

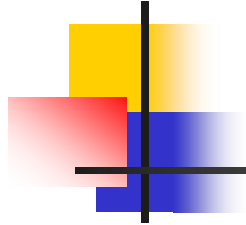


Thapar Institute of Engineering & Technology
(Deemed to be University)
Bhadson Road, Patiala, Punjab, Pin-147004
Contact No. : +91-175-2393201
Email : info@thapar.edu

Engineering Design Project-II (UTA 024)



THAPAR INSTITUTE
OF ENGINEERING & TECHNOLOGY
(Deemed to be University)



Engineering Design Project-II

(UTA 024)

Buggy Lab

Dr. Amit Mishra



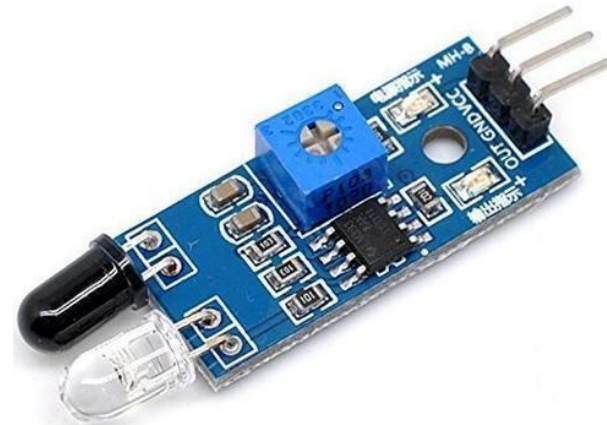
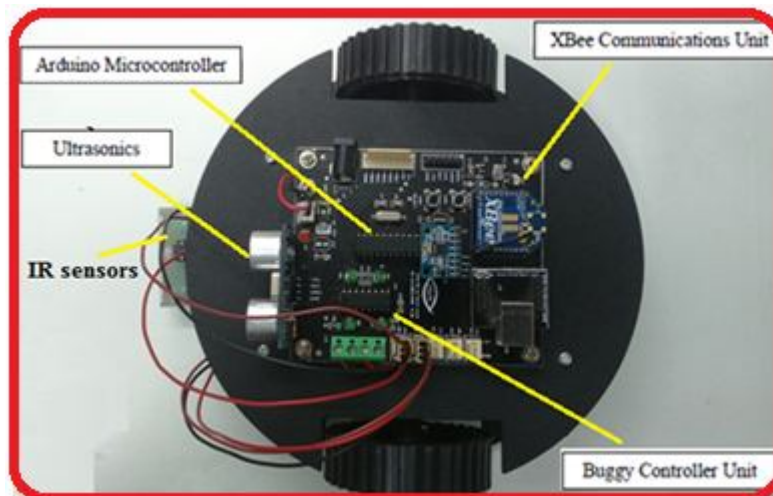
Index

- **Objective**
- **IR sensor Circuit schematic diagram**
- **Component list**
- **Design Specification and selection of components**
- **IR sensor Circuit on PCB**
- **IR sensor Circuit testing**
- **Reference**

Objective

Design and testing of IR sensor module circuit which helps Buggy robot to move on a predefined path as a line follower.

- ❖ To solder IR sensor module circuit on a general purpose PCB.
- ❖ To test the output pulses of IR sensor module on predefined track as path follower.





Component List

Sr. no	Component	Count	Specification
1	High Gain Operational Amplifier	01	LM358
2	IR sensor pair (Transmitter, Receiver)	02	
3	Resistors	04	330 Ω
4	Potentiometer (Variable resistance)	2	10 K
5	LED	02	
6	DC power supply	01	5V
7	PCB (small piece)	01	General purpose

Components



Dual Operational Amplifier



LED



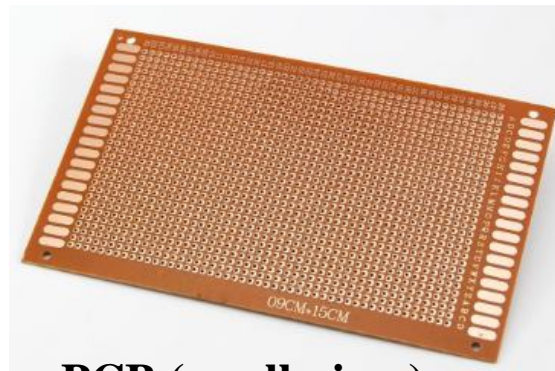
Potentiometer



IR sensor pair



Resistor



PCB (small piece)

