

How to Solder an MX-Style Key Switch

Warnings

Danger: Soldering irons exceed 300°C. Contact with skin will cause severe burns.

Solder fumes contain flux vapor that is harmful when inhaled, always work in a well-ventilated area or use a fume extractor.

Caution: This guide uses 60/40 leaded solder, which can be toxic if ingested or inhaled.

Non-leaded solder requires higher temperatures and is not recommended for beginners.

Equipment and Supplies

Item	Notes
Soldering iron	Adjustable temperature, 300-400°C.
Safety Glasses	Protect your eyes from flyaway solder beads.
Solder wire	60/40 rosin core, 0.8mm diameter.
Brass wire tip cleaner	Used to clean and re-tin the iron tip.
Tweezers	For straightening bent pins and handling small parts.
Anti-static mat	Protects the PCB from electrostatic damage and protects your working space from solder residue and burn marks.
USB cable	To connect the PCB to a computer.
PCB	Printed Circuit Board. The keyboard printed circuit board that the switch is being soldered to.
Plate (optional)	Holds the switch in position
MX-style switch	The specific switch you are soldering to your PCB.

Steps

Preparing the Switch and PCB

- Step 1. Ensure you and your workspace is adequately protected. Solder can jump around, so eye protection for yourself and a mat for your workspace is recommended.
- Step 2. Ensure the switch pins (the copper pieces of metal at the bottom of the switch) are straightened out and are not bent. They should form a 90° angle with the bottom of the switch housing (See: Figure 1).
If the switch pins are bent, carefully straighten them out to the best of your ability with your fingers, and if the pin breaks off, get a new switch, the pin cannot be reattached.



Figure 1. The bottom side of a KTT Hyacinth switch, showing straight two pins. (Source: <https://www.thockking.com/products/ktt-hyacinth-switches>)

- Step 3. Push the switch through the top of the plate (the stem of the switch will be facing you once inserted) with the bottom of the switch (the side with the pins) facing the floor (See: Figure 2).



Figure 2. Switches mounted through a plate, on top of the PCB. (Source: <https://switchandclick.com/plate-mounted-vs-pcb-mounted-keyboard/>)

Step 4. Push the switch into the PCB, ensuring the pins are seated within the copper pads.

Soldering

Step 5. Set the iron to 320-420°C, and allow it to heat for 2-3 minutes.

If the temperature is too low, the solder will not flow. If the temperature is too high, you risk causing permanent damage to the PCB, as the copper pad may lift.

Step 6. Tin the iron tip.

Touch solder wire to the tip of your soldering iron until the soldering iron tip is uniformly shiny and silver with no dark patches (See: Figure 3). This is done to ensure proper heat transfer from the iron to the pad.

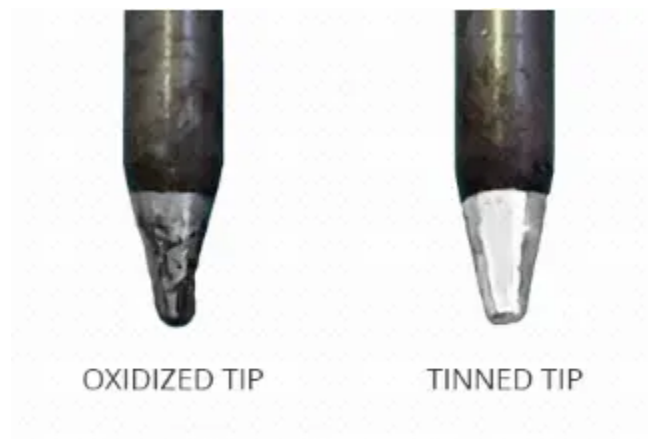


Figure 3. A tinned soldering iron tip next to an oxidized tip. (Source: <https://www.seeedstudio.com/blog/2019/08/21/how-to-look-after-soldering-iron-tips/>)

Step 7. Place the side of the iron tip on the switch pin and the copper pad. Both surfaces should be heated for the solder to bond to both. Heating only one side will always result in a “cold” joint (See: Figure 4).

