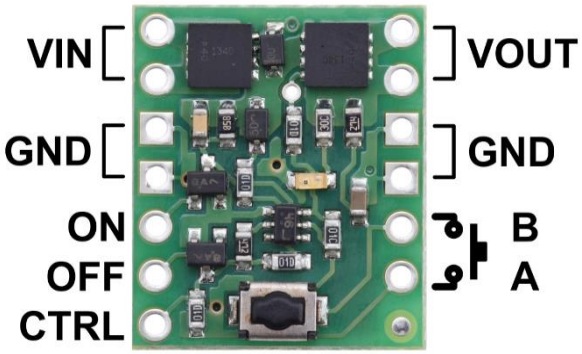
MINI PUSHBUTTON POWER SWITCH WITH REVERSE VOLTAGE PROTECTION, LV

USER'S GUIDE

USING THE PUSHBUTTON POWER SWITCH

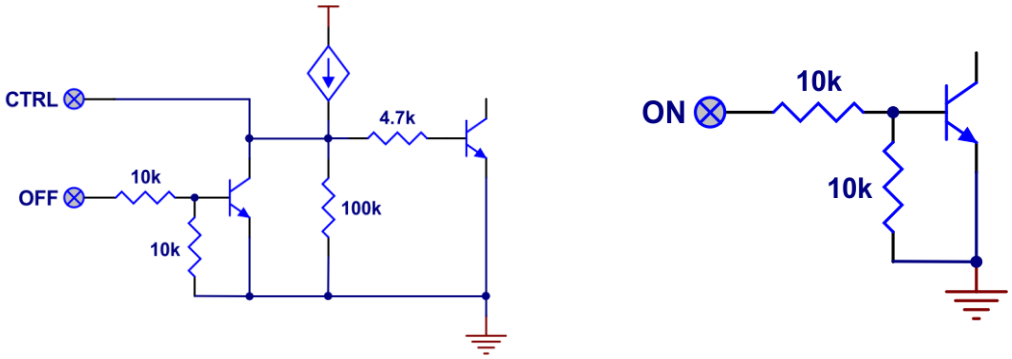


The simplest way to control the Pushbutton Power Switch is via its installed pushbutton: one push turns on power and another turns it off. Alternatively, a separate pushbutton, such as a remote panel-mounted unit, can be connected to the *A* and *B* pins and used instead. Multiple pushbuttons can be wired in parallel for multiple control points, and each of the parallel pushbuttons, including the one on the board itself, will be able to turn the switch on or off. The latching circuit performs some button debouncing, but pushbuttons with excessive bouncing (several ms) might not function well with this product.

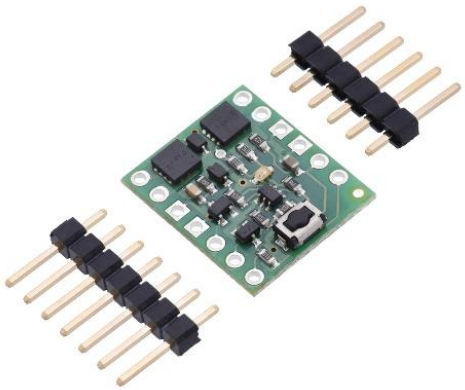
More advanced control options are available through the button connection pins and three control inputs:

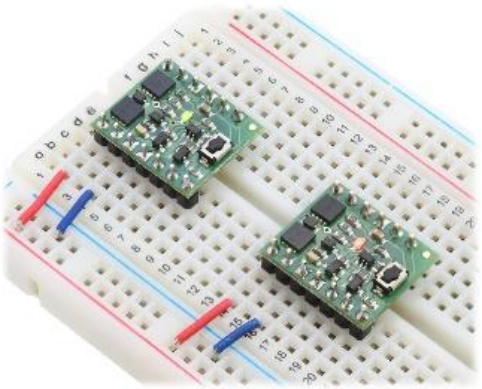
PIN	Description
A	Connect through momentary switch to pin "B" for standard push-on/push-off operation. Connect through momentary switch to ground for on-only operation.
B	Connect through momentary switch to pin "A" for standard push-on/push-off operation.
ON	A high pulse (> 1 V) on this pin turns on the switch.
OFF	A high pulse (> 1 V) on this pin turns off the switch (e.g. allowing the target device to shut off its own power).
CTRL	This pin directly determines the state of the switch. A high pulse (> 1 V) on this pin turns on the switch; a low pulse (e.g. driving the pin low with a microcontroller output line or pushing a button connected from this pin to ground) turns the switch off. Leave this pin disconnected or floating when not trying to set the switch state. Note that this pin should not be driven high at the same time the "OFF" pin is driven high.

The input structures for the three control inputs are shown below:



The Pushbutton Power Switch is compatible with solderless breadboards and perforated circuit boards with standard 0.1″ spacing. For such applications, the included male header pins can be soldered to the switch PCB. Alternatively, wires can be soldered directly to the switch PCB for non-breadboard applications. For high-current applications, make sure that the wires can safely carry the current. Two pads/pins are provided for each of the power nodes, and multiple pads should be used for applications drawing over 5 A.





THERMAL AND POWER DISSIPATION CONSIDERATIONS

Because MOSFETs in the on state are effectively resistive, the power heating the board is proportional to the square of the current flowing through it. The comparison table near the top of this page shows typical currents that heat the MOSFETs to 55°C, where the MOSFETs start being noticeably warm but are still generally safe to touch, and currents that heat the MOSFETs to 150°C, the absolute limit for the MOSFETs. With adequate cooling, or for brief periods if the MOSFETs are not hot to begin with, currents up to the listed maximums are attainable.

TRANSIENT PROTECTION

Interrupting large currents can cause voltage spikes (positive on the input side and negative on the output side) that depend on the inductance of the power connections and that can exceed the limits of the device. Appropriate measures to limit the size of these spikes include minimizing lengths of wires, placing capacitors at the power switch to smooth the spikes and absorb some of the energy, placing a schottky diode across the power output to absorb negative spikes, and placing a transient voltage suppressor (TVS) across the power input to absorb positive spikes.

CHARACTERISTICS AT LIMITS OF OPERATING RANGE

The switch operating range is limited by the ability to change state reliably. At low voltages, the switch is difficult to turn on, and the switch will turn itself off once the voltage falls far enough (this shutoff point can be as high as 4.5 V and 2 V for the SV and LV versions, respectively). At high voltages, the switches are more likely to turn on when power is initially applied. The reliability of turning off is affected by a combination of the supply voltage, the amount of bouncing on the pushbutton switch, and the amount of noise on the supply line. For applications at the high end of the operating range, tests should be performed to ensure that the device can properly turn off.