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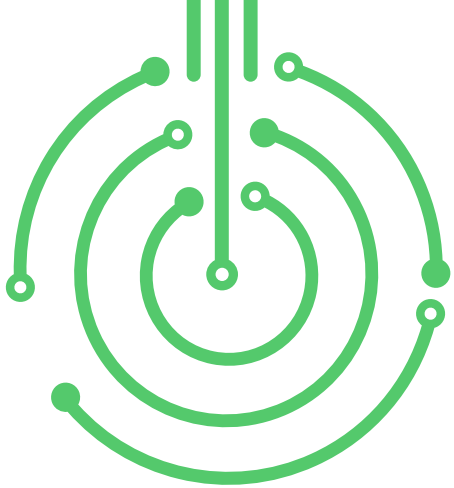


Brushed DC Motor Speed Controller Using Radio Control (RC) Remote

SKU: EL136367

Brushed DC Motor Speed Controller using Radio Control (RC) Remote

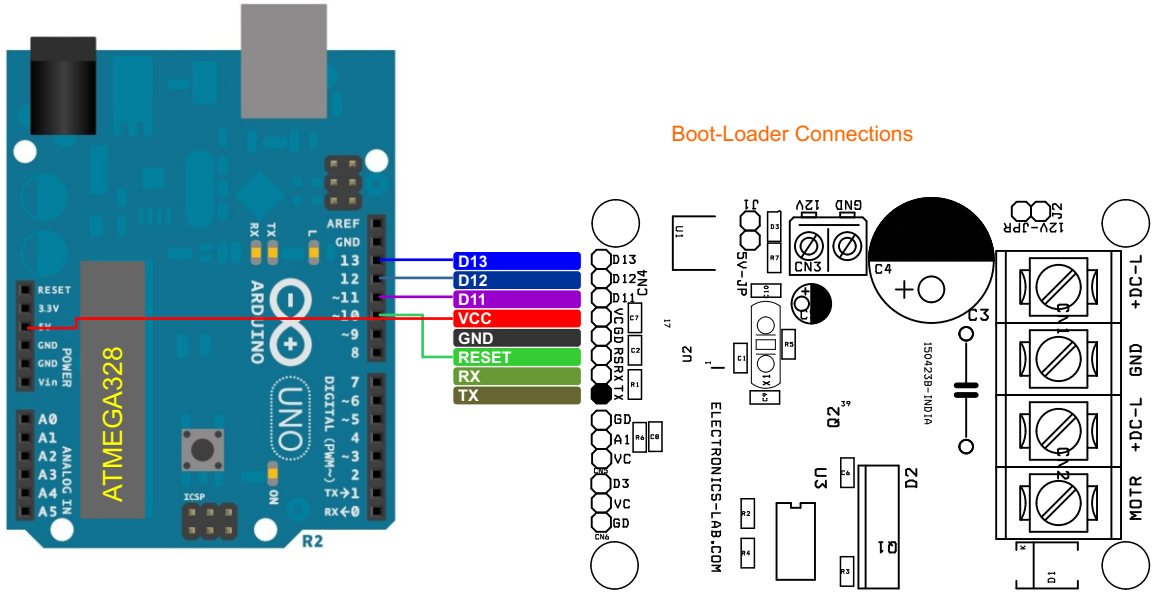
This is a Brushed DC motor controller designed to control one brushed DC motor up to 5A. It can control the speed of the DC motor using a Radio Control (RC) System. This Arduino compatible hardware converts RC PWM signal into 0 to 100% duty cycle PWM which further drives high current load using MOSFET. The project consists of an Atmega328 microcontroller, and a gate driver optocoupler provides isolation between MOSFET and microcontroller circuit to prevent high voltage and noise traveling from the motor and related circuit to the microcontroller. The circuit can drive a motor up to 5A with a power supply of 12V to 40V DC. The board has the option to mount higher voltage and current MOSFET, which can drive higher Voltage and current load. In this case don't install Q2, install Q1 MOSFET FDH3632, and replace diode D2 with a higher current diode.

