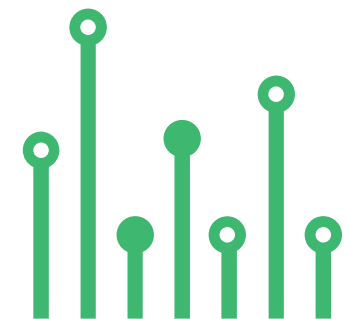


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Self-Oscillating Half Bridge Module



SKU: EL148957

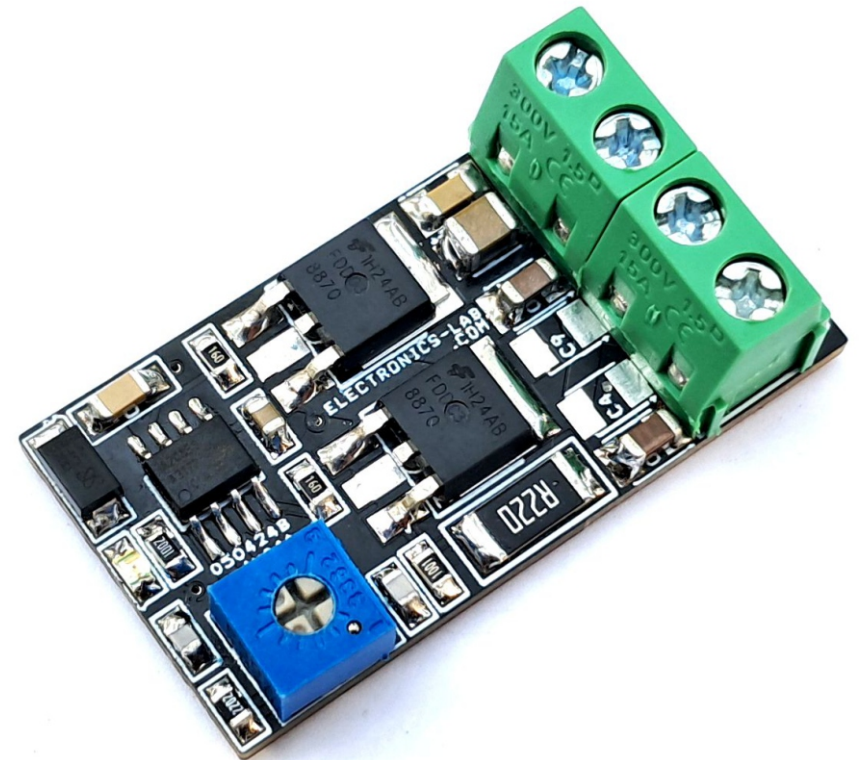
Self-Oscillating Half Bridge Module



This is an automotive-grade self-oscillation 50% duty cycle half-bridge module built using the AUIR2085S chip from Infineon. The project consists of 2 x N-channel MOSFETs, and the module provides a primary side control solution to enable Half-Bridge DC-bus converters. The module is a self-oscillating half-bridge driver with 50% duty cycle ideally suited for 10V – 15V half-bridge DC-bus converters. The board is also suitable for push-pull converters. Each channel frequency is equal to f_{OSC} , which can be set by selecting RT (R2+PR1) & CT-(C7), Dead-time can be controlled through proper selection of CT range from 50ns to 200ns. Internal soft-start increases the pulse width during power-up and maintains pulse width matching for the high and low outputs throughout the start-up cycle. Typically, the soft-start duty cycle varies beginning from 5-10% ramping up to about 50% over 1000 cycles. The AUIR2085S initiates a soft start at power up and after every overcurrent condition. Undervoltage lockout prevents operation if VCC is less than 7.5V.

FEATURES

- Power Supply 10V to 14V DC
- Integrated 50% duty cycle oscillator and half-bridge driver
- Adjustable switching frequency 84Khz to 260Khz
- Undervoltage lockout prevents operation if VCC is less than 7.5V.
- +/- 1A drive current capability optimized for low charge MOSFETs
- Adjustable dead-time 50ns - 200ns (Read Data Sheet for More Info)
- High and low side pulse width matching to +/- 25ns
- Adjustable Over-Current Protection,
- Over Current Shut Down Threshold 300mV
- Over Current Shutdown Delay 200nS
- Turn-on Rise Time 40nS
- Turn-off Fall Time 20nS
- Undervoltage lockout and internal soft start
- PCB Dimensions 40.16X21.27MM



Push-Pull Converter Application

The components like transistors Q1, Q2, the external transformer, and the capacitors C4, C5, C9, and C10 make up a so-called single-ended, push-pull converter. This converter operates the potential-isolating transformer with an alternating voltage in which both half-oscillations are used for energy transmission.

