THE

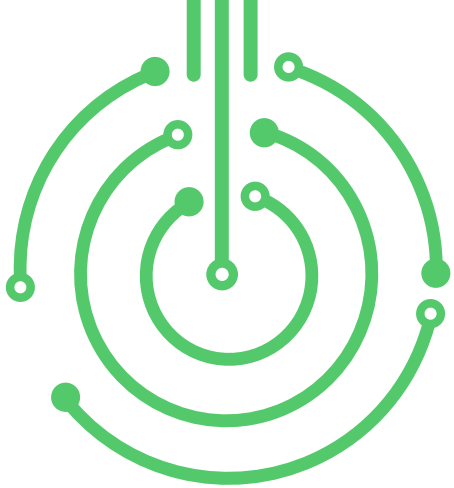
electronics-lab.com

from ideas to boards

electronics-lab - Projects | Embedded News | Online Community | e-Shop

Open Source Hardware Electronics Projects

electronics-lab.com /projects



Half Bridge with Single PWM Input

SKU: EL148984

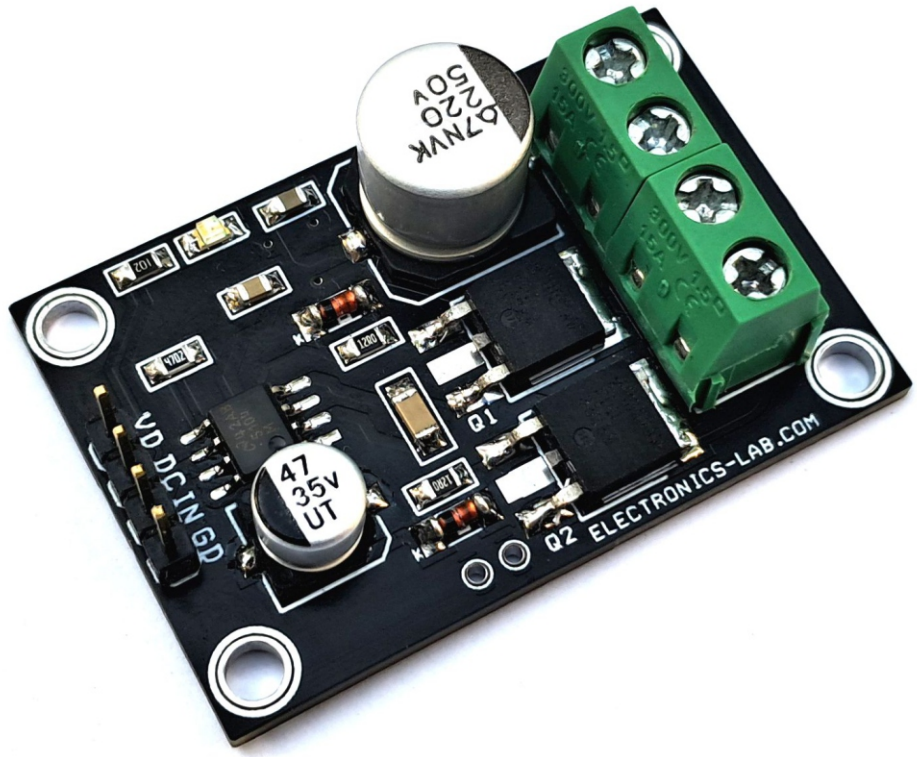
MODULES

Half Bridge with Single PWM Input

This is a Half-bridge module based on the LM5104 chip, which is a high-voltage gate driver. This High-Voltage Gate Driver is designed to drive both the high-side and the low-side N-channel MOSFETs in a synchronous buck configuration. The floating high-side driver can work with supply voltages up to 100V. The high-side and low-side gate drivers are controlled from a single PWM input. Each state change is controlled adaptively to prevent shoot-through issues. In addition to the adaptive transition timing, an additional delay time can be added, proportional to an external setting resistor. An integrated high-voltage diode is provided to charge the high-side gate drive bootstrap capacitor. A robust level shifter operates at high speed while consuming low power and providing clean level transitions from the control logic to the high-side gate driver. Undervoltage lockout is provided on both the low-side and the high-side power rails.

