6 §2.1091 – RF EXPOSURE

6.1 Applicability

According to §1.1307(b)(1) and §1.1307(b)(2), 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

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

6.2 MPE Prediction

PCS Band (1930-1995 MHz)

MPE Limit Calculation:@ 1850-1995MHz; highest conducted power=26.28dBm

EUT maximum EIRP per users manual=2500mW (34.0dBm), therefore the maximum antenna gain in this band= 7.72dBi

Prediction of MPE limit at a given distance

Equation from page 18 of 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

Maximum peak output power at antenna input terminal (dBm):	26.28
Maximum peak output power at antenna input terminal (mW):	466
Prediction distance (cm):	20
Prediction frequency (MHz):	1962.5
Maximum Antenna Gain, typical (dBi):	7,72
Maximum Antenna Gain (numeric):	5.92
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.5488
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0

IDEN Band (851-869 MHz)

MPE Limit Calculation:@ 809MHz-869MHz; highest conducted power=25.61dBm

EUT maximum EIRP per users manual=2500mW (34.0dBm), therefore the maximum antenna gain in this band= 8.39dBi

Prediction of MPE limit at a given distance

Equation from page 18 of 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

Maximum peak output power at antenna input terminal (dBm):	25.61
Maximum peak output power at antenna input terminal (mW):	364
Prediction distance (cm):	20
Prediction frequency (MHz):	860
Maximum Antenna Gain, typical (dBi):	8.39
Maximum Antenna Gain (numeric):	6.902
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.4997
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	0.58

IDEN Band (935-941 MHz)

MPE Limit Calculation:@ 896MHz-941MHz; highest conducted power=25.61dBm

EUT maximum EIRP per users manual=2500mW (34.0dBm), therefore the maximum antenna gain in this band= 8.39dBi

Prediction of MPE limit at a given distance

Equation from page 18 of 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

Maximum peak output power at antenna input terminal (dBm):	25.61
Maximum peak output power at antenna input terminal (mW):	364
Prediction distance (cm):	20
Prediction frequency (MHz):	938
Maximum Antenna Gain, typical (dBi):	8.39
Maximum Antenna Gain (numeric):	6.902
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.4997
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	0.58

Note: Please refer to the Users manual.