Power Supply

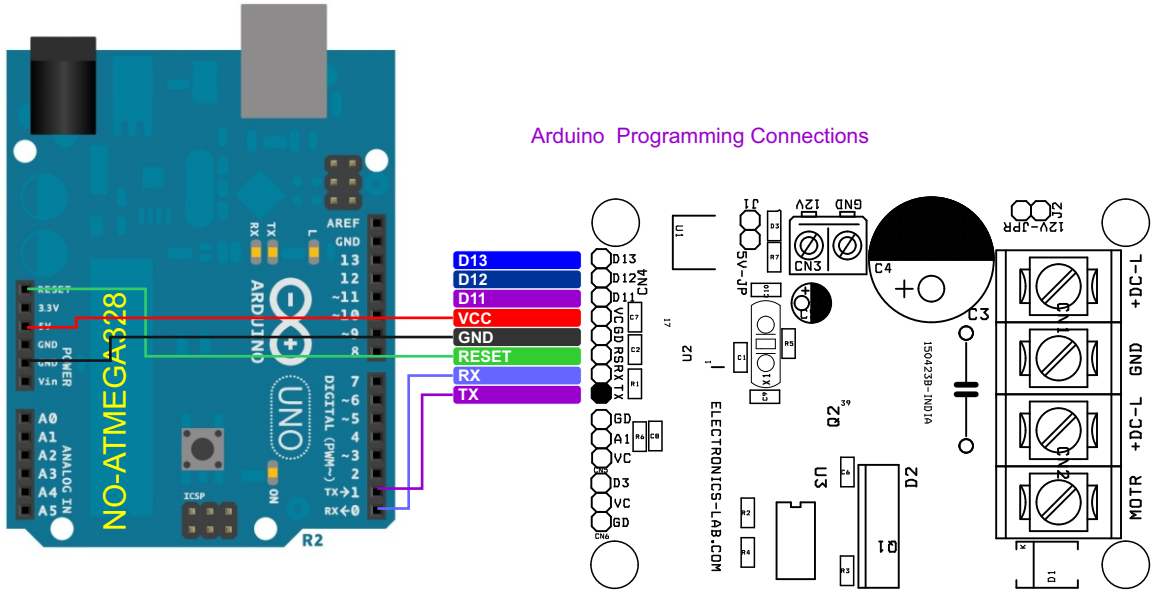
- For Motor up to 12-15V project can work with single supply, Close jumper J1 and Jumper J2, use connector CN1 to apply 12V to 15V DC.
- For Higher Voltage up to 90V (Limited due to DC bus capacitor) project required dual supply, one for DC motor load, 2nd for gate driver 12V to 15V Cn3.
- It advisable to use 3 separate power supply for large size motor such as 90V, 20Amps. 1. Logic supply 5V. 2. Gate Driver Supply 12V to 15V and
- Load supply 90V DC.
- Use Connector CN1 for load power supply up to 90V DC, Gate driver required 12V to 15V power at CN3, and use CN5 Pin 1-5V DC and
- Pin 3 GND to power the micro-controller.

Features

- Power Supply up to 40V (Read description for higher power input)
- Load Current Up to 5Amps
- Dual Supply 12V-15V DC for Gate driver and 40V for the Load
- On Board Power LED
- Optocoupler MOSFET Gate driver for noise immunity and provides isolation
- Arduino Compatible Hardware to create many application
- On Board connector for Arduino Programming and Boot-Loader burring
- Barrier Terminal Blocks for easy connection of Motor and power supply
- On board 5V Regulator for single supply operation for lower voltage motor
- PCB Dimensions 74.45 X 52.23 MM
- 4 X 3MM Mounting Holes

