

FCC §1.1307 & §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247 (i) and subpart 1.1307 (b)(1), 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication 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/cm²)	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

Result

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Uplink

Test Band	Frequency (MHz)	Target power (dBm)	Target power (mW)	Antenna Gain		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
				(dBi)	(numeric)			
Lower 700MHz (B+C Block)	706.5	24	251.19	9.5	8.91	30	0.20	0.47
	710.0	24	251.19	9.5	8.91	30	0.20	0.47
	713.5	24	251.19	9.5	8.91	30	0.20	0.48
Upper 700MHz C Block	778.5	24	251.19	9.5	8.91	30	0.20	0.52
	781.5	24	251.19	9.5	8.91	30	0.20	0.52
	784.5	24	251.19	9.5	8.91	30	0.20	0.52
CELLULAR	824.2	24	251.19	9.5	8.91	30	0.20	0.55
	836.6	24	251.19	9.5	8.91	30	0.20	0.56
	848.8	24	251.19	9.5	8.91	30	0.20	0.57
PCS	1850.2	24	251.19	9.5	8.91	30	0.20	1.00
	1880.0	24	251.19	9.5	8.91	30	0.20	1.00
	1909.8	24	251.19	9.5	8.91	30	0.20	1.00
AWS-1	1710.8	24	251.19	9.5	8.91	30	0.20	1.00
	1732.5	24	251.19	9.5	8.91	30	0.20	1.00
	1754.2	24	251.19	9.5	8.91	30	0.20	1.00

Downlink

Test Band	Frequency (MHz)	Target power (dBm)	Target power (mW)	Antenna Gain		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
				(dBi)	(numeric)			
Lower 700MHz (B+C Block)	736.5	24	251.19	9.5	8.91	30	0.20	0.49
	740.0	24	251.19	9.5	8.91	30	0.20	0.49
	743.5	24	251.19	9.5	8.91	30	0.20	0.50
Upper 700MHz C Block	748.5	24	251.19	9.5	8.91	30	0.20	0.50
	751.5	24	251.19	9.5	8.91	30	0.20	0.50
	754.5	24	251.19	9.5	8.91	30	0.20	0.50
CELLULAR	869.2	24	251.19	9.5	8.91	30	0.20	0.58
	881.6	24	251.19	9.5	8.91	30	0.20	0.59
	893.8	24	251.19	9.5	8.91	30	0.20	0.60
PCS	1930.2	24	251.19	9.5	8.91	30	0.20	1.00
	1960.0	24	251.19	9.5	8.91	30	0.20	1.00
	1989.8	24	251.19	9.5	8.91	30	0.20	1.00
AWS-1	2110.8	24	251.19	9.5	8.91	30	0.20	1.00
	2132.5	24	251.19	9.5	8.91	30	0.20	1.00
	2154.2	24	251.19	9.5	8.91	30	0.20	1.00

The Maximum indoor and outdoor Gain is 9.5 dBi

Note: To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 30cm from nearby persons.

Result: Compliance