

S12ZVM-EWP USER GUIDE - HARDWARE

Ultra-Reliable MCUs for Industrial and Automotive Applications

Network address of RDB



Contents

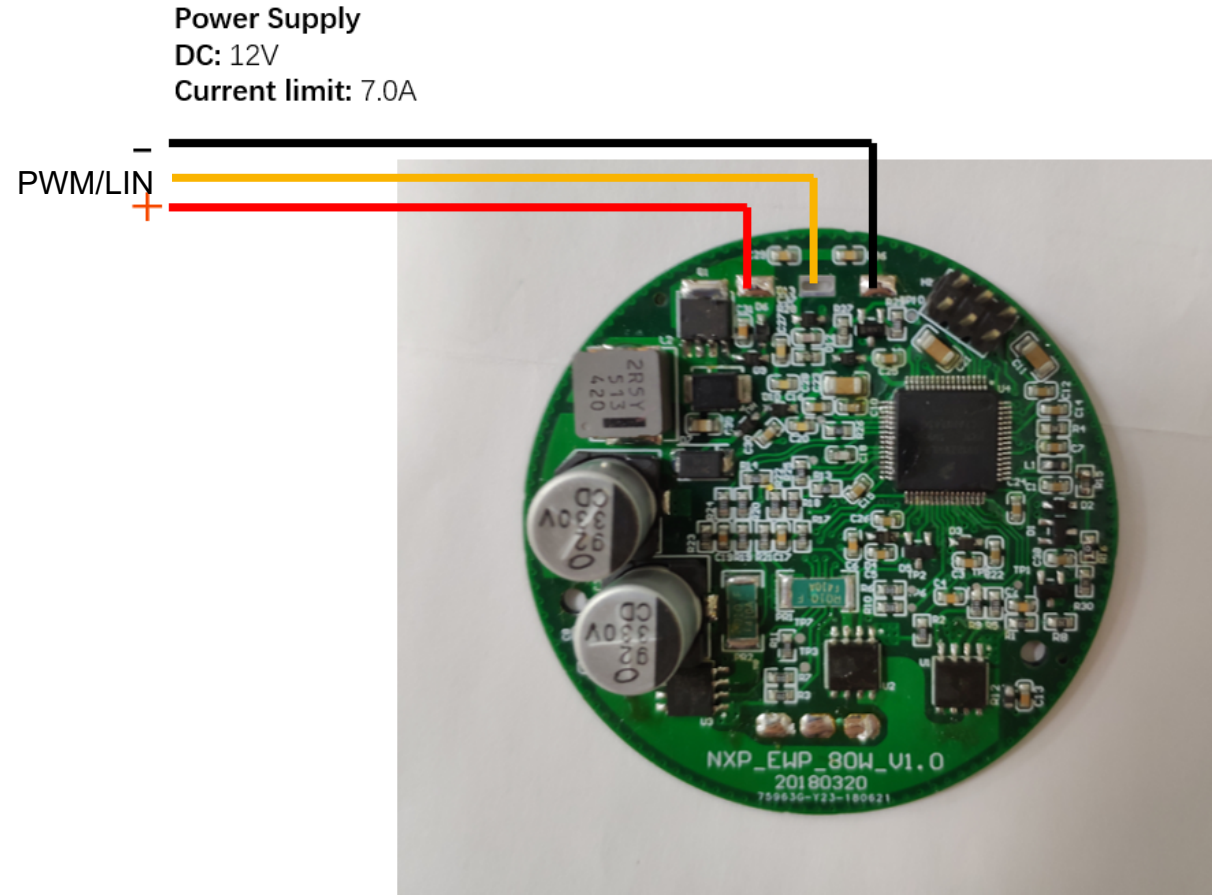
- Hardware Setup
- Hardware Consideration
- SCH and PCB

