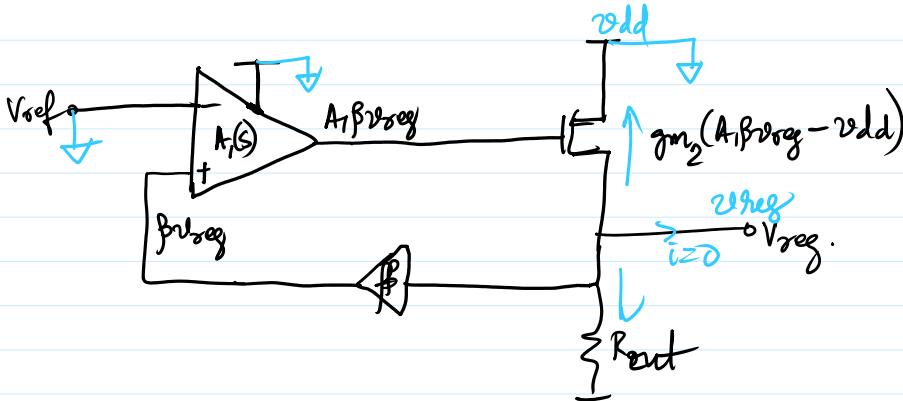


22/06/24

22 June 2024 13:04

Line Regulation & PSRR of LDO



$$\frac{v_{reg}}{v_{dd}} = \text{Line R}$$

$$\frac{v_{reg}}{R_{out}} + g_{m2}(A_1\beta v_{reg} - v_{dd}) = 0$$

$$\frac{v_{reg}}{R_{out}} + g_{m2}A_1\beta v_{reg} - g_{m2}v_{dd} \Rightarrow v_{reg}(1 + g_{m2}A_1\beta R_{out}) = g_{m2}v_{dd}R_{out}$$

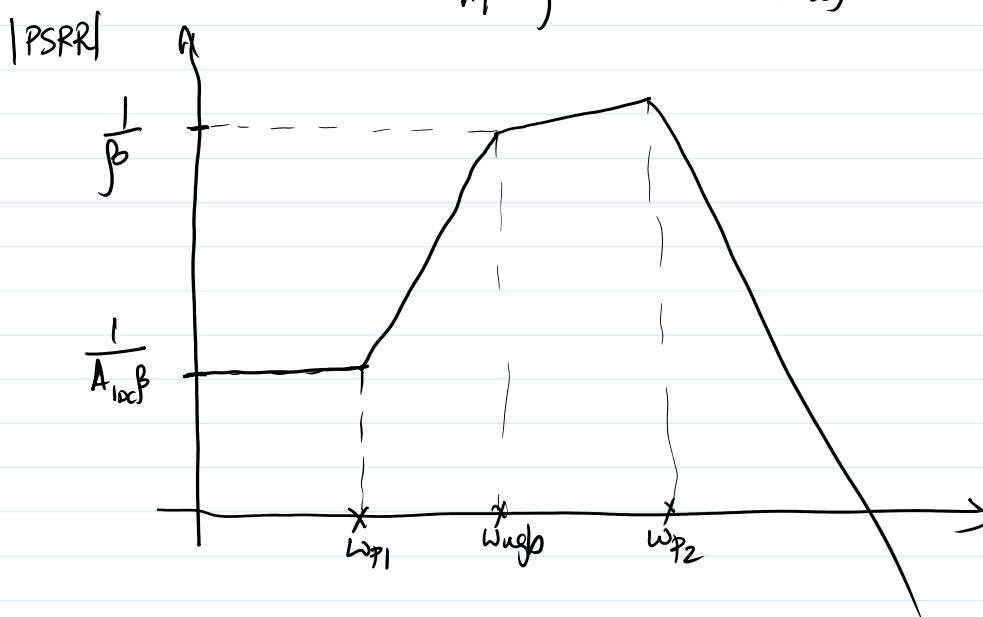
$$\frac{v_{reg}}{v_{dd}} = \frac{g_{m2}R_{out}}{1 + g_{m2}A_1\beta R_{out}}$$

$$g_{m2}A_1\beta R_{out} \gg 1$$

$$= \frac{g_{m2}R_{out}}{g_{m2}A_1\beta R_{out}}$$

$$\text{Line Reg} = \frac{1}{A_1\beta}$$

$$\text{PSRR} = \text{L.R(ac)} \quad \text{PSRR} \approx \frac{1}{A_1(s)\beta} = \frac{v_{out}(s)}{v_{dd}(s)}$$



after w_{p2}
 $v_{out} \rightarrow 0$
 bcs output cap
 shorts