

# Quiz: 3-wire 4-20mA Transmitters

TI Precision Labs – Current Loop Transmitters

Presented by Katlynn Jones

Prepared by Katlynn Jones

# Quiz: 3-wire 4-20mA Transmitters || Question

1. Which statement about a 3-wire transmitter is true?
  - a) The transmitter always uses an independent supply from the receiver.
  - b) The transmitter and receiver share a ground.
  - c) The signal current and supply current are shared in one loop.
  - d) None of the above

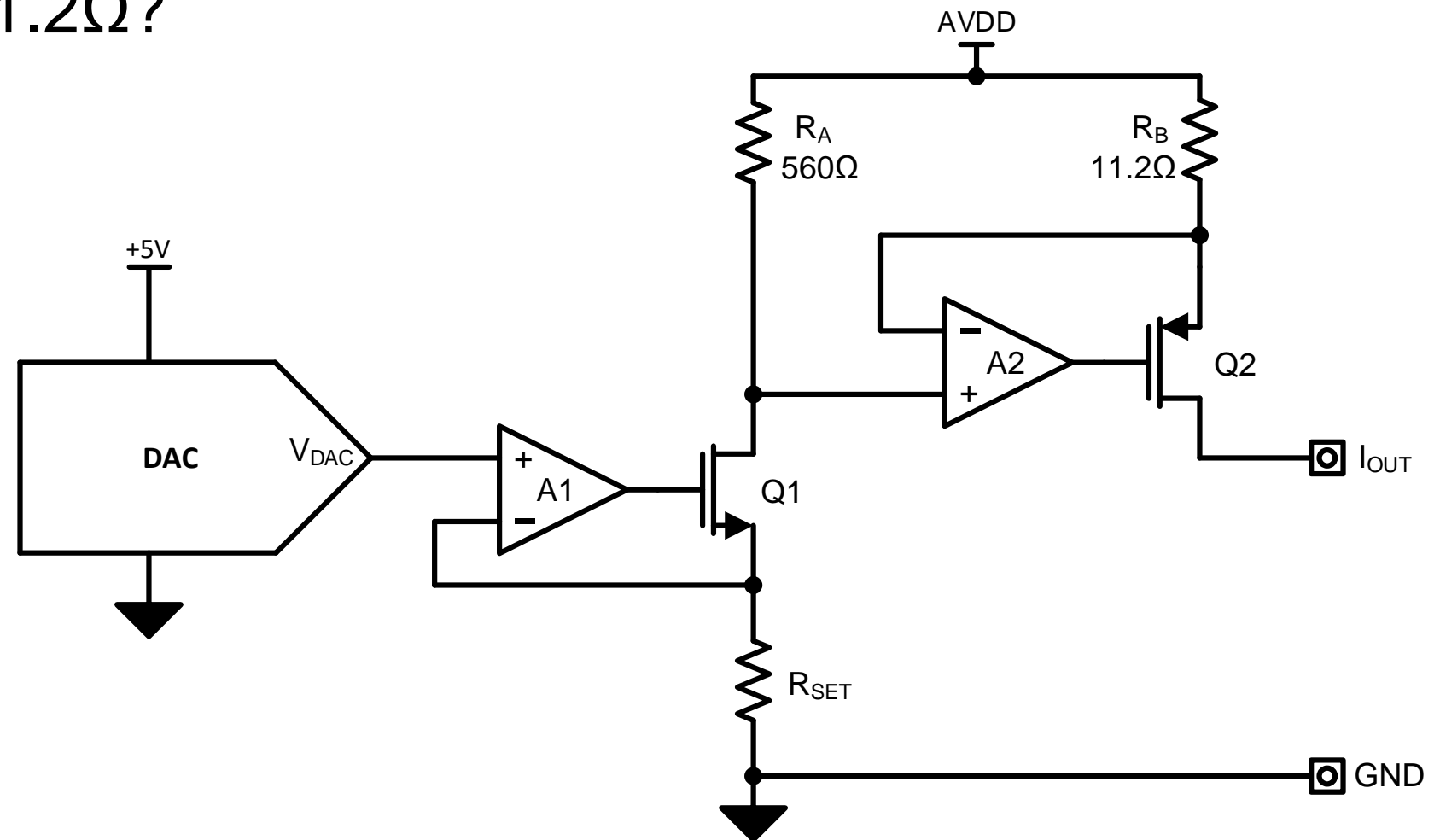
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  - c) The signal current and supply current are shared in one loop.
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2. Given the discrete 3-wire transmitter below, what is the gain of the transmitter if  $R_A$  is  $560\Omega$  and  $R_B$  is  $11.2\Omega$ ?