HARDWARE SETUP



Step-1

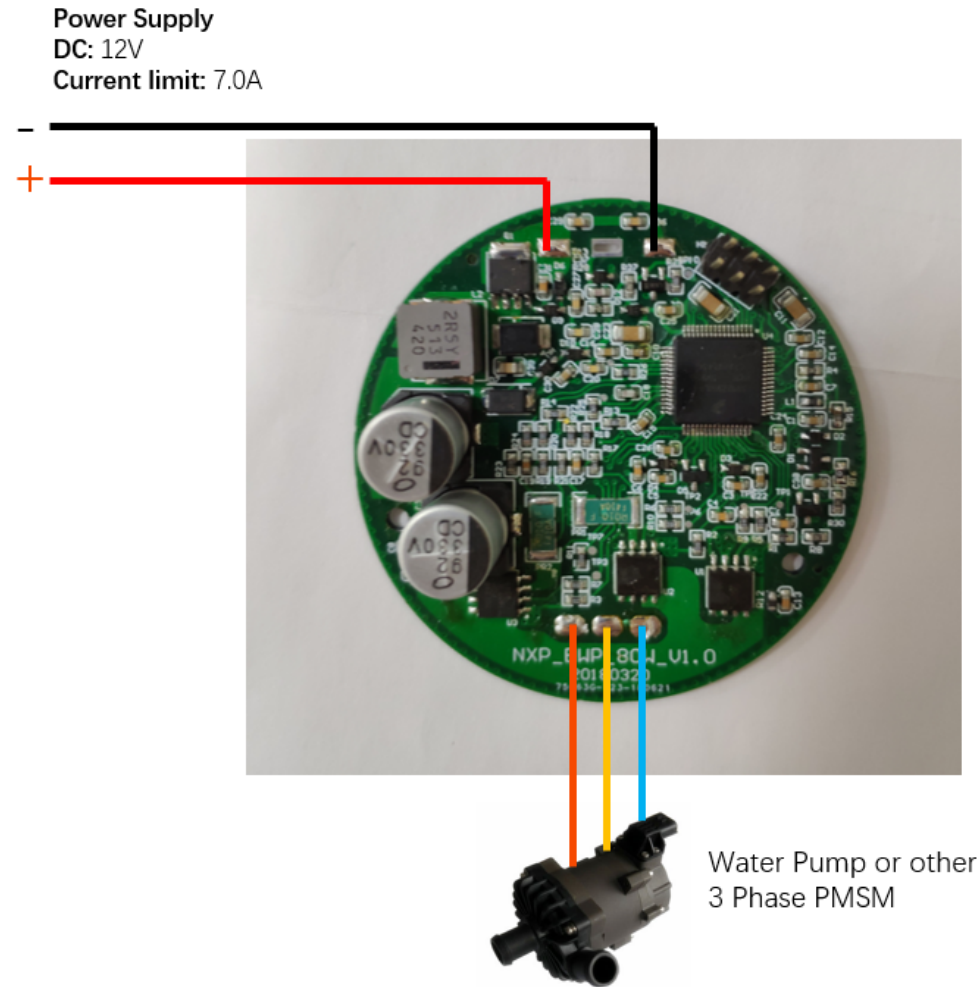
Solder 2 wires and connect the S12ZVM-EWP with DC power supply. Set the voltage to 12V and the current limit to 7.0A; If want to test PWM/LIN, solder the orange wire.



Do not turn power on this moment!