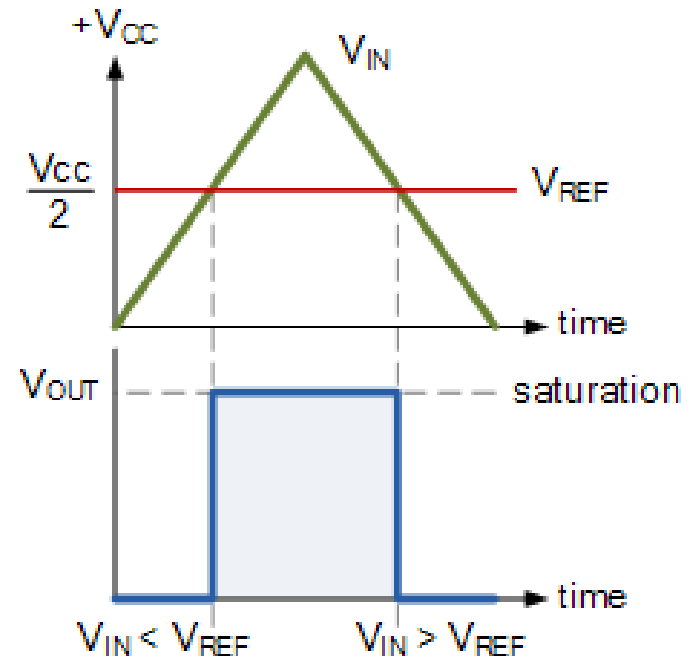
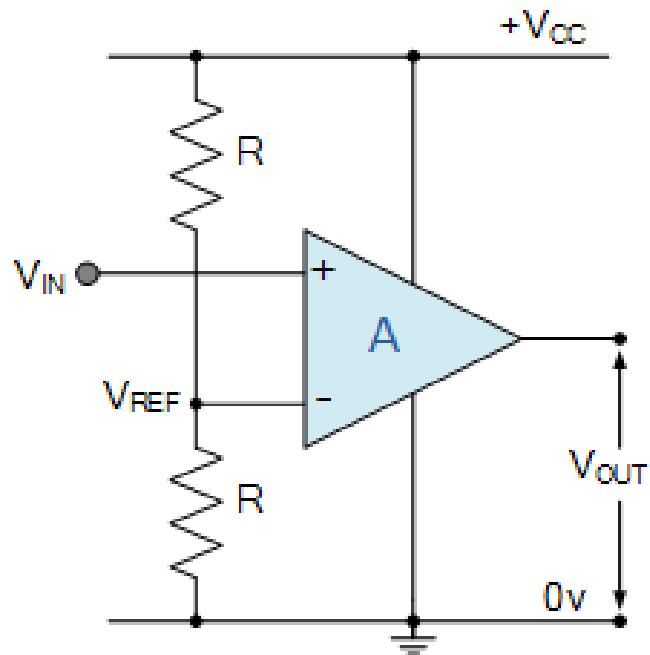
September 22, 2020

Image source: Google

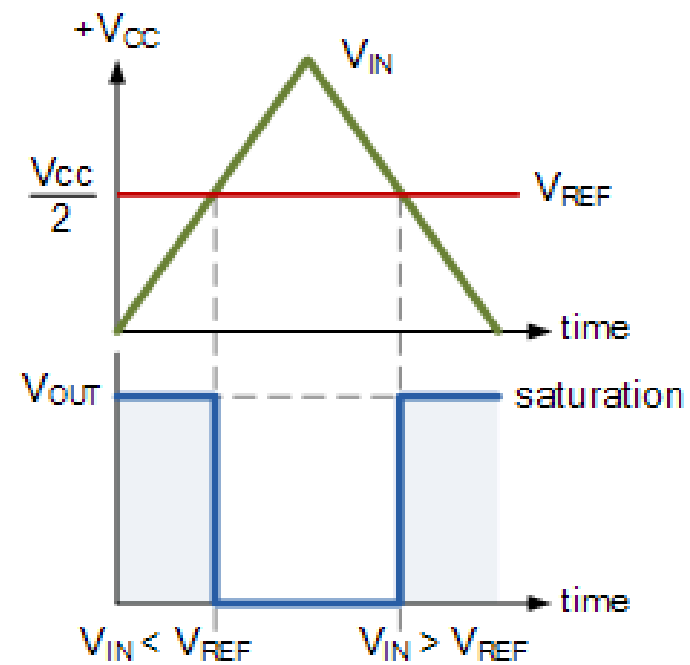
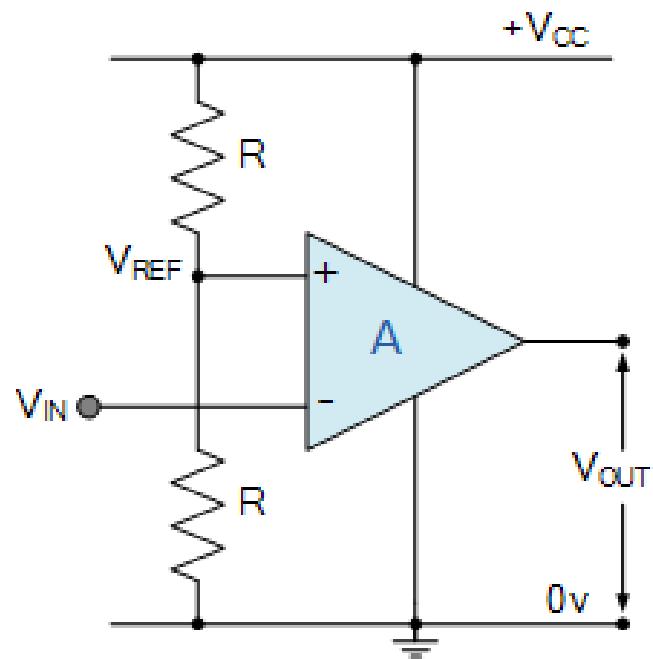


