Current Sense Resistors

Product Portfolio

Introduction

We are expanding our range of passive components with Current Sense Resistors.

Metal Plate Resistors

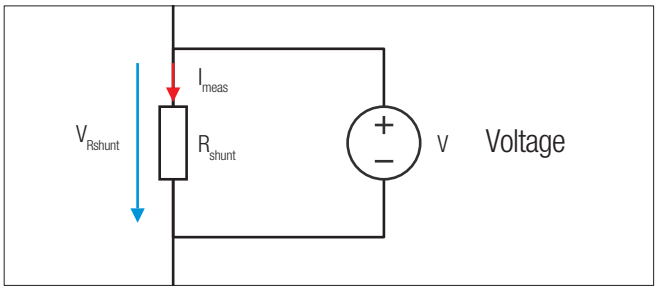
Thick Film Resistors

How does Current Sensing of the application work?

- Using a resistor within the circuit of the application to make the current measurable (called: shunt)
- The current through such a resistor generates a proportional voltage drop according to **Ohm's Law**:

$$I_{meas} = \frac{V_{Rshunt}}{R_{shunt}}$$

- Very low resistance values are used to generate a low voltage drop up to a few hundred mV
- In case of low currents, very precise resistance values and an amplifying circuit have to be used to get stable measurements, because of the very small voltage drop



Example Calculation for a shunt*

Given:

- I_0 = 10 A
- We want to measure a voltage drop of 50 mV

Searched:

- Shunt, which is required to measure 50 mV
- Power loss, which will be caused by the shunt

Formulas:

Shunt $R = \frac{U}{I}$ Power Loss $P = U \times I = I^2 \times R$

Calculation:

Shunt, which is required: $R_{Shunt} = \frac{U}{I} = \frac{50\ mV}{10\ A} = 0{,}005\ \Omega = \mathbf{5\ m\Omega}$

Power loss of the shunt: $P_{Loss} = I^2 \times R = 10^2\ A \times 5\ m\Omega = \mathbf{0{,}5\ W}$

*Calculation is only an example, for application specific calculation or detailed support, please contact our technical support.