Frequency Adjust

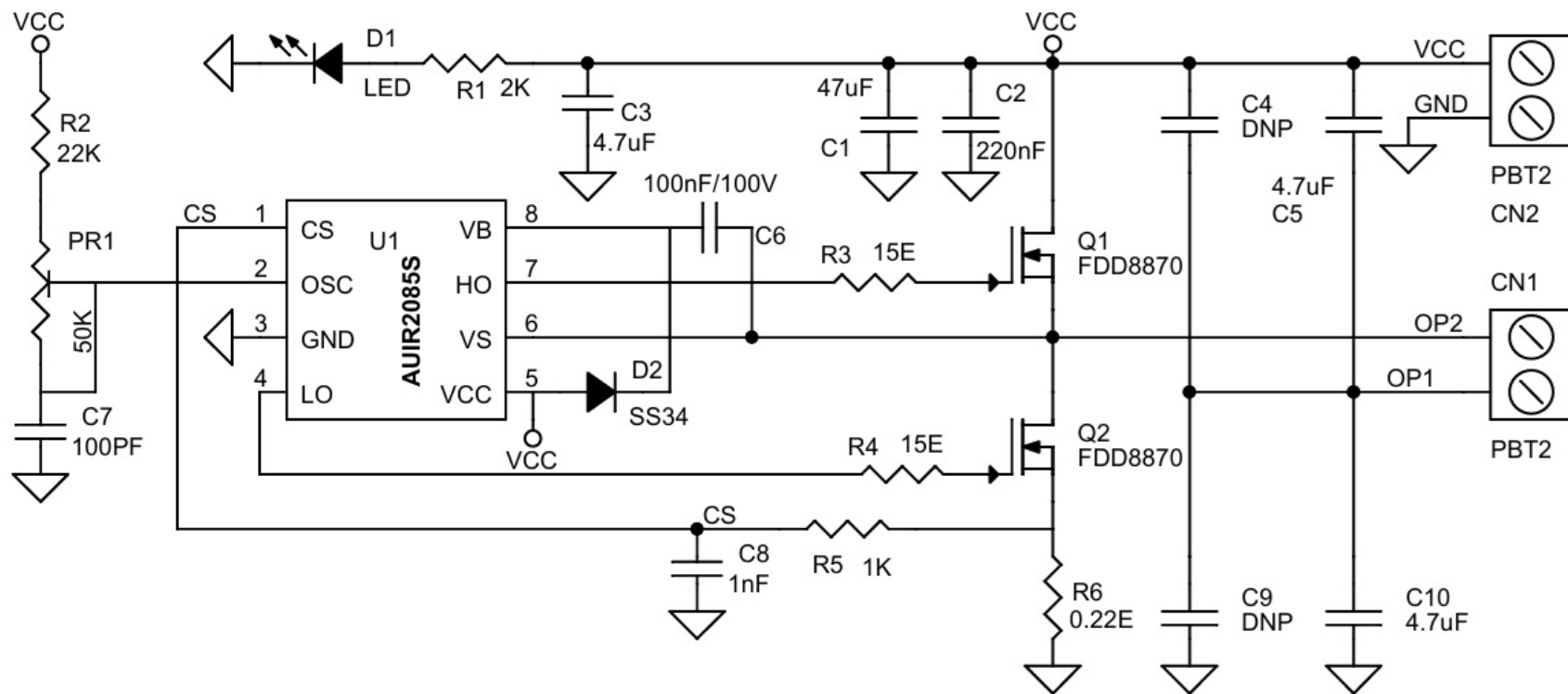
A Trimmer potentiometer is provided to adjust the frequency from 84Khz to 200Khz. The module supports higher frequencies up to 500Khz, read the datasheet of the AU1R2185S chip to learn more about frequency and dead time adjustment. For 500Khz Output CT should be 100pF and RT 10k Ω .

DC-DC Converters, Push-Pull Drivers

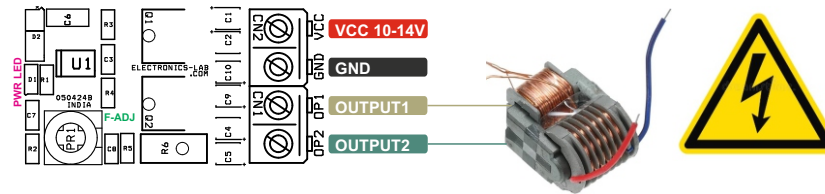
High Voltage Converters
HEV Auxiliary Converter
Battery Management Converters

The recommended range of timing resistors RT is between 10k Ω and 100k Ω and the range of timing capacitor CT is between 47pF and 470pF. Timing resistor values less than 10k Ω should be avoided. The value of the timing capacitor determines the amount of dead time between the two output drivers: the lower the CT, the shorter the dead time, and vice versa. It is not recommended to use a timing capacitor below 47pF, for best performance keep the timing components physically as close as possible to the AU1R2085S. Separated ground and VCC traces to the timing components are encouraged.

