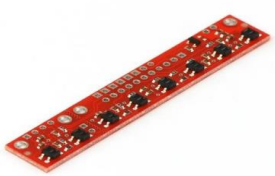
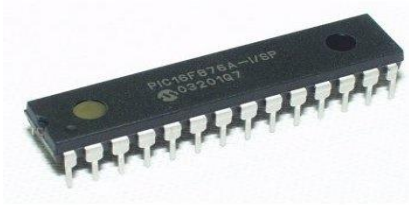
MUFE

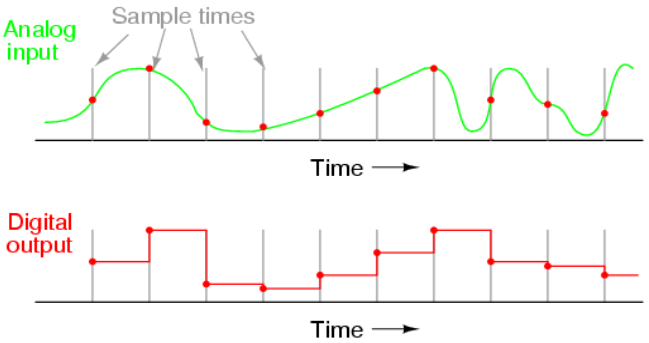
MARMARA UNIVERSITY - FACULTY OF ENGINEERING

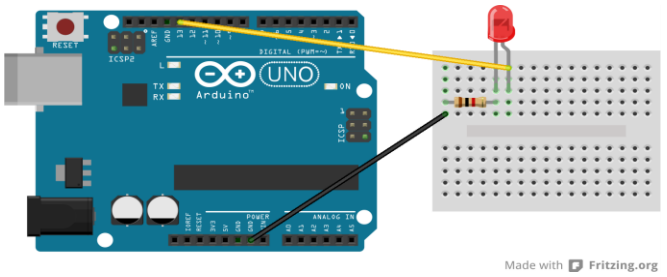
ROBOTICS TEAM

Neler gördük?



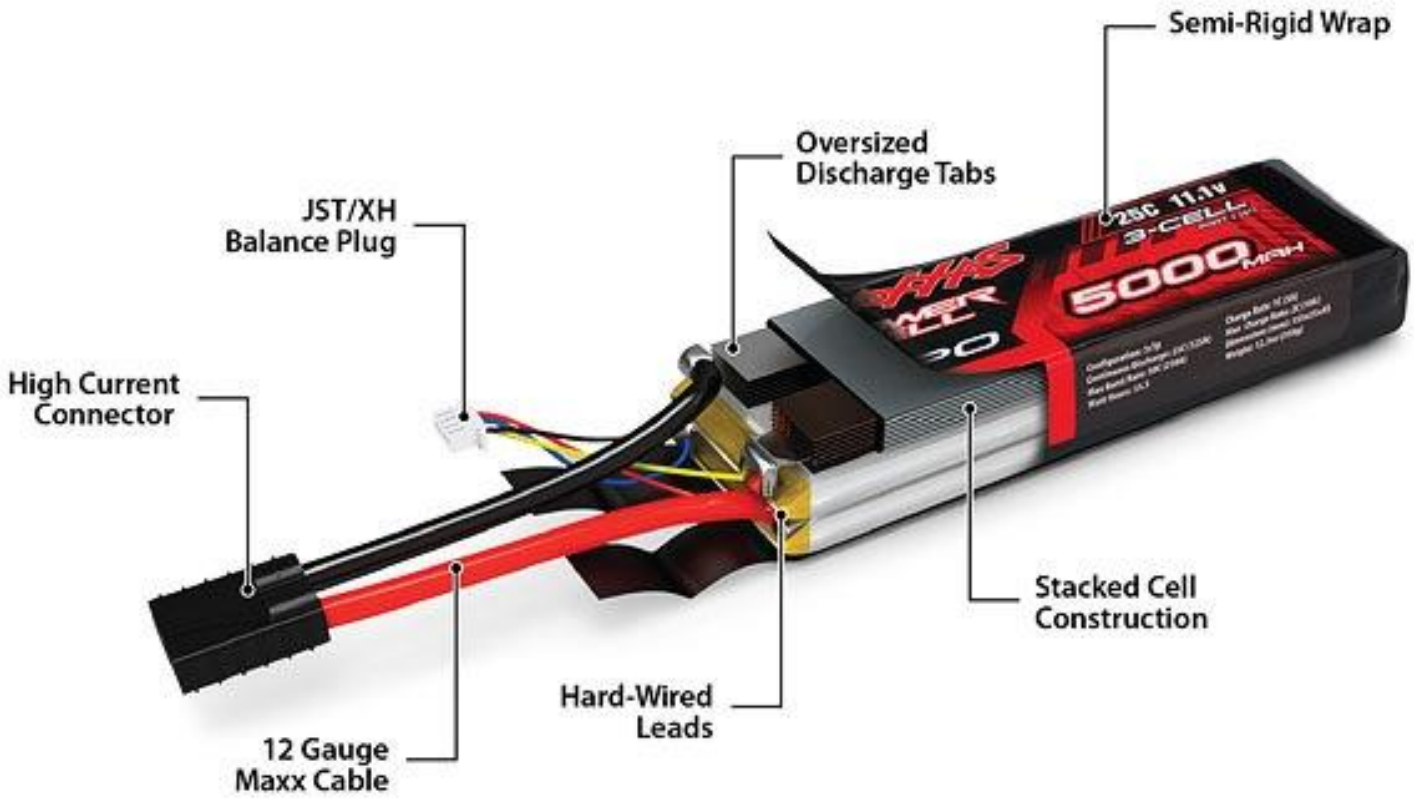






Elektrik – Elektroniğe Giriş
Robot Enerji Kaynağı

Li-Po Pil


Semi-Rigid Wrap
Oversized
Discharge Tabs
JST/XH
Balance Plug
High Current
Connector
Stacked Cell
Construction
Hard-Wired
Leads
12 Gauge
Maxx Cable
25C 11.1V
3-CELL
5000 MAH

Otonom Robotlar

- Algılama
- Hareket
- Enerji
- Zeka

Pil Voltajları

Li-Po 2S 7,4Volt

1000mAh

Li-Po 3S 11,1Volt

2200mAh

Li-Po 4S 14,8Volt

1300mAh

Genel Çalışma Voltajları

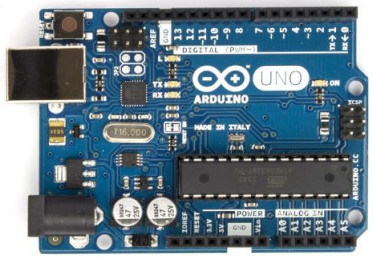
5,0 Volt

3,3 - 5,0 Volt

3,0 - 12,0 Volt

10,0 Volt

6,0 – 7,2 Volt



5,0 – 15,0 Volt

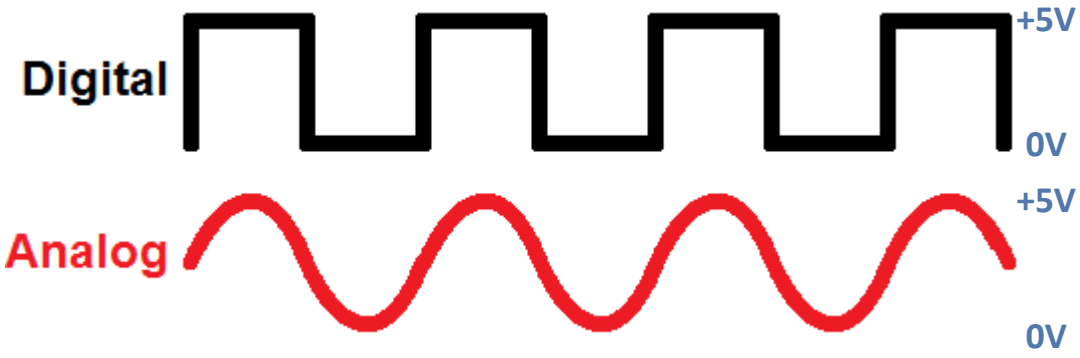
(Regülatör)

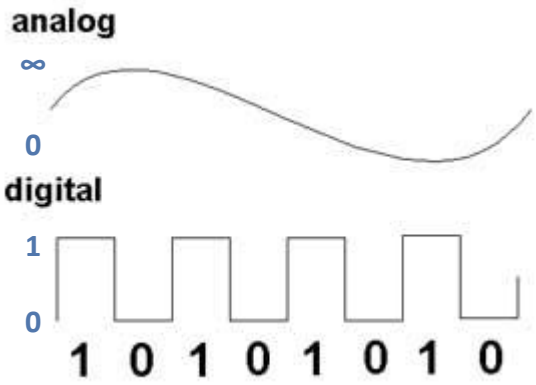
5,0 Volt

Sorularınız?

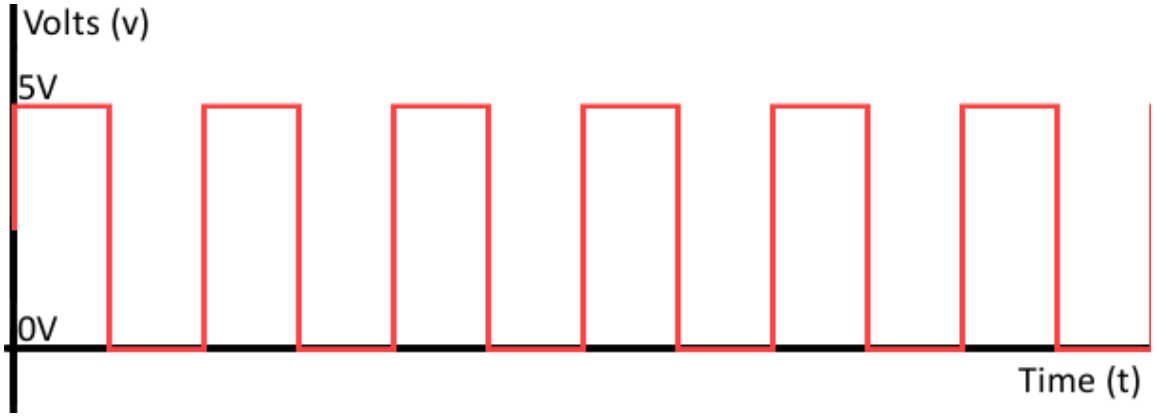
Elektrik – Elektroniğe Giriş
Sinyal

Digital – Analog Sinyaller





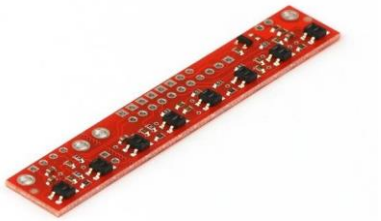
Digital Input / Output

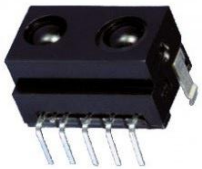


0 = LOW = 0 Volt = No Voltage

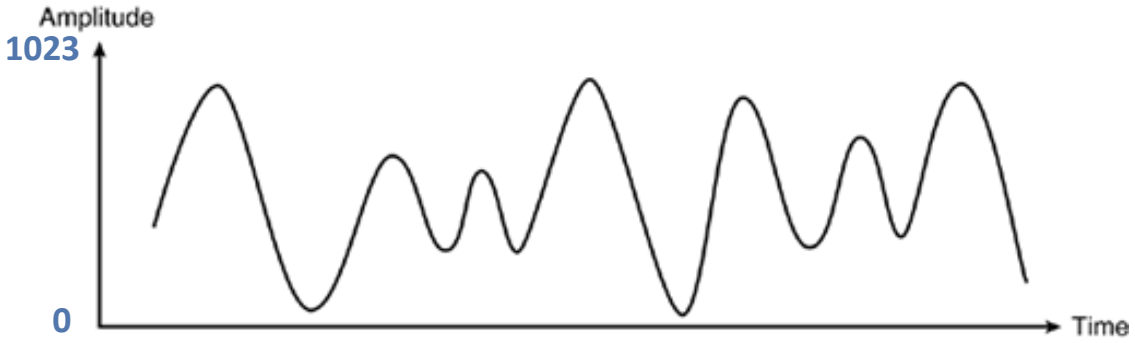
1 = HIGH = +5 Volt = Yes Voltage

Digital Sinyal İle Çalışanlar





Analog Input

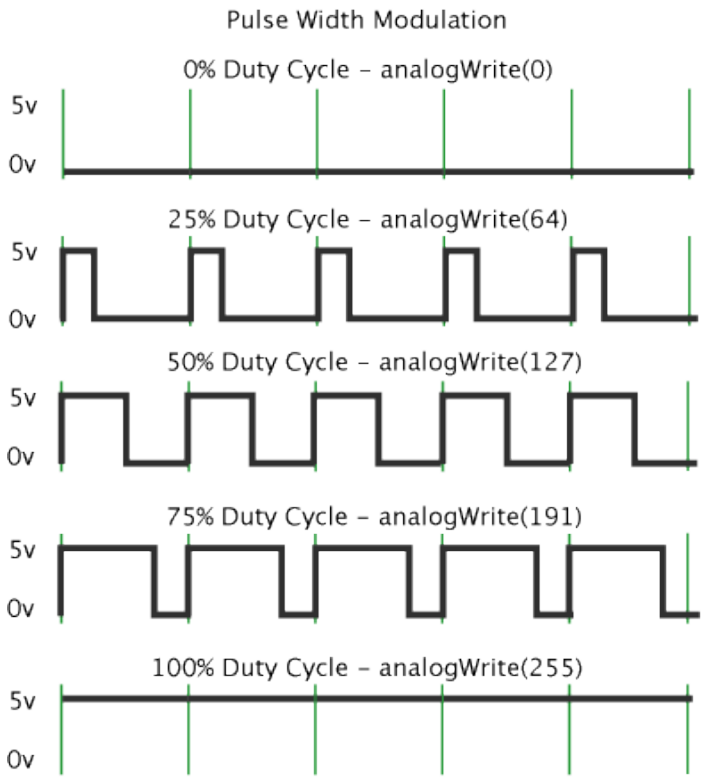


0 = 0 Volt = Low Voltage

1023 = +5 Volt* = High Voltage

*Maximum Analog voltajı kullanılan sisteme ve referans voltajına göre farklılık gösterebilir.

