5 FCC §1.1307(b)(1), §2.1091 & IC RSS-102 - RF EXPOSURE

5.1 Applicable Standards

According to FCC §1.1307(b)(1), §2.1091 and IC RSS-102, RF exposure is calculated.

FCC:

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

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

IC:

RSS-102, RF Field Strength Limits for Devices Used by the General Public

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (W/m^2)	Averaging Time (minutes)
Limits for General Population/Uncontrolled Exposure				
0.003-1	280	2.19	-	6
1-10	280/f	2.19/f	-	6
10-30	28	2.19/f	-	6
30-300	28	0.073	2*	6
300-1500	$1.585\ f^{0.5}$	$0.0042\ f^{0.5}$	f/150	6
1500-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000/f\ f^{1.2}$
150000-300000	$0.1585\ f^{0.5}$	$4.21x10^{-4}\ f^{0.5}$	$6.67x10^{-5}\ f$	$616000/f\ f^{1.2}$

Note: *f* is frequency in MHz
* Power density limit is applicable at frequencies greater than 100 MHz.

5.2 MPE Prediction

Predication of MPE limit at a given distance

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

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

Cellular Band

Maximum peak output power at antenna input terminal (dBm):	33.45
Maximum peak output power at antenna input terminal (mW):	2213.09
Prediction distance (cm):	28
Prediction frequency (MHz):	824.6
Antenna Gain, typical (dBi):	-0.3
Maximum Antenna Gain (numeric):	0.933
Power density at predication frequency and distance (mW/cm^2):	0.2097
Power density at predication frequency and distance (W/m^2):	2.097
FCC MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	0.5497
IC MPE limit for uncontrolled exposure at predication frequency (W/m^2):	5.4973

PCS Band

Maximum peak output power at antenna input terminal (dBm):	30.58
Maximum peak output power at antenna input terminal (mW):	1142.88
Prediction distance (cm):	28
Prediction frequency (MHz):	1850.2
Antenna Gain, typical (dBi):	2.2
Maximum Antenna Gain (numeric):	1.66
Power density at predication frequency and distance (mW/cm^2):	0.1927
Power density at predication frequency and distance (W/m^2):	1.927
FCC MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	1.0
IC MPE limit for uncontrolled exposure at predication frequency (W/m^2):	10.0

Result

The device is compliant with the requirement MPE limit for uncontrolled exposure. The maximum power densities at the distance of 28 cm are 0.2097 mW/cm^2 (2.097 W/m^2) for Cellular band and 0.1927 mW/cm^2 (1.927 W/m^2) for PCS band. Proper use this device results in exposure the government limits below has been addressed in the user manual.