

The diagram illustrates the wiring for a Raspberry Pi Pico (M1A) in a vehicle control system. It is divided into three main sections: Power, I2C, and Actuators/Sensors.

Power Section:

- 5V Regulation:** A 5V input is connected to a 10uF capacitor (C7) and a 100nF capacitor (C9) in parallel, which are then connected to the 5V pin of the Pico.
- 3V3-OUT Regulation:** A 3V3-OUT input is connected to a 10uF capacitor (C8) and a 100nF capacitor (C10) in parallel, which are then connected to the 3V3-OUT pin of the Pico.
- Pico Power Pins:** The Pico's 39 (VSYS), 40 (VBUS), 30 (RUN), 27 (3V3_EN), 36 (3V3(OUT)), 35 (ADC_VREF), and 33 (GND/AGND) pins are connected to the 5V and 3V3-OUT lines. Pins 41 (SWCLK), 43 (SWDIO), 3 (GND), 8 (GND), 13 (GND), 18 (GND), 23 (GND), 28 (GND), 38 (GND), and 42 (GND) are connected to ground.

I2C Section:

- Pico Pins:** GP0/SPI0_RX/I2C0_SDA/UART0_TX (pin 1), GP1/SPI0_CS/I2C0_SCL/UART0_RX (pin 2), GP2/SPI0_SCK/I2C1_SDA (pin 3), GP3/SPI0_TX/I2C1_SCL (pin 4), GP4/SPI0_RX/I2C0_SDA/UART1_TX (pin 5), GP5/SPI0_CS/I2C0_SCL/UART1_RX (pin 6), GP6/SPI0_SCK/I2C1_SDA (pin 9), GP7/SPI0_TX/I2C1_SCL (pin 10), GP8/SPI1_RX/I2C0_SDA/UART1_TX (pin 11), GP9/SPI1_CS/I2C0_SCL/UART1_RX (pin 12), GP10/SPI1_SCK/I2C1_SDA (pin 14), GP11/SPI1_TX/I2C1_SCL (pin 15), GP12/SPI1_RX/I2C0_SDA/UART0_TX (pin 16), and GP13/SPI1_CS/I2C0_SCL/UART0_RX (pin 17).
- External Components:**
 - U1:** I2C module connected to GP0 and GP1.
 - U2:** I2C module connected to GP2 and GP3.
 - U3:** I2C module connected to GP4 and GP5.
 - U4:** I2C module connected to GP6 and GP7.
 - U5:** I2C module connected to GP8 and GP9.
 - U6:** I2C module connected to GP10 and GP11.
 - U7:** I2C module connected to GP12 and GP13.

Actuators/Sensors Section:

- UART-TX/RX:** Connected to Sockets[2C] and Sockets[2C].
- OW-Temp-sensors:** Connected to Actuator[1A] (Seat-heat-pwm-L) and Actuator[1B] (Seat-heat-pwm-R).
- ACC-control:** Connected to Power[1C] (VCC-relay-on).
- CAN-BUS:** CAN-INT, CAN-SCK, CAN-SI, CAN-SO, and CAN-CS are connected to various pins.
- Relays:**
 - AC-compressor-relay:** Connected to GP14/SPI1_SCK/I2C1_SDA (pin 19), GP15/SPI1_TX/I2C1_SCL (pin 20), GP16/SPI0_RX/I2C0_SDA/UART0_TX (pin 21), and GP17/SPI0_CS/I2C0_SCL/UART0_RX (pin 22).
 - Rear-window-heat-relay:** Connected to GP18/SPI0_SCK/I2C1_SDA (pin 24), GP19/SPI0_TX/I2C1_SCL (pin 25), GP20/I2C0_SDA (pin 26), and GP21/I2C0_SCL (pin 27).
 - Heater-relay:** Connected to GP22 (pin 28).
 - Cycle-relay:** Connected to GP26/ADC0/I2C1_SDA (pin 31) and GP27/ADC1/I2C1_SCL (pin 32).
 - Fan-pwm:** Connected to Sockets[6C].
 - Temperature-servo:** Connected to Sockets[6C].
 - Middle-dir-servo:** Connected to Sockets[6C].
 - Window-dir-servo:** Connected to Sockets[6C].

Temperature Sensors

The diagram illustrates the electrical connection for a temperature sensor module. A horizontal blue line represents the main power rail, labeled "OW-Temp-sensors" on the right. A yellow rectangular block, labeled "Temperature-sensor-OW", is connected to this rail. A vertical red line, labeled "5V" at the top, connects the rail to a blue rectangular component labeled "R3 4K7". To the left of the yellow block, the text "Sockets[6C]" is present.

ACC Voltage control

The diagram illustrates the internal structure of the LTV-817S IC, which is a PNP Darlington transistor. The pins are numbered 1 through 4:

- Pin 1:** Connected to the **ACC-IN** supply through a resistor **R1** (1K).
- Pin 2:** Connected to **GND**.
- Pin 3:** Connected to **GND**.
- Pin 4:** Connected to the **3V3-OUT** supply through a resistor **R2** (10K). This pin also provides the **ACC-control** signal.

The IC is labeled **IC_LiteOn_LTV817** and **LTV-817S**.

