

# ECE 320 - Homework #9

MOSFET Switches, CMOS logic. Due Monday, March 23rd

## MOSFET Switch

The characteristics for a MOSFET are

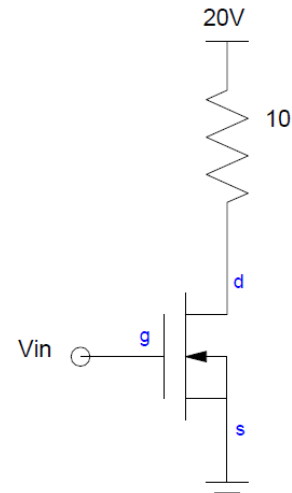
- Part: AOI4286
- Current - 100V, 4A continuous. 35W
- $R_{ds\ On\ (Max)} @ I_d, V_{gs}$  68mOhm @ 5A, 10V
- $V_{gs(th)} (Max) @ I_d$  2.9V @ 250μA

1) Determine the transconductance gain,  $k_n$

2) Determine the voltages for the following circuit for

- $V_{in} = V_g = 0V$
- $V_{in} = V_g = 5V$
- $V_{in} = V_g = 10V$

3) Design a circuit using this MOSFET to turn on and off a DC servo motor. Assume the DC motor draws 200mA @ 10V.



## CMOS Logic

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

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