

# **SELF-BIAS**

## **JFET DC BIASING**

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# TOPIC OUTLINE

## **Self-Bias**

- **Gate-to-Source Loop**
- **Drain-to-Source Loop**
- **Transconductance Curve**



# **SELF-BIAS**



## GENERAL RELATIONSHIPS

Gate Current

$$i_G \cong 0$$

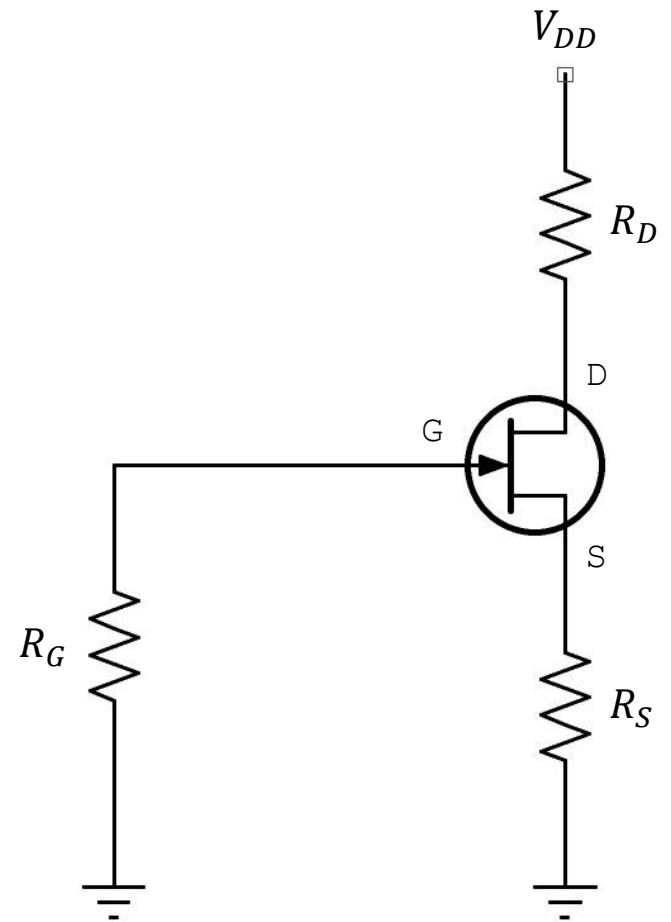
Drain Current

