

1. Fetures

- 1. Overcurrent protection function and Overvoltage protection function.
- 2. Support Tool communication.

2. Specifications

2.1 Specification

Table 2.1 Overview of Three-phase rectifier Specifications(1/3)


Item	Specification
Product name	Three-phase 5kW bridgeless PFC rectifier
Product content	RA6T2 Control board Power board
Exterior view	

Table 2.2 Overview of Three-phase rectifier Specifications(2/3)


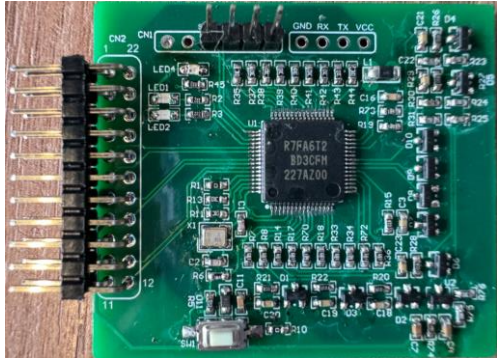
Item	Specification
Product name	Power board
Exterior view	
Operating input voltage	AC 380 (± 10%)
Max. input power	5KW
Rated output current	7.1A
Rated output voltage	700V
Switching frequency	80kHz
Connectors	• RA6T2 Control board × 1

Table 2.2 Overview of Three-phase rectifier Specifications(3/3)

Item	Specification
Product name	RA6T2 Control board
Exterior view	
Microcontroller	RA6T2
CPU max. operating frequency	240MHz
Bit count	32 bit
Package / Pin count	LFQFP / 64 pin
RAM	64K byte
MCU input clock	Crystal resonator 10 MHz
Input power supply voltage	DC 3.3 V
Connectors	<ul style="list-style-type: none"> • Power board connectors × 2 • USART × 1 • SW × 1
Switch	MCU external reset switch
LEDs	<ul style="list-style-type: none"> • User source LEDs × 1 • User control LEDs × 2

