

# RF Radiation Safety Calculations

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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	0.45 Meters
Gain of Antenna	32.8 dBi
Input Power to Antenna	13 dBW
Input Power to Antenna	19.95 Watts

## Resultant EIRP

45.80 dBW
38018.94 Watts

## Power Density At Antenna Surface

(From Bulletin 65 Equation 11)

Maximum Power Density At Antenna Surface =	501.82 W/m <sup>2</sup>
Maximum Power Density At Antenna Surface =	50.18 mW/cm <sup>2</sup>
Maximum Power Density At Antenna Surface =	17.01 dBW/cm <sup>2</sup>

Is this Compliant With Limits?

For Occupational/Controlled Exposure (5 mW/cm<sup>2</sup>)= NO

For General Population/Uncontrolled Exposure (1 mW/cm<sup>2</sup>)= NO

## Power Density in the Near-Field Region

Extent of the Near-Field = (From Bulletin 65 Equation 12)	2.40 Meters
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Aperture Efficiency = (From Bulletin 65 Equation 14)	0.426 Units
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On-Axis Near-Field Power Density = (From Bulletin 65 Equation 13)	213.54 W/m <sup>2</sup>
	21.35 mW/cm <sup>2</sup>

Is this Compliant With Limits?

For Occupational/Controlled Exposure (5 mW/cm<sup>2</sup>)= NO

For General Population/Uncontrolled Exposure (1 mW/cm<sup>2</sup>)= NO

## Power Density in the Transition Region

Beginning of Far-Field Region = **5.75 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 = **21.35** mW/cm<sup>2</sup> at **2.40 Meters**

Power Density = **8.90** mW/cm<sup>2</sup> at **5.75 Meters**

Is the Full Transition Region Compliant With Limits?

For Occupational/Controlled Exposure (5 mW/cm<sup>2</sup>)= **NO**

For General Population/Uncontrolled Exposure (1 mW/cm<sup>2</sup>)= **NO**

At What Range Is Power Density Compliant With Limits?

For Occupational/Controlled Exposure (5 mW/cm<sup>2</sup>)= **Too Many Meters**

For General Population/Uncontrolled Exposure (1 mW/cm<sup>2</sup>)= **Too Many Meters**

### **Power Density in the Far-Field Region**

Far-Field Starts at = **5.75 Meters**

Power Density at the start of Far-Field Region = **9.15 mW/cm<sup>2</sup>**  
(From Bulletin 65 Equation 18)

At What Range Is Power Density Compliant With Limits?

For Occupational/Controlled Exposure (5 mW/cm<sup>2</sup>)= **7.78 Meters**

For General Population/Uncontrolled Exposure (1 mW/cm<sup>2</sup>)= **17.39 Meters**