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Engineering Design Project-II (UTA 024)

THAPAR INSTITUTE
OF ENGINEERING & TECHNOLOGY
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Engineering Design Project-II
(UTA 024)
Buggy Lab

Dr. Amit Mishra

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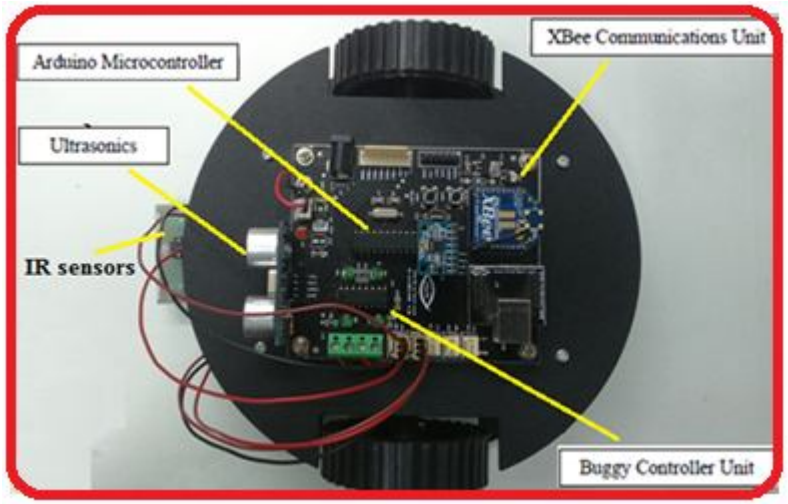
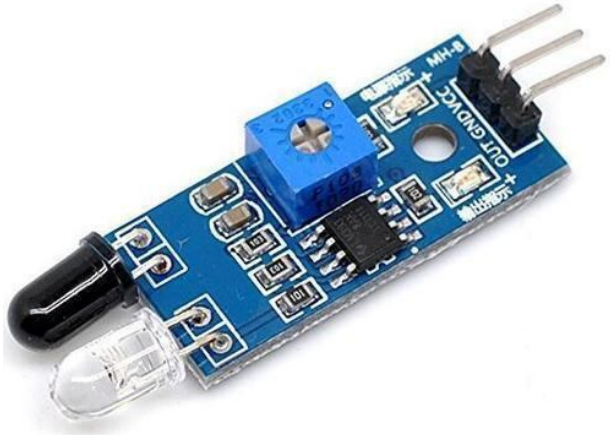
Objective

