

AKL-Mini Spezial Construction Kit

Contents:

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|-----------------------------------|----------------------------------|
| 1 PCB "AKL-Mini Spezial Rev. 1.5" | 1 Controller ATtiny2313 (SOIC20) |
| 1 Battery CR2032 | 1 Controller ATtiny11 (SOIC8) |
| 1 Battery Holder for CR2032 (SMD) | 1 Jumper (0 Ω resistor, 0805) |
| 20 LEDs red (0805) | 6 Resistors 47 Ω (0805) |
| 1 Push-button (SMD) | 1 Resistor 20 kΩ (0805) |
| 1 Piezo buzzer (12×12 mm) | 1 Capacitor 100 pF (0805) |
| | 2 Capacitor 100 nF (0805) |

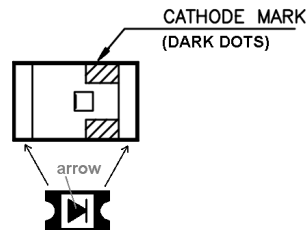
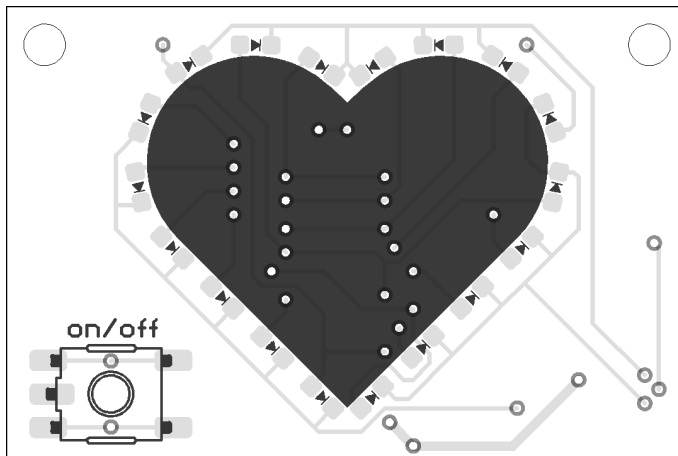
SMD Soldering Advice

To solder the SMD components, tin only one pad (corner pad for ICs), grab the component with tweezers, re-heat the tinned pad and slide the component in sideways. When component is aligned properly, remove soldering iron, let solder joint cool and solder remaining pins (starting with diagonally opposite pin for ICs). Solder bridges between adjacent pins can be removed with desoldering wick or by heating the solder joint, then very quickly knocking the board against the table (with the heated solder bridge facing down). For illustrated soldering instructions, see

<http://talkingelectronics.com/projects/SurfaceMount/SurfaceMount-P1.html#table2>

It is recommended to solder the components in the order listed below.

1. LEDs: The orientation is important for the LEDs. You can see two small black or green dots inside the LED on one side, the same side the arrow on the bottom of the LED is pointing to (cathode). This side must face in the direction the little arrow on the PCB is pointing to, as shown in the image below. Don't solder too long on the LEDs, they will have reduced brightness if they become too hot during soldering. The kit contains two spare LEDs in case you break or lose one.



2. Capacitors: Small (size 0805) brown components with no marking (you can identify the value only by the quantity in the kit). The orientation doesn't matter.



Name	C1, C2	C3
Value	100 nF	100 pF

3. Resistors: Small (size 0805, meaning 0.08" × 0.05" ≈ 2 mm × 1.25 mm) rectangular components. The orientation doesn't matter.

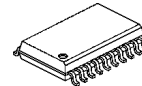


Name	R1~R6	R7	R8
Value	47 Ω	Jumper	20 kΩ
Marking	470 (47·10 ⁰) or 47R0	0 or 000	203 (20·10 ³) or 2002 (200·10 ²)

4. Controllers

(IC1, IC2):

The dent in one corner (indicating pin 1) must match the notch in the outline on the board.



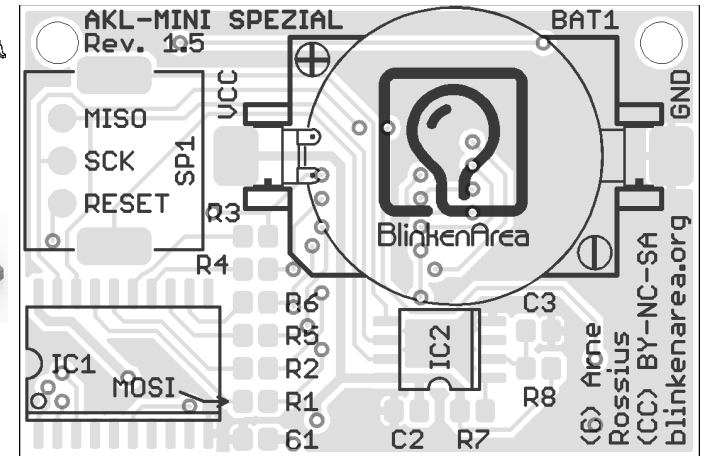
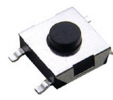
5. Piezo Buzzer

(SP1): Orientation doesn't matter.

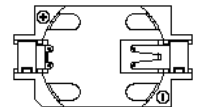


6. Push-button:

Solder the push-button to the intended location on the board (on the LED side). Orientation is not important if your push-button has only 4 pins, the fifth pad remains unused. 5-pin push-buttons will only fit in one orientation.



7. Battery Holder (BAT1): You need a decently sized soldering tip for the battery holder – a long, thin tip for SMD soldering doesn't work very well. If your tip is pointy, hold the *side* of the tip against the battery holder's contact for better heat transfer. Make sure the chamfered corner as well as the ⊕ and ⊖ marks match the silkscreen outline on the board.



Insert battery (text side facing up, i.e. visible) and press push-button to switch on.

- If the melody doesn't play, check IC2 and the value of C3 (must be 100 pF, not 100 nF).
- If a LED lights up at odd times or when off, it is probably oriented wrong. Desolder it by heating the two pads in quick succession (or using two soldering irons), push LED away with the tip, remove remaining solder with desoldering wick and solder LED again (rotated 180°).
- If every 6th LED or a group of 6 consecutive LEDs is not working, the cause is probably a bad solder joint on a controller pin (IC1).
- If nothing works, check IC1 pins 10 and 20 (bottom left, top right) and the battery holder.
- To switch to "always-on" mode, solder a bridge between IC1 pins 9 and 10 (bottom left).
- The default melody is Mendelssohn's wedding march. To select "Happy Birthday", solder a bridge between IC2 pins 3 and 4 (top right). For other melodies, desolder & re-program IC2.

Questions? Problems? Comments? Ideas? Please contact me:

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Project webpage: de: http://wiki.blinkenarea.org/index.php/AKL-Mini_Spezial
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