Schematic



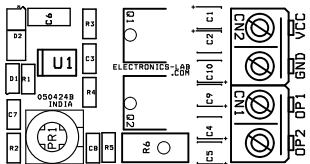
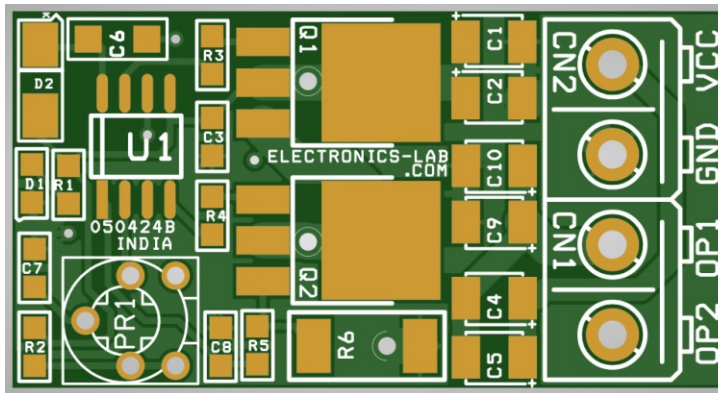
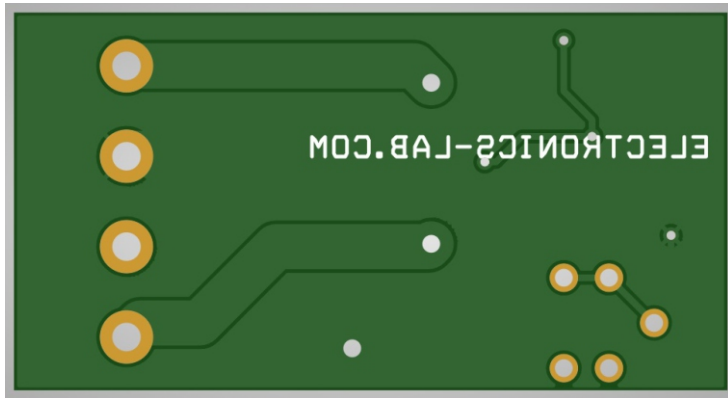
Connections



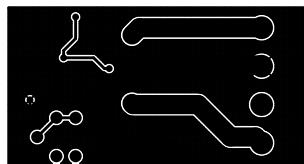
Connections

- CN1: Pin 1 Output 2, Pin 2 Output 1 (for Push-Pull)
- CN2: Pin 1 VCC, Pin 2 GND
- PR1: Oscillator Adjust
- D1: Power LED

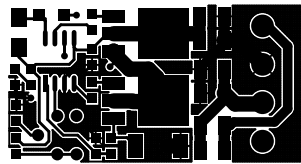
PCB



SILK SCREEN TOP



BOTTOM LAYER



TOP LAYER

PCB DIMENSIONS 40.16X21.27MM

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	C1	47uF/25V CERAMIC SMD SIZE 1210	MURATA/YAGEO	DIGIKEY	
3	1	C2	220nF/25V CERAMIC SMD SIZE 1210 OR 1206	MURATA/YAGEO	DIGIKEY	
4	2	C5,C10	4.7uF/25V CERAMIC SMD SIZE 1210 OR 1206	MURATA/YAGEO	DIGIKEY	
5	2	C4,C9	DNP			
6	1	C6	100nF/100V CERAMIC SMD SIZE 1206	MURATA/YAGEO	DIGIKEY	
7	1	C7	100PF/50V CERAMIC SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
8	1	C8	1nF/50V CERAMIC SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
9	1	D1	LED SMD SIZE 0805	OSRAM	DIGIKEY	475-1278-1-ND
10	1	D2	SS34 OR SS14	ONSEMI	DIGIKEY	SS34FSCT-ND
11	1	PR1	50K TRIMMER POT	BOURNS	DIGIKEY	3362P-503LF-ND
12	2	Q1,Q2	FDD8870 DPAK	ONSEMI	DIGIKEY	FDD8870FSCT-ND
13	1	R1	2K 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
14	1	R2	22K 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
15	2	R3,R4	15E 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
16	1	R5	1K 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
17	1	R6	0.22E/2W 1% SMD SIZE 2512	MURATA/YAGEO	DIGIKEY	
18	1	U1	AUIR2085S SOIC8	INFINEON	DIGIKEY	AUIR2085S-ND
19	1	C3	4.7uF/25V CERAMIC SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	

Notes

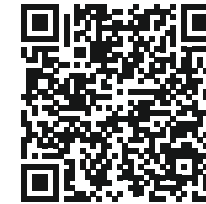


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