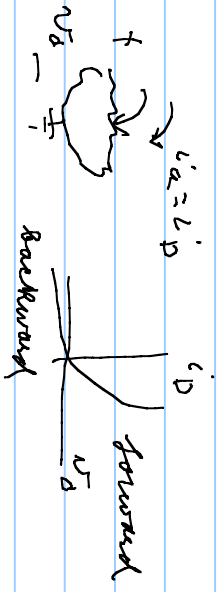
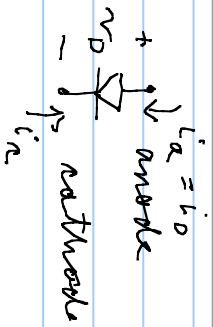
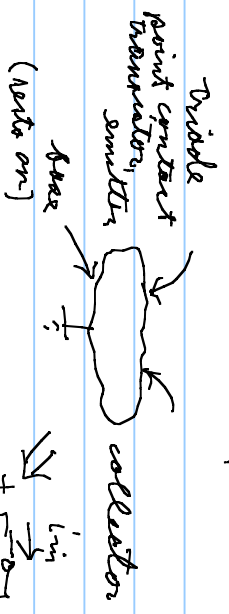


SE 303H
08/30/16 b

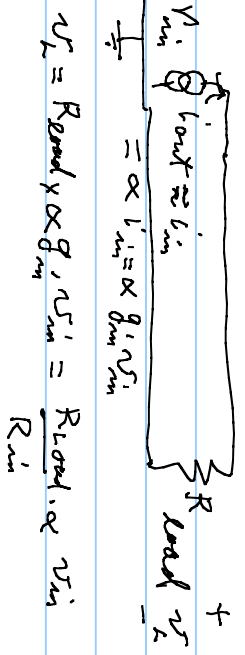
diodes \approx di + ode



Transistor = transfer resistor

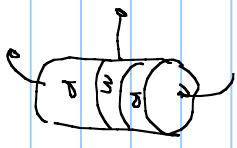


$i_{in} = g_m V_{in}$
 $g_m = 1/R_{in}$



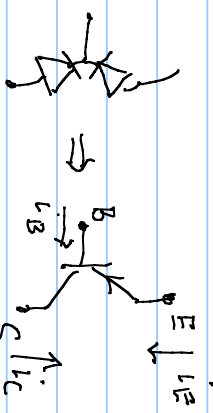
$V_L = R_{load} \times \beta \times g_m V_{in} = \frac{R_{load} \times \beta}{R_{in}} V_{in}$

$$G_D = \frac{R_{load}}{R_{in}}, \alpha = \frac{V_L}{V_{in}}, G_L = \alpha$$



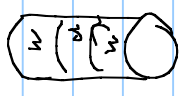
Bipolar

BJT

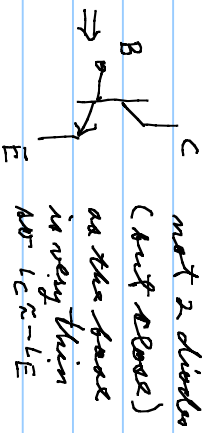


PNP Transistor

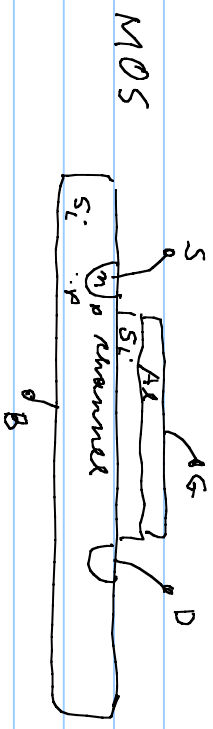
B = base
E = emitter
C = collector



NPN



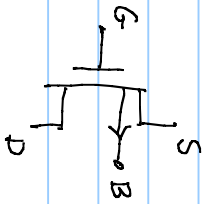
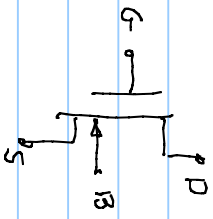
$I_B + I_C + I_E = 0$ by KCL
normally $I_B < 0$ for nnp
 > 0 for pnp



MOS

G = gate
S = source
D = drain
B = bulk (not to be ignored)

2 kinds of MOS

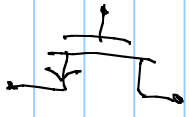


NMOS

PMOS

↑ n-channel

↑ p-channel



if gate is
connected to
source



