STM32 motherboard

Starting guide 2

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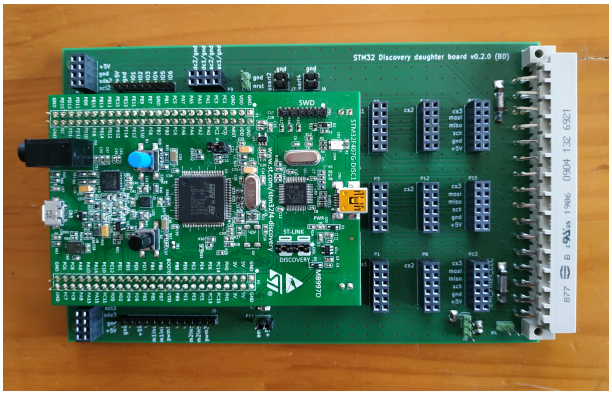

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Revision History

Revision	Date	Author(s)	Description
1.0	2021, january 10	BD	First release

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Chapter 1

Hardware

1.1 Overview

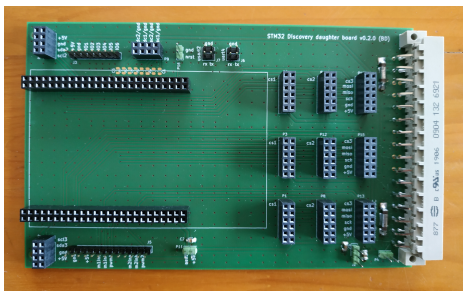


Figure 1.1: Motherboard for STM32F407G

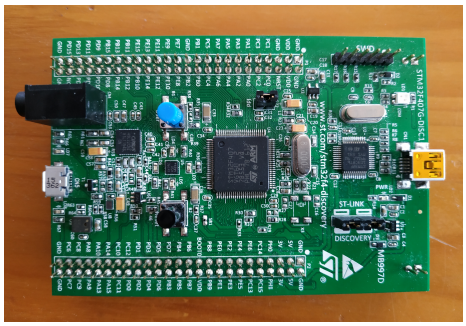


Figure 1.2: STM32F407G board

This report cover use of STM32 motherboard v0.2.0. In the document, the term “STM32Disc” refer to the STM32 Discovery board (Fig.1.2) and the term “STM32Mother” refer to the STM32 motherboard (Fig.1.1).

- Motherboard for STM32Disc (reference STM32F407G-DISCxx)
- Euroboard standard format: rack plugable

- Powered from standard 5V/15V Euroboard standard or from external 5V/15V power supply (section 1.3)

1.2 I/O

1.2.1 SPI PMOD

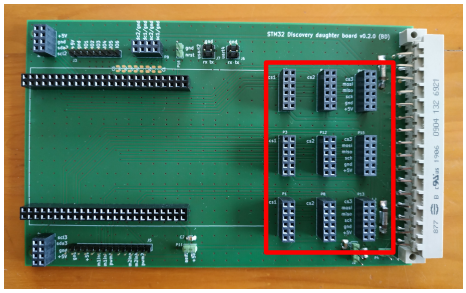


Figure 1.3: SPI PMOD interface

Three SPI bus are availlables from board. Find pin name in use for each bus in table 1.1.

Bus	SCK	MISO	MOSI	CS1	CS2	CS3
SPI1	PB3	PB4	PB5	PE0	PE1	PD7
SPI2	PB13	PB14	PB15	PD8	PD9	PD10
SPI3	PC10	PC11	PC12	PD0	PA14	PA15

Table 1.1: OTA transistor sizes before and after DfR

1.2.2 I2C PMOD

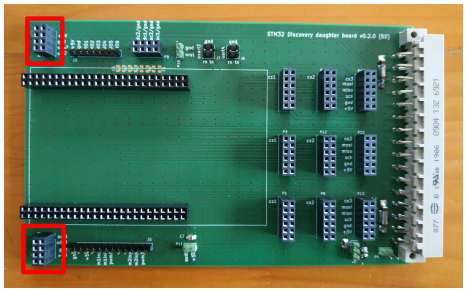


Figure 1.4: I2C PMOD interface

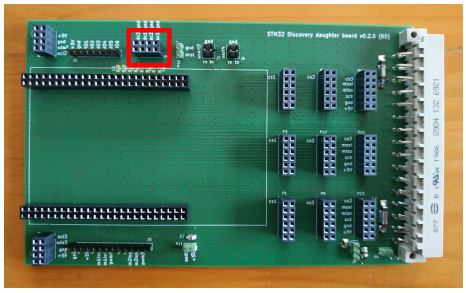


Figure 1.5: ADC and DAC interface

1.2.3 Integrated ADC and DAC

1.2.4 VNH5019

The board integrate an interface to a VNH5019 shield (Fig.1.6). The VNH5019 is a H-bridge motor driver handled by PWM.