Sun, Coolagent pressure, DC voltage sensors

The diagram illustrates the wiring for three sensors connected to an ADS1115 ADC. The components and connections are as follows:

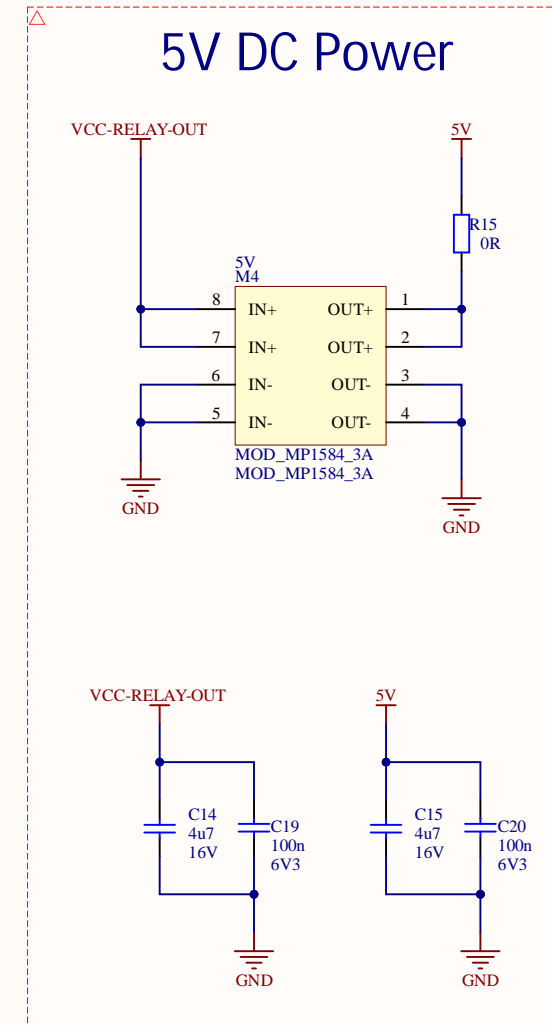
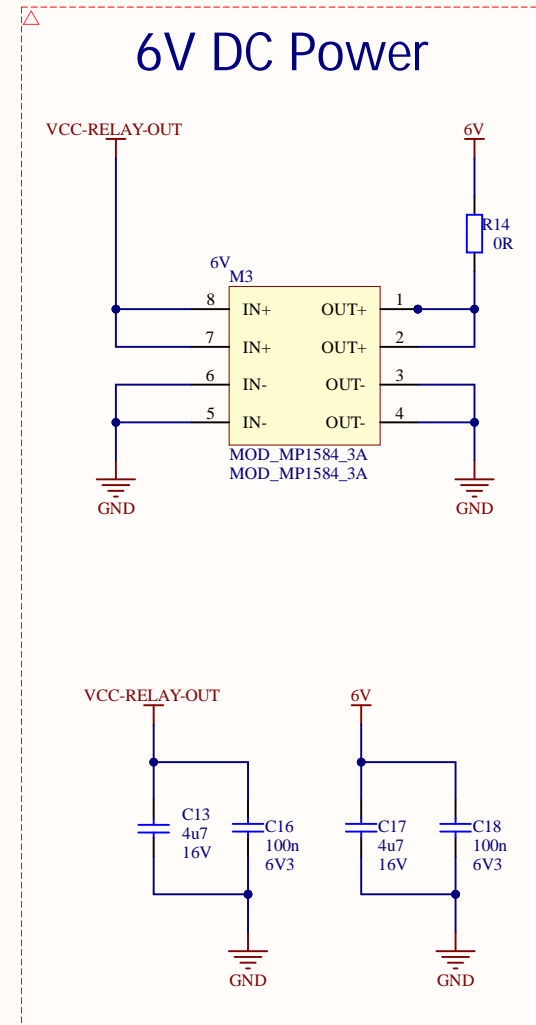
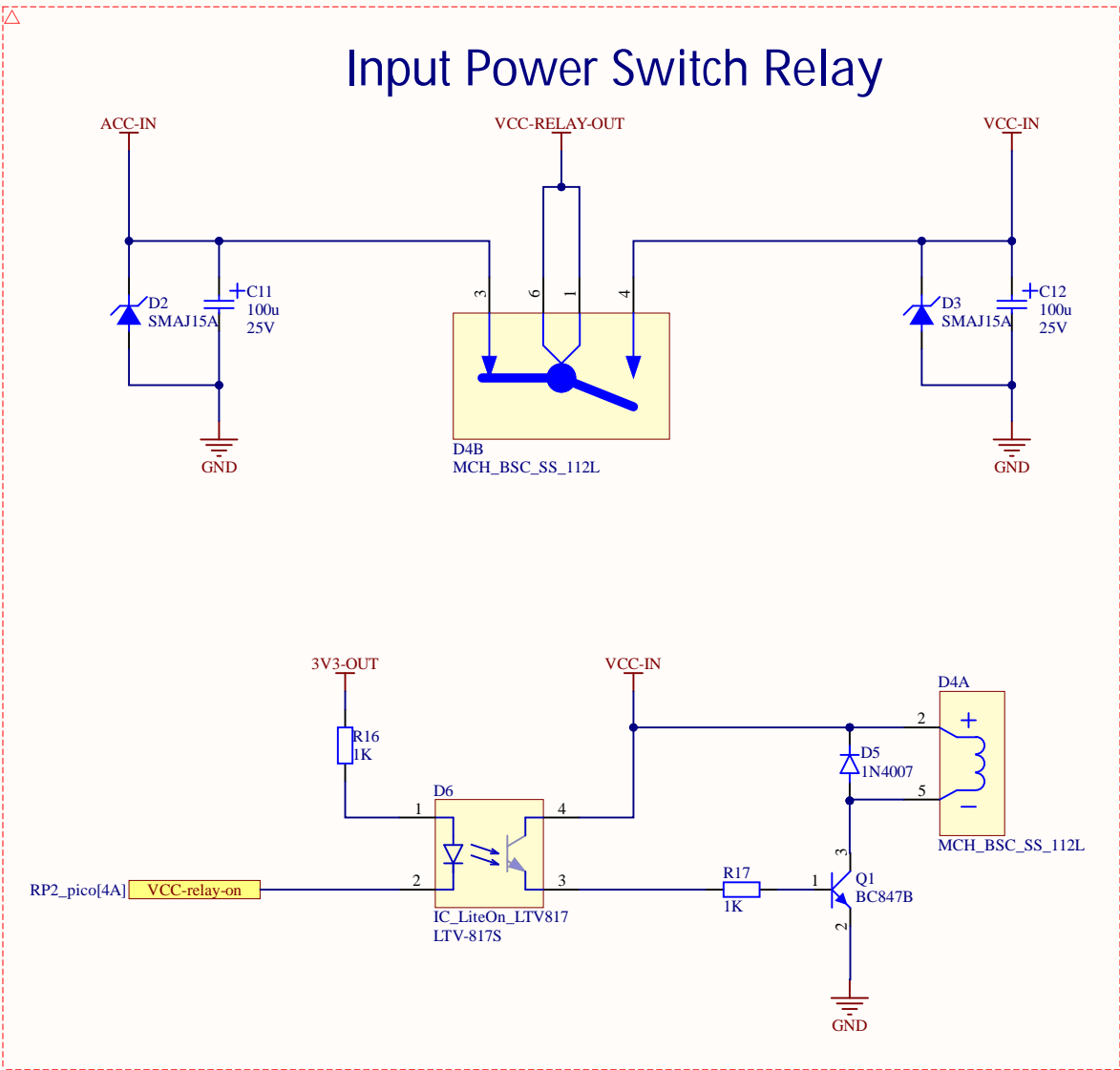
- 3V3-OUT Section:** A 3V3-OUT voltage source is connected to the VDD (pin 8) and GND (pin 3) of the ADS1115. Pull-up resistors R7 (10K), R8 (10K), and R9 (10K) are connected between the 3V3-OUT and the SDA (pin 9), SCL (pin 10), and ADDR (pin 1) lines, respectively.
- VCC-RELAY-OUT Section:** A VCC-RELAY-OUT voltage source is connected to the VDD (pin 8) and GND (pin 3) of the ADS1115. Pull-up resistors R10 (50K) and R11 (10K) are connected between the VCC-RELAY-OUT and the AIN3 (pin 7) and AIN1 (pin 5) lines, respectively.
- 3V3-OUT Section:** A 3V3-OUT voltage source is connected to the VDD (pin 8) and GND (pin 3) of the ADS1115. Pull-up resistors R12 (10K) and R13 (10K) are connected between the 3V3-OUT and the AIN0 (pin 4) and AIN2 (pin 6) lines, respectively.
- ADS1115 IC:** The IC is labeled IC1 and is an ADS1115IDGSR. It has pins for VDD, ALERT/RDY, SDA, SCL, ADDR, GND, AIN3, AIN2, AIN1, and AIN0.
- Other Components:** The circuit includes capacitors C3 (100nF), C4 (1uF), C5 (1uF), and C6 (1uF) connected to ground. Resistor R5 (100K) is connected between the 3V3-OUT and GND.

