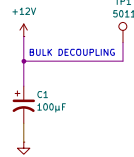


TVS: PLACE AS CLOSE
AS POSSIBLE TO
EXTERNAL 12V SOURCE



SECONDARY CONNECTOR: DAISY-CHAIN CAN DEVICES

Diagram illustrating the output stages for A2, A6, A9, and A12:

- A2_OUTPUT_STAGE:** OUT_PIN_A2D → OUT_PIN
- A6_OUTPUT_STAGE:** OUT_PIN_A6D → OUT_PIN
- A9_OUTPUT_STAGE:** OUT_PIN_A9D → OUT_PIN
- A12_OUTPUT_STAGE:** OUT_PIN_A12D → OUT_PIN

The diagram illustrates the input stages for a double-throw switch. It consists of 10 input stages, each represented by a yellow rectangle with a red border. Each stage has an input labeled 'IN_PIND' and an output labeled 'IN_PIN_B' followed by a number (1 through 10). The stages are arranged in two columns of five. A central text block indicates 'TANDEM INPUTS: FOR DOUBLE-THROW SWITCH CONNECTIONS'.

Input Stages:

- B1_INPUT_STAGE: IN_PIND → IN_PIN_B1
- B2_INPUT_STAGE: IN_PIND → IN_PIN_B2
- B10_INPUT_STAGE: IN_PIND → IN_PIN_B10
- B13_INPUT_STAGE: IN_PIND → IN_PIN_B13
- B14_INPUT_STAGE: IN_PIND → IN_PIN_B14
- B9_INPUT_STAGE: IN_PIND → IN_PIN_B9
- B8_INPUT_STAGE: IN_PIND → IN_PIN_B8
- B7_INPUT_STAGE: IN_PIND → IN_PIN_B7
- B11_B12_INPUT_STAGE: IN_PIN_0C → IN_PIN_B11, IN_PIN_1C → IN_PIN_B12
- B5_B6_INPUT_STAGE: IN_PIN_0C → IN_PIN_B5, IN_PIN_1C → IN_PIN_B6

TANDEM INPUTS: FOR DOUBLE-THROW SWITCH CONNECTIONS

The schematic diagram illustrates the STM32G081CxTx evaluation board. The central component is the STM32G081CxTx microcontroller (U1). The board includes a +3.3V power supply, a VREF+ pin, and a VDD pin. The microcontroller's pins are labeled with their functions: PD1, PD0, PD3, PA14-SWCLK, PA13-SWDIO, PF0-XIN, PF1-XOUT, PF2-NRST, IN_PIN_B1D through IN_PIN_B9D, and PA12 through PA1. External components include capacitors C3 (12pF), C4 (12pF), C5 (10µF), C6 (100nF), C7 (100nF), and an external crystal Y1 (32MHz). A reset button (SW1) is connected to the NRST pin. The board also features a CAN interface (CAN_TX, CAN_RX, CAN_STANDBY) and a USB interface (SWCLK, SWDIO, RESET).

3.3V

C14 10µF

C15 100nF

CAN_TX

CAN_RX

CAN_STANDBY

R4 10kΩ

TXD

RXD

STBY

VDD

VSS

CANH

CANL

R3 120Ω

OPTIONAL TERMINATION

U3 5N65HV02300R

SLOPE CONTROL: LET $10k\Omega < R4 < 100k\Omega$
 HIGH SPEED MODE: POPULATE $R4 < 10k\Omega$



Author: Bryce Mooney
<https://github.com/BryceMvt/STeering-wheel>
SolarCar at Virginia Tech

