

3.5A Unipolar Stepper Motor Driver

Compact Unipolar stepper motor driver can drive unipolar motor up to 3.5A and supply range 10 To 50V DC. This compact board is based on STK672-440BN IC from ON semiconductor. The STK672-440BN is a hybrid IC for use as a unipolar, 2-phase stepper motor driver with PWM current control with Micro-stepping.

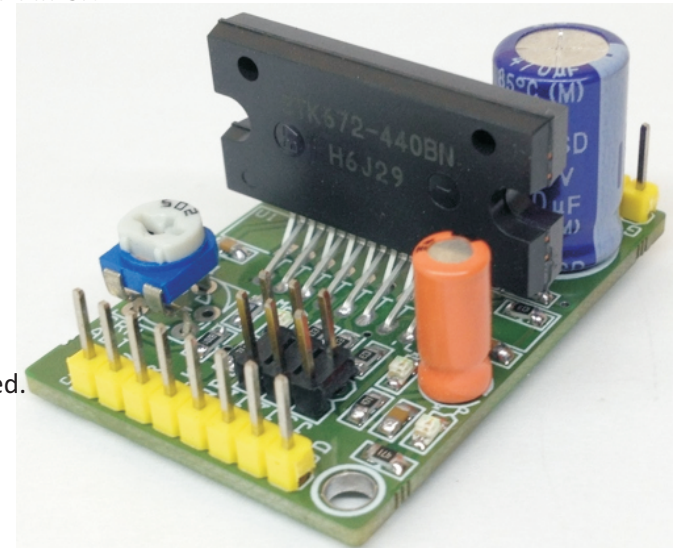
Note: This Board can work with motor supply up to 36V DC, for 50V DC Supply Remove IC U2 LM317, and provide 5V Logic supply from external source. Default Enable pin is High for normal operations, pull down 0 to disable the operations, for internal Power on Reset R7 is 0E , C4 can be omit or its fine as it is.

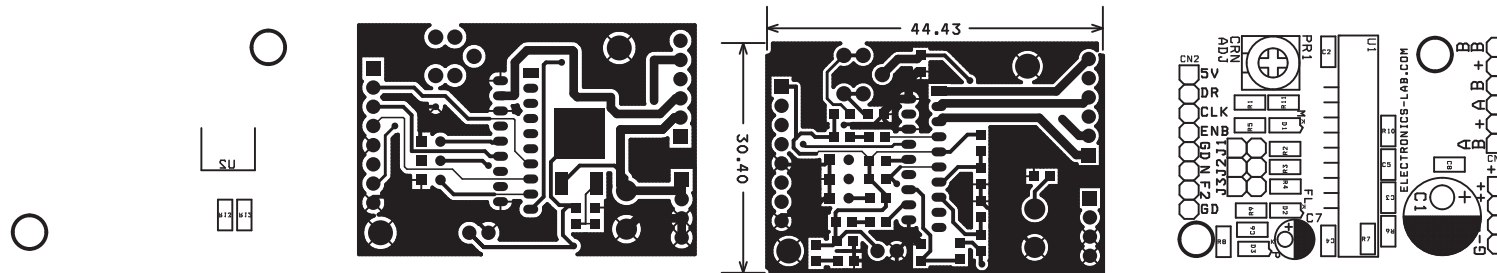
- D1 LED : Excitation Monitor (Motor Pulse Indicator)**
- D3 LED : Power LED**
- D2 LED : Fault Indicator When Over Current, Over Heat, and Motor wires open**

- CN2 :** 1 Pin 5V DC, 2 Pin Direction Put, 3 Pin Clock Input, 4 Pin Enable, 5 Pin Not Connected, 6 Pin Fault 2, 7 Pin GND
- CN3 :** Stepper Motor Connection
- CN 1 :** Supply Input (10-36V DC) Read Note For Supply 46V Input

Features

- Supply 36V DC (Up to 50V DC See Note)
- Load Current 3.5Amps
- Stepper Motor: 5 Wires, 6 Wires, 8 Wires (Unipolar)
- Built-in motor terminal open detection function, (output current OFF).
- Overcurrent detection function, (output current OFF).
- Overheat detection function (output current OFF).
- FAULT1 signal (active low) is output when any of motor terminal open, overcurrent or overheat is detected.
- The FAULT2 signal is used to output the result of activation of protection circuit detection at 3 levels.
- Built-in power on reset function
- A micro-step sine wave-driven driver can be activated merely by inputting an external clock.
- External pins can be used to select 2, 1-2 (including pseudo-micro), W1-2, 2 W1-2, or 4W1-2 excitation.
- The switch timing of the 4-phase distributor can be switched by setting an external pin (MODE3) to detect either the rise or fall, or rise only, of CLOCK input.
- Phase is maintained even when the excitation mode is switched.
- Incorporating a current detection resistor (0.122Ω: resistor tolerance 2%),
- Motor current can be set using Trimmer Potentiometer (V Ref Range 0.2V-1.8V)
- The ENABLE pin can be used to cut output current while maintaining the excitation mode.





Micro-Stepping J1=M1, J2=M2, J3=M3

M2	0	0	1	1	CLOCK Edge Timing for Phase Switching
M3 \ M1	0	1	0	1	
1	2-phase excitation selection	1-2-phase excitation ($I_{OH}=100\%$)	W1-2 phase excitation	2W1-2 phase excitation	CLOCK rising edge
0	1-2 phase excitation ($I_{OH}=100\%$, 71%)	W1-2 phase excitation	2W1-2 phase excitation	4W1-2 phase excitation	CLOCK both edges

$I_{OH}=100\%$ results in the V_{ref} voltage setting, I_{OH} .

During 1-2 phase excitation, the hybrid IC operates at a current setting of $I_{OH}=100\%$ when the CLOCK signal rises. Conversely, pseudo micro current control is performed to control current at $I_{OH}=100\%$ or 71% at both edges of the CLOCK signal.

BOM			
SR.	QNTY.	REF.	DESC.
1	1	CN1	4 PIN HEADER CONNECTOR
2	1	CN2	8 PIN HEADER CONNECTOR
3	1	CN3	6 PIN HEADER CONNECTOR
4	1	C1	470/50V
5	6	C2,C3,C4,C5,C6,C8	0.1uF SMD 0805
6	1	C7	10uF
7	3	D1,D2,D3	LED SMD 0805
8	3	J1,J2,J3	JUMPER & CLOSURE
9	1	PR1	5K TRIMMER POT
10	1	R1	8K2 SMD 0805
11	5	R2,R3,R4,R6,R10	10K SMD 0805
12	3	R5,R8,R9	470E SMD 0805
13	1	R11	560E SMD 0805
14	1	R12	680E SMD 0805
15	1	R13	220E SMD 0805
16	1	U1	STK672-440BN-E
17	1	U2	LM317 DPAK
18	1	R7	0E SMD 0805