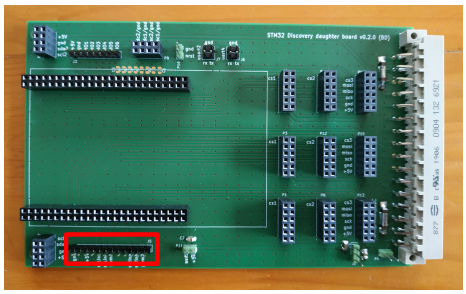


Figure 1.6: VNH5019 interface

⚠You need to select timer 4 and channel 1 or 2 only (see Fig.1.7) in your software development if you want to use the VNH5019 interface.

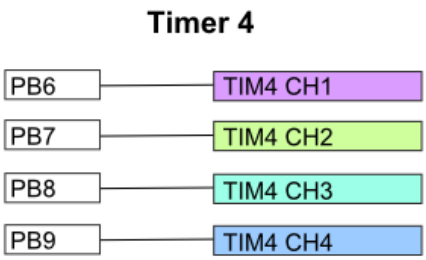


Figure 1.7: VNH5019 interface

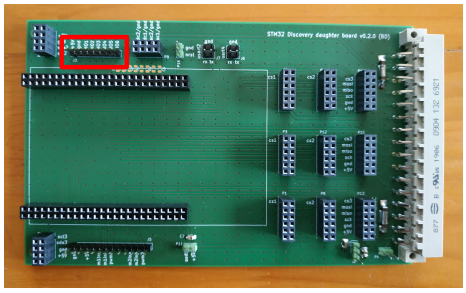


Figure 1.8: GPIO interface

1.2.5 GPIO

1.2.6 U(S)ART

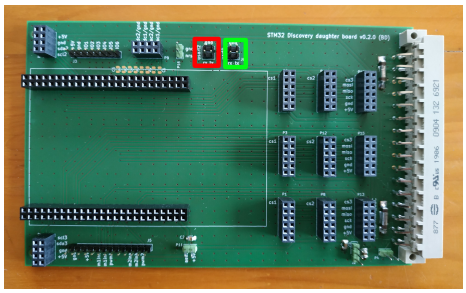


Figure 1.9: U(S)ART interface

USART2 RX: A3 USART2 TX: A2
UART4 RX: A1 UART4 TX: A0 NOTE: A0 also connects to the user switch. To use UART4 you should set MICROPY_HW_HAS_SWITCH to 0 (if you build micropython), and also remove SB20 (on the back of the STM32 board near the USER switch).

1.2.7 NRST

NRST pin is connected to Reset button of the STM32Disc. This pin can be used to deport a reset button on the front panel of the STM32Mother for example.

1.3 Power

1.3.1 Supply from DIN 5V

Set the jumper of connector P11 (surrounded in red on fig. 1.10)

1.3.2 Supply from DIN 15V

Set the jumper of connector P11 (surrounded in red on fig. 1.10) To use a power supply of 15 V, you need to