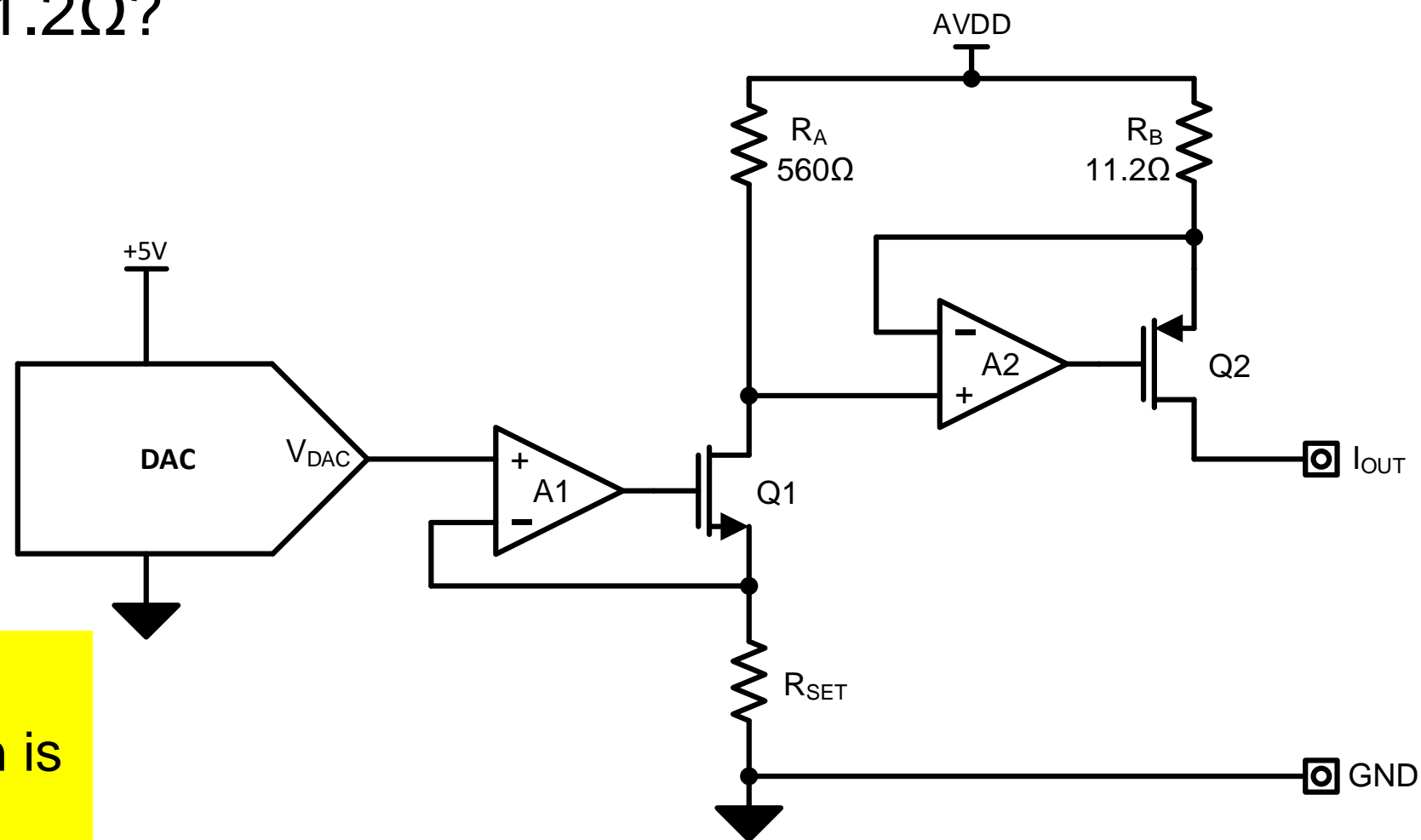
- a) 50
- b) 51
- c) 99
- d) 100



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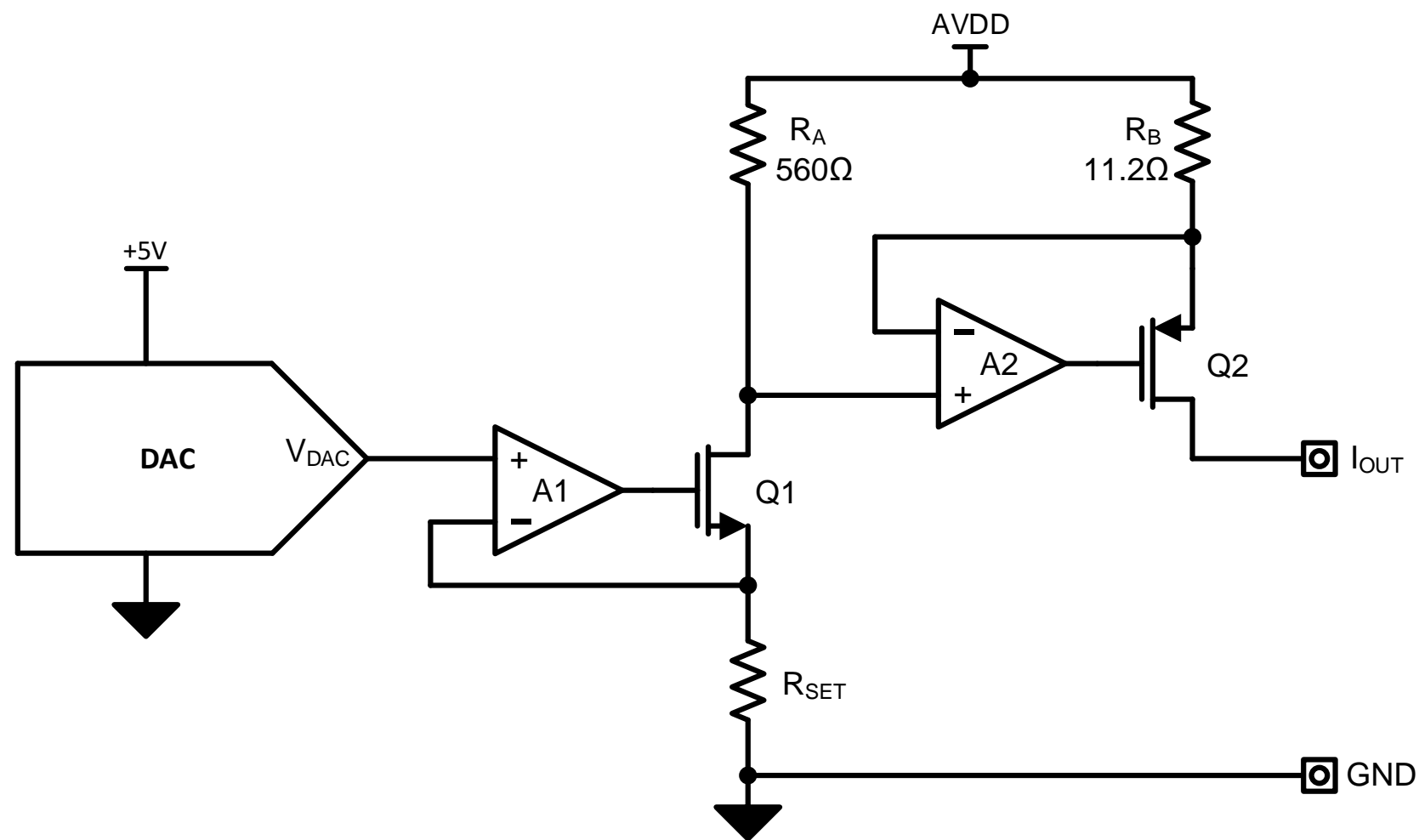


The transfer function of this 3-wire transmitter is  $I_{OUT} = \frac{R_A}{R_B} \frac{V_{DAC}}{R_{SET}}$ . The gain is defined by  $\left(\frac{R_A}{R_B}\right)$ .

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3. Given the 3-wire transmitter below, what value for  $R_{SET}$  should be chosen to get an output of 0-25mA with  $V_{DAC}$  voltage of 0-4V?