Analog Output (PWM)



0 = 0 Volt = No Voltage

64 = ~1,25 Volt

127 = ~2,5 Volt

191 = ~3,75 Volt

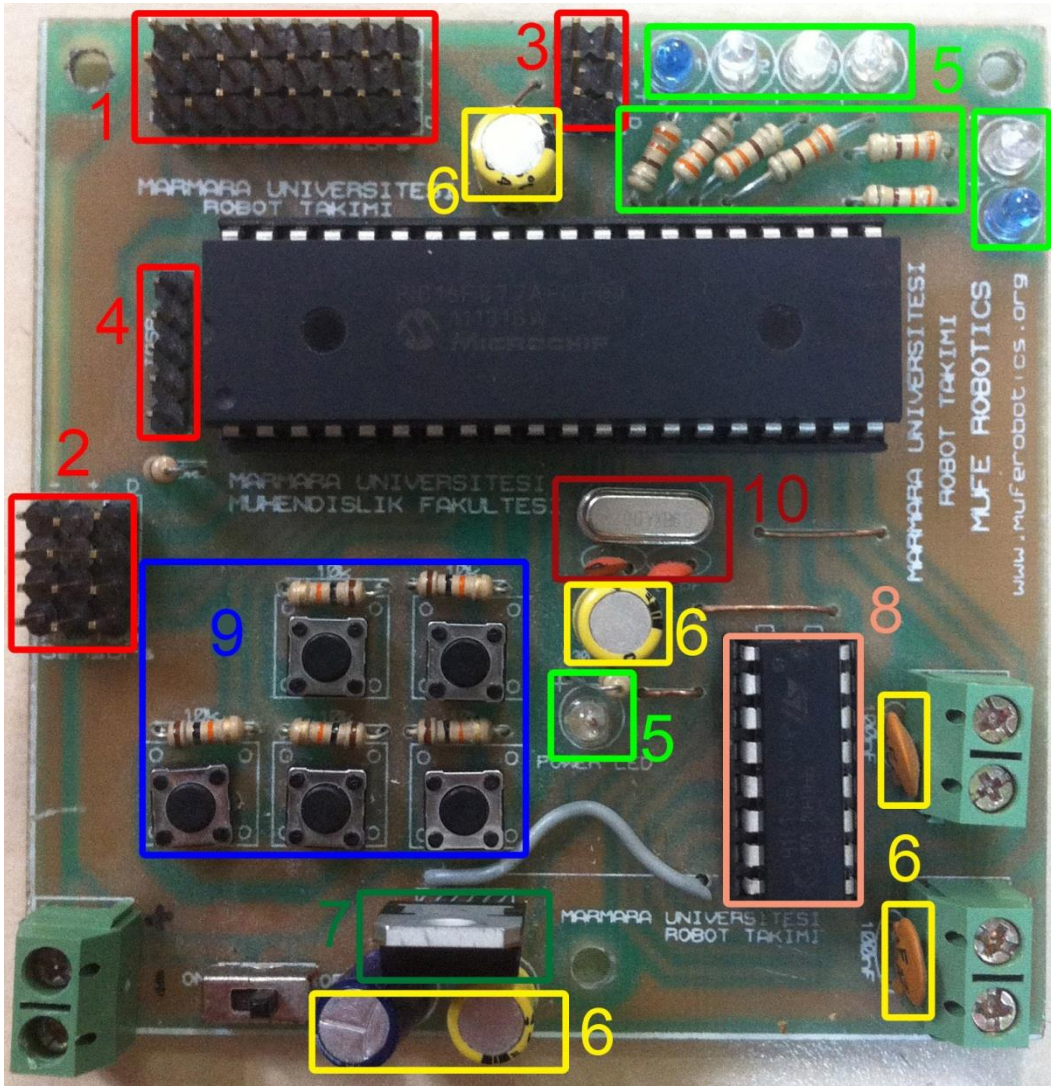
255 = +5 Volt = High Voltage

Analog Sinyal İle Çalışanlar

Sorularınız?

Elektrik – Elektroniğe Giriş
Devre Elemanları

Elektrik - Elektronik



1- Digital I/O PINS PORT B

2- Analog I/O PINS PORT A

3- Digital I/O PINS PORT D

4- ICSP Program PINS

5- LED Devreleri

6- Capacitors (Ceramic / Electrolytic)

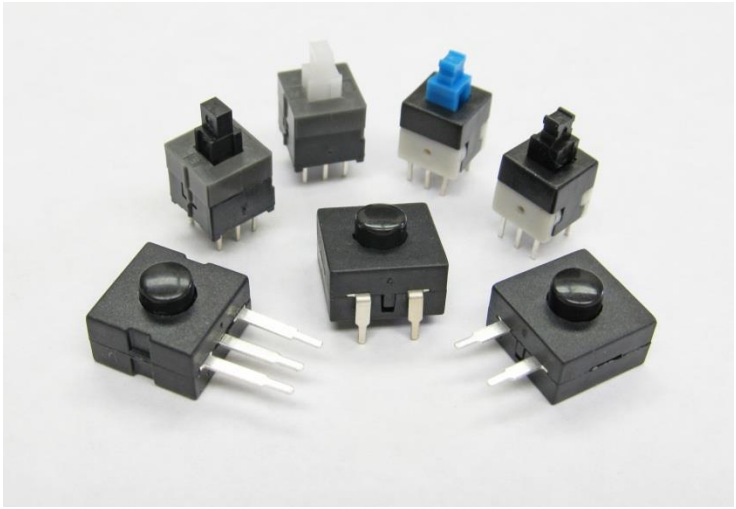
7- LM7805 – 5V Regulator

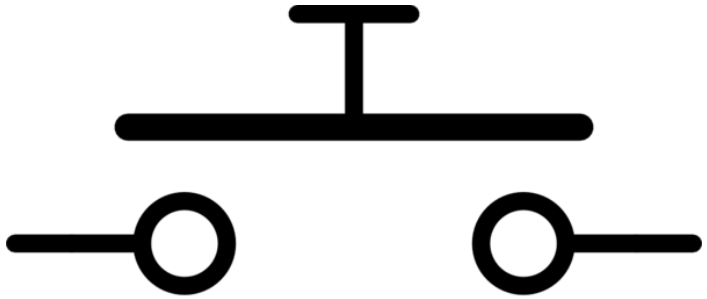
8- L293D – Motor Driver

9- Button Devreleri

10- Crystal Oscillator Devresi

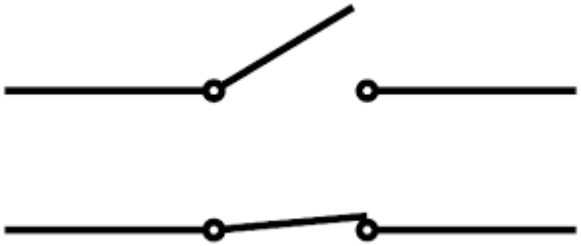
Button



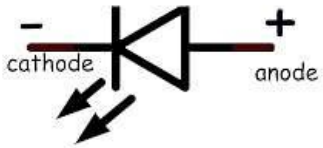


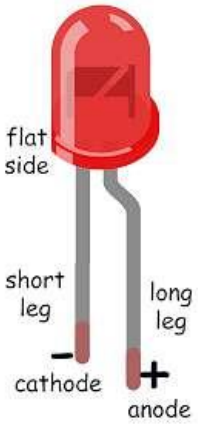
SW1

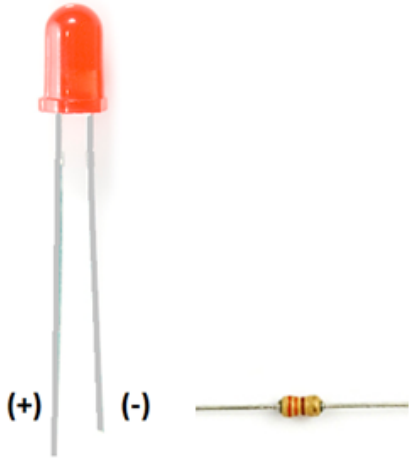
Switch



LED

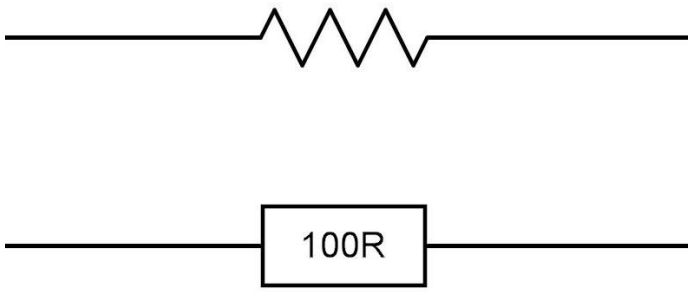




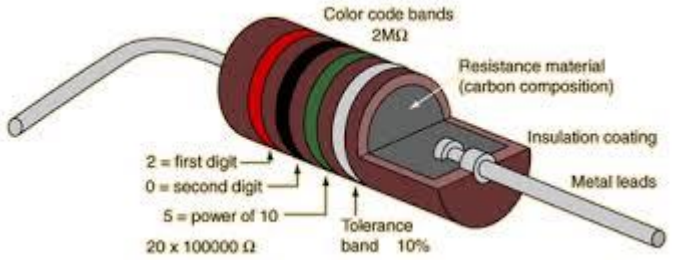


5mm LED (Light Emitting Diode)

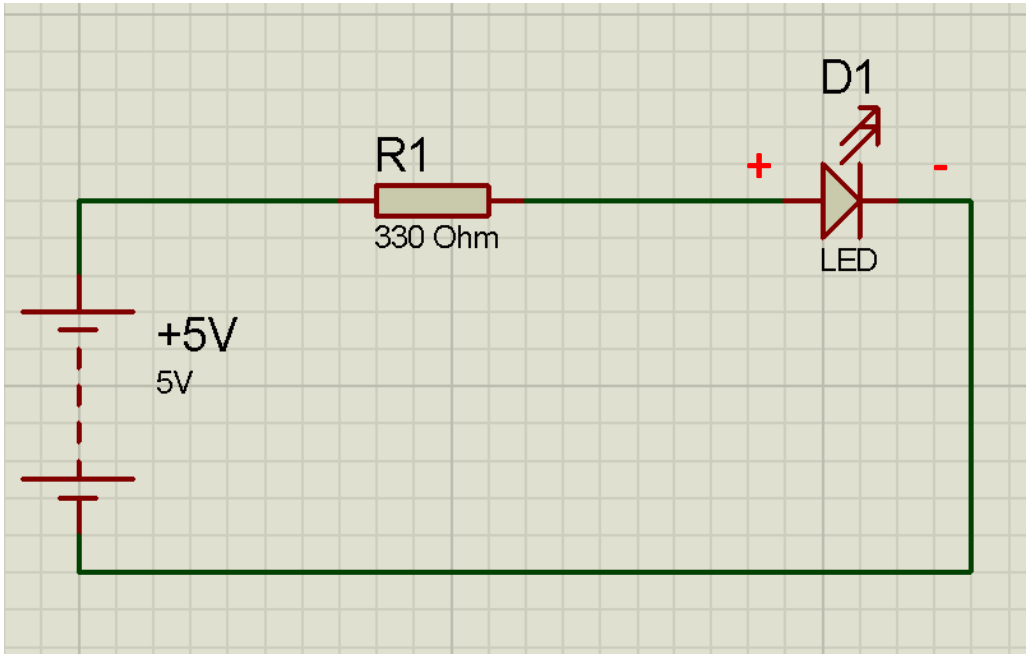
Direnç


100R

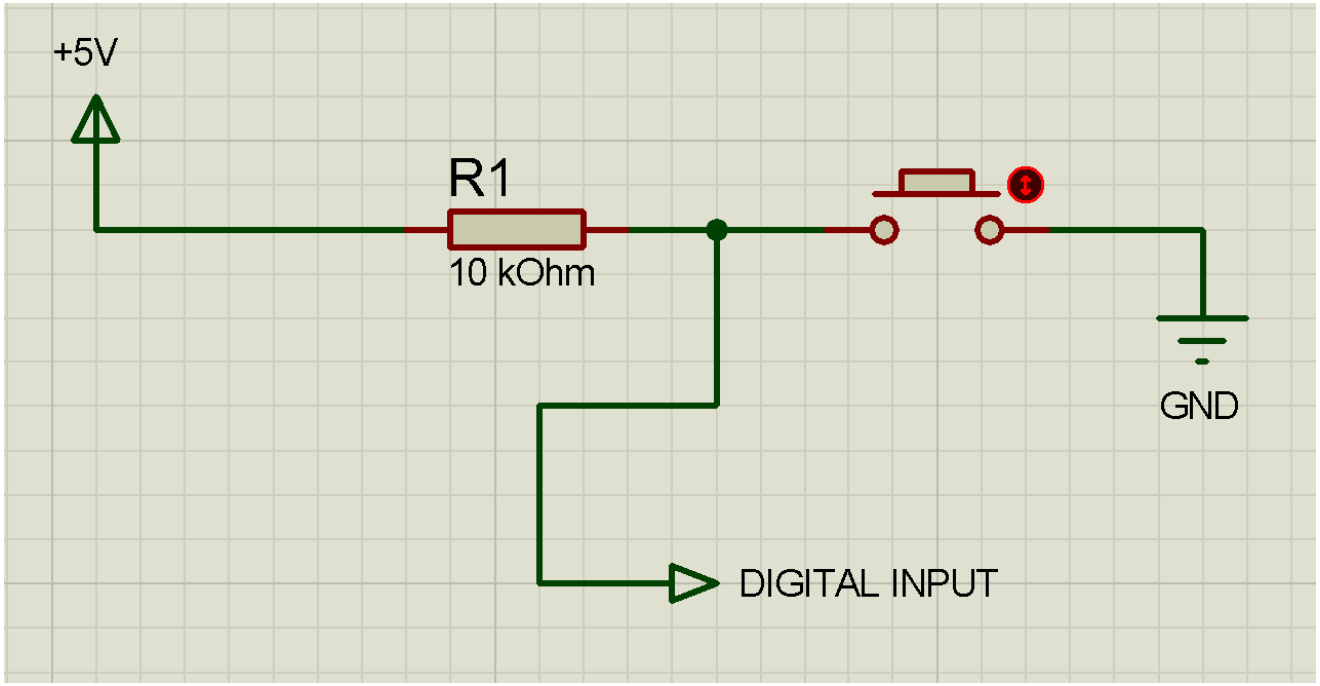
391
270
30R9
30R9


Color code bands
2MΩ
Resistance material
(carbon composition)
Insulation coating
Metal leads
2 = first digit
0 = second digit
5 = power of 10
20 x 100000 Ω
Tolerance
band 10%