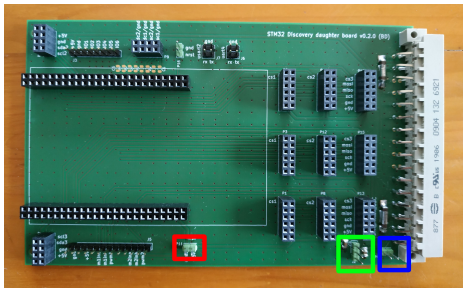


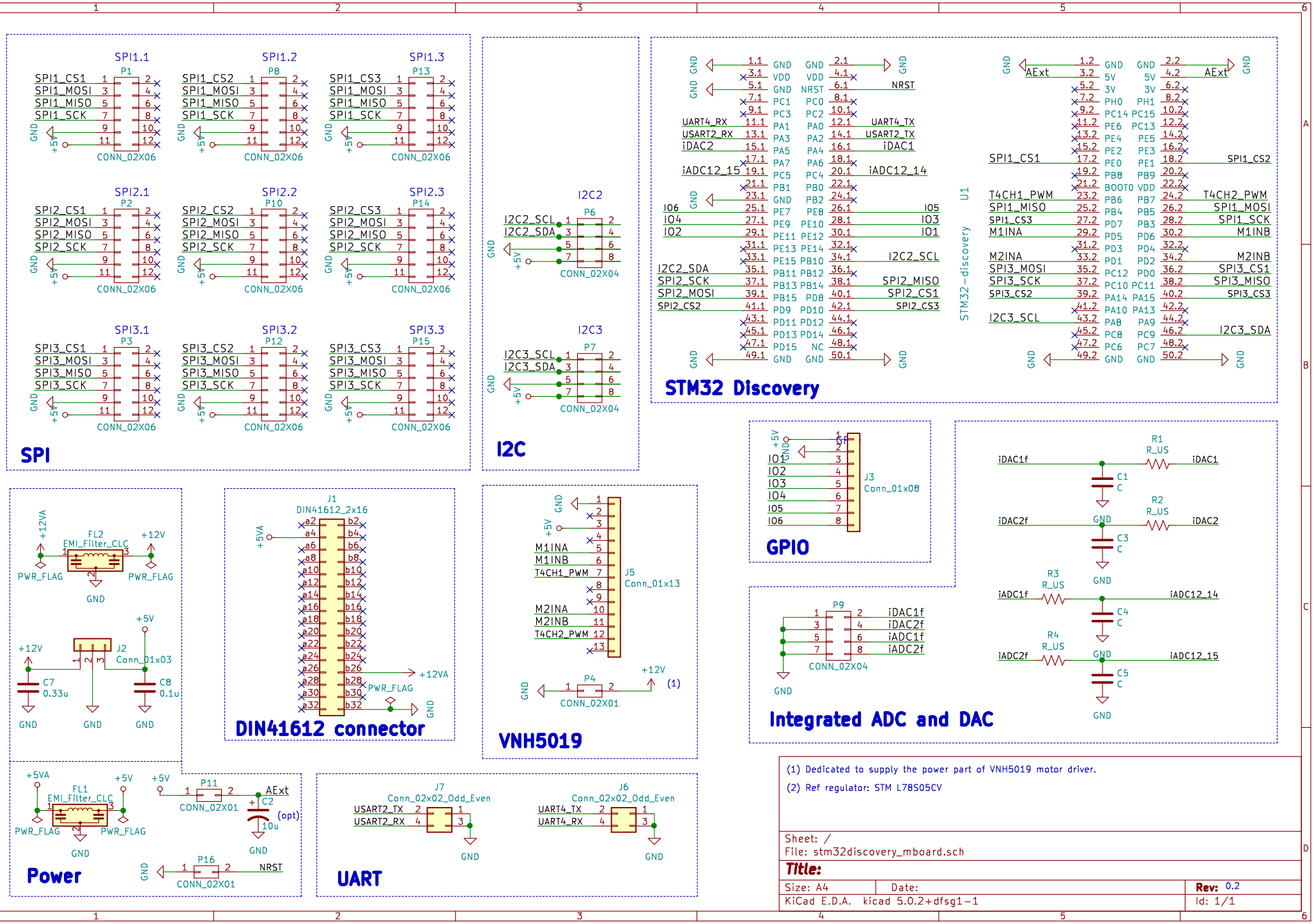
Figure 1.10: Power supply

1.3.3 Supply from external 5V

1.3.4 Supply from external 15V

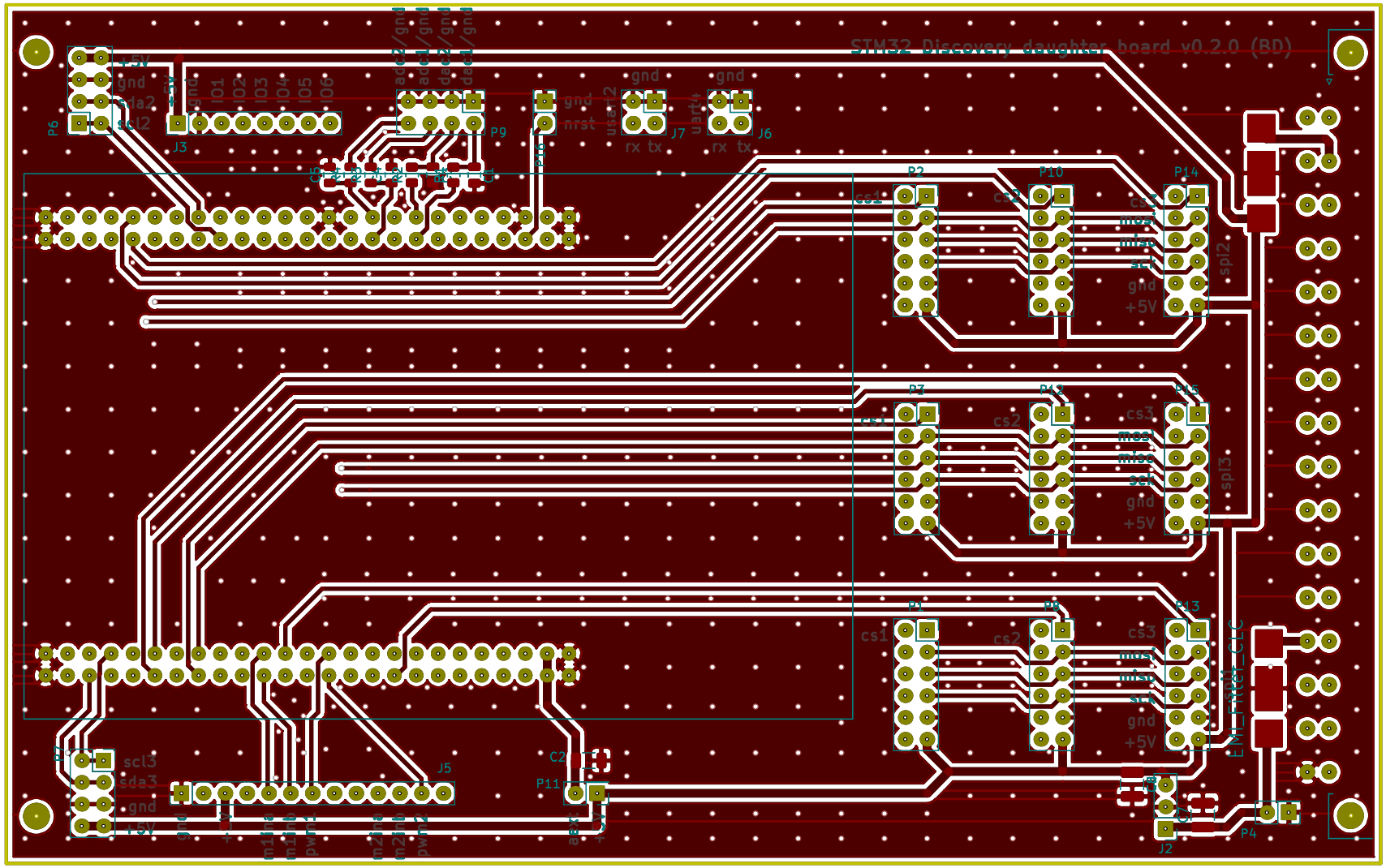
Appendix A

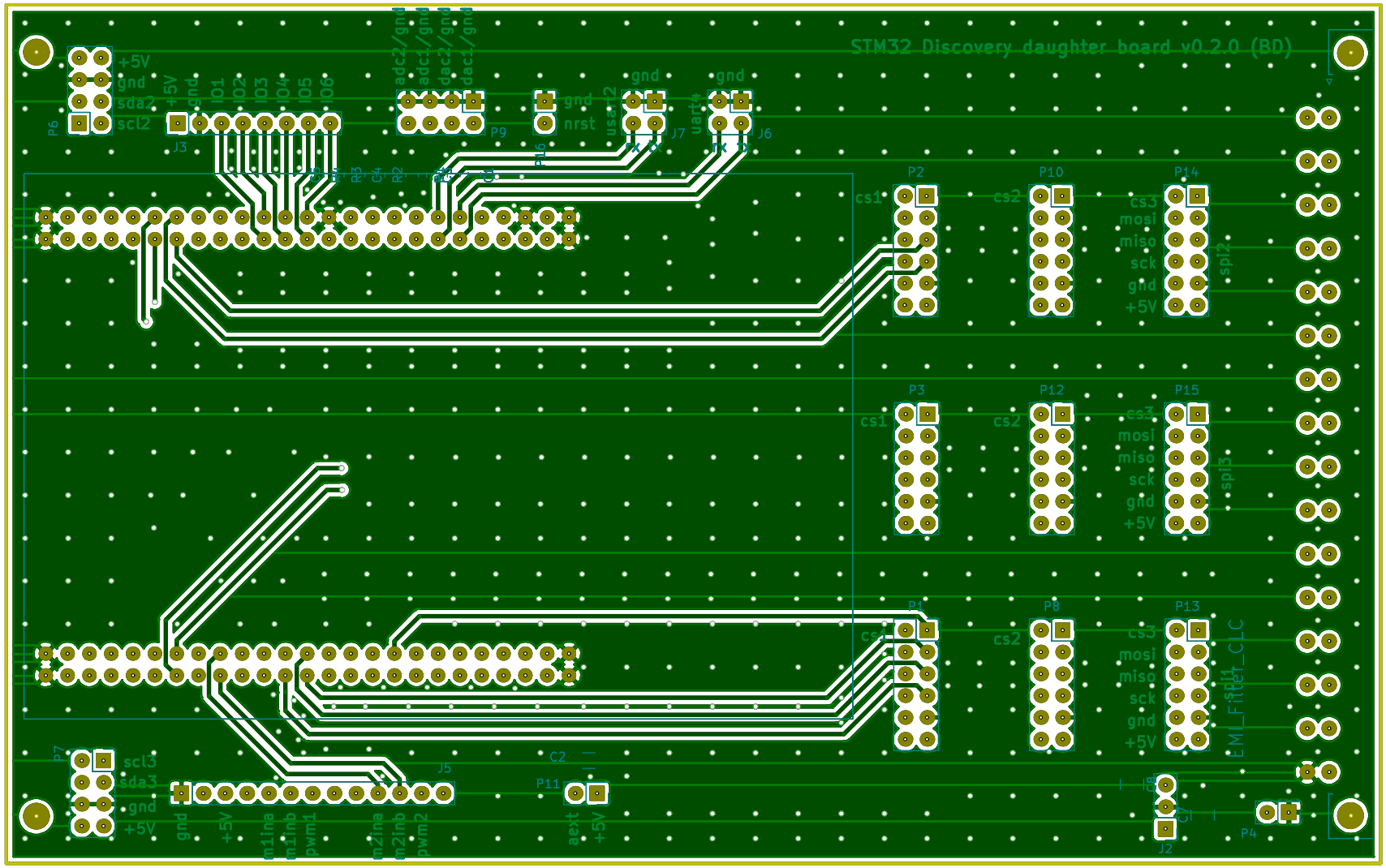
Schematic


SPI1.1
SPI1.2
SPI1.3
SPI2.1
SPI2.2
SPI2.3
SPI3.1
SPI3.2
SPI3.3
SPI
I2C
I2C2
I2C3
STM32 Discovery
STM32-discovery
GPIO