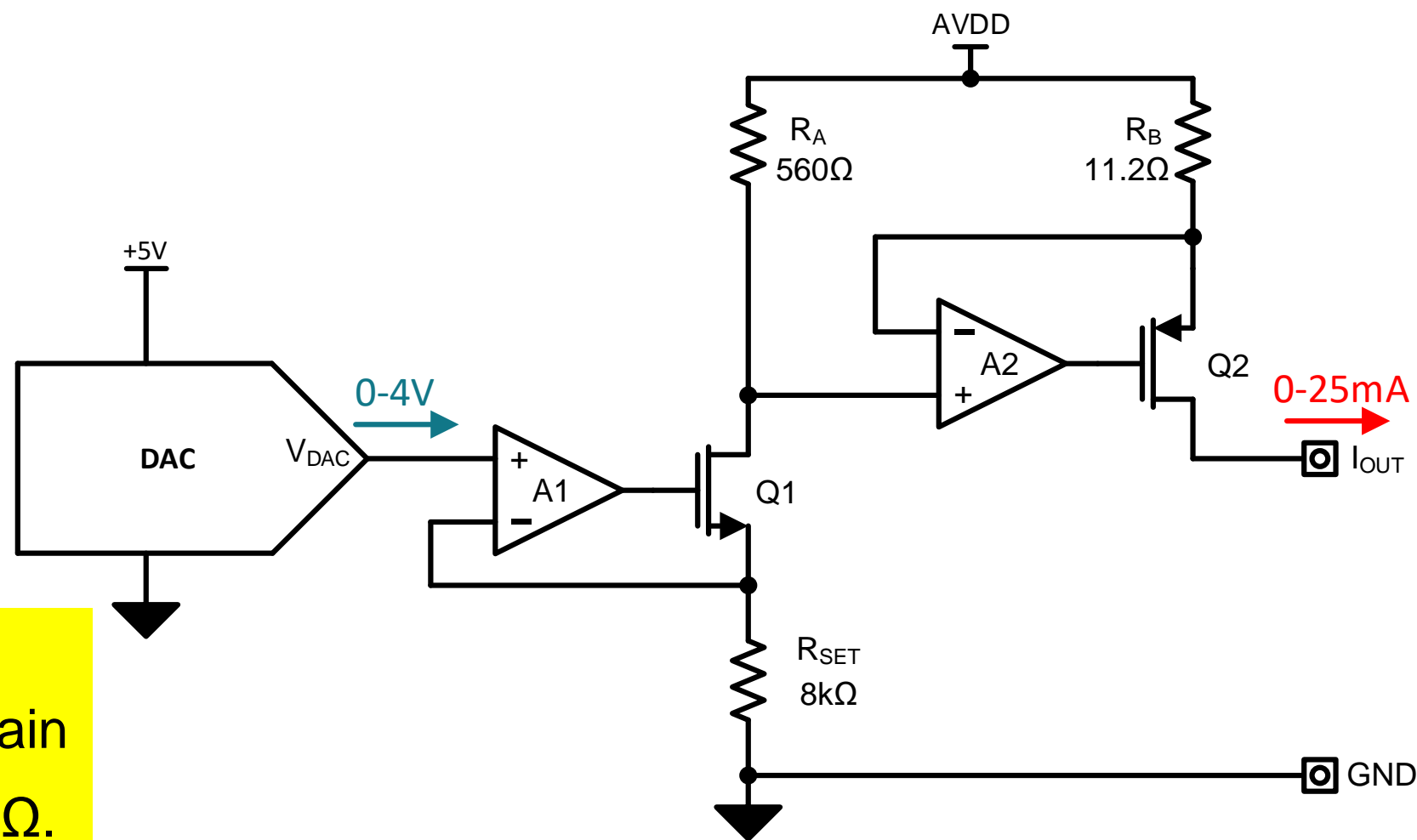
- a)  $5k\Omega$
- b)  $8k\Omega$
- c)  $10k\Omega$
- d)  $12k\Omega$



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3. Given the 3-wire transmitter below, what value for  $R_{SET}$  should be chosen to get an output of 0-25mA with  $V_{DAC}$  voltage of 0-4V?

- a) 5k $\Omega$
- b) 8k $\Omega$**
- c) 10k $\Omega$
- d) 12k $\Omega$



The transfer function of this 3-wire transmitter is  $I_{OUT} = \frac{R_A V_{DAC}}{R_B R_{SET}}$ . With a gain of 50, the correct value for  $R_{SET}$  is 8k $\Omega$ .