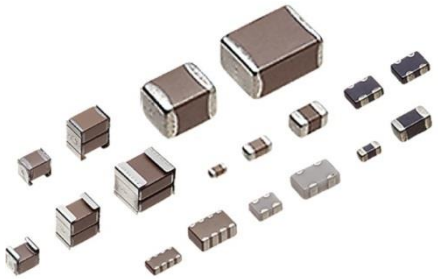
LED Devresi

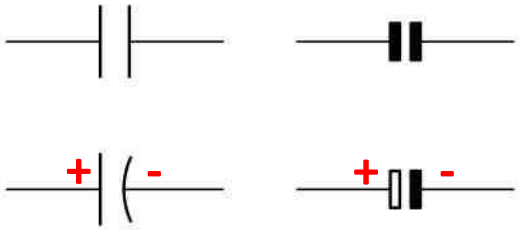


Button Devresi



Capacitors

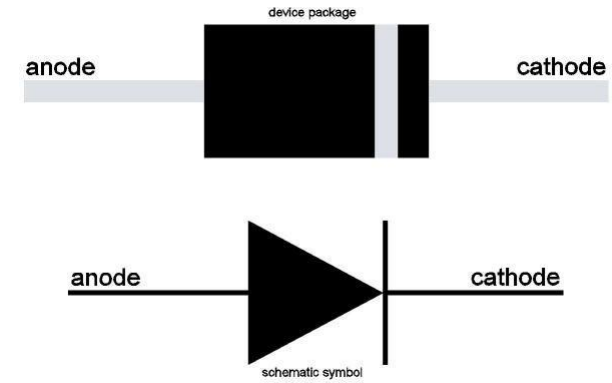




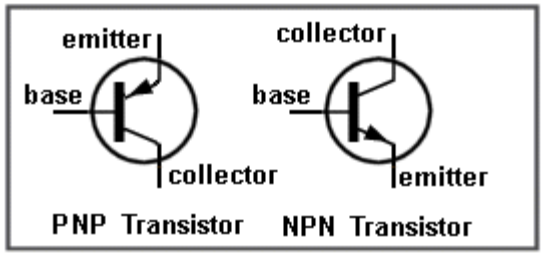
Normal (Ceramic)

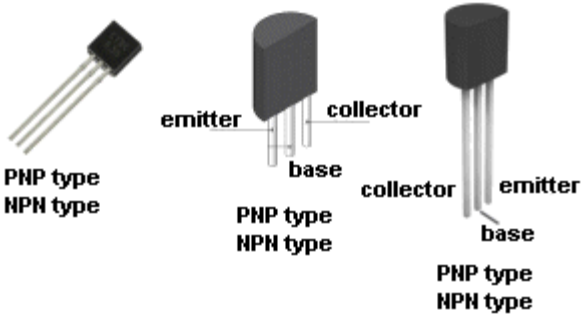
Electrolytic

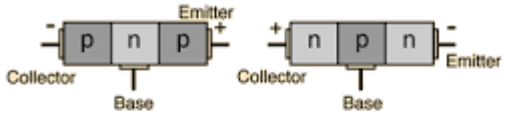
Diyot

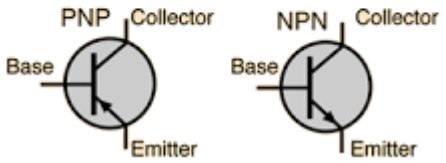

device package
anode
cathode
anode
cathode
schematic symbol

Transistor

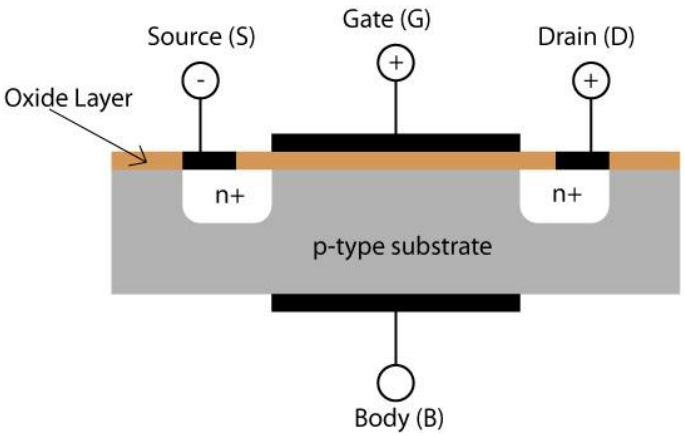

emitter
base
collector
collector
base
emitter
PNP Transistor
NPN Transistor

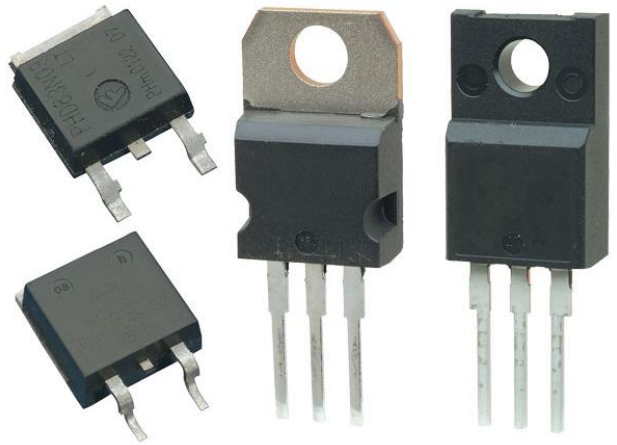

PNP type
NPN type
emitter
collector
base
PNP type
NPN type
collector
emitter
base
PNP type
NPN type

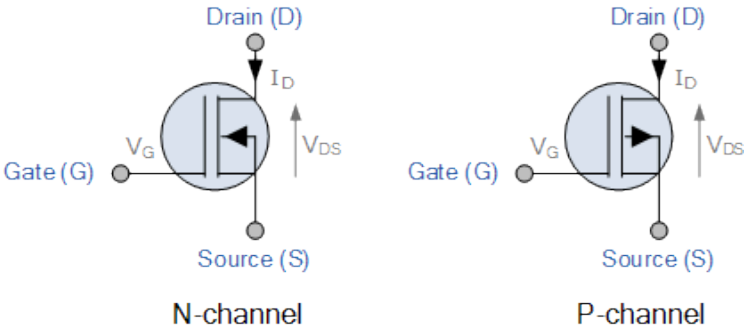

Emitter
p
n
p
Collector
Base
n
p
n
Collector
Base
Emitter

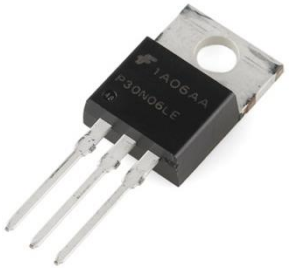

PNP
Collector
Base
Emitter
NPN
Collector
Base
Emitter

MOSFET


Source (S)
Gate (G)
Drain (D)
Oxide Layer
n+
n+
p-type substrate
Body (B)



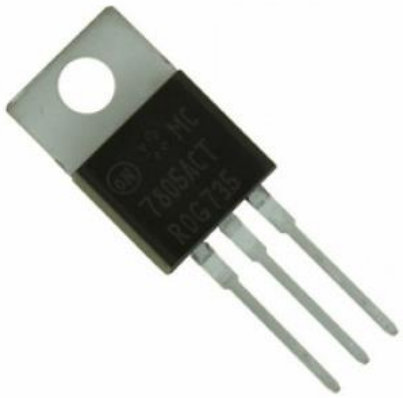

Drain (D)
I_D
V_G
V_{DS}
Gate (G)
Source (S)
N-channel
Drain (D)
I_D
V_G
V_{DS}
Gate (G)
Source (S)
P-channel

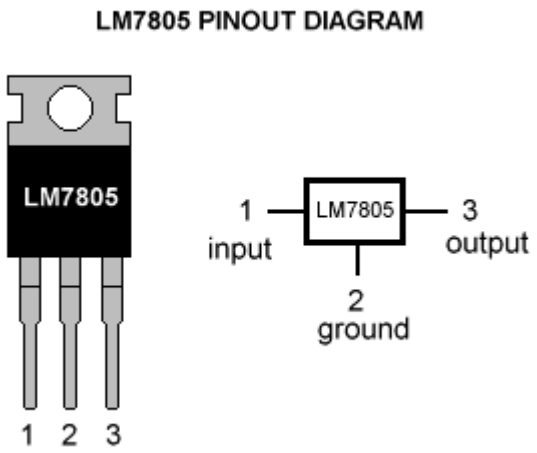


LM78xx – Fixed Regulators

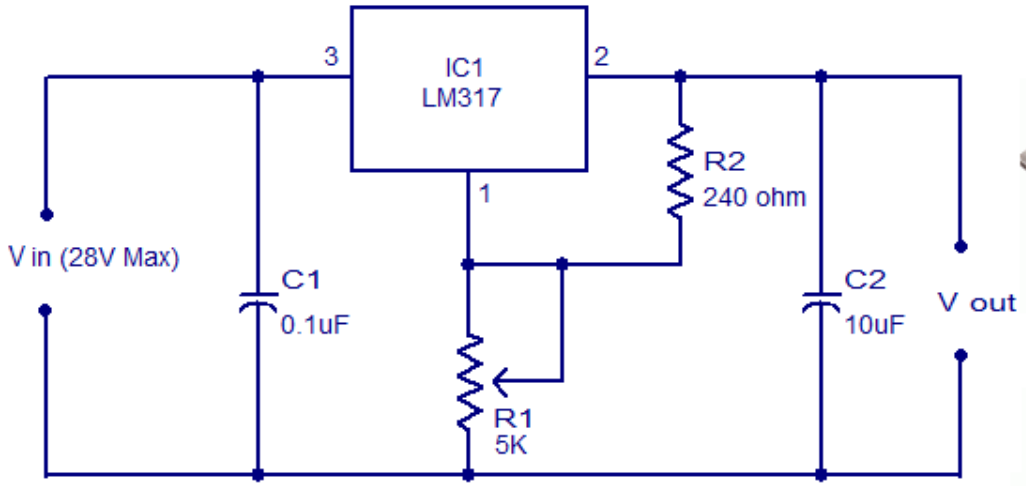
- Maximum current: 1A

- LM 7805
- LM 7808
- LM 7809
- LM 7812
- LM 7815



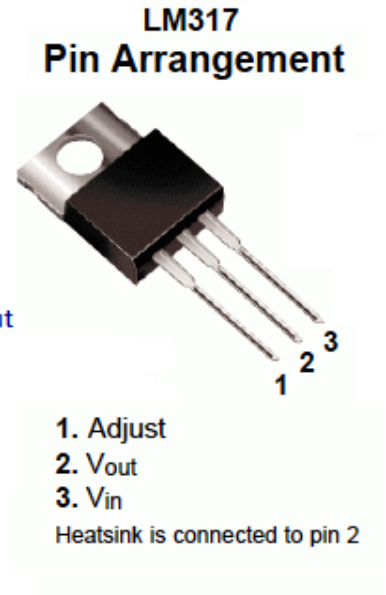


Adjustable Regulators



Typical adjustable regulator using LM317 www.circuitstoday.com

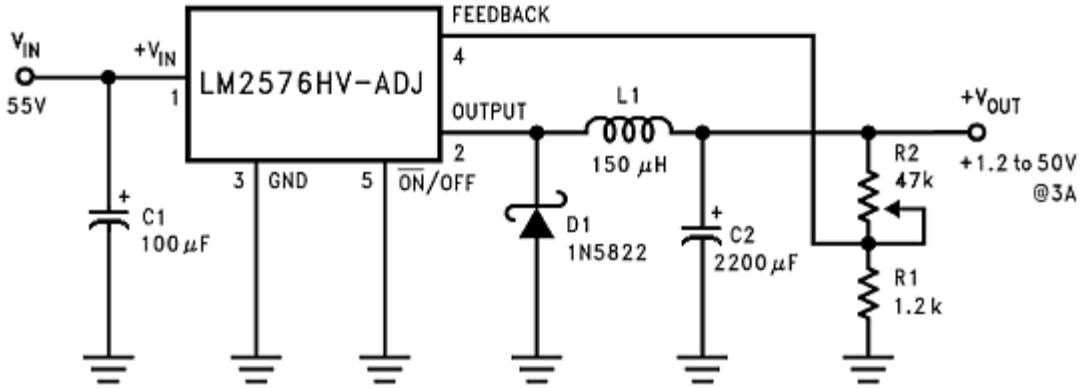
Vout = 1.25V (1+ (R2/R1)) + (I adj x R2)

