

68. (a) The radius of the central disk is

$$R = \frac{1.22f\lambda}{d} = \frac{(1.22)(3.50 \text{ cm})(515 \text{ nm})}{3.00 \text{ mm}} = 7.33 \mu\text{m} .$$

- (b) The average power flux density in the incident beam is

$$\frac{P}{\pi d^2/4} = \frac{4(5.00 \text{ W})}{\pi(3.00 \text{ mm})^2} = 707 \text{ kW/m}^2 .$$

- (c) The average power flux density in the central disk is

$$\frac{(0.84)P}{\pi R^2} = \frac{(0.84)(5.00 \text{ W})}{\pi(7.33 \mu\text{m})^2} = 24.9 \text{ GW/m}^2 .$$