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

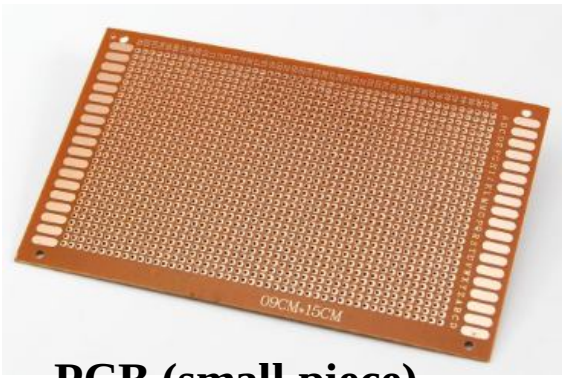
Dual Operational Amplifier

LED

Potentiometer

IR sensor pair

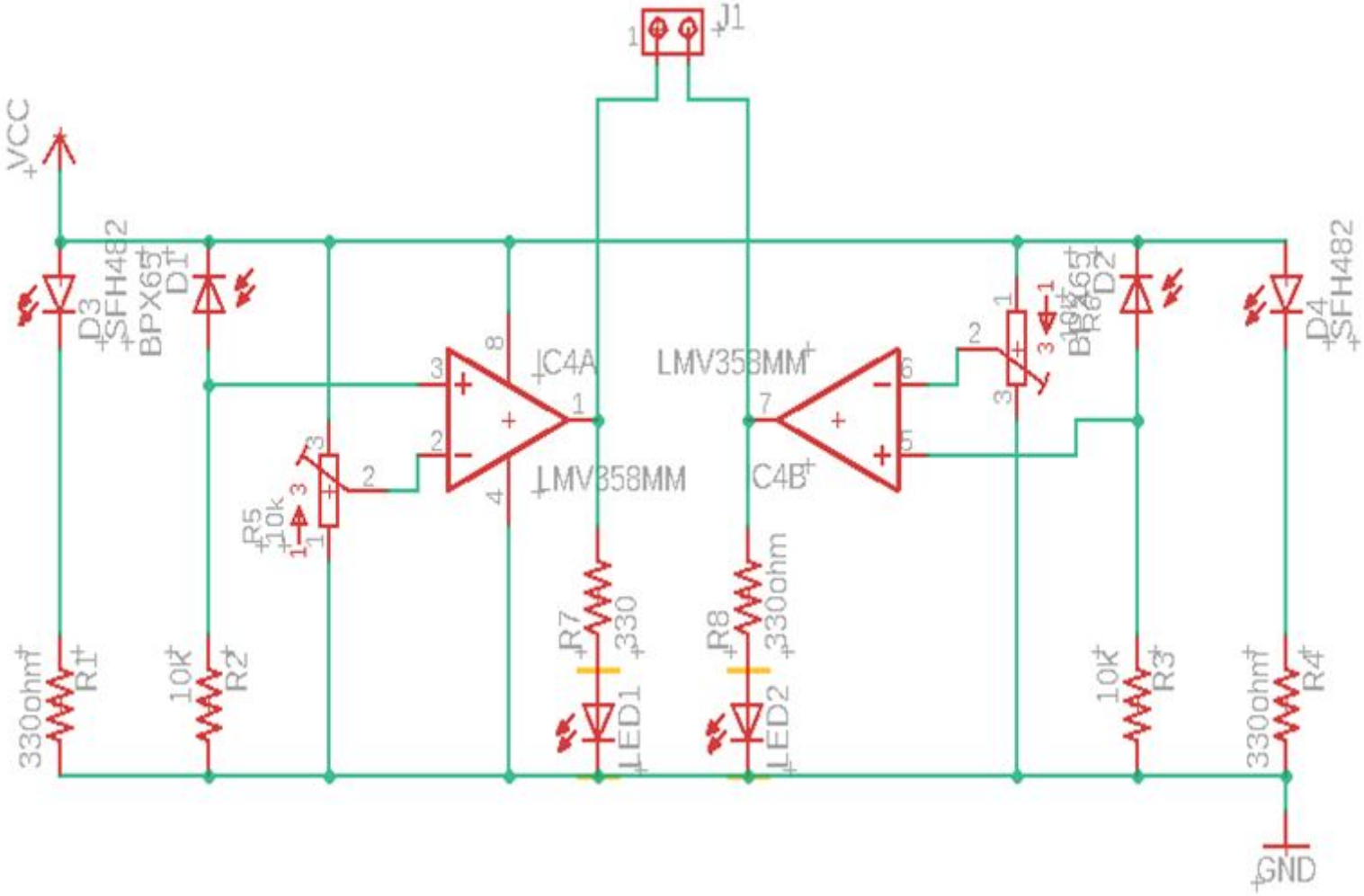
Resistor



PCB (small piece)

