

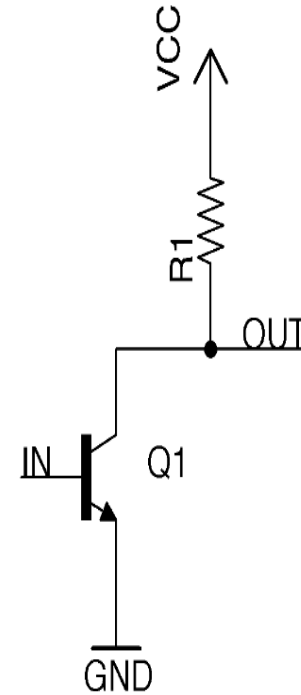
# Assignment 15.1: Circuit Card Inquiry lab

By: Marcus Frazier

# The Circuit

- This circuit's function is to change the impedance between the output and base.
- Components
  - Transistor
  - Pull up resistor

## OPEN-COLLECTOR LOGIC



# Uses

- Used in devices like a GPIO or microcontroller
- Used when multiple devices share a common single line that need different currents
- Switches incompatible loads
- Indicator lamps and relays

# Advantages

- Creates connections with multiple outputs
- Ideal for driving LEDs
- Reduces amount of EMI(electrical interference) generated
- Load can be connected to independent power supply than controlling circuit

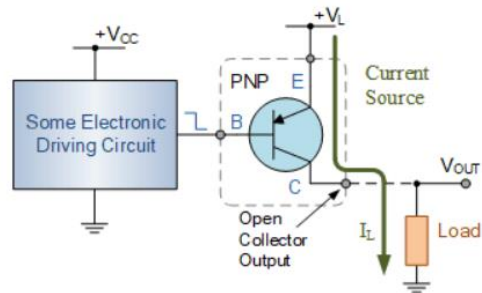
# Disadvantages

- Contention can be happen
- Outputs can only sink current not source it
- Sometimes requires a pull up resistor

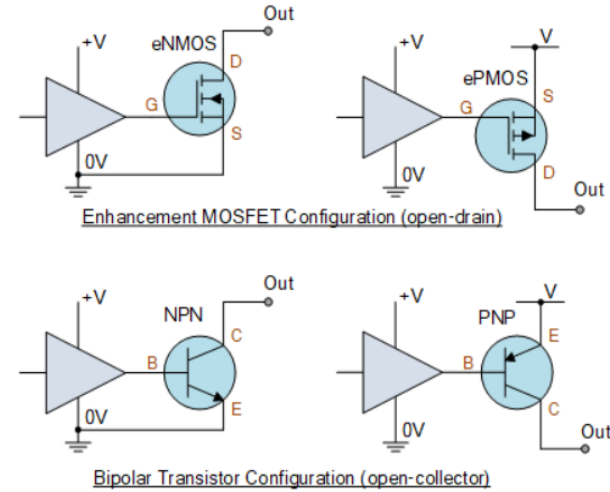
# Variations

- Can work with a NPN or PNP transistor
- Also can be used with a MOSFET

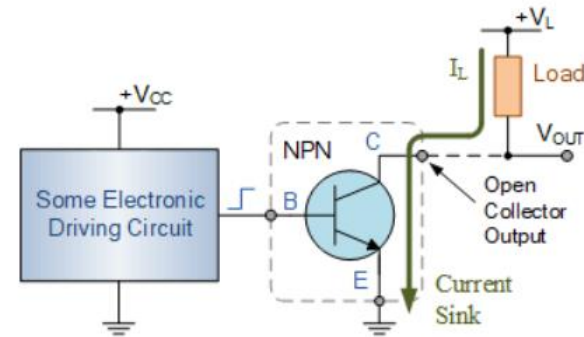
Open Collector PNP Transistor Circuit



Open Drain Enhancement MOSFET Configuration



Open Collector Transistor Circuit



# References

- Bishop, J. (2024, April 16). *What is an open collector output?*. CircuitBread. <https://www.circuitbread.com/tutorials/open-collector-output>
- GeeksforGeeks. (2022, November 9). *Open-collector logic*. <https://www.geeksforgeeks.org/open-collector-logic/>
- Storr, W. (2023, January 5). *Open collector outputs for bipolar transistors*. Basic Electronics Tutorials. <https://www.electronicstutorials.ws/transistor/open-collector-outputs.html>