

Lecture 16 -- Dynamic Models

What physical phenomenon gives rise to junction capacitance?

Draw a picture and write a formula describing how junction capacitance varies in the large signal sense. Is junction capacitance linear?

What is an expression for small signal junction capacitance? Is small signal junction capacitance linear?

Draw a small signal model of a diode with junction capacitance included.

What is base charging capacitance?

Draw a BJT and show the junctions & base charging that give rise to C_{pi} and C_{mu}

Draw a small signal model of a BJT including C_{pi} and C_{mu}

What is f_t ? Derive it for a BJT

What is the full transfer function of a common emitter amplifier?

Extras:

What is f_{max} ?

Why does the junction cap of a photodiode matter? How should a photodiode be biased?

What are the capacitances in a MOSFET? Draw a small signal model