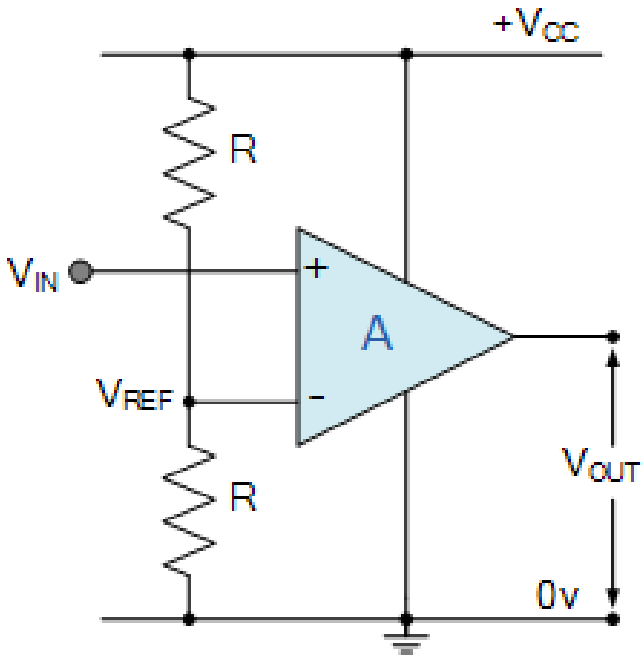
Image source: Google

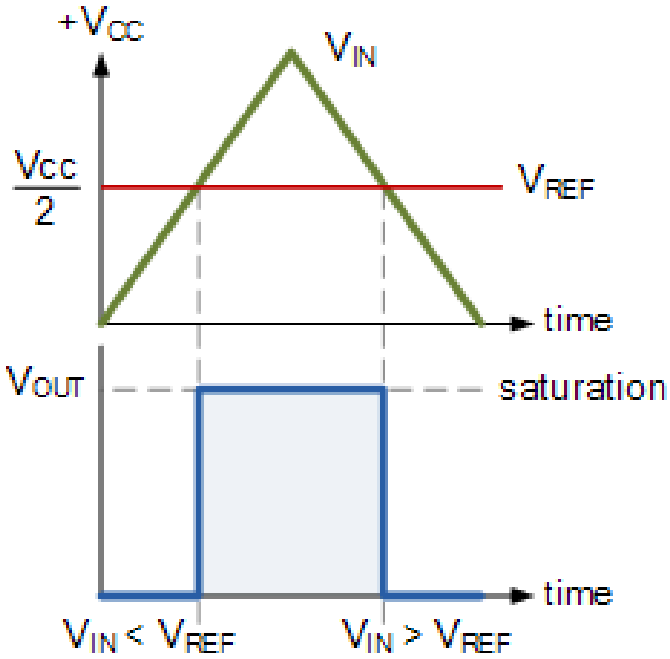
IR Sensor circuit



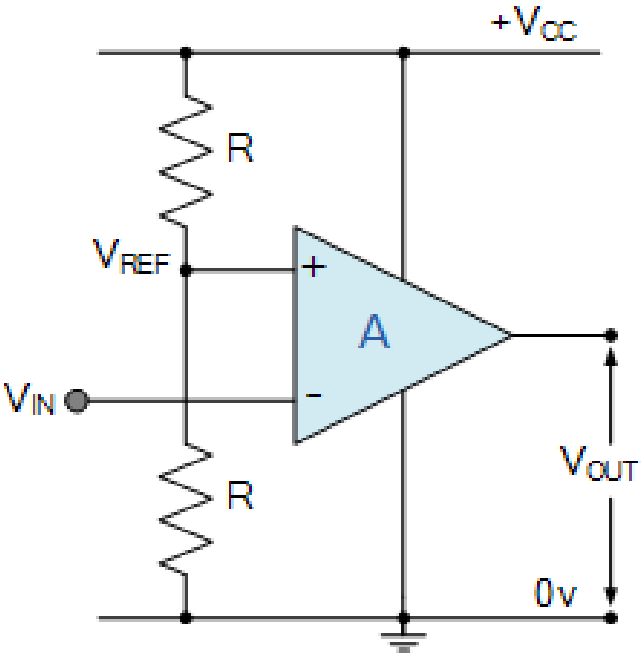
Working principle