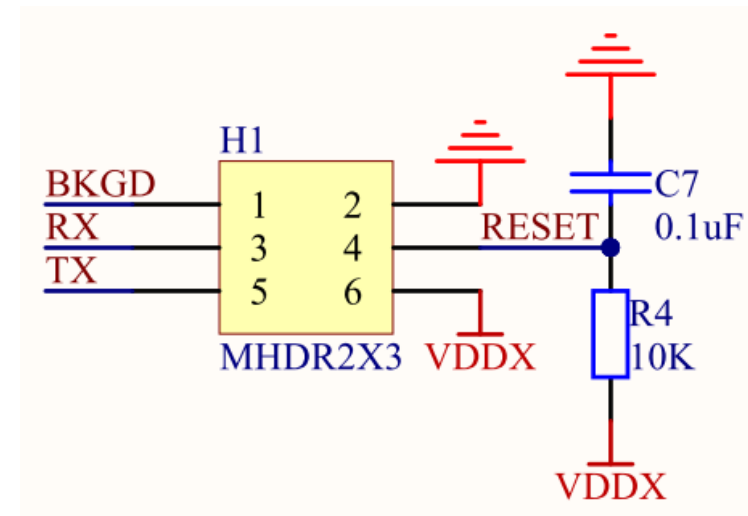
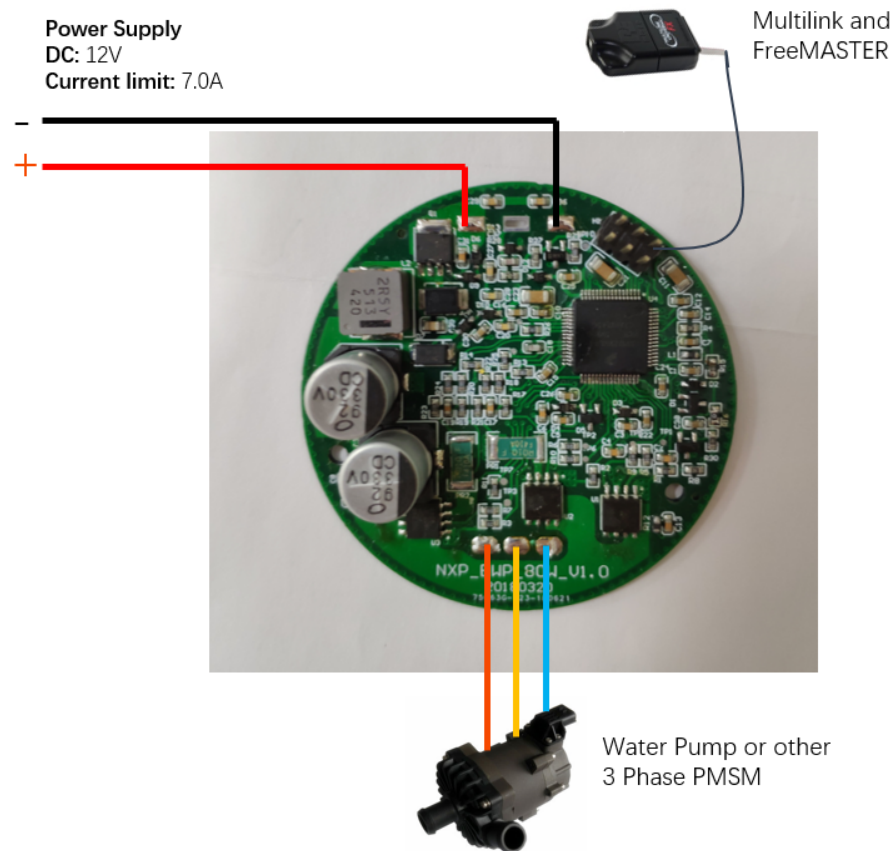
Step-2

- Solder 3 wires and connect to the 3 phase water pump or other PMSMs.



Step-3

Connect PE Multilink debugger to BDM port (H1) onboard and PC. If you want to connect FreeMASTER by SCI, please solder H1 port 3 wires on the other side of PCB, connect TX, RX and GND to a SCI-to-USB tool.



Step-4

- Turn the power supply on
- Follow the QSG, get the S12ZVML-EWP software package, change the MCAT parameters to compatible with your PMSM
- Download the firmware to the board and using FreeMASTER to control your PMSM
- If you have issues about the firmware download or debug, please following software user manual for more information

HARDWARE CONSIDERATION



Heat Dissipation

- If water pump or PMSM running with big load, S12ZVM and MOSFETs will produce heat. So be careful.
- If heat accumulate and very hot, using some heat sink or cooling fan can help.

