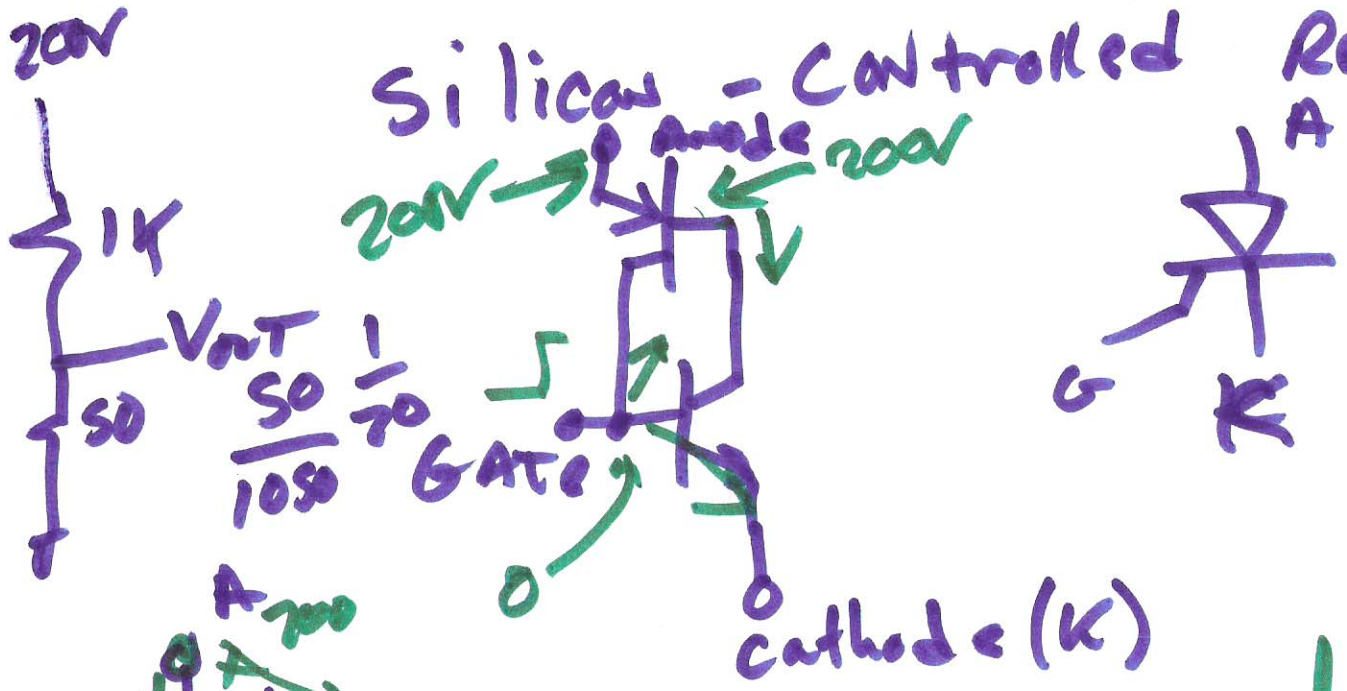
ECE 5/472 Power Electronics

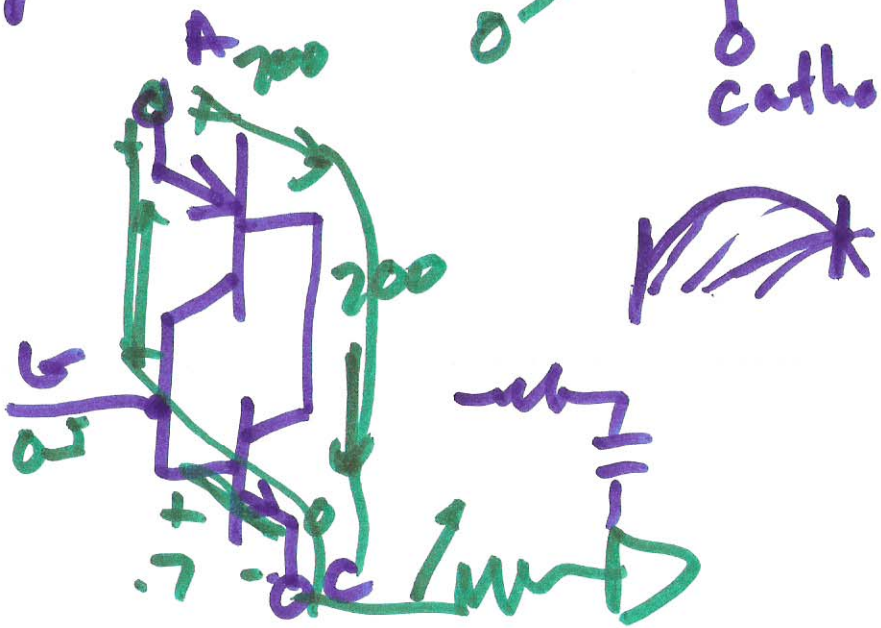
BOISE STATE UNIVERSITY

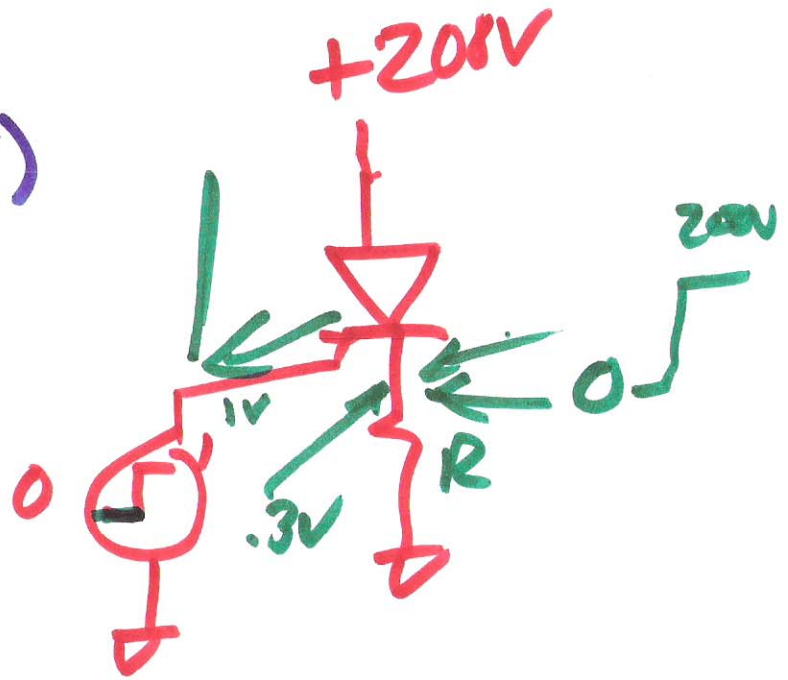
Lecture 24 Ch. 10