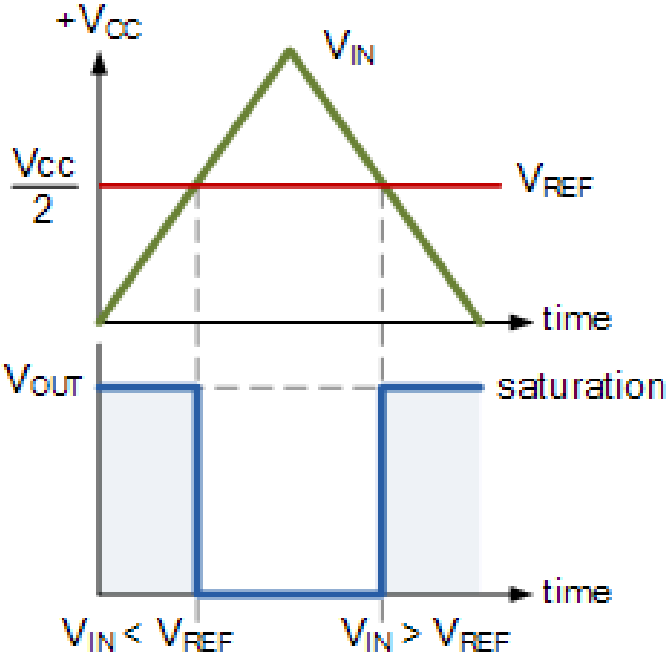
Non-inverting comparator





Inverting comparator





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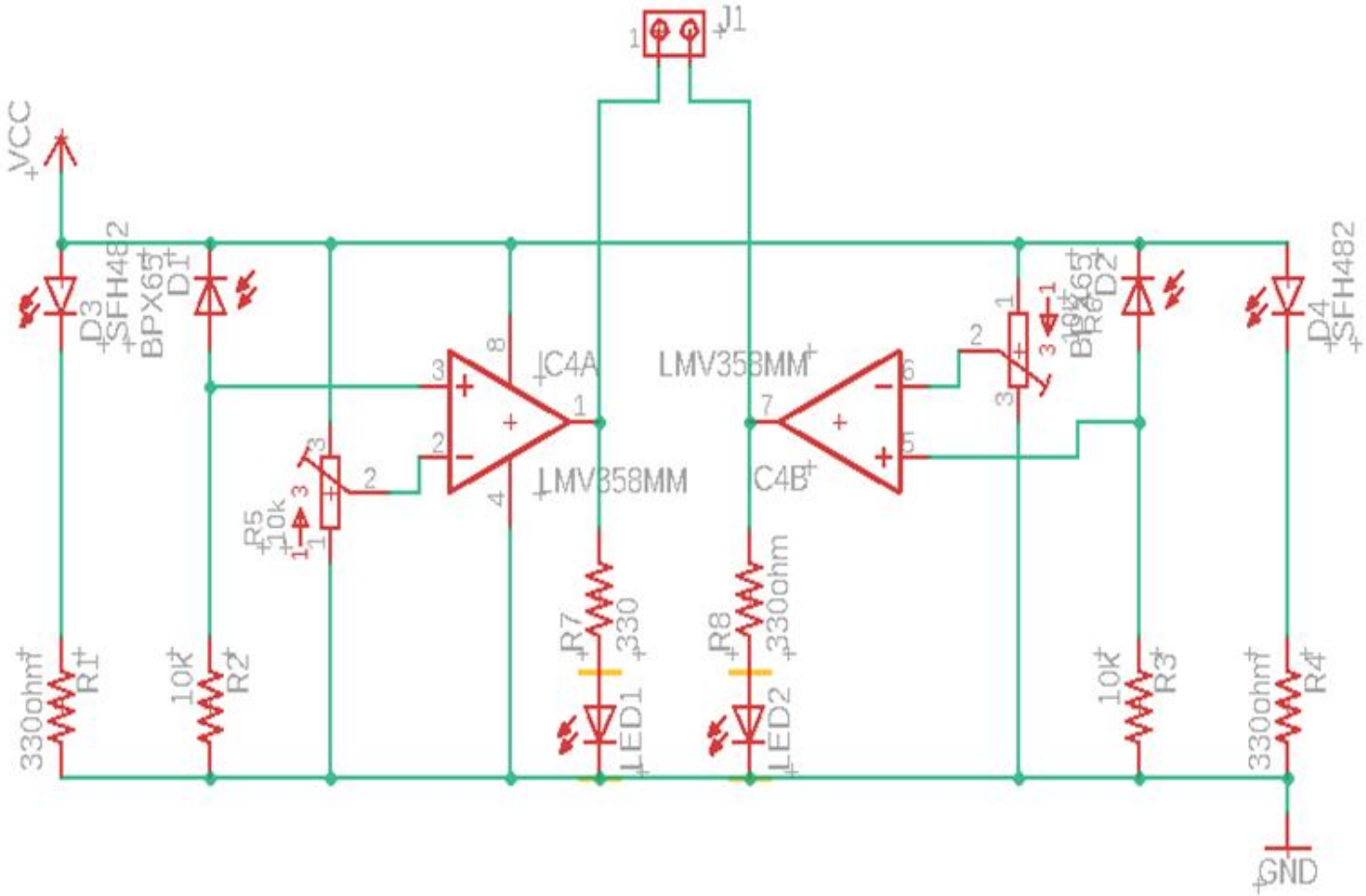

