

Road Sensor

*Abstract

How H8/3048 can get external state ?

H8/3048 is the brain of line trace robot.
Line trace robot has two DC motors as legs.

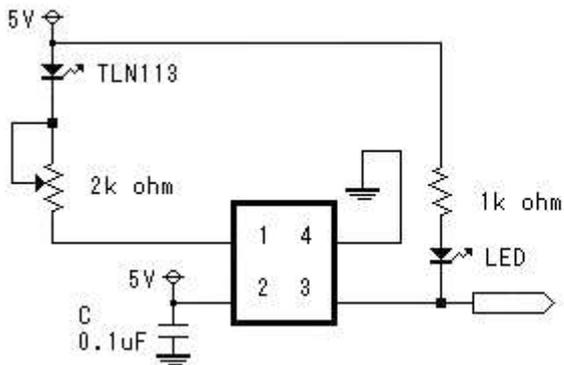
Road sensor is the eyes of line trace robot.

*Circuit diagram

H8/3048 will get road state from road sensor.
Road sensor consists of Infrared LED, monitoring LED, capacitor, oscillator and resistor.
H8/3048 supplies stable 5 V to road sensor board.

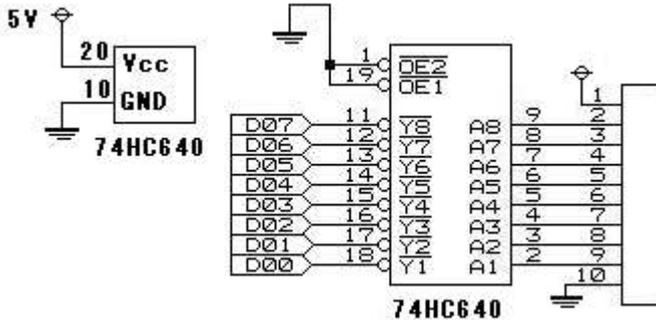
Watch circuit diagram.

One cell sensor block has an infrared LED, a variable resistor, a carbon resistor, a LED, a capacitor and black square IC. Left truth value table indicates the information of H8/3048F.



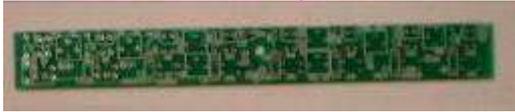
Read	Logic
White	H
Gray	H
Black	L
Out of track	L

74HC640 will invert sensor data.



*Parts

1 print circuit board (top and bottom)



2 monitoring LED and current limit resistor



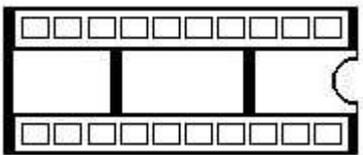
3 capacitor and variable resistor



Variable resistor is the gain adjuster of sensibility.

Capacitor is used as the part which converts analog signal to digital signal.

4 20 pin IC socket



5 black square IC



This black square IC has 1 kHz to 4 kHz rectangle wave oscillator and infrared photo transistor.

Shortest pin is number 4.

6 Infrared LED



Infrared LED gets the rectangle wave from IC and radiates to floor.

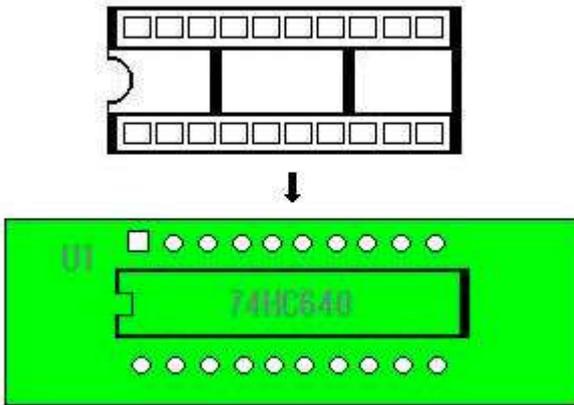
Center pin is Cathod. Outer side pin is Anode.

7 pin socket

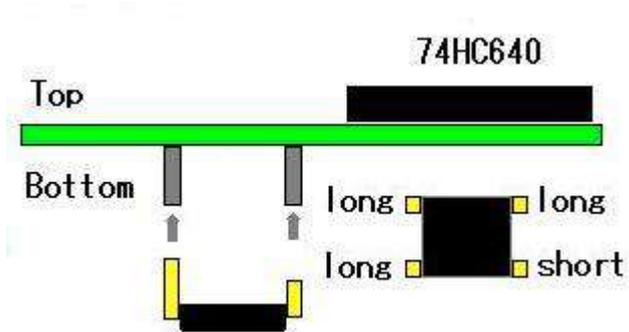
*Soldering procedure

In this PCB pin 1 hole is square. Others are round.