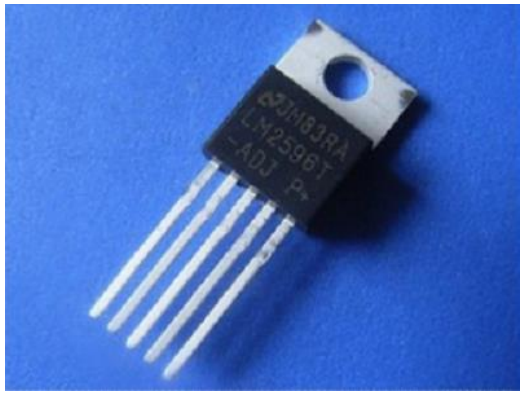


- **Maximum current: 1,5A***

*LM317T datasheet'indeki verilere göre

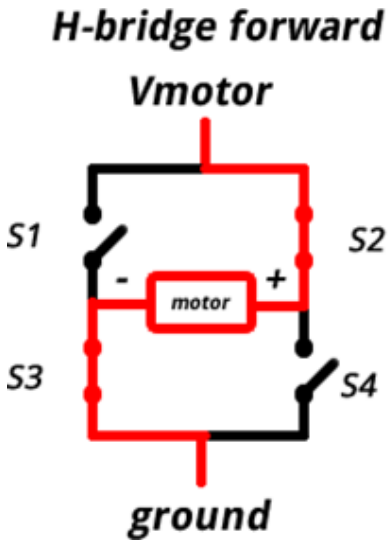
Adjustable Regulators

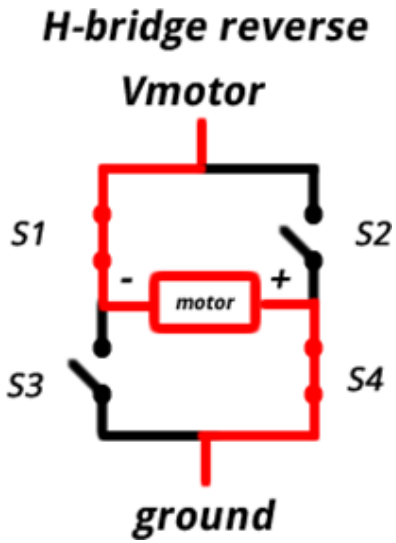


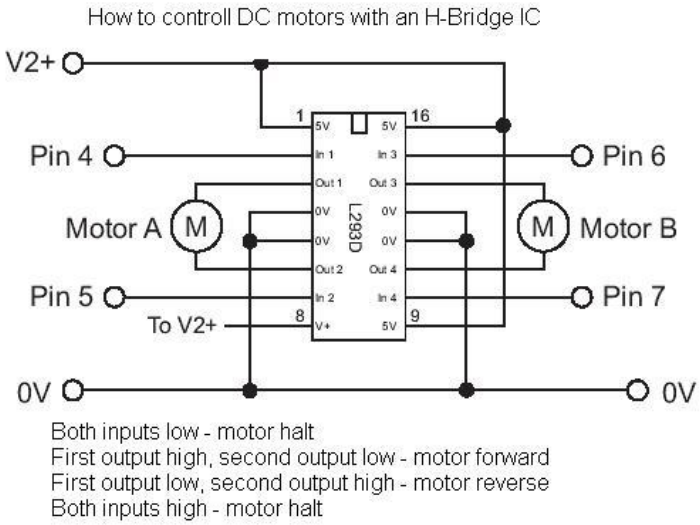


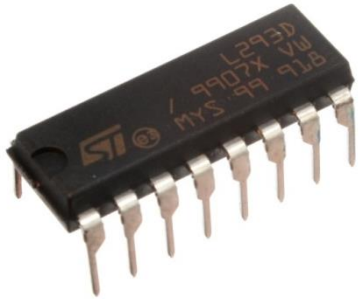
- Maximum current: 3A

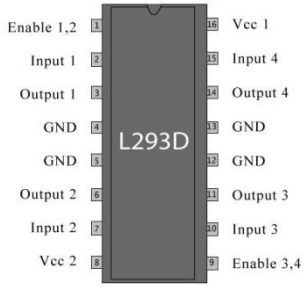
H-Bridge Motor Drivers











Crystal Oscillator

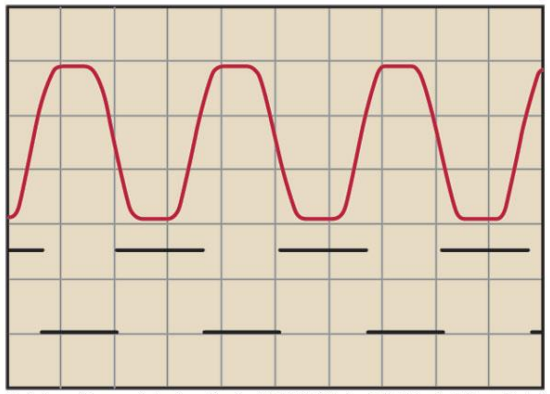
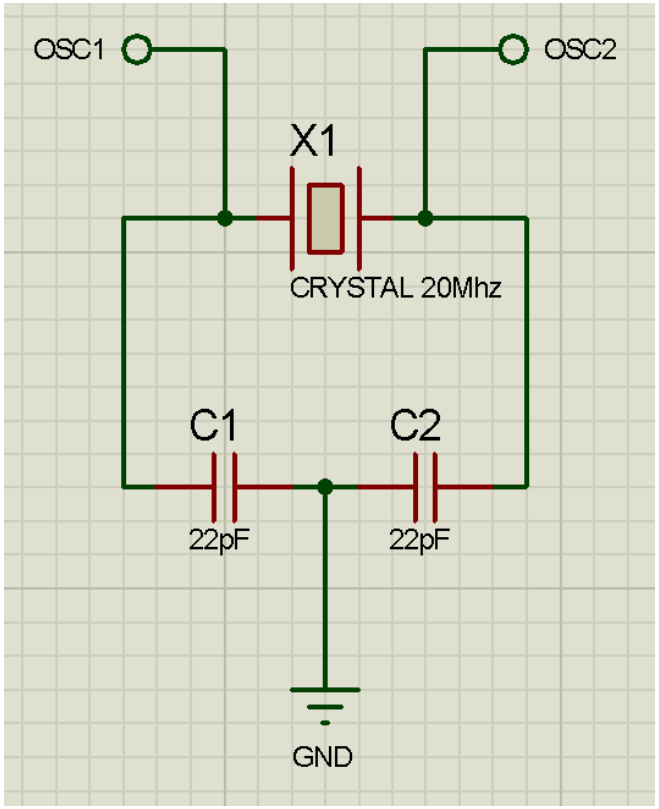
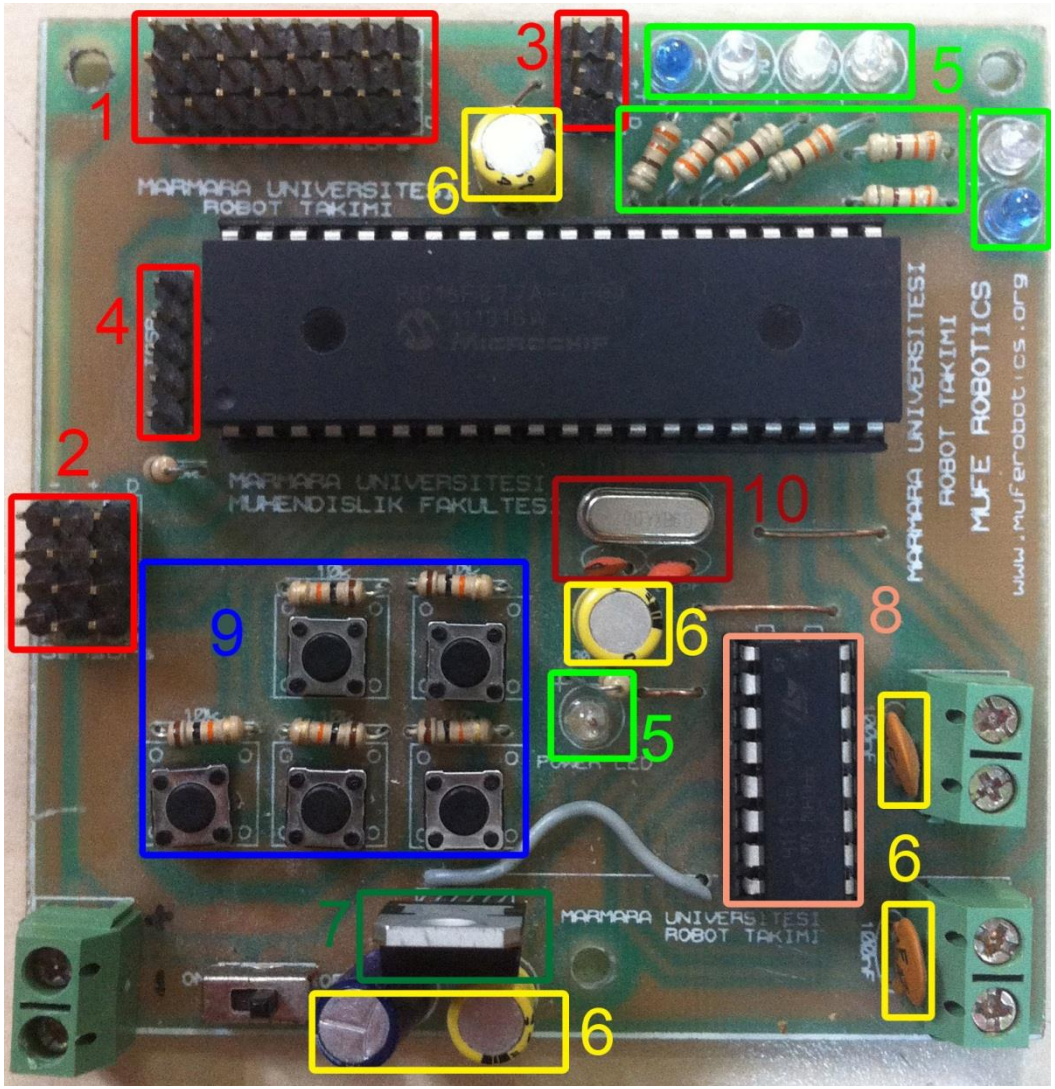


Fig 2. An oscilloscope photo shows the circuit's 32.768-kHz signals (at 10 µs/cm): the oscillator's output at 1 V/cm (top) and the buffer's output at 2 V/cm (bottom).



Elektrik - Elektronik



1- Digital I/O PINS PORT B

2- Analog I/O PINS PORT A

3- Digital I/O PINS PORT D

4- ICSP Program PINS

5- LED Devreleri

6- Capacitors (Ceramic / Electrolytic)

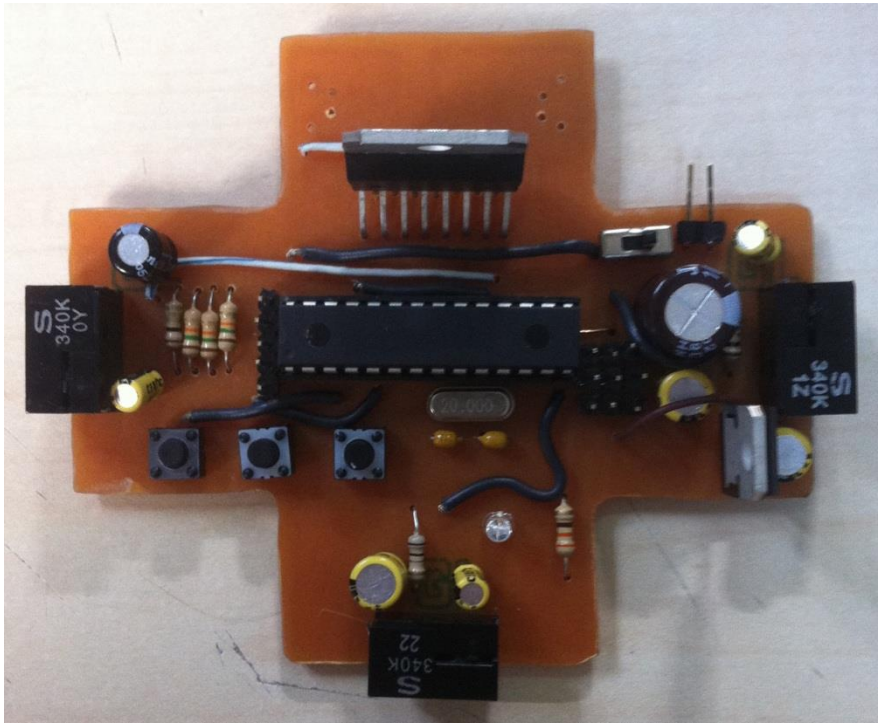
7- LM7805 – 5V Regulator

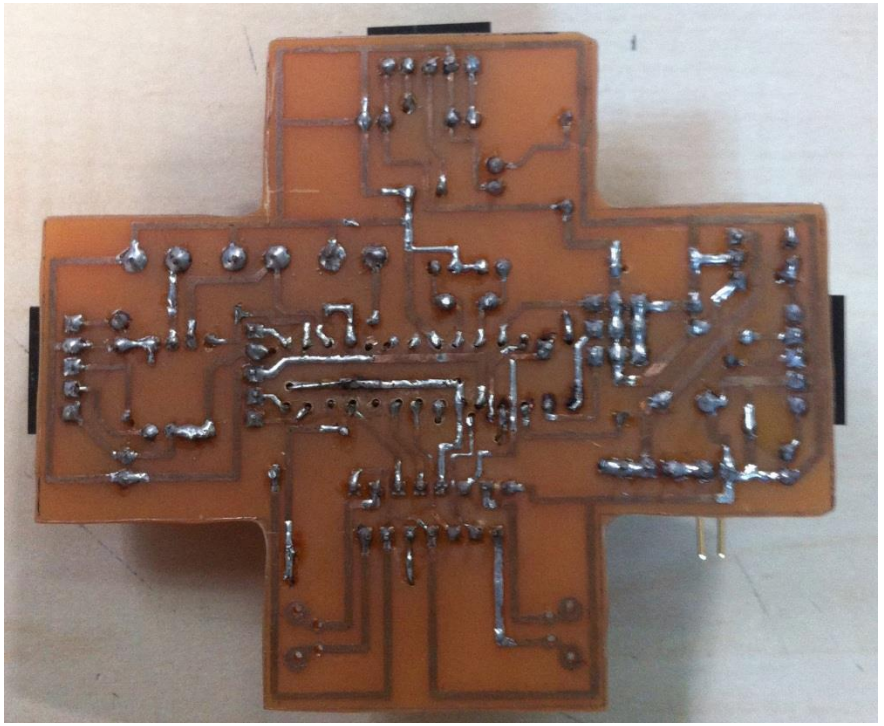
8- L293D – Motor Driver

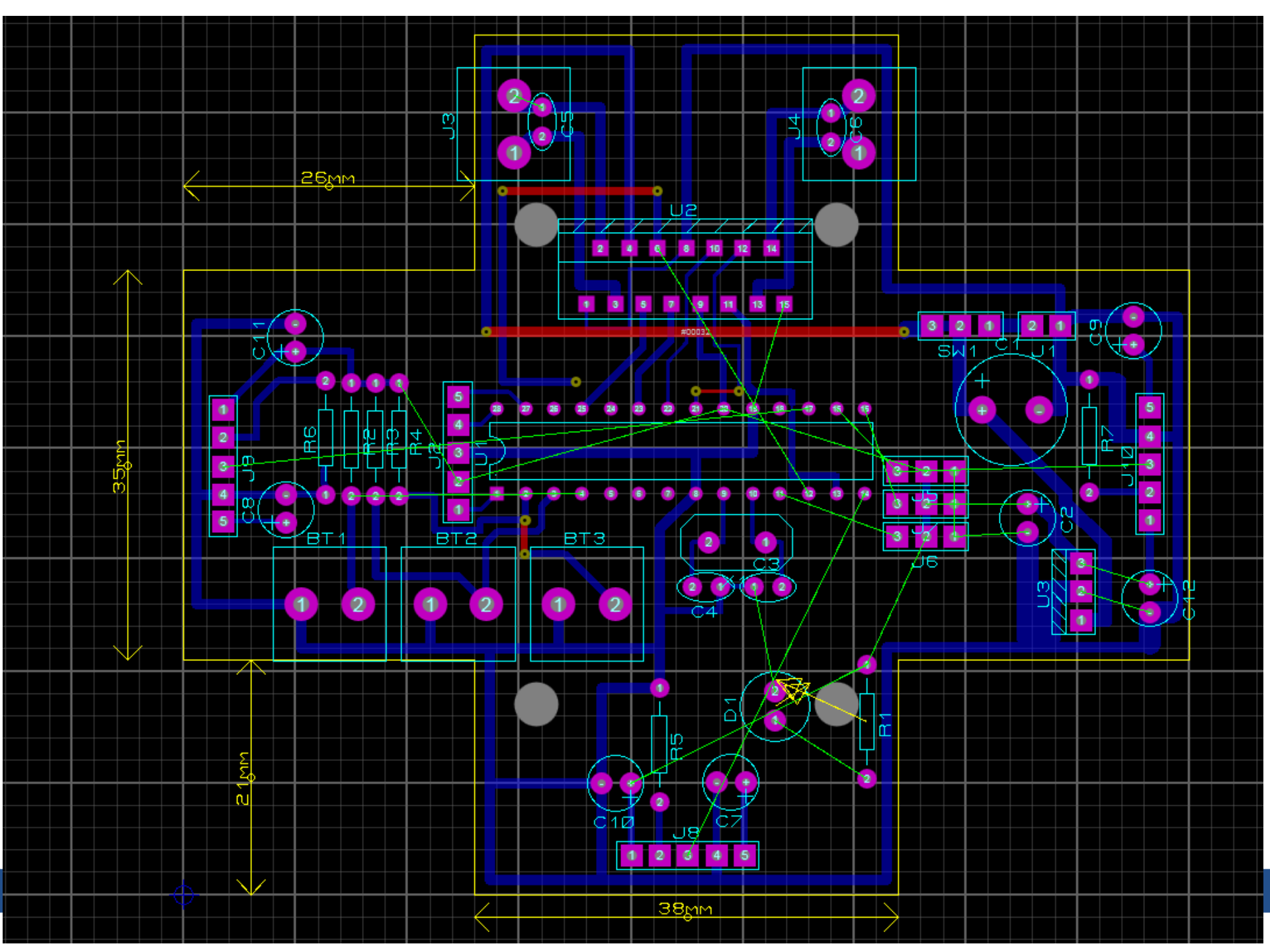
9- Button Devreleri

10- Crystal Oscillator Devresi

Elektrik - Elektronik

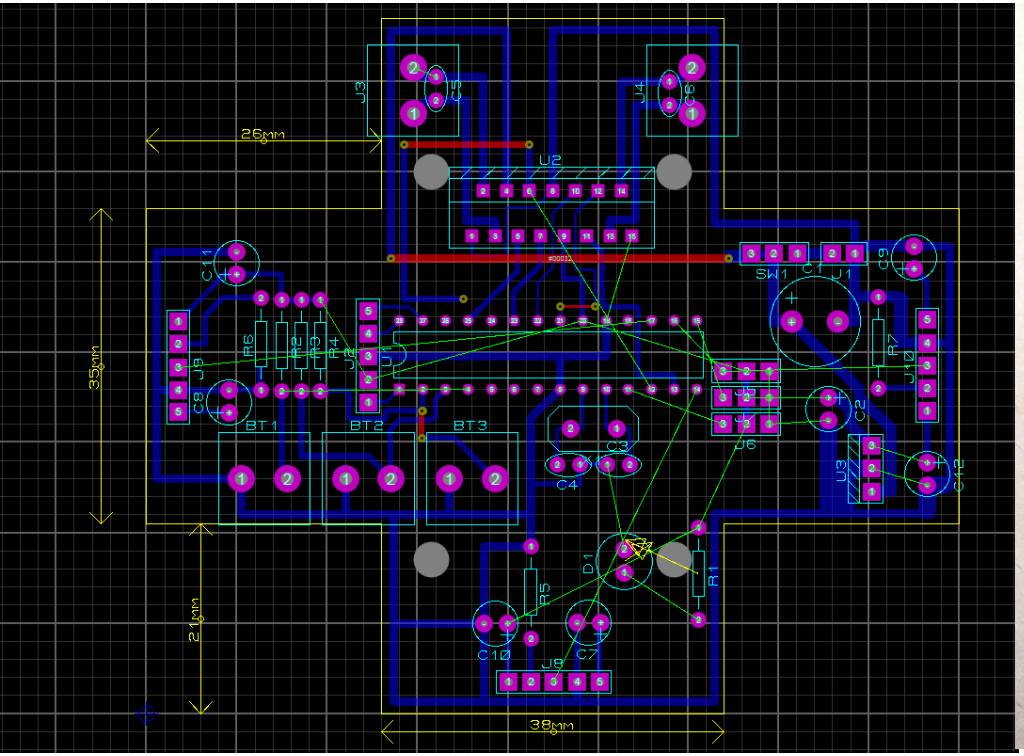


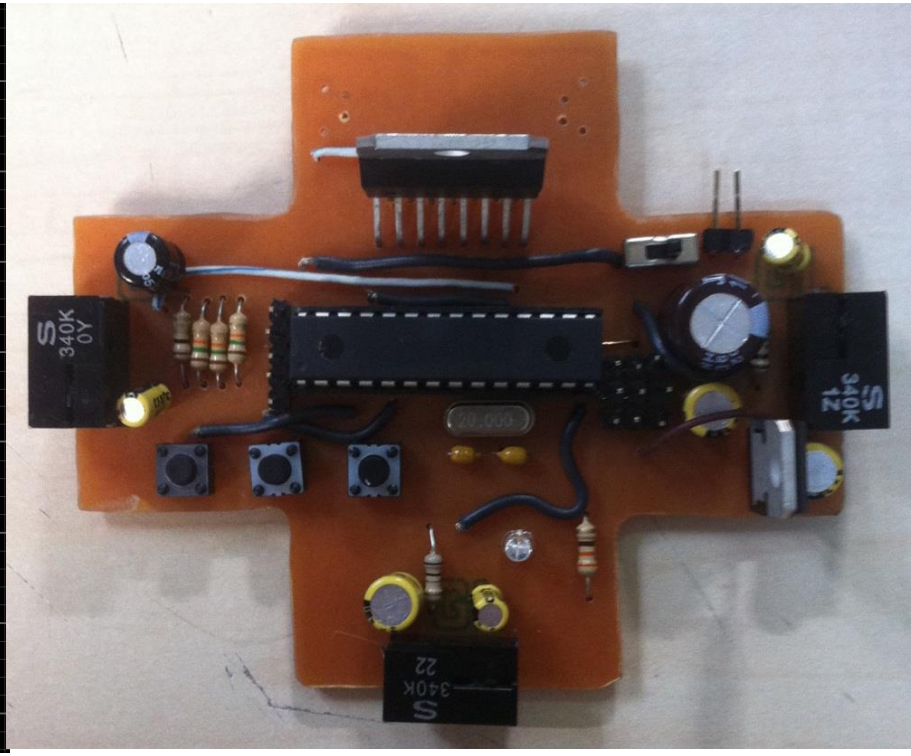




26mm
35mm
21mm
38mm
J3
C5
J4
C6
U2
C11
R6
R2
R3
R4
J2
U1
J9
C8
BT1
BT2
BT3
SW1
C1
J1
C9
R7
J10
J5
J7
J6
C2
C3
C4
U3
C12
D1
R1
R5
C10
C7
J8

Elektrik - Elektronik





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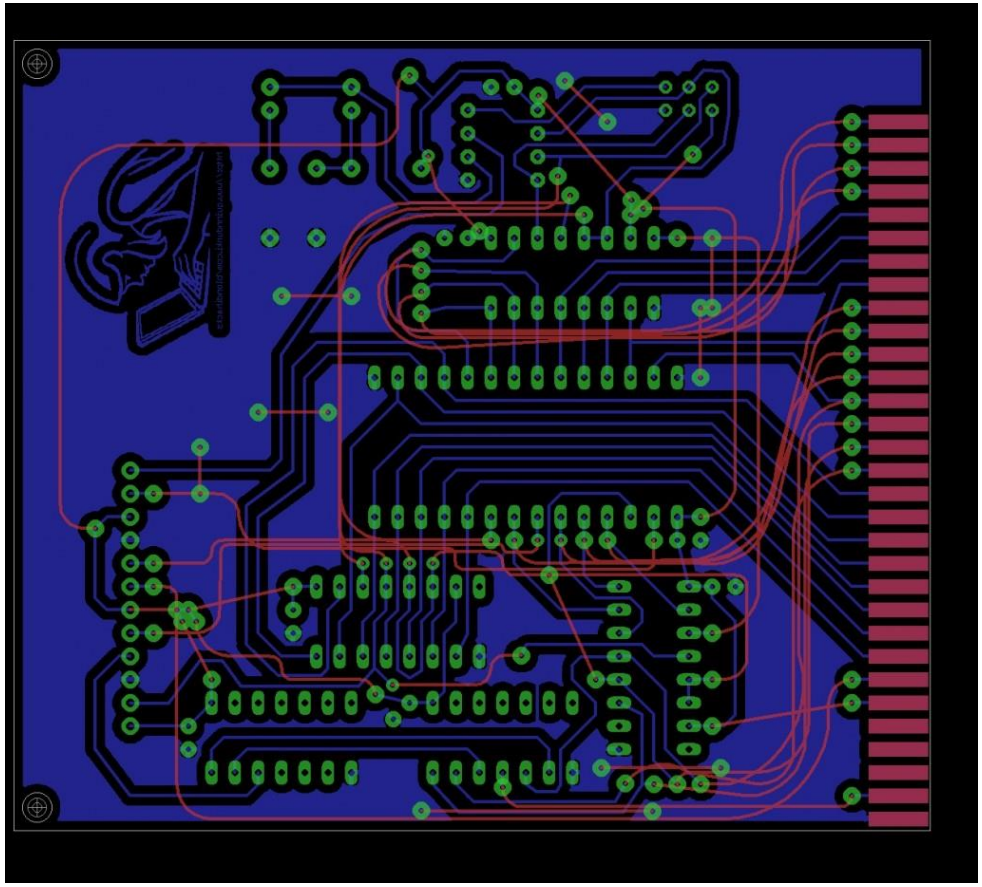
Elektrik – Elektroniğe Giriş
PCB Kart Basımı

PCB Kart Basımı



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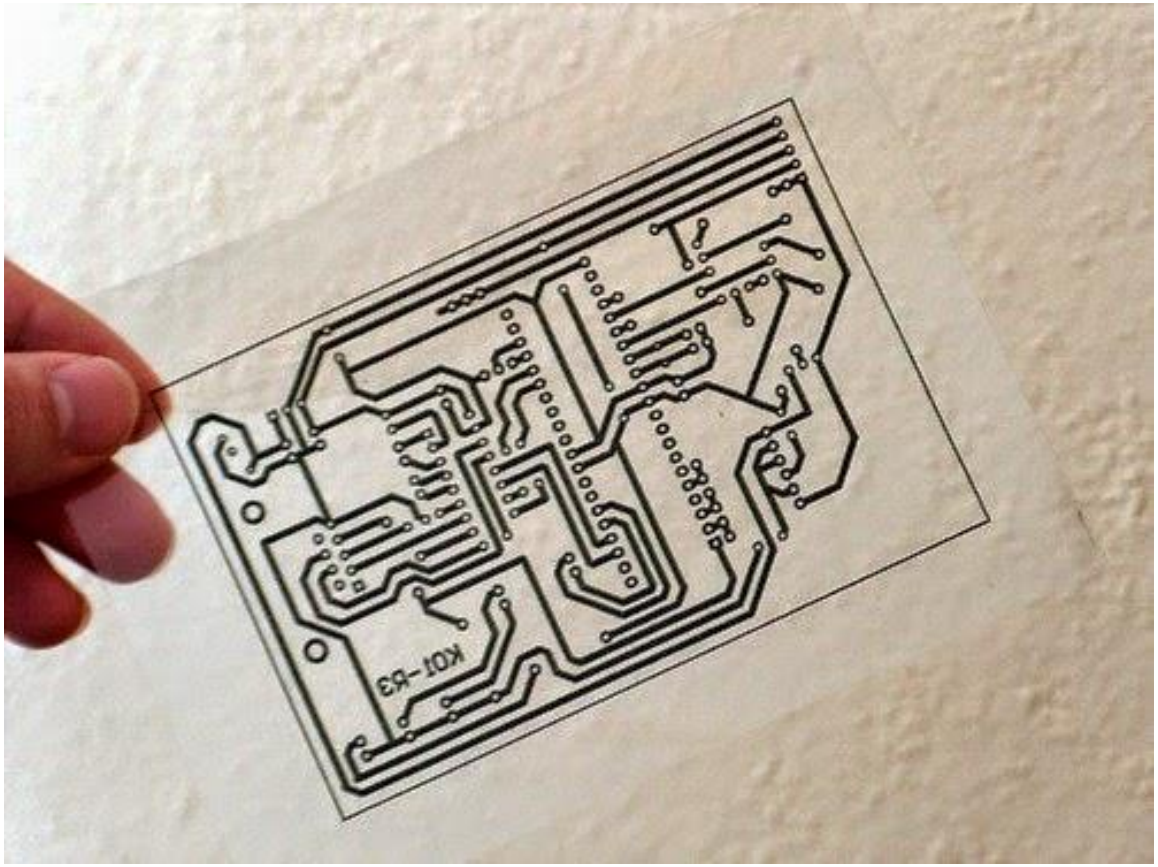
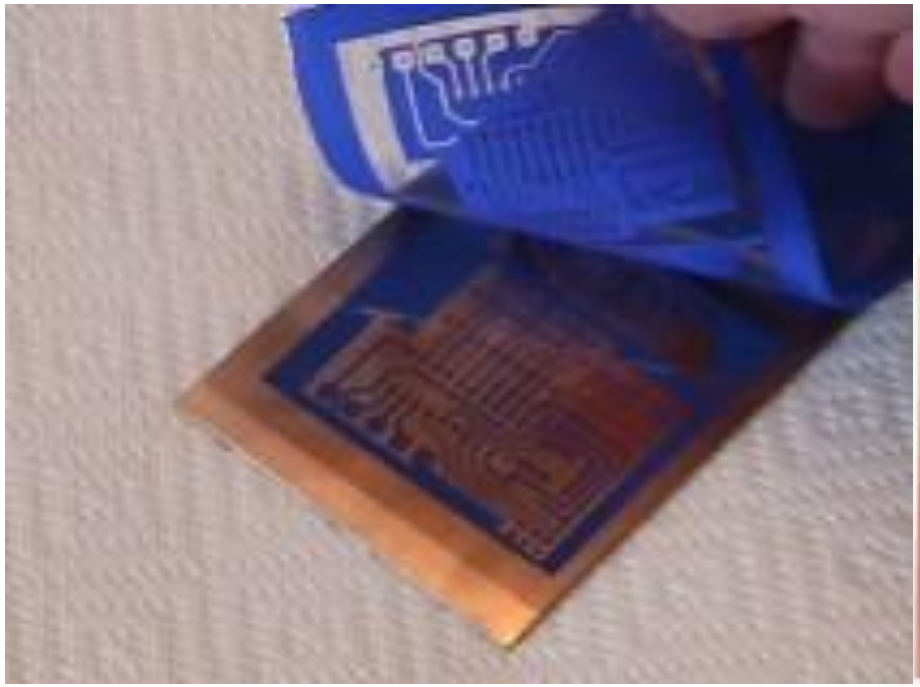
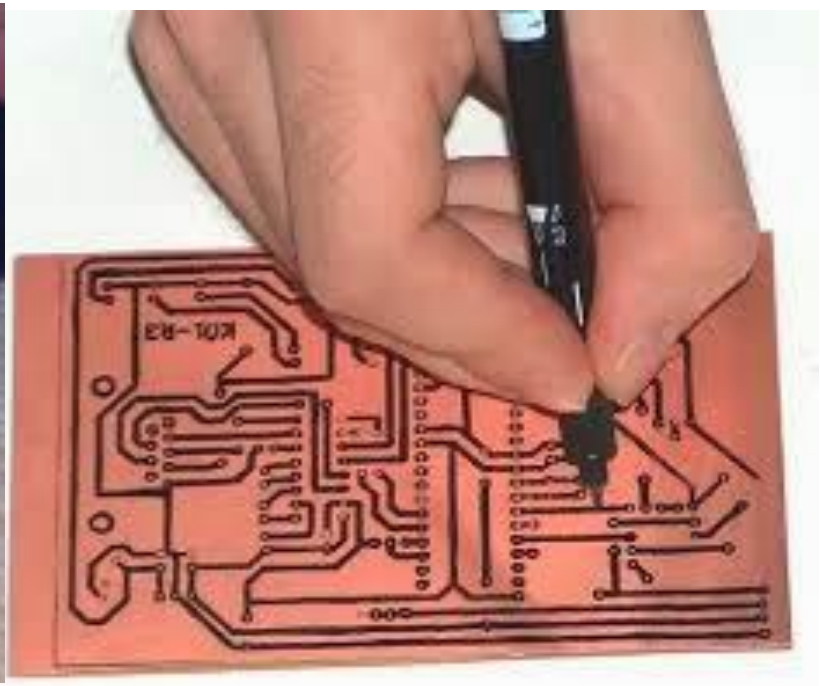


PCB Kart Basımı

PCB Kart Basımı





Elektrik - Elektronik

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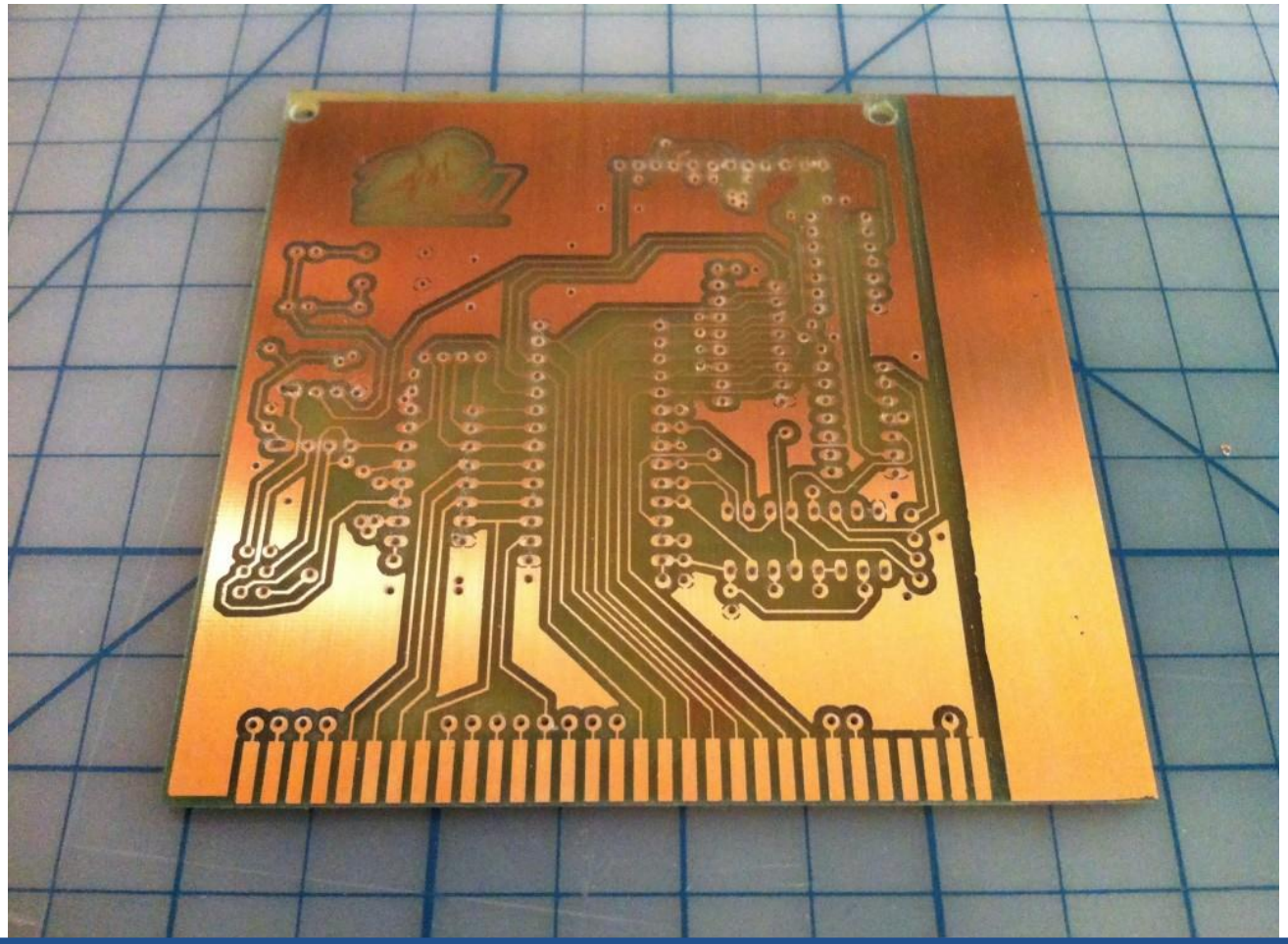

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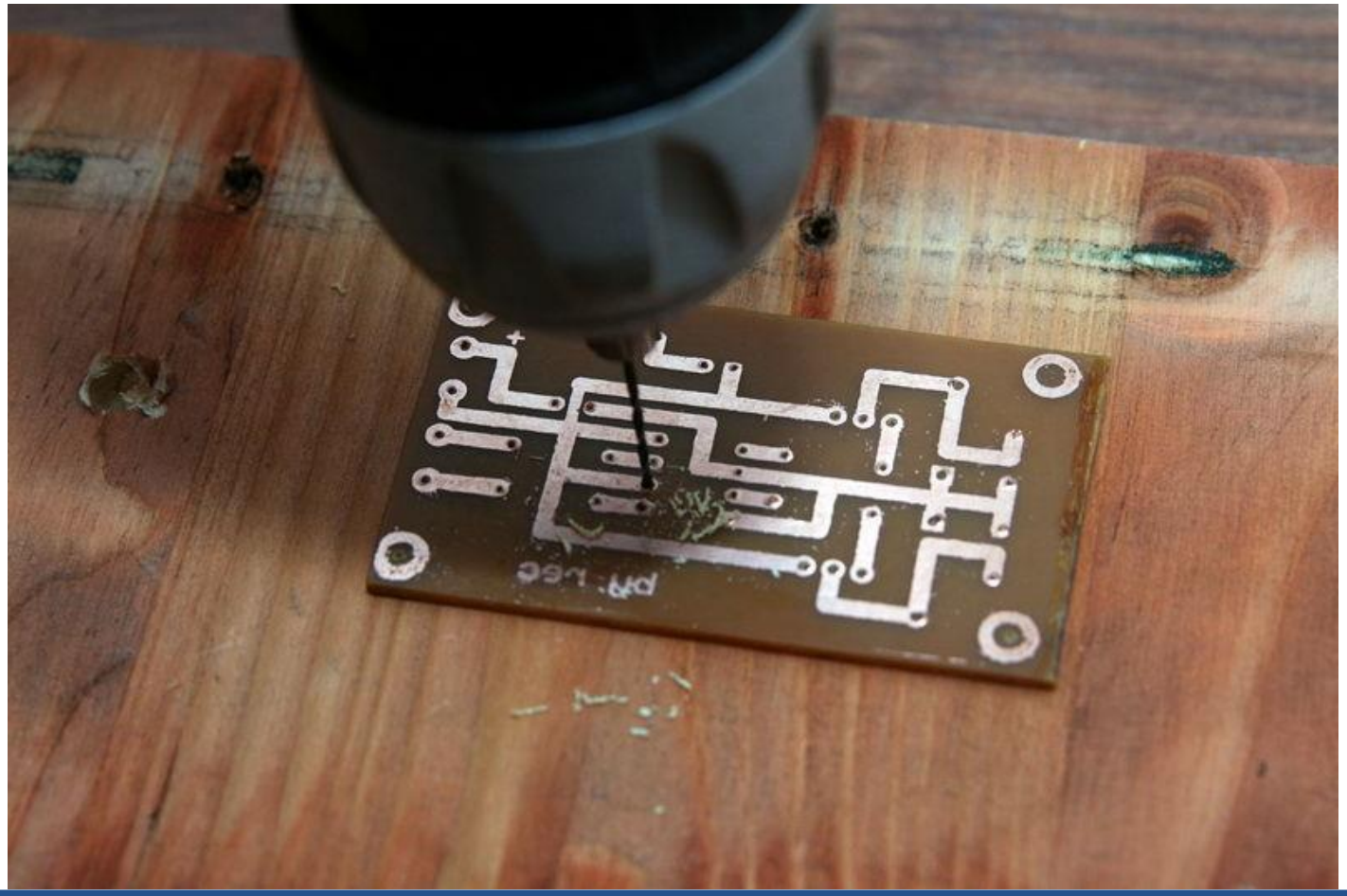

