

6.012

Microelectronic Devices and Circuits

Tutorial #12

Problem 1 – Bipolar Cascode Amplifier Frequency Response

1. (E10.16) A bipolar cascode transconductance amplifier is shown in Figure E10.16. Given $R_S=1\text{k}\Omega$, $R_L=50\text{k}\Omega$, $C_L=0.1\text{pF}$, $I_{SUP}=100\text{uA}$ and $r_{oc}=\text{infinity}$, find i_{out}/v_s at DC and ω_{3dB} . Assume that V_{BIAS} is set such that all devices are operating in their constant-current region. Include $C_{CS}=50\text{fF}$ in the calculations.

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