

FCC OET-65 RF Exposure Study - Satellite Uplink Facility  
4226-TWC-KC

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

**Input Data**

Antenna Diameter	datasheet	150.0 cm
Antenna surface area	calculated	17671 cm <sup>2</sup>
Sub-reflector diameter	measured	N/A cm
Sub-reflector area	calculated	N/A cm <sup>2</sup>
Feed flange diameter	measured	7.300 cm <sup>2</sup>
Feed flange area	calculated	42 cm <sup>2</sup>
Frequency	(entry)	14125 MHz
Wavelength (speed of light = 299,792,458 m/s)	calculated	2.122 cm
Transmit power at flange	Application	108870 milliwatts
Antenna gain	datasheet	45 dBi
Antenna gain factor	calculated	31623
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

**FCC Maximum Permissible Exposure (MPE)**  
Uncontrolled      Controlled

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

			Uncontrolled	Controlled
Maximum power density at antenna surface	Eq. 11 Pg 27	24.643127 mW/cm <sup>2</sup>	Potential Hazard	Potential Hazard
Power density at subreflector	Eq. 11 Pg 27	0 mW/cm <sup>2</sup>	N/A	N/A
Power density at feed flange	Eq. 11 Pg 27	10404.7731 mW/cm <sup>2</sup>	Potential Hazard	Potential Hazard
Extent of near-field	Eq. 12 Pg 27	2650 cm		
Maximum near-field power density	Eq. 13 Pg 28	16.0180325 mW/cm <sup>2</sup>	Potential Hazard	Potential Hazard
Aperture efficiency	datasheet	0.65		
Distance to beginning of far-field	Eq. 16 Pg 29	6360.65034 cm		
Power density at end of the transition region	Eq. 17 Pg 29	6.67418022 mW/cm <sup>2</sup>	Potential Hazard	Potential Hazard
Maximum far-field power density	Eq. 18 Pg 29	6.772 mW/cm <sup>2</sup>	Potential Hazard	Potential Hazard

**Main Beam Far-field region safe exposure distances**

Minimum distance for public/uncontrolled exposure	Eq. 18 Pg 29	165.519505 meters
Height at minimum antenna elevation angle	calculated	45.0106003 meters
Horizontal distance	calculated	159.879565 meters
Minimum distance for occupational/controlled exposure	Eq. 18 Pg 29	74.0225731 meters
Height at minimum antenna elevation angle	calculated	21.3294517 meters
Horizontal distance	calculated	71.500315 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.)	OET-65 Pg 30		
Maximum off-axis near field power density	Eq. 13 Pg 28	0.1602 mW/cm <sup>2</sup>	Below FCC MPE      Below FCC MPE
Public/uncontrolled exposure off-axis distance	Diam/or Eq 17	1.5 meters	
Occupational/controlled exposure off-axis distance	Diam/or Eq 17	1.5 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 **	63.6065034 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.