Sheet: /
File: STeering_wheel.kicad_sch

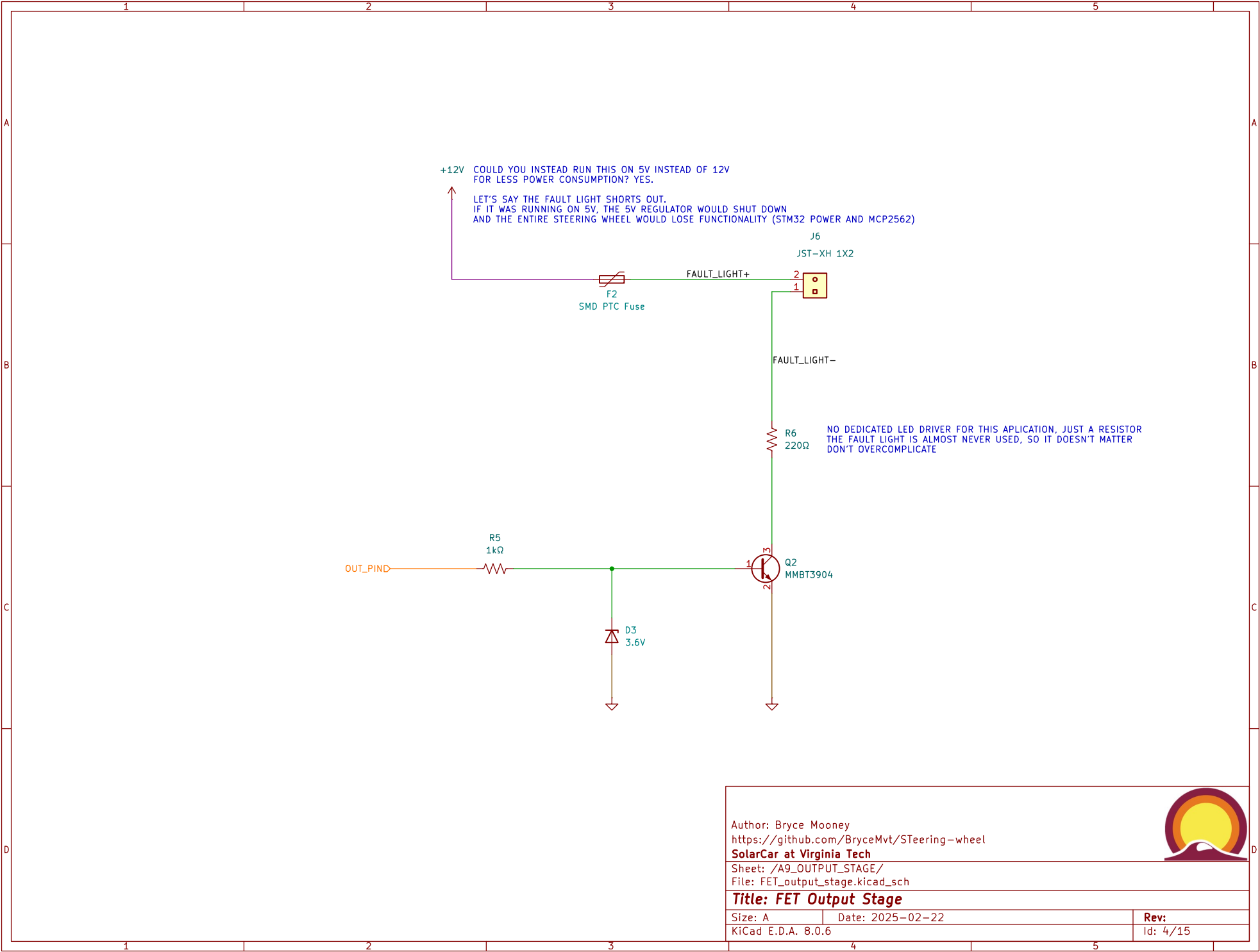
Title: Steering Wheel STM32 CAN Module

| | |
|---------|------------------|
| Size: B | Date: 2025-02-22 |
|---------|------------------|

KiCad E.D.A. 8.0.6

Date: 2025-02-22

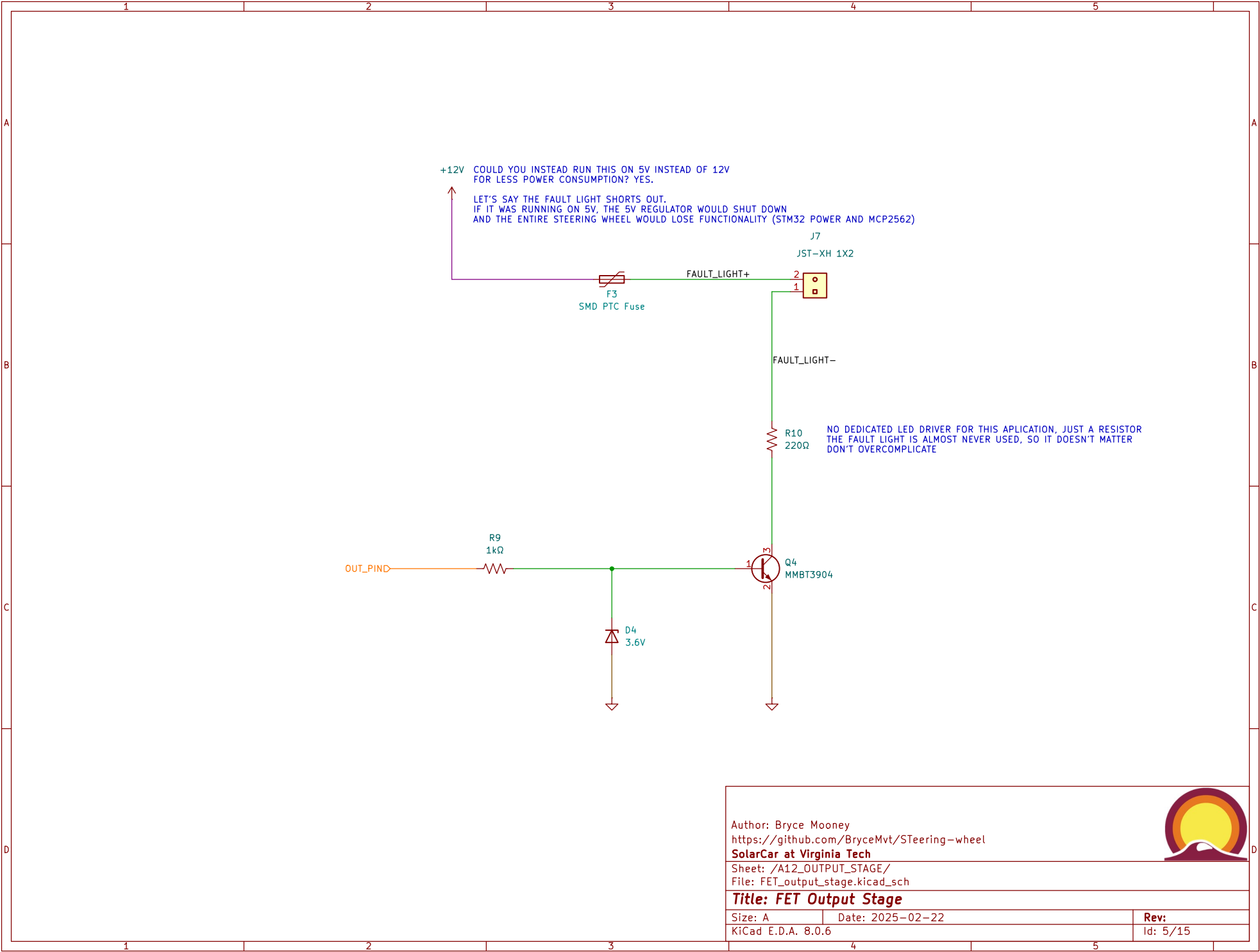
Rev: –
Id: 1/15



Author: Bryce Mooney
<https://github.com/BryceMvt/STeering-wheel>
SolarCar at Virginia Tech
Sheet: /A9_OUTPUT_STAGE/
File: FET_output_stage.kicad_sch



