SHPI.zero lite prototype

Functional schematic / population overview

Functional net names and modular circuit groups

Populated circuit at the front / non-populated options at the back

Raspberry Pi Zero / DPI / reset / touch

Sheet 02 | 26 components

Display / connector / charge pumps

Sheet 03 | 21 components

Supply / panel connections / protection

Sheet 04 | 15 components

AL3050 / backlight

Sheet 05 | 7 components

I2C level / climate / light

Sheet 06 | 19 components

Motion / PIR / infrared temperature

Sheet 07 | 11 components

ADS1015 / NTC / analog options

Sheet 08 | 6 components

RGB LED / data / expansion

Sheet 09 | 4 components

Fan / low-side switch / filter

Sheet 10 | 9 components

USB audio / HS100B / USB connection

Sheet 11 | 11 components

Audio power amplifier / speaker / microphone

Sheet 12 | 14 components

DNP / Raspberry Pi Zero / DPI / reset / touch

Sheet 13 | 2 components

DNP / I2C level shifter / climate / light

Sheet 14 | 2 components

DNP / ADS1015 / NTC / Analog options

Sheet 15 | 2 components

DNP / Audio power amplifier / speaker / microphone

Sheet 16 | 4 components

Identical global net names connect the functional sheets.

Non-populated options are marked with DNP and a cross.

SHPI

Sheet: /
File: SHPI-zero-lite-prototype.kicad_sch

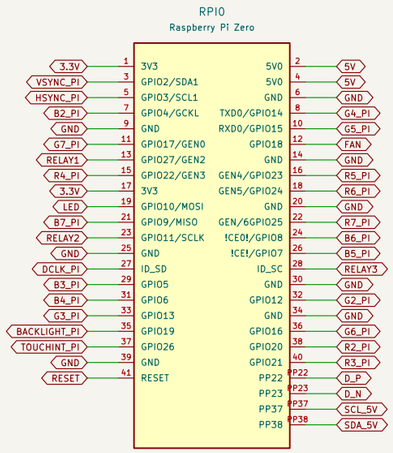
Title: SHPI.zero lite prototype / Function overview

Size: A3	Date: 2026-11-08	**Rev: R1**
KiCad E.D.A. 10.0.6		Id: 1/16

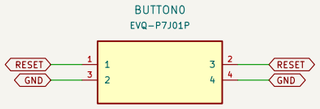
Raspberry Pi Zero / DPI / reset / touch

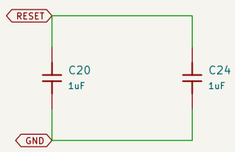
Raspberry Pi module, DPI pin assignment, system reset and touch interrupt.

Raspberry Pi Zero

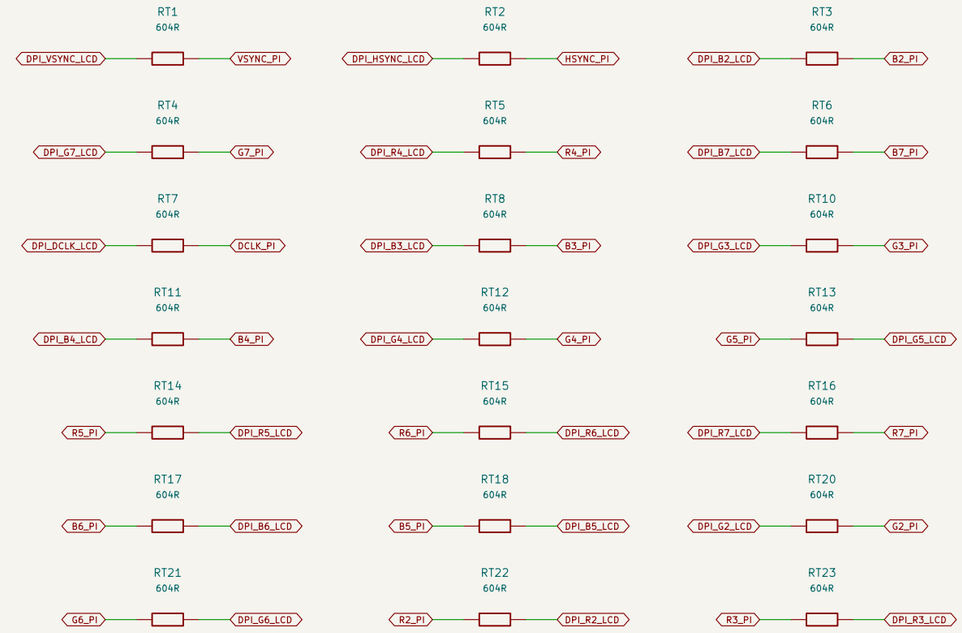


System reset / push button





DPI series components / production nets



Touch interrupt / production bridge



SHPI.zero lite prototype | Functional schematic

SHPI

Sheet: /Raspberry Pi Zero / DPI / reset / touch/
File: 01_Raspberry_Pi.kicad_sch

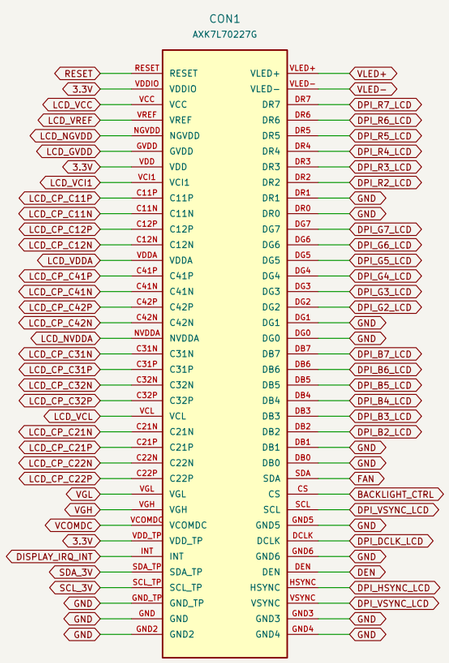
Title: SHPI.zero lite prototype / Raspberry Pi

Size: A3	Date: 2026-11-08	**Rev: R1**
KiCad E.D.A. 10.0.6		Id: 2/16

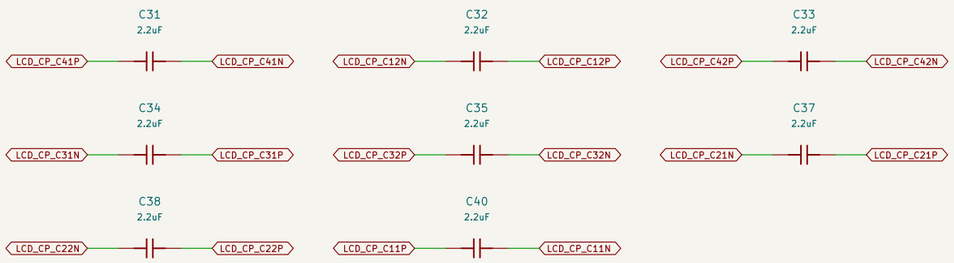
Display / connector / charge pumps

Display connector with eight pump capacitors and separate local supply nodes.

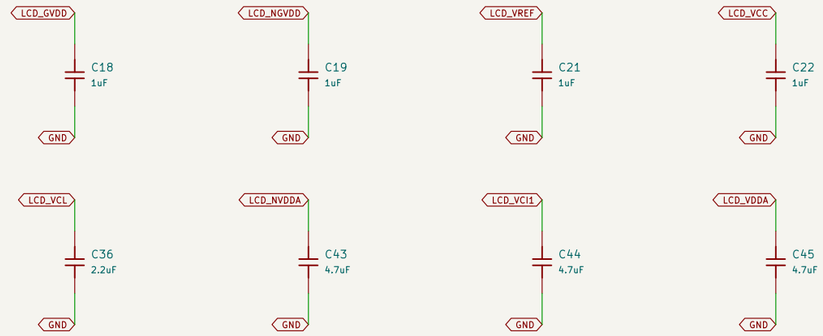
Display/touch connector



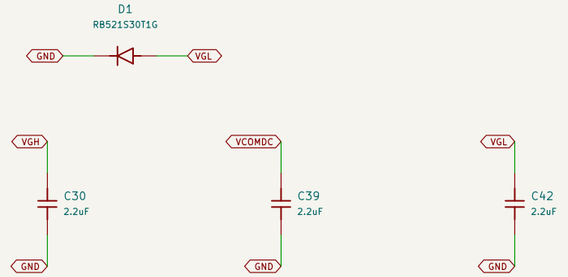
Display charge pumps



Local display supplies



VGH / VGL / VCOMDC



SHPI.zero lite prototype | Functional schematic

SHPI

Sheet: /Display / connector / charge pumps/
File: 02_Display_Connector.kicad_sch

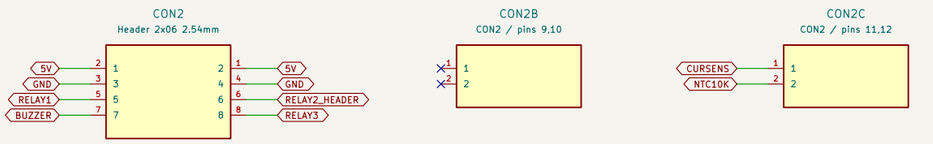
Title: SHPI.zero lite prototype / Display Connector

Size: A3	Date: 2026-11-08	**Rev: R1**
KiCad E.D.A. 10.0.6		Id: 3/16

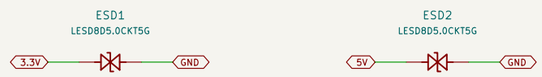
Supply / panel connections / protection

Common connection field for supply, relays, analog signals and PCB contact options.

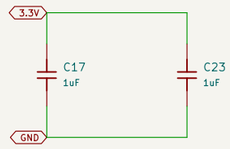
Common panel CON2 / CON2B / CON2C



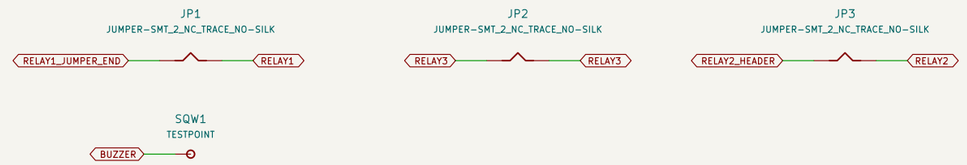
Supply protection



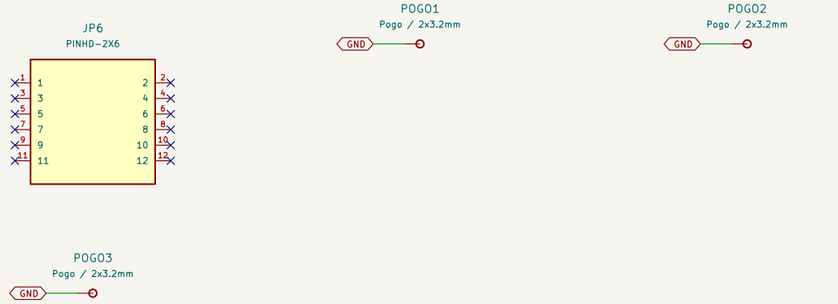
Common 3.3V decoupling



Relay header jumper / BUZZER test contact



Ground pogo contacts / alternative pin header



SHPI.zero lite prototype | Functional schematic

SHPI

Sheet: /Supply / panel connections / protection/
File: 03_Power_Panel.kicad_sch

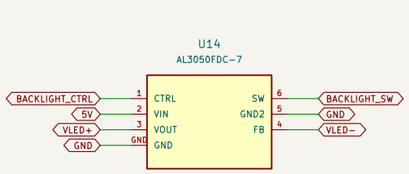
Title: SHPI.zero lite prototype / Power Panel

Size: A3	Date: 2026-11-08	**Rev: R1**
KiCad E.D.A. 10.0.6		Id: 4/16

AL3050 / backlight

Backlight driver with switching node, current feedback and control line.