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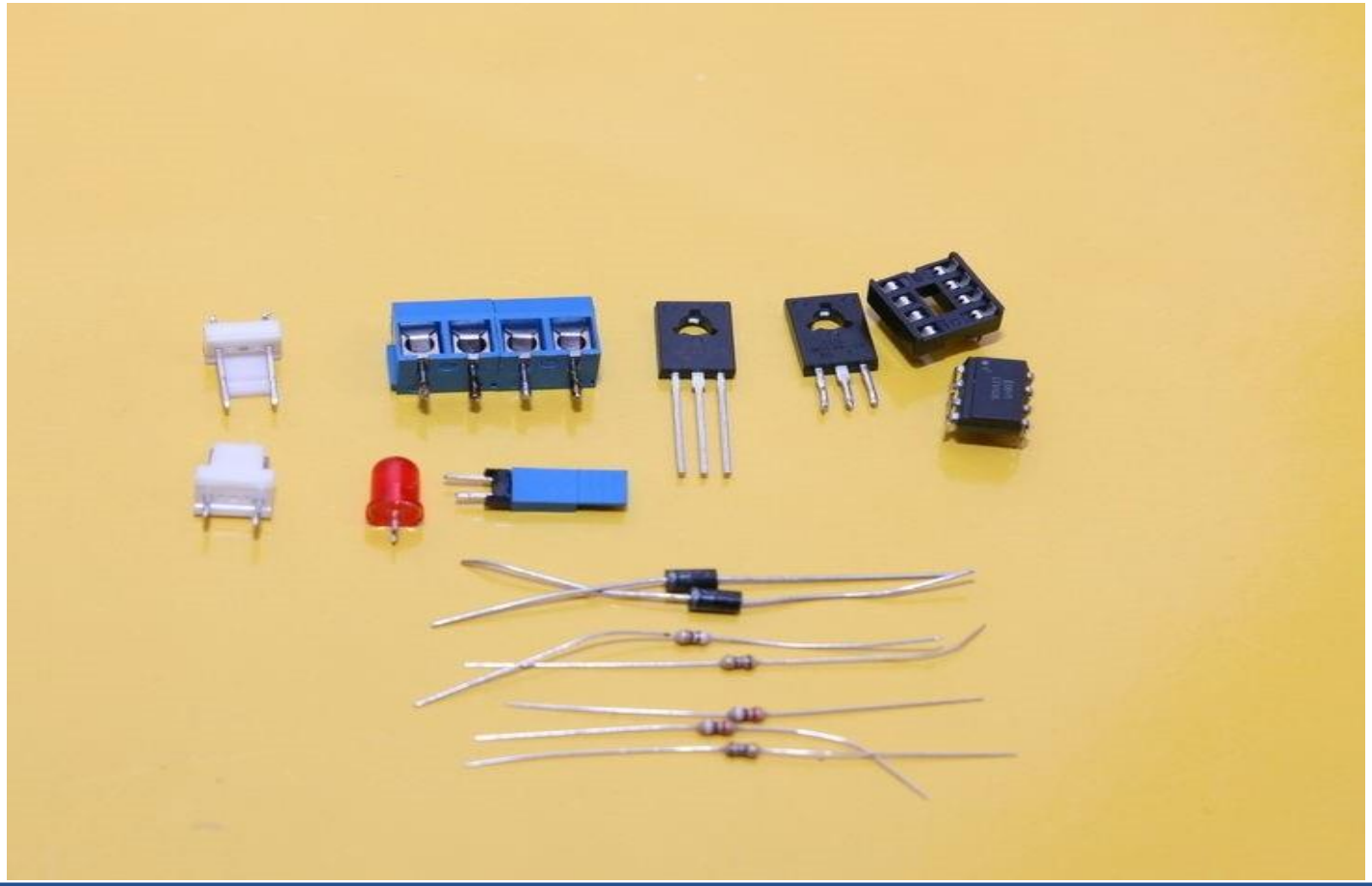

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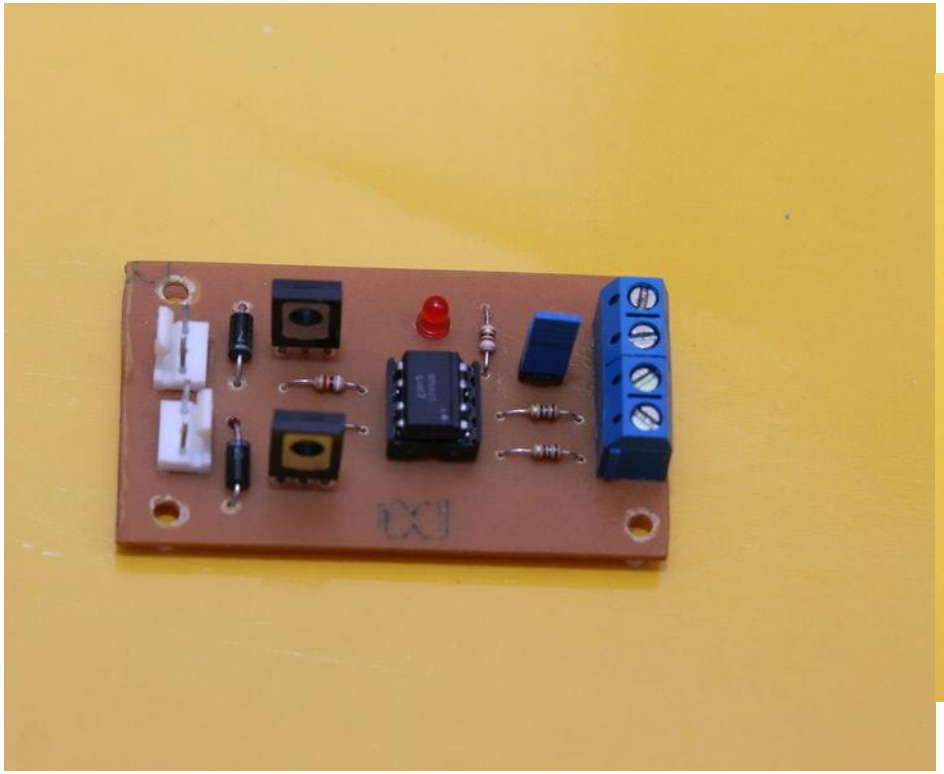

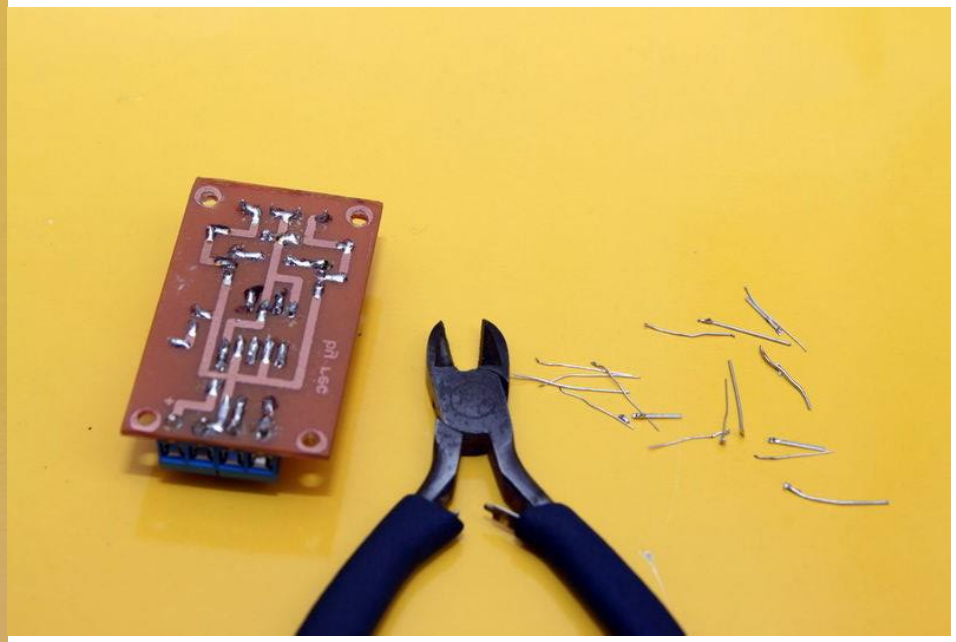

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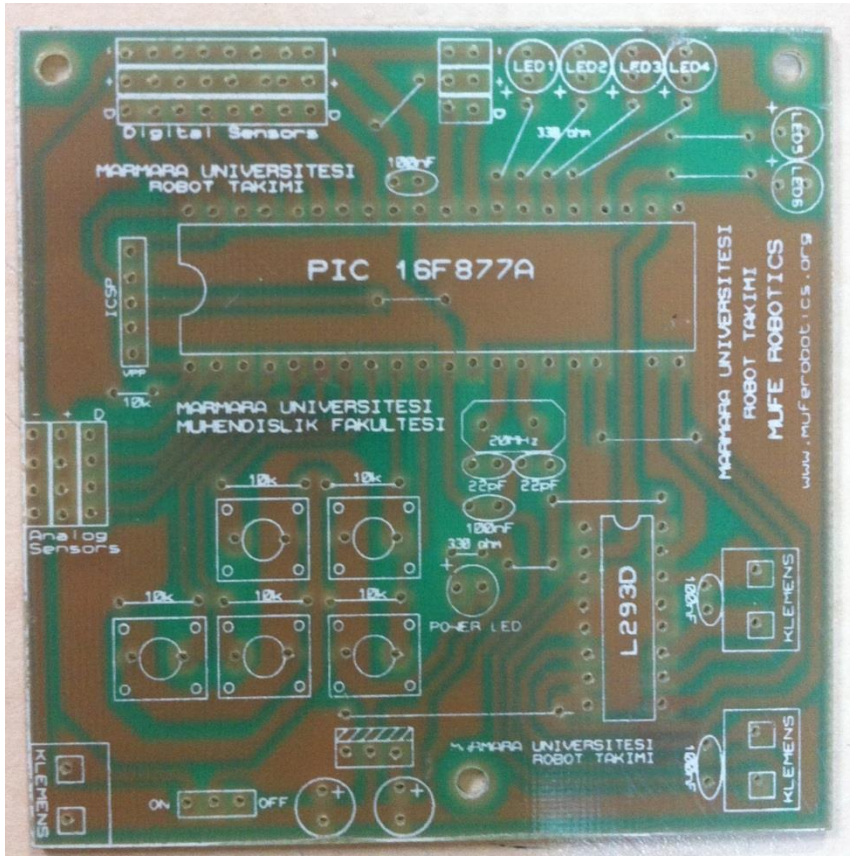