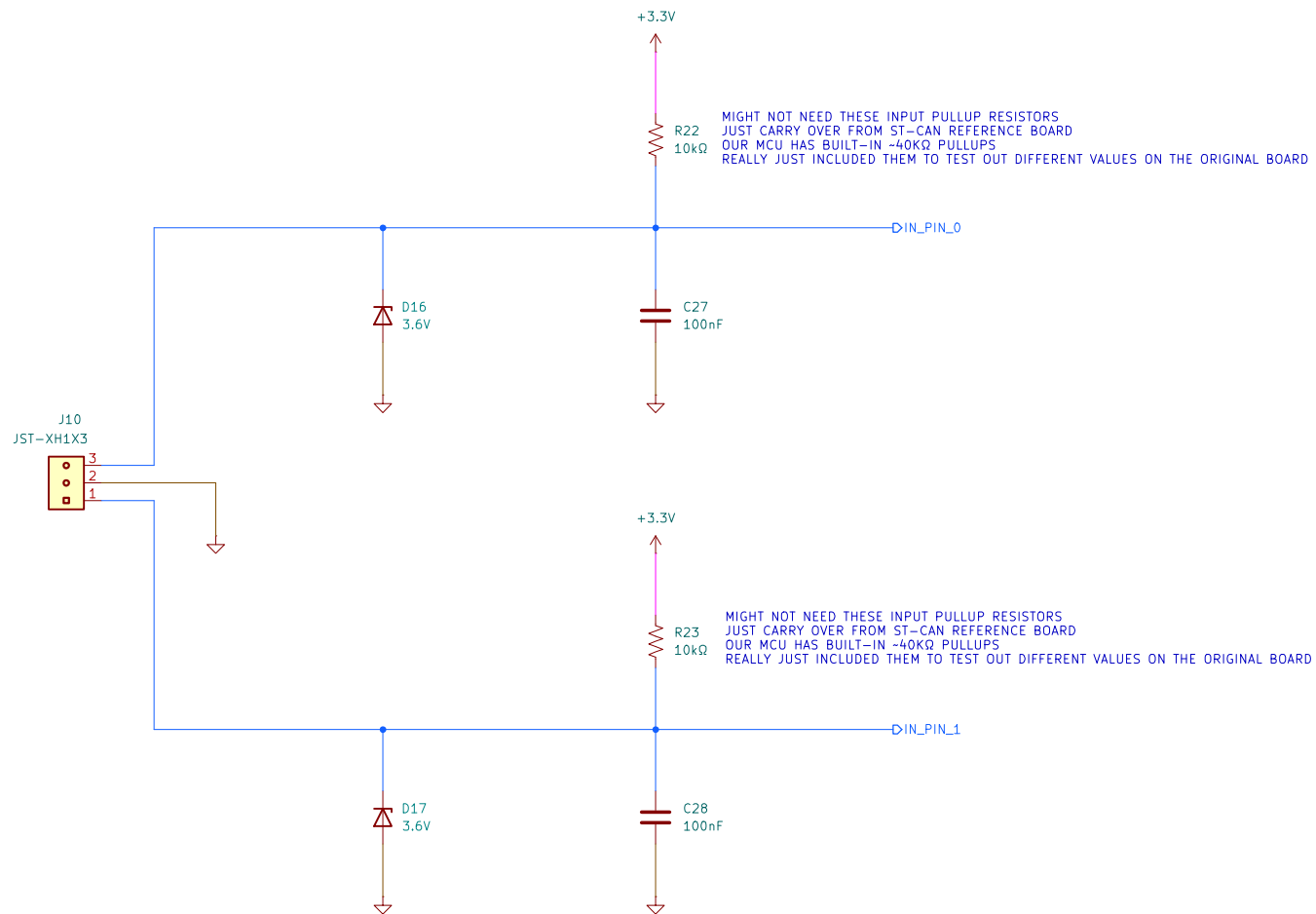
| | | |
|--------------------------------|------------------|----------|
| Title: FET Output Stage | | |
| Size: A | Date: 2025-02-22 | Rev: |
| KiCad E.D.A. 8.0.6 | | Id: 4/15 |



Author: Bryce Mooney
<https://github.com/BryceMvt/STeering-wheel>
SolarCar at Virginia Tech
Sheet: /A12_OUTPUT_STAGE/
File: FET_output_stage.kicad_sch



| | | |
|--------------------------------|------------------|----------|
| Title: FET Output Stage | | |
| Size: A | Date: 2025-02-22 | Rev: |
| KiCad E.D.A. 8.0.6 | | Id: 5/15 |



Author: Bryce Mooney
<https://github.com/BryceMvt/STeering-wheel>
SolarCar at Virginia Tech
 Sheet: /B5_B6_INPUT_STAGE/
 File: tandem_input_stage.kicad_sch