AL3050 switching branch











Backlight control





SHPI.zero lite prototype | Functional schematic

SHPI

Sheet: /AL3050 / backlight/
File: 04_Backlight.kicad_sch

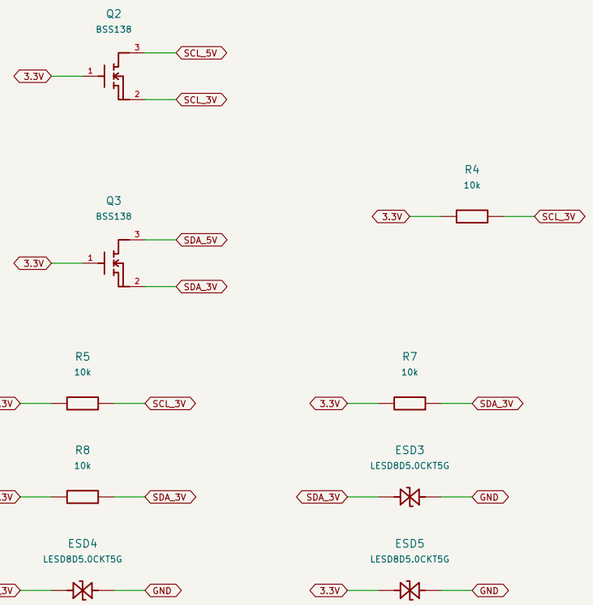
Title: SHPI.zero lite prototype / Backlight

Size: A3	Date: 2026-11-08	**Rev: R1**
KiCad E.D.A. 10.0.6		Id: 5/16

I2C level / climate / light

I2C level conversion, BMP/BME, humidity and light sensors, address and reset.