Motor running direction

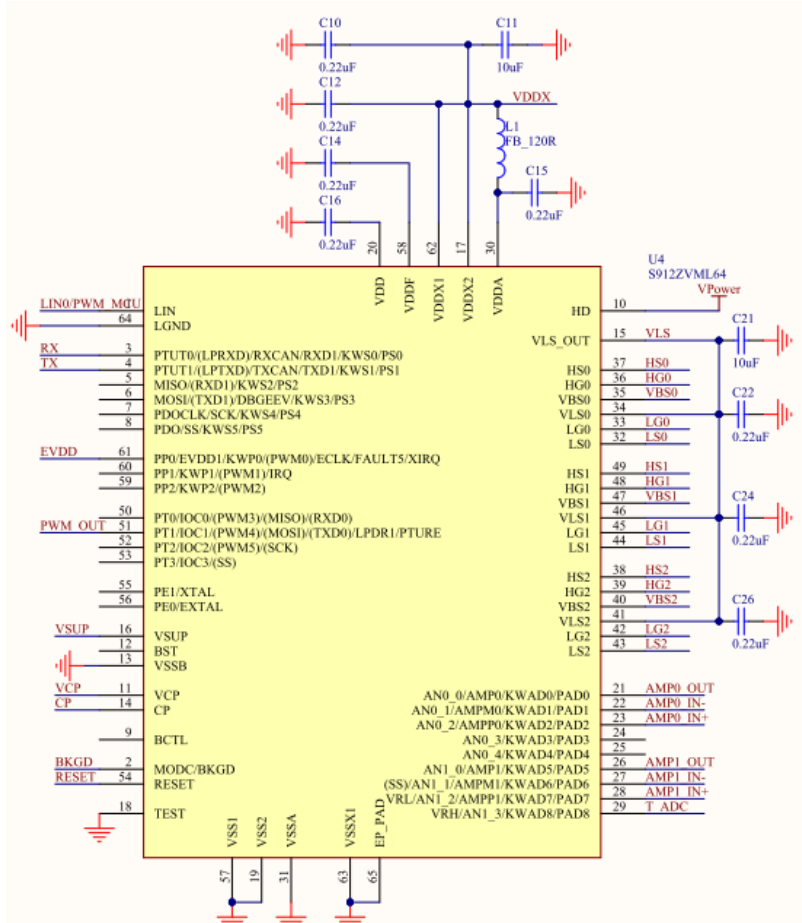
If motor running in the wrong direction, 2 methods can help:

- Change the 2 wires of motor phases
- Set the motor speed to the minus speed

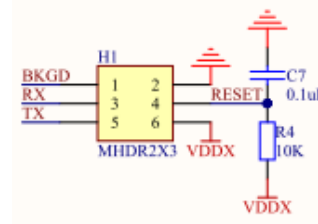
SCH AND PCB



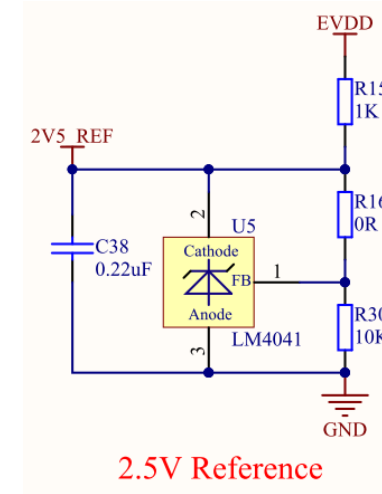
Hardware Introduction – Schematics 1



MCU circuit



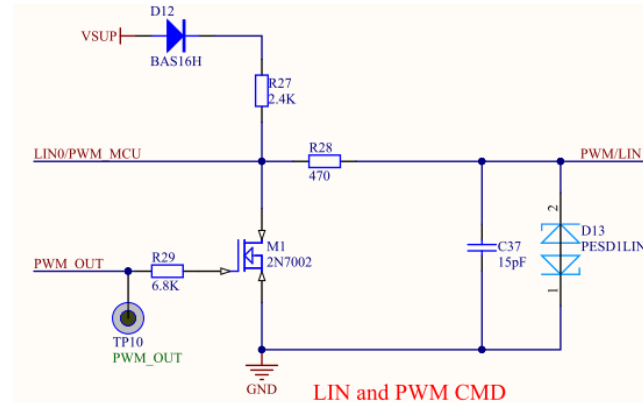
BDM and SCI (FreeMASTER)