FEATURES

- Power Supply Load up to 50V (Limited Due to Capacitor Volt)
- Power Supply Gate Driver 9V to 14V DC
- Load Up to 5Amps (Higher with Cooling Fan)
- Drives Both a High-Side and Low-Side N-Channel MOSFET
- Adaptive Rising and Falling Edges with Programmable
- Additional Delay
- Under Voltage Threshold 7V
- Adjustable Delay 90 to 200nS (RT(R4) 10K to 100K)
- Operating Frequency Input up to 1000Khz
- Single Input Control
- Bootstrap Supply Voltage Range up to 118-V DC
- Fast Turnoff Propagation Delay (25 ns Typical)
- Drives 1000-pF Loads With 15-ns Rise and Fall Times



- Supply Rail Under Voltage Lockout
- On Board Power LED
- Screw Terminals for Load Supply and Load
- Header Connector for Input signal and Gate Driver Supply
- 2.5MMX4 PCB Mounting Holes
- PCB Dimensions 44.45X29.53MM

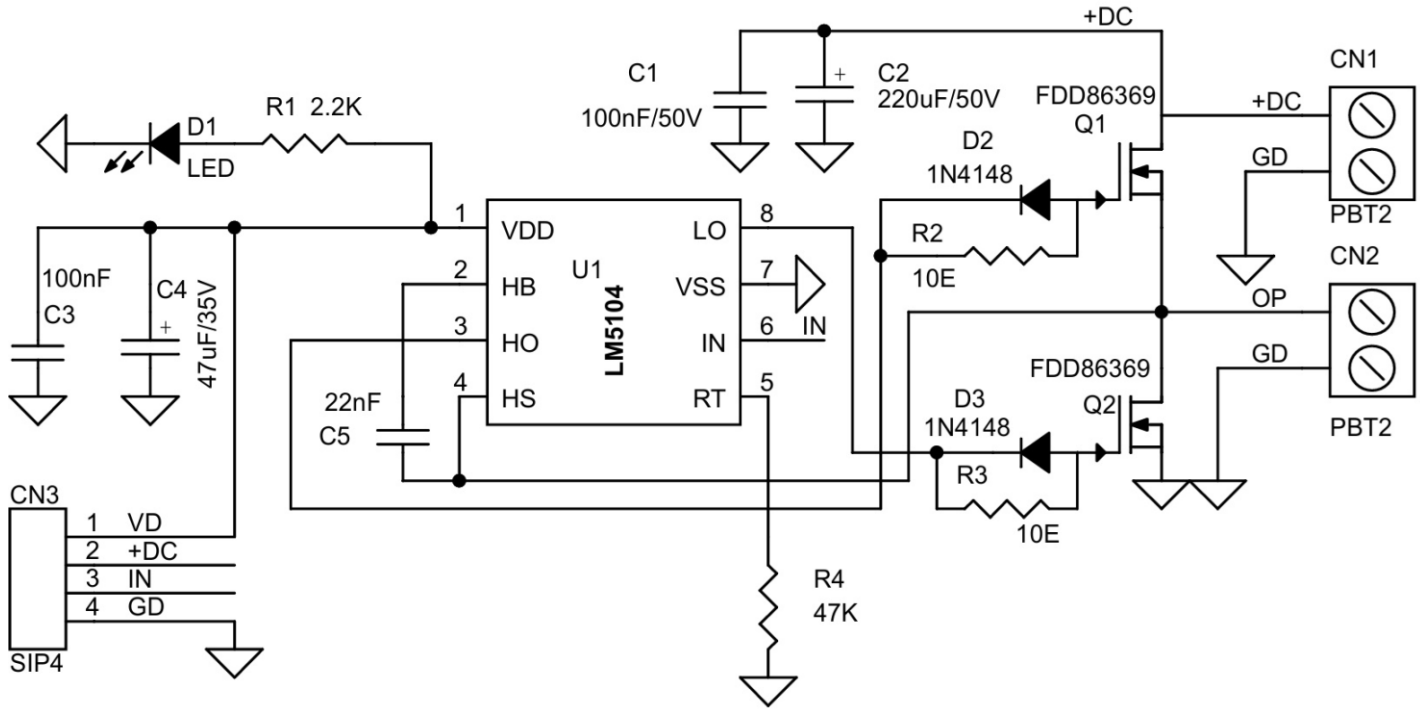
The user must take care of the following:

- Bootstrap capacitor value depends on the input frequency
- Choose the right MOSFET as per Load Current/Voltage
- Choose the Right Value for delay resistor R4-RT, Depending on MOSFET Gate Capacitance. Refer to Datasheet for more info.

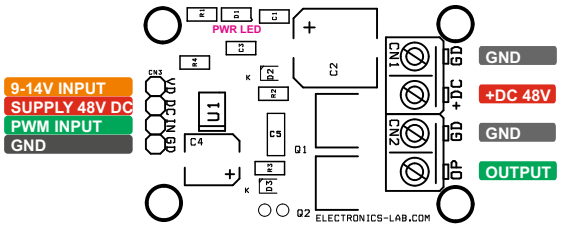
Applications

- Current Fed Push-Pull Power Converters
- High Voltage Buck Regulators
- Active Clamp Forward Power Converters
- Half-Bridge and Full-Bridge Converters

