Sheet: MCU

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Sheet: Power

File: Power.sch

Sheet: CAN

File: CAN.sch

Sheet: MOSFET

File: MOSFET.sch

Sheet: Driver

File: Driver.sch

Sheet: THM

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Sheet: Accelerometer

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Sheet: USB

File: USB.sch

Sheet: Header

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FID1
Fiducial

FID3
Fiducial

FID5
Fiducial

FID2
Fiducial

FID4
Fiducial

FID6
Fiducial

M1

Github : https://github.com/makerbase-mks
FaceBooK : https://www.facebook.com/Makerbase.mks/
**Makerbase**
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File: MKS THR42.sch

**Title: MKS THR42**

| Size: A4 | Date: 2022-10-27 | Rev: V1.0_001 |
| KiCad E.D.A.  kicad (5.1.10)-1 | | Id: 1/10 |

## Components and Labels

**Boot Switch section:**
- GND, S1, R1, R2, +3V3, QSPI_SS, BOOT
- Pin 1, Pin 2

**U1 W25Q16JVUXIQ (QSPI Flash):**
- +3V3, C1, GND
- CS 1, VCC 8
- DI(IO0) 5 QSPI_SD0
- DO(IO1) 2 QSPI_SD1
- IO2 3 QSPI_SD2
- IO3 7 QSPI_SD3
- CLK 6
- GND 4
- QSPI_SS, QSPI_SCK
- GND

**Oscillator section:**
- OSC_IN, C2, GND, Y2, GND
- OSC_OUT, C3, GND
- Y1: O2, GND, GND, O1, GND

**Reset section:**
- S2, +3V3, R3, RESET, C4, GND, Pin 1, Pin 2

**Power decoupling (top):**
- +3V3, C8 C9 C11 C12 C13 C14, GND
- 1.1Vout, C5 C6, GND
- C7, GND, C10, GND, +3V3
- +3V3, R4, R5, ADC_AVDD, C16, GND

**U2 RP2040:**

Top pins:
- DVDD 50, DVDD 23, VREG_VOUT 45, VREG_IN 44, IOVDD 49, IOVDD 42, IOVDD 33, IOVDD 22, IOVDD 10, IOVDD 1, USB_VDD 48, ADC_AVDD 43

Left pins:
- QSPI_SS 56 — QSPI_SS
- QSPI_SD0 53 — QSPI_SD0
- QSPI_SD1 55 — QSPI_SD1
- QSPI_SD2 54 — QSPI_SD2
- QSPI_SD3 51 — QSPI_SD3
- QSPI_SCK 52 — QSPI_SCLK
- OSC_IN 20 — XIN
- OSC_OUT 21 — XOUT
- RESET 26 — RUN
- SWCLK 24 — SWCLK
- SWDIO 25 — SWD

Right pins:
- USB_DP 47 — USB_D+
- USB_DM 46 — USB_D−
- GPIO0 2 — HE0
- GPIO1 3 — FAN0
- GPIO2 4 — FAN1
- GPIO3 5 — FAN2
- GPIO4 6 — E0_DIR
- GPIO5 7 — E0_STEP
- GPIO6 8 — E0_UART
- GPIO7 9 — E0_DIAG
- GPIO8 11 — CAN_RX
- GPIO9 12 — CAN_TX
- GPIO10 13 — E0_EN
- GPIO11 14 — 3D_Touch
- GPIO12 15 — SPI1_MISO
- GPIO13 16 — SPI1_CS
- GPIO14 17 — SPI1_SCK
- GPIO15 18 — SPI1_MOSI
- GPIO16 27 — SPI0_MISO — T1
- GPIO17 28 — SPI0_CS — T2
- GPIO18 29 — SPI0_SCK — T3
- GPIO19 30 — SPI0_MOSI — T4
- GPIO20 31 — Neopixel
- GPIO21 32 — Z+
- GPIO22 34 — I2C_SDA — T5
- GPIO23 35 — I2C_SCL — T6
- GPIO24 36 — IO24
- GPIO25 37 — IO25
- GPIO26_ADC0 38 — TH0
- GPIO27_ADC1 39 — (X)
- GPIO28_ADC2 40 — (X)
- GPIO29_ADC3 41 — IO29

