

$$I_a(s) = \frac{Js + B}{K_m} \omega(s)$$

$$\frac{I_a(s)}{E_a(s)} = \frac{Js + B}{K_m} \frac{\omega(s)}{E_a(s)} = \frac{Js + B}{K_m} G(s)$$

$$H(s) = \frac{Js + B}{K_m} \frac{K_D}{s^2 + 2\zeta\omega_n s + \omega_n^2}$$

$$I_a(s) = H(s) E_a(s) = \frac{(Js + B) K_D}{K_m (s^2 + 2\zeta\omega_n s + \omega_n^2)} \cdot \frac{E_{a, NOM}}{s}$$

$$\bar{I}_a(t) = \mathcal{L}^{-1} \left[I_a(s) \right] = \frac{JK_D}{K_m} \left[\underbrace{\frac{E_{a, NOM}}{s^2 + 2\zeta\omega_n s + \omega_n^2}} + \underbrace{\left[\frac{B K_D E_{a, NOM}}{K_m s (s^2 + \dots)} \right]} \right]$$