

## 10 FCC §1.1307(b), §27.52 & §2.1091 - RF EXPOSURE INFORMATION

### 10.1 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 <sup>2</sup> )	Averaging Time (minute)
<b>Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	<sup>1</sup> (100)	30
1.34-30	824/f	2.19/f	<sup>1</sup> (180/f <sup>2</sup> )	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

<sup>1</sup> = Plane-wave equivalent power density

### 10.2 MPE Prediction

Predication of MPE limit at a given distance, Equation from 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

### Test Results:

WCDMA/HSPA Band (Band 4) Uplink

Maximum peak output power at antenna input terminal (dBm):	20.02
Maximum peak output power at antenna input terminal (mW):	100.46
Prediction distance (cm):	20.00
Prediction frequency (MHz):	1732.4
Antenna Gain, typical (dBi):	5.0
Antenna Gain, typical (numeric):	3.16
Power density at predication frequency and distance (mW/cm <sup>2</sup> ):	0.063
MPE limit for uncontrolled exposure at predication frequency (mW/cm <sup>2</sup> ):	1.0

## WCDMA/HSPA Band (Band 4) Downlink

<u>Maximum peak output power at antenna input terminal (dBm):</u>	<u>10.09</u>
<u>Maximum peak output power at antenna input terminal (mW):</u>	<u>10.21</u>
<u>Prediction distance (cm):</u>	<u>20</u>
<u>Prediction frequency (MHz):</u>	<u>2132.4</u>
<u>Antenna Gain, typical (dBi):</u>	<u>3.00</u>
<u>Antenna Gain, typical (numeric):</u>	<u>2.00</u>
<u>Power density at predication frequency and distance (mW/cm<sup>2</sup>):</u>	<u>0.004</u>
<u>MPE limit for uncontrolled exposure at predication frequency (mW/cm<sup>2</sup>):</u>	<u>1.0</u>

## LTE Band (Band 13) Uplink

<u>Maximum peak output power at antenna input terminal (dBm):</u>	<u>20.59</u>
<u>Maximum peak output power at antenna input terminal (mW):</u>	<u>114.55</u>
<u>Prediction distance (cm):</u>	<u>20</u>
<u>Prediction frequency (MHz):</u>	<u>782</u>
<u>Antenna Gain, typical (dBi):</u>	<u>3.0</u>
<u>Antenna Gain, typical (numeric):</u>	<u>2.0</u>
<u>Power density at predication frequency and distance (mW/cm<sup>2</sup>):</u>	<u>0.0455</u>
<u>MPE limit for uncontrolled exposure at predication frequency (mW/cm<sup>2</sup>):</u>	<u>0.5213</u>

## LTE Band (Band 13) Downlink

<u>Maximum peak output power at antenna input terminal (dBm):</u>	<u>13.56</u>
<u>Maximum peak output power at antenna input terminal (mW):</u>	<u>22.70</u>
<u>Prediction distance (cm):</u>	<u>20</u>
<u>Prediction frequency (MHz):</u>	<u>755</u>
<u>Antenna Gain, typical (dBi):</u>	<u>3.0</u>
<u>Antenna Gain, typical (numeric):</u>	<u>2.0</u>
<u>Power density at predication frequency and distance (mW/cm<sup>2</sup>):</u>	<u>0.0090</u>
<u>MPE limit for uncontrolled exposure at predication frequency (mW/cm<sup>2</sup>):</u>	<u>0.5033</u>

**Results**

For uplink and downlink, the highest power density levels at 20 cm are below the MPE uncontrolled exposure limit.