

LED Series Resistor Calculator

Estimate ideal series-resistor voltage, resistance, common value, and dissipation from supply, LED, count, and target current.

Generated October 10, 2026

<https://www.elecatrrix.com/circuits-components/led-series-resistor-calculator/>

Inputs		
Input	Value	Unit
Supply voltage	12	V
LED forward voltage	2	V
LED count	3	
LED current	20	mA

Results		
Result	Value	Unit
Series LED voltage	6	V
Resistor voltage	6	V
Ideal resistance	300	ohm
Resistor power	0.12	W
Current used	0.02	A
Recommended common resistance	330	ohm

Calculation details		
Detail	Value	Unit
Calculation basis	Ideal series arithmetic: the resistor drops supply voltage remaining after the entered LED forward-voltage estimates.	
Boundary	Screening arithmetic only. No LED regulation, temperature, tolerance, pulse behavior, supply variation, thermal margin, manufacturer data, listing, or safety approval is made.	

Formulas		
series LED voltage = LED count x forward voltage		

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resistor voltage = supply voltage - series LED voltage

ideal resistance = resistor voltage / LED current

recommended resistance = next higher common value

Warnings and limitations

This is an ideal LED-string estimate and does not verify thermal, tolerance, regulation, or component ratings.