

2.2.

$$\left\{ \begin{array}{l} V_s = -g_m v_e R_d \\ Z_e = \frac{R_e}{1 + j R_e C_{e\omega}} \\ v_e = \frac{Z_e}{Z_e + r} \cdot e \end{array} \right.$$

$$V_s = -g_m R_d e \cdot \frac{\frac{R_e}{1 + j R_e C_{e\omega}}}{\frac{R_e}{1 + j R_e C_{e\omega}} + r}$$

$$= -g_m R_d \cdot e \cdot \frac{R_e}{R_e + r (1 + j R_e C_{e\omega})}$$

$$\frac{V_s}{e} = -g_m \frac{R_d R_e}{(R_e + r) + j R_e C_{e\omega} r} = -g_m \frac{R_d R_e}{(R_e + r) \cdot \left(1 + j \frac{R_e C_{e\omega} r}{R_e + r}\right)}$$

$$= -g_m \frac{R_d R_e}{R_e + r} \cdot \frac{1}{1 + j \frac{R_e C_{e\omega} r}{R_e + r}}$$

gain en BF

évolution phase
en fonction de f.