

Voltage Divider Calculator

Review voltage-divider output, divider current, and resistor power from source voltage, top resistance, bottom resistance, and optional load resistance.

Generated October 10, 2026

<https://www.elecatrrix.com/circuits-components/voltage-divider-calculator/>

Inputs		
Input	Value	Unit
Source voltage	12	V
Top resistance	10000	ohm
Bottom resistance	5000	ohm
Load resistance	N/A	ohm
Results		
Result	Value	Unit
Output voltage	4	V
Effective bottom resistance	5000	ohm
Total divider resistance	15000	ohm
Divider current	0.0008	A
Top resistor power	0.0064	W
Bottom path power	0.0032	W
Calculation details		
Detail	Value	Unit
Calculation basis	Ideal two-resistor divider arithmetic. When a load resistance is entered, it is treated as parallel with the bottom resistor.	
Boundary	Educational estimate only; no resistor tolerance, source impedance, load regulation, heat rise, component rating, or circuit-safety decision is made by this calculator.	
Formulas		

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$$R_{\text{effective}} = R_{\text{bottom}} \text{ when } R_{\text{load}} = 0$$

$$R_{\text{effective}} = \frac{R_{\text{bottom}} \times R_{\text{load}}}{R_{\text{bottom}} + R_{\text{load}}}$$

$$V_{\text{out}} = V_{\text{s}} \times \frac{R_{\text{effective}}}{R_{\text{top}} + R_{\text{effective}}}$$

$$R_{\text{total}} = R_{\text{top}} + R_{\text{effective}}$$

$$I_{\text{divider}} = \frac{V_{\text{s}}}{R_{\text{total}}}$$

$$P_{\text{top}} = I_{\text{divider}}^2 \times R_{\text{top}}$$

$$P_{\text{bottom path}} = \frac{V_{\text{out}}^2}{R_{\text{effective}}}$$

Warnings and limitations

This is an educational component estimate. Verify resistor tolerance, wattage, source impedance, input leakage, load regulation, temperature rise, and manufacturer ratings before using a divider in real equipment.