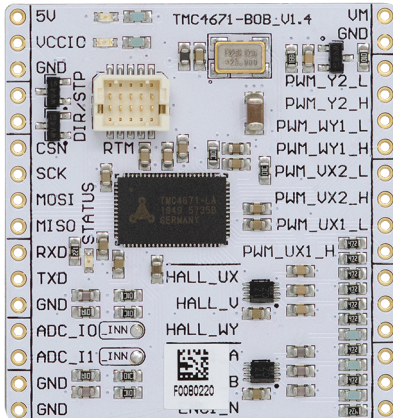


# TMC4671 BOB Description

Document Revision V1.2 • 2020-Apr-10

## Module Top View



## Pin List

| Left | Signal       | Right | Signal       |
|------|--------------|-------|--------------|
| 1    | +5V          | 17    | VM (0...80V) |
| 2    | VCCIO (3.3V) | 18    | GND          |
| 3    | GND          | 19    | PWM_Y2_L     |
| 4    | STP          | 20    | PWM_Y2_H     |
| 5    | DIR          | 21    | PWM_WY1_L    |
| 6    | CSN          | 22    | PWM_WY1_H    |
| 7    | SCK          | 23    | PWM_VX2_L    |
| 8    | MOSI         | 24    | PWM_VX2_H    |
| 9    | MISO         | 25    | PWM_UX1_L    |
| 10   | RXD          | 26    | PWM_UX1_H    |
| 11   | TXD          | 27    | HALL_UX      |
| 12   | GND          | 28    | HALL_V       |
| 13   | ADC_IO       | 29    | HALL_WY      |
| 14   | ADC_I1       | 30    | ENC1_A       |
| 15   | GND          | 31    | ENC1_B       |
| 16   | GND          | 32    | ENC1_N       |

## Features and additional Resources

- TMC4671-LA Hardware Servo Controller
- Supply and I/O voltage 3.3V and 5V (with blue LED indicator)
- Motor supply voltage input to measure motor supply (0...80V)
- Communication and configuration via SPI and UART interface
- Real-time Monitoring Interface for live debugging and tuning using [Trinamic's RTMI adapter](#)
- Additional Step/Direction Interface from a motion controller
- Encoder- and Hall-Feedback
- Supply and status indicator LEDs
- Board width 1.5", board height 1.6"
- 2x16 pin 0.1" header rows for pins/connectors, distance of rows 1.4"
- Link to [additional information and IC data sheet](#)
- Link to [evaluation kit](#)

## RTMI Connector

The real-time monitoring interface connector is used to connect to [Trinamic's RTMI adapter](#) for live monitoring and tuning of the TMC4671 control loops at control loop sampling frequency.

The onboard connector itself is of type [Hirose DF20F-10DP-1V\(56\)](#).

The mating female counter part is of type [Hirose DF20A-10DS-1C](#). A connecting cable comes with the USB-2-RTMI adapter.