J1
VCC
D3
SFH482
D1
BPX65
C4A
LMV358MM
LMV358MM
C4B
R5
10k
R7
330
R8
330ohm
LED1
LED2
330ohm
R1
10k
R2
10k
R3
330ohm
R4
D2
D4
SFH482
GND

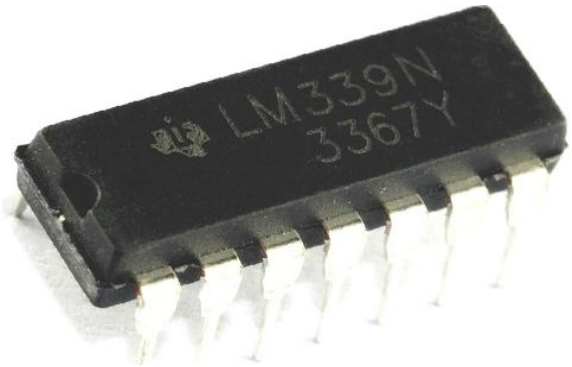
Selection criterion of Comparator

Options available

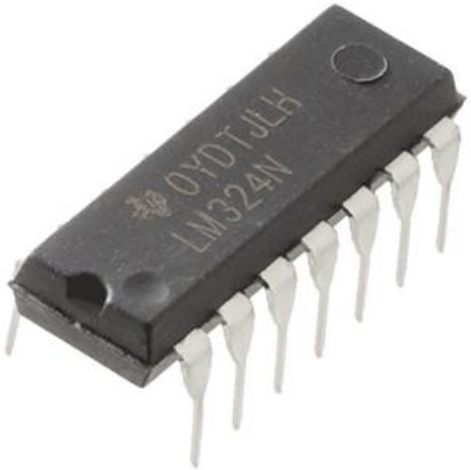
- LM 358
- LM 339
- LM324

LM 358

LM 339



LM324



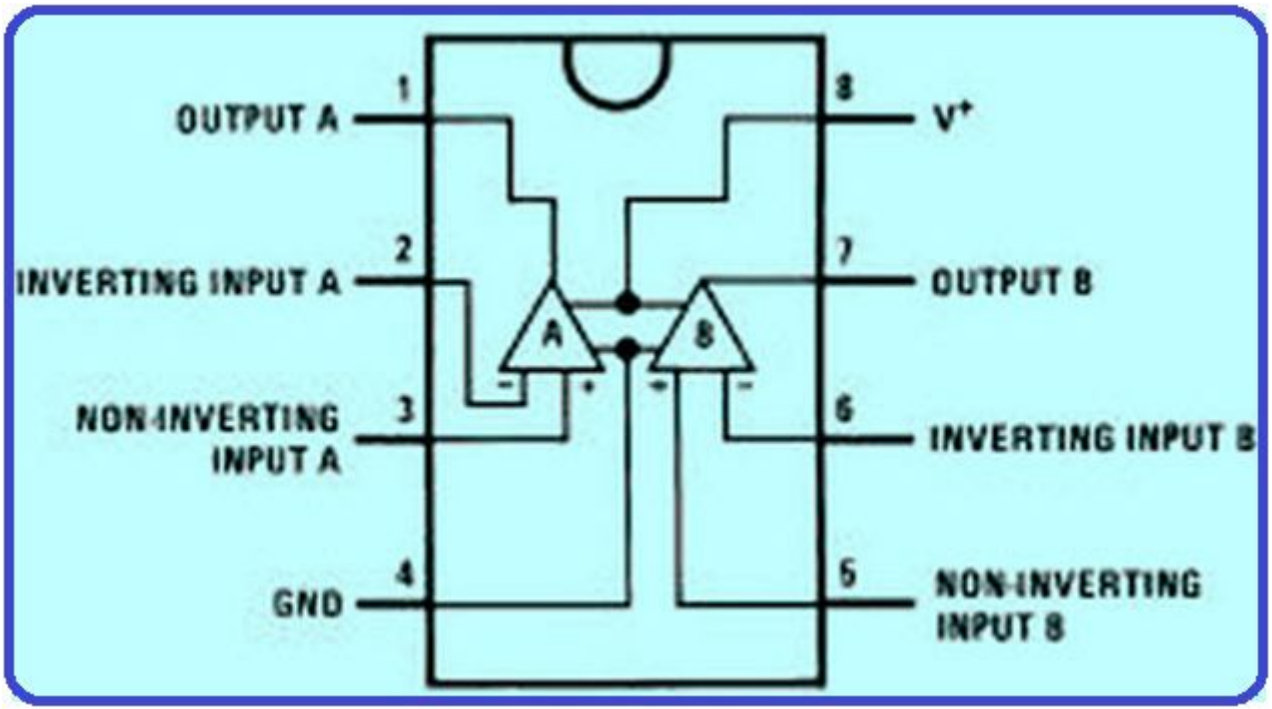
LM358: Dual comparator, 3 ~ 32V, 20-40 mA

LM339: Quad comparator, 2 ~ 36V, 800µA

LM324: Quad comparator, ±1.5V to ±16V, 700µA

Image source: Google

LM358: Dual operational amplifier



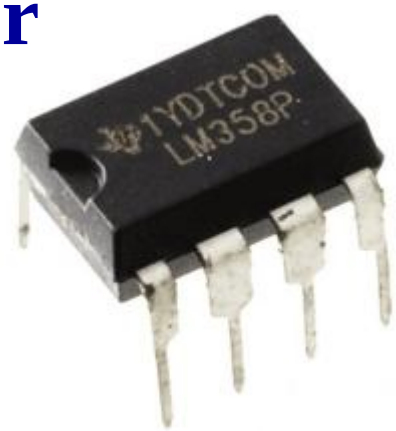
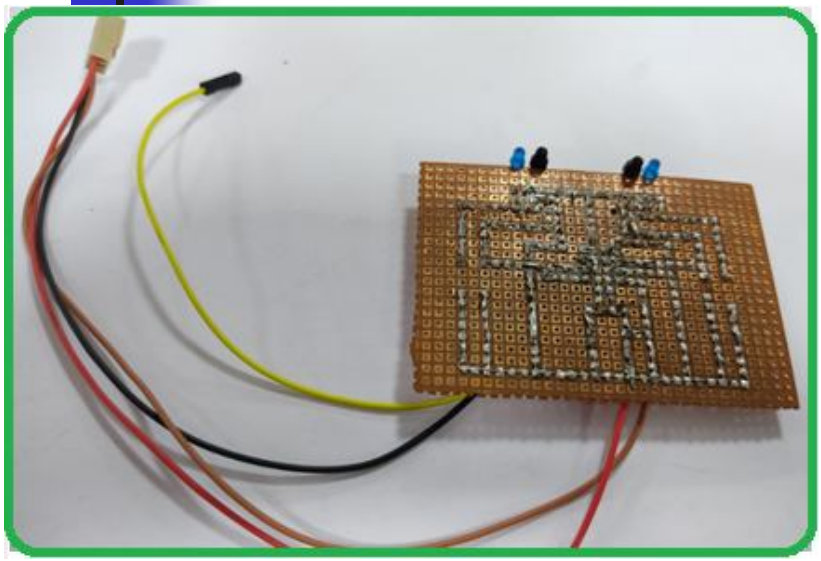
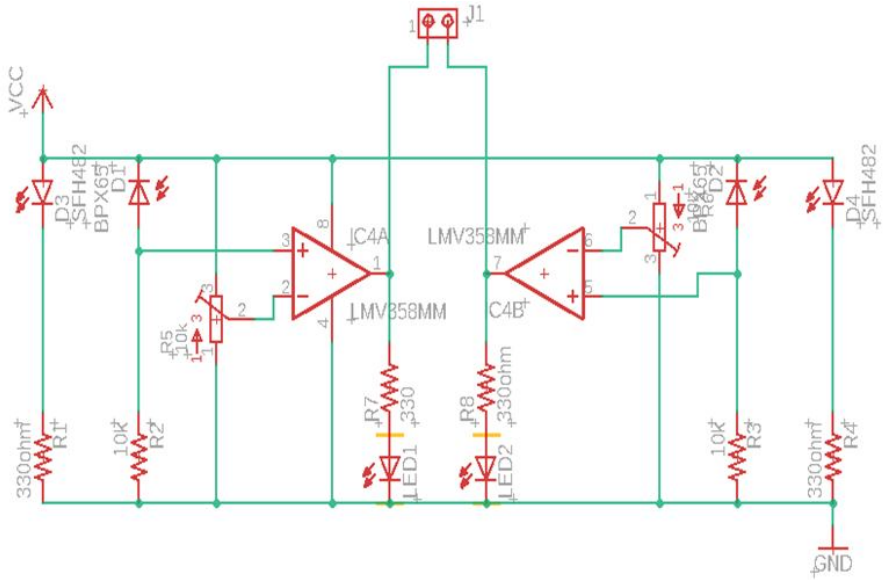


