FCC §1.1307 (b) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247 (i) and subpart 1.1307 (b)(1), 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

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

Result

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

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)

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

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

Mode	Frequency (MHz)	Antenna Gain		Max Tune-up Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
		(dBi)	(numeric)	(dBm)	(mW)			
Wi-Fi	2412-2462	2.0	1.58	21.5	141.25	20	0.044	1.0
WCDMA band 5	826.4-846.6	0.5	1.12	25.0	316.23	20	0.070	0.55
WCDMA band 2	1852.4-1907.6	0.5	1.12	25.0	316.23	20	0.070	1.0
LTE band 2	1850.7-1909.3	0.5	1.12	25.7	371.54	20	0.083	1.0
LTE band 4	1710.7-1754.3	0.5	1.12	25.7	371.54	20	0.083	1.0
LTE band 12	699.7-715.3	0.5	1.12	25.7	371.54	20	0.083	0.47

Note   LTE Data please refer to LTE module's FCC ID: UDV-201606 which has been certified on 2016-10-21 by ACB, Inc.

The worst case of simultaneous transmitting condition (Wi-Fi& LTE band 12) is below:

$$\sum_i \frac{S_i}{S_{Limit,i}} = 0.044/1 + 0.083/0.47 = 0.044 + 0.176 = 0.220 < 1.0$$

Note: To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliance