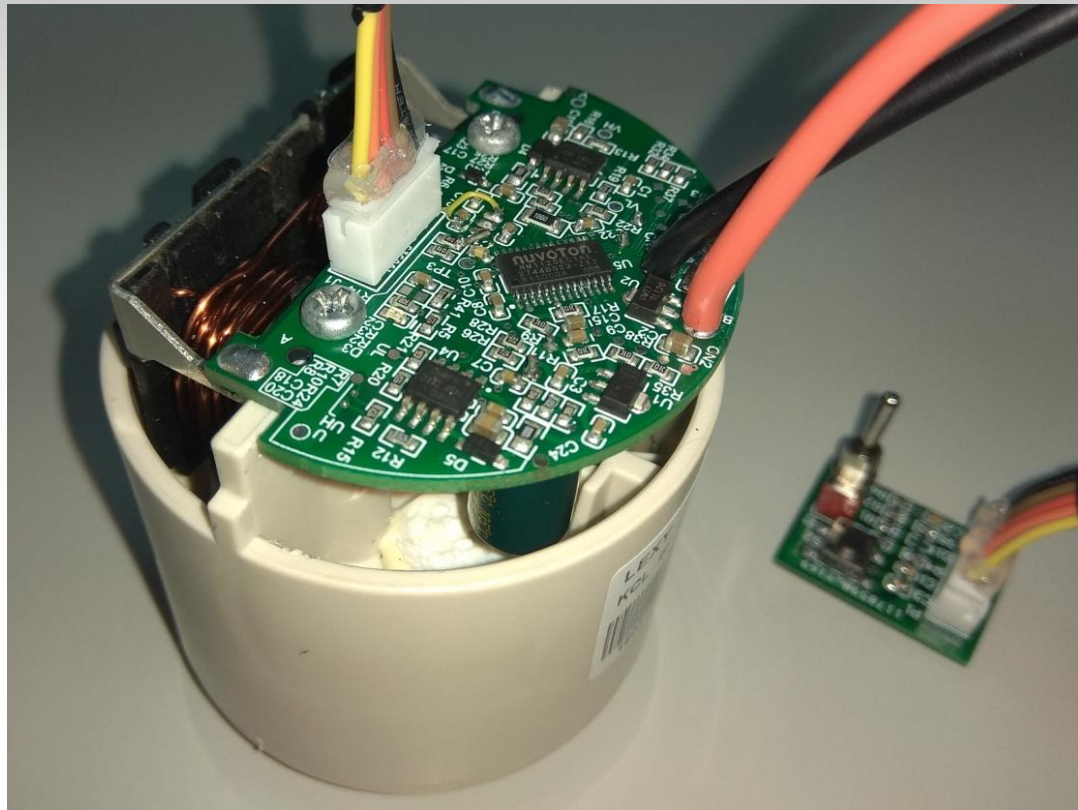# Introduction to Single Phase Motor Driver for Vacuum

Single Phase Motor Driver for Vacuum

System specification

➢ 21V/10A(16.5V~24V)

➢ Single phase/One pole pair/BLDC with hall sensor

➢ High/Low Speed selectable

  ➢ High speed : up to 72000rpm

  ➢ Low speed : up to 56000rpm

➢ LED indicator

  ➢ Normal state : High/Low Speed indicator

  ➢ Abnormal state :

