Sensorless Battery Cell Temperature Measurement
How to measure the temperature of each individual cell in a large battery pack
  - e.g. in an electric vehicle
Traditional solution

- Thermistors or diodes distributed throughout the pack
  - high cost of components
  - lots of wiring
  - complex and error-prone assembly
NXP solution

- NXP solution extracts the temperature from an impedance measurement
  - no cost for sensors, wiring, and assembly
Demo setup

the content of these two boards will be integrated in an IC

analogue front end FPGA

apply freeze spray here

thermocouple

NXP solution shows temperature change immediately
thermocouple follows with 30 seconds delay
(the bigger battery cell, the longer the delay)

this component is not needed with NXP’s solution
Sensorless temperature measurement

- Instantaneous measurement of the internal temperature
  - based on an impedance measurement, performed by the cell supervisory circuit
  - no delay due to thermal mass of the cell
  - no additional components needed
  - saves the cost of temperature sensors, wires, connectors, and assembly

![Graph showing temperature over time](image)

*At t=30s freeze spray is applied to one side of the battery cell.*
Thank you