Title: Tandem Digital Input Stage

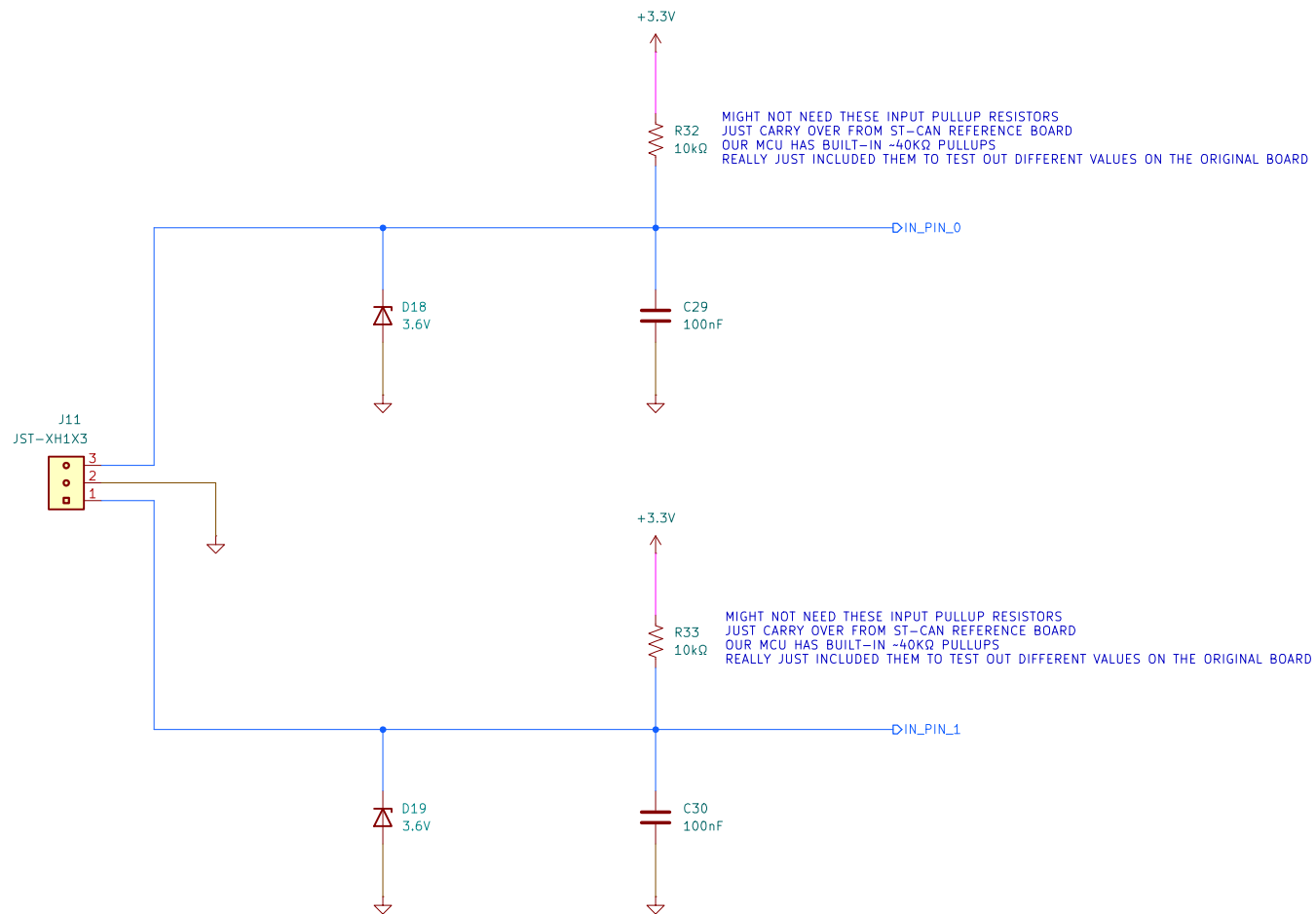
Size: A4

Date: 2025-02-22

Rev: —

KiCad E.D.A. 8.0.6

Id: 8/15

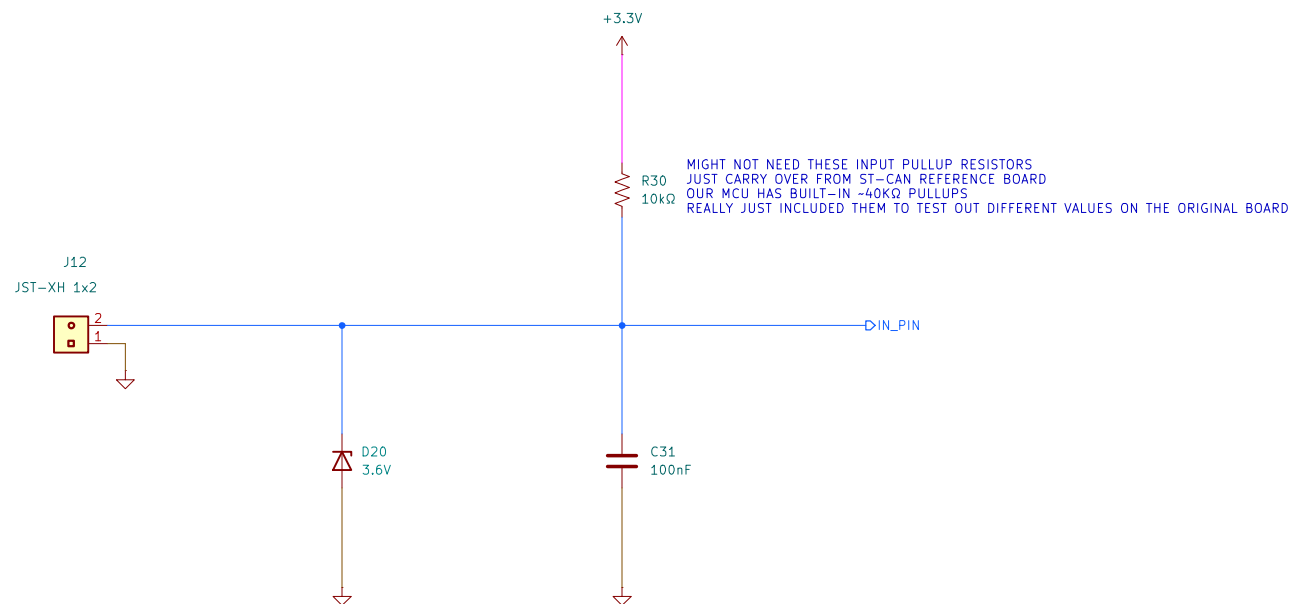


Author: Bryce Mooney
<https://github.com/BryceMvt/STeering-wheel>
SolarCar at Virginia Tech
 Sheet: /B11_B12_INPUT_STAGE/
 File: tandem_input_stage.kicad_sch



Title: Tandem Digital Input Stage

| | | |
|--------------------|------------------|----------|
| Size: A4 | Date: 2025-02-22 | Rev: — |