Step 8. Touch the solder wire to the joint.

You will notice the solder melts into place around the pad. Keep feeding solder wire until the solder forms a small, smooth, volcano-shaped cone around the pin. Remove the solder wire, ensure the joint is adequately covered, and then remove the iron.

The iron should only be in contact for 3-4 seconds, and then allow for 5 seconds of cooling time.

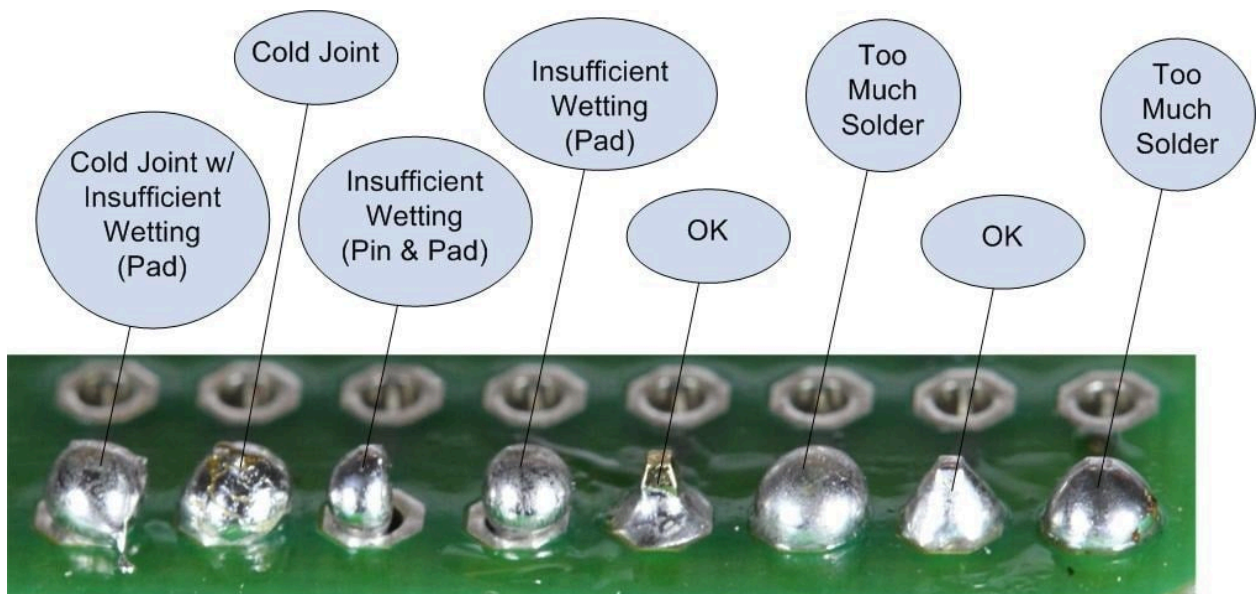


Figure 4. A diagram showing different types of solder joints. (Source: <https://learn.adafruit.com/adafruit-guide-excellent-soldering/common-problems>)

Step 9. Place the side of the iron tip on the next switch pin and the next copper pad. Both surfaces should be heated for the solder to bond to both. Heating only one side will always result in a “cold” joint (See: Figure 4).

You will notice the solder melts into place around the pad. Keep feeding solder wire until the solder forms a small, smooth, volcano-shaped cone around the pin. Remove the solder wire, ensure the joint is adequately covered, and then remove the iron.

Step 10. The iron should only be in contact for 3-4 seconds, and then allow for 5 seconds of cooling time.

Step 11. Touch the solder wire to the joint.

Step 12. Using the brass cleaner, dip your soldering iron into the coils to remove solder from the tip.

Step 13. Tin the iron tip.

Touch solder wire to the tip of your soldering iron until the soldering iron tip is uniformly shiny and silver with no dark patches (See: Figure 3). This is done to ensure proper heat transfer from the iron to the pad.

Testing

Step 14. Plug the PCB into a computer.

Step 15. Open a keyboard tester (such as keyboardtester.com), and press down on the switch, and watch as the respective keypress is registered immediately.