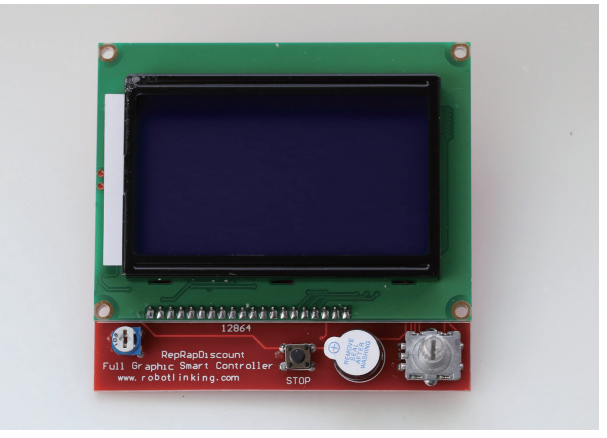
Part 10

資料編

Chapter 1

フルグラフィック・スマートコントローラ (RepRap Discount Full Graphic Smart Controller)

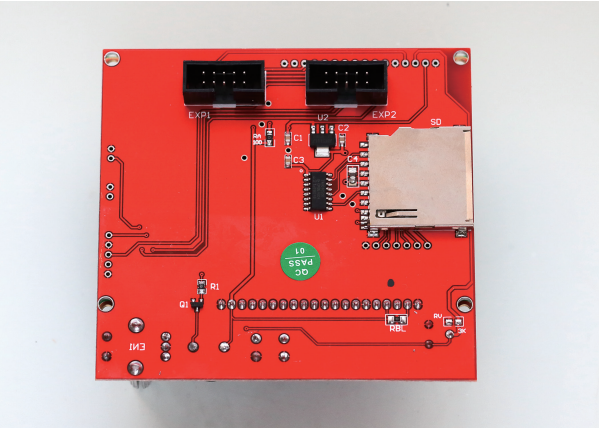
(P-99)

