RF Radiation Safety Calculations

RF Safety Calculations based on OET Bulletin 65 for Parabolic Reflectors.

Calculations are based on Bulletin 65 Equations 11 through 18.

Input Values

Frequency of Operation	14200	MHz
Reflector Diameter	0.43	Meters
Gain of Antenna	32.9	dBi
Input Power to Antenna	13	dBW
Input Power to Antenna	19.95	Watts
Resultant EIRP	45.90	dBW
	38904.51	Watts

Power Density At Antenna Surface

(From Bulletin 65 Equation 11)

Maximum Power Density At Antenna Surface =	549.58	W/m^2
Maximum Power Density At Antenna Surface =	54.96	mW/cm^2
Maximum Power Density At Antenna Surface =	17.40	dBW/cm^2

Is this Compliant With Limits?	
For Occupational/Controlled Exposure (5 mW/cm^2)=	NO
For General Population/Uncontrolled Exposure (1 mW/cm^2)=	NO

Power Density in the Near-Field Region

Extent of the Near-Field = (From Bulletin 65 Equation 12)	2.19	Meters
Aperture Efficiency = (From Bulletin 65 Equation 14)	0.477	Units
On-Axis Near-Field Power Density =	262.10	W/m^2
(From Bulletin 65 Equation 13)	26.21	mW/cm^2

Is this Compliant With Limits?	
For Occupational/Controlled Exposure (5 mW/cm^2)=	NO
For General Population/Uncontrolled Exposure (1 mW/cm^2)=	NO

Power Density in the Transition Region

Beginning of Far-Field Region = 5.25 Meters
(From Bulletin 65 Equation 16)

Transition Region Power Density
(From Bulletin 65 Equation 17)
In the Transition Region, Power Density varies from

Power Density =	26.21	mW/cm^2 at	2.19 Meters
Power Density =	10.92	mW/cm^2 at	5.25 Meters

Is the Full Transition Region Compliant With Limits?
For Occupational/Controlled Exposure (5 mW/cm^2)= NO
For General Population/Uncontrolled Exposure (1 mW/cm^2)= NO

At What Range Is Power Density Compliant With Limits?
For Occupational/Controlled Exposure (5 mW/cm^2)= Too Many Meters
For General Population/Uncontrolled Exposure (1 mW/cm^2)= Too Many Meters

Power Density in the Far-Field Region

Far-Field Starts at = 5.25 Meters
Power Density at the start of Far-Field Region = 11.23 mW/cm^2
(From Bulletin 65 Equation 18)

At What Range Is Power Density Compliant With Limits?
For Occupational/Controlled Exposure (5 mW/cm^2)= 7.87 Meters
For General Population/Uncontrolled Exposure (1 mW/cm^2)= 17.60 Meters

RF Radiation Safety Calculations

RF Safety Calculations based on OET Bulletin 65 for Parabolic Reflectors.

Calculations are based on Bulletin 65 Equations 11 through 18.

Input Values

Frequency of Operation	14200	MHz
Reflector Diameter	0.50	Meters
Gain of Antenna	33.8	dBi
Input Power to Antenna	13	dBW
Input Power to Antenna	19.95	Watts
Resultant EIRP	46.80	dBW
	47863.01	Watts

Power Density At Antenna Surface

(From Bulletin 65 Equation 11)

Maximum Power Density At Antenna Surface =	406.47	W/m^2
Maximum Power Density At Antenna Surface =	40.65	mW/cm^2
Maximum Power Density At Antenna Surface =	16.09	dBW/cm^2

Is this Compliant With Limits?	
For Occupational/Controlled Exposure (5 mW/cm^2)=	NO
For General Population/Uncontrolled Exposure (1 mW/cm^2)=	NO

Power Density in the Near-Field Region

Extent of the Near-Field = (From Bulletin 65 Equation 12)	2.96	Meters
Aperture Efficiency = (From Bulletin 65 Equation 14)	0.434	Units
On-Axis Near-Field Power Density =	176.38	W/m^2
(From Bulletin 65 Equation 13)	17.64	mW/cm^2

Is this Compliant With Limits?	
For Occupational/Controlled Exposure (5 mW/cm^2)=	NO
For General Population/Uncontrolled Exposure (1 mW/cm^2)=	NO

Power Density in the Transition Region

Beginning of Far-Field Region = 7.10 Meters
(From Bulletin 65 Equation 16)

Transition Region Power Density
(From Bulletin 65 Equation 17)
In the Transition Region, Power Density varies from

Power Density =	17.64	mW/cm^2 at	2.96 Meters
Power Density =	7.35	mW/cm^2 at	7.10 Meters

Is the Full Transition Region Compliant With Limits?
For Occupational/Controlled Exposure (5 mW/cm^2)= NO
For General Population/Uncontrolled Exposure (1 mW/cm^2)= NO

At What Range Is Power Density Compliant With Limits?
For Occupational/Controlled Exposure (5 mW/cm^2)= Too Many Meters
For General Population/Uncontrolled Exposure (1 mW/cm^2)= Too Many Meters

Power Density in the Far-Field Region

Far-Field Starts at = 7.10 Meters
Power Density at the start of Far-Field Region = 7.56 mW/cm^2
(From Bulletin 65 Equation 18)

At What Range Is Power Density Compliant With Limits?
For Occupational/Controlled Exposure (5 mW/cm^2)= 8.73 Meters
For General Population/Uncontrolled Exposure (1 mW/cm^2)= 19.52 Meters

RF Radiation Safety Calculations

RF Safety Calculations based on OET Bulletin 65 for Parabolic Reflectors.