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4. The \_\_\_\_\_ uses digital control inputs to select between a current and voltage output mode.
- a) XTR110
  - b) XTR111
  - c) XTR115
  - d) XTR300/305



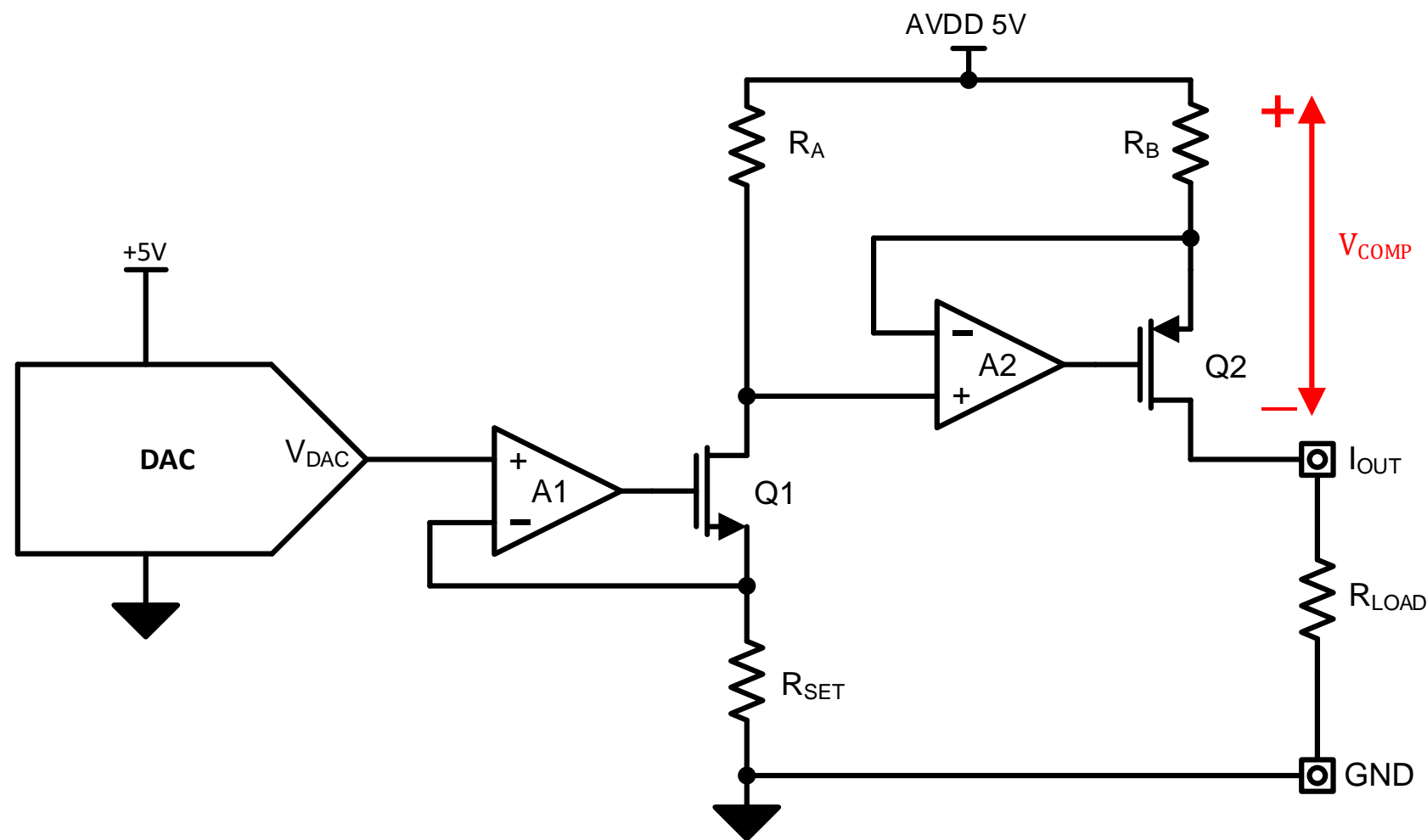
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  - b) XTR111
  - c) XTR115
  - d) XTR300/305**

# Quiz: 3-wire 4-20mA Transmitters || Question

5. If the below 3-wire transmitter has a compliance voltage of 1V and a full scale current output of 20mA, what is the max allowed  $R_{LOAD}$  that can be used to ensure operation.

