

Maximum Power Transfer Calculator

Evaluates a known Thevenin source against an entered resistive load and separates matched-load power from efficiency and equipment limits.

Generated October 10, 2026

<https://www.elecatrix.com/circuits-components/maximum-power-transfer-calculator/>

Inputs

Input	Value	Unit
Thevenin voltage	12	V
Source resistance	4	ohm
Entered load resistance	4	ohm

Results

Result	Value	Unit
Optimal load resistance	4	ohm
Maximum load power	9	W
Entered-load power	9	W
Entered-load current	1.5	A
Entered-load efficiency	50	%

Calculation details

Detail	Value	Unit
Calculation basis	For an ideal resistive DC source, maximum load power occurs when load resistance equals source resistance.	
Boundary	Resistive DC equivalent-source arithmetic only. AC conjugate matching, nonlinear sources, thermal design, fault duty, protection, and component approval are outside this page.	

Formulas

$$R_{L,opt} = R_{th}$$

$$P_{max} = \frac{V_{th}^2}{4R_{th}}$$

$$I_L = \frac{V_{th}}{R_{th} + R_L}$$

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$$P_L = I_L^2 R_L$$

$$\eta_L = \frac{P_{LP_source}}{P_{LP_source}} \times 100$$

Warnings and limitations

Ideal resistive DC matching screen only. Do not extend this result to AC conjugate matching, nonlinear circuits, heat dissipation, fault duty, protection, or final component selection.