

1 FCC § 1.1307 (b) (1)& § 2.1091–RF EXPOSURE

1.1 Applicable Standard

According to § 1.1310 and § 2.1091 (Mobile Devices) RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Power Density (mW/cm ²)
Limits for General Population/Uncontrolled Exposure	
0.3-1.34	*(100)
1.34-30	*(180/f ²)
30-300	0.2
300 – 1,500	f/1500
1,500 – 100,000	1

Note: f= frequency in MHz

*=Plane-wave equivalent power density

1.2 MPE Prediction

1.2.1 Calculation of MPE at 20 cm 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= maximum power gain of the antenna in the direction of interest relative to an isotropic radiator, subtract antenna's cable loss, (result is in numeric form)

R=distance to the center of radiation of the antenna (20cm in the following calculation)

1.2.2 Calculation formula of G (numeric)

$$G(\text{numeric}) = 10^{\frac{\{\text{Maximum Antenna Gain (dBi)} - \text{Cable Loss (dB)}\}}{10}}$$

Where: G (numeric) = Maximum power gain of the antenna in the direction of interest relative to an isotropic radiator, subtract antenna's cable loss, (result is converted from decibel into numeric form with above equation)

1.3 Test Result

Outdoor Antenna			
Outdoor Antenna	Outdoor Antenna Gain		
	At 1900MHz(dBi)	At 800MHz(dBi)	At 700MHz(dBi)
CM288W	4	3	3
CM230W	10	10	10
MAX GAIN	10	10	10

Outdoor Cable			
Outdoor Cable	Outdoor Cable Loss		
	At 1900MHz(dB)	At 800MHz(dB)	At 700MHz(dB)
CM240-40FN 40Feet	6.52	3.98	3.52
CM400-75NN 75Feet	6.17	4.41	4.22
MIN LOSS	6.17	3.98	3.52

Indoor Antenna			
Indoor Antenna	Indoor Antenna Gain		
	At 1900MHz(dBi)	At 800MHz(dBi)	At 700MHz(dBi)
CM222W	6	3	3
CM248W	10	7	7
MAX GAIN	10	7	7

Indoor Cable			
Indoor Cable	Indoor Cable Loss		
	At 1900MHz(dB)	At 800MHz(dB)	At 700MHz(dB)
CM240-20FN 20Feet	3.56	2.29	2.06
CM400-30NN 30Feet	2.83	2.12	2.05
MIN LOSS	2.83	2.12	2.05

Cellular Band UL:	
Maximum peak output power at antenna input terminal(dBm):	19.80
Maximum peak output power at antenna input terminal(mW):	95.50
Prediction distance(cm):	20
Prediction frequency(MHz):	829.05
Maximum Antenna Gain (dBi):	10
Cable Loss(dB):	3.98
G(numeric) :	4.00
Power density at predication frequency and distance(mW/cm ²):	0.0760
MPE limit for uncontrolled exposure at predication frequency(mW/cm ²):	0.5527

Cellular Band DL:	
Maximum peak output power at antenna input terminal(dBm):	-3.30
Maximum peak output power at antenna input terminal(mW):	0.47
Prediction distance(cm):	20
Prediction frequency(MHz):	877.60
Maximum Antenna Gain (dBi):	7
Cable Loss(dB):	2.12
G(numeric) :	3.08
Power density at predication frequency and distance(mW/cm ²):	0.0003
MPE limit for uncontrolled exposure at predication frequency(mW/cm ²):	0.5851

PCS Band UL:	
Maximum peak output power at antenna input terminal(dBm):	21.40
Maximum peak output power at antenna input terminal(mW):	138.04
Prediction distance(cm):	20
Prediction frequency(MHz):	1867.10
Maximum Antenna Gain (dBi):	10
Cable Loss(dB):	6.17
G(numeric) :	2.42
Power density at predication frequency and distance(mW/cm ²):	0.0664
MPE limit for uncontrolled exposure at predication frequency(mW/cm ²):	1.0000

PCS Band DL:	
Maximum peak output power at antenna input terminal(dBm):	-1.80
Maximum peak output power at antenna input terminal(mW):	0.66
Prediction distance(cm):	20
Prediction frequency(MHz):	1958.95
Maximum Antenna Gain (dBi):	10
Cable Loss(dB):	2.83
G(numeric) :	5.21
Power density at predication frequency and distance(mW/cm ²):	0.0007
MPE limit for uncontrolled exposure at predication frequency(mW/cm ²):	1.0000

LTE Band UL:	
Maximum peak output power at antenna input terminal(dBm):	21.30
Maximum peak output power at antenna input terminal(mW):	134.90
Prediction distance(cm):	20
Prediction frequency(MHz):	784.90
Maximum Antenna Gain (dBi):	10
Cable Loss(dB):	3.52
G(numeric) :	4.45
Power density at predication frequency and distance(mW/cm ²):	0.1194
MPE limit for uncontrolled exposure at predication frequency(mW/cm ²):	0.5233

LTE Band DL:	
Maximum peak output power at antenna input terminal(dBm):	-2.30
Maximum peak output power at antenna input terminal(mW):	0.59
Prediction distance(cm):	20
Prediction frequency(MHz):	752.50
Maximum Antenna Gain (dBi):	7
Cable Loss(dB):	2.05
G(numeric) :	3.13
Power density at predication frequency and distance(mW/cm ²):	0.0004
MPE limit for uncontrolled exposure at predication frequency(mW/cm ²):	0.5017