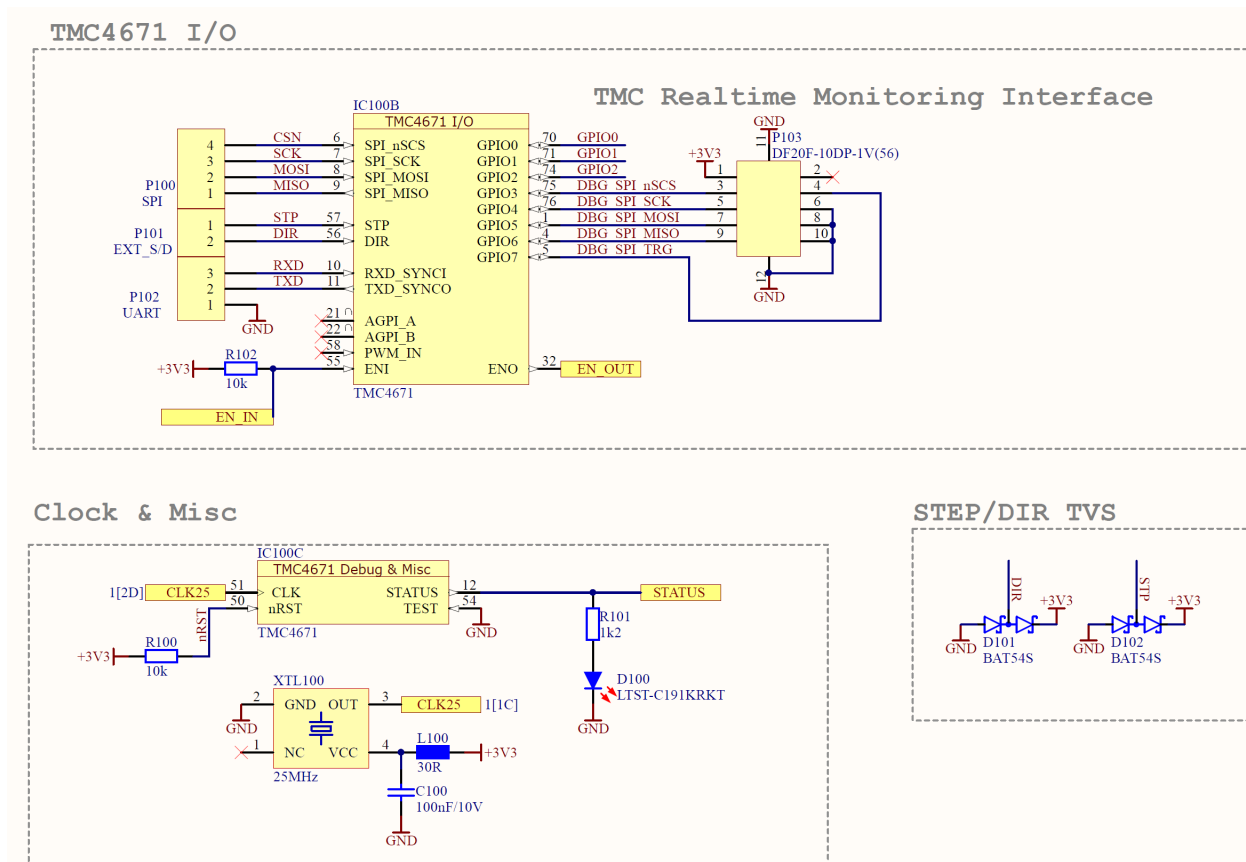
| Left | Signal       | Right | Signal      |
|------|--------------|-------|-------------|
| 1    | +3.3V        | 2     | n.c.        |
| 3    | DBG_SPI_nSCS | 4     | DBG_SPI_TRG |
| 5    | DBG_SPI_SCK  | 6     | GND         |
| 7    | DBG_SPI_MOSI | 8     | GND         |
| 9    | DBG_SPI_MISO | 10    | GND         |



