

Persamaan Representasi Kecerahan ke Arus di Sensor

$$Kecerahan = \frac{I}{I_0} \times 100\%$$

dengan:

I : Intensitas (Cd)

I_0 : Intensitas awal (Cd)

dan

$$I = \frac{P}{\frac{A_1}{A_0}}$$

$$= \frac{V \times I_A}{\frac{\pi r_1^2}{4\pi r_0^2}}$$

$$= \frac{V \times \frac{V}{R}}{\frac{\pi r_1^2}{4\pi r_0^2}}$$

$$= \frac{V^2}{R} \times \frac{4\pi r_0^2}{\pi r_1^2}$$

$$= \frac{4V^2 r_0^2}{R r_1^2}$$

dengan:

I : Intensitas (Cd)

P : Daya (watt)

A_1 : Luas penampang LDR (cm^2)

A_0 : Luas bola (cm)

R : Resistansi (Ohm)

I_A : Arus (Ampere)

V: Tegangan (Volt)

V_0 : Tegangan awal (Volt)

r_0 : Jari-jari (cm)

r_1 : Jari-ari LDR (cm)

Jadi,

$$Kecerahan = \frac{I}{I_0} \times 100\%$$

$$\begin{aligned} Kecerahan &= \frac{\frac{4V^2 r_0^2}{Rr_1^2}}{\frac{4V_0^2 r_0^2}{Rr_1^2}} \times 100\% \\ &= \frac{4V^2 r_0^2}{Rr_1^2} \times \frac{Rr_1^2}{4V_0^2 r_0^2} \times 100\% \\ &= \frac{V^2}{V_0^2} \times 100\% \end{aligned}$$