

10 FCC §2.1091 & §27.52 - 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 ²)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	¹ (100)	30
1.34-30	824/f	2.19/f	¹ (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

¹ = 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): 22.16

Maximum peak output power at antenna input terminal (mW): 164.43

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/cm²): 0.103

MPE limit for uncontrolled exposure at predication frequency (mW/cm²): 1.0

WCDMA/HSPA Band (Band 4), Downlink

<u>Maximum peak output power at antenna input terminal (dBm):</u>	<u>16.01</u>
<u>Maximum peak output power at antenna input terminal (mW):</u>	<u>39.90</u>
<u>Prediction distance (cm):</u>	<u>20</u>
<u>Prediction frequency (MHz):</u>	<u>2153</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/cm²):</u>	<u>0.016</u>
<u>MPE limit for uncontrolled exposure at predication frequency (mW/cm²):</u>	<u>1.0</u>

LTE Band (Band 17), Uplink

<u>Maximum peak output power at antenna input terminal (dBm):</u>	<u>22.12</u>
<u>Maximum peak output power at antenna input terminal (mW):</u>	<u>162.93</u>
<u>Prediction distance (cm):</u>	<u>20</u>
<u>Prediction frequency (MHz):</u>	<u>710</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/cm²):</u>	<u>0.0648</u>
<u>MPE limit for uncontrolled exposure at predication frequency (mW/cm²):</u>	<u>0.473</u>

LTE Band (Band 17), Downlink

<u>Maximum peak output power at antenna input terminal (dBm):</u>	<u>15.95</u>
<u>Maximum peak output power at antenna input terminal (mW):</u>	<u>39.36</u>
<u>Prediction distance (cm):</u>	<u>20</u>
<u>Prediction frequency (MHz):</u>	<u>737</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/cm²):</u>	<u>0.0157</u>
<u>MPE limit for uncontrolled exposure at predication frequency (mW/cm²):</u>	<u>0.491</u>

Results

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