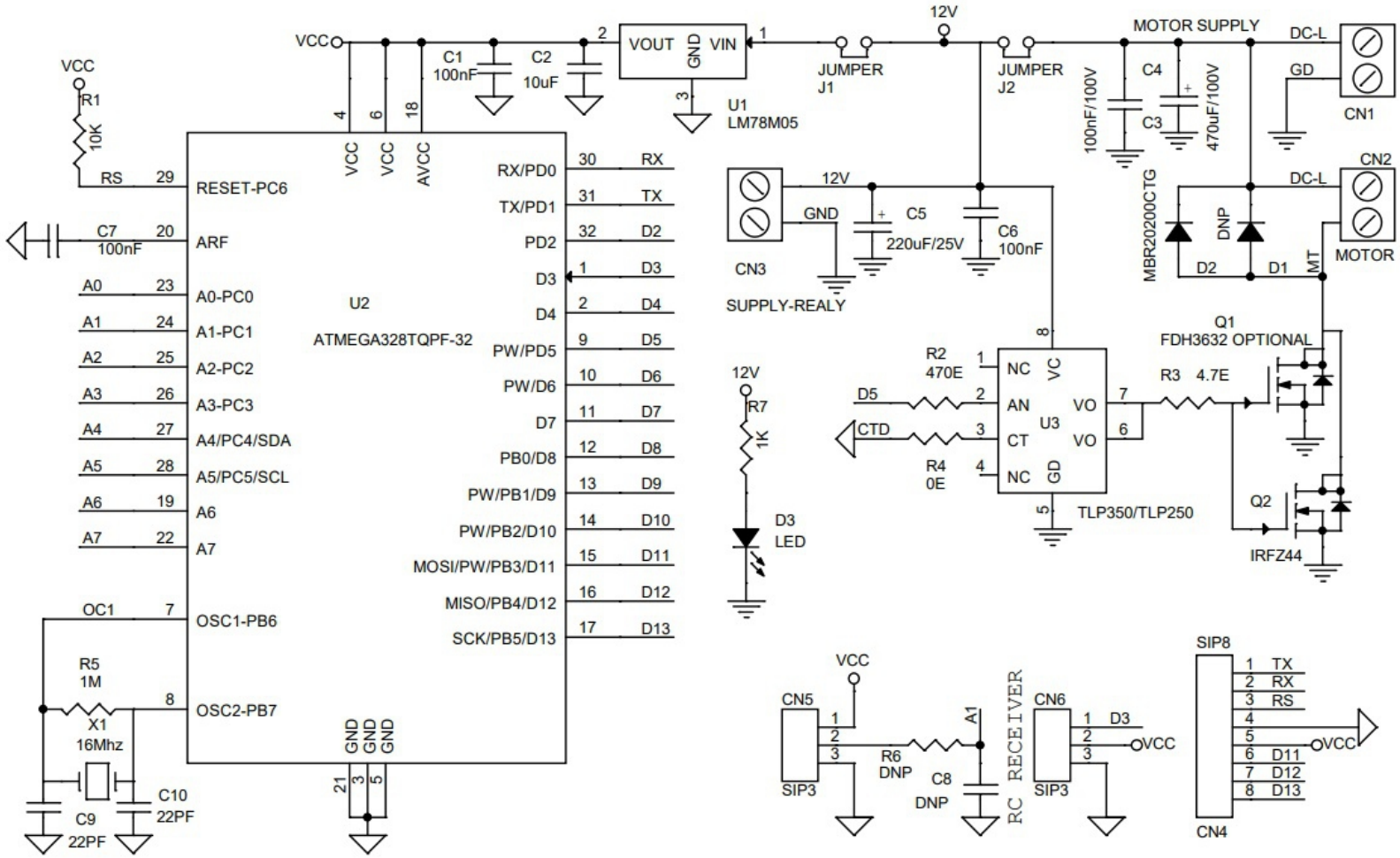


Boot-Loader Connections

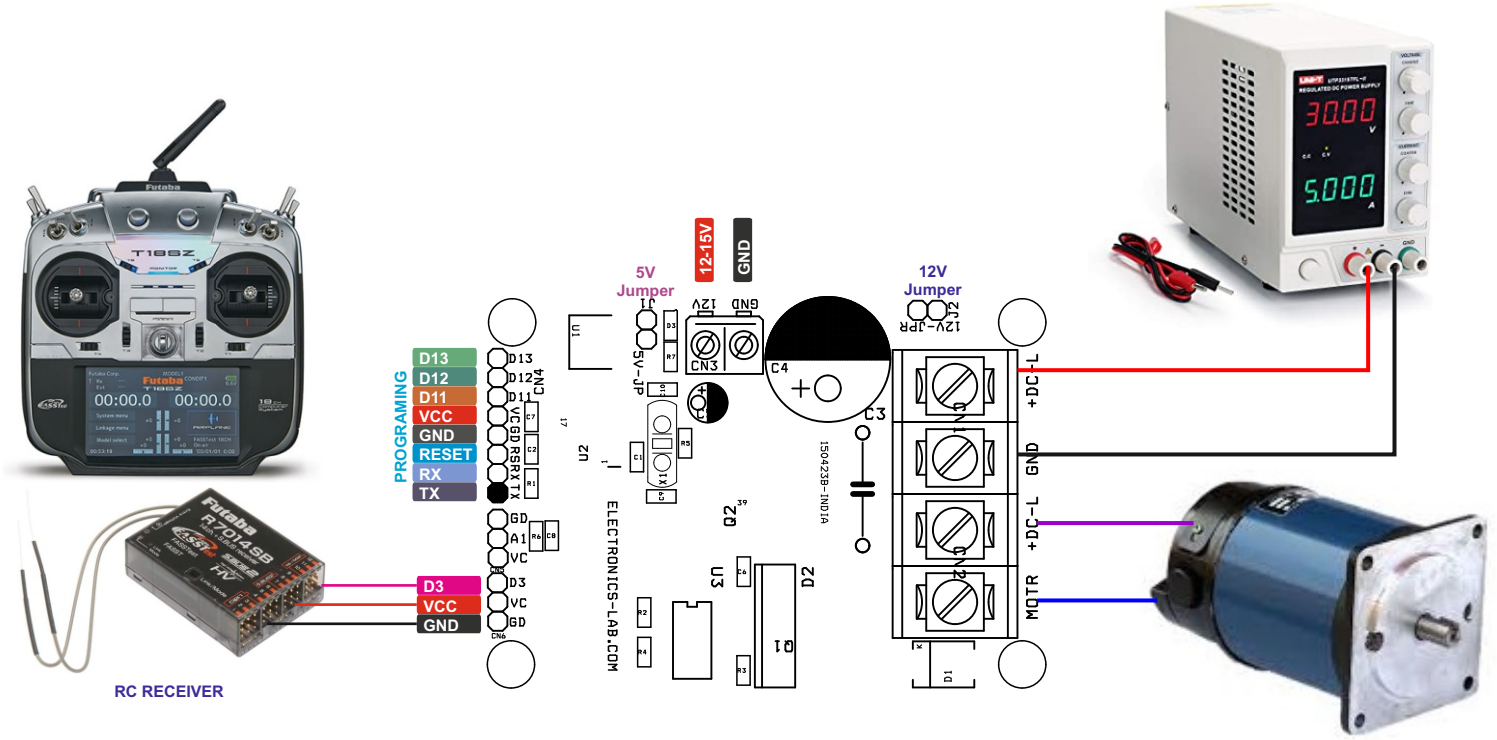


Arduino Programming Connections

Schematic


VCC
R1
10K
RS
29
RESET-PC6
C7
100nF
20
ARF
A0
23
A0-PC0
A1
24
A1-PC1
A2
25
A2-PC2
A3
26
A3-PC3
A4
27
A4/PC4/SDA
A5
28
A5/PC5/SCL
A6
19
A6
A7
22
A7
OC1
7
OSC1-PB6
R5
1M
8
OSC2-PB7
X1
16Mhz
C9
22PF
C10
22PF
U2
ATMEGA328TQPF-32
4
6
18
VCC
VCC
AVCC
21
3
5
GND
GND
GND
RX/PD0
30
RX
TX/PD1
31
TX
PD2
32
D2
D3
1
D3
D4
2
D4
PW/PD5
9
D5
PW/D6
10
D6
D7
11
D7
PB0/D8
12
D8
PW/PB1/D9
13
D9
PW/PB2/D10
14
D10
MOSI/PW/PB3/D11
15
D11
MISO/PB4/D12
16
D12
SCK/PB5/D13
17
D13
C1
100nF
C2
10uF
2
VOUT
GND
VIN
1
3
U1
LM78M05
JUMPER
J1
12V
JUMPER
J2
MOTOR SUPPLY
DC-L
GD
CN1
100nF/100V
C4
C3
470uF/100V
CN2
DC-L
MOTOR
MBR20200CTG
DNP
D2
D1
MT
CN3
SUPPLY-REALY
12V
GND
C5
220uF/25V
C6
100nF
12V
R7
1K
D3
LED
R2
470E
D5
CTD
R4
0E
1
2
3
4
NC
AN
CT
NC
VC
VO
VO
GD
8
7
6
5
U3
TLP350/TLP250
R3
4.7E
Q1
FDH3632 OPTIONAL
Q2
IRFZ44
VCC
CN5
SIP3
R6
DNP
A1
C8
DNP
RC RECEIVER
CN6
SIP3
D3
VCC
SIP8
1
2
3
4
5
6
7
8
TX
RX
RS
VCC
D11
D12
D13
CN4

