0.02232/1	0.02449	≤1.0	Complies

Note:

1. The device supports both 2.4G Wi-Fi and 5G Wi-Fi operation; however, these two radios cannot transmit simultaneously due to board-level design constraints. They are active concurrently only in an interleaved, time-multiplexed manner, where data packets from each radio are switched and transmitted in alternating time slots. This hardware-enforced arbitration ensures that at any given instant, only one Wi-Fi radio (either 2.4G or 5G) is actively transmitting.
2. BT and Wi-Fi can be active at the same time. This scenario represents the worst-case simultaneous transmission condition, as the 2.4G Wi-Fi exhibits the highest single-transmitter power density among all radios.

All single-transmitter power densities are well below the 1.0 mW/cm² limit.

Simultaneous transmission scenarios (BT + 2.4G Wi-Fi) comply with the MPE limits.

The device qualifies for SAR exemption under FCC KDB 447498 D01 and 47 CFR §2.1091, as the calculated power density values at 20 cm separation distance are all below the applicable MPE limits.

Conclusion: So, SAR test is not required

-----End of RF Exposure Evaluation -----