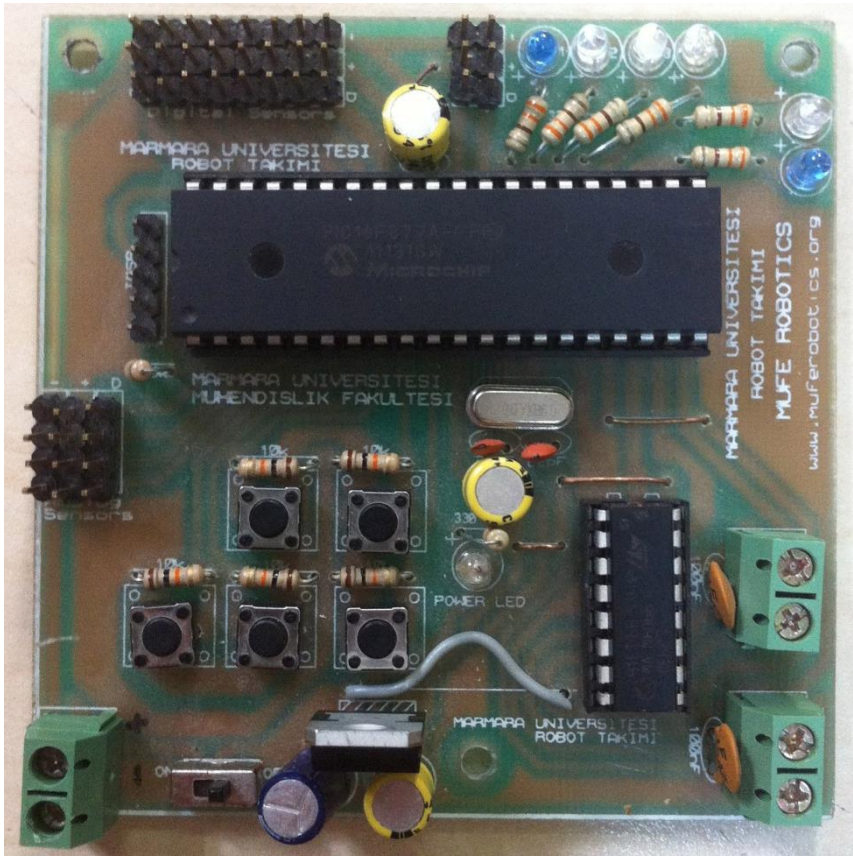

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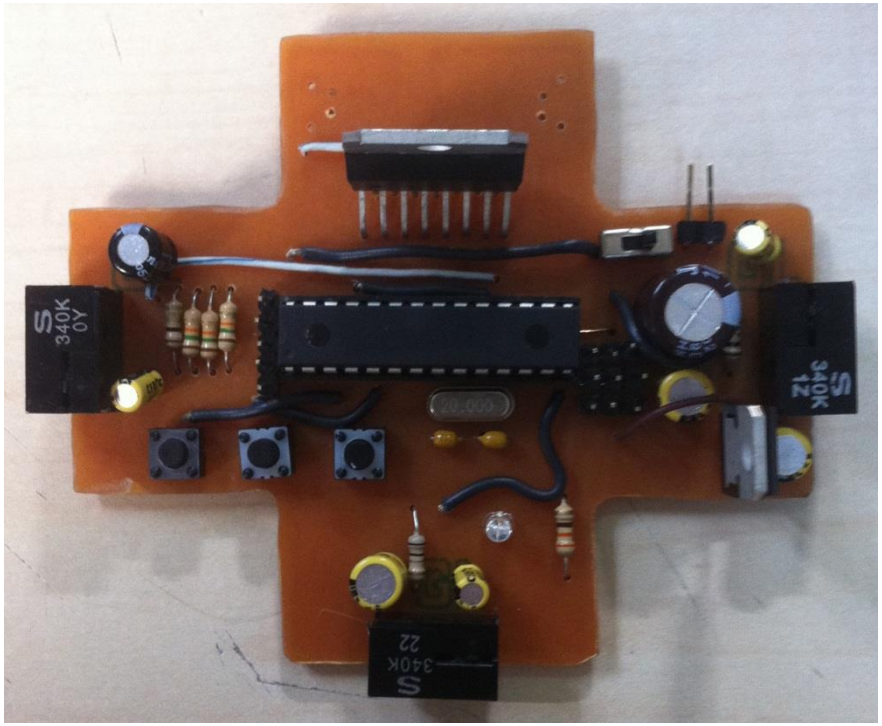
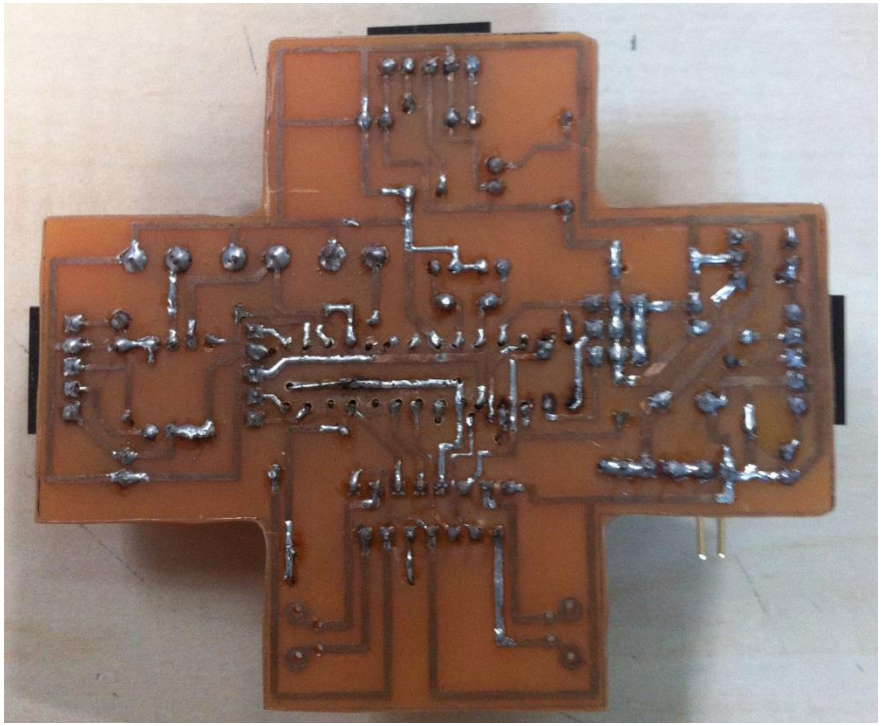
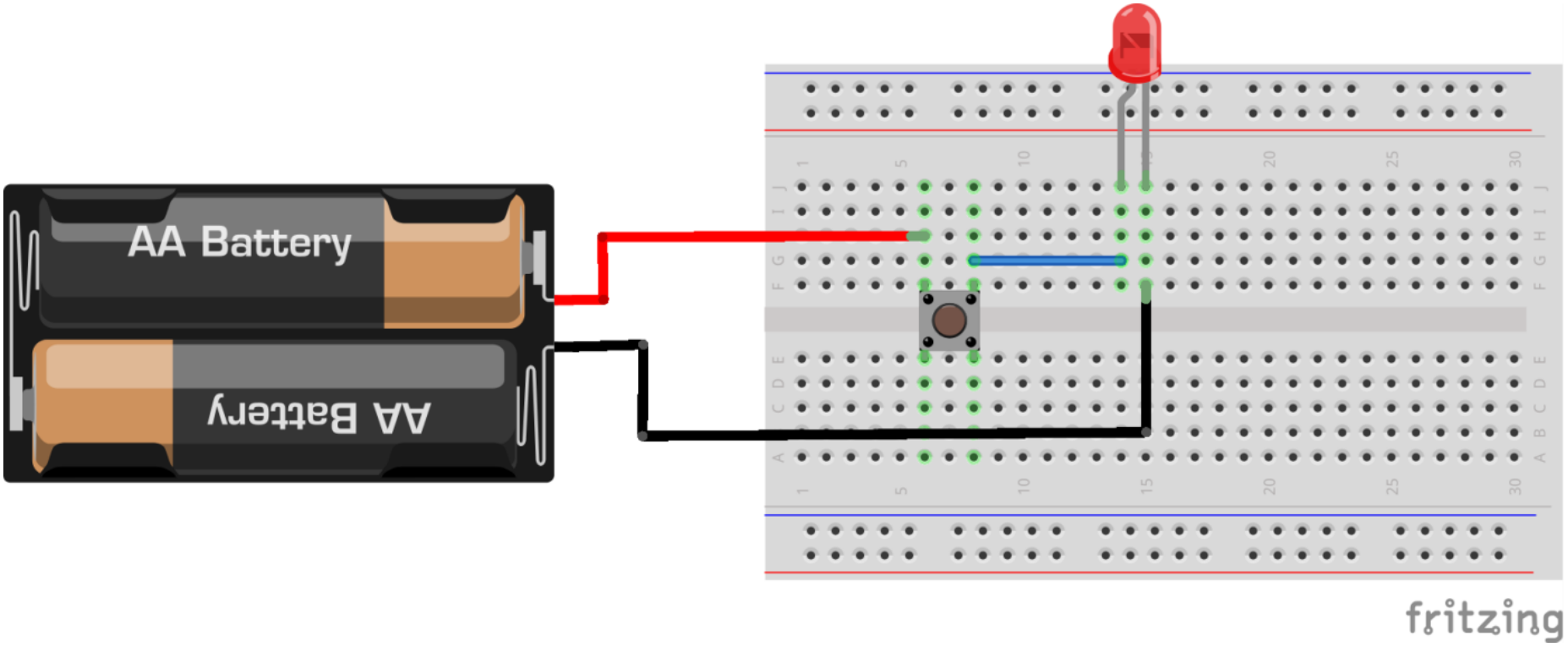


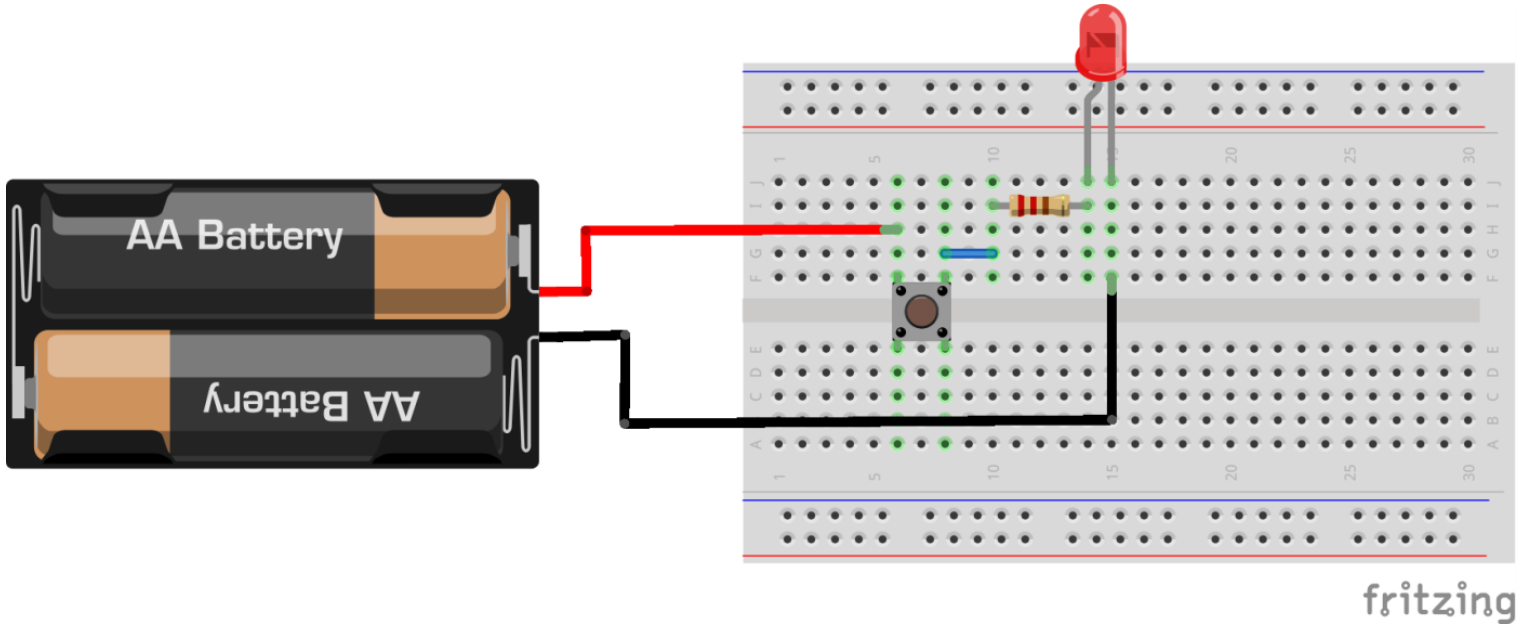


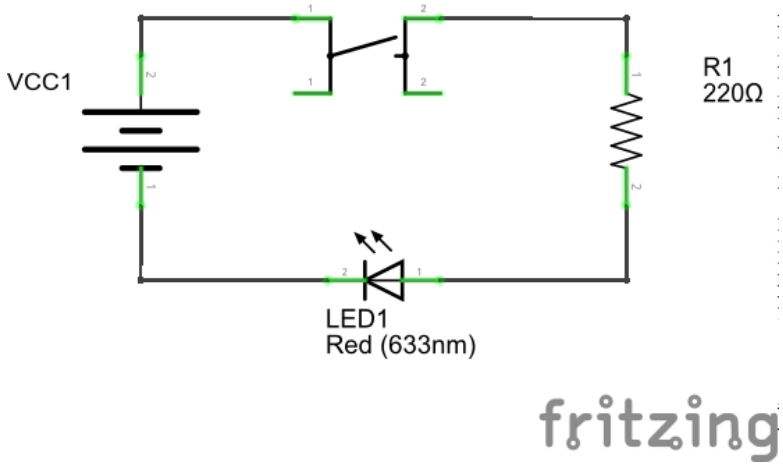
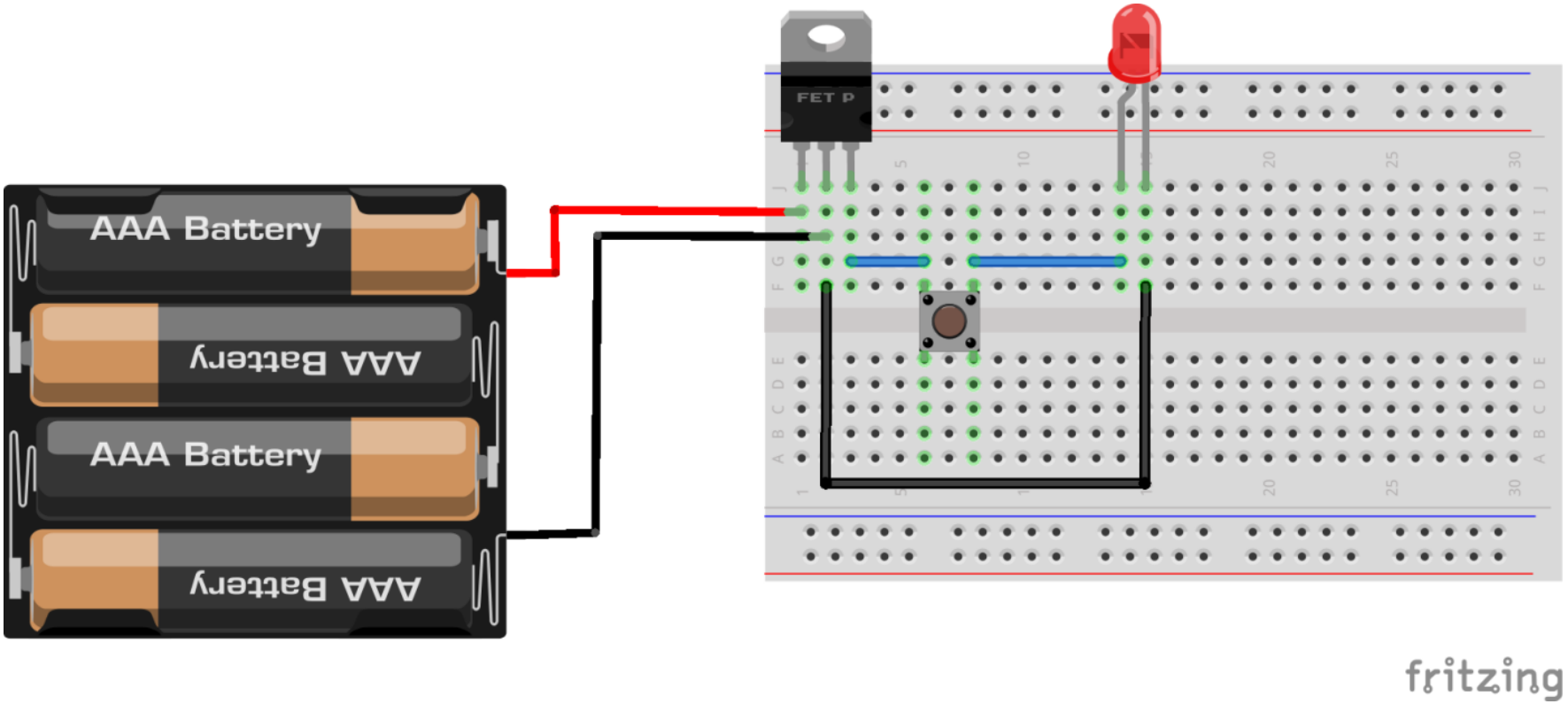
Sorularınız?

Elektrik - Elektronik



Elektrik - Elektronik





Elektrik - Elektronik