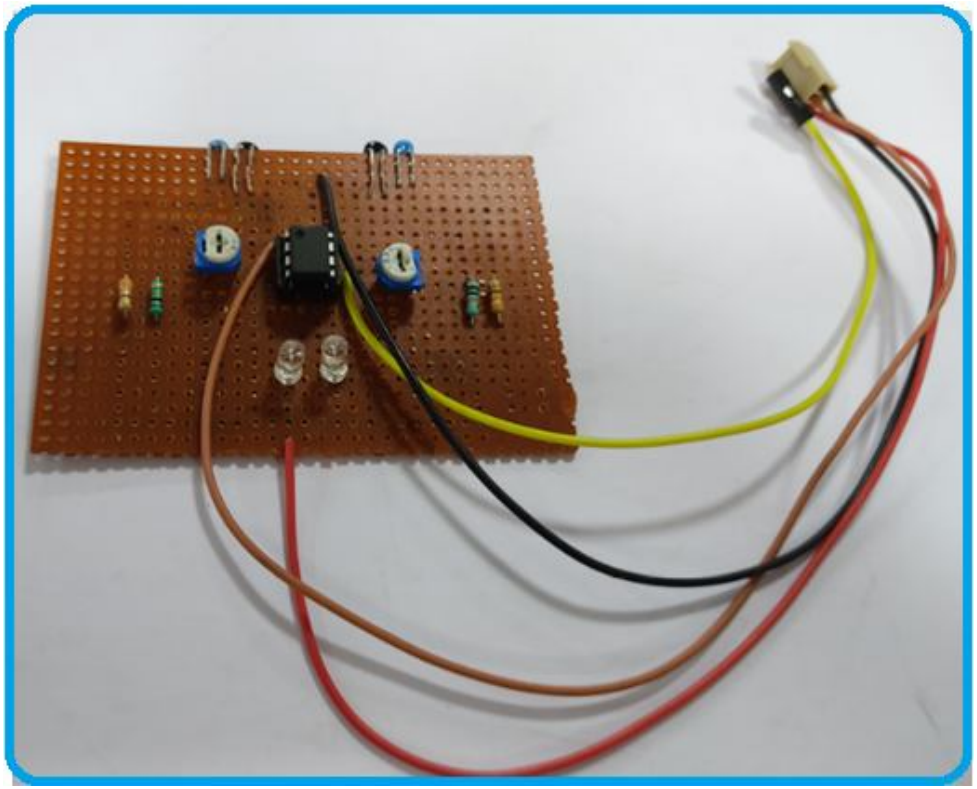
Image source: Google

IR sensor circuit on PCB

IR sensor circuit on PCB