| KiCad E.D.A. 8.0.6 | | Id: 9/15 |



Author: Bryce Mooney
<https://github.com/BryceMvt/STeering-wheel>
SolarCar at Virginia Tech
 Sheet: /B2_INPUT_STAGE/
 File: input_stage.kicad_sch



Title: Digital Input Stage

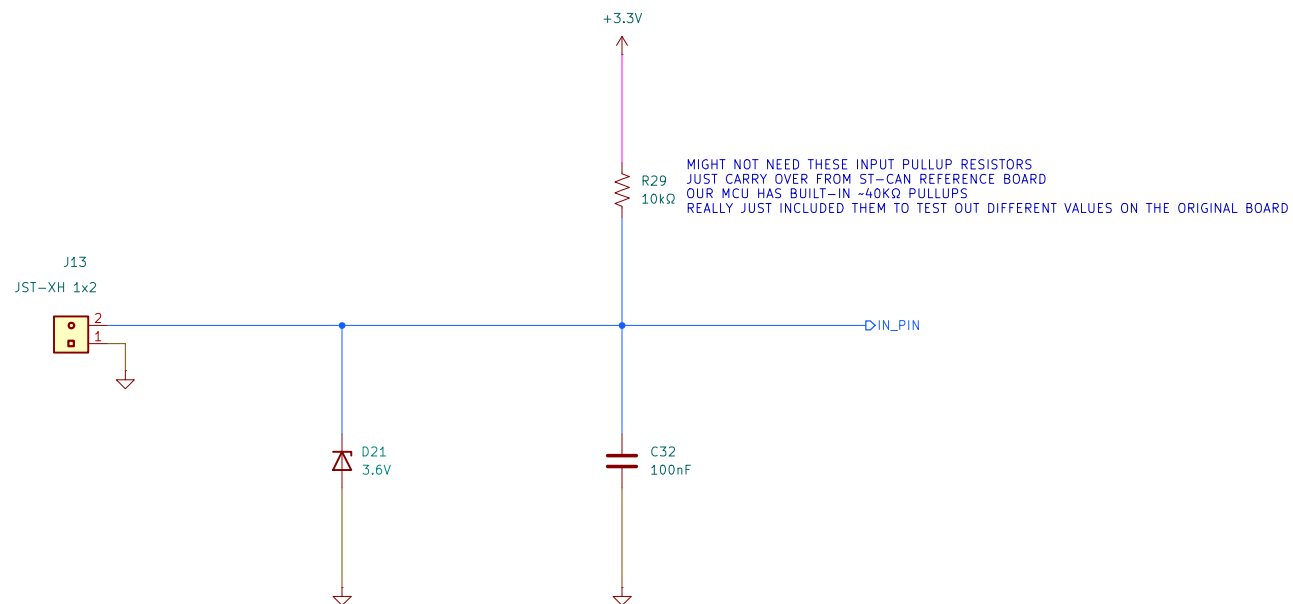
Size: A4

Date: 2025-02-22

Rev: —

KiCad E.D.A. 8.0.6

Id: 16/15



Author: Bryce Mooney
<https://github.com/BryceMvt/STeering-wheel>
SolarCar at Virginia Tech
 Sheet: /B1_INPUT_STAGE/
 File: input_stage.kicad_sch