Bottom pins:
- TESTEN 19 — GND
- GND 57 — GND

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PWR-VIN

F1

D2

GND

C43    C20

VIN1

D3

VIN2

GND    GND

U4

C28

L2

F2

+5V

VIN2

C21

VIN

BST    SW

D24

C18

C38

D1

R6

EN

FB

R51

GND

GND

GND

FREQ

GND    COMP

C32

GND

GND

R7    R8

GND    GND

GND    PAD

R39    R50

GND

+3V3

R12

D4
CGREEN

+5V

C17    C44

U3

+3.3V

C22    C45

R9

VIN    VO

R11

EN    ADJ

GND

R10    R54

GND
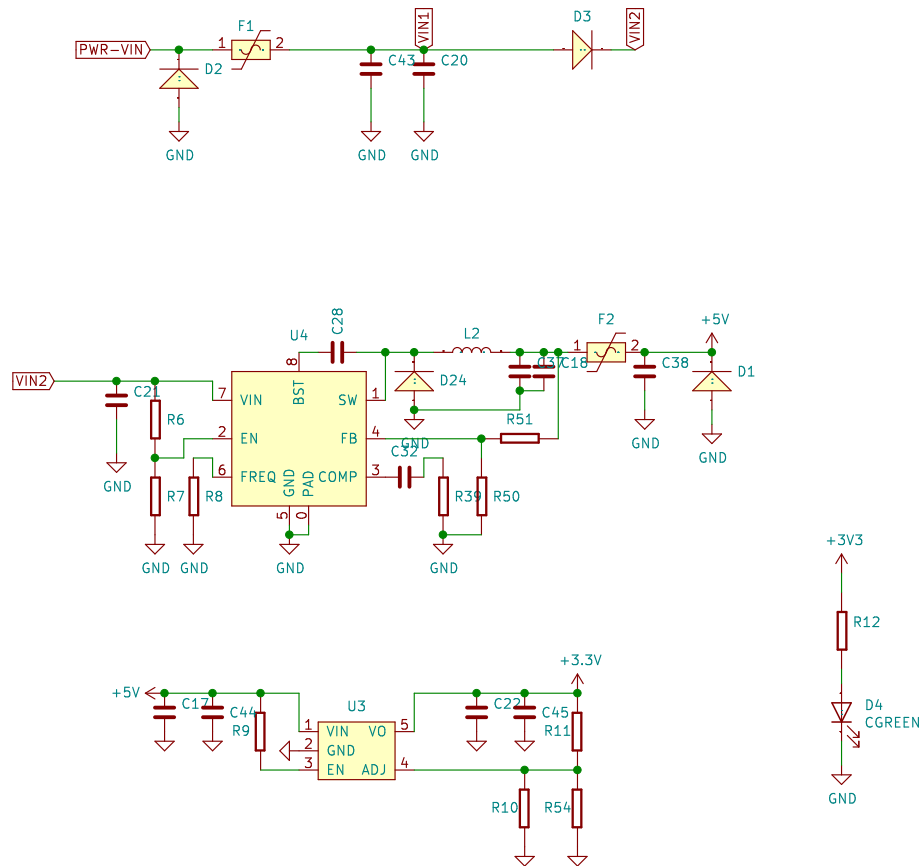
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File: Power.sch

