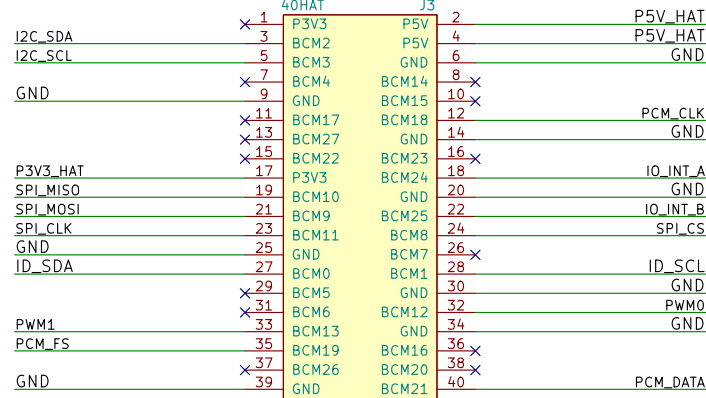


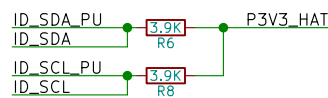
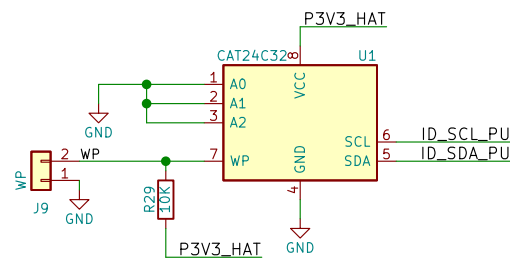
This is based on the official Raspberry Pi spec to be able to call an extension board a HAT.  
<https://github.com/raspberrypi/hats/blob/master/designguide.md>

## 40-Pin HAT Connector



## HAT ID-EEPROM

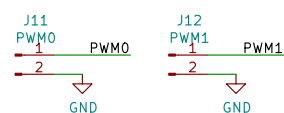
The HAT spec requires this EEPROM with system information to be in place in order to be called a HAT. It is set up as write protected (WP pin held high) and can be enabled for writing by placing a jumper on J9 or by bridging TP1.



## Mounting Holes

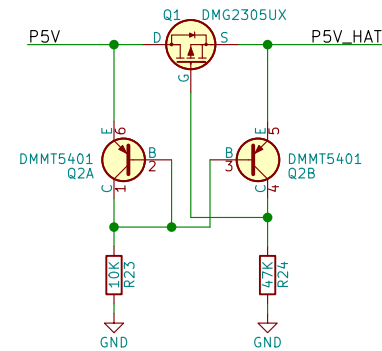


## PWM Connectors

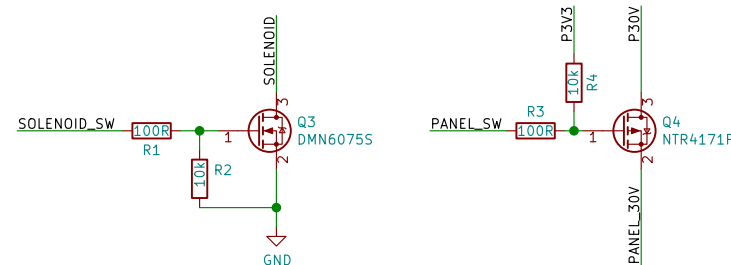


## 5V Powered HAT Protection

This is the recommended 5V rail protection for a HAT with power going to the Pi.  
See <https://github.com/raspberrypi/hats/blob/master/designguide.md#back-powering-the-pi-via-the-j8-gpio-header>

