USB-C Temperature Sensor

1.1 Description

A compact board for measuring ambient temperature with a digital sensor.



Assembly view

1.2 Device specifications

Parameter	Specification
Measurement	Ambient temperature
Sensor output	Signed 12-bit temperature in default mode
Sensor bus	I²C, 7-bit address 0x48
PCB dimensions	18 × 24 mm
Mounting holes	2 × Ø2.2 mm for M2 screws; 10 mm center spacing

1.3 Using the board

Place the sensor end near an opening, away from the USB connector and other heat sources. Air circulation and heat conducted through a mount can affect the reading. Compare the assembled enclosure with a reference thermometer before using it for calibrated measurements.

Device guide

2 Protocol reference

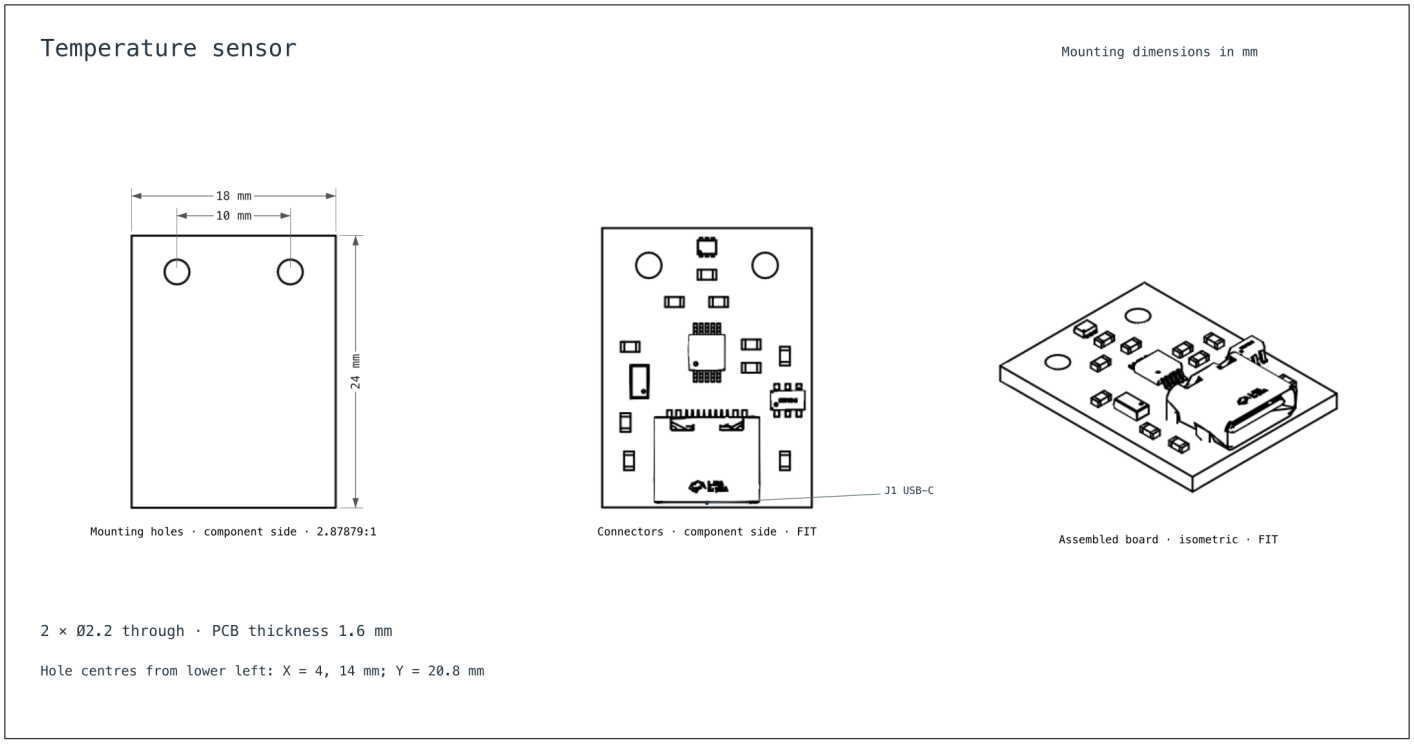
I²C · 7-bit address `0x48`. This prototype has no published USB command set. The table describes the interface on the PCB.

Operation	Request or signal	Result
Select temperature	Write register pointer `0x00`.	Selects the temperature register.
Read temperature	Read two bytes, most significant first.	The upper 12 bits contain a signed two’s-complement value in default mode.

Multiply the signed value by 0.0625 °C. For example, `19 00` in hexadecimal gives 400 counts, or 25 °C.

3 Mechanical information

3.1 Assembly and mounting



Component-side plan and isometric assembly. Dimensions in millimeters.

3.2 Installation dimensions

The PCB measures **18 × 24 mm**, with **2 × Ø2.2 mm** clearance holes for M2 screws. The centre-to-centre spacing is **10 mm**. Orient the component side with the **J1 USB-C port at the bottom**. Measure right and up from the **lower-left corner of the PCB** in the component-side view. The hole centres are at X = 4, 14 mm and Y = 20.8 mm.

Modeled component height: approximately 3.3 mm above the component-side PCB surface.

3.3 Design resources

Device guide · **Full-size mounting drawing** · **Drawing TSX** · **PCB source**