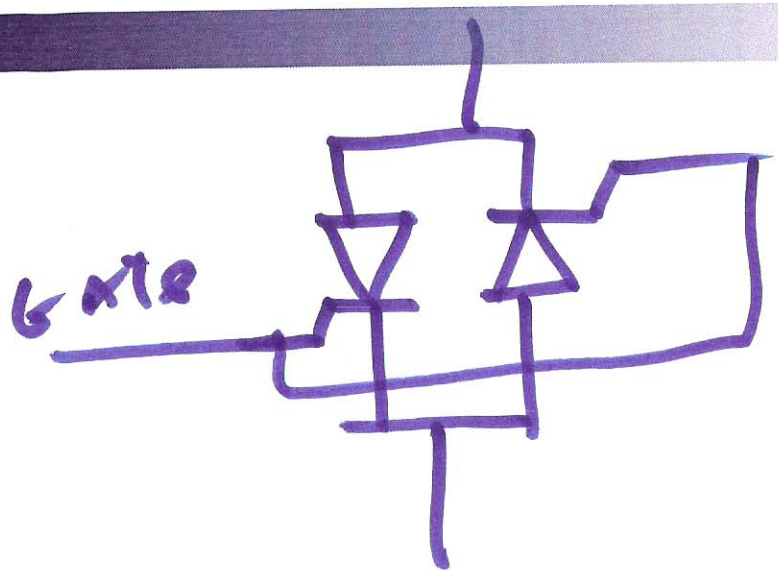
Nov. 29, 2018

Silicon-Controlled Rectifier

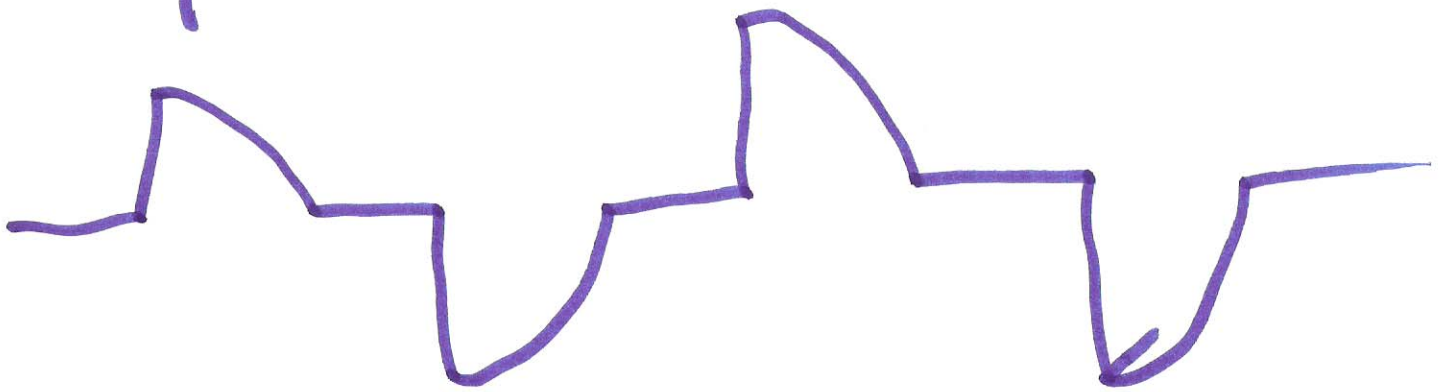


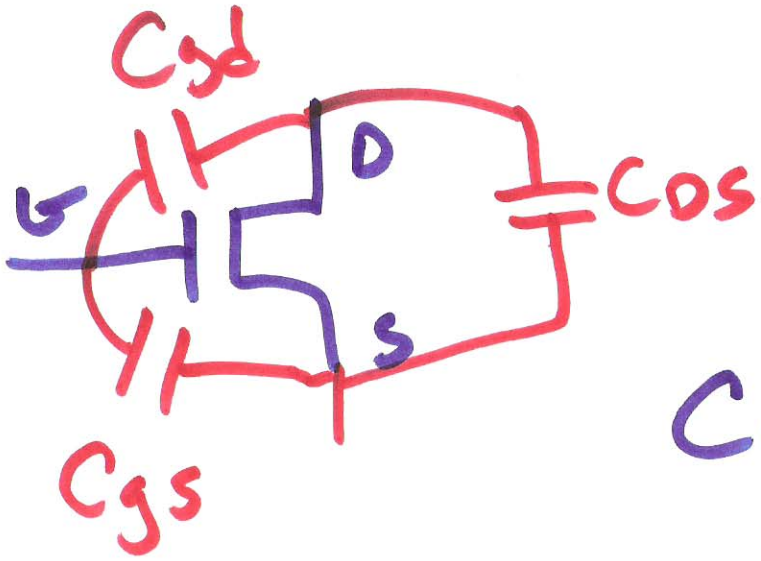




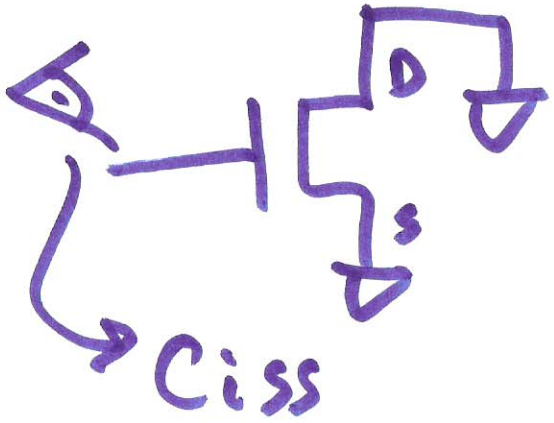


