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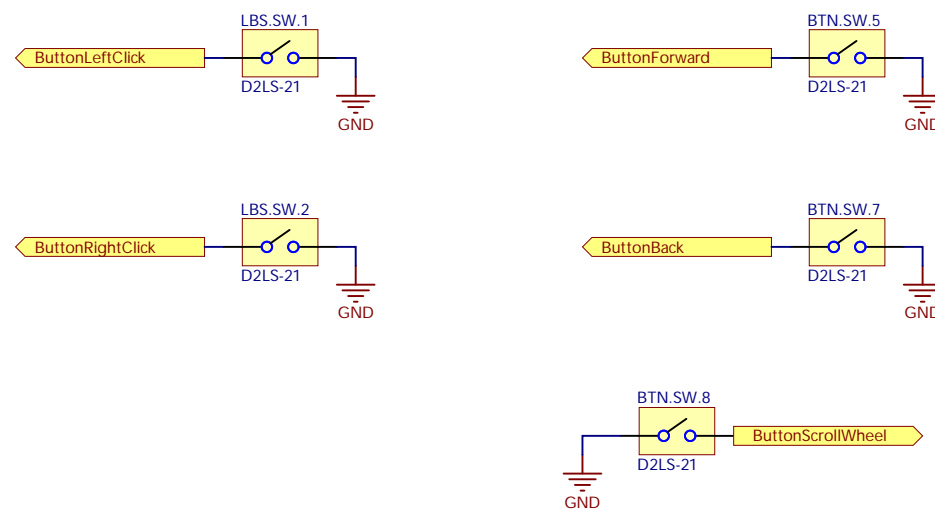
Please see the CERN-OHL-S v2 for applicable conditions.

Source location:
<https://github.com/ploopyco/trackball-mini>

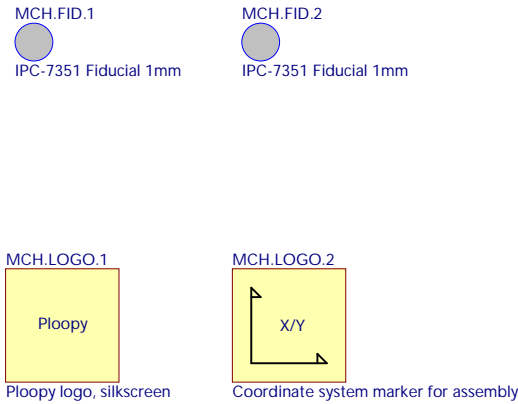
As per CERN-OHL-S v2 section 4, should You produce hardware based on this source, You must where practicable maintain the Source Location visible on the external case of the Ploopy Mini Trackball or other products you make using this source.

These switches can be found under the various buttons on the mouse.

Activate the pull-up resistors on the GPIO pins attached to these switches to make them work.