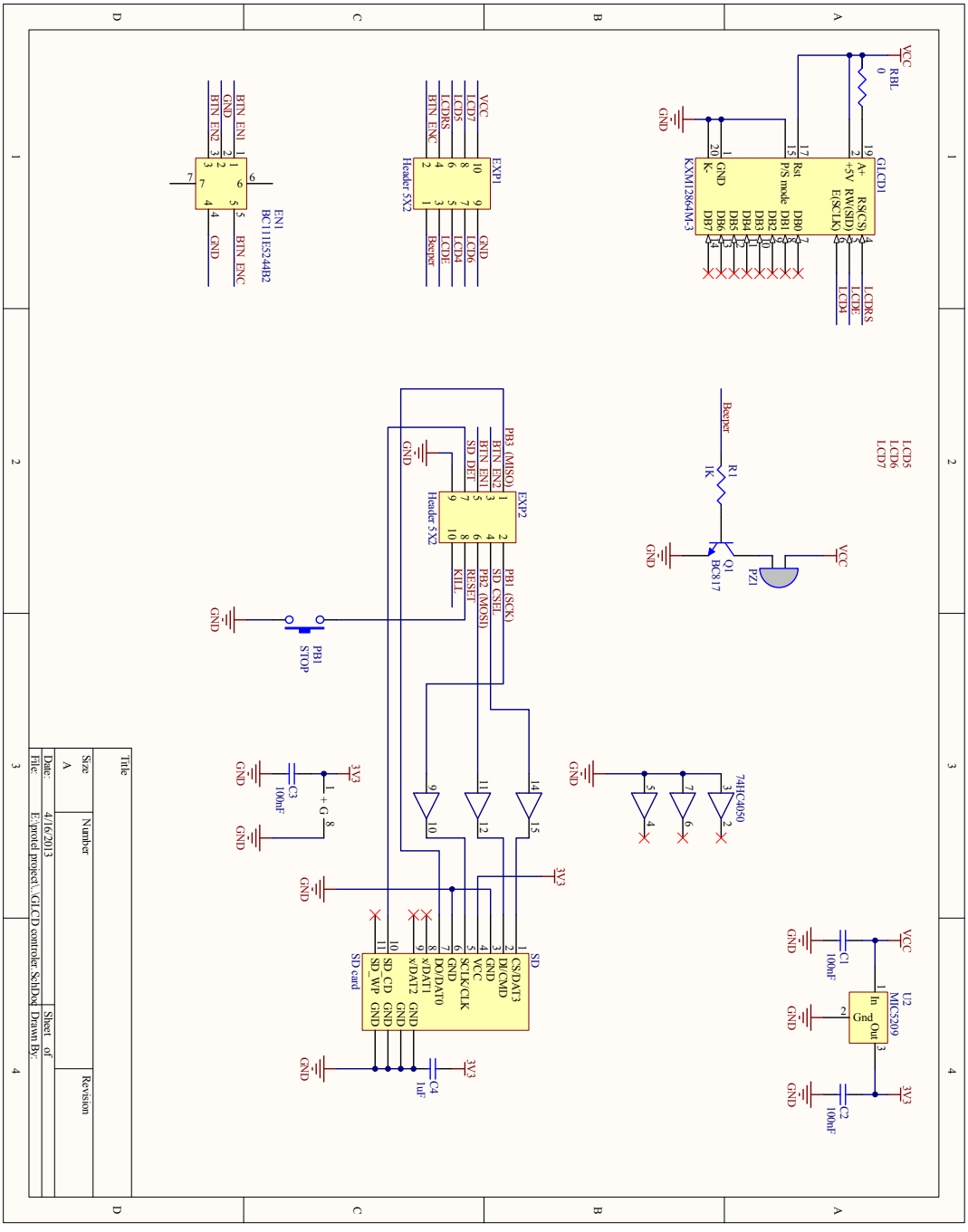


大型LCD12864を搭載し，テキストの他アイコン表示などグラフィック表示にも対応しています．（20文字×6行，128×64グラフィック）

操作にはロータリースイッチが採用され，ブザーやリセットスイッチ，輝度調整半固定抵抗，SDカードスロットなどが搭載されています．

ファームウェアのコンパイル時にはArduino用グラフィックライブラリ u8glib をインストールする必要があります．