3.block diagram

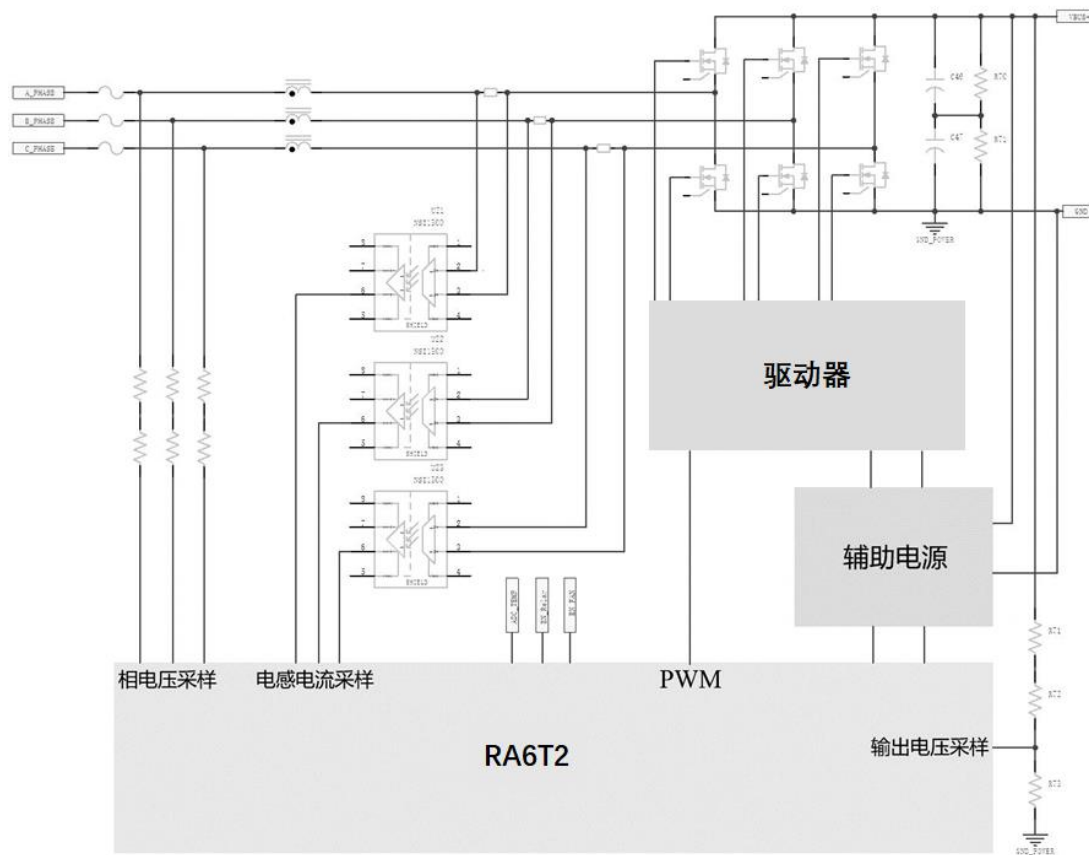


Figure3.1 Three-phase 5kW bridgeless PFC rectifier Block Diagram

4.Layout

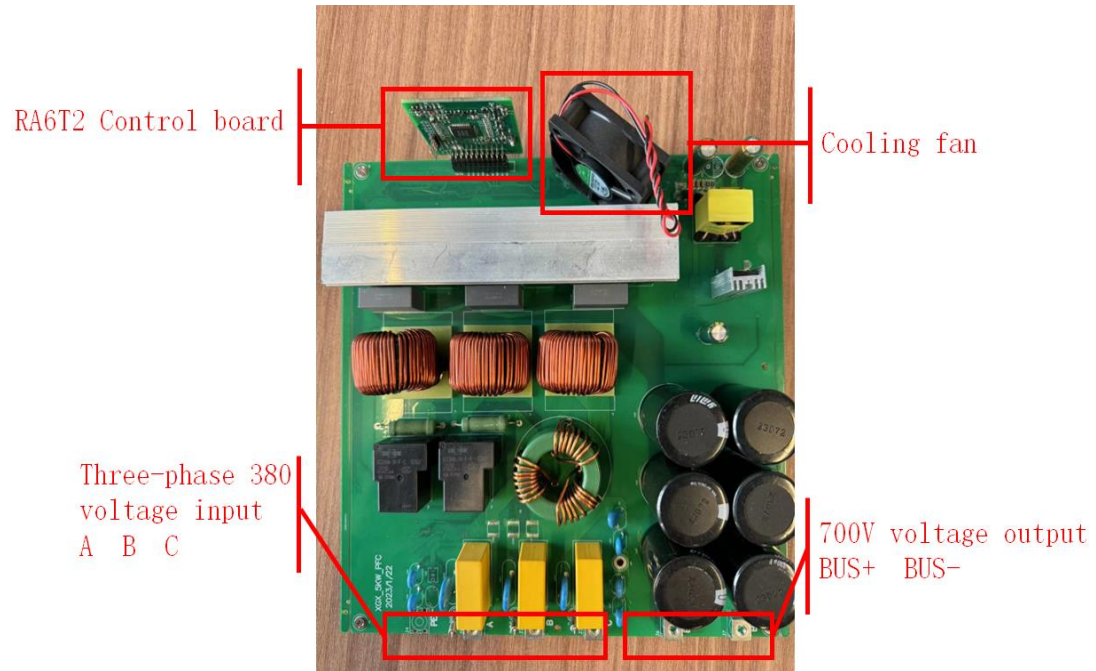


Figure4.1 Three-phase 5kW bridgeless PFC rectifier Layout

5.Usage

5.1 Quick Start

This chapter describes the quick start procedure for the product. Perform steps (1) to (9) in that order.

Step	Item
(1)	Insert the RA6T2 Control board into the seat
(2)	Connect the output to the load
(3)	Connect 380V three-phase AC power
(4)	Finish the operation