    ➢ Over current protection by HW

    ➢ Low voltage protection
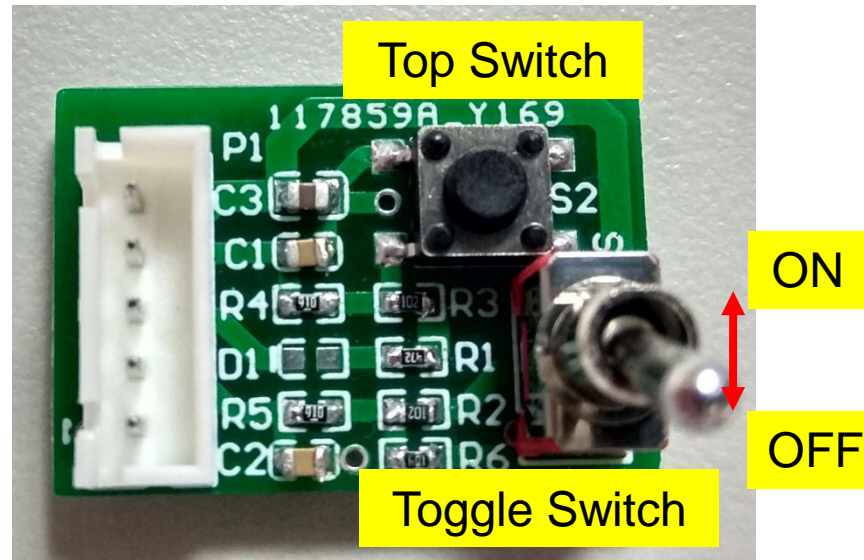
    ➢ Over speed protection

    ➢ Lock protection
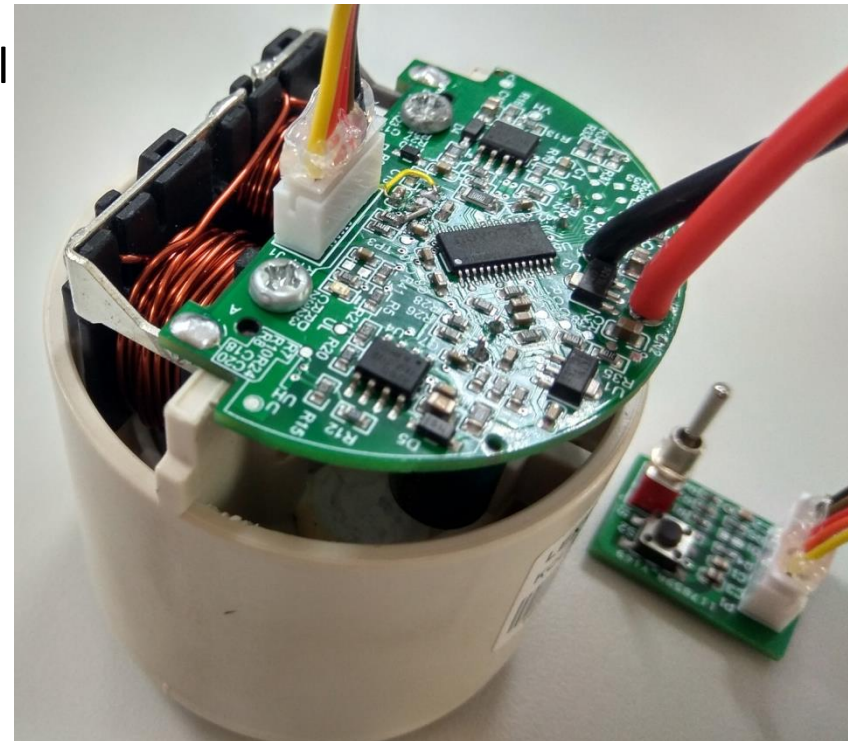