IR sensor circuit Testing

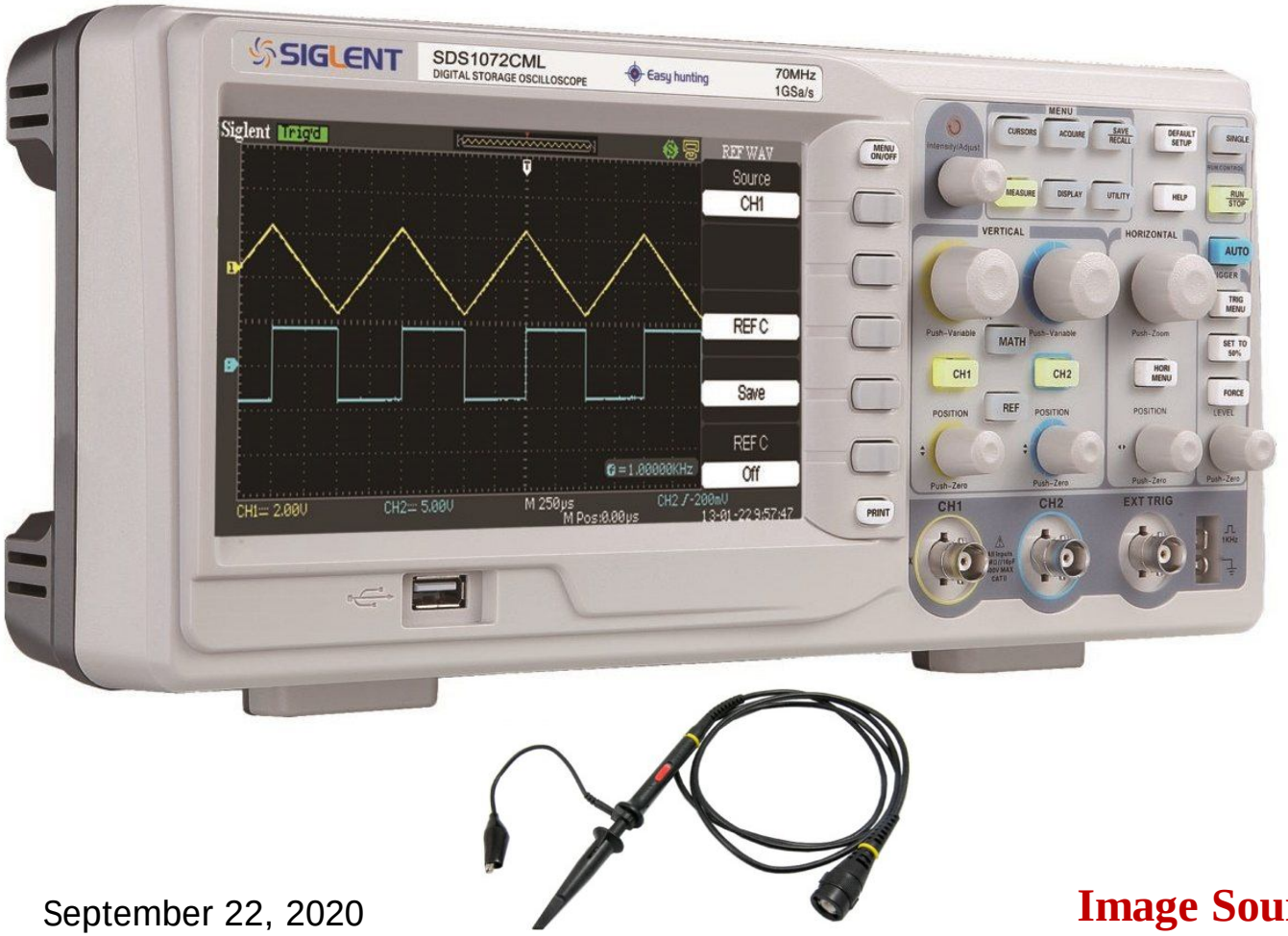
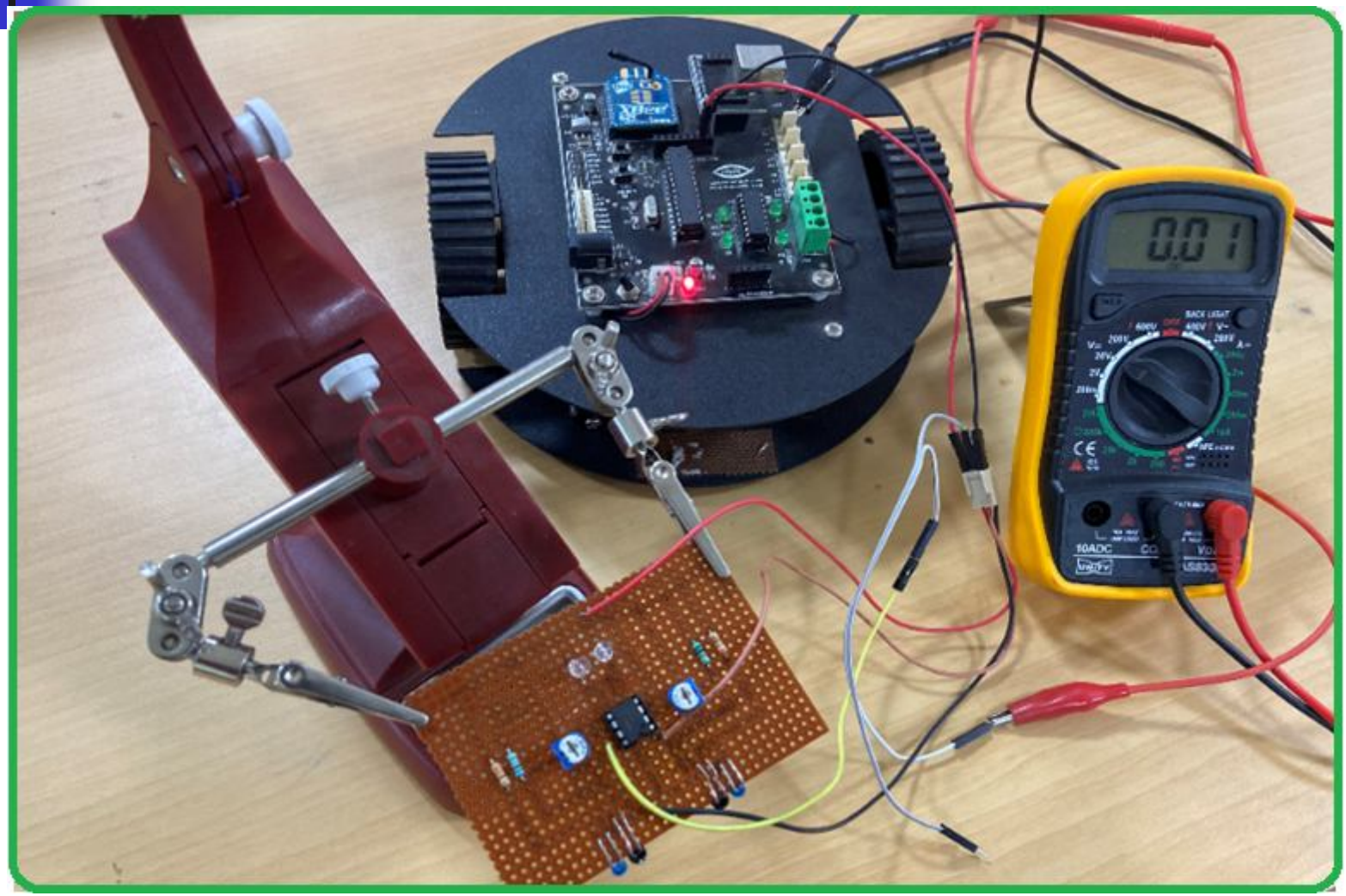


