

# MCP9601/L01/RL01 Thermocouple Conditioning ICs

## MCP9601 Open/Short Detection Feature Enhance System Performance

### Summary

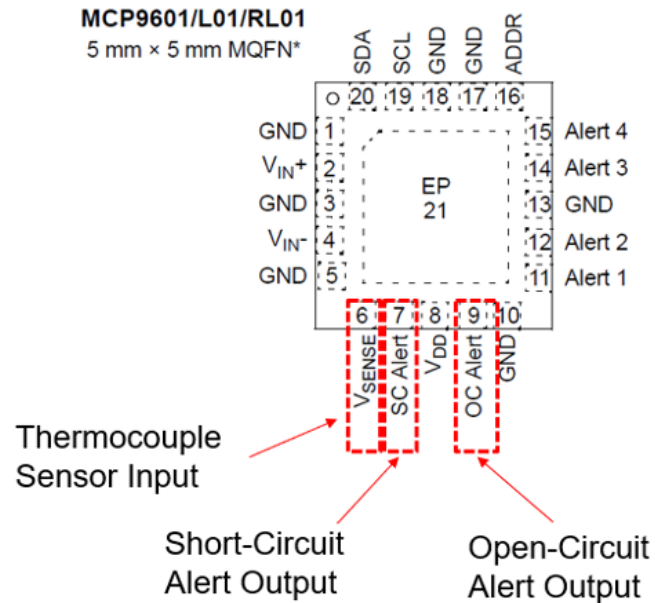
Microchip's MCP9601 thermocouple conditioning IC integrated Open detection feature which is used to detect a break in the thermocouple due to wear and tear from corrosion or other mechanical conditions.

A Thermocouple is an industrial grade temperature device that consists of two dissimilar wires. Due to the extreme conditions of the application environment, may cause the wires to come apart creating an open or short condition.

To prevent invalid or inaccurate temperature readings, Microchip Technology has developed the MCP9601/L01/RL01 Thermocouple Conditioning ICs that have Open/Short Circuit detection feature.

Thermocouple wires are long, and overtime may corrode, break or a combination of both. Other scenarios besides the wear and tear can also damage and compromise the thermocouple performance. For example, the thermocouple wire touching a chassis ground (short to GND) or accidentally touches a supply voltage (short to Vdd), would create invalid temperature measurements.

The MCP9601/L01/RL01 pinouts and features:  
MCP9601/L01/RL01 Thermocouple ICs integrates an open/short circuit detection mechanism that enhances system performance.



An alert signal is asserted when the thermocouple wire is broken, disconnected or shorted. Therefore, the respective alert signal will be asserted.

The open/short circuit detection mechanism is implemented using a Sense-Input pin ( $V_{SENSE}$ ). The  $V_{SENSE}$  pin, uses three external resistors to detect the thermocouple status. For proper operation, the resistor values must also be within the specified resistance range.

When open circuit or short circuit conditions are detected, the OC Alert and SC Alert Active-High Push-Pull outputs are asserted, respectively.

Alert pins are user-programmable push-pull outputs which can be used to detect rising or falling temperatures.

The device outputs signal when the ambient temperature exceeds the user-programmed temperature alert limit.

The Additional features on the MCP9601/L01/RL01, the OC Alert and the SC Alert outputs are also active-high push-pull outputs.

These outputs are asserted when Open-Circuit and Short-Circuit conditions are detected on  $V_{SENSE}$  the pin. In addition, the alerts can detect either a rising or a falling temperature with up to +255°C hysteresis.

The MCP9601/L01/RL01 products provide a complete "plug-and-play", fully integrated thermocouple conditioning solution in a single chip.