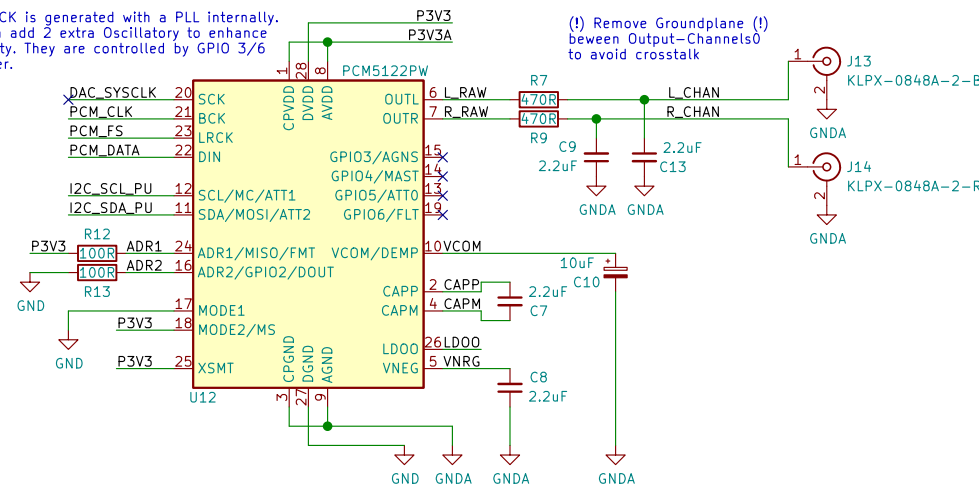


## Panel Power Switching

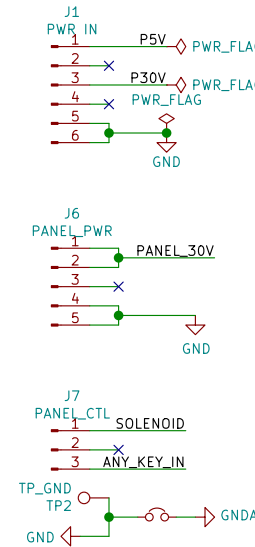


## Audio DAC

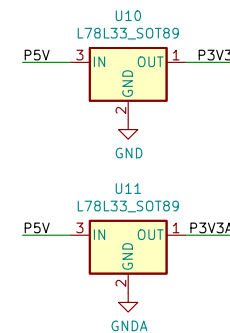
The System-Clock SCK is generated with a PLL internally. Alternatively one can add 2 extra Oscillators to enhance the frequency stability. They are controlled by GPIO 3/6 from the Linux-Driver.



## Audio Connector



GNDA and GND are to be joined in a start-ground point

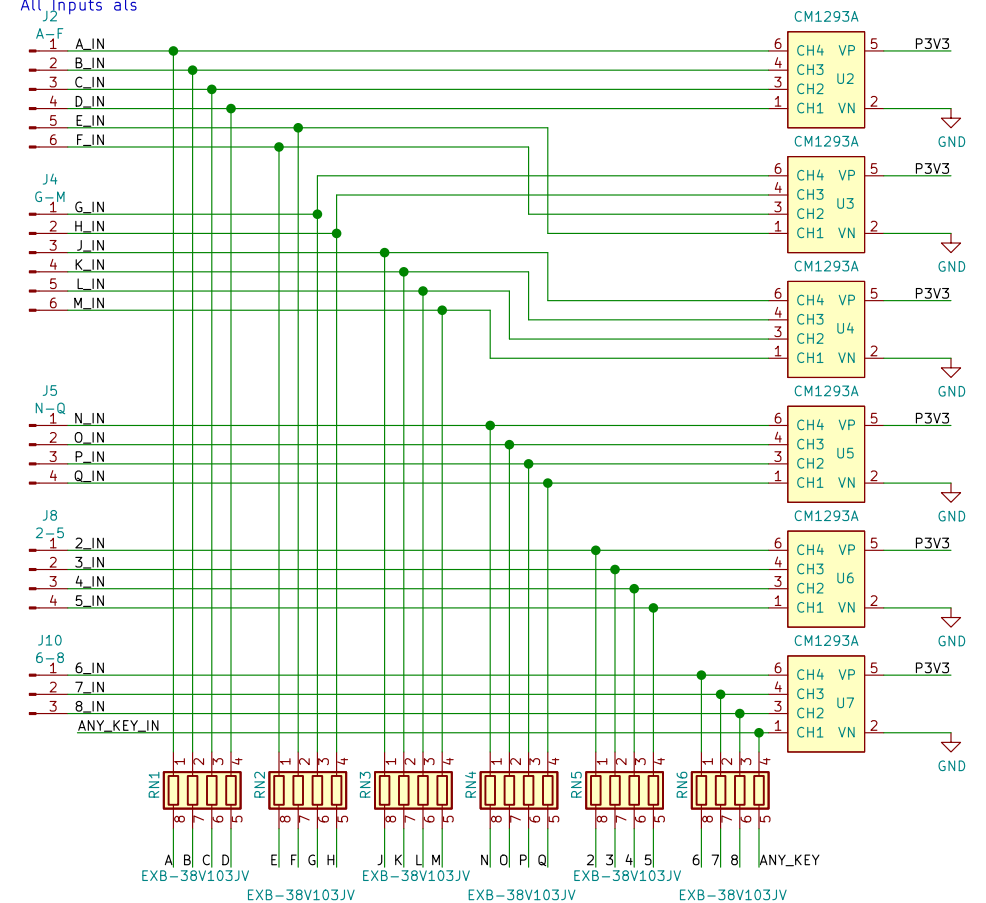


## Power Input

The Hat is powered from an external Power-Supply Block that provides at least 5V 3A and 30V 500mA. The 5V is used to backpower the Pi.

## Panel Input & Protection

All Inputs are equipped with 3.3V ESD Suppression Diodes and series resistors for ESD and inductive coupled Transients to support the the long cable runs and close high-current solenoids and incandescent bulbs.



## GPIO Port Extender

The MCP23S17 (SPI 16bit Port Extender) is used to drive and read from the Panel-I/Os and to drive the Panel-Power FETs. This device supports an Address-Based selection mode: only the Chip-Select is used for both chips; The Interrupt-Mirror-Feature is used, to only have one Interrupt for all 4 Banks.

