

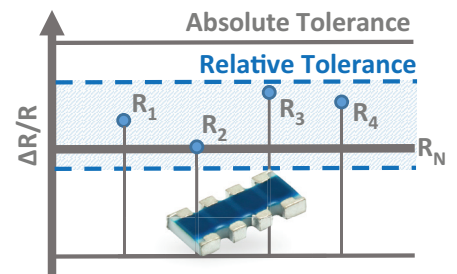


# DID YOU KNOW?

## THIN FILM CHIP RESISTOR ARRAYS FOR INCREASING ACCURACY

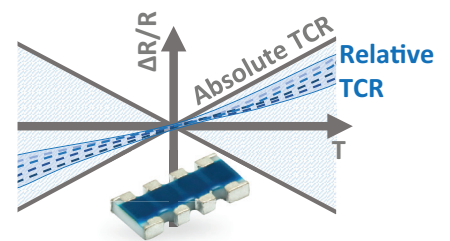
Many electronic circuits, such as voltage dividers and feedback circuits, require a stable divider ratio throughout the application's lifetime. For those applications, thin film chip resistor arrays are the optimum choice. These arrays consist of several resistors of equal or different resistance values combined in one package. During the manufacturing process and the component's lifecycle, all resistive elements experience virtually the same conditions, which allows the specification of a relative tolerance, relative temperature coefficient, and even a relative resistance drift.

**Relative Tolerance:** Precise laser trimming allows for different resistance values to be created on the same array. Their variance with respect to the nominal resistance value is defined as absolute tolerance. The even smaller difference between the individual resistance values is described as relative tolerance or tolerance matching and is the decisive parameter for an accurate divider ratio.



**Relative Resistance Drift:** Since the resistive elements are deposited on the same ceramic substrate, they are thermally coupled. Thereby, independent of the individual power load on the elements, a homogeneous heat distribution is achieved across the entire array, ensuring that all resistors within the array will age at virtually the same rate. The relative resistance change between elements over time is therefore negligible. Hence, the long term load-life stability of the resistance ratio is very high.

**Relative Temperature Coefficient:** Due to the virtually identical processing conditions during manufacturing and homogeneous heat distribution during operation, the individual resistive elements are all influenced by temperature to the same extent. Thus, the temperature coefficient curves of all the resistors in the array follow one another. The resulting tight temperature coefficient tracking makes the circuit almost independent from temperature changes.



More details on the properties that define a thin film chip array are given in the application note "[Increasing Accuracy in Feedback Circuits and Voltage Dividers With Thin Film Chip Resistor Arrays.](#)" Thin film chip arrays are frequently used in applications that require a stable divider ratio:

- Precision analog circuits
- DC/DC converters
- Voltage dividers
- Signal conditioning
- Feedback circuits