

Voltage Drop Across Resistor Calculator

Calculate ideal resistor voltage drop and power dissipation from known current and resistance, separately from conductor voltage-drop and code-sizing decisions.

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<https://www.elecatrix.com/circuits-components/voltage-drop-resistor-calculator/>

Inputs

Input	Value	Unit
Current	2	A
Resistance	12	ohm

Results

Result	Value	Unit
Current used	2	A
Resistance used	12	ohm
Voltage drop	24	V
Resistor power	48	W

Calculation details

Detail	Value	Unit
Calculation basis	Resistor voltage drop equals current multiplied by resistance. Resistor power equals voltage drop multiplied by current.	
Boundary	Ideal resistor arithmetic only. It does not model temperature coefficient, tolerance, pulse behavior, wiring resistance, source impedance, or component ratings.	

Formulas

$$V_{\text{drop}} = I R$$

$$P = V_{\text{drop}} I$$

$$P = I^2 R$$

Warnings and limitations

This is ideal resistor arithmetic. It does not model wire resistance, source impedance, temperature coefficient, tolerance, pulse behavior, resistor derating, or installation requirements.