# DID YOU KNOW?

# IT'S EASY FOR VISHAY TO CUSTOMIZE A LEADED THROUGH-HOLE NTCLE THERMISTOR

Vishay's leaded through-hole thermistors are the perfect solutions for a wide range of end products, including EV charging plugs, fire detectors, ambient thermostats, and nearly all automotive applications. The need for custom wire lengths and materials is common in the field of mechanical assembly, and Vishay has the capabilities to easily meet your requirements. For example, if your application calls for a 200 mm wire, a stripping length of 10 mm, or a 3 m cable for a fridge freezer, Vishay is your source. If you produce automotive seat heating control systems, we will provide you with very flexible PTFE multi-stranded copper wires to fit various seat geometries. If you manufacture a boiler temperature clip sensor, Vishay will supply you with a micro sensor featuring a very low thermal conductive wire to avoid temperature surface gradients. When high moisture resistance is requested, a PEEK wire will ensure full immersion in conductive water for 500 hours. In addition, our different lead wire platings are made to accommodate different mounting processes (pure Sn coating for soldering by brazing, Ag plating for electrical welding).

Aside from this mechanical flexibility, Vishay offers electrical models as well. PSpice and LTspice models for numerous NTCLE ranges are available online. For temperature sensing, we understand the need to drive models with a user-defined temperature profile. Complete models with the appropriate heat transfer function can be integrated in electronic simulations in PSpice, LTspice, Multisim, and TINA TI — to name but a few. Online videos are also available, including one for the application circuit below (https://www.youtube.com/watch?v=ozGK2PGVSOs). Figure 1 represents a full electronic thermostat based on Linear Technology's LTC1040 with a leaded through-hole Vishay NTC thermistor, measuring the temperature of a heated body modeled in the same simulation. Figure 2 shows the resulting temperature of this system regulated within pre-programmed temperature boundaries. All component tolerances can be handled and external temperature noise influences can be extensively studied.

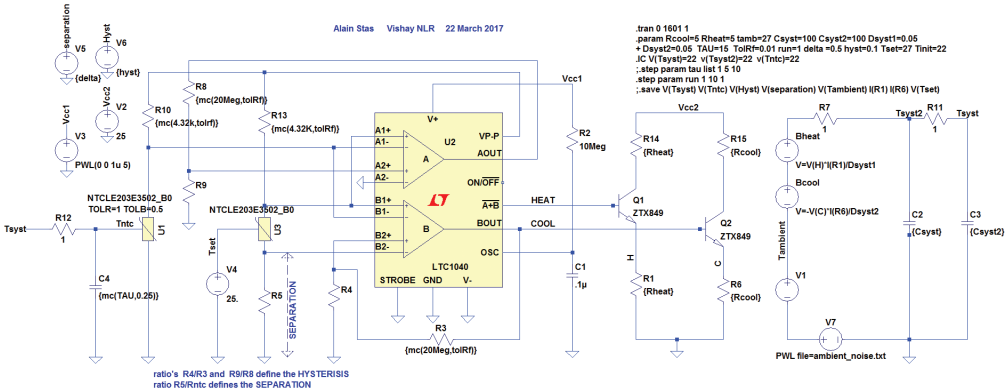


**Figure 1.** LTspice simulation of an LTC1040 with NTCLE

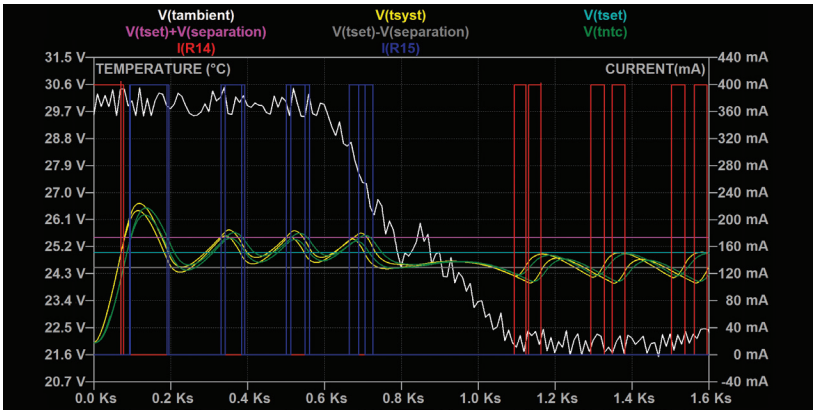


**Figure 2.** Transient simulation of the system temperature



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