6. Hardware module specifications

6.1 Main power topology

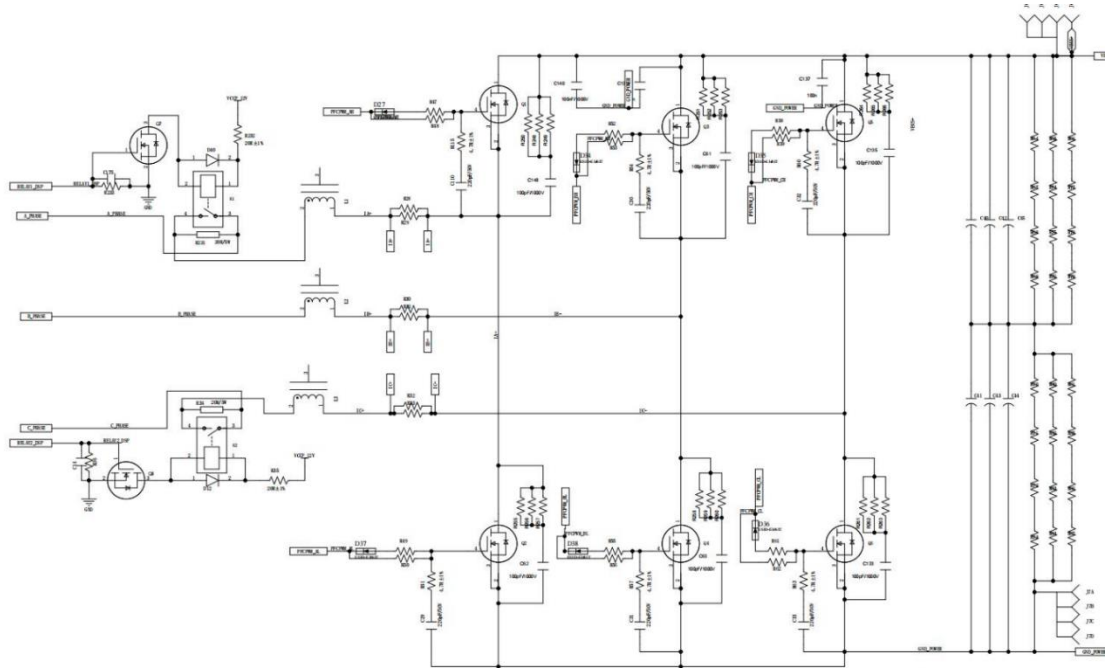


Figure6.1 Main power topology

This Main power circuit is a basis for the operation of this three-phase rectifier. It has three and a half Bridges, six switches. Each switch uses SiC.

6.2 Power drive circuit

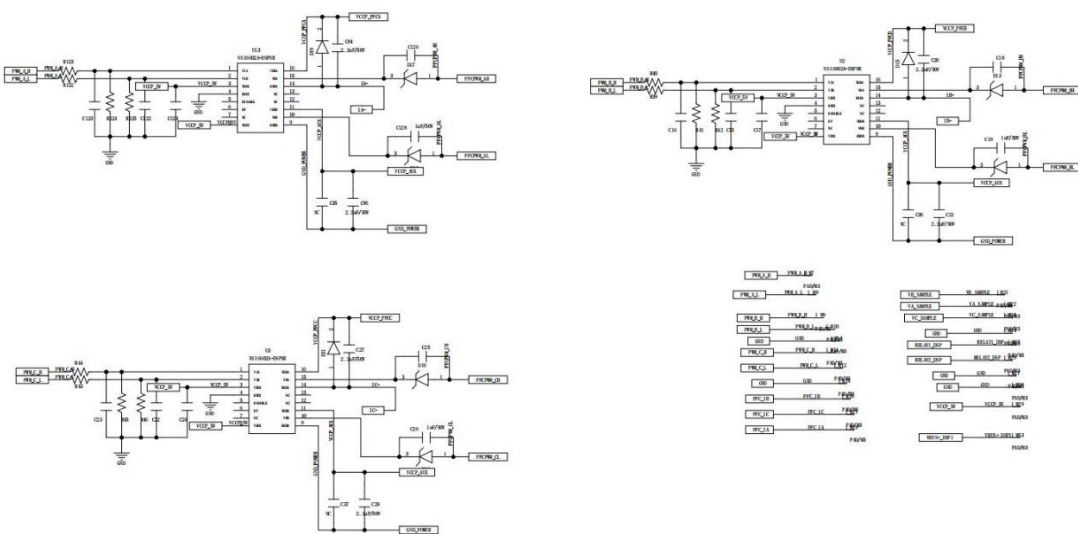


Figure6.2 Power drive circuit

It can control the closing and opening of each SiC.

