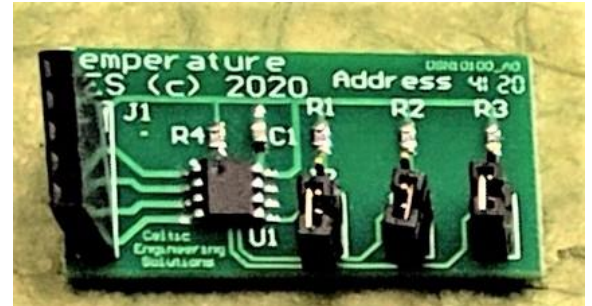


## Solstice Family: Temperature Sensor

### I<sup>2</sup>C Temperature Sensor

#### General Description

The SF-1 is a serial interfaced temperature sensor board. The board is based on Microchips TCN75AVOA digital sensor. The board can be powered with between 2.7V and 5.5V. The communication to the board is through a two-wire interface and will require pullups on the SDA and SCL lines; 4.99K recommended to start. Actual resistance will depend on the length of the serial cable and the number of devices on the bus.



The sensor has user programmable registers that allow customizable temperature sensing. Some things that are customizable are the temperature measurement resolution, power-saving shutdown and one-shot modes, temperature alert output and hysteresis limits. There is a single alert that can be set active-high or active-low for the comparator output. The output can be used as part of an analog circuit such as a thermostat or can be connected to a microcontroller to serve as an interrupt.

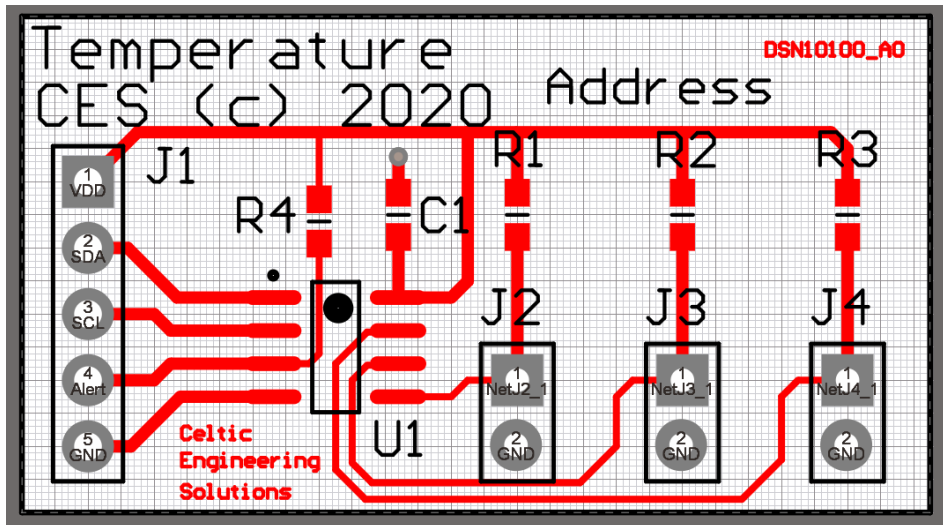
Using the Address selection jumpers, J2, J3 and J4 up to 8 of these boards can be controlled on a single bus.

#### Applications

- Entertainment Systems
- Office Equipment
- General Purpose Temperature Monitoring
- Room Temperature
- Refrigerator and freezer monitoring
- Outside temperature

#### Benefits and Features

- Operating Temperature -55°C ~125°C
- Resolution 11 bits
- Typical Operating Current is 200-500  $\mu$ A
- Shutdown Current 2  $\mu$ A + Address load
- 2-wire I<sup>2</sup>C™ Compatible
- Power-Saving One-Shot Temperature Measurement
- Accuracy  $\pm 2^\circ$ C
- User Selectable Resolution: 0.5°C to 0.0625°C
- Board Size: 0.750" x 1.375"



## Pin Configuration

| Pin | Name  | Function                  |
|-----|-------|---------------------------|
| 1   | VDD   | Power Supply Input        |
| 2   | SDA   | Bidirectional Serial Data |
| 3   | SCL   | Serial Clock Input        |
| 4   | Alert | Temperature Alert Output  |
| 5   | GND   | Ground                    |

## Absolute Maximum Ratings

|  |                    |
|--|--------------------|
| VDD .....                                    | 6.0V               |
| Voltage at all Input/Output pins .....       | GND – 0.3V to 5.5V |
| Storage temperature.....                     | -65°C to +150°C    |
| Ambient temperature with power applied ..... | -55°C to +125°C    |
| Junction Temperature (T <sub>j</sub> ) ..... | 150°C              |
| ESD Protection on all Pins (HBM:MM) .....    | (4kV:400V)         |
| Latch-up current at each pin .....           | ±200 mA            |

## Pin Description

### Serial Data Pin (SDA)

SDA is a bidirectional input/output pin, used to serially transmit data to and from the host controller. This pin requires a pull-up resistor to output data.

### Serial Clock Pin (SCL)

SCL is a clock input pin. All communication and timing is relative to the signal on this pin. The clock is generated by the host controller on the bus.

### ALERT Output

The TCN75A's ALERT pin is an open-drain output. The device outputs an alert signal when the ambient temperature goes beyond the user-programmed temperature limit.



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## **Power supply Input (VDD)**

VDD is the power pin. The operating voltage is between 2.7Vdc and 5.5Vdc.

## **Ground (GND)**

This is the system ground pin

## Serial Interface

### **Address**

The address of the device (1001xxx) must be set by the user by placing or removing Jumper J2(A2), J3(A1) and J4(A0). The address pins are the least significant bits of the address. The most significant bits are set at the factory to 1001. The pins are all pulled high, a logical 1. Placing a jumper pulls the pin low, making it a logical 0.

For additional information about the performance of the temperature sensor and for the registers please see Microchips TCN75A datasheet.

## Revision History

| NR | New Release |
|----|-------------|
|    |             |
|    |             |