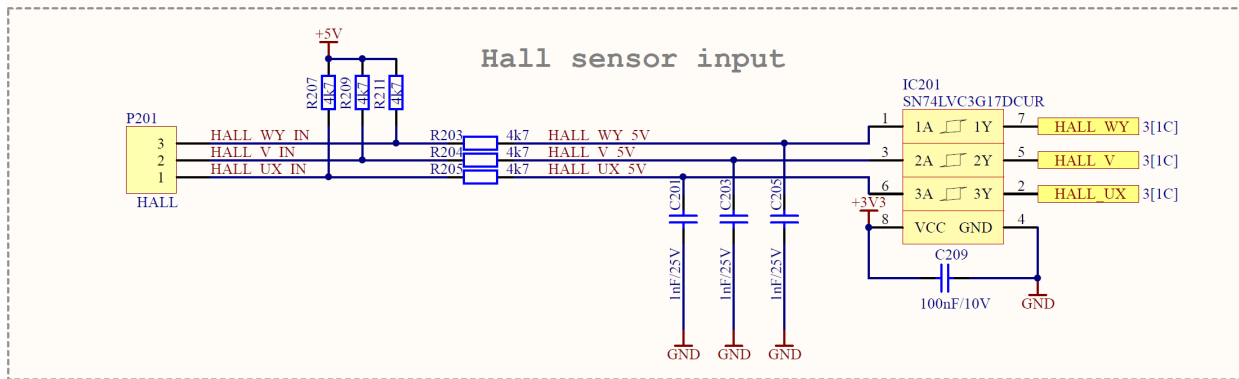
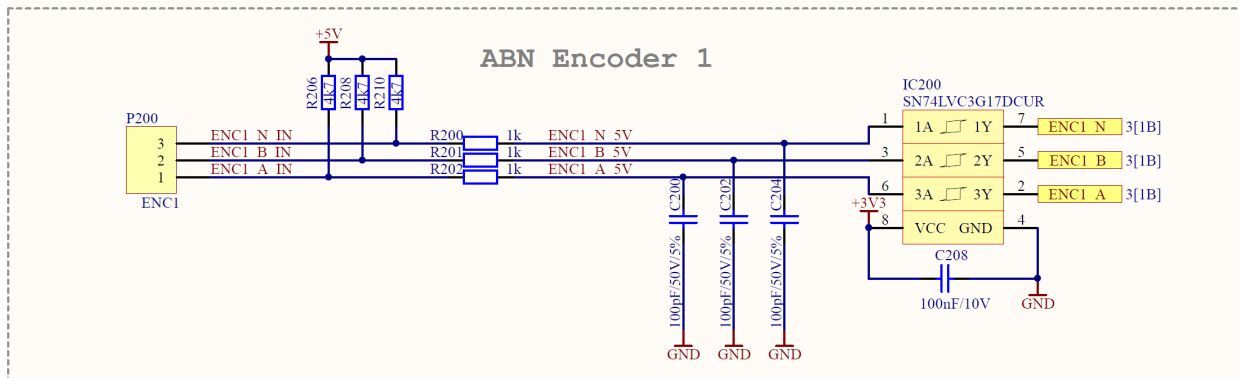
## Bill of Materials

| Pcs. | MPN                | Value                                   | Footprint                | Description                       |
|------|--------------------|---|--------------------------|-----------------------------------|
| 11   | MC0603B104K100CT   | 100nF, 10V                              | 0603                     | Cap, Multicomp                    |
| 5    | MC0603N101J500CT   | 100pF, 50V, 5%                          | 0603                     | Cap, Multicomp                    |
| 1    | MCSH18B103K100CT   | 10nF, 10V                               | 0603                     | Cap, Multicomp                    |
| 1    | GRM31CR61A476ME15L | 47uF, 10V                               | 1206                     | Cap, Murata                       |
| 1    | MC0603B104K100CT   | 100nF, 10V                              | 0603                     | Cap, Multicomp                    |
| 1    | MC0603X474K160CT   | 470nF, 16V                              | 0603                     | Cap, Multicomp                    |
| 1    | MC0603X475K100CT   | 4.7uF, 10V                              | 0603                     | Cap, Multicomp                    |
| 1    | LTST-C191KRKT      | $V_f = 2V @ I_f = 20mA$                 | 0603                     | LED, Lite-On                      |
| 3    | BAT54S             | 30V, 200mA                              | SOT95P237X130-3N         | SS Schottky, Taiwan Semiconductor |
| 2    | LTST-C191TBKT      | $V_f = 2.8V @ I_f = 20mA$               | 0603                     | LED, Lite-On                      |
| 1    | TMC4671-LA         | Integrated Servo Controller IC          | QFN40P1050X650X90_HS-77N | TRINAMIC Motion Control           |
| 2    | SN74LVC3G17DCUR    | triple schmitt trigger, 1.65V-5.5V      | TSSOP50P310X90-8L        | Texas Instruments                 |
| 1    | MFB-160808-0030PQ  | 30R                                     | 0603                     | MECMARCOM                         |
| 1    | DF20F-10DP-1V(56)  | Wire-2-board header, 1mm pitch, 10pins, | DF20 series, SMD         | Hirose Electric Co Ltd            |
| 6    | MC0063W0603110K    | 10k                                     | 0603                     | Res, Multicomp                    |
| 1    | MCWR06X1201FTL     | 1k2                                     | 0603                     | Res, Multicomp                    |
| 5    | MCWR06X1001FTL     | 1k, 1/10W, 1%                           | 0603                     | Res, Multicomp                    |
| 9    | WR06X4701FTL       | 4k7, 1/10W, 1%                          | 0603                     | Res, Walsin                       |
| 2    | MCWR06X1000FTL     | 100R                                    | 0603                     | Res, Multicomp                    |
| 1    | MCWR06X1501FTL     | 1k5                                     | 0603                     | Res, Multicomp                    |
| 1    | MCWR06X1003FTL     | 100k                                    | 0603                     | Res, Multicomp                    |
| 1    | FOX924B-25.000     | 25MHz, 2.5ppm, 3.3V                     | 4-SMD, no lead           | Oscillator, FOX Electronics       |