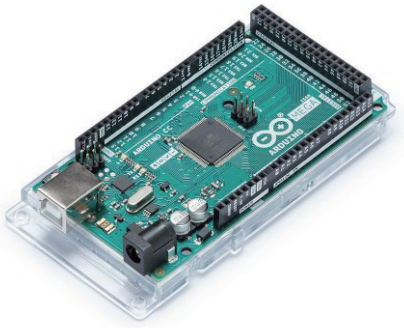


フルグラフィック・スマートコントローラ回路図

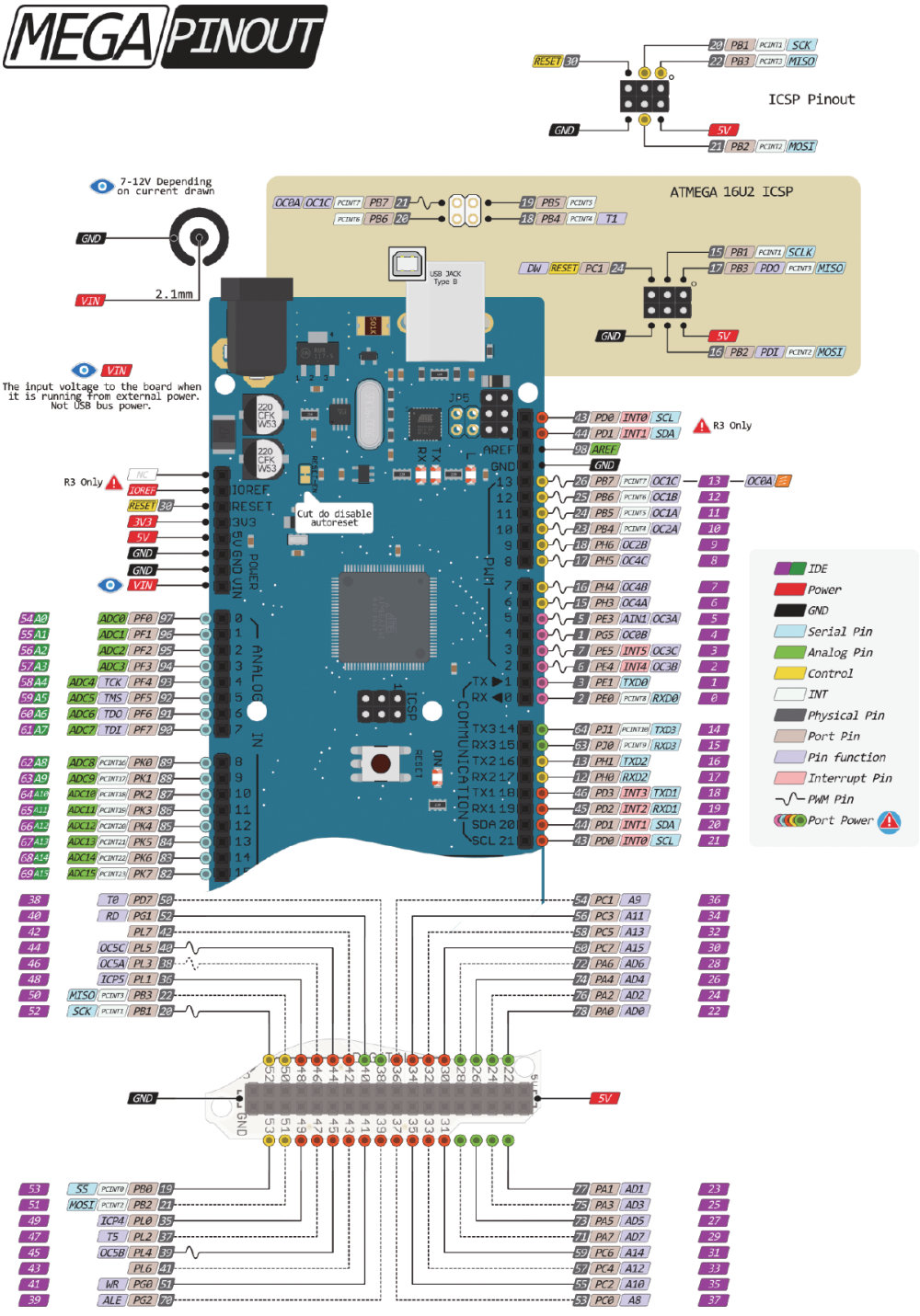
Chapter

2 Arduino Mega 2560 Rev.3

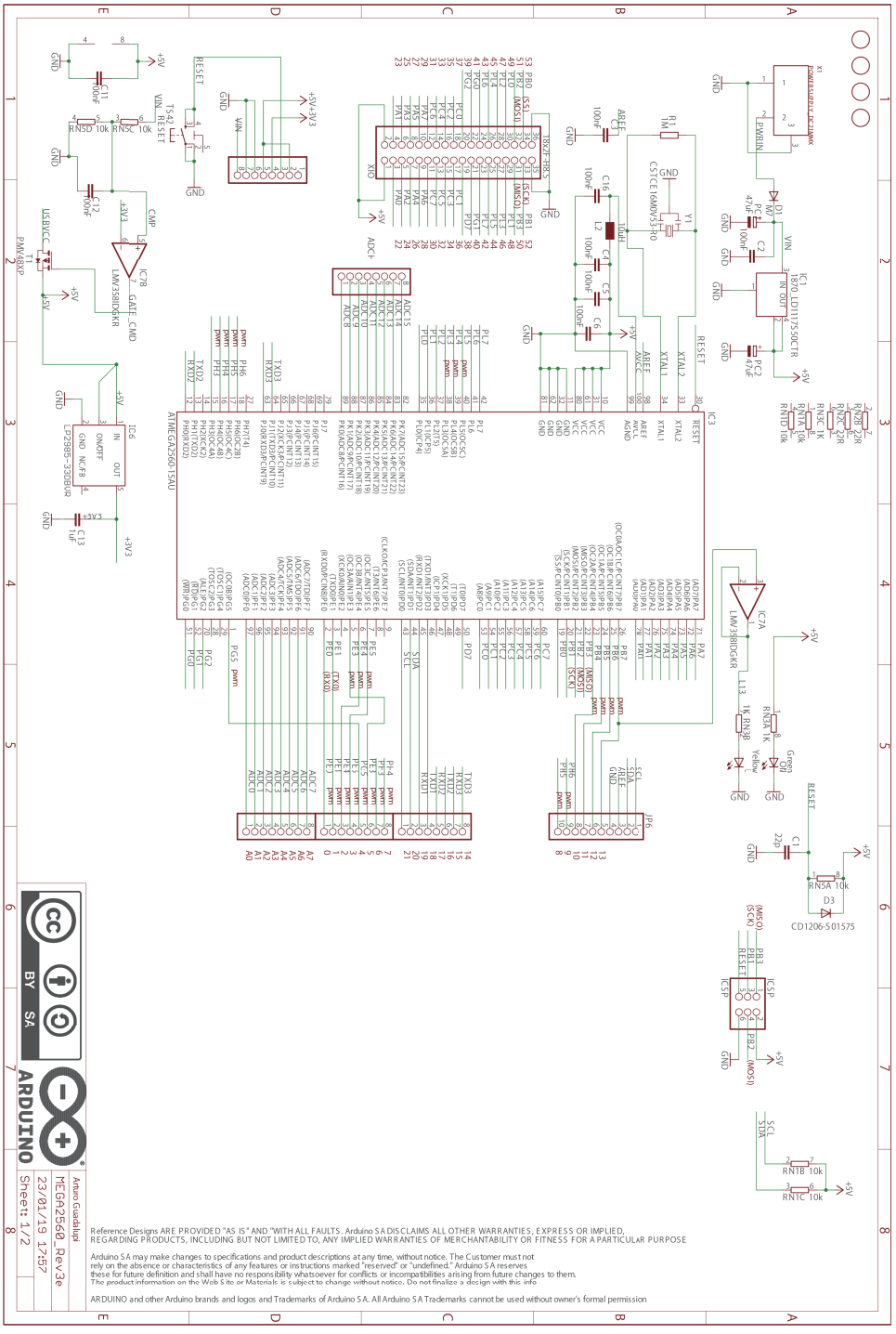
(P-104)