Title: Digital Input Stage

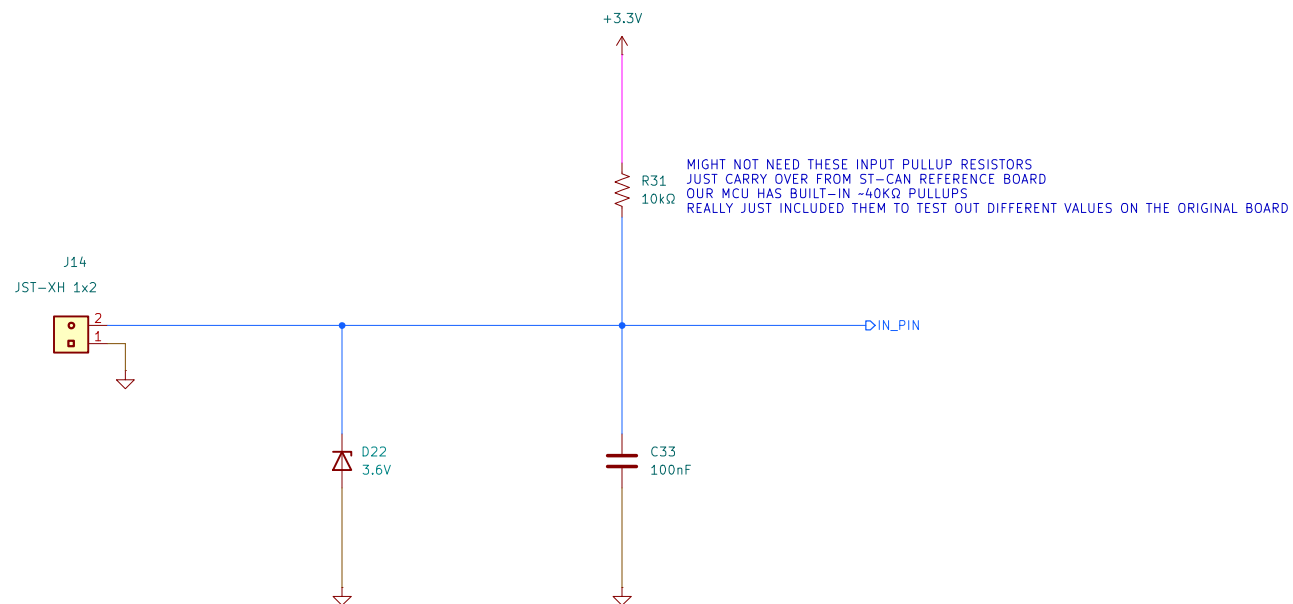
Size: A4

Date: 2025-02-22

Rev: —

KiCad E.D.A. 8.0.6

Id: 17/15



Author: Bryce Mooney
<https://github.com/BryceMvt/STeering-wheel>
SolarCar at Virginia Tech
 Sheet: /B10_INPUT_STAGE/
 File: input_stage.kicad_sch