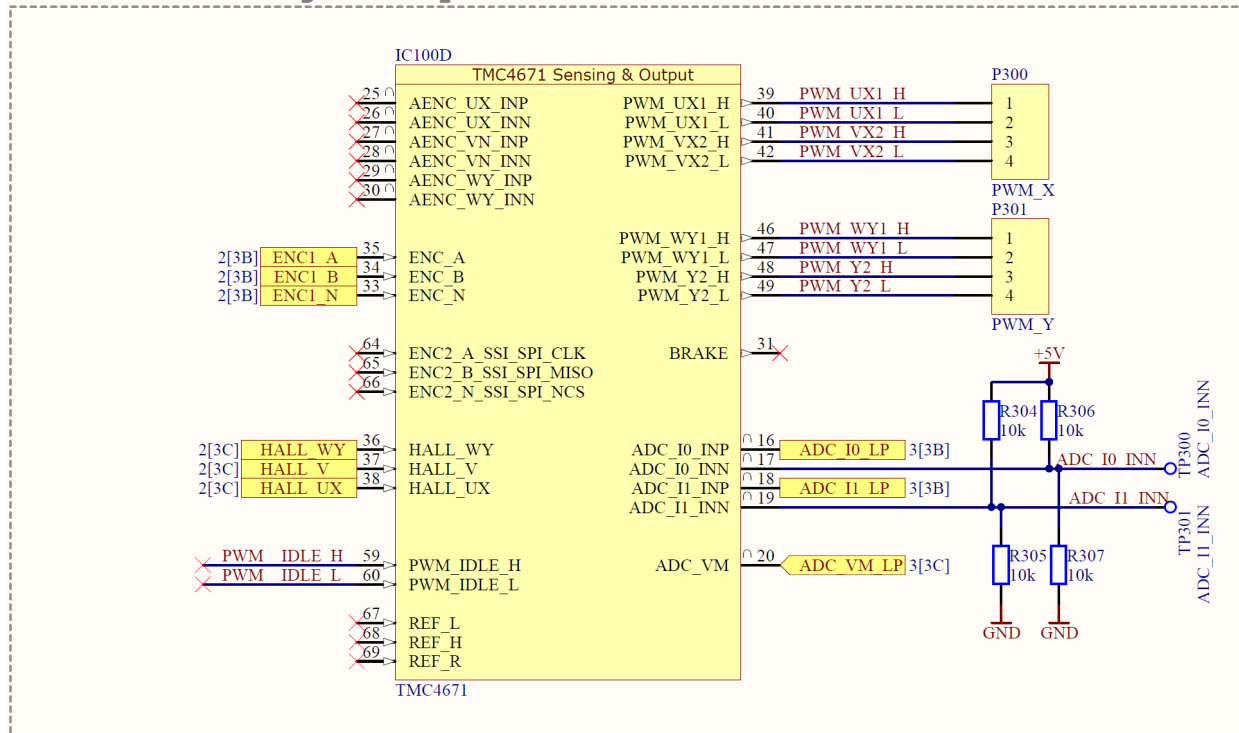
## BOB Schematics



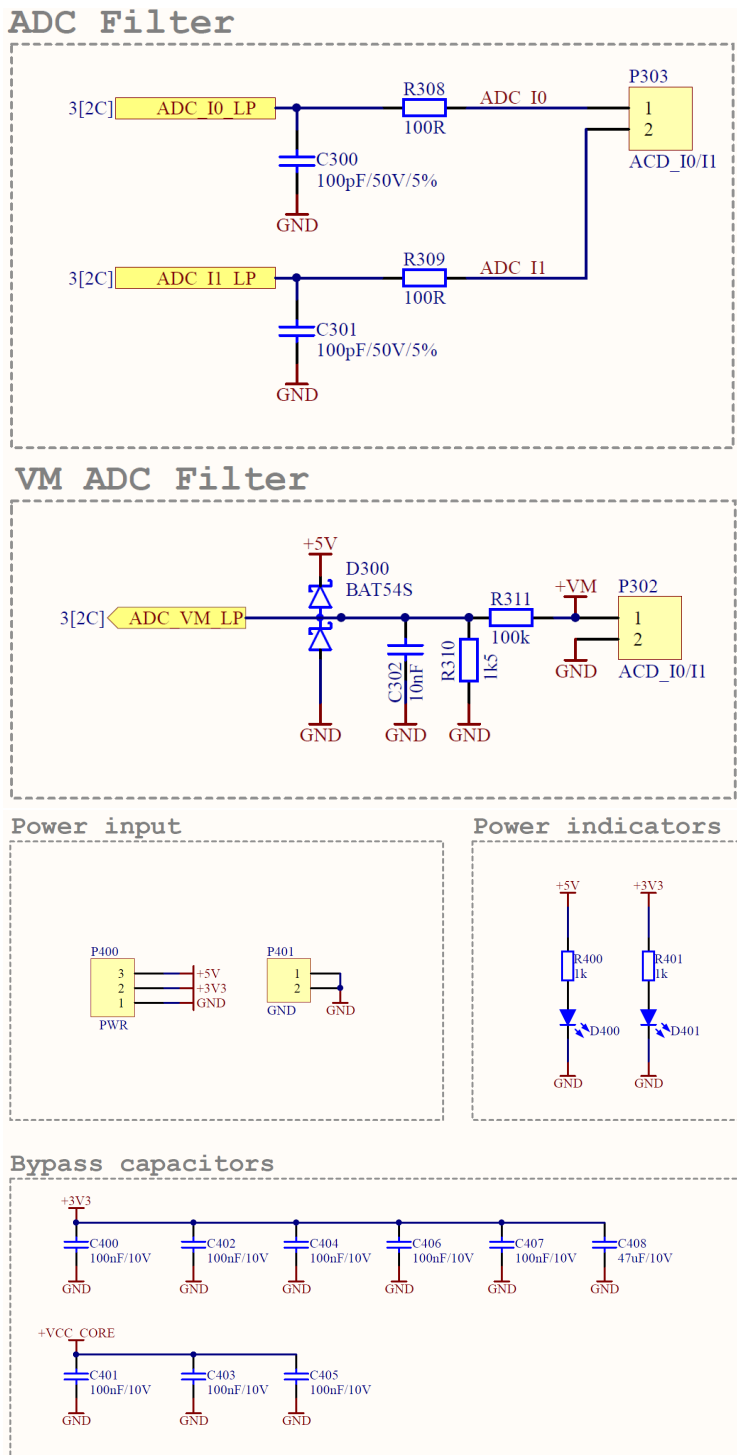
## BOB Schematics



## TMC4671 Sensing & Output



## BOB Schematics



## BOB Schematics