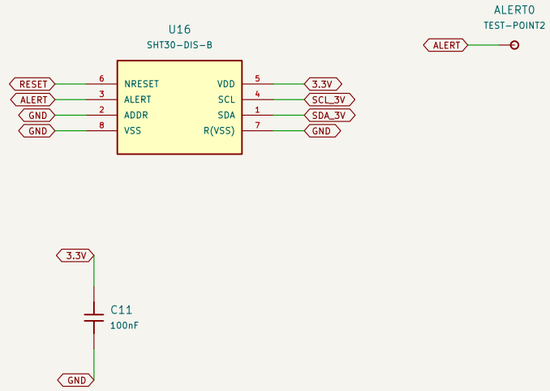
I2C 5V / 3.3V / protection



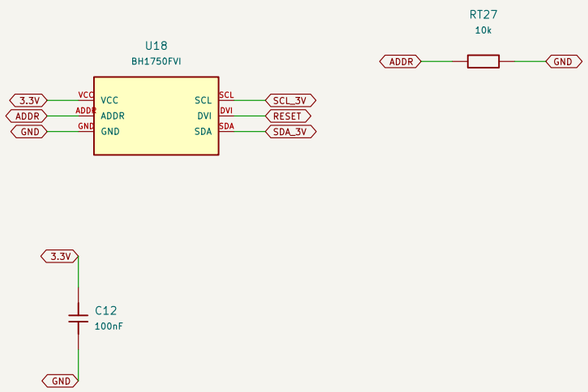
BME680 option



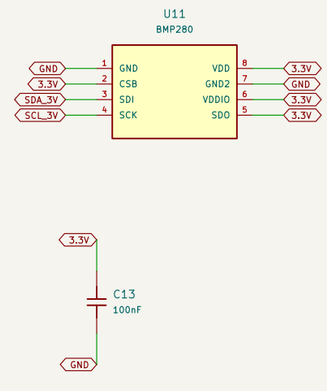
SHT30 / Reset / ALERT



BH1750 / address



BMP280 / BME280 position



HTU21D alternative / 3.3V decoupling



SHPI.zero lite prototype | Functional schematic

SHPI

Sheet: /I2C level / climate / light/
File: 05_I2C_Climate_Light.kicad_sch

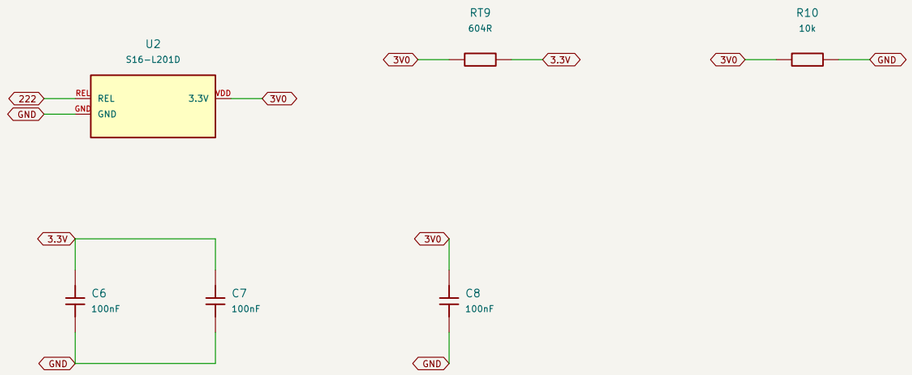
Title: SHPI.zero lite prototype / I2C Climate Light

Size: A3	Date: 2026-11-08	**Rev: R1**
KiCad E.D.A. 10.0.6		Id: 6/16

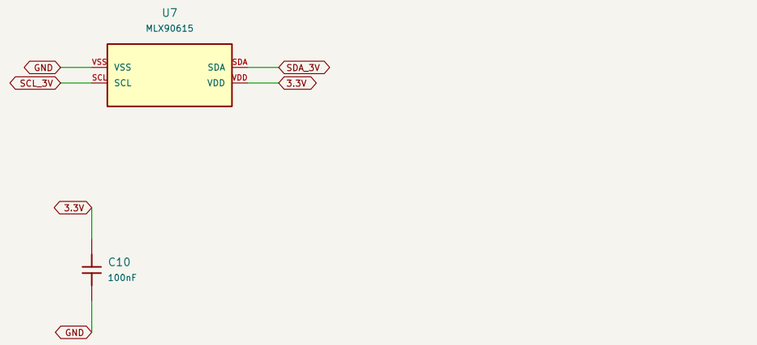
Motion / PIR / infrared temperature

PIR supply and output selection as well as contactless temperature measurement.

S16-L201D PIR / local supply



MLX90615 temperature



PIR / LED / touch output selection

SHPI.zero lite prototype | Functional schematic

SHPI

Sheet: /Motion / PIR / infrared temperature/
File: 06_Motion_Temperature.kicad_sch

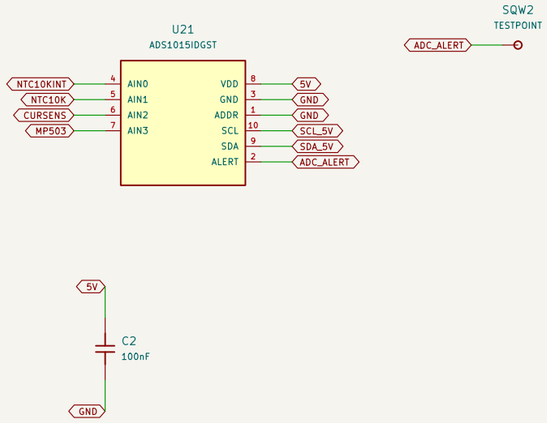
Title: SHPI.zero lite prototype / Motion Temperature

Size: A3	Date: 2026-11-08	**Rev: R1**
KiCad E.D.A. 10.0.6		Id: 7/16

ADS1015 / NTC / analog options

Four ADC inputs, ALERT test pad and the analog sensor branches.