Title: Digital Input Stage

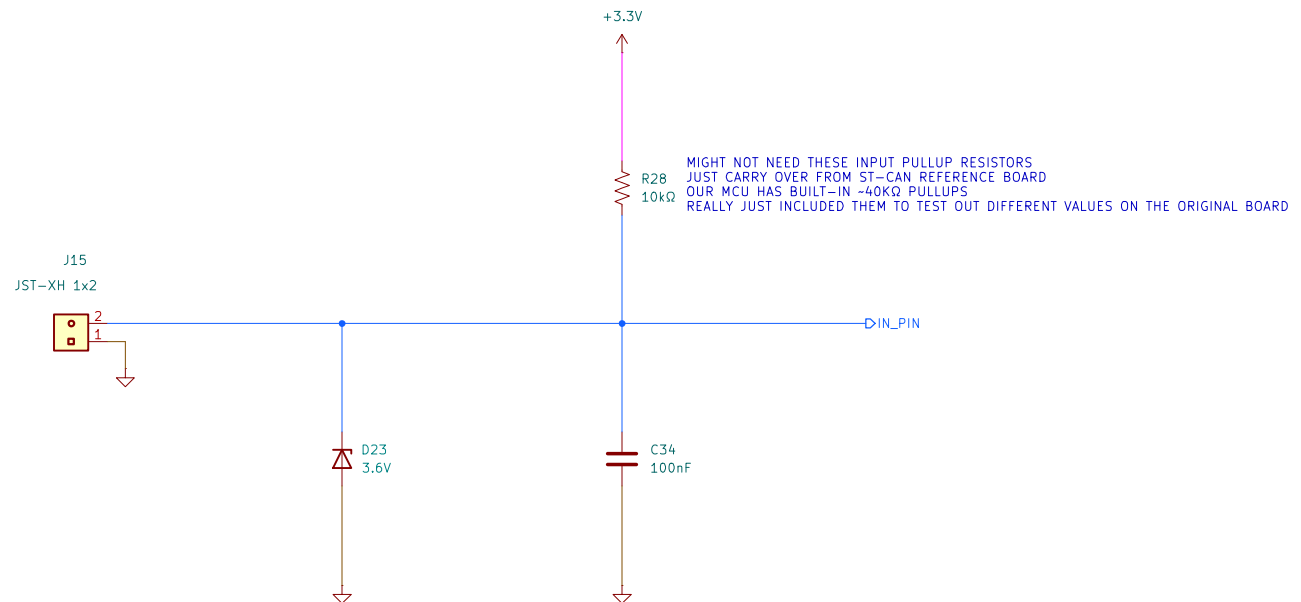
Size: A4

Date: 2025-02-22

Rev: —

KiCad E.D.A. 8.0.6

Id: 18/15



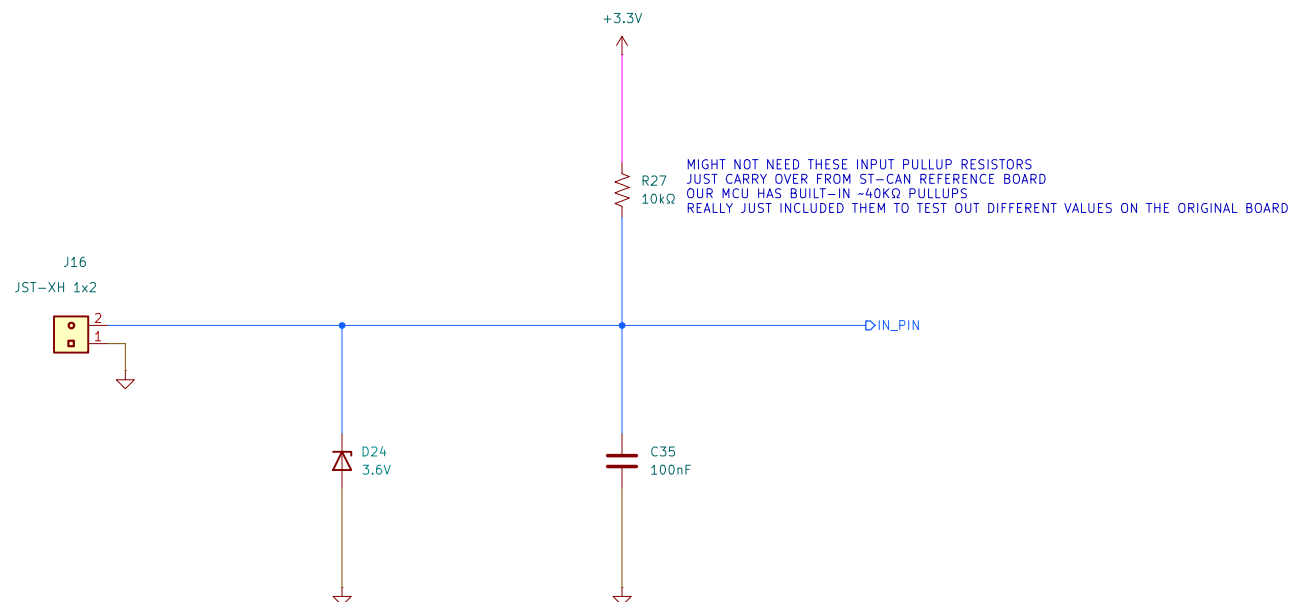
Author: Bryce Mooney
<https://github.com/BryceMvt/STeering-wheel>
SolarCar at Virginia Tech
 Sheet: /B13_INPUT_STAGE/
 File: input_stage.kicad_sch



Title: Digital Input Stage

Size: A4 Date: 2025-02-22
 KiCad E.D.A. 8.0.6

Rev: —
 Id: 19/15



Author: Bryce Mooney
<https://github.com/BryceMvt/STeering-wheel>
SolarCar at Virginia Tech
 Sheet: /B14_INPUT_STAGE/
 File: input_stage.kicad_sch



