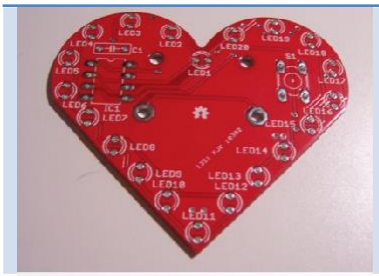
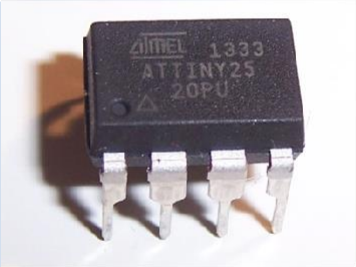
Heartboard PCB Assembly Instructions

Thanks for purchasing a Heartboard! These instructions will guide you through assembling and testing the Heartboard. Let's get started!

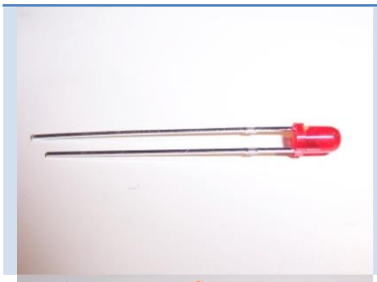
Stuff you need

	Soldering iron
	Solder
	Wire cutters
	Wire strippers
	Multimeter
	A CR2032 Coin-cell battery

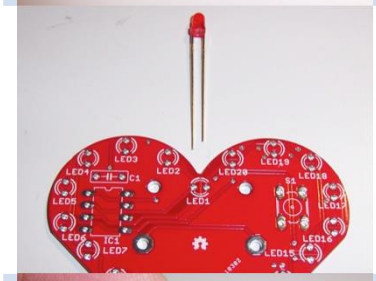
Parts in the kit

	Circuit board
	IC socket
	ATTiny25 microcontroller
	100nF capacitor (marked 104)
	Button
	Battery holder
	22 red LEDs

Instructions



We'll start by inserting the LEDs. LEDs are polarized –they need to go into the board in a certain orientation. Looking at the LED, they have two leads – a long one and a short one. They have a positive side – the anode, which has the longer of the two leads, and the negative cathode side, which has the short lead.



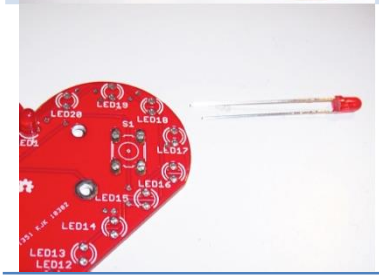
Starting with LED1, align the LED so that the **cathode (short lead) is towards the right.**

Insert LED1 into the board.

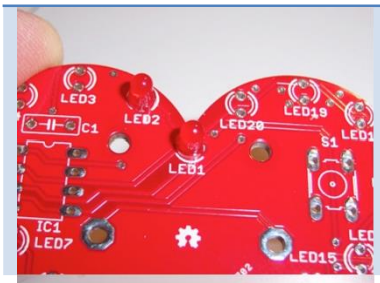
Holding the LED close to the board, flip the board over and bend out the two leads. This prevents the LED from falling through when you solder it.

Solder the leads of the LED in place. Clip the leads.

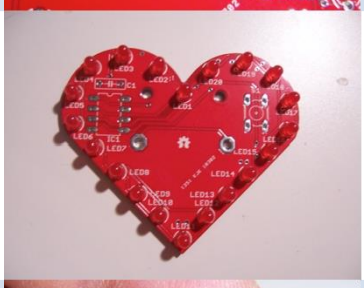
Your LED should be firmly attached! If it's on a slight angle, heat up both leads with the iron and straighten the LED by pressing from the other side. Work quickly, though – the LED will get hot.



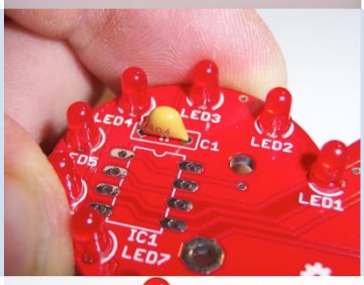
Now, repeat for LED2. This, and all of the other LEDs, align so that the **shorter cathode lead is towards the bottom of the board.**



Insert the LED, bend out the leads, flip the board, solder it and clip the leads, as before with LED1.