1 Soldering 20 pin IC socket

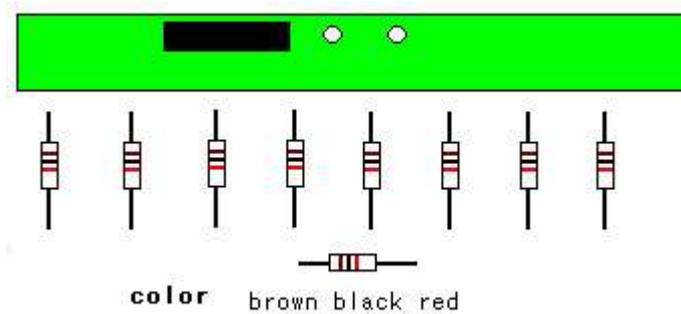


2 Soldering socket and 8 black square IC

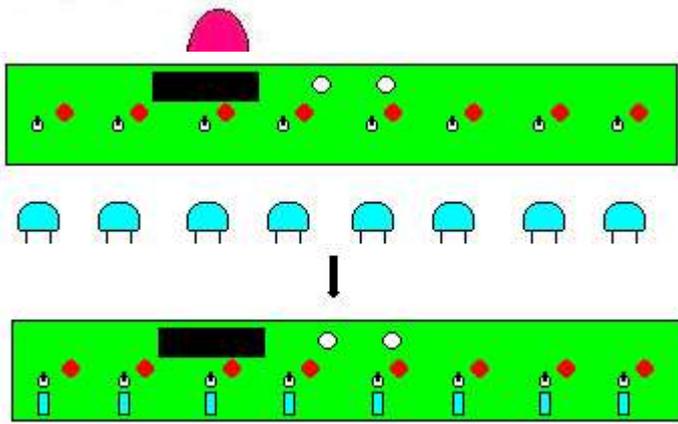


This IC has 4 pins. No. 4 pin is shortest.

3 Soldering 8 current limit resistors on top

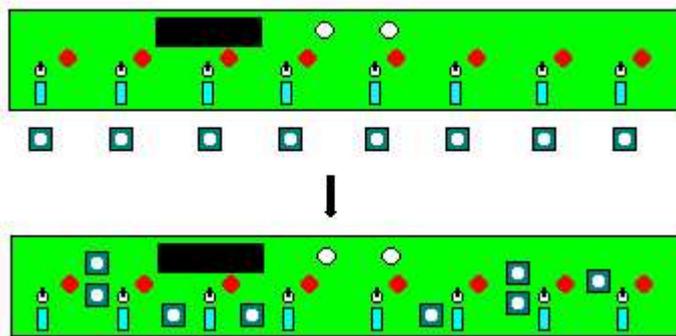


4 Soldering 8 monitoring LED (LED has polarity.)

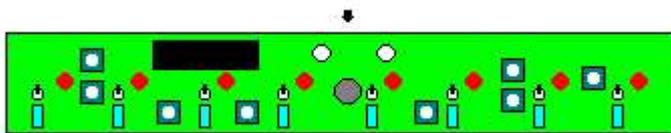


5 Soldering 8 capacitors

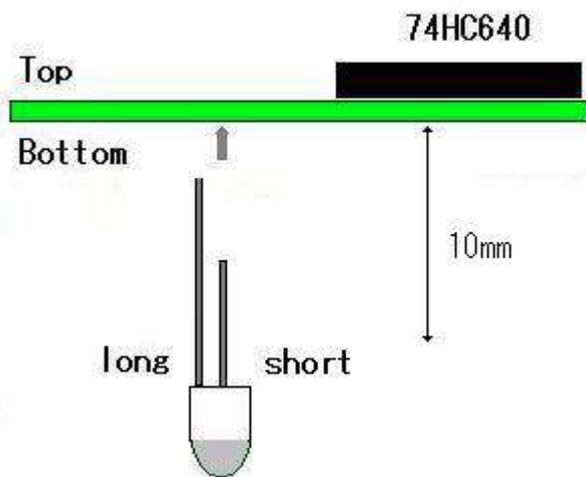
6 Soldering variable resistors



7 Soldering cemical capacitor on top. **This capacitor has porality.**



8 Soldering 8 infrared LEDs on bottom



9 Soldering 10 pin cable.

- 1 Red → Vcc 6 Gray → 3
- 2 Gray → 7 7 Gray → 2

3 Gray -> 6 8 Gray -> 1
4 Gray -> 5 9 Gray -> 0
5 Green -> 4 10 Green -> GND

*Check

After soldering, watch your board carefully.
Please go on self check and staff check.

I had maken testing tools.
The following picture is one of them.



You can check your road sensor with this tool.

The above board has clock generator, 8 bit memory and inverters.
Get road sensor data and put them to inverters.

Apply this tool to check your road sensor board.