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Makerbase

D5
BAT54S

GND 1 3 2 +3V3

FAN-2

1 2 J2

FAN2 R13

R14 1 Q1 CJ3400 2

GND

D8 R19

RED VIN1

D6
BAT54S

GND 1 3 2 +3V3

FAN-1

1 2 J3

FAN1 R15

R16 1 Q2 CJ3400 2

GND

D9 R20

RED VIN1

D11
BAT54S

GND 1 3 2 +3V3

FAN-0

1 2 J15

FAN0 R64

R65 1 Q4 CJ3400 2

GND

D12 R66

RED VIN1

D7
BAT54S

GND 1 3 2 +3V3

Q3

GND

S D 8
S D 7
S D 6
S D 5
1 2 3 4 G

Heater0

1 2 J4

HE0 R17

R18

GND

D10 R21 D13

RED VIN1

3 1 Q5 HY1403D 2

GND
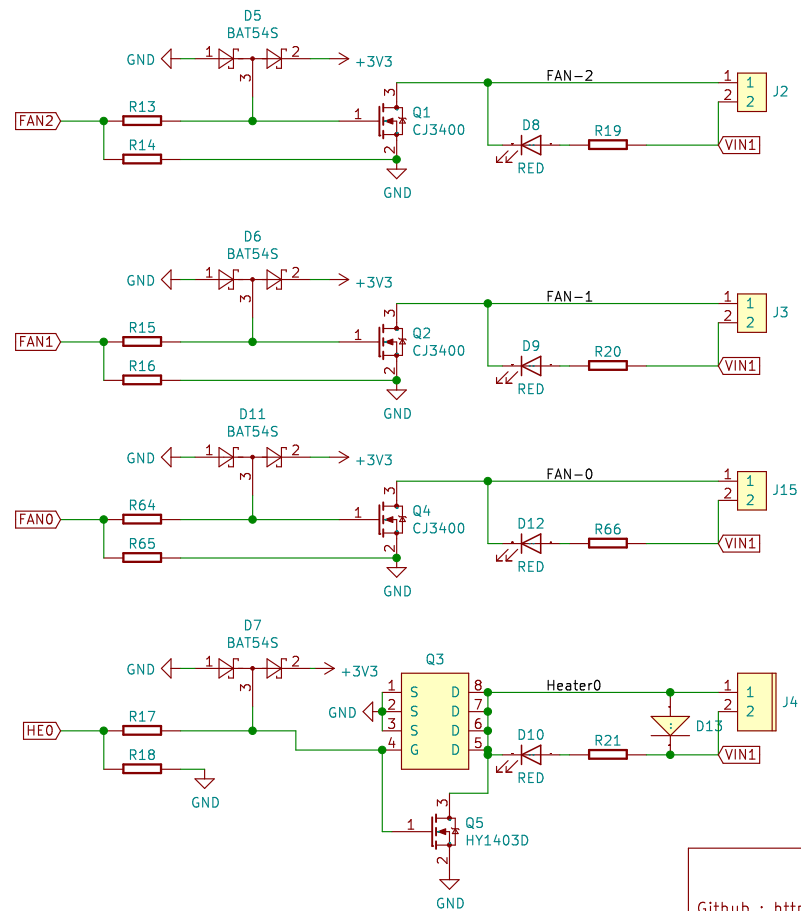
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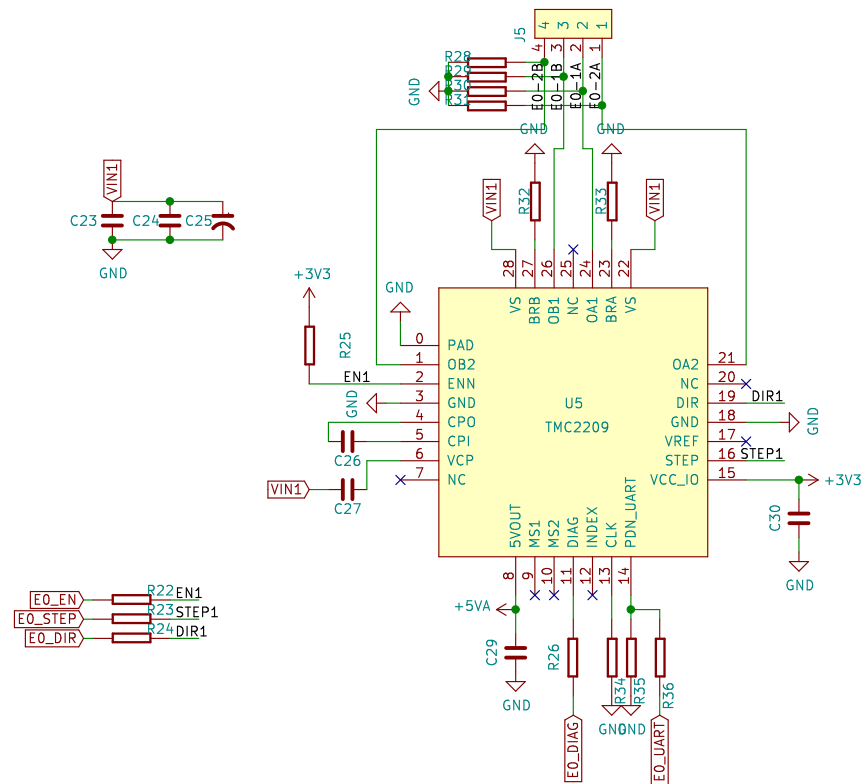
Size: A4     Date: 2022-10-27     Rev: V1.0_001
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J1