ADS1015 / supply / ALERT



NTC / external measurement input



TGS2600 / MP503 option



SHPI.zero lite prototype | Functional schematic

SHPI

Sheet: /ADS1015 / NTC / analog options/
File: 07_ADC_Analog.kicad_sch

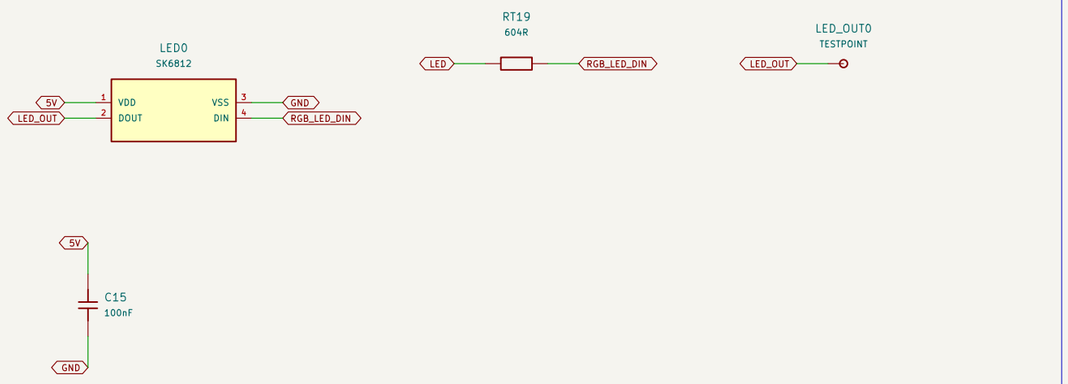
Title: SHPI.zero lite prototype / ADC Analog

Size: A3	Date: 2026-11-08	**Rev: R1**
KiCad E.D.A. 10.0.6		Id: 8/16

RGB LED / data / expansion

Digital RGB LED with data termination and output test pad.

SK6812 RGB LED



SHPI.zero lite prototype | Functional schematic

SHPI

Sheet: /RGB LED / data / expansion/
File: 08_RGB_LED.kicad_sch

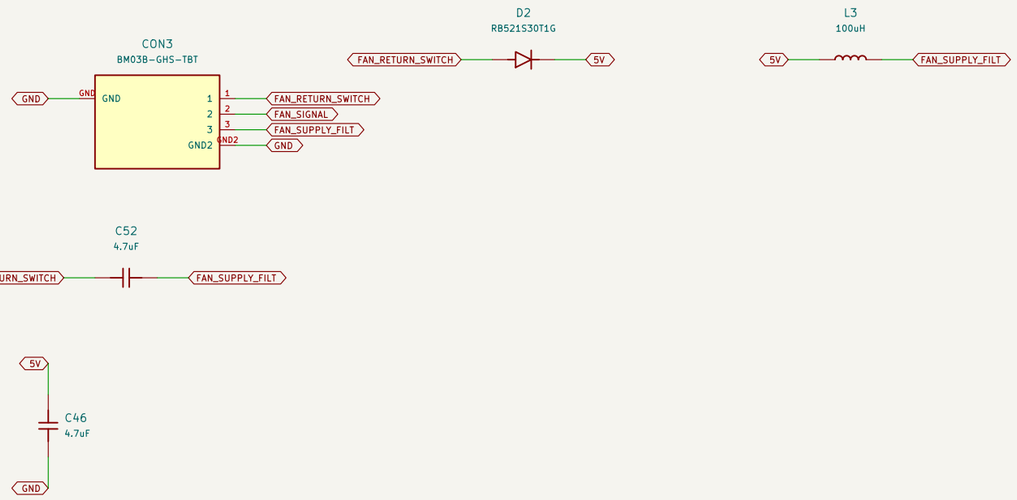
Title: SHPI.zero lite prototype / RGB LED

Size: A3	Date: 2026-11-08	**Rev: R1**
KiCad E.D.A. 10.0.6		Id: 9/16

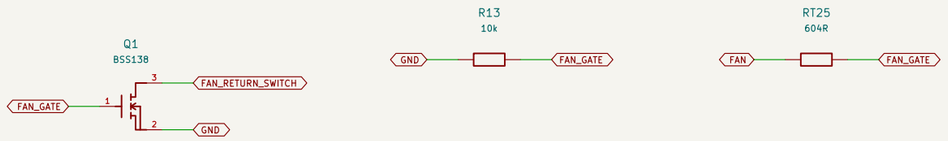
Fan / low-side switch / filter

Fan connector with filtered supply and separately switched return conductor.