CAN Module

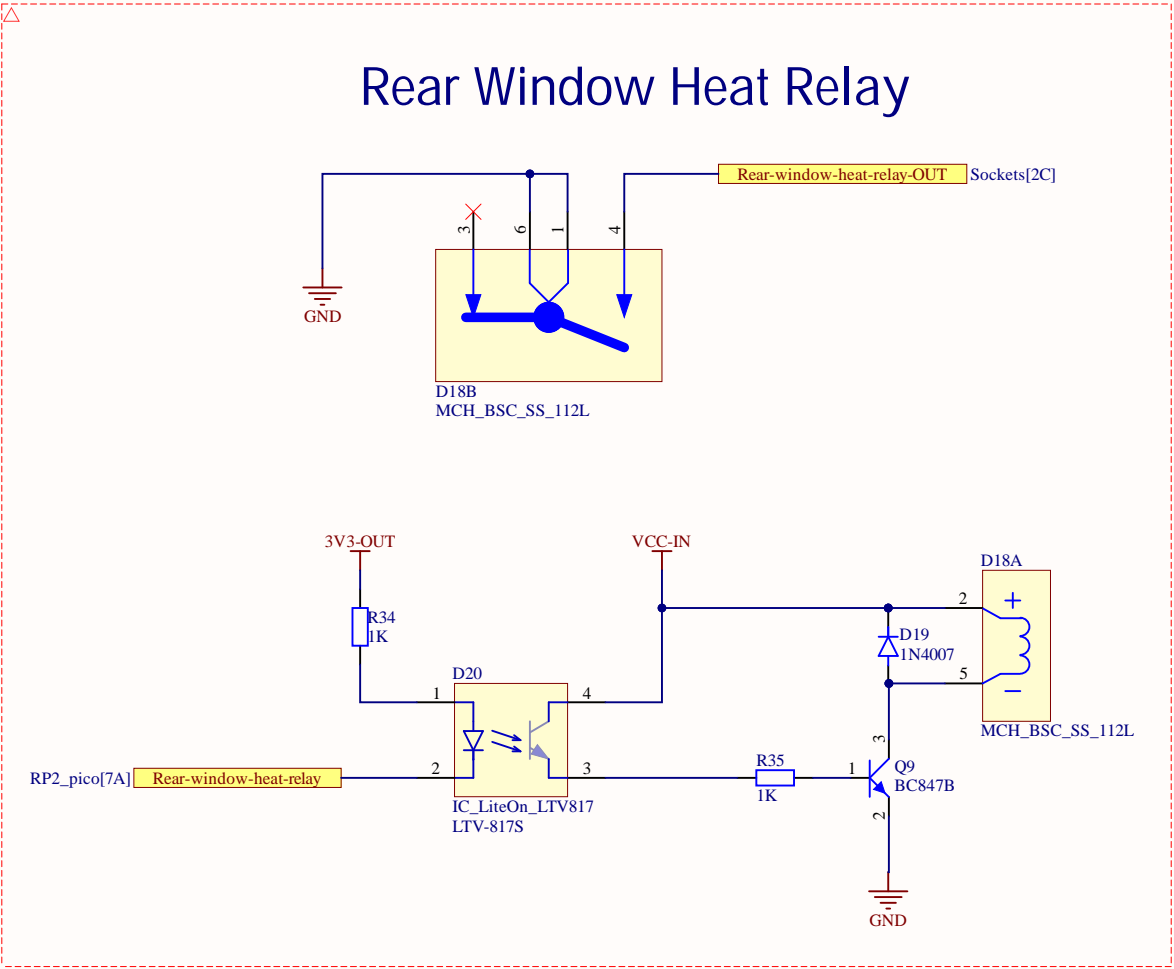
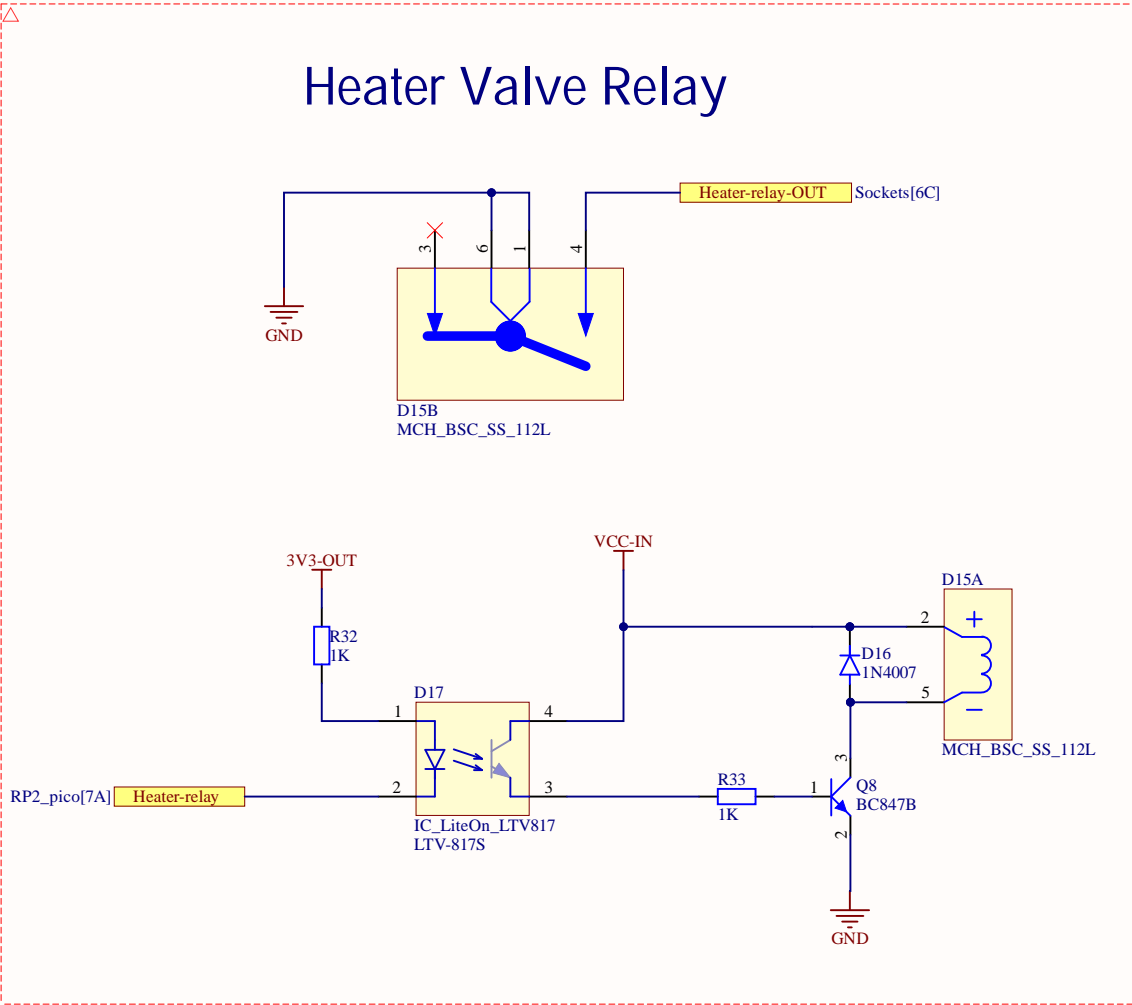
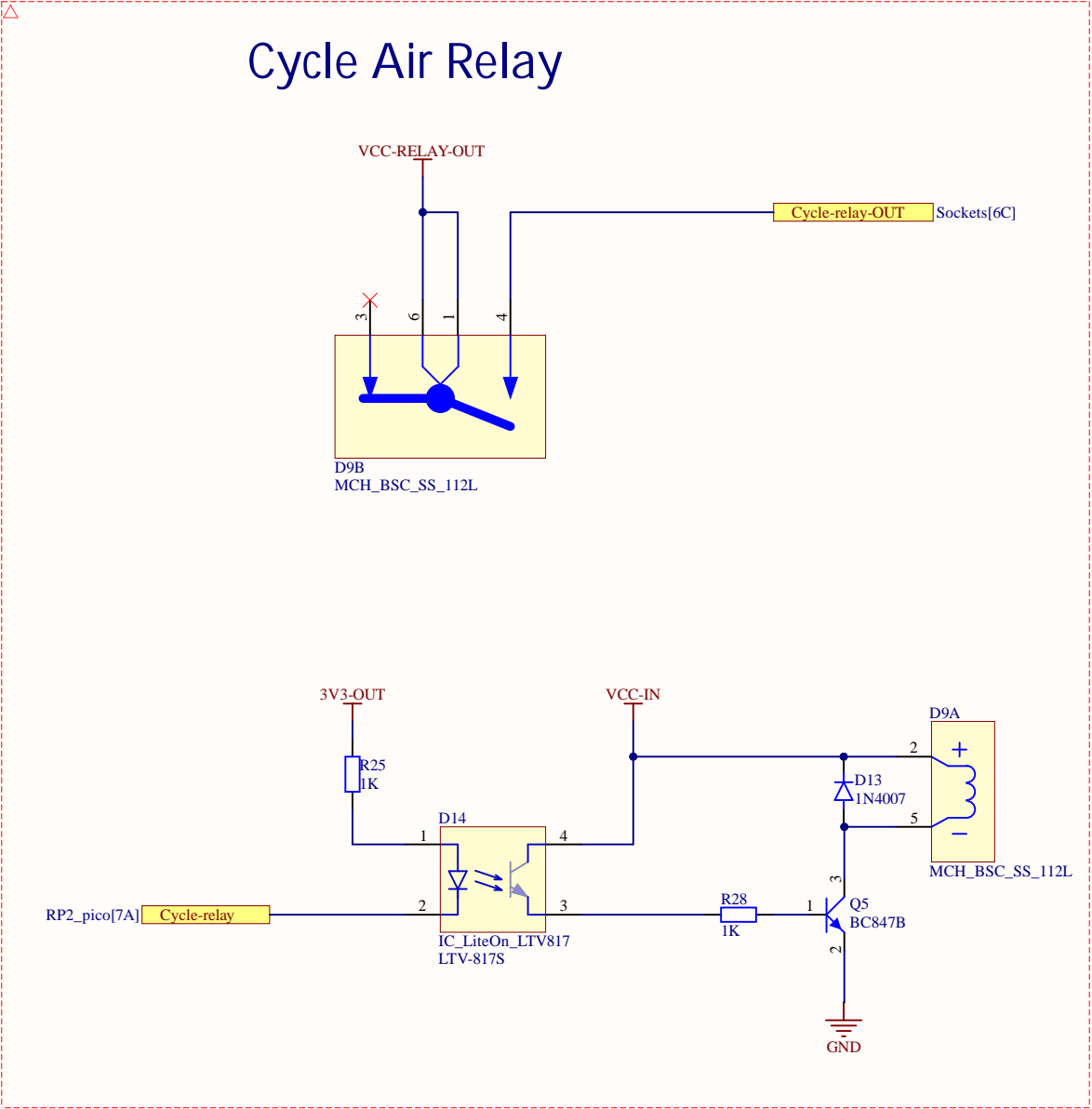
