

RMS Current Calculator

Calculate RMS current from a sine-wave peak, verified waveform factor, equally spaced samples, or separate AC and DC components.

Generated October 10, 2026

<https://www.elecatrrix.com/voltage-current-resistance/rms-current-calculator/>

Inputs

Input	Value	Unit
Calculation mode	Sine wave from peak	
Peak current	10	A
RMS-to-peak waveform factor	0.7071	x
Current samples	Rows: 4	
Row 1 - Sample current	10	A
Row 2 - Sample current	5	A
Row 3 - Sample current	-10	A
Row 4 - Sample current	-5	A
RMS AC component	5	A
DC component	2	A

Results

Result	Value	Unit
RMS current	7.0711	A
Mean current	N/A	A
Peak current used	10	A
Crest factor	1.4142	x

Mode used

Sine wave from peak

Calculation details

Detail	Value	Unit
Calculation basis	Sine-wave RMS current equals peak current divided by square root of 2.	

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Boundary

Waveform arithmetic only; confirm sampling window, bandwidth, sensor range, instrument category, crest-factor capability, conductor heating, and equipment ratings separately.

Formulas

$$I_{RMS} = \frac{I_{Peak}}{\sqrt{2}}$$

$$I_{RMS} = I_{Peak} \times F_{waveform}$$

$$I_{RMS} = \sqrt{\sum I_n^2 / n}$$

$$I_{RMS, total} = \sqrt{I_{RMS, AC}^2 + I_{DC}^2}$$

$$Crest\ factor = \frac{I_{Peak}}{I_{RMS}}$$

Warnings and limitations

This is a waveform arithmetic estimate. It does not replace a suitable true-RMS instrument and does not approve conductor ampacity, breaker, fuse, service, motor, VFD, UPS, or equipment loading.