11 FCC §1.1307(b) (1) & §2.1091 - RF EXPOSURE

11.1 Applicable Standard

According to FCC §1.1310 and §2.1091 (Mobile Devices) RF exposure is calculated.

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 (minute)
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

Note: f = frequency in MHz
* = Plane-wave equivalent power density

11.2 MPE Prediction

Predication of MPE limit at a given distance, Equation from FCC 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

850 MHz Cellular Band, Uplink:

Maximum peak output power at antenna input terminal (dBm):	10.2
Maximum peak output power at antenna input terminal (mW):	10.47
Prediction distance (cm):	20
Prediction frequency (MHz):	836.6
Antenna Gain, typical (dBi):	3.0
Maximum Antenna Gain (numeric):	2
Power density at predication frequency and distance (mW/cm^2):	0.0042
MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	0.558

850 MHz Cellular Band, Downlink:

Maximum peak output power at antenna input terminal (dBm):	15.15
Maximum peak output power at antenna input terminal (mW):	32.73
Prediction distance (cm):	20
Prediction frequency (MHz):	881.6
Antenna Gain, typical (dBi):	6.0
Maximum Antenna Gain (numeric):	3.98
Power density at predication frequency and distance (mW/cm^2):	0.0259
MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	0.588

Test Result

For Uplink, the highest power density level at 20 cm is 0.0042mW/cm², which is below the uncontrolled exposure limit of 0.558 mW/cm² at 836.6 MHz.

For Downlink, the highest power density level at 20 cm is 0.0259mW/cm², which is below the uncontrolled exposure limit of 0.588 mW/cm² at 881.6 MHz.

So the indoor antenna prediction distance should be greater then 20 cm, and outdoor antenna prediction distance should be greater then 20 cm.