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

Applicable Standard

According to subpart 15.247 (i) and subpart 1.1310, 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm²)	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

Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4 \pi R^2$ = power density (in appropriate units, e.g. mW/cm²);
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);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

Calculated Data:

Mode	Frequency Range (MHz)	Antenna Gain		Target Output Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
		(dBi)	(numeric)	(dBm)	(mW)			
Wi-Fi 802.11b	2412~2462	0.50	1.12	14.00	25.12	20	**0.0056**	1.0
Wi-Fi 802.11g		0.50	1.12	11.00	12.59	20	0.0028	1.0
Wi-Fi 802.11n-HT20		0.50	1.12	11.00	12.59	20	0.0028	1.0
LTE Band 2	1850~1910	0.50	1.12	24.00	251.19	20	0.0561	1.0
LTE Band 4	1710~1755	0.50	1.12	24.00	251.19	20	0.0561	1.0
LTE Band 12	699~716	0.50	1.12	24.45	278.61	20	**0.0622**	0.466

Note:
(1) The target output powers are all declared by the Manufacturer.
(2) The LTE module FCC ID: RI7ME910C1NA.
(3) Wi-Fi and LTE can transmit simultaneously; the worst condition is 802.11b of Wi-Fi and LTE Band 12 as below:

$$\sum_i \frac{S_i}{S_{Limit,i}} = 0.0056/1.00+0.0622/0.466=0.0056+0.1335=0.1391< 1.0$$

Result: The device meet FCC MPE at 20 cm distance.