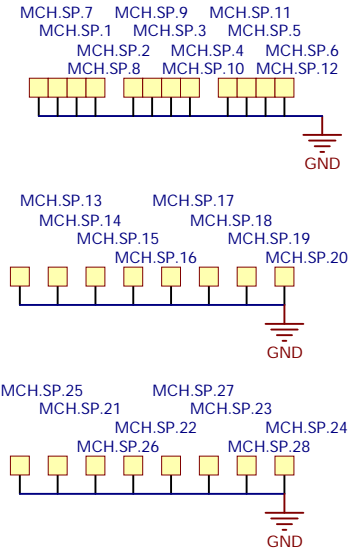


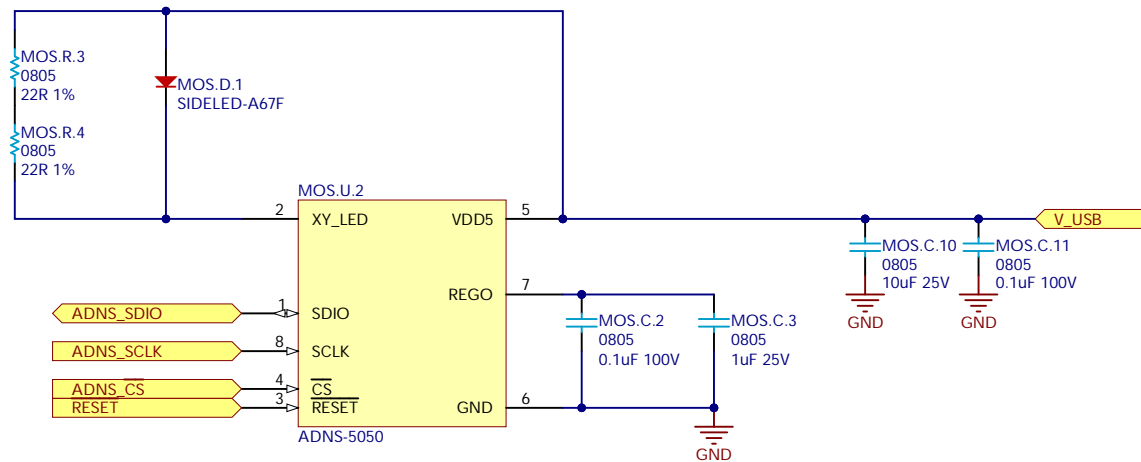
Pick and Place Fiducials

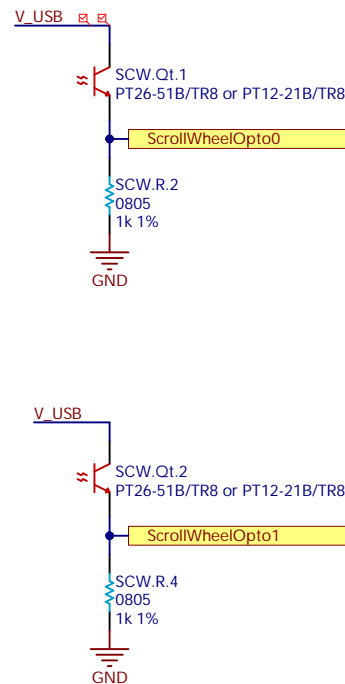
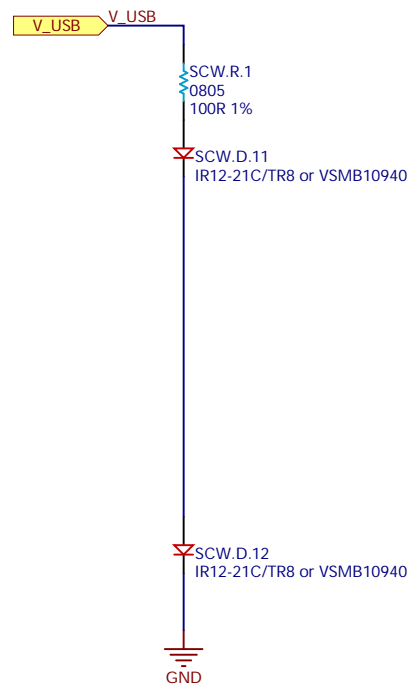


Spark Gaps -- Case

Since the case has gaps in it, we expect ESD to worm its way in via creepage and perhaps other ways. To protect the board from this eventuality, we place spark gaps along the edges.







The scroll wheel mechanism is a 2-bit optical encoder. The light paths are spaced 1.5 periods over the encoder wheel holes, which should allow for the detection of the rotation direction as well as the rotation itself.

Two IR LEDs are used as light sources; the light from these is obstructed by the encoder wheel built into the scroll wheel mechanism. Two phototransistors are used to detect when the light is blocked/not blocked by the wheel.

Typical LED forward voltage is 1.3V @20mA. To achieve this current level with a 5.0V supply, we'll put two LEDs in series and use a 100R resistor to get 24mA.

At this power level, the output should be approx 2.6mW/sr.

Since the light path distance is about 12mm, that works out to about 2mW/cm², though the actual delivered power will be lower due to the vagaries of the obstructions in the mechanism.

With this amount of light (and accounting for the fact that we'll probably lose a lot of it along the way), we are expecting 1-3mA out of the phototransistor (see figure 6 of the datasheet), so we size the biasing resistor accordingly to produce a useful signal.

