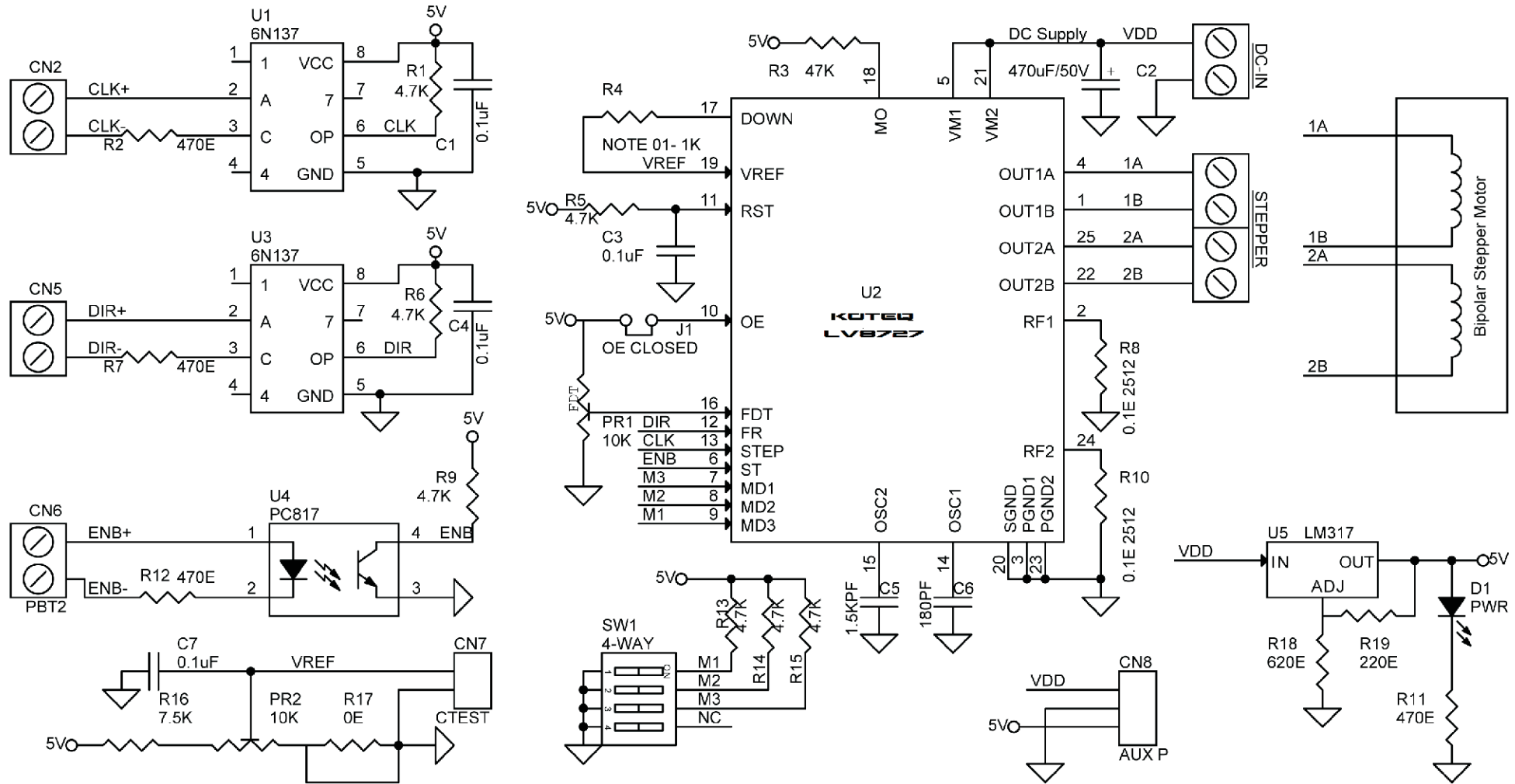# 4A BIPOLAR STEPPER MOTOR DRIVER BASED ON LV8727E

The Project based on LV8727E IC from ON Semiconductor. This Bipolar Driver works with supply input 9V to 36V (Replace L317 with L317HVT for supply input up to 45V DC). Load current up to 4Amps. The LV8727 is a PWM current-controlled micro step bipolar stepping motor driver. This driver can provide eight ways of micro step resolution of 1/2, 1/8, 1/16, 1/32, 1/64, 1/128, 1/10, 1/20, and can drive simply by the step input.
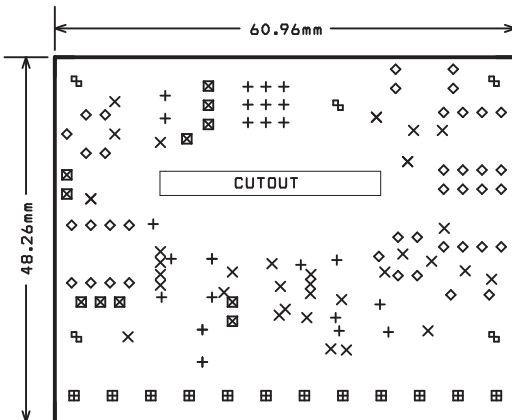
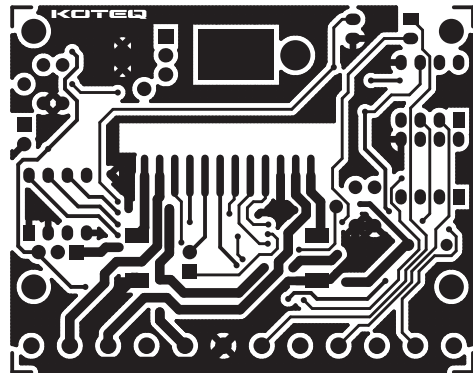# 4A BIPOLAR STEPPER MOTOR DRIVER BASED ON LV8727E