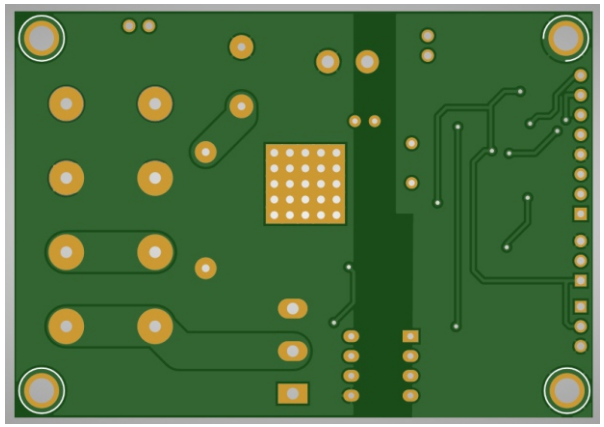
Connections

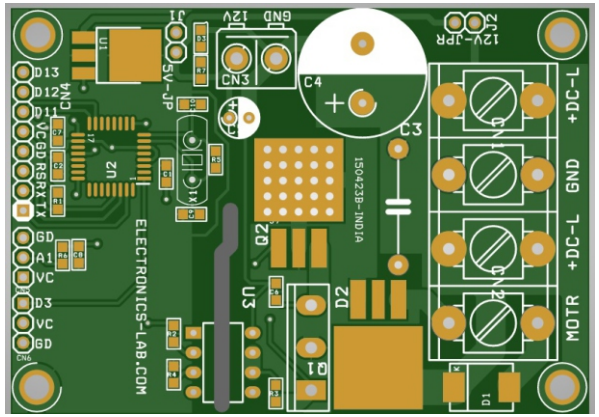


Connections and Other Details

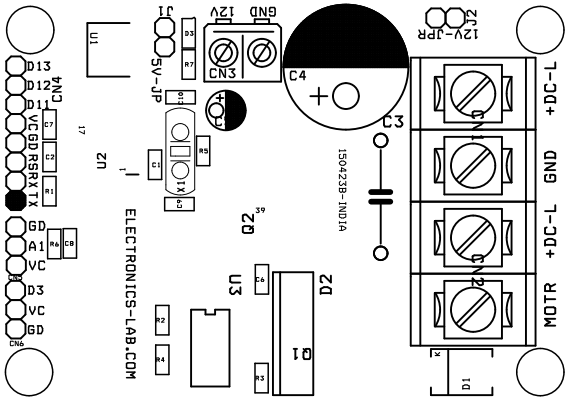
- CN1: Pin 1 = + DC Supply for Load, Pin 2 = GND
- CN2: DC Brushed Motor, Pin 1 = Motor, Pin 2= Motor
- CN3: Gate Driver Power Supply 12V to 15V, Pin 1 = +12V to 15V, Pin 2 = GND
- CN4: Programming and Boot-Loader, Pin 1 = TX, Pin 2 = RX, Pin 3 = Reset, Pin 4 = GND, Pin 5 = VCC, Pin 6 = D11, Pin 7 = D12, Pin 8 = D13
- CN6: RC Receiver, Pin 1 = D3 – RC PWM Input, Pin 2 = VCC 5V, Pin 3 = GND
- J1: For lower voltage single supply option, Close Jumper 1, Jumper J2, Use CN1 to power 12V to 15V DC.
- J2: For Lower Voltage motor 12V to 15V Close Jumper J2 to power the Gate driver
- For Higher Voltage motor such 90V, advisable to use three power supply, Load Supply CN1, Gate driver Supply 12V to 15V Cn3, Logic supply 5V CN5, open jumper J1 and J2 in this case
- CN5: Do not Install
- D3: Power LED