6.3 Sampling circuit

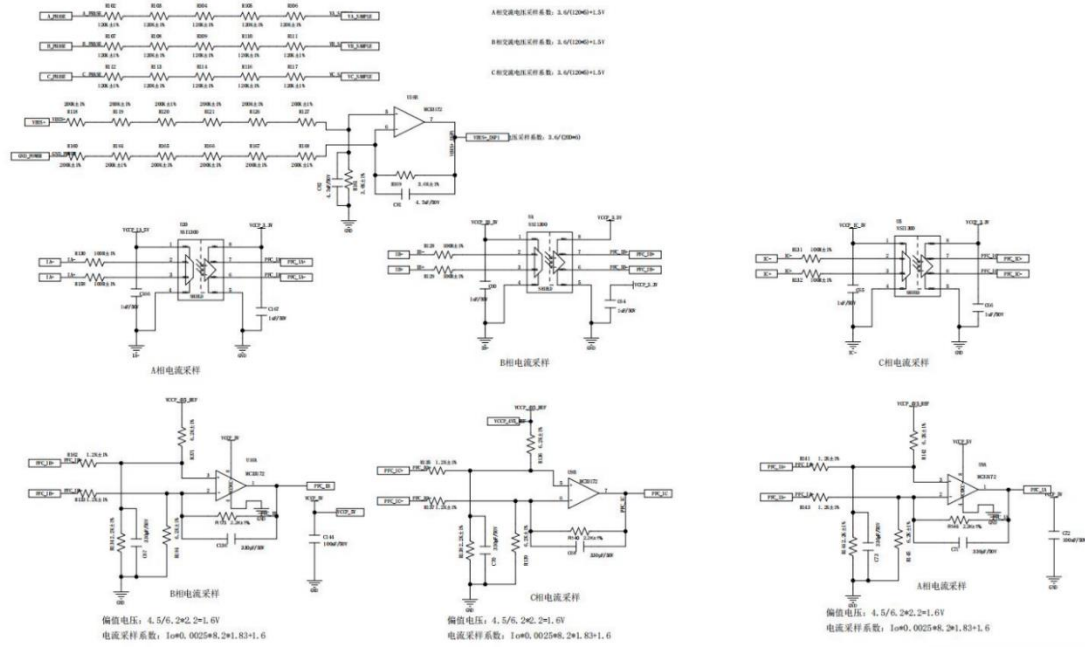


Figure 6.3 Sampling circuit

Sample the current of the 380V three-phase input and output voltage. The sample value is transferred to the MCU.

6.4 Auxiliary power supply

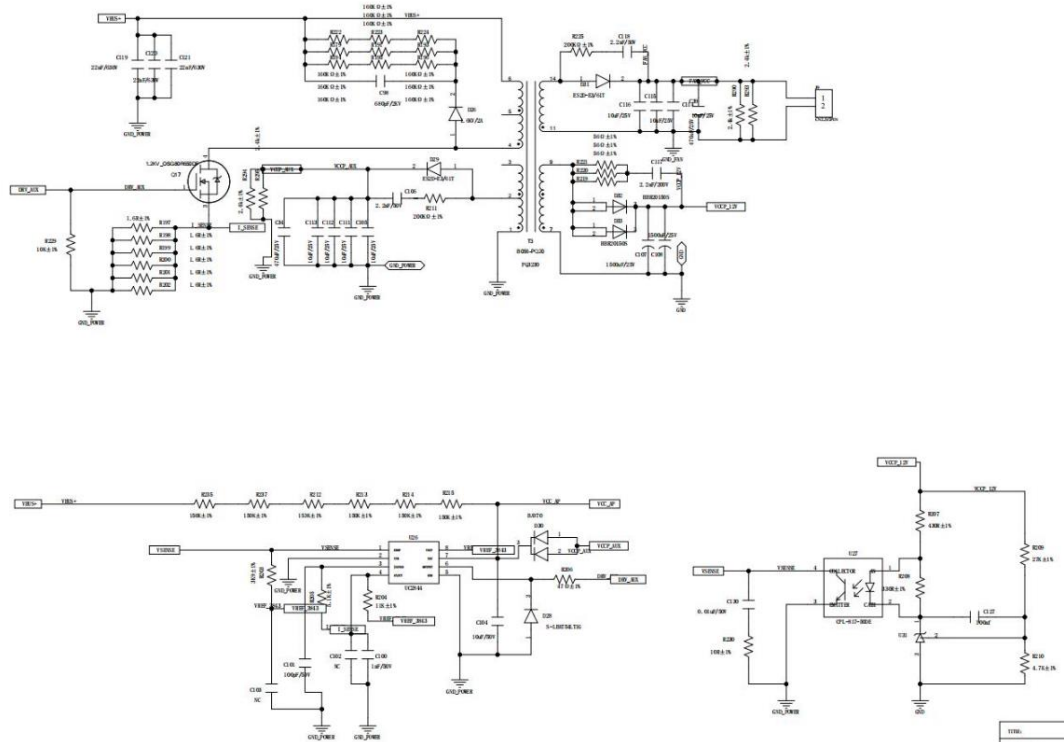


Figure 6.4 Auxiliary power supply(1)