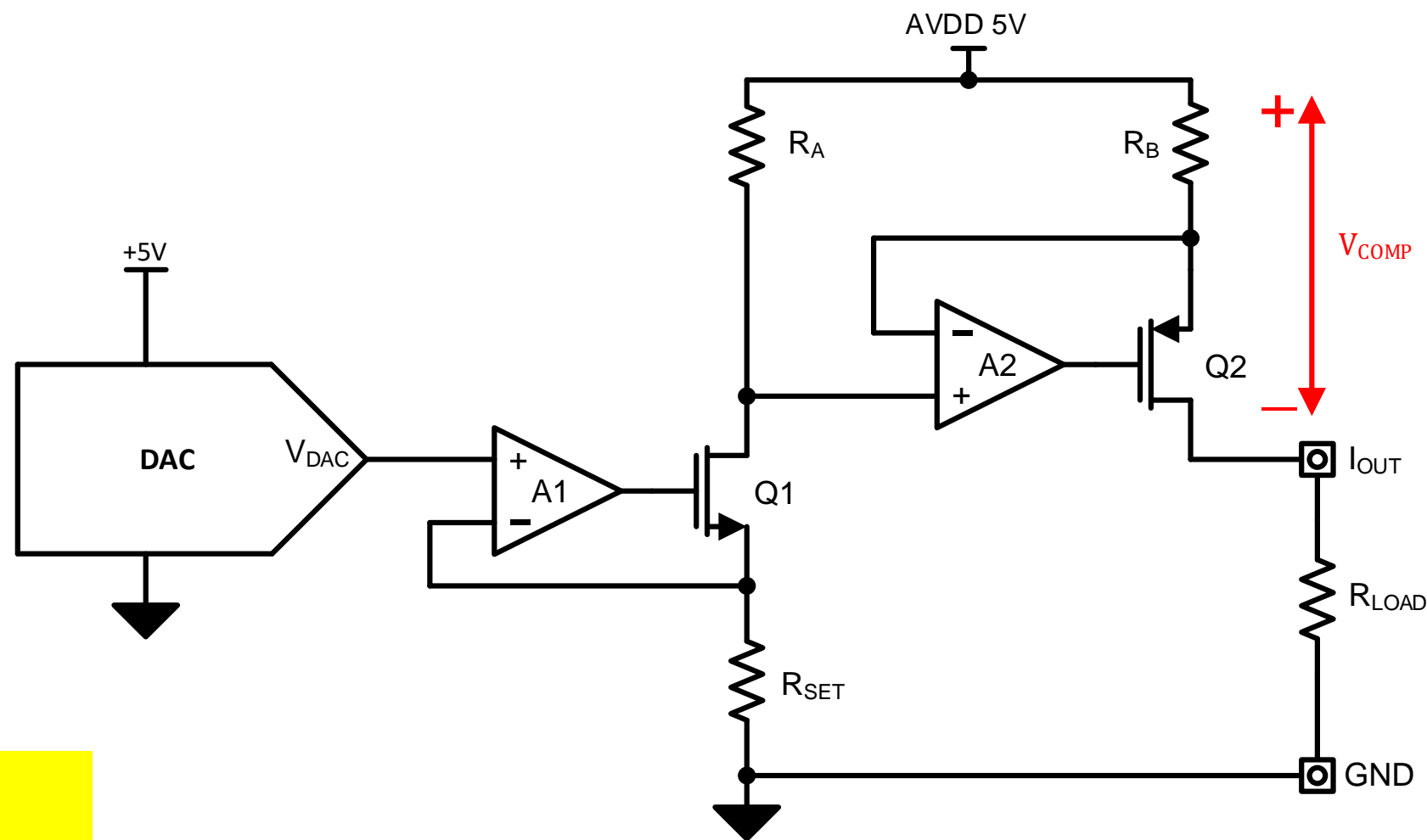
- a)  $100\Omega$
- b)  $150\Omega$
- c)  $200\Omega$
- d)  $250\Omega$



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- a) 100Ω
- b) 150Ω
- c) 200Ω
- d) 250Ω



$$\frac{AVDD - V_{COMP}}{I_{MAX}} > R_{LOAD\_MAX}$$

**Thanks for your time!**

**To find more Current Transmitter  
technical resources and search  
products, visit:**

**[https://www.ti.com/amplifier-  
circuit/special-function/4-20ma-signal-  
conditioners.html](https://www.ti.com/amplifier-circuit/special-function/4-20ma-signal-conditioners.html)**