A4 VBUS
A5 CC1
B5 CC2

+5V   D14
C71
GND  USB_D−   R37   D−
USB_D+   R38   D+

VBUS
A7 D−
B7 D−
A6 D+
B6 D+

D15  D16  D17

A8 SBU1
B8 SBU2

GND

A1 GND   S1 SHIELD   J6

GND
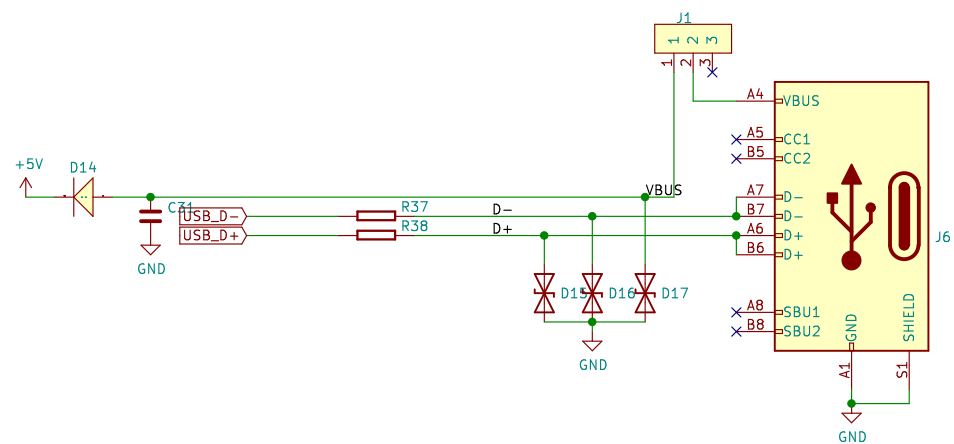
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Title: MKS THR42
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KiCad E.D.A.  kicad (5.1.10)−1     Id: 6/10
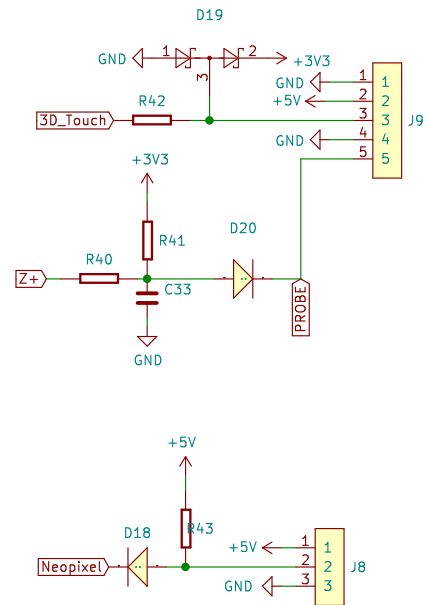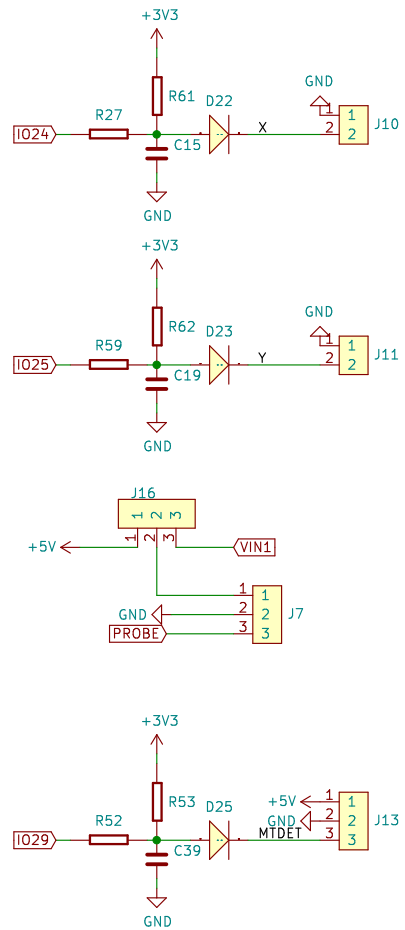
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File: Header.sch