Fan connector / supply / freewheeling



Gate drive / switch



Feedback test pad



SHPI.zero lite prototype | Functional schematic

SHPI

Sheet: /Fan / low-side switch / filter/
File: 09_Fan.kicad_sch

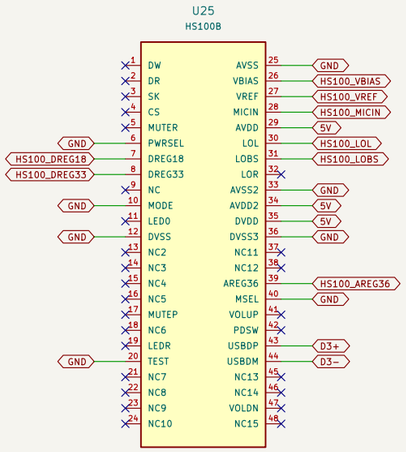
Title: SHPI.zero lite prototype / Fan

Size: A3	Date: 2026-11-08	**Rev: R1**
KiCad E.D.A. 10.0.6		Id: 10/16

USB audio / HS100B / USB connection

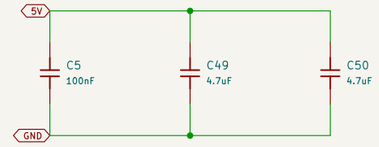
HS100B codec, local regulator/reference branches and USB jumpers to the Raspberry Pi.

HS100B codec / local regulators

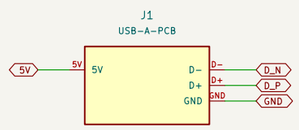




HS100B 5V decoupling



USB to Raspberry Pi / PCB contacts







SHPI.zero lite prototype | Functional schematic

SHPI

Sheet: /USB audio / HS100B / USB connection/
File: 10_USB_Audio.kicad_sch

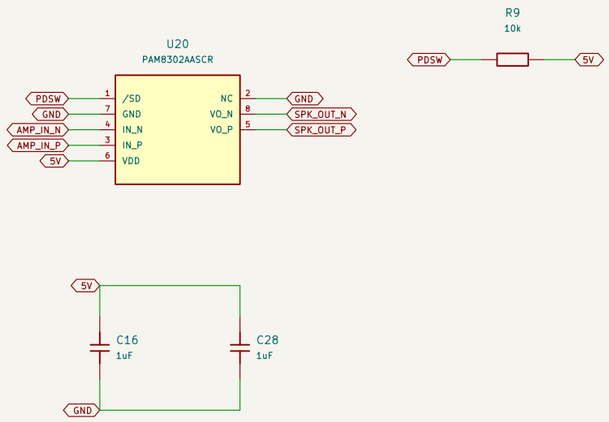
Title: SHPI.zero lite prototype / USB Audio

Size: A3	Date: 2026-11-08	**Rev: R1**
KiCad E.D.A. 10.0.6		Id: 11/16

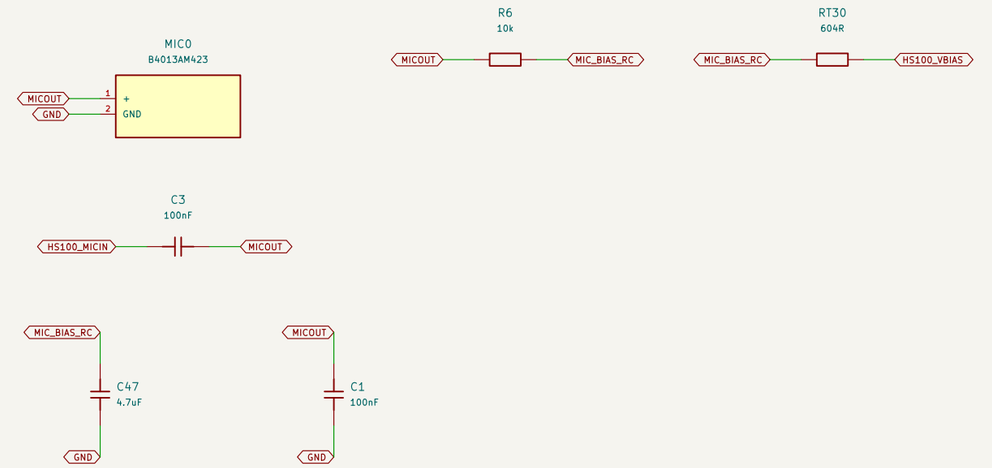
Audio power amplifier / speaker / microphone

PAM8302A, differential output coupling and Goertek microphone with bias branch.