TRIAC
Back-to-Back
SCR

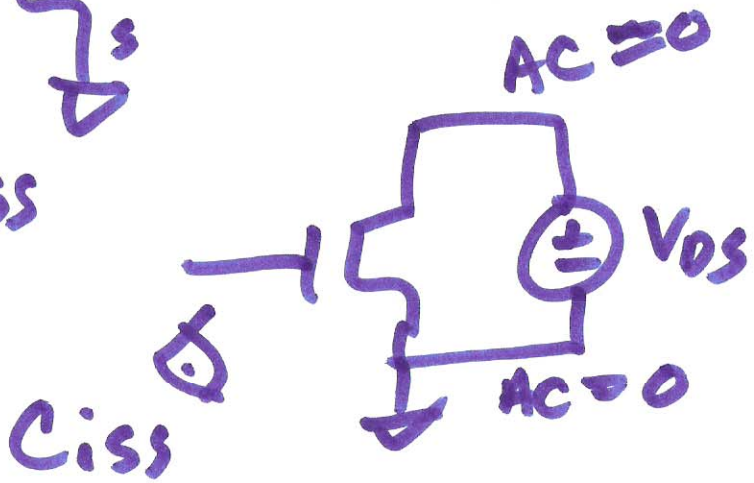




$C_{iss} = C_{gs} + C_{gd}$ | d-s shorted

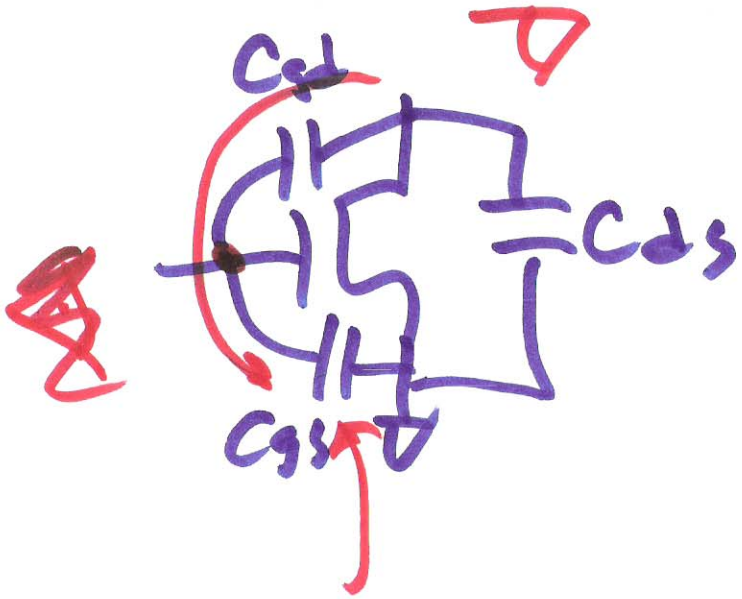


$C_{rss} = C_{gd}$