$$i_D = I_{DSS} \left( 1 - \frac{v_{GS}}{V_P} \right)^2$$

Source Current

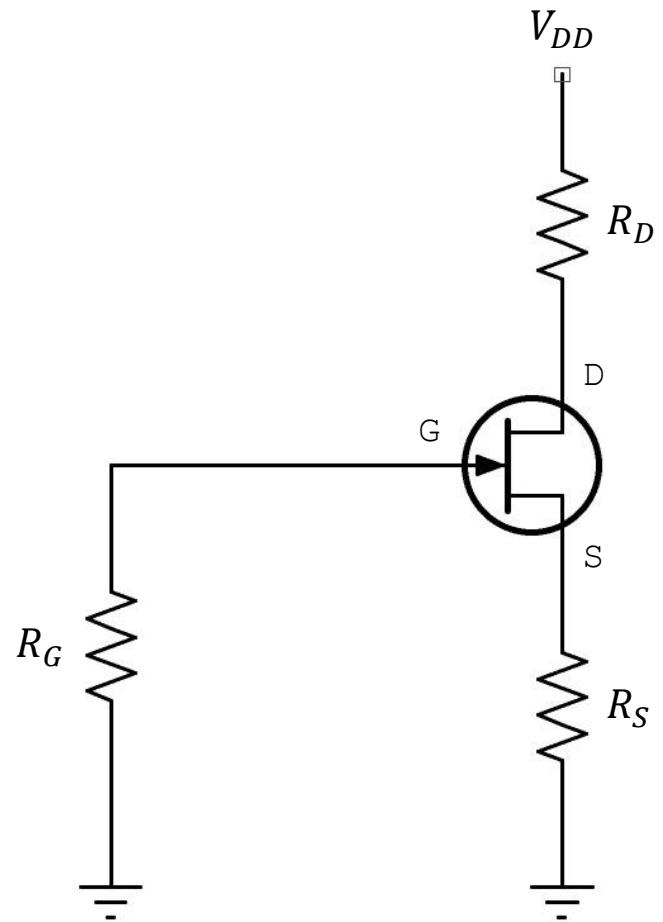
$$i_D = i_S$$

## SELF-BIAS CONFIGURATION



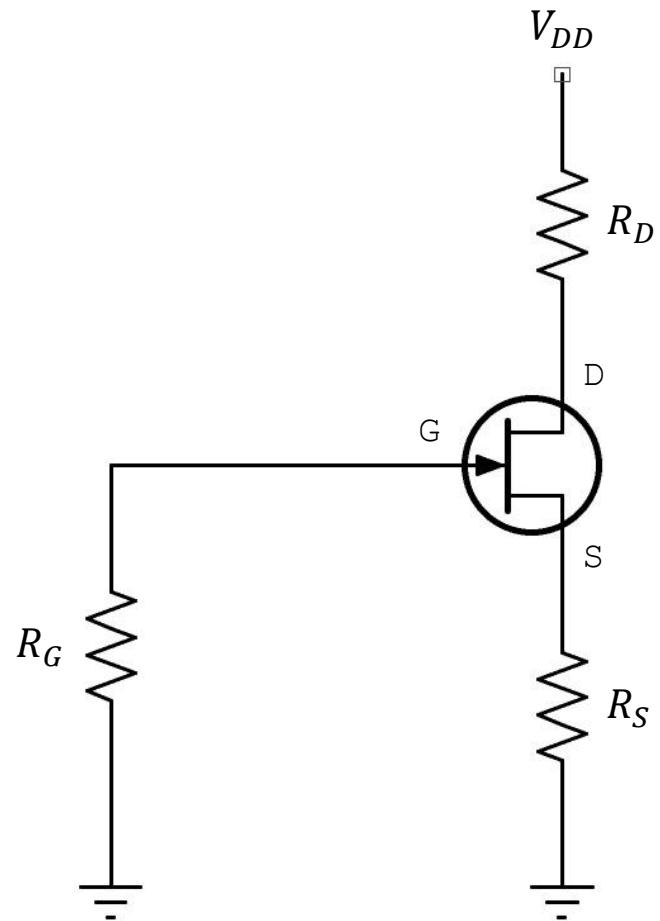
## GATE-TO-SOURCE

KVL @ G-S



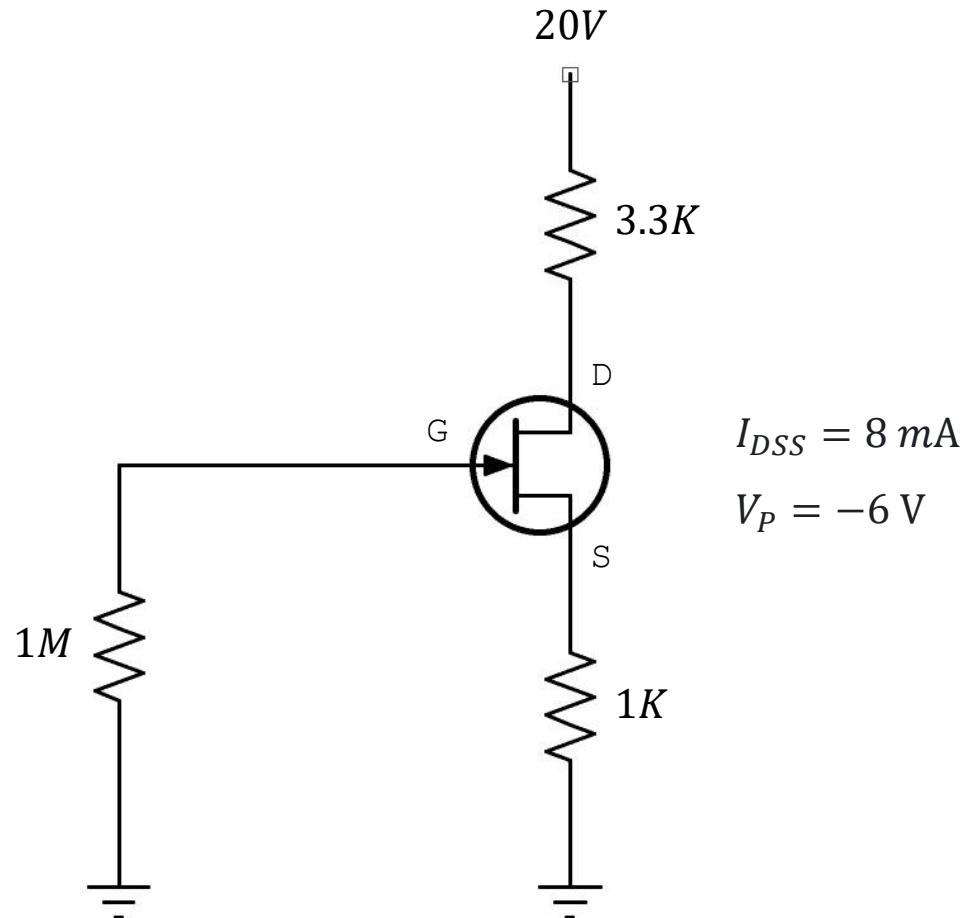
## DRAIN-TO-SOURCE

KVL @ D-S