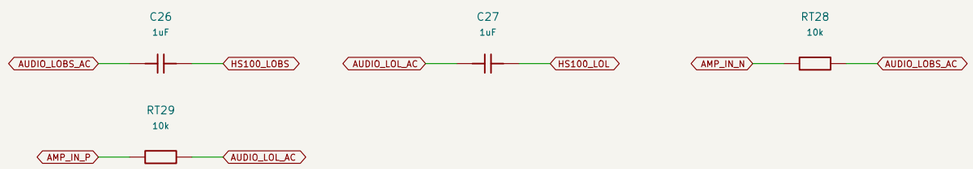
PAM8302A output stage / enable



Goertek microphone / bias / coupling



Codec coupling / input resistors



SHPI.zero lite prototype | Functional schematic

SHPI

Sheet: /Audio power amplifier / speaker / microphone/
File: 11_Audio_Analog.kicad_sch

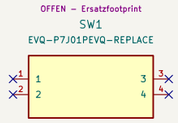
Title: SHPI.zero lite prototype / Audio Analog

Size: A3	Date: 2026-11-08	**Rev: R1**
KiCad E.D.A. 10.0.6		Id: 12/16

DNP / Options: Raspberry Pi Zero / DPI / reset / touch

DNP = not populated (option).

Alternative push button pad



Touch interrupt / production bridge



SHPI.zero lite prototype | Functional schematic

SHPI

Sheet: /DNP / Options: Raspberry Pi Zero / DPI / reset / touch/
File: DNP_01_Raspberry_Pi.kicad_sch

Title: SHPI.zero lite prototype / DNP: Raspberry Pi

Size: A3	Date: 2026-11-08	**Rev: R1**
KiCad E.D.A. 10.0.6		Id: 13/16

DNP / Options: I2C level shifter / climate / light

DNP = not populated (option).

BME680 option



HTU21D alternative / 3.3V decoupling



SHPI.zero lite prototype | Functional schematic

SHPI

Sheet: /DNP / Options: I2C level shifter / climate / light/
File: DNP_05_I2C_Climate_Light.kicad_sch

Title: SHPI.zero lite prototype / DNP: I2C Climate Light

Size: A3	Date: 2026-11-08	**Rev: R1**
KiCad E.D.A. 10.0.6		Id: 14/16

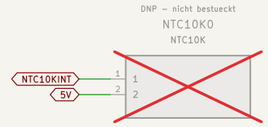
DNP / Options: ADS1015 / NTC / Analog options

DNP = not populated (option).

TGS2600 / MP503 option



NTC / external measurement input



SHPI.zero lite prototype | Functional schematic

SHPI

Sheet: /DNP / Options: ADS1015 / NTC / Analog options/
File: DNP_07_ADC_Analog.kicad_sch

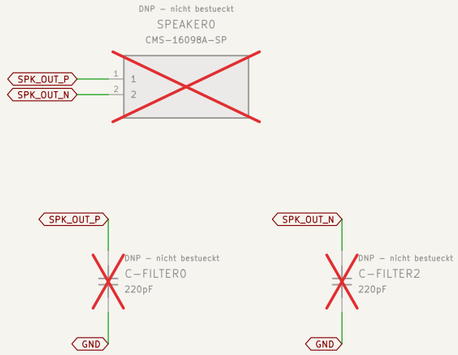
Title: SHPI.zero lite prototype / DNP: ADC Analog

Size: A3	Date: 2026-11-08	**Rev: R1**
KiCad E.D.A. 10.0.6		Id: 15/16

DNP / Options: Audio power amplifier / speaker / microphone

DNP = not populated (option).

Speaker / output capacitors



Codec coupling / input resistors



SHPI.zero lite prototype | Functional schematic

SHPI

Sheet: /DNP / Options: Audio power amplifier / speaker / microphone/
File: DNP_11_Audio_Analog.kicad_sch

Title: SHPI.zero lite prototype / DNP: Audio Analog

Size: A3	Date: 2026-11-08	**Rev: R1**
KiCad E.D.A. 10.0.6		Id: 16/16