$$C_{oss} = \frac{C_{gs} \cdot C_{gd}}{C_{gs} + C_{gd}} + C_{ds} \approx C_{ds} + C_{gd}$$

3)



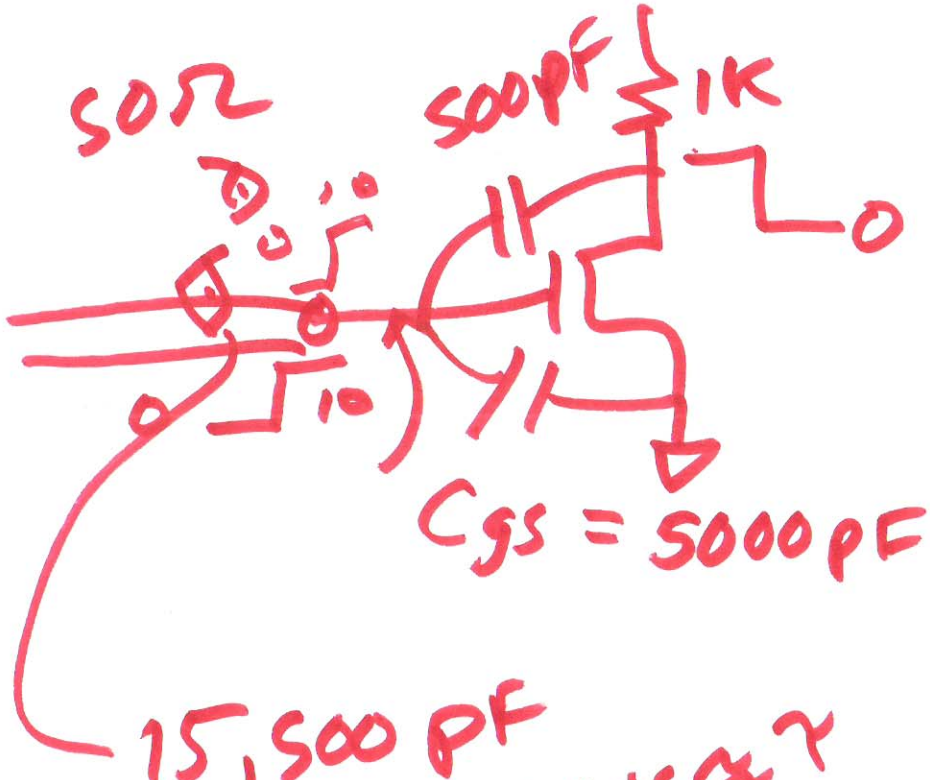
$$C_{ds} + \frac{C_{gd} \cdot C_{gs}}{C_{gd} + C_{gs}} \simeq C_{gd}$$