Title: Digital Input Stage

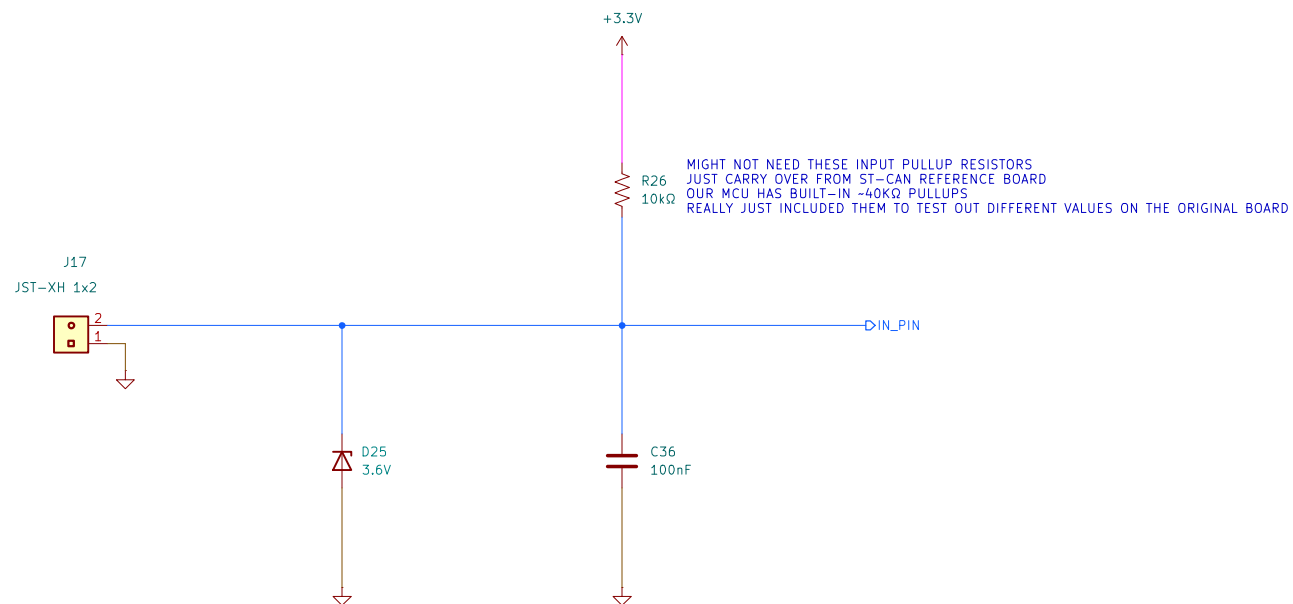
Size: A4

Date: 2025-02-22

Rev: —

KiCad E.D.A. 8.0.6

Id: 20/15

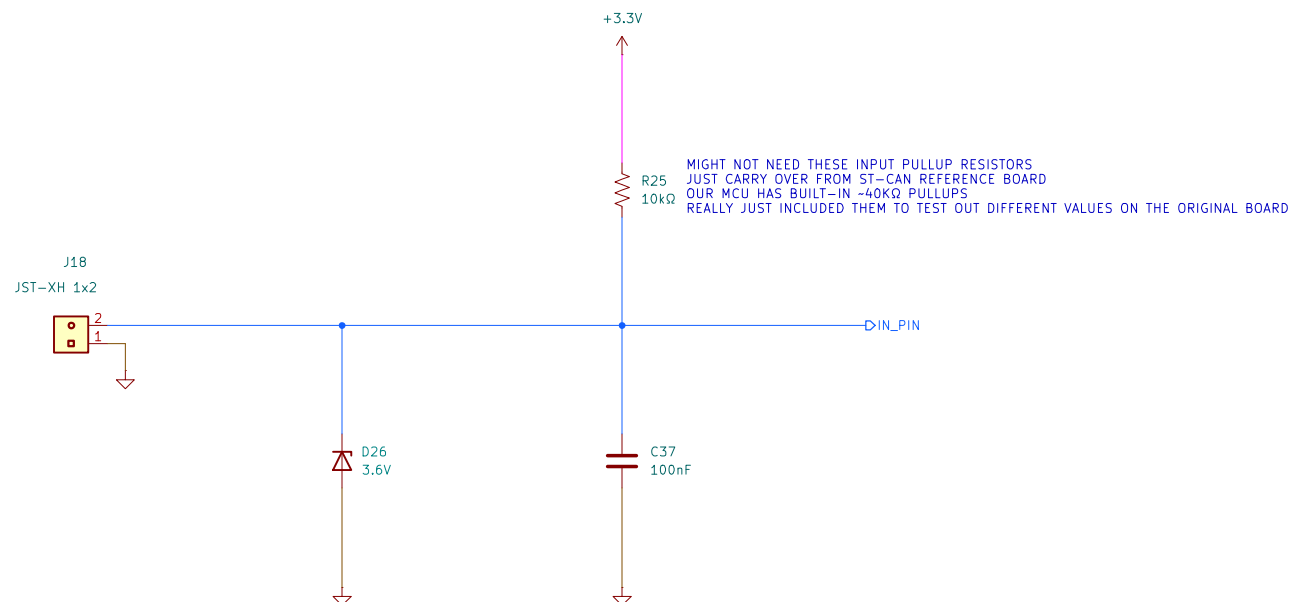


Author: Bryce Mooney
<https://github.com/BryceMvt/STeering-wheel>
SolarCar at Virginia Tech
 Sheet: /B9_INPUT_STAGE/
 File: input_stage.kicad_sch



Title: Digital Input Stage

| | | |
|--------------------|------------------|-----------|
| Size: A4 | Date: 2025-02-22 | Rev: — |
| KiCad E.D.A. 8.0.6 | | Id: 21/15 |

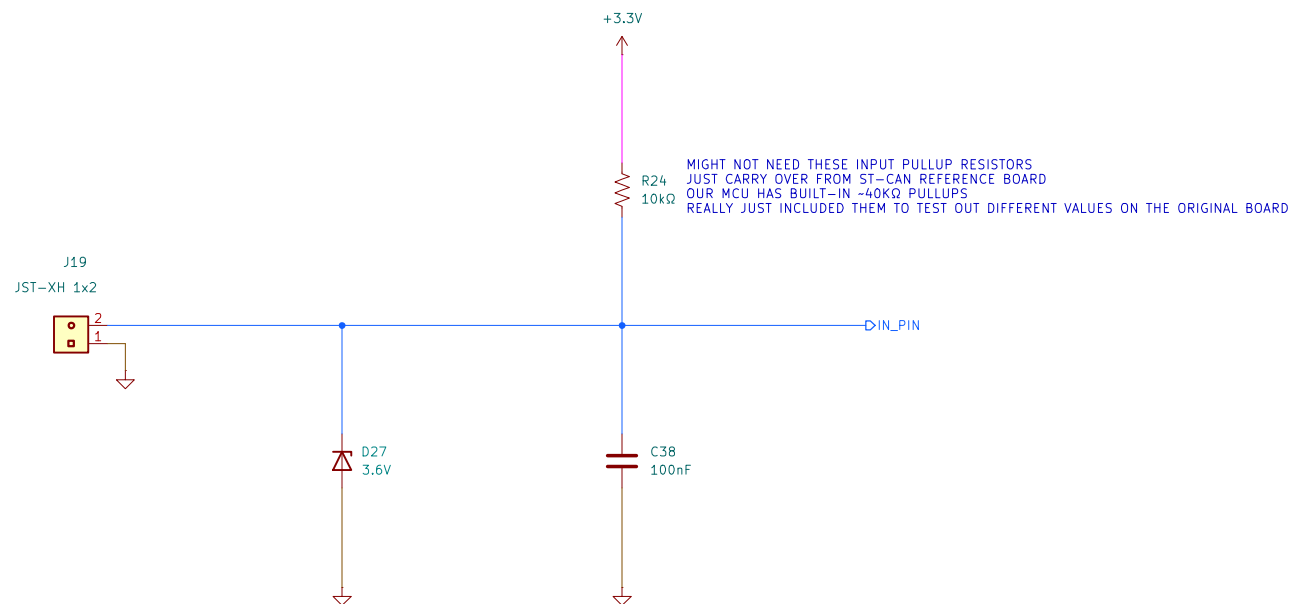


Author: Bryce Mooney
<https://github.com/BryceMvt/STeering-wheel>
SolarCar at Virginia Tech
 Sheet: /B8_INPUT_STAGE/
 File: input_stage.kicad_sch



Title: Digital Input Stage

| | | |
|--------------------|------------------|-----------|
| Size: A4 | Date: 2025-02-22 | Rev: — |
| KiCad E.D.A. 8.0.6 | | Id: 22/15 |



Author: Bryce Mooney
<https://github.com/BryceMvt/STeering-wheel>
SolarCar at Virginia Tech
 Sheet: /B7_INPUT_STAGE/
 File: input_stage.kicad_sch



Title: Digital Input Stage

| | | |
|--------------------|------------------|-----------|
| Size: A4 | Date: 2025-02-22 | Rev: — |
| KiCad E.D.A. 8.0.6 | | Id: 23/15 |