Working principle

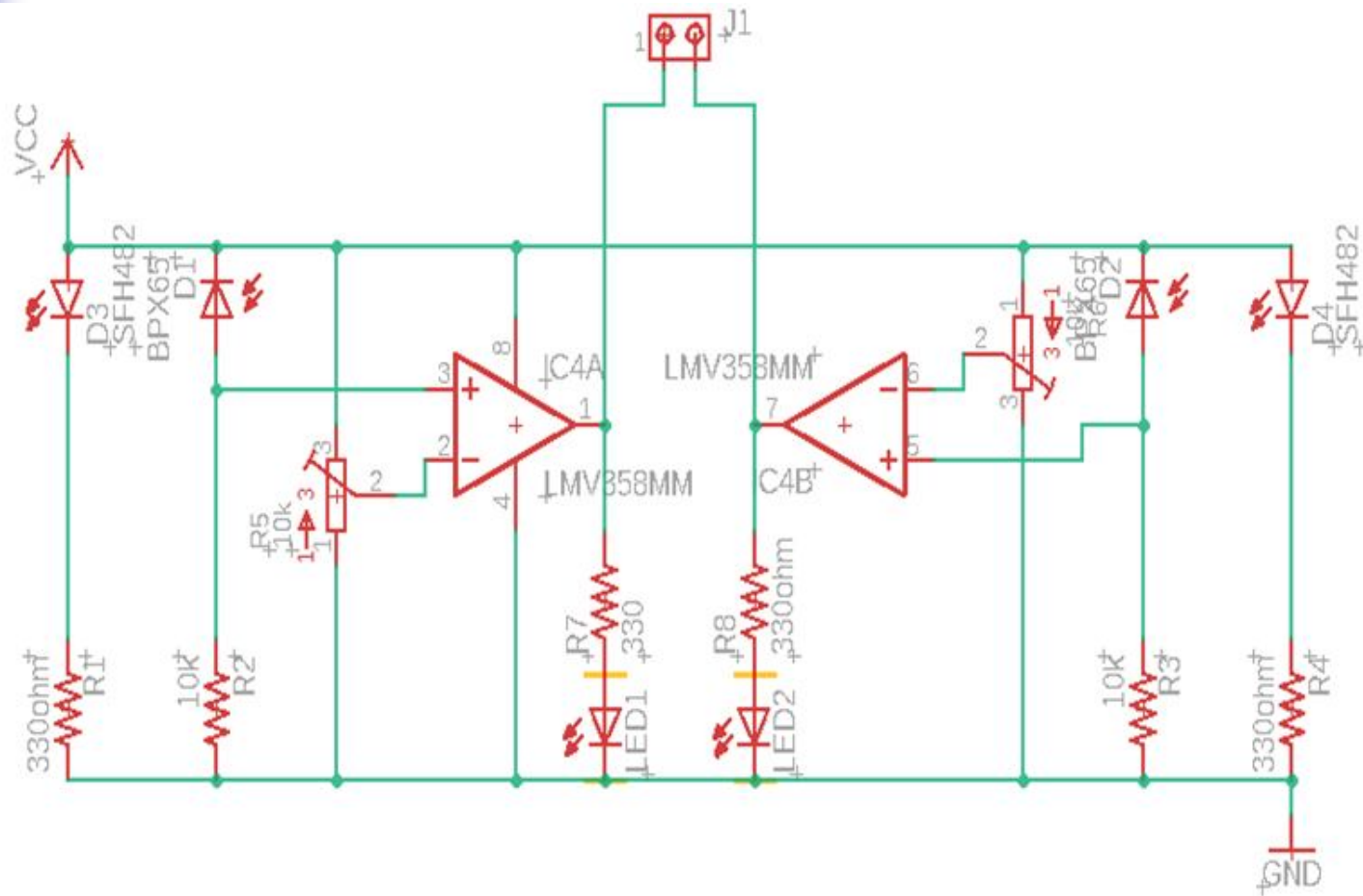
Non-inverting comparator



Inverting comparator



Continued...



