

PUNTO 1

$$V_U = -R_G I_{RG}$$

$$I_{RG} = I_3 + I_2$$

$$I_2 = E/R_2$$

$$I_3 = \frac{V_{U2}}{R_3}$$

$$V_{U2} = -R_T I_1$$

$$I_1 = E/R_1$$

$$V_{U2} = -\frac{R_T E}{R_1} \quad I_3 = -\frac{R_T E}{R_1 R_3}$$

$$\Rightarrow V_U = -R_G (I_3 + I_2) = -R_G \left(-\frac{R_T E}{R_1 R_3} + \frac{E}{R_2} \right)$$

$$V_U = E R_G \left(\frac{R_T}{R_1 R_3} - \frac{1}{R_2} \right) \rightarrow \text{RISOLUZIONE CIRCUITO}$$

$$V_U = E R_G \left(\frac{R_T}{R_1 R_3} - \frac{1}{R_2} \right) \underset{R_1 = R_2}{=} E \frac{R_G}{R_1} \left(\frac{R_T}{R_3} - 1 \right)$$

$$R_T = R_o (1 + GF E) \quad R_o = 100 \Omega \quad GF = 2 \quad R_3 = 100 \Omega = R_o$$

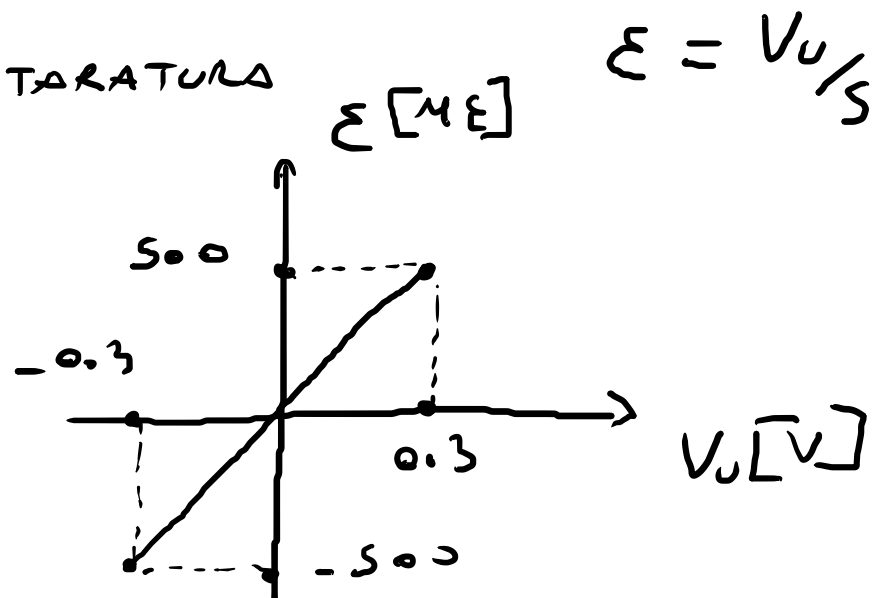
$$V_U = E \frac{R_G}{R_1} \left(\frac{\cancel{R_o} (1 + GF E)}{\cancel{R_3}} - 1 \right) = E \frac{R_G}{R_1} GF E$$

$$E = 3V \quad \frac{R_G}{R_1} = 100 \quad GF = 2 \quad \Rightarrow \quad V_U = 5 E \quad 5 = 600 V$$

$$\varepsilon_M = V_U / 5 = \frac{1V}{600V} = 0.001667 \quad (1667 \mu\varepsilon)$$

PUNTO 2

CURVA CARATTERISTICA



$$V_U (500 \mu\text{E}) = S \cdot \frac{500}{10^6} = 0.3 \text{ V}$$

$$V_U (-500 \mu\text{E}) = -0.3 \text{ V}$$

$$C = 1/S = 0.001667 \text{ [V}^{-1}\text{]}$$

$$\theta = \phi$$

PUNTO 3

$$V_U = \frac{R_G}{R_1} E \left(\frac{R_{T1}}{R_3} - 1 \right) = \frac{R_G E}{R_1} \left(\frac{R_0 (1 + GFE) (1 + \alpha \Delta T)}{R_3} - 1 \right)$$

$$V_U = \frac{R_G E}{R_1} \left(\cancel{1} + \alpha \Delta T + GFE + \cancel{\alpha \Delta T GFE} - \cancel{1} \right) \quad \Delta T = T - T_0 \quad T_0 = 25^\circ\text{C}$$

L' SUGGERIMENTO

$$V_U = \frac{R_G E}{R_1} GFE + \frac{R_G E}{R_1} \alpha \Delta T$$

$$V_U = \underbrace{S \varepsilon}_{\text{USCITA NOMINALE}} + \underbrace{\frac{R_G E}{R_1} \alpha \Delta T}_{\Delta V}$$

$$S = \frac{R_G E}{R_1} G_F$$

$$\varepsilon_M = \frac{V_U}{S} = \frac{2V}{S} = 0.003333 \quad (3333 \mu\varepsilon)$$

$$\text{ERRORE} = \frac{\Delta V}{S} = \frac{\cancel{R_G E} \alpha \Delta T}{\cancel{R_1}} / \frac{\cancel{R_G E} G_F}{\cancel{R_1}}$$

$$\Rightarrow \text{ERRORE} = \frac{\alpha}{G_F} \Delta T = \frac{\alpha}{G_F} (20^\circ\text{C} - 25^\circ\text{C}) = -7.5 \cdot 10^{-5} \quad (-75 \mu\varepsilon)$$

DUMMY GAGE $R_{OG} = R_{T1} \rightarrow$ MONTATO AL POSTO DI R_2

$$V_U = \frac{R_G}{R_1} E \left(\frac{\cancel{R_0} (1 + G_F \varepsilon) (1 + \cancel{\alpha \Delta T})}{\cancel{R_0} (1 + \cancel{\alpha \Delta T})} - 1 \right) = \frac{R_G}{R_1} E G_F \varepsilon = S \varepsilon$$

N.B!
VALORE RISUNTO
($\frac{\text{USCITA-OFFSET}}{S}$)

NO O.P.
OP ΔT