

FCC OET-65 RF Exposure Study - Satellite Uplink Facility
2958-WNEM

FCC Maximum Permissible Exposure Levels	Source	Units
Public/uncontrolled area exposure limit	47CFR §1.1310	1 mW/cm ²
Occupational/controlled area exposure limit	47CFR §1.1310	5 mW/cm ²

Input Data

Antenna Diameter	datasheet	120.0 cm
Antenna surface area	calculated	11310 cm ²
Sub-reflector diameter	measured	N/A cm
Sub-reflector area	calculated	N/A cm ²
Feed flange diameter	measured	4.445 cm
Feed flange area	calculated	16 cm ²
Frequency	(entry)	14125 MHz
Wavelength (speed of light = 299,792,458 m/s)	calculated	2.122 cm
Transmit power at flange	Application	79432 milliwatts
Antenna gain	datasheet	43.3 dBi
Antenna gain factor	calculated	21380
Height of base of antenna above ground	measured	2.921 m
Height of center of antenna above ground	measured	2.171 m
Minimum Elevation Angle	(entry)	15 degrees
Minimum Elevation Angle	calculated	0.26180 radians

Results calculated using FCC Bulletin OET-65 (Edition 97-01 August 1997)

			FCC Maximum Permissible Exposure (MPE)	
			Uncontrolled	Controlled
Maximum power density at antenna surface	Eq. 11 Pg 27	28.0933232 mW/cm ²	Potential Hazard	Potential Hazard
Power density at subreflector	Eq. 11 Pg 27	0 mW/cm ²	N/A	N/A
Power density at feed flange	Eq. 11 Pg 27	20474.9136 mW/cm ²	Potential Hazard	Potential Hazard
Extent of near-field	Eq. 12 Pg 27	1696 cm		
Maximum near-field power density	Eq. 13 Pg 28	18.2606601 mW/cm ²	Potential Hazard	Potential Hazard
Aperture efficiency	datasheet	0.65		
Distance to beginning of far-field	Eq. 16 Pg 29	4070.81622 cm		
Power density at end of the transition region	Eq. 17 Pg 29	7.60860837 mW/cm ²	Potential Hazard	Potential Hazard
Maximum far-field power density	Eq. 18 Pg 29	8.155 mW/cm ²	Potential Hazard	Potential Hazard

Main Beam Far-field region safe exposure distances

Minimum distance for public/uncontrolled exposure	Eq. 18 Pg 29	116.249961 meters
Height at minimum antenna elevation angle	calculated	32.258704 meters
Horizontal distance	calculated	112.28884 meters
Minimum distance for occupational/controlled exposure	Eq. 18 Pg 29	51.9885632 meters
Height at minimum antenna elevation angle	calculated	15.6266303 meters
Horizontal distance	calculated	50.2170958 meters

Off-Axis Near Field/Transition Region safe exposure distances from antenna

(20 dB reduction in power density at distances greater than one antenna diameter from the main beam center.)				
Maximum off-axis near field power density	OET-65 Pg 30			
	Eq. 13 Pg 28	0.1826 mW/cm ²	Below FCC MPE	Below FCC MPE
Public/uncontrolled exposure off-axis distance	Diam/or Eq 17	1.2 meters		
Occupational/controlled exposure off-axis distance	Diam/or Eq 17	1.2 meters		

Off-Axis Far Field safe exposure distances from the antenna

(Based on side lobe attenuation required by FCC 25.209(a)(2))		
Angle off main beam axis (1 to 48 degrees)	(entry)	15 degree(s)
Off-axis antenna gain factor	OET-65 Pg 30*	2
Minimum distance for public/uncontrolled exposure	Eq. 18 Pg 29 **	40.7081622 meters

* Gain converted from dBi to linear multiple

** If calculated distance is less than the start of the far field region, the distance to the start of the far field region is used.