September 22, 2020

Selection criterion of Comparator



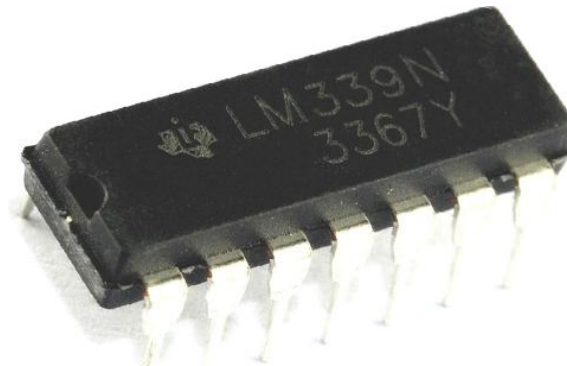
Options available

- ❖ LM 358
- ❖ LM 339
- ❖ LM324

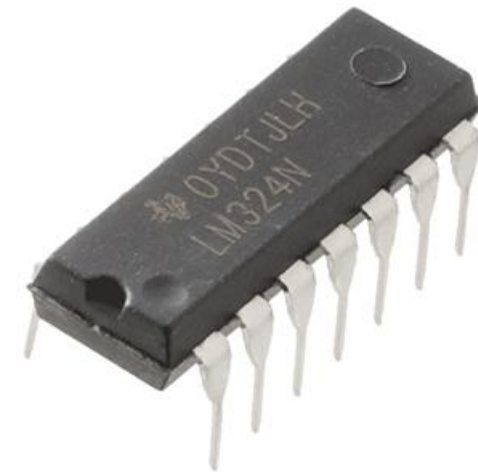
LM 358



LM 339



LM324

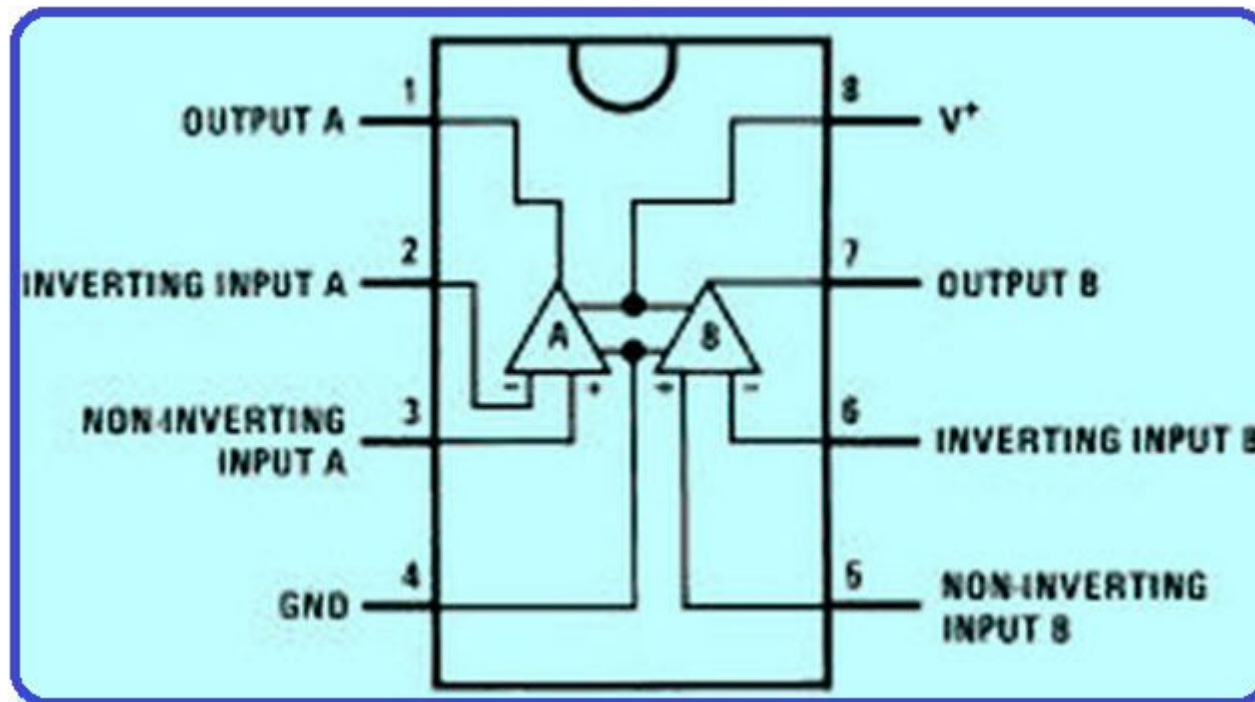


LM358: Dual comparator, 3 ~ 32V, 20-40 mA