Driver Board
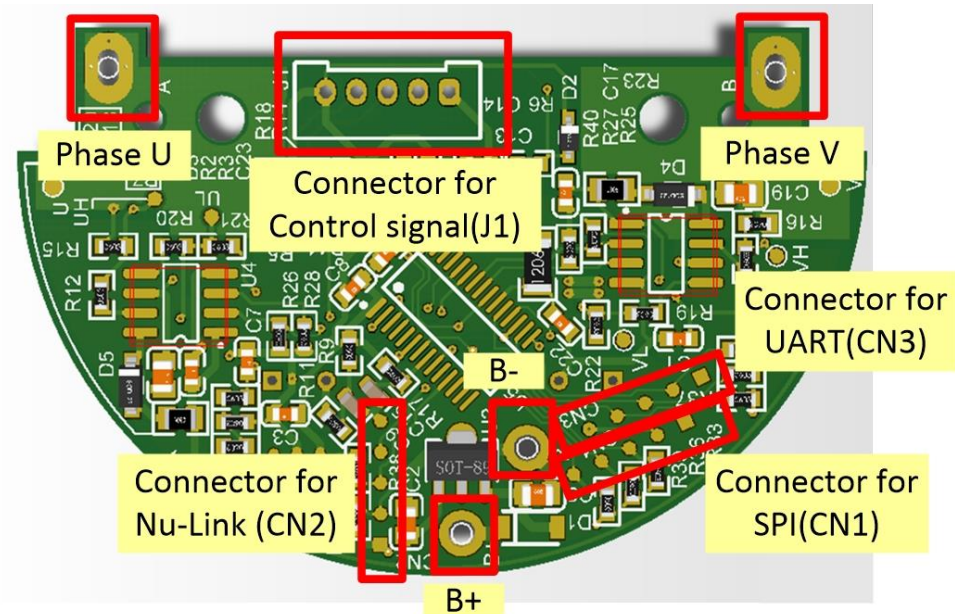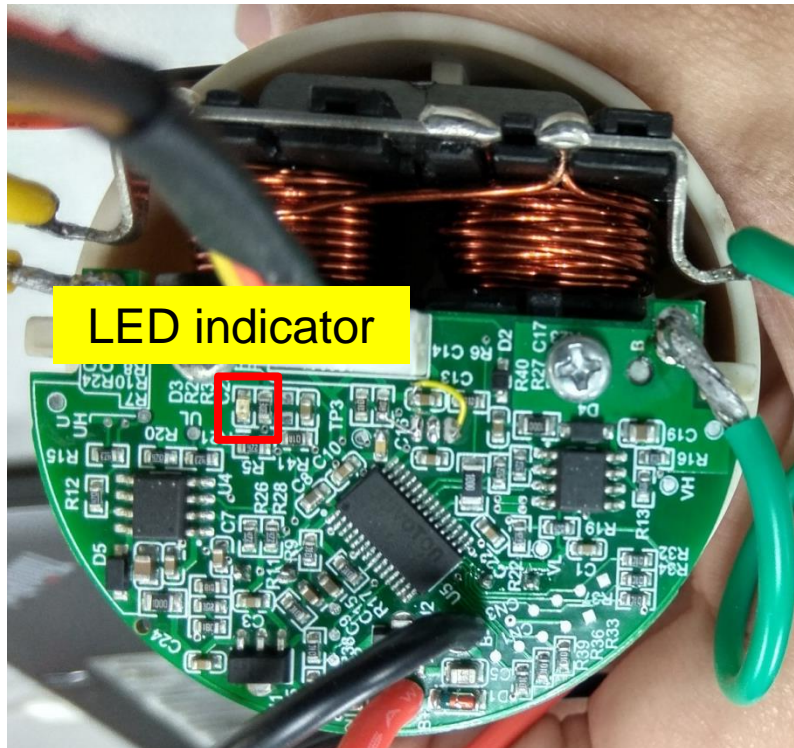
> The pin order of CN2 is GND/RESET/ICE_CLK/ICE_DAT/VCC from top to bottom.

