

FCC 47 CFR MPE
Report

FCC ID:2BYGT-WP-006

RF Exposure Report

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Maximum Permissible Exposure

1. Maximum Permissible Exposure Applicable Standards

According to KDB 447498 D01 General RF Exposure Guidance v06, 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

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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	0.75	1.189	1	± 1	2	1.585
	2441	1.34	1.361	1	± 1	2	1.585
	2480	1.47	1.403	1	± 1	2	1.585
π/4-DQPSK	2402	1.38	1.371	1	± 1	2	1.585
	2441	2.01	1.589	2	± 1	2	1.585
	2480	2.15	1.641	2	± 1	2	1.585
8-DPSK	2402	1.63	1.455	2	± 1	2	1.585
	2441	2.39	1.734	2	± 1	2	1.585
	2480	2.47	1.766	2	± 1	2	1.585

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

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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	15.39	34.594	15	± 1	2	1.585
	2437	15.93	39.174	16	± 1	2	1.585
	2462	16.15	41.210	16	± 1	2	1.585
IEEE 802.11g	2412	8.31	6.776	8	± 1	2	1.585
	2437	8.85	7.674	9	± 1	2	1.585
	2462	9.03	7.998	9	± 1	2	1.585
IEEE 802.11n HT20	2412	9.52	8.954	10	± 1	2	1.585
	2437	10.03	10.069	10	± 1	2	1.585
	2462	10.22	10.520	10	± 1	2	1.585
IEEE 802.11n HT40	2412	9.24	8.395	9	± 1	2	1.585
	2437	9.61	9.141	10	± 1	2	1.585
	2462	9.76	9.462	10	± 1	2	1.585

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



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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	3	2	1.585	0.00063	1.0	Complies
2.4G Wi-Fi	17	2	1.585	0.01580	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	0.00063/1+0.01580/1	0.01643	≤1.0	Complies

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

The device qualifies for SAR exemption under FCC KDB 447498 D01 v06 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 -----