Integrated ADC and DAC
DIN41612 connector
VNH5019
Power
UART
(1) Dedicated to supply the power part of VNH5019 motor driver.
(2) Ref regulator: STM L78S05CV
Sheet: /
File: stm32discovery_mboard.sch
Title:
Size: A4
Date:
Rev: 0.2
KiCad E.D.A. kicad 5.0.2+dfsg1-1
Id: 1/1

Appendix B

Layout


STM32 Discovery daughter board v0.2.0 (BD)
+5V
gnd
sda2
scl2
P6
J3
P9
J7
J6
rx tx
P2
P10
P14
P7
P12
P15
P1
P5
P13
cs1
cs2
cs3
mosi
miso
scl
spi2
spi3
scl3
sda3
J5
C2
P11
J2
P4
EM_Meter_CLC


STM32 Discovery daughter board v0.2.0 (BD)
+5V
gnd
sda2
scl2
P6
J3
IO1
IO2
IO3
IO4
IO5
IO6
adc2/gnd
adc1/gnd
dac2/gnd
dac1/gnd
P9
gnd
nrst
P16
usart2
J7
gnd
uart4
J6
P2
P10
P14
cs1
cs2
cs3
mosi
miso
sck
gnd
+5V
spi2
P3
P12
P15
spi3
P1
P8
P13
spi1
EM_Filter_CLC
P7
scl3
sda3
J5
C2
P11
aext
m1ina
m1inb
pwm1
m2ina
m2inb
pwm2
J2
P4