## EXERCISE

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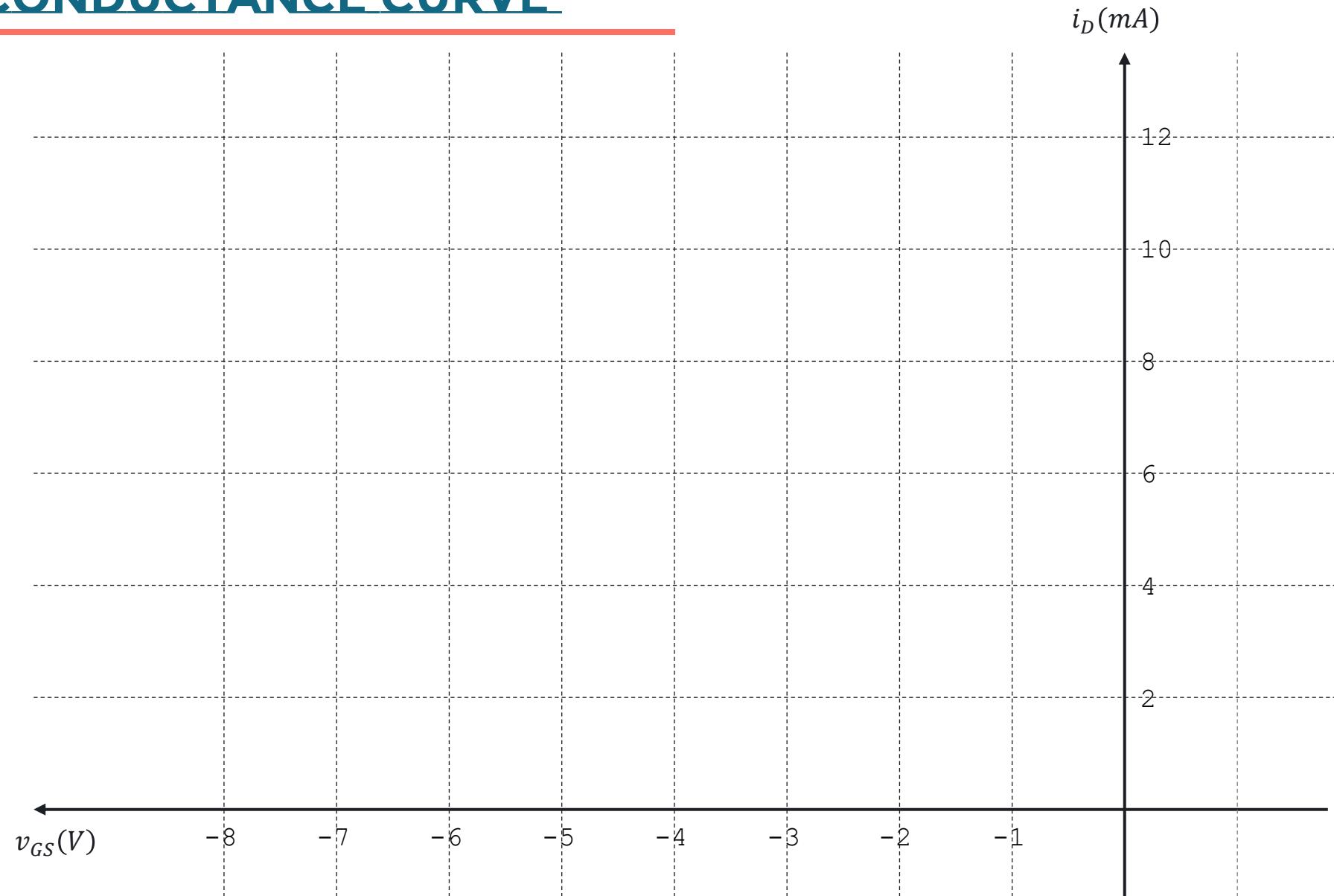


For the given network, determine the following :

- Gate-source voltage ( $v_{GSQ}$ )
- Drain current ( $i_{DQ}$ )
- Drain-source voltage ( $v_{DS}$ )
- Source voltage ( $v_S$ )

and sketch the transconductance curve.

# TRANSCONDUCTANCE CURVE



# LABORATORY