LM339: Quad comparator, 2 ~ 36V, 800 μ A

LM324: Quad comparator, ± 1.5 V to ± 16 V, 700 μ A

LM358: Dual operational amplifier



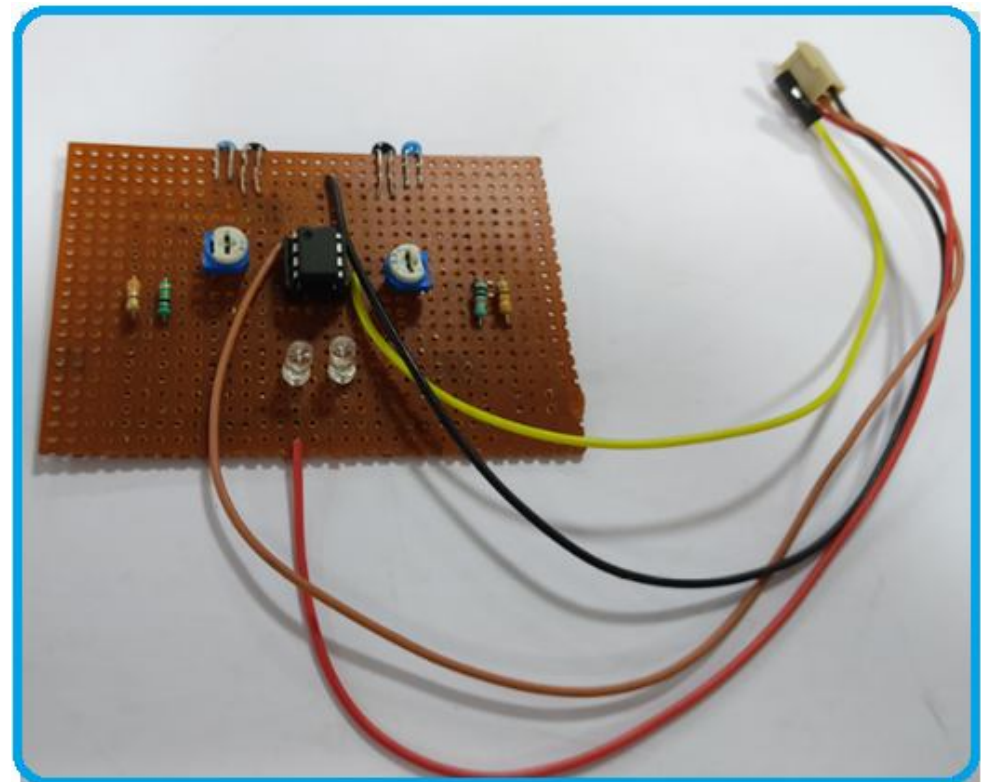
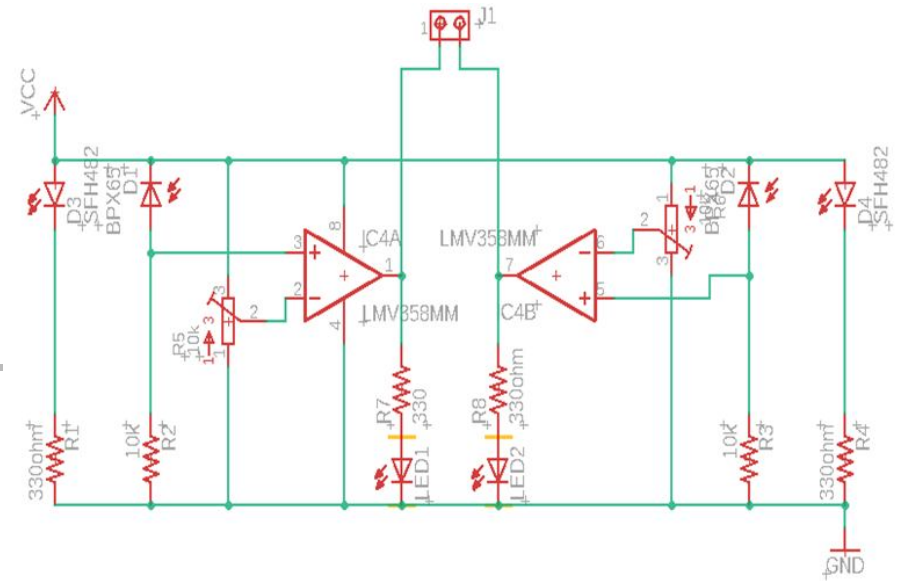
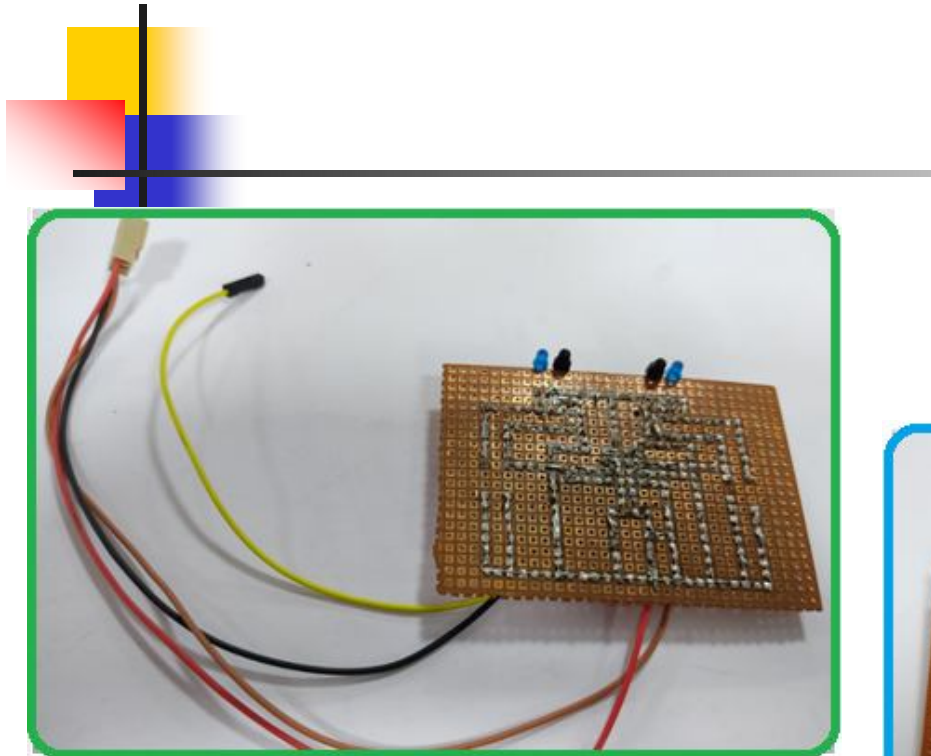
September 22, 2020