2.5V Reference

Voltage reference for current sampling

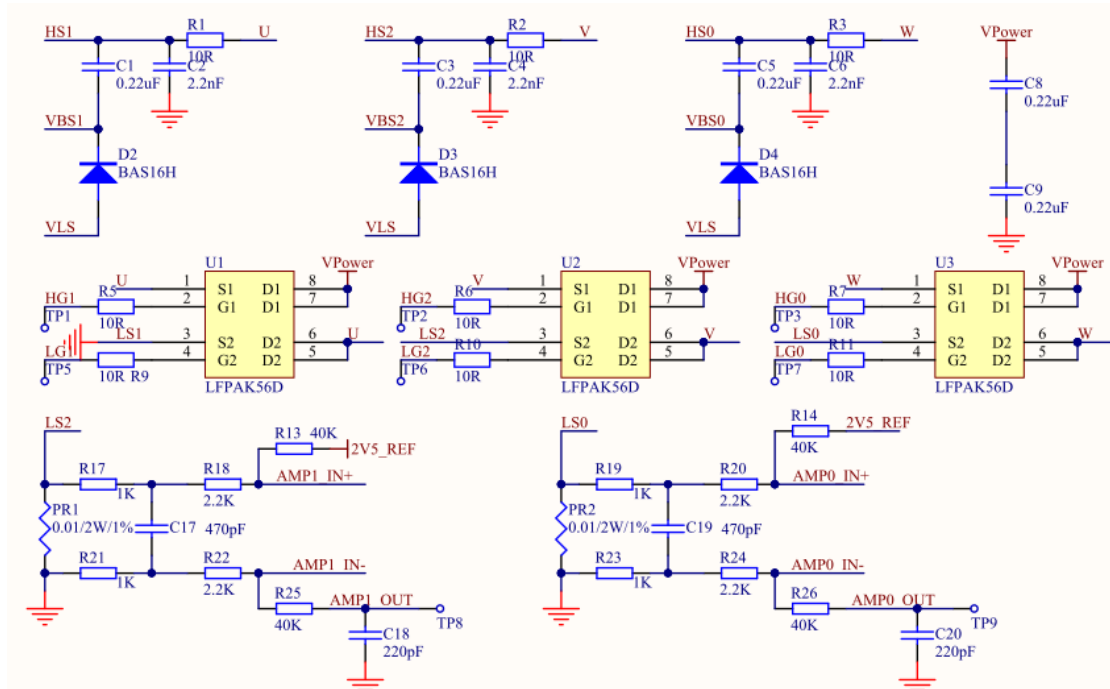
Controlled by EVDD for power management



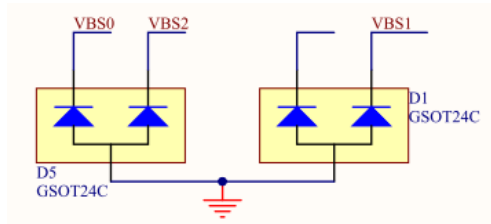
LIN and PWM CMD

LIN and PWM are using one wire
Meanwhile It can achieve the PWM feedback function by corporation with the MASTER

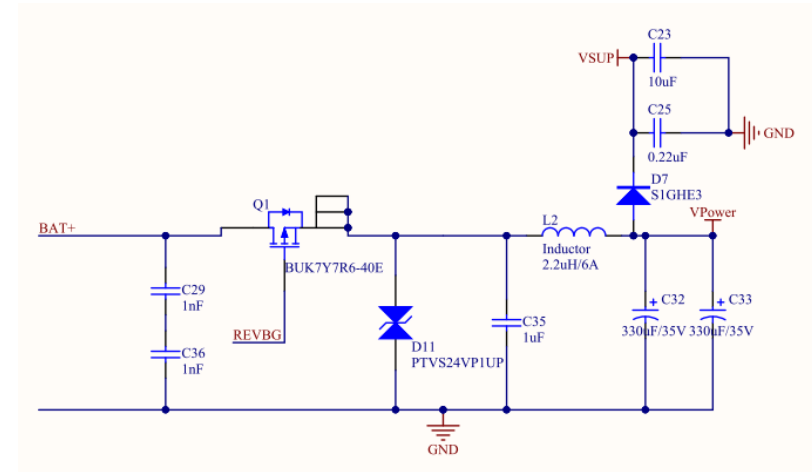
Hardware Introduction – Schematics 2



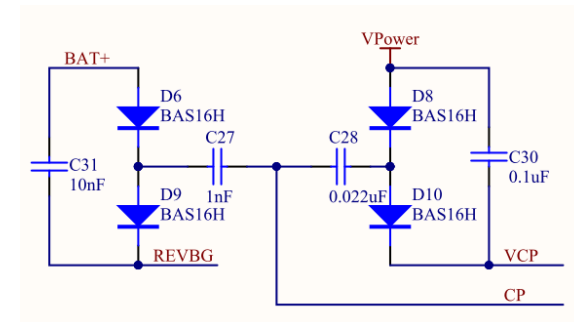
Power inverter circuit, including current sampling



