

# ECE 320 - Homework #9

MOSFET switch, CMOS logic. Due Monday, October 26th

## MOSFET Switch

One of the MOSFET's that CircuitLab has is an IRF1047. It's specifications are

- $\max(I_c) = 100A$  continuous
- $V_{gs(th)} = 4V$  (max)
- $R_{ds} = 7.8m\Omega @ I_{ds} = 78A @ V_{gs} = 10V$
- \$0.53 each

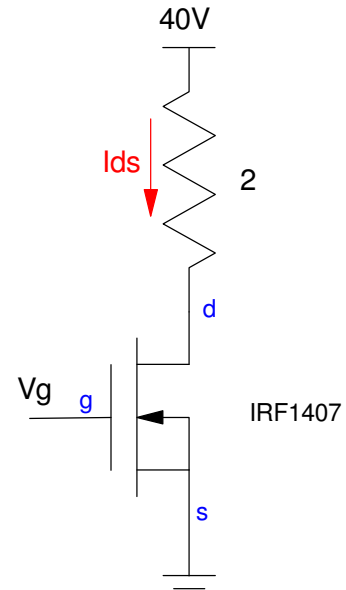
1) Determine the transconductance gain,  $k_n$ , for this MOSFET. Assume  $V_{tn} = 4.00V$

2) Determine the voltages and currents for the following circuit when  $V_g = 5V$

- Check your result in CircuitLab
- Note: You'll have to change  $K_n$  in CircuitLab (double click on the part) to input  $K_n$ .

3) Determine the voltages and currents for the following circuit when  $V_g = 10V$

- Check your result in CircuitLab



## CMOS Logic

4) Design a CMOS gate to implement the function:  $f(A, B, C, D)$

f(A,B,C,D)		CD			
		00	01	11	10
AB	00	1	0	0	0
	01	1	1	0	1
	11	x	x	x	x
	10	1	1	x	x