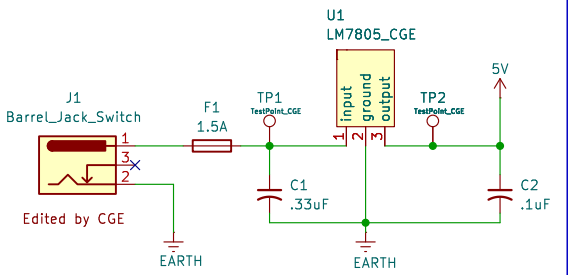
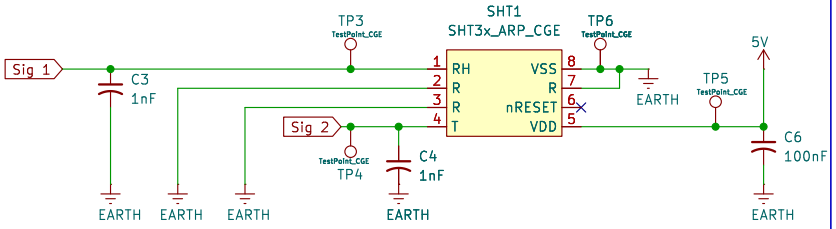
9V DC to 5V Regulated Supply



9 V DC input from barrel jack (J1) is protected by a 1.5 A fuse (F1)
The LM7805 regulator (U1) converts 9 V to a stable 5 V output
C1 (33 µF) and C2 (1 µF) for input/output filtering
EARTH net is the common ground reference

SHT31–ARP–B Humidity and Temperature Sensor

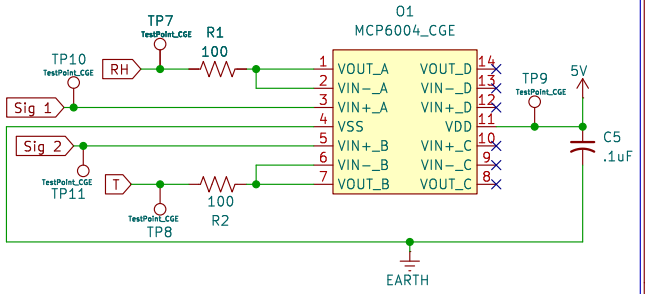


SHT31–ARP–B Humidity and Temperature Sensor is expected to output 10% of VDD up to 90% of VDD for both Signal 1 [Relative Humidity (RH) pin] and Signal 2 [Temperature (T) pin]

VDD: 5V

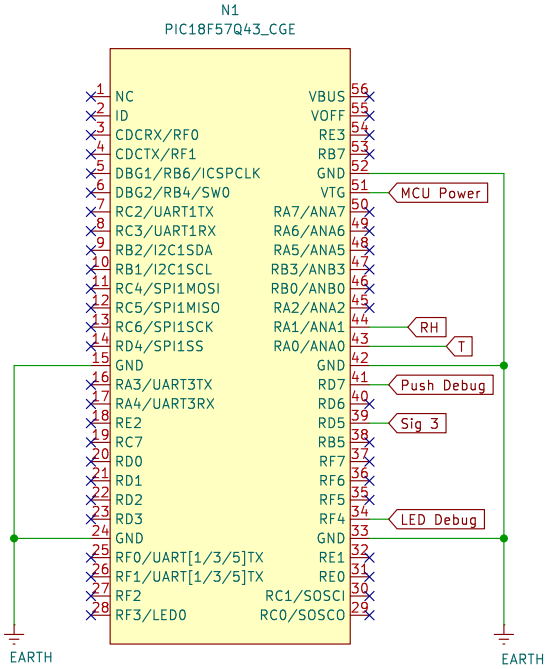
RH pin voltage output range: 0.5 V – 4.5 V for 0 – 100 % RH
T pin voltage output range: ~0.77 V – ~4.34 V for −40 °C – +125 °C

Op–Amp Buffer Circuit for SHT31 Outputs



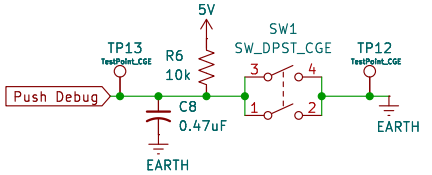
RH (Signal 1) and T (Signal 2) output is buffered by MCP6004
unity–gain op–amps (5 V supply, 2 of 4 op amps used) with ~100 Ω output
isolation to the PIC ADC; 0.1 µF decoupling capacitor placed between VDD and VSS

Microchip PIC18F57Q43 Curiosity Nano



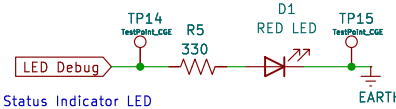
PIC18F57Q43 MCU – Receives analog inputs (T, RH), debug input (Push Debug), and drives LED Debug and Sig 3 alert output.
Powered via VTG with local decoupling

MCU Debug Pushbutton Input



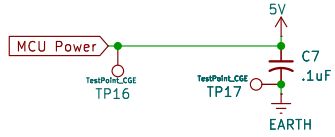
Push Debug Input (to RD7)
Includes pull–up resistor R6 (10 kΩ) to hold RD7 HIGH
Pressing the switch connects the input to GND (logic LOW)
Hardware–debounced using C8 (0.47 µF)
Intended for triggering or testing MCU debug functions

Status Indicator



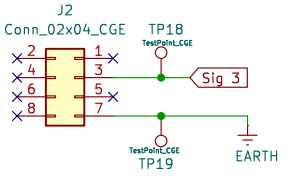
Status Indicator LED
Connected to MCU pin (RF3)
Indicates system activity or status

MCU Power Supply



MCU receives its operating power through this pin
0.1 µF bypass capacitor at VTG (VDD)
EARTH net is tied to MCU ground (GND)

8–pin header (Team Connector)



Sig 3 is digital output from the PIC18F57Q43 to 8–pin team connector
Pin 3 in the team connector connects to the subsystem that will trigger an alarm when Humidtiy threshold is met

General Notes for Subsystem Schematic Design: Humidity & Temperature Sensor

* Note: All resistors are ¼ W unless otherwise specified

Cristopher Gutierrez Team 208

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Title: Subsystem Schematic Design: Humidity & Temperature Sensor

Size: A4	Date: 2025–10–25	**Rev: 3.0**
KiCad E.D.A. 9.0.4		Id: 1/1