Calculations are based on Bulletin 65 Equations 11 through 18.

Input Values

Frequency of Operation	14200	MHz
Reflector Diameter	0.60	Meters
Gain of Antenna	35.5	dBi
Input Power to Antenna	13	dBW
Input Power to Antenna	19.95	Watts
Resultant EIRP	48.50	dBW
	70794.58	Watts

Power Density At Antenna Surface

(From Bulletin 65 Equation 11)

Maximum Power Density At Antenna Surface =	282.27	W/m^2
Maximum Power Density At Antenna Surface =	28.23	mW/cm^2
Maximum Power Density At Antenna Surface =	14.51	dBW/cm^2

Is this Compliant With Limits?	
For Occupational/Controlled Exposure (5 mW/cm^2)=	NO
For General Population/Uncontrolled Exposure (1 mW/cm^2)=	NO

Power Density in the Near-Field Region

Extent of the Near-Field = (From Bulletin 65 Equation 12)	4.26	Meters
Aperture Efficiency = (From Bulletin 65 Equation 14)	0.446	Units
On-Axis Near-Field Power Density =	125.81	W/m^2
(From Bulletin 65 Equation 13)	12.58	mW/cm^2

Is this Compliant With Limits?	
For Occupational/Controlled Exposure (5 mW/cm^2)=	NO
For General Population/Uncontrolled Exposure (1 mW/cm^2)=	NO

Power Density in the Transition Region

Beginning of Far-Field Region = 10.22 Meters
(From Bulletin 65 Equation 16)

Transition Region Power Density
(From Bulletin 65 Equation 17)
In the Transition Region, Power Density varies from

Power Density =	12.58	mW/cm^2 at	4.26 Meters
Power Density =	5.24	mW/cm^2 at	10.22 Meters

Is the Full Transition Region Compliant With Limits?
For Occupational/Controlled Exposure (5 mW/cm^2)= NO
For General Population/Uncontrolled Exposure (1 mW/cm^2)= NO

At What Range Is Power Density Compliant With Limits?
For Occupational/Controlled Exposure (5 mW/cm^2)= Too Many Meters
For General Population/Uncontrolled Exposure (1 mW/cm^2)= Too Many Meters

Power Density in the Far-Field Region

Far-Field Starts at = 10.22 Meters
Power Density at the start of Far-Field Region = 5.39 mW/cm^2
(From Bulletin 65 Equation 18)

At What Range Is Power Density Compliant With Limits?
For Occupational/Controlled Exposure (5 mW/cm^2)= 10.61 Meters
For General Population/Uncontrolled Exposure (1 mW/cm^2)= 23.74 Meters

RF Radiation Safety Calculations

RF Safety Calculations based on OET Bulletin 65 for Parabolic Reflectors.

Calculations are based on Bulletin 65 Equations 11 through 18.

Input Values

Frequency of Operation	14200	MHz
Reflector Diameter	0.76	Meters
Gain of Antenna	37.1	dBi
Input Power to Antenna	13	dBW
Input Power to Antenna	19.95	Watts
Resultant EIRP	50.10	dBW
	102329.30	Watts

Power Density At Antenna Surface

(From Bulletin 65 Equation 11)

Maximum Power Density At Antenna Surface =	175.93	W/m^2
Maximum Power Density At Antenna Surface =	17.59	mW/cm^2
Maximum Power Density At Antenna Surface =	12.45	dBW/cm^2

Is this Compliant With Limits?	
For Occupational/Controlled Exposure (5 mW/cm^2)=	NO
For General Population/Uncontrolled Exposure (1 mW/cm^2)=	NO

Power Density in the Near-Field Region

Extent of the Near-Field = (From Bulletin 65 Equation 12)	6.83	Meters
Aperture Efficiency = (From Bulletin 65 Equation 14)	0.402	Units
On-Axis Near-Field Power Density =	70.65	W/m^2
(From Bulletin 65 Equation 13)	7.06	mW/cm^2

Is this Compliant With Limits?	
For Occupational/Controlled Exposure (5 mW/cm^2)=	NO
For General Population/Uncontrolled Exposure (1 mW/cm^2)=	NO

Power Density in the Transition Region

Beginning of Far-Field Region = 16.40 Meters
(From Bulletin 65 Equation 16)

Transition Region Power Density
(From Bulletin 65 Equation 17)
In the Transition Region, Power Density varies from

Power Density =	7.06	mW/cm^2 at	6.83 Meters
Power Density =	2.94	mW/cm^2 at	16.40 Meters

Is the Full Transition Region Compliant With Limits?
For Occupational/Controlled Exposure (5 mW/cm^2)= NO
For General Population/Uncontrolled Exposure (1 mW/cm^2)= NO

At What Range Is Power Density Compliant With Limits?
For Occupational/Controlled Exposure (5 mW/cm^2)= 9.66 Meters
For General Population/Uncontrolled Exposure (1 mW/cm^2)= Too Many Meters

Power Density in the Far-Field Region

Far-Field Starts at = 16.40 Meters
Power Density at the start of Far-Field Region = 3.03 mW/cm^2
(From Bulletin 65 Equation 18)

At What Range Is Power Density Compliant With Limits?
For Occupational/Controlled Exposure (5 mW/cm^2)= 12.76 Meters
For General Population/Uncontrolled Exposure (1 mW/cm^2)= 28.54 Meters