TVS for critical pin protection, recommend

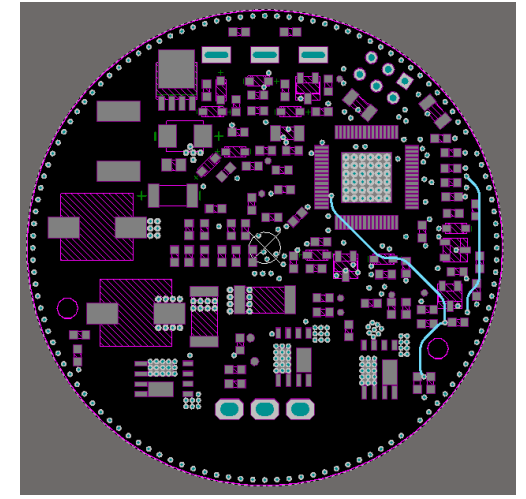
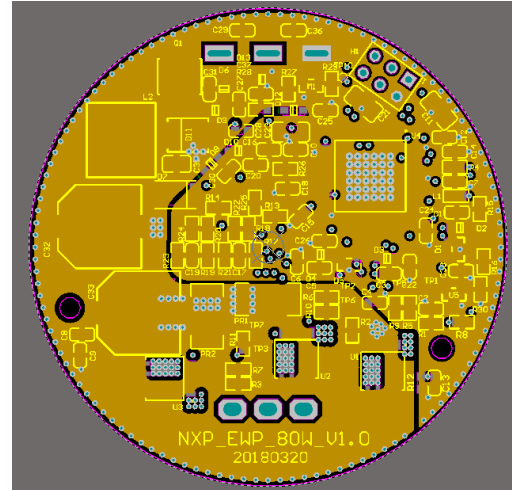
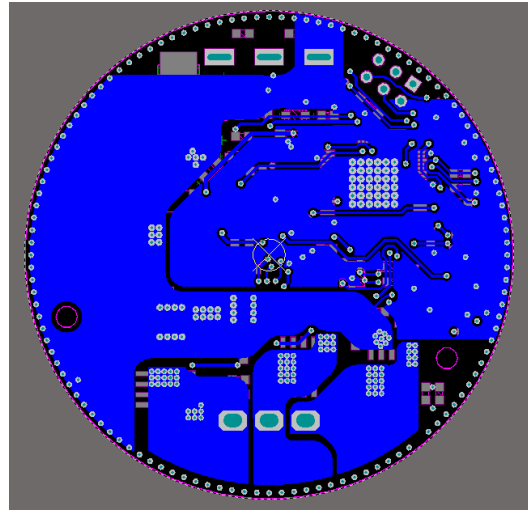
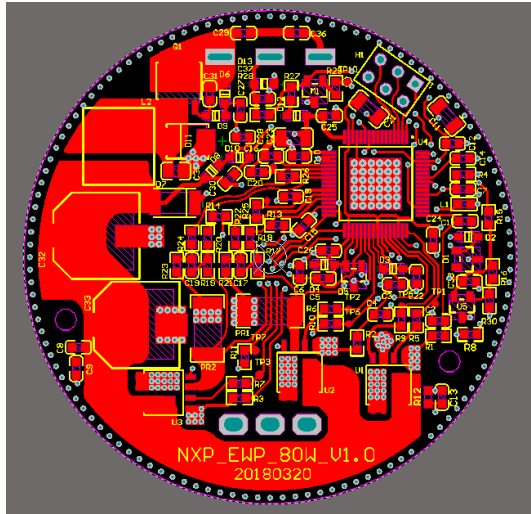


Power input and reverse protection



Charge pump circuit

Hardware Introduction – PCB



Four layer PCB

All components are in top layer, good for manufactory
GND are separated with Power GND and Signal GND



SECURE CONNECTIONS
FOR A SMARTER WORLD