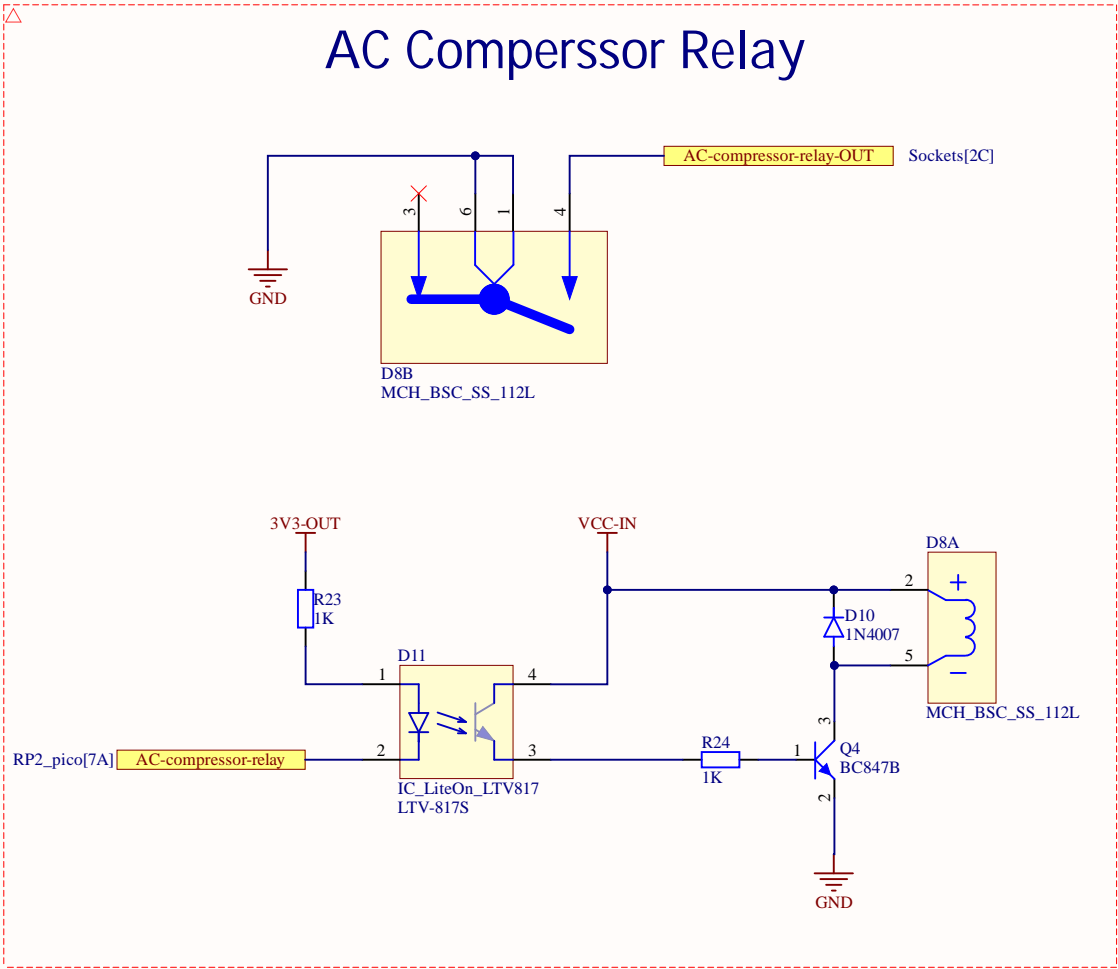
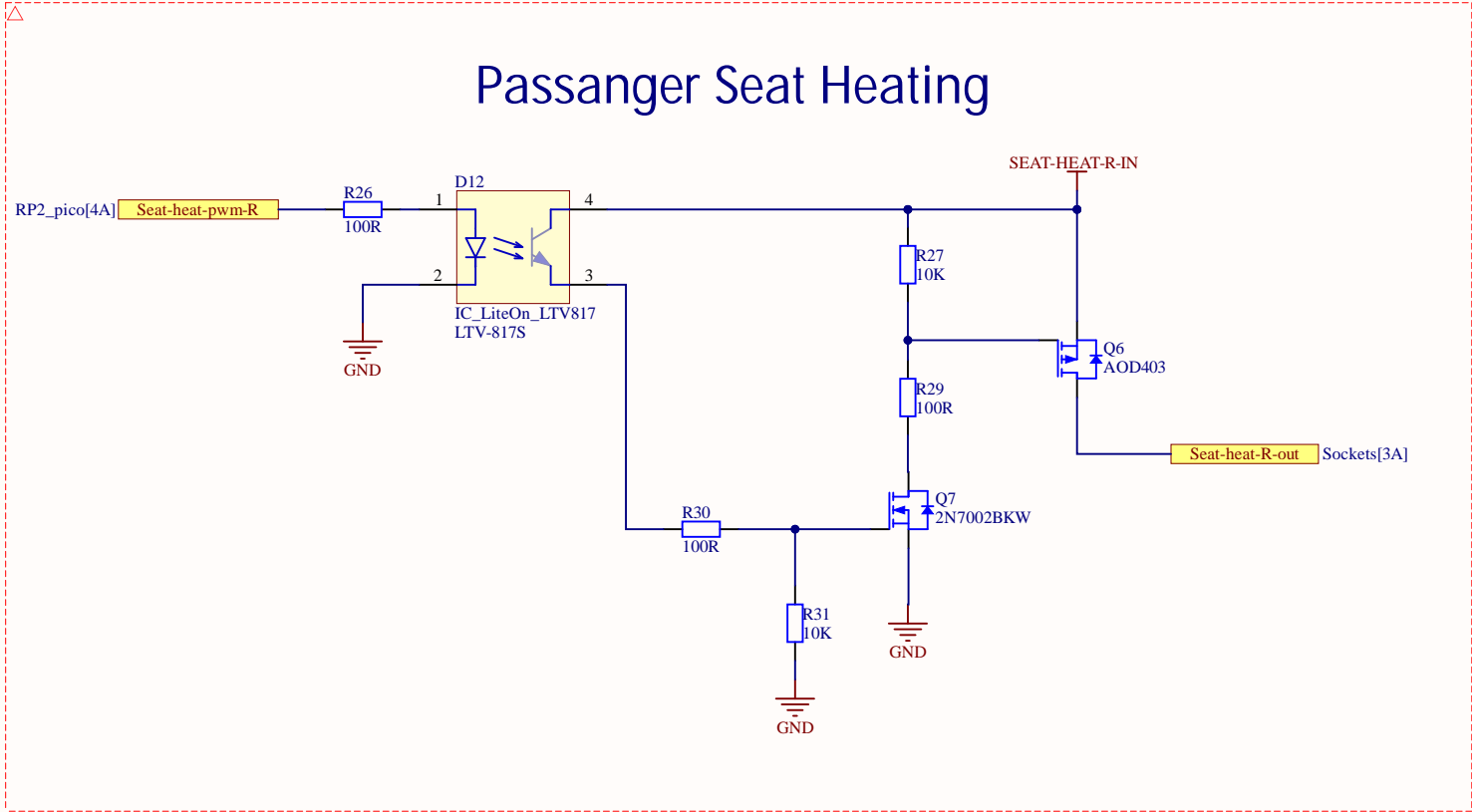
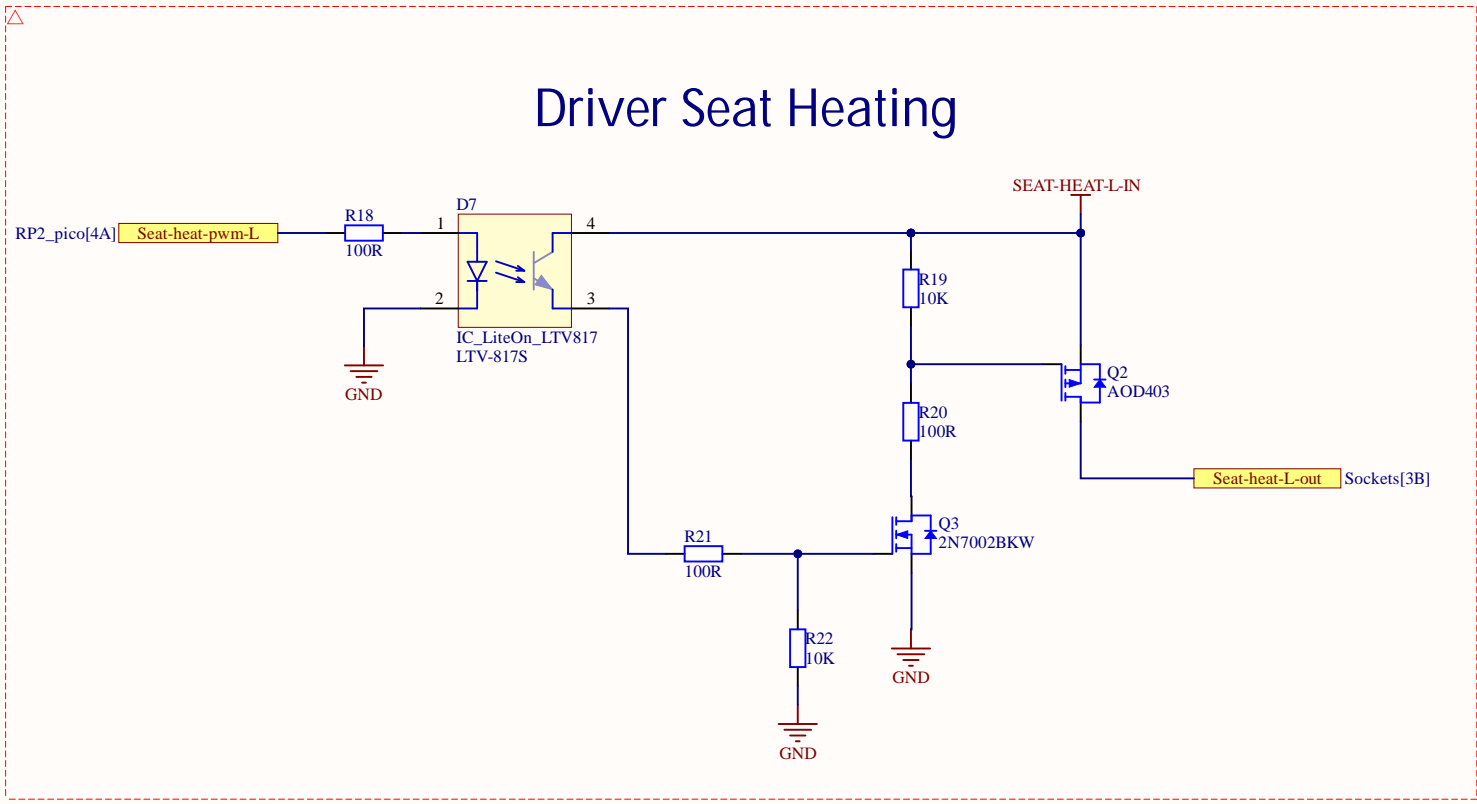
The diagram illustrates the wiring for a CAN module (MCP2515) on a breadboard. The module is represented by a yellow box labeled 'M2' with the part number 'MOD_MCP2515 MCP2515' below it. The connections are as follows:

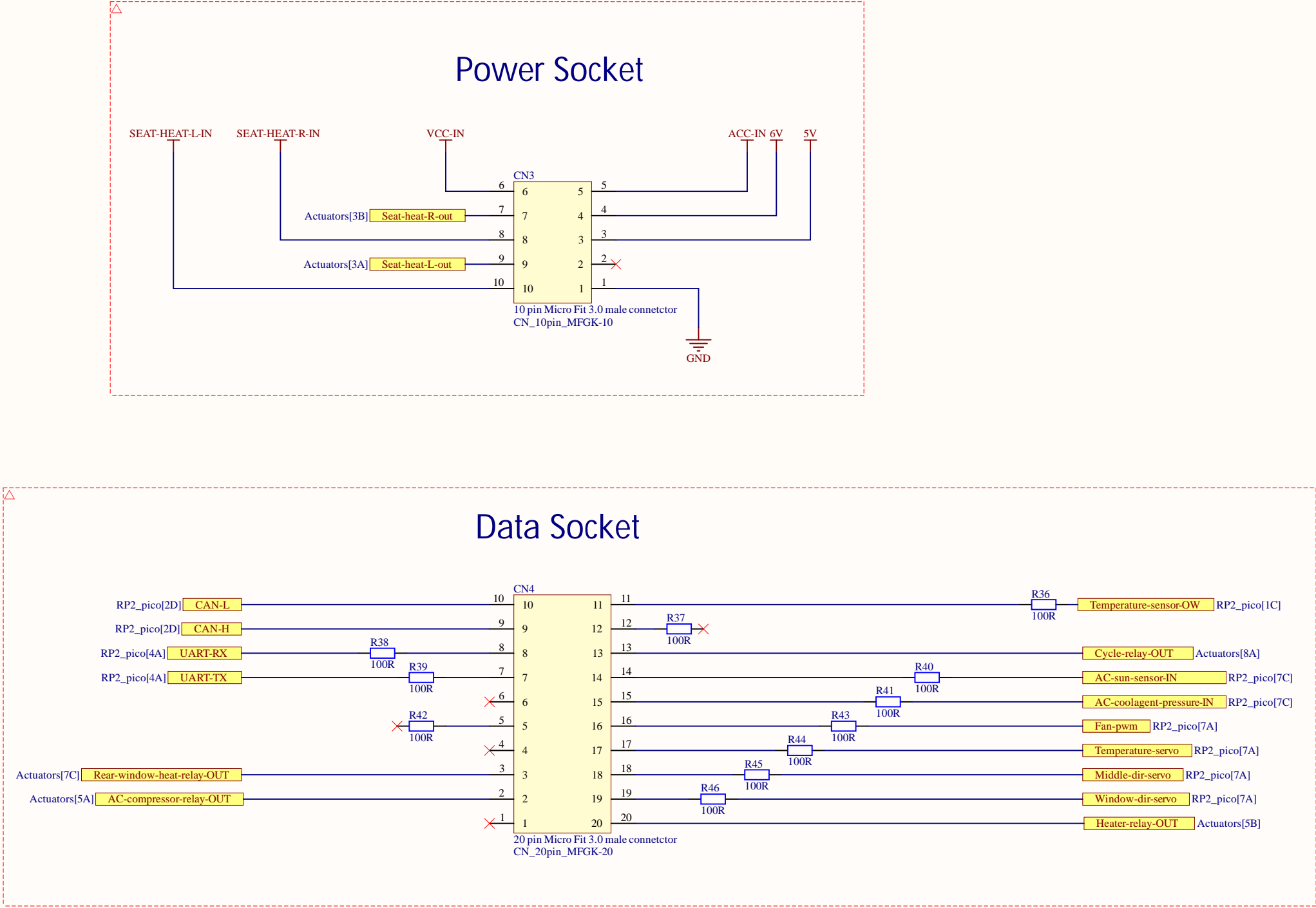
- Power Supply:** A 5V supply is connected to pin 7 (VCC) and pin 6 (GND). A 5V label is placed above the VCC connection.
- Capacitors:** A 10uF capacitor (C1) and a 16V capacitor (C2) are connected in parallel between the 5V supply and GND. A 100nF capacitor (C2) and a 6V3 capacitor are also connected in parallel between the 5V supply and GND.
- Signal Inputs:** Two sockets labeled 'Sockets[2C]' are connected to the CAN_H and CAN_L pins (pins 9 and 8 respectively) of the module. The sockets are labeled 'CAN-L' and 'CAN-H'.
- Signal Outputs:** The module has five output pins:
 - Pin 1 (INT) is connected to a 3V3-OUT supply through a 10K resistor (R4) and is labeled 'CAN-INT'.
 - Pin 2 (SCK) is connected to 'CAN-SCK'.
 - Pin 3 (SI) is connected to 'CAN-SI'.
 - Pin 4 (SO) is connected to 'CAN-SO'.
 - Pin 5 (CS) is connected to 'CAN-CS'.

Title		
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Title		
Size A3	Number	Revision
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Title		
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