Image source: Google

IR sensor circuit on PCB

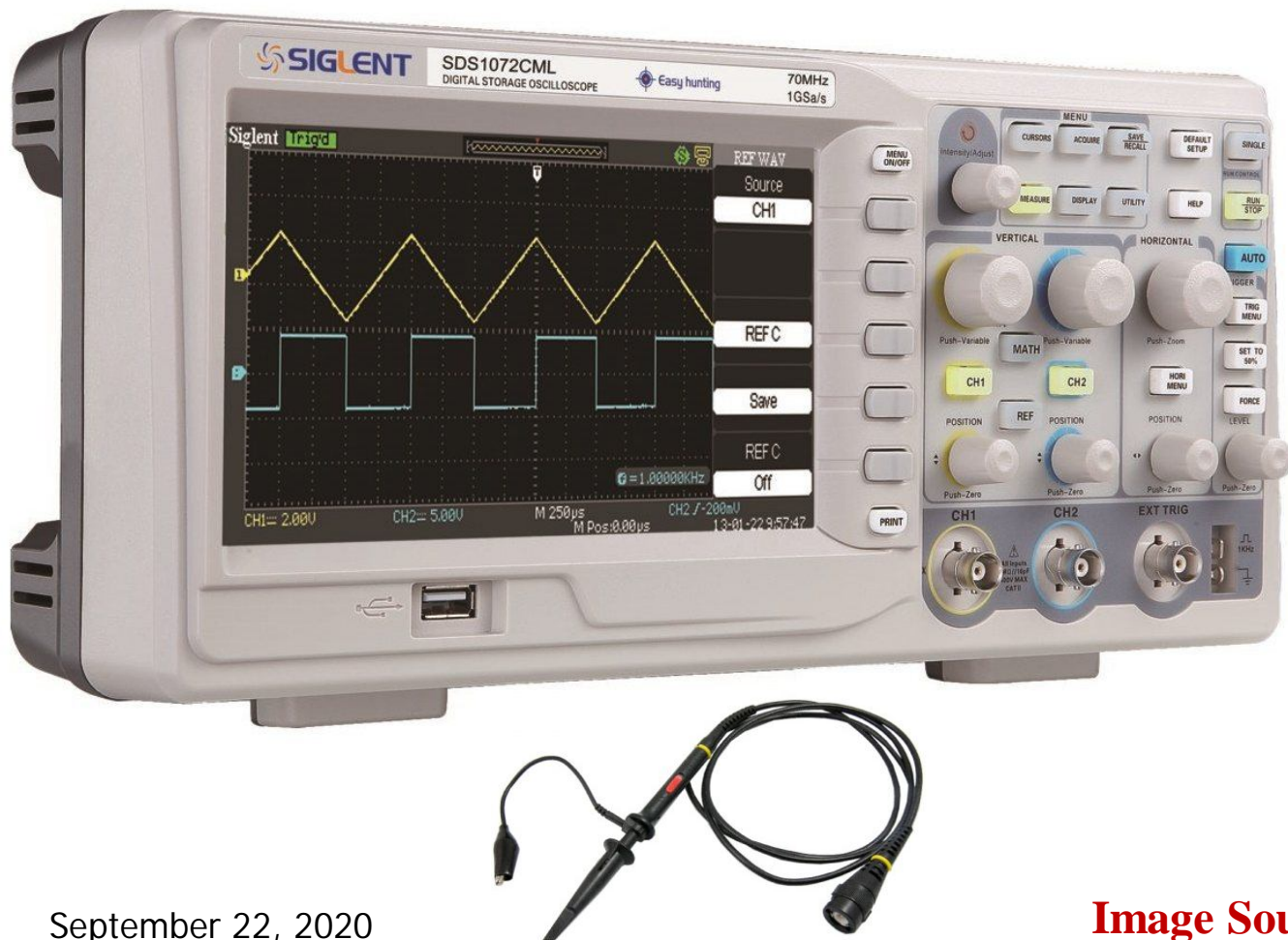


IR sensor circuit on PCB



September 22, 2020

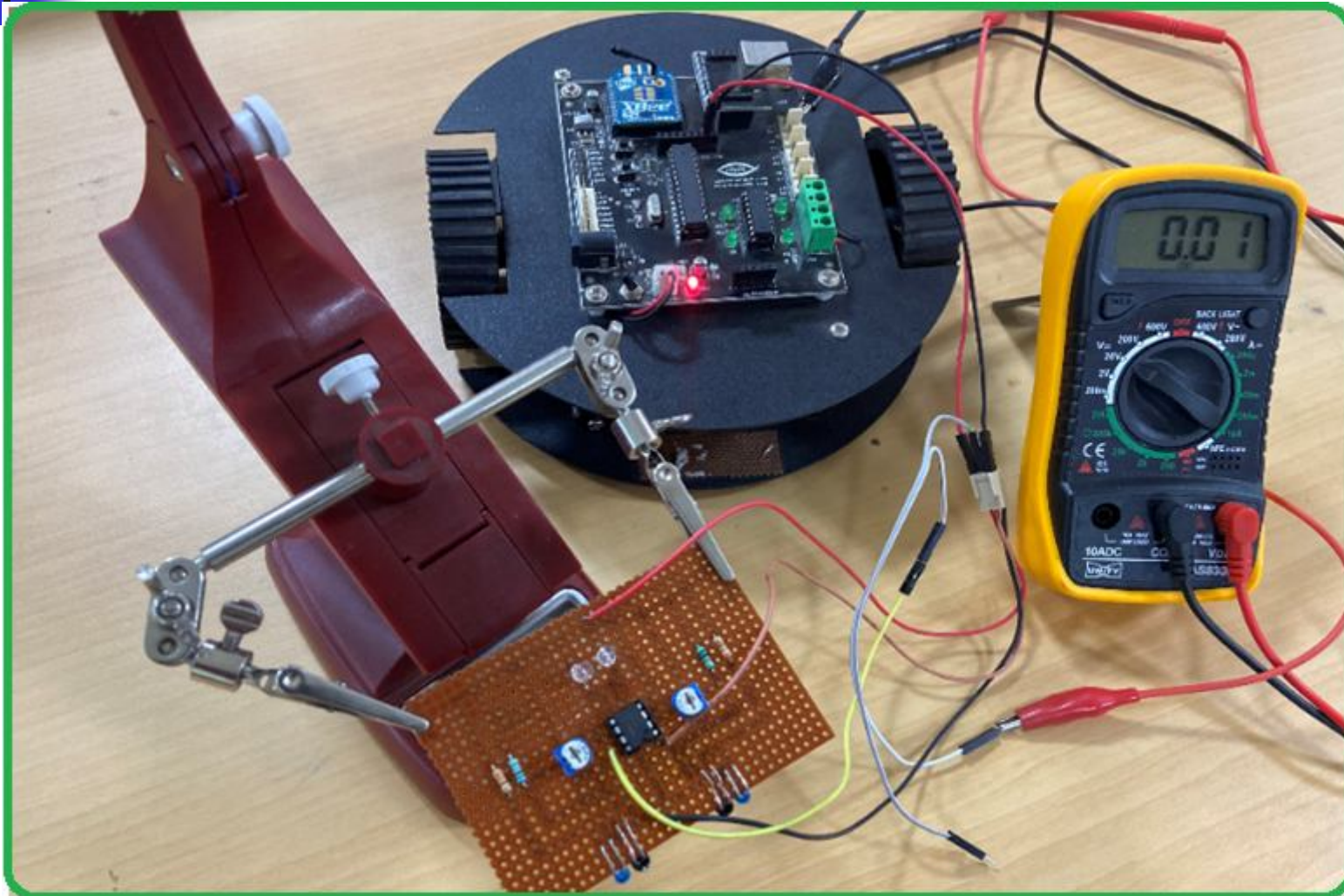