Image Source: Google

Testing: IR sensor Circuit



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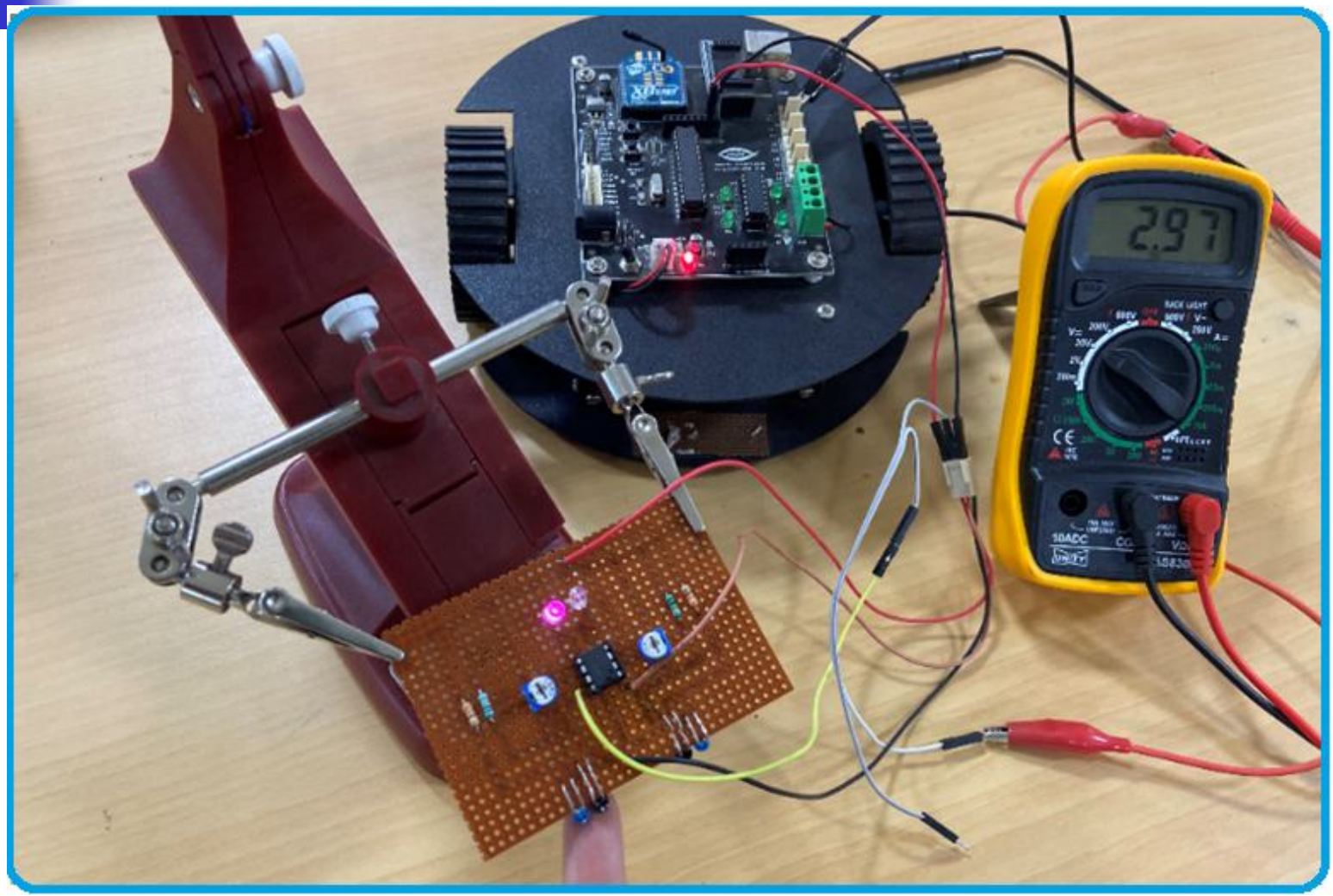

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- https://www.ti.com/lit/ds/symlink/lm358-n.pdf?ts=1595072390098&ref_url=https%253A%252F%252Fwww.google.com%252F

Thanks !