Repeat the process for the rest of the LEDs.

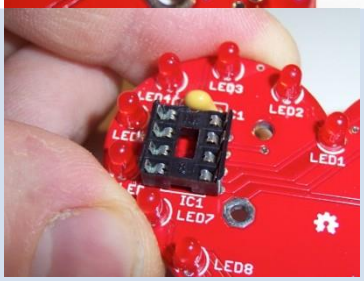


Insert the 100nF capacitor in the spot for C1. Bend out the leads, solder it in and clip the leads.

For the capacitor, it doesn't matter which pin goes in which hole.

Insert the button in the spot for S1. There are two ways that it will fit – either will work. The button should stay in the board when you flip it over to solder.

Solder it in, and clip the leads.



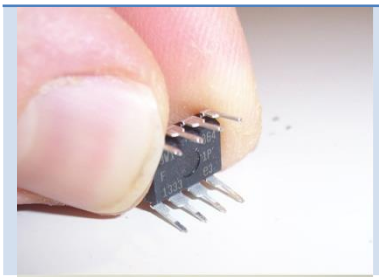
Optionally, you can insert the 8-pin IC socket in the spot for IC1. Not doing this makes the board shorter, but if you accidentally solder in IC1 backwards, it's really tricky to fix. Only skip this if you're really confident in your assembly skills.

Note that one end of the socket has a little notch in it, as does the outline on the board. This is to indicate which pin is pin #1. Make sure to line those up when you insert the socket.

Holding the socket in place, flip the board over, and bend out two pins on opposite sides. This helps keep the socket in place as you solder it. Make sure to hold the socket flush against the board when you bend the pins, so that it goes on straight.

Solder the pins in, and then clip off the excess leads. Don't clip too much – you don't want to be clipping off the solder join, just the pointy ends of the leads.

(This photo is from a different board)

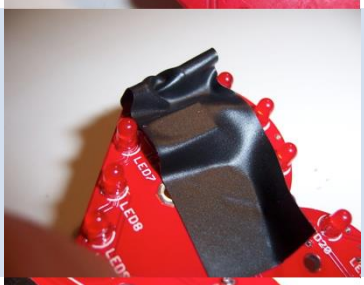


You need to bend the leads on the ATTiny25 IC to make them parallel, so that they fit in the socket nicely. Grab the two sides of the chip as shown, and press each side of the chip – VERY GENTLY – against a flat table.

This is what the chip should look like when you're done – the two rows of leads are parallel, rather than bent more outwards.

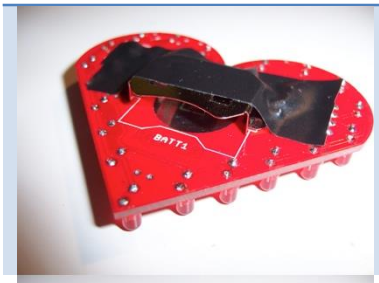
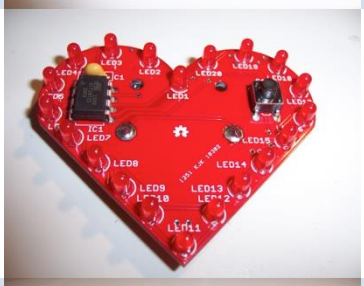
If you installed the IC socket, insert the chip into the socket. It's very important to have it go in the right way – there's a small divot on the chip that indicates pin #1. This goes towards the end of the socket with the notch.

If you did not install the IC socket, insert the chip into the board. Be VERY careful about alignment. Pin 1 is indicated on the ATTiny25 with a dot – this goes on the same side as the notch on the outline on the board, so that the dot is toward the round side of the heart.



Again, if you did not install the IC socket, tape IC1 in place, and flip over the board.

Solder in the pins, and then remove the tape.

	Tape the battery holder in place with some electrical tape. Make sure it's flush with the board – if it's at an angle, the battery won't make good contact.
	Flip the board over and solder it in. You'll need a lot of heat – it's a big metal part you're trying to solder in.
	Slide in your battery with the positive side towards the battery holder – this is the side with the printing on it. Push the button, and you should see lights. Congratulations – you've finished your Heartboard!
	Optionally, you can stick the included pin backing to the battery holder as shown, or thread a non-conductive string or other cord through the two holes provided to wear the board as a pendant.