Schematic


+DC
C1
100nF/50V
C2
220uF/50V
CN1
FDD86369
Q1
+DC
D1
LED
R1 2.2K
D2
1N4148
GD
PBT2
R2
10E
1
VDD
LO
8
2
HB
U1
LM5104
VSS
7
IN
100nF
C3
C4
47uF/35V
3
HO
IN
6
IN
CN2
OP
FDD86369
Q2
GD
4
HS
RT
5
22nF
C5
D3
1N4148
PBT2
R3
10E
CN3
1 VD
2 +DC
3 IN
4 GD
SIP4
R4
47K

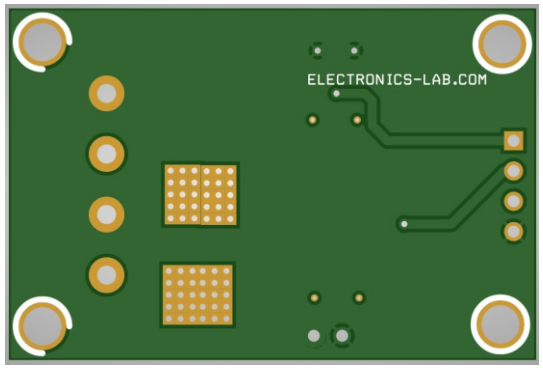
Connections

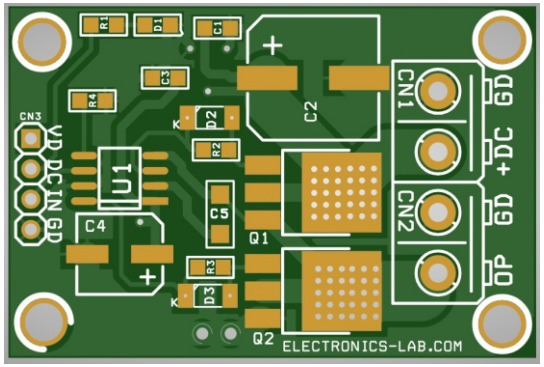


Connections

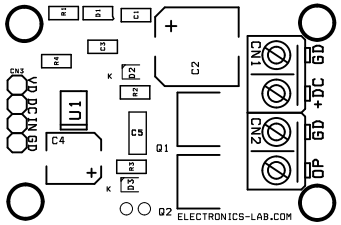
- CN1: Pin 1 Power Supply Load 48V DC, Pin 2 = GND
- CN2: Pin 1 Output, Pin 2 = GND
- CN3: Pin 1 VDD 9V to 14V, Pin 2 = Load Power Supply, Pin 3 = PWM Input, Pin 4 = GND
- D1: Power LED

PCB

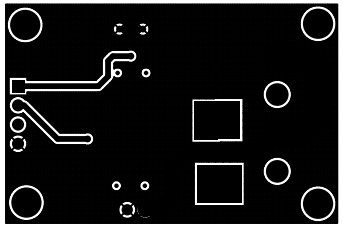




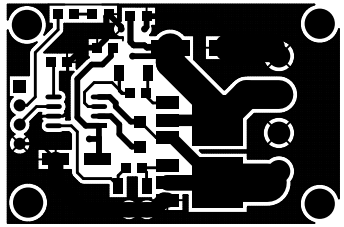
PCB GERBER FILES AVAILABLE



SILK SCREEN TOP



BOTTOM LAYER



TOP LAYER

PCB DIMENSIONS 44.45X29.53MM

Parts List

BOM						
NO	QNTY.	REF.	DESC,	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
1	2	CN1,CN2	2 PIN SCREW TERMINAL PITCH 5.08MM	PHOENIX	DIGIKEY	277-1247-ND
2	1	CN3	4 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5317-ND
3	1	C1	100nF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
4	1	C2	220uF/50V ELECKTROLYTIC	PANASONIC	DIGIKEY	PCE3921CT-ND
5	1	C3	100nF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
6	1	C4	47uF/35V ELEKTROLYTIC	WURTH	DIGIKEY	732-8508-1-ND
7	1	C5	100nF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
8	1	D1	LED SMD SIZE 0805	OSRAM	DIGIKEY	475-1278-1-ND
9	2	D2,D3	1N4148	ONSEMI	DIGIKEY	FDLL4148CT-ND
10	2	Q1,Q2	FDD86369 DPAK	ONSEMI	DIGIKEY	FDD86369OSCT-ND
11	1	R1	2.2K 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
12	2	R2,R3	10E 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
13	1	R4	47K 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
14	1	U1	LM5104 SOIC8	TI	DIGIKEY	LM5104MX/NOPBCT-ND

Notes

APP

Android App

DOWNLOAD

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

SCAN QR CODE

Keep
In touch..

electronics-lab
.com

info@electronics-lab.com
www.electronics-lab.com

from ideas to boards