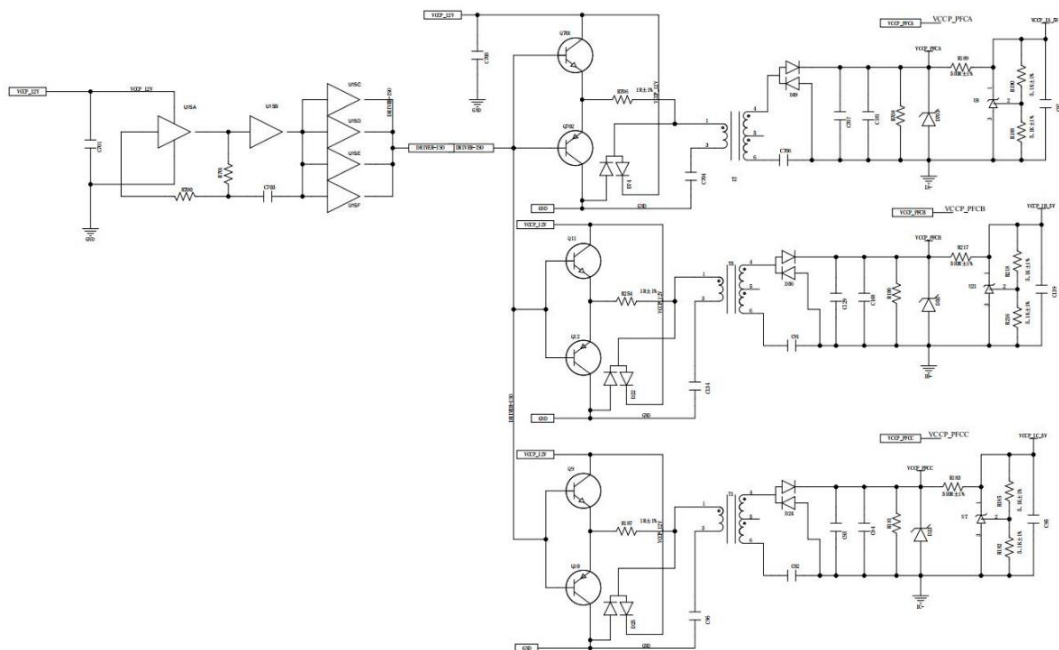


Figure 6.5 Auxiliary power supply(2)

Power supply for drivers and isolated op amps.

6.5 Reference voltage supply

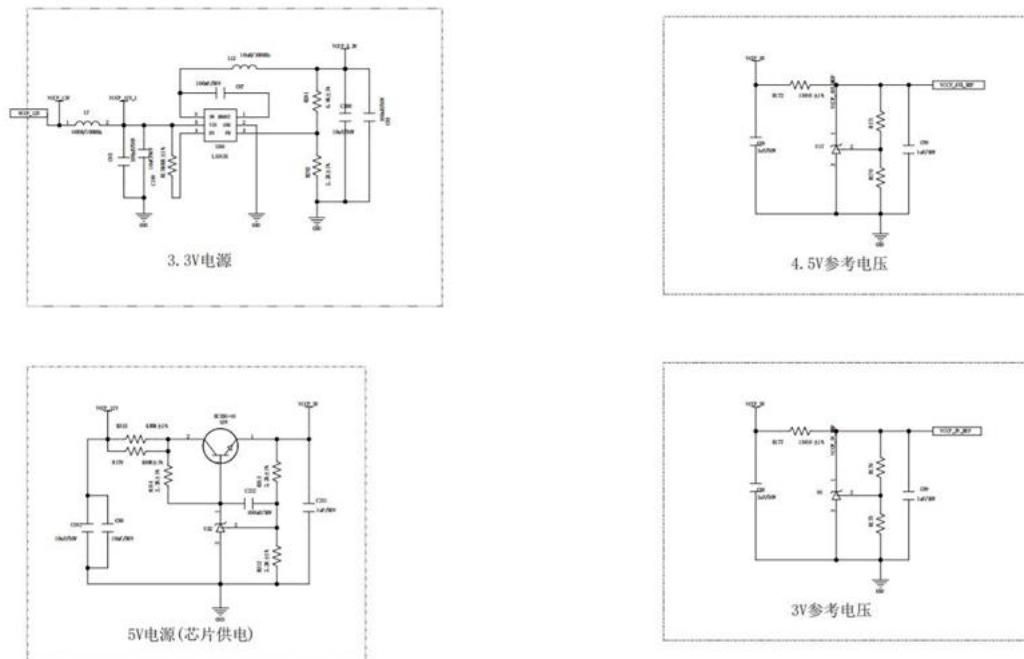


Figure 6.6 Reference voltage supply

Supply 3.3V and 5V source voltage to the chip ,supply 3V and 4.5V reference voltage to the chip.

