- $R = \dfrac{\rho L}{wh}$

$$\frac{dR}{dL} = \frac{\rho}{wh}\cdot\frac{dL}{dL} - \frac{\rho L}{w^2 h}\frac{dw}{dL} - \frac{\rho L}{wh^2}\frac{dh}{dL} + \frac{L}{wh}\frac{d\rho}{dL}$$

$$K \equiv \frac{dR}{dL}\cdot\frac{L}{R} = \frac{dR}{dL}\cdot\frac{wh}{\rho}$$

$$= 1 - \frac{L}{w}\cdot\frac{dw}{dL} - \frac{L}{h}\cdot\frac{dh}{dL} + \frac{L}{\rho}\cdot\frac{d\rho}{dL}$$

$$= 1 - \frac{dw/w}{dL/L} - \frac{dh/h}{dL/L} + \frac{d\rho/\rho}{dL/L}$$

$$= 1 + 2\nu + \frac{d\rho/\rho}{dL/L}$$

- constant volume

$$V = Lwh = \text{constant}$$

$$\frac{dV}{dL} = 0$$

$$\frac{dV}{dL} = wh + Lh\frac{dw}{dL} + Lw\frac{dh}{dL} = 0$$

$$1 + \frac{L}{w}\frac{dw}{dL} + \frac{L}{h}\frac{dh}{dL} = 0$$

$$1 - \nu - \nu = 0 \Rightarrow \nu = 1/2$$

$$K = 1 + 2\nu = 2 \qquad (\text{note } \rho = \text{const.})$$

- $$\Delta R = \Delta L \cdot \frac{dR}{dL} \Rightarrow$$

$$\Delta R \frac{L}{R} = \Delta L \cdot \frac{dR}{dL} \cdot \frac{L}{R} \Rightarrow$$

$$\Delta R = R \cdot \frac{\Delta L}{L} \cdot k$$

$$= 1k\Omega \cdot 1\% \cdot 2$$

$$= 20\ \Omega$$