PCB

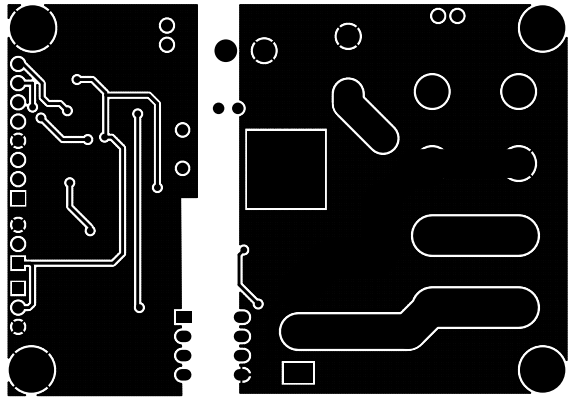




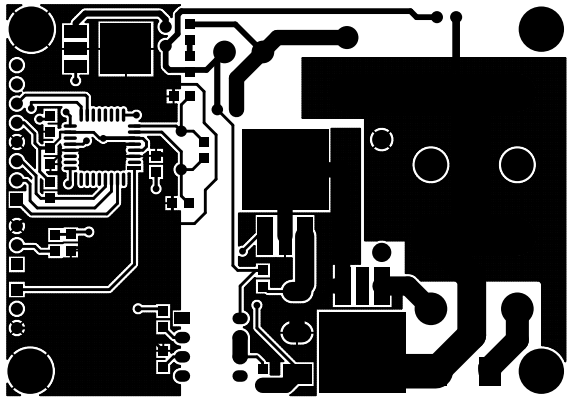
PCB GERBER FILES AVAILABLE



SILK SCREEN TOP



BOTTOM LAYER



TOP LAYER

PCB DIMENSIONS 74.45 X 52.23 MM

Parts List

BOM						
NO	QNTY	REF.	DESC.	MANUFACTURER	SUPPLIER	SUPPLIER'S PART N0
1	1	CN1	2 PIN BARRIER CONNECTOR PITCH 9.53MM	TE CONNECTIVITY	DIGIKEY	A98482-ND
2	1	CN2	2 PIN BARRIER CONNECTOR PITCH 9.53MM	TE CONNECTIVITY	DIGIKEY	A98482-ND
3	1	CN3	2 PIN SCREW TERMINAL PITCH 5.08MM	PHOENIX	DIGIKEY	277-1247-ND
4	1	CN4	8 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5321-ND
5	2	CN5,CN6	3 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5316-ND
6	3	C1,C6,C7	100nF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
7	1	C2	10uF/16V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
8	1	C3	100nF/100V THT FILM	CORNELL	DIGIKEY	160104K160C-F-ND
9	1	C4	470uF/100V ELECTROLYTIC	NICHICON	DIGIKEY	493-1379-ND
10	1	C5	220uF/25V ELECTROLYTIC	RUBYCON	DIGIKEY	1189-2913-ND
11	2	SHUNT	SHUNT FOR JUMPER J1 AND J2	SULINS CONNCT	DIGIKEY	S9001-ND
12	3	D1,R6,C8	DNP			
13	2	C9,C10	22PF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
14	1	D2	MBR20200CTG TO263	ONSEMI	DIGIKEY	MBR20200CTGOS-ND
15	1	D3	LED RED SMD SIZE 0805	OSRAM	DIGIKEY	475-1278-1-ND
16	2	J1,J2	JUMPER 2PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5315-ND
17	1	Q1	FDH3632 OPTIONAL TO247	ON SEMI	DIGIKEY	DO NOT INSTALL
18	1	Q2	IRFZ44	INFINEO	DIGIKEY	IRFZ44NSTRLPBFTR-ND
19	1	R1	10K 5% smd size 0805	YAGEO/MURATA	DIGIKEY	
20	1	R2	470E 5% smd size 0805	YAGEO/MURATA	DIGIKEY	
21	1	R3	4.7E 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
22	1	R4	0E SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
23	1	R5	1M 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
24	1	R7	1K 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
25	1	U1	LM78M05 SMD DPAK	TI	DIGIKEY	MC78M05CDTGOS-ND
26	1	U2	ATMEGA328TQPF-32	MICROCHIP	DIGIKEY	ATMEGA328PB-AURCT-ND
27	1	U3	TLP350/TLP250	TOSHIBA	DIGIKEY	TLP350F-ND
28	1	X1	16Mhz	ECS INC	DIGIKEY	X1103-ND

Notes

APP

Android App

DOWNLOAD

Android App launched in 2017 and has 100k+ downloads - rated with 4.5 stars.

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