

6 §2.1091 & RSS- GEN 5.5 and RSS-102 – 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

C4FM (763-775MHz Downlink, 793-805MHz Uplink)

MPE Limit Calculation: @ 763-775MHz; highest conducted power=17.72dBm

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): 17.72

Maximum peak output power at antenna input terminal (mW): 59.16

Prediction distance (cm): 20

Prediction frequency (MHz): 769.50

Maximum Antenna Gain, typical (dBi): 7.72

Maximum Antenna Gain (numeric): 5.92

Power density of prediction frequency at 20.0 cm (mW/cm²): 0.0697

MPE limit for uncontrolled exposure at prediction frequency (mW/cm²): 0.513

CQPSK Band (763-775MHz Downlink, 793-805MHz Uplink)

MPE Limit Calculation: @ 763MHz - 775MHz; highest conducted power=17.78dBm

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

<u>Maximum peak output power at antenna input terminal (dBm):</u>	<u>17.78</u>
<u>Maximum peak output power at antenna input terminal (mW):</u>	<u>59.98</u>
<u>Prediction distance (cm):</u>	<u>20</u>
<u>Prediction frequency (MHz):</u>	<u>769.5</u>
<u>Maximum Antenna Gain, typical (dBi):</u>	<u>8.39</u>
<u>Maximum Antenna Gain (numeric):</u>	<u>6.902</u>
<u>Power density of prediction frequency at 20.0 cm (mW/cm²):</u>	<u>0.4997</u>
<u>MPE limit for uncontrolled exposure at prediction frequency (mW/cm²):</u>	<u>0.513</u>

WCDMA Band (763-775MHz Downlink, 793-805MHz Uplink)

MPE Limit Calculation: @ 763MHz-775MHz; highest conducted power=15.93dBm

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

<u>Maximum peak output power at antenna input terminal (dBm):</u>	<u>15.93</u>
<u>Maximum peak output power at antenna input terminal (mW):</u>	<u>39.17</u>
<u>Prediction distance (cm):</u>	<u>20</u>
<u>Prediction frequency (MHz):</u>	<u>769.5</u>
<u>Maximum Antenna Gain, typical (dBi):</u>	<u>8.39</u>
<u>Maximum Antenna Gain (numeric):</u>	<u>6.902</u>
<u>Power density of prediction frequency at 20.0 cm (mW/cm²):</u>	<u>0.4997</u>
<u>MPE limit for uncontrolled exposure at prediction frequency (mW/cm²):</u>	<u>0.513</u>

CDMA2000 Band (763-775MHz Downlink, 793-805MHz Uplink)

MPE Limit Calculation: @ 763MHz-775MHz; highest conducted power=16.49dBm

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

<u>Maximum peak output power at antenna input terminal (dBm):</u>	<u>16.49</u>
<u>Maximum peak output power at antenna input terminal (mW):</u>	<u>44.57</u>
<u>Prediction distance (cm):</u>	<u>20</u>
<u>Prediction frequency (MHz):</u>	<u>769.5</u>
<u>Maximum Antenna Gain, typical (dBi):</u>	<u>8.39</u>
<u>Maximum Antenna Gain (numeric):</u>	<u>6.902</u>
<u>Power density of prediction frequency at 20.0 cm (mW/cm²):</u>	<u>0.4997</u>
<u>MPE limit for uncontrolled exposure at prediction frequency (mW/cm²):</u>	<u>0.513</u>

IDEN Band (763-775MHz Downlink, 793-805MHz Uplink)

MPE Limit Calculation: @ 763MHz-775MHz; highest conducted power=17.72dBm

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

<u>Maximum peak output power at antenna input terminal (dBm):</u>	<u>17.72</u>
<u>Maximum peak output power at antenna input terminal (mW):</u>	<u>59.16</u>
<u>Prediction distance (cm):</u>	<u>20</u>
<u>Prediction frequency (MHz):</u>	<u>769.5</u>
<u>Maximum Antenna Gain, typical (dBi):</u>	<u>8.39</u>
<u>Maximum Antenna Gain (numeric):</u>	<u>6.902</u>
<u>Power density of prediction frequency at 20.0 cm (mW/cm²):</u>	<u>0.4997</u>
<u>MPE limit for uncontrolled exposure at prediction frequency (mW/cm²):</u>	<u>0.513</u>

Note: Please refer to the Users manual.