

-----BJT-----

Book Razavi

Example 10.6

Design a bipolar differential pair for a gain of 10 and a power budget of 1 mW with a supply voltage of 2 V.

Example 10.8

Determine the differential input voltage that steers 98% of the tail current to one transistor.

Additional Exercise

What differential input is necessary to steer 90% of the tail current?

-----MOS-----

Book Razavi

Example 10.15

A MOS differential pair is driven with an input CM level of 1.6 V. If $I_{SS} = 0.5$ mA, $V_{TH} = 0.5$ V, and $V_{DD} = 1.8$ V, what is the maximum allowable load resistance?

Example 10.16

Design an NMOS differential pair for a voltage gain of 5 and a power budget of 2 mW subject to the condition that the stage following the differential pair requires an input CM level of at least 1.6 V. Assume $\mu_n C_{ox} = 100$ $\mu\text{A}/\text{V}^2$, and $V_{DD} = 1.8$ V.

Example 10.20

Design an NMOS differential pair for a power budget of 3 mW and $V_{in,max} = 500$ mV. Assume $\mu_n C_{ox} = 100$ $\mu\text{A}/\text{V}^2$ and $V_{DD} = 1.8$ V.