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+3V3

C34   C35

GND   GND

RES   Vs   Vdd_I/O
3     6    1

+3V3

R44  SPI1_MISO  12  SDO/ADDR
R45  SPI1_MOSI  13  SDA/SDI/SDIO   INT1  8
R46  SPI1_SCK   14  SCL/SCLK       INT2  9
R47  SPI1_CS    7   CS

GND   RES
2     11

GND   GND

U6
ADXL345BCCZ
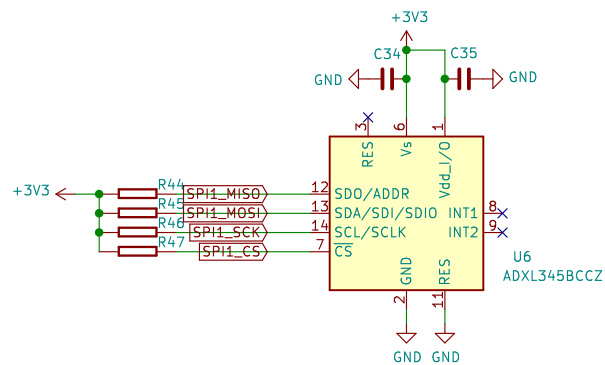
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File: Accelerometer.sch

**Title: MKS THR42**
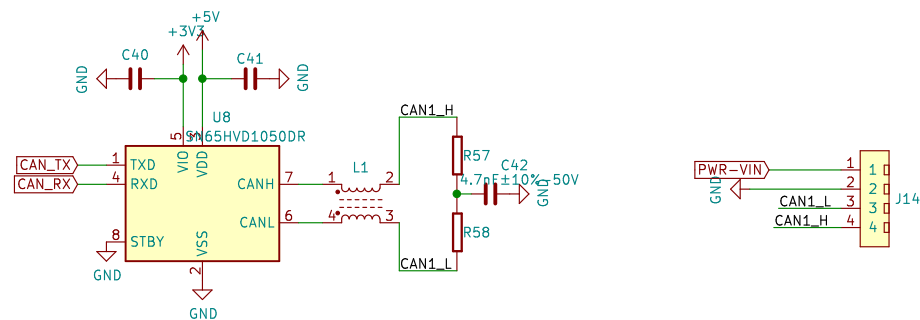
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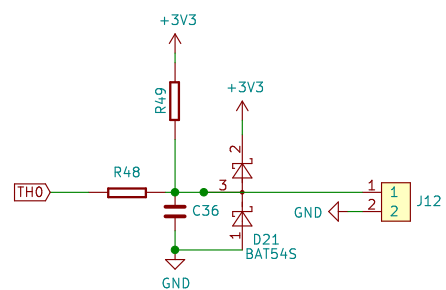
**Makerbase**

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File: THM.sch

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|---|---|---|
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THO
R48
R49
+3V3
+3V3
C36
GND
GND
D21
BAT54S
J12
1
2
GND

**U8**
SN65HVD1050DR

CAN_TX — 1 TXD
CAN_RX — 4 RXD
5 VIO / VDD 3
CANH 7
CANL 6
8 STBY
VSS 2

C40  C41
GND  GND
+5V +3V3

L1
CAN1_H
CAN1_L
R57
R58
C42 4.7nF±10% 50V
GND

**PWR-VIN** — 1
GND — 2
CAN1_L — 3
CAN1_H — 4
**J14**

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