4 FCC §2.1091 - RF Exposure

4.1 Applicable Standard

According to FCC §1.1307(b)(1), 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 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)
Limits for General Population/Uncontrolled Exposure				
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

4.2 MPE Prediction

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

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

Where: S = power density
P = power input to antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

4.3 MPE Results

Chain 0

Maximum peak output power at antenna input terminal (dBm):	13.4
Maximum peak output power at antenna input terminal (mW):	21.88
Prediction distance (cm):	20
Prediction frequency (MHz):	5860
Maximum Antenna Gain, typical (dBi):	7.6
Maximum Antenna Gain (numeric):	5.75
Power density of prediction frequency at 20 cm (mW/cm^2):	0.0250
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1

Chain 1

Maximum peak output power at antenna input terminal (dBm):	18.43
Maximum peak output power at antenna input terminal (mW):	69.66
Prediction distance (cm):	20
Prediction frequency (MHz):	5860
Maximum Antenna Gain, typical (dBi):	7.6
Maximum Antenna Gain (numeric):	5.75
Power density of prediction frequency at 20 cm (mW/cm^2):	0.0797
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1

Additional Radios MPE Evaluation

LTE

Maximum peak output power at antenna input terminal (dBm):	25
Maximum peak output power at antenna input terminal (mW):	316.23
Prediction distance (cm):	20
Prediction frequency (MHz):	2498.5
Maximum Antenna Gain, typical (dBi):	3.5
Maximum Antenna Gain (numeric):	2.24
Power density of prediction frequency at 20 cm (mW/cm^2):	0.141
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1

Radio Co-location MPE Evaluation

DSRC + Cellular

$$0.0797/1+0.141/1=0.2207 \leq 1.0$$

Conclusion

The device compliances with FCC MPE limit at 20 cm distance.