DID YOU KNOW?

HOW EASY IT IS TO DESIGN WITH THE VERSATILE NTCC200 WIRE BONDABLE THERMISTOR DIE

The NTCC200 series of wire bondable NTC thermistor dies has been developed principally for temperature sensing in IGBT modules. The series encompasses several resistance values in order to fit any application. For example, 5 kΩ MELF thermistors from at least two Vishay competitors — widely used up to now — can be replaced in current and future applications by the Vishay NTCC200E4C90008 on a one on one basis.

The NTCC200 can be mounted with the same methods as the semiconductors, provided basic guidelines are respected (these guidelines can be obtained on request at nlr@vishay.com). However, the versatility of the NTCC200 is so high that the devices can also be mounted by co-firing in nanosilver paste sintering processes. The NTCC200's connections are made of Ag paste (with some added dope elements) for wire bonding with aluminum wires. In the case of wire bonding with gold wire in certain applications, the same ceramic dies are delivered with an Au paste (NTCC300).

All the electrical characteristics of the different resistance values (4.7 kΩ, 5 kΩ, 12 kΩ, and 20 kΩ) of the NTCC200 and 300 series can be computed in Excel spreadsheets with the help of the software "My_Vishay_NTC_Curve," which can be downloaded at https://www.vishay.com/thermistors/ntc-curve-list/.

PSpice models are also available by sending a request to edesign.ntc@vishay.com. Complete models (including possible self-heating) can be integrated in PSpice or even SLPS simulations; for example, in order to optimize complex automotive applications. Figure 1 represents a temperature threshold detection circuit designed in the CADENCE ORCAD capture software. Figure 2 shows opamp output voltage switching when the temperature is swept in the circuit of Figure 1. Worst-case scenarios can then be analyzed.

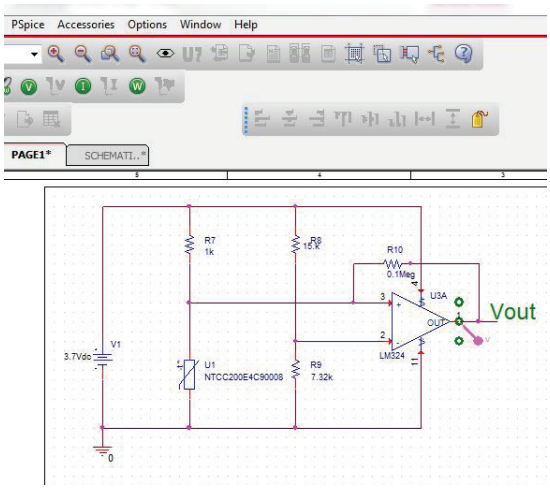

Figure 1. PSpice simulation of Wheatstone bridge for temperature detection

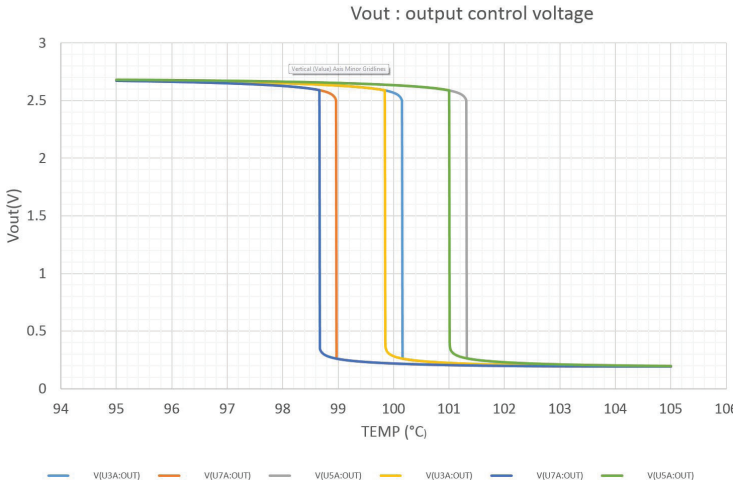

Figure 2. Opamp switching for NTC thermistor worst-case analysis