Features

Supply 9V to 36V DC (Replace L317 with L317HVT for Supply up to 45V DC)
Load Current Up to 4Amps
Inputs: Step Pulse, Direction, Enable
Micro-Stepping: 4 Way DIP Slide Switch
On Board Power Indication
On Board L317 for 5V DC Regulator
Current Adjust Preset
Over Current protection
Thermal Shutdown
FDT Adjust Preset (DECAY Setting)
Single-Channel PWM current control stepping motor driver.
Output Current 4Amps
Micro Stepping 1/2,1/8,1/16,1/32,1/64,1/128,1/10,1/20 Step are selectable.
Advance the excitation step with the only step signal input

MICRO-STEPPING SELECTION			
	SW3-MD3	SW2-MD2	SW1-MD1	Micro-Stepping
1	ON	ON	ON	1/2 STEP
2	ON	ON	OFF	1/ 8 STEP
3	ON	OFF	ON	1/16 STEP
4	ON	OFF	OFF	1/32 STEP
5	OFF	ON	ON	1/64 STEP
6	OFF	ON	OFF	1/128 STEP
7	OFF	OFF	ON	1/10 STEP
8	OFF	OFF	OFF	1/20 STEP

MICRO-STEPPING SELECTION SW1 DIP SLIDE SWITCH

SW4 NC-NOT IN USE

60.96mm

48.26mm

CUTOUT

BOTTOM

TOP
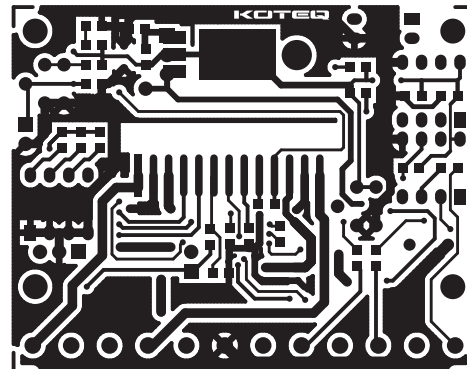
SILK SCREEN BOTTOM
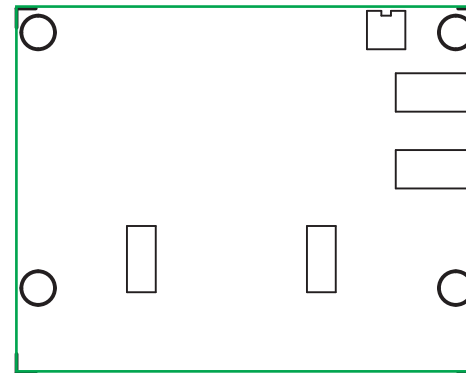
SILK SCREEN TOP
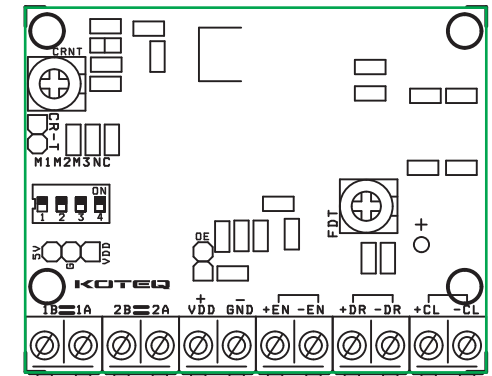
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Output Current Settings (PR2 Preset Constant Current Setting)

Current Output= (VREF/3)/0.1E (Shunt Resistor R8, R10)
Example: (VREF 0.9V/3)/)0.1E=3Amps

Enable (Stand-by function)
When enable input is high the ST pin is at low levels, The IC enters stand-by mode, all logic is reset and output in turned off
Keep Enable input low (No Signal Input at Enable) for Normal operations, Apply 5V at disable the drive

Jumper-J1 Output Enable (J1 Closed for Normal Operation)
Jumper Open put the output forced off and goes to high impedance. However the internal logic circuits are operating, so excitation position proceeds when the STP is input, when J1 close, the output level conforms to the excitation position proceed by the step input.

FDT DECAY mode setting (PR1-Prest)
Current DECAY method is selectable as shown below by applied voltage to the FDT pin.

3.5V to 5V Slow DECAY
3.1V to 3.5V Inhibited Zone
1.1V to 3.1V or Open Mixed DECAY
0.8V to 1.1V Inhibited Zone
0 to 0.8V Fast DECAY
Note: It is not recommended e to change DECAY method during Motor operation.

