

4 Maximum Permissible Exposure

4.1 Maximum Permissible Exposure

4.1.1 Limit of Maximum Permissible Exposure

Limits for Occupational / Controlled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6
Limits for General Population / Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30
NOTE 1: f = frequency in MHz ; *Plane-wave equivalent power density				
NOTE 2: For the applicable limit, see FCC 1.1310				

4.1.2 MPE Calculation Method

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d}$$

E = Electric field (V/m)

G = EUT Antenna numeric gain (numeric)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

$$\text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

P = RF output power (W)

d = Separation distance between radiator and human body (m)

4.1.3 Result of Maximum Permissible Exposure

MPE	30 MHz-QPSK			
MPE Limit	5	mW/cm ²		
RF Power (dBm)	Antenna Gain	EIRP (dBm)	EIRP (mW)	Distance (cm)
28.79	56.21	85	316227766.02	2243.99
28.79	38	66.79	4775292.74	275.75

Directional antennas										
Frequency (MHz)	Category	Maximum beamwidth	Min. antenna gain (dBi)	Minimum radiation suppression to angle in degrees from centerline of main beam in decibels						
				5° to 10°	10° to 15°	15° to 20°	20° to 30°	30° to 100°	100° to 140°	140° to 180°
5925 ~ 6425MHz	A	2.2	38	25	29	33	36	42	55	55
	B	2.2	38	21	25	29	32	35	39	45
6525 ~ 6875MHz	A	2.2	38	25	29	33	36	42	55	55
	B	2.2	38	21	25	29	32	35	39	45