

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Department of Electrical Engineering and Computer Science
6.301 Solid State Circuits

Fall 2013
Problem Set 2

Issued : Sept 10, 2013
Due : Sept 17, 2013

Problem 1: Saturation

Determine the DC Operating voltage V_1 at which Q_1 saturates and M_1 enters the triode regime. Your answer may be in terms of transistor parameters (I_S , $V_{CE,sat}$, β_0 , etc).

Problem 2: Small-signal Parameters

Calculate the small-signal transistor parameters g_m , r_π , and r_o in the following circuit.

$$V_A = 60v$$

$$\beta_0 = 200$$

$$V_{BE} = .6v$$

(a)