> The pin order of J1 is VCC/H_L/LED/ON_OFF/GND from left to right.

> LED is always on at high-speed, and off at low-speed.

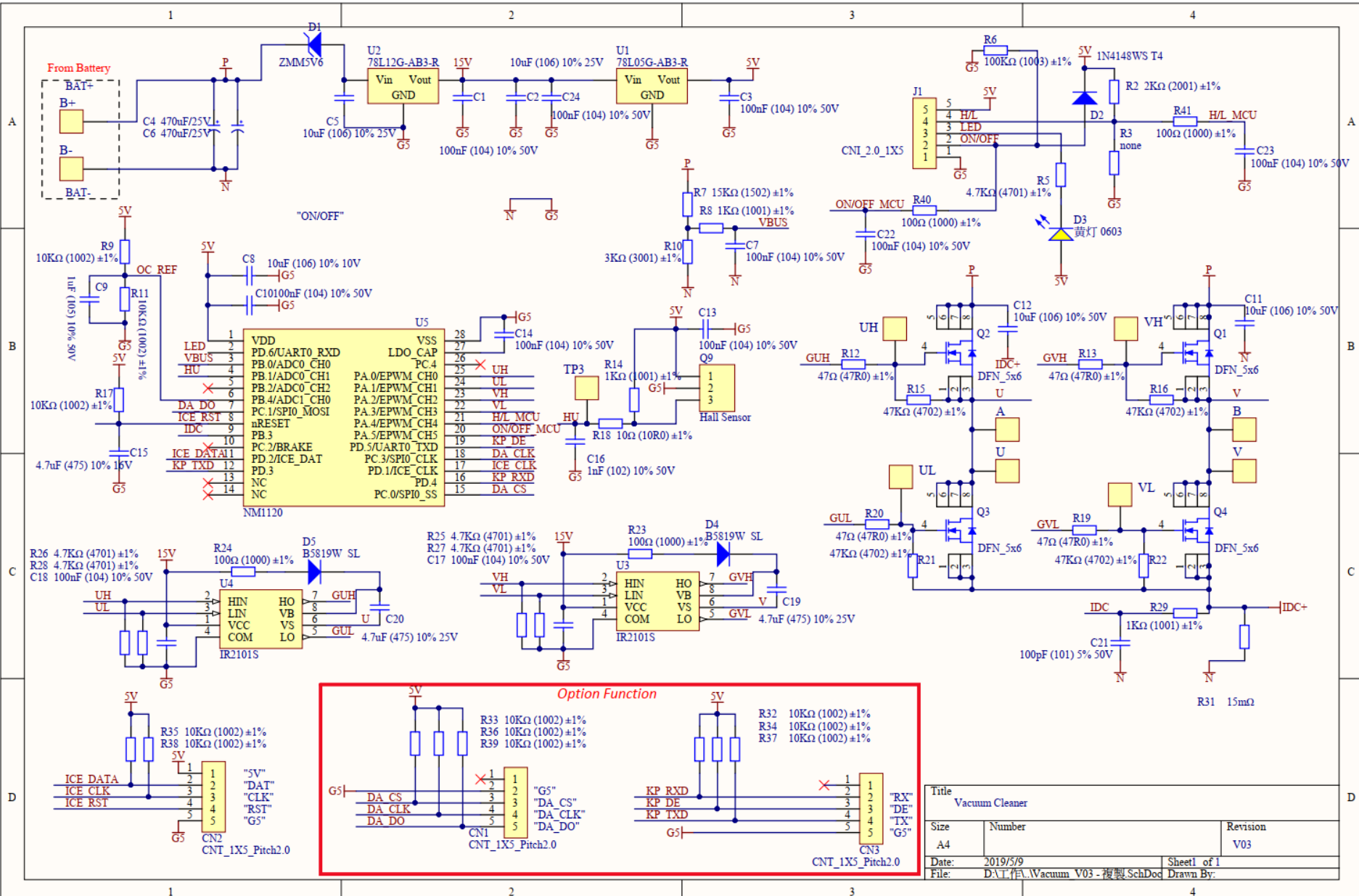> The input voltage between B+/B- should not be over 24VDC.

Control Board

> Please make sure that the power is connected correctly before operation.
> Start up:
> Step1 : Turn the toggle switch to the "ON" side.
> Step2 : Press top switch to turn to high/low speed.
> Stop : Turn the toggle switch to the "OFF" side.
> If there is any error, the motor stops.

Circuit

Core-NM1120

➢ Built-in EPWM module with Brake0/1 function to realize real-time current limiting/overcurrent protection.

➢ ECAP module captures Hall sensor signals.

➢ Built-in ADC module samples Idc/Vbus.

➢ Built-in PGA module amplifies Idc.

➢ Built-in ACMP module for current protection.

Display for Abnormal State

Currently, there are four protection functions in the system. Once the protection function is triggered, the motor stops. The LED lights as follows:

➤Over-current protection by hardware: LED turns on and off once every 1.5 seconds.

➤Low-voltage protection (Vbus <16.5VDC): The LED turns on and off twice every 1.5 seconds.

➤Over-speed protection (970Hz/1300Hz): LED turns on and off 3 times every 1.5 seconds.

➤Start-up protection: LED turns on and off 4 times every 1.5 seconds