6.7 MCU

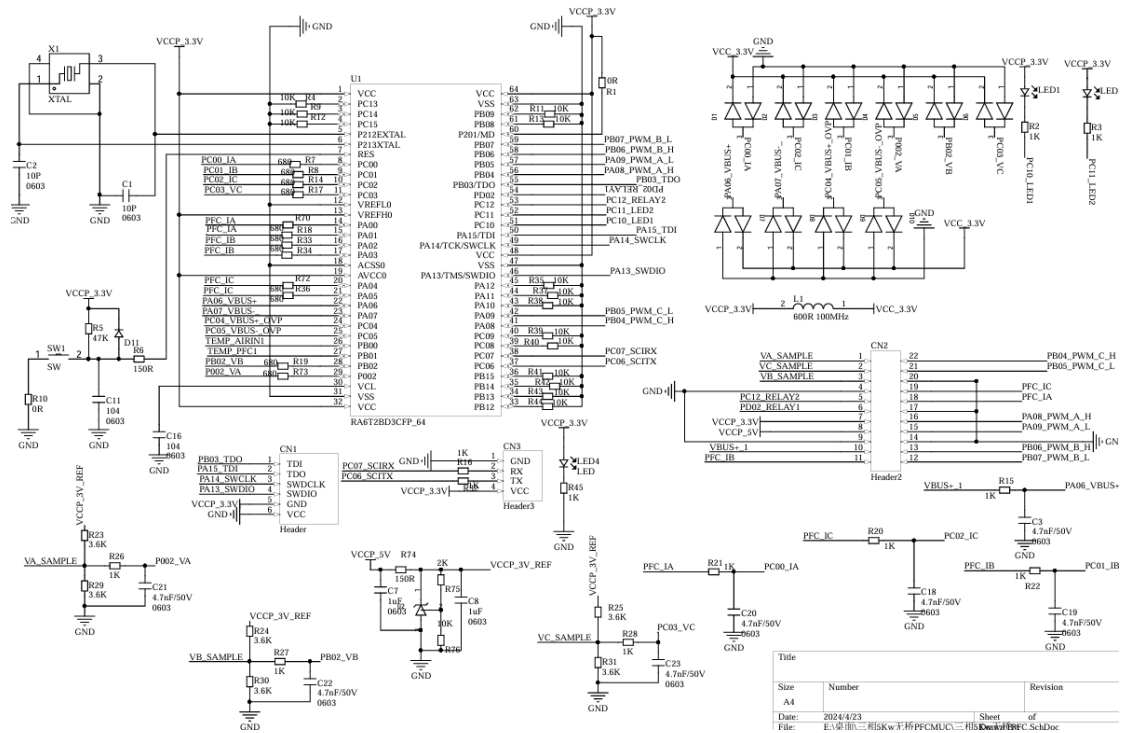


Figure 6.7 MCU control circuit

Three-phase rectifier control circuit.

6.8 EMI circuit

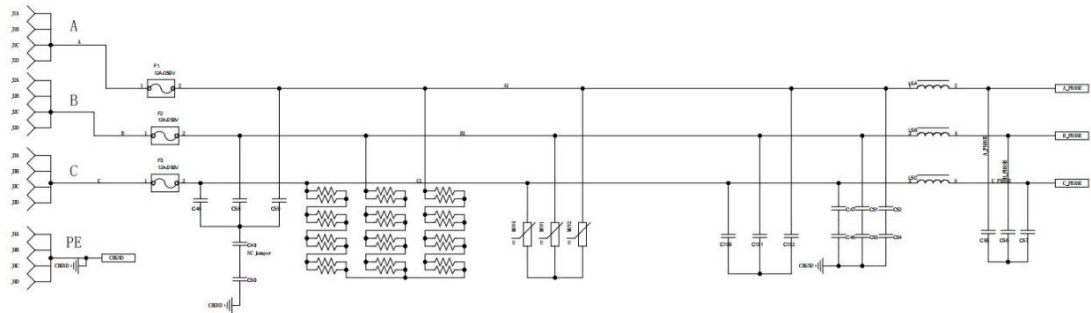


Figure 6.8 EMI circuit