RF Exposure Compliance Requirement

1. LIMITS

The EUT is a mobile device. It has three modular (3G modular, BT modular and land radio modular), it support GSM850/PCS1900/WCDMA 850/WCDMA 1900/ land radio 450~470MHz.

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

Frequency Range(MHz)	Electric Field Stength(V/m)	Magnetic Field Stength(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

f=frequency in MHz

*=Plane-wave equivalent power density

2. Prediction of MPE limit at given distance, equations from OET Bulletin 65, Edition 97‐01:

$S = (1.64 * P * G) / (4 * \pi * R^2)$ (where PG = ERP)

$S = (P * G) / (4 * \pi * R^2)$ (where PG=EIRP) Where:

S = power density

P= power input to antenna

G= numeric gain of the antenna

R= distance to the center of radiation of the antenna

1. GSM850

Prediction frequency (MHz): 824.2

Maximum RF output power (ERP, dBm): 27.53

Maximum RF output power (ERP, mW): 566.24

MPE limit for uncontrolled exposure at predication frequency (mW/cm^2): 0.377

Prediction distance (cm) $R=\sqrt{\frac{1.64*P*G}{S*4*3.14}}$: 14cm

2. PCS1900

Prediction frequency (MHz): 1880

Maximum RF output power (ERP, dBm): 22.79

Maximum RF output power (EIRP, mW): 190.11

MPE limit for uncontrolled exposure at predication frequency (mW/cm^2): 1

Prediction distance (cm) R= $\sqrt{\frac{P*G}{S*4*3.14}}$: 3.89cm

3. BT 2400~2483.5MHz

Prediction frequency (MHz):	2441
Maximum RF output power (EIRP, dBm):	3.71+0.9=4.61
Maximum RF output power (EIRP, mW):	2.89
MPE limit for uncontrolled exposure at predication frequency (mW/ cm ^{2}):	1

Prediction distance (cm) R= $\sqrt{\frac{P*G}{S*4*3.14}}$: 0.48cm

4. Land radio

Prediction frequency (MHz):	466.625
Maximum peak output power at antenna terminal (dBm):	31.80
Maximum RF output power (Conducted, mW):	1514
Maximum antenna gain (dBi):	4.0
Maximum antenna gain (dBd):	1.85
Maximum antenna gain (linear):	1.531
MPE limit for uncontrolled exposure at predication frequency (mW/ cm ^{2}):	f/1500=0.311

Prediction distance (cm) R= $\sqrt{\frac{1.64*P*G}{S*4*3.14}}$: 31.19cm

Prediction frequency (MHz):	463.2125
Maximum peak output power at antenna terminal (dBm):	31.72
Maximum RF output power (Conducted, mW):	1486
Maximum antenna gain (dBi):	4.0
Maximum antenna gain (dBd):	1.85
Maximum antenna gain (linear):	1.531
MPE limit for uncontrolled exposure at predication frequency (mW/ cm ^{2}):	f/1500=0.3088

Prediction distance (cm) R= $\sqrt{\frac{1.64*P*G}{S*4*3.14}}$: 31.01cm

The worst case:

Prediction distance(cm) R=14+0.48+31.19=45.67cm

So the distance between the transmitter's radiating structure(s) and the body of the user or nearby persons is cannot less than 0.4567m.

In page 68 of manual, the saftey distance is 0.6m. It can meet the requirement.