FCC §15.319 (i) & §2.1091 - RF EXPOSURE INFORMATION

Limit

According to FCC KDB 447498, 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.

a) Transmitters and modules certified for mobile or portable exposure conditions and categorically excluded by §2.1091(c) can be incorporated in mobile host devices without further testing or certification when:

i) The closest separation among all simultaneous transmitting antennas is ≥ 20 cm; or
ii) The antenna separation distance and MPE compliance boundary requirements that enable all simultaneous transmitting antennas incorporated within the host to comply with MPE limits are specified in the application filing of at least one of the certified transmitters incorporated in the host device.
In addition, when transmitters certified for portable use are incorporated in a mobile host device the antenna(s) must be ≥ 5 cm from all other simultaneous transmitting antennas.

b) All antennas in the final product must be at least 20 cm from users and nearby persons.

Note: The distances between antennas are: antenna 1 and antenna 3 is 14.2 cm, antenna 1 and antenna 6 is 17 cm, antenna 1 and antenna 7 is 10.1 cm. please refer to EUT photos for details.

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

Limits for Maximum Permissible Exposure (MPE)

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

Test Data

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

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

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 = gain of the antenna in the direction of interest relative to an isotropic radiator.
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Maximum peak output power at antenna input terminal: 20.04(dBm)
Maximum peak output power at antenna input terminal: 100.93(mW)
Prediction distance: >20 (cm)
Predication frequency: 1924.992(MHz)
Antenna Gain (typical):2 (dBi)
Antenna Gain (typical): 1.6 numeric
The worst case is power density at predication frequency at 20 cm: 0.032(mW/cm^2)
MPE limit for general population exposure at prediction frequency: 1 (mW/cm^2)

Result: The device meets MPE limit at 20 cm distance.