

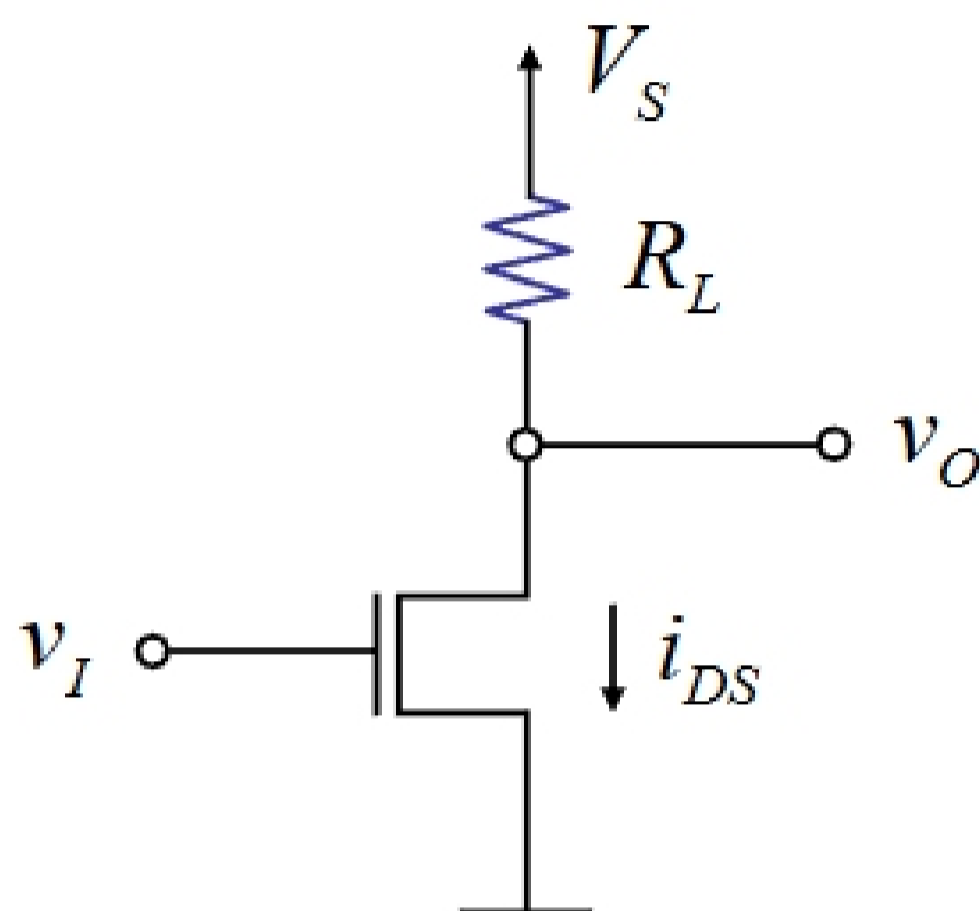
6.002

**CIRCUITS AND
ELECTRONICS**

Amplifiers -- Small Signal Model

Review

■ MOSFET amp



■ Saturation discipline — operate MOSFET only in saturation region

■ Large signal analysis

1. Find v_O vs v_I under saturation discipline.
2. Valid v_I, v_O ranges under saturation discipline.

Reading: Small signal model -- Chapter 8

Large Signal Review

① v_O vs v_I

$$v_O = V_S - \frac{K}{2} (v_I - 1)^2 R_L$$

valid for $v_I \geq V_T$
and

$$v_O \geq v_I - V_T$$

(same as $i_{DS} \leq \frac{K}{2} v_O^2$)