Feedback

Monday, November 14, 2016 8:28 AM

$\frac{dA}{A}$ $\frac{dA_f}{A_f}$

$$A_f = \frac{A}{1+\beta A} = A(1+\beta A)^{-1}$$

$$\frac{dA_f}{dA} = \frac{1}{(1+\beta A)} - \frac{A \cdot \beta}{(1+\beta A)^2}$$

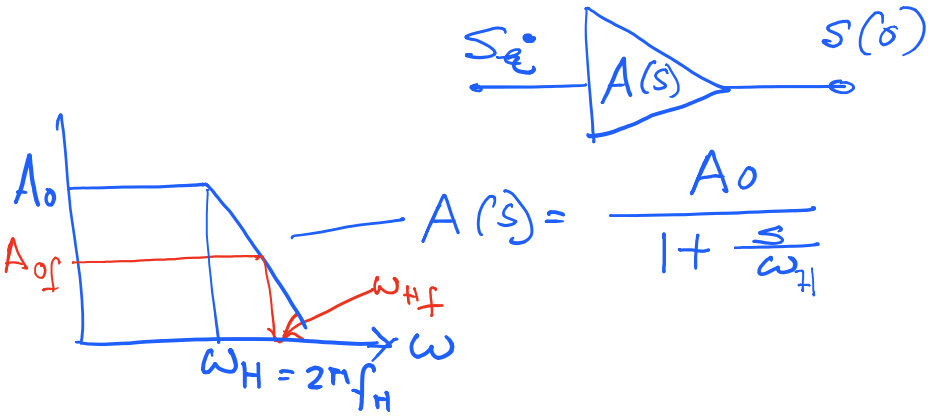
$$= \frac{1+\beta A - A\beta}{(1+\beta A)^2} = \frac{1}{(1+\beta A)^2}$$

$$= \frac{A \cdot}{1+\beta A} \frac{}{A(1+\beta A)}$$

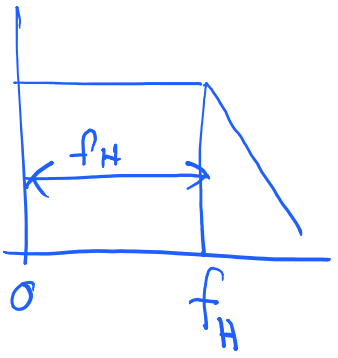
$$\frac{dA_f}{dA} = \frac{A_f}{A} \cdot \frac{1}{(1+\beta A)}$$

$$\frac{dA_f}{A_f} = \frac{dA}{A} \cdot \frac{1}{(1+\beta A)}$$

BW extension



$$A(s) = \frac{A_0}{1 + \frac{s}{\omega_H}}$$



$$A_f(s) = \frac{A(s)}{1 + \beta A(s)}$$

$$= \frac{\frac{A_0}{1 + s/\omega_H}}{1 + \frac{\beta A_0}{1 + \frac{s}{\omega_H}}}$$

$$= \frac{A_0}{\left(1 + \frac{s}{\omega_H}\right) + \beta A_0}$$

$$= \frac{A_0}{(1 + \beta A_0) + \frac{s}{\omega_H}}$$

$$= \frac{A_0}{(1 + \beta A_0)\left[1 + \frac{s}{\omega_H (1 + \beta A_0)}\right]}$$

$$A_f(s) = \frac{A_{0f}}{\quad}$$

$$A_f(s) = \frac{A_{of}}{1 + \frac{s}{\omega_{Hf}}}$$

$$\omega_{Hf} = \omega_H (1 + \beta A_0)$$

$$BW \Rightarrow f_{Hf} = f_H (1 + \beta A_0)$$

$$A_{of} \times \omega_{Hf} = \frac{A_0}{1 + \beta A_0} \times \omega_H (1 + \beta A_0)$$

$$= A_0 \times \omega_H$$

$$A_{of} \times f_{Hf} = A_0 \times f_H$$

$$A_{of} \times BW_{CL} = A_0 \times BW_{OP} = \text{const.} = \boxed{\text{Gain} \times BW}$$