FCC §15.407(f) & §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.407(f)and subpart §1.1310, 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 of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minutes)
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
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

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

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary:

Predication of MPE limit at a given distance
$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Calculated Data:

Band	Mode	Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
			(dBi)	(numeric)	(dBm)	(mW)			
5150-5250 MHz	802.11a	5200	4.4	2.75	13.23	21.04	20	0.012	1.0
	802.11n ht20	5240	4.4	2.75	12.64	18.37	20	0.010	1.0
	802.11n ht40	5230	4.4	2.75	12.17	16.48	20	0.009	1.0
	802.11ac80	5210	4.4	2.75	11.70	14.79	20	0.008	1.0
5725-5850 MHz	802.11a	5745	4.4	2.75	12.58	18.11	20	0.010	1.0
	802.11n ht20	5825	4.4	2.75	11.76	15.00	20	0.008	1.0
	802.11n ht40	5755	4.4	2.75	12.50	17.78	20	0.010	1.0
	802.11ac80	5775	4.4	2.75	10.24	10.57	20	0.006	1.0

Result: The device meet FCC MPE at 20 cm distance