



The diagram shows an ATmega328P-PU microcontroller (U1) with the following connections:

- Power:** VCC (pin 7) and AVCC (pin 20) are connected to +5V. GND (pin 8) and other ground pins are connected to GND.
- Crystal:** XTAL1/PB6 (pin 9) and XTAL2/PB7 (pin 10) are connected to a 16MHz crystal (Y1) with 22pF capacitors (C4, C5) to ground.
- ISP Header (J2):**
  - Pin 1: +5V
  - Pin 2: GND
  - Pin 3: RESET (pin 1 of U1)
  - Pin 4: GND
  - Pin 5: RESET (pin 28 of U1)
  - Pin 6: GND
- Row/Column Headers:**
  - ROW0 (pin 23), ROW1 (pin 18), ROW2 (pin 17), ROW3 (pin 16), ROW4 (pin 15), COL0 (pin 14), COL1 (pin 13), COL2 (pin 12), COL3 (pin 6), COL4 (pin 15), COL5 (pin 24), COL6 (pin 25), COL7 (pin 3), COL8 (pin 26), COL9 (pin 2).
- Other Components:**
  - SW72: RESET switch connected to pin 1 (RESET) and GND.
  - SW73: BOOT switch connected to pin 11 and GND.
  - R9: 10k resistor connected to pin 1 (RESET) and +5V.

The diagram shows the MCP23008 (U2) connected to a +5V supply and ground. The I2C lines (I2c\_SDA, I2c\_SCL) are connected to pins 2 (SDA) and 1 (SCL) through 10k pull-up resistors (R10, R11). The chip select (CS) is connected to pin 17 through a 4.5V diode (D70) and a 4.5V resistor (R7). The chip is configured with address 0x20. The output pins (GP0-GP7) are connected to the COL10-COL14 outputs of the 74VHC125 (U1). The 74VHC125 is also connected to +5V and ground.

H21 M2	H17 M2	H13 M2	H9 M2	H5 M2	H1 M2
H22 M2	H18 M2	H14 M2	H10 M2	H6 M2	H2 M2
	H19 M2	H15 M2	H11 M2	H7 M2	H3 M2
	H20 M2	H16 M2	H12 M2	H8 M2	H4 M2