

Maximum power transfer

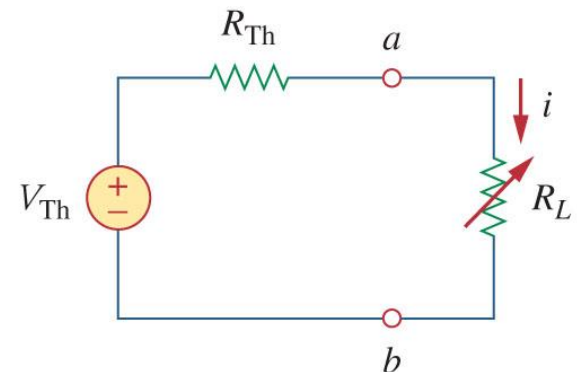
- In many applications, a circuit is designed to power a load.
- Among those applications there are many cases where we wish to maximize the power transferred to the load.
- Unlike an ideal source, internal resistance will restrict the conditions where maximum power is transferred.

Maximum power transfer II

- We can use the Thevenin equivalent circuit for finding the maximum power in a linear circuit.
- We will assume that the load resistance can be varied.
- Looking at the equivalent circuit with load included, the power transferred is:

$$p = \left(\frac{V_{Th}}{R_{Th} + R_L} \right)^2 R_L$$

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Maximum power transfer III

- For a given circuit, V_{TH} and R_{TH} are fixed. By varying the load resistance R_L , the power delivered to the load varies, as shown.
- You can see that as R_L approaches 0 and ∞ the power transferred goes to zero.
- In fact the maximum power transferred is when $R_L = R_{TH}$.

