FCC §15.247 (I), §2.1091 & §1.1307(B)(1) - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247(i)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/f²)	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

$$S = PG/4\pi R^2$$

Where:
S = 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);

The rated turn-up output power and antenna gain in the below table:

WIFI + GSM (FCC ID: RI7HE910)

Worst case

Mode	Frequency	Antenna Gain		Conducted Power		Evaluation Distance	Power Density	Limit	MPE Ratios
	MHz	dBi	numeric	dBm	mW	cm	mW/cm^2	mW/cm^2	(%)
WIFI	2412-2462	2	1.58	18.50	70.79	20	0.022	1.0	2.2
GSM	824-849	2.7	1.86	29.20	831.76	20	0.308	0.55	**56.0**
Total sum of MPE ratios (%)									58.2

For WIFI and GSM module, WIFI and WCDMA transmit simultaneously, two modes were tested, the worst case for MPE was chosen to be added up.
For GSM mode, the worst case for MPE was chosen to be added up.

Result: 58.2%<1, the device meet FCC MPE at 20 cm distance.