$C_{gs} >> C_{gd}$

4)

$C_{gs} = 5000pF$

$C_{gd} = 500pF$



$15,500\,pF$

800ns à γ

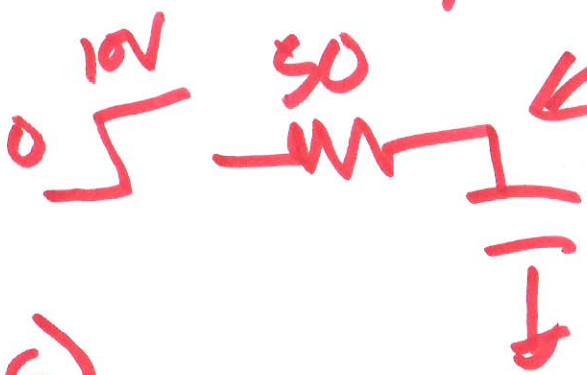
$|(0-200)\,500pF -$

$(10-0)\cdot 500pF|$

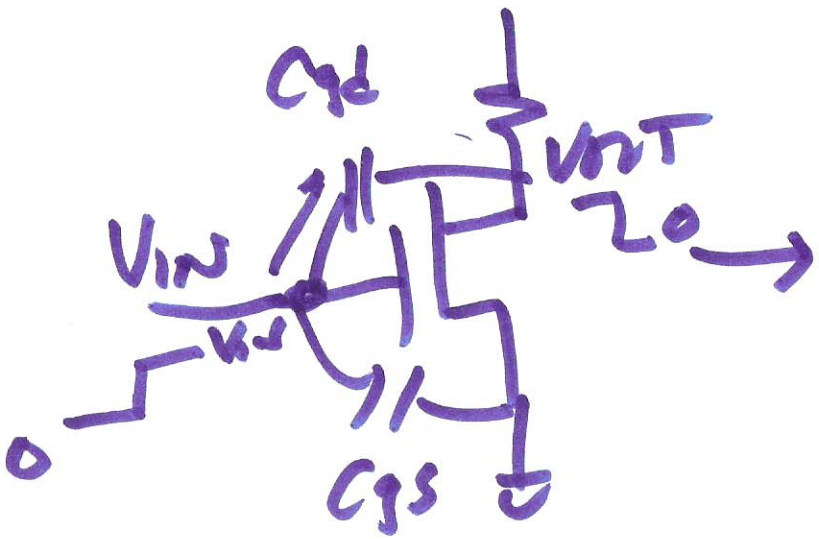
$\approx 210 \cdot 500\,pF = Q$

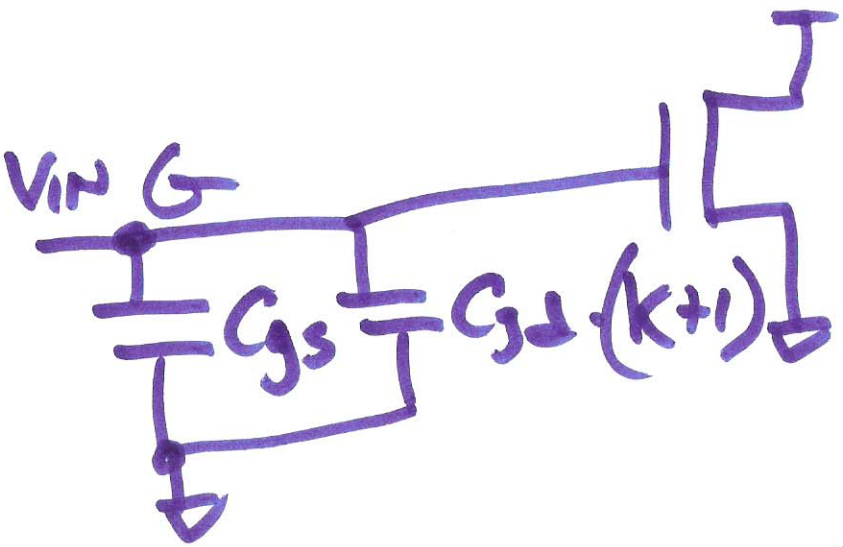
$(0 \to 10)\cdot 21 \cdot 500pF$

$10,500pF$



5)





$$(0 - V_{out}) \cdot C_{gd} - (V_{IN} - 0) C_{gd} = Q$$

$$-V_{out} \cdot C_{gd} - V_{in} \cdot C_{gd} = Q$$

$$V_{in} \cdot K = V_{out}$$

$$V_{in} \underline{C_{gd}(K+1)} = Q$$

6)