超格

$$\text{overshoot} = e^{-\frac{\pi\zeta}{\sqrt{1-\zeta^2}}}$$

setting time $t_s = \frac{3}{\zeta\omega_n}$ $t_s = \frac{4}{\zeta\omega_n}$ $t_s = \frac{4.6}{\zeta\omega_n}$

5% 2% 1%

$$e_{st} = \lim_{k\to\infty}(r(k) - y(k))$$

$$= \lim_{z\to 1}(1-z^{-1})R(z)(1 - G_{CC}(z))$$

$$e_{ss} = \lim_{k\to\infty}(r(k) - b(k))$$

$$= \lim_{k\to\infty} e(k)$$

$$= \lim_{z\to 1}(1-z^{-1})\frac{R(z)}{1 + \underbrace{G_1H(z)}}$$

$G_{2AS}H(z)$

$G_1G_2H(z)$

K_p $\quad e_{ss} = \frac{1}{1+K_p}$

K_v $\qquad$ $e_{ss} = \frac{1}{K_v}$

K_a $\qquad$ $e_{ss} = \frac{1}{K_a}$