Note 01 DOWN output Pin
This pin is turned ON when no rising edge STEP between the input signals. This pin used to set the holding current when motor at HOLD state. Its help reducing the current when motor is not moving and it's in Holding position.

R4 is associated to control the holding current when motor is in HOLD State, value of R4 to be calculated as per Input Ref voltage, and required holding current, see below formula to calculate the R4

Down Output OFF: $VREF=5VXR2/(R1+R2)=0.741V$
Down Output On: $VREF=5VXR2 (R2 IIR4)/(R1+(R2IIR4)=0.126V$
Note02 R1 and R2 Divide PR2 and R4=1K

CN8 : 3Pin Header Connector
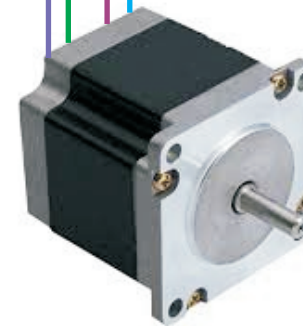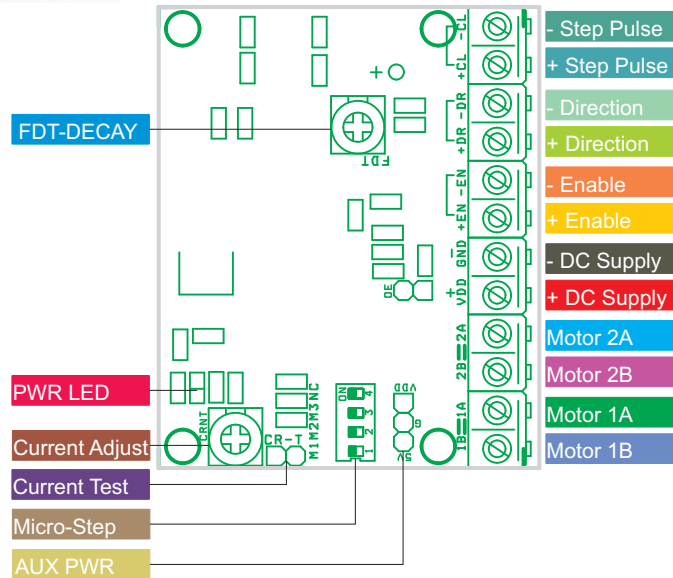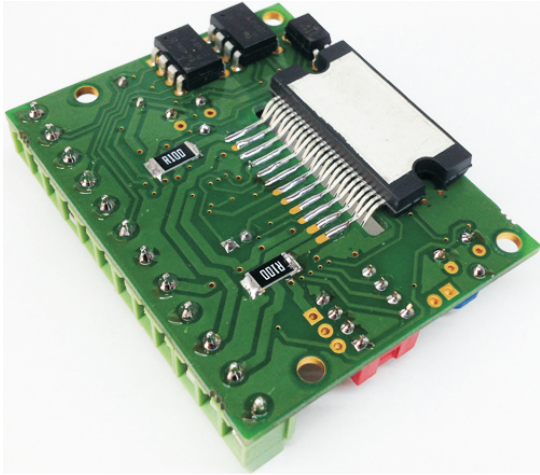Auxiliary Power output 5V DC, GND, VDD-Supply Voltage

CN7 : 2 Pin Header Connector
Current Test (Voltage)

BOM			
1	5	CN2,CN4,CN5,CN6,CN3	10 PIN Screw Terminal
2	1	CN7	2 Pin Header Connector
3	1	CN8	3 Pin Header Connector
4	4	C1,C3,C4,C7	0.1uF
5	1	C2	470uF/50V
6	1	C5	1.5KPF
7	1	C6	180PF
8	1	DC-IN	2 Pin Screw Terminal
9	1	D1	RED LED SMD0805
10	1	J1	2 Pin Header with Jumper Closer
13	2	PR1,PR2	10K Preset
14	7	R1,R5,R6,R9,R13,R14,R15	4.7K SMD 0805
15	4	R2,R7,R11,R12	470E SMD 0805
16	1	R3	47K SMD0805
17	1	R4	1K (Read Note 01)
18	2	R8,R10	0.1E , 2W, 1%, SMD 2512
19	1	R16	7.5K SMD 0805
20	1	R17	0E SMD 0805
21	1	SW1	4-WAY DIP SWITCH
22	2	U1,U3	6N137
23	1	U2	LV8727
24	1	U4	PC817
25	1	U5	L317
26	1	R18	620E SMD0805
27	1	R19	220E SMD0805
28	1	HT	Heatsink

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www.twovolt.com www.youtube.com/thetwovolt Author Rajkumar Sharma

4A BIPOLAR STEPPER MOTOR DRIVER BASED ON LV8727E

FDT-DECAY

PWR LED

Current Adjust

Current Test

Micro-Step

AUX PWR

- Step Pulse
+ Step Pulse
- Direction
+ Direction
- Enable
+ Enable
- DC Supply
+ DC Supply
Motor 2A
Motor 2B
Motor 1A
Motor 1B

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