

Lecture 23: Advanced Isolation & MOS CV

• Announcements:

• Lab 1 Report due Friday, April 23

• Lecture Topics:

↳ Advanced Isolation

↳ MOS CV

• Last Time:

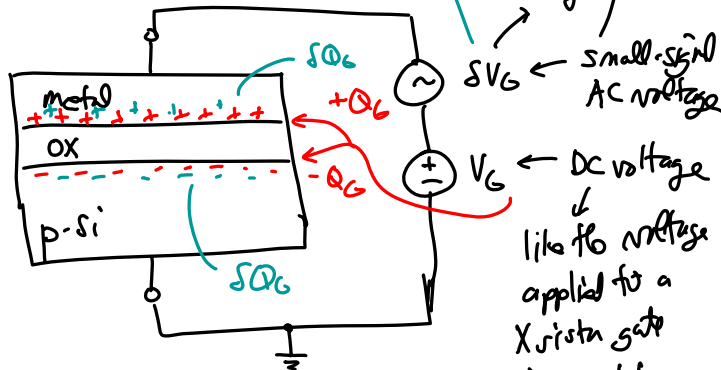
• Going through Advanced Isolation notes ... continue with this to start today

HF



Review MOS Device Physics

CV-Curves



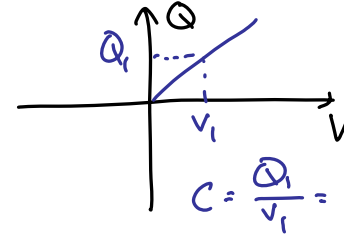
sV\_G  
 sQ\_G  
 typ. ~50mV

⇒ want to measure a small-signal capacitance:

$$C_G(V_G) = \frac{\delta Q_G}{\delta V_G} = \frac{dQ_G}{dV_G}$$

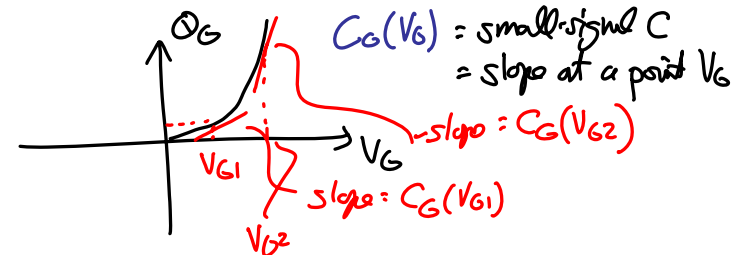
Ideal Linear Capacitance:

$$Q = CV \rightarrow C = \frac{Q}{V}$$



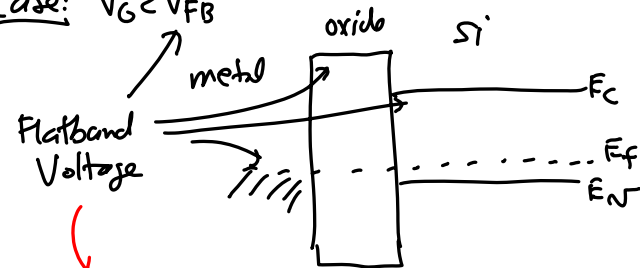
$$\frac{+Q}{-Q} \frac{1}{C} \frac{+V}{-V}$$

Nonlinear Semiconductor Capacitance:



$C_G(V_G)$  = small-signal C  
 = slope at a point  $V_G$

Case:  $V_G < V_{FB}$



When  $V_G = V_{FB}$ , there is no net charge on the gate or the substrate.