IR sensor circuit Testing



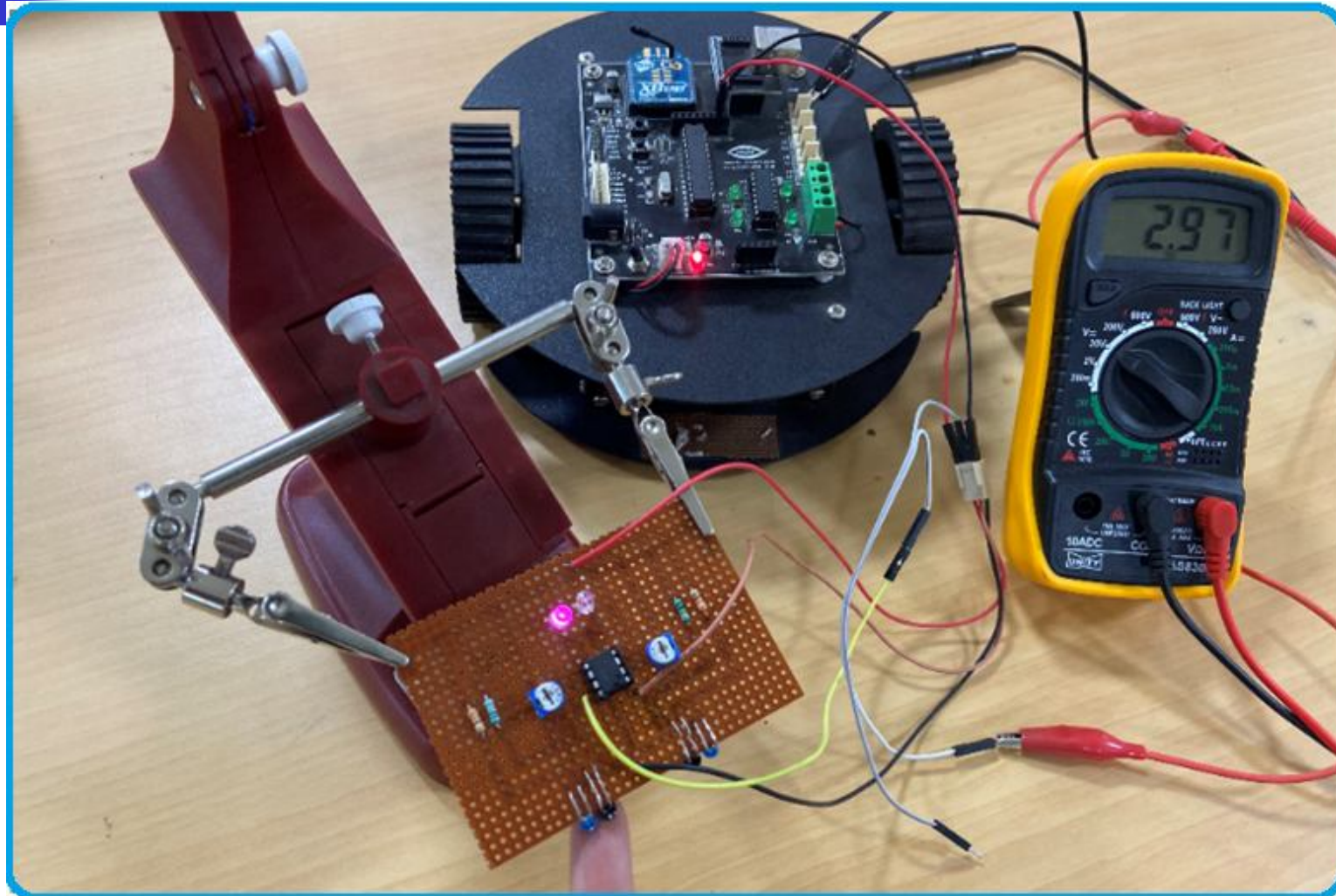
September 22, 2020

Image Source: Google 16

Testing: IR sensor Circuit



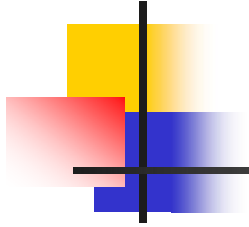
Continued...





References

- ❖ <http://www.bristolwatch.com/ele/vc.htm>
- ❖ https://www.ti.com/lit/ds/symlink/lm358-n.pdf?ts=1595072390098&ref_url=https%253A%252F%252Fwww.google.com%252F



Thanks !