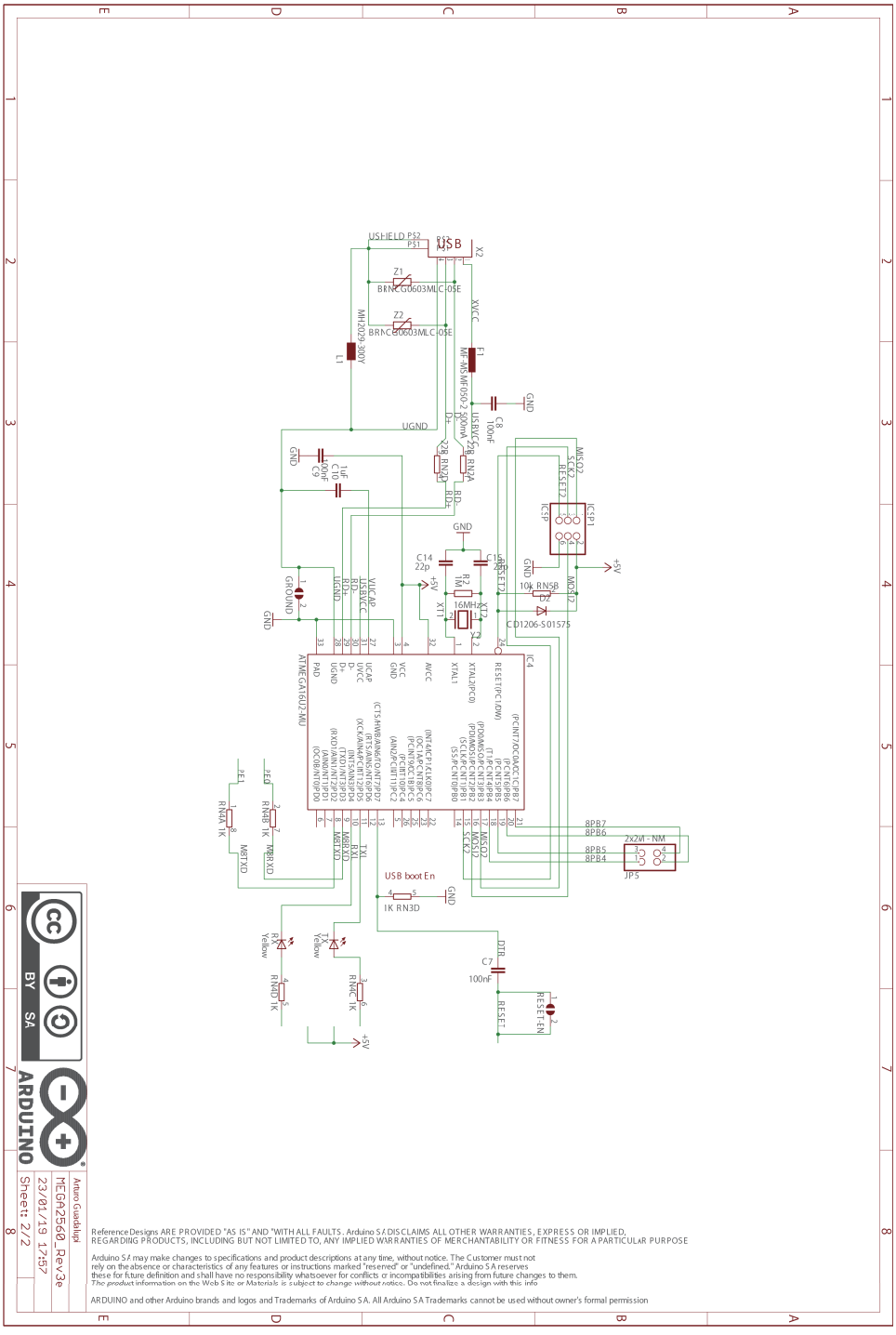
Arduino Mega 2560 Rev.3



Arduino Mega 2560 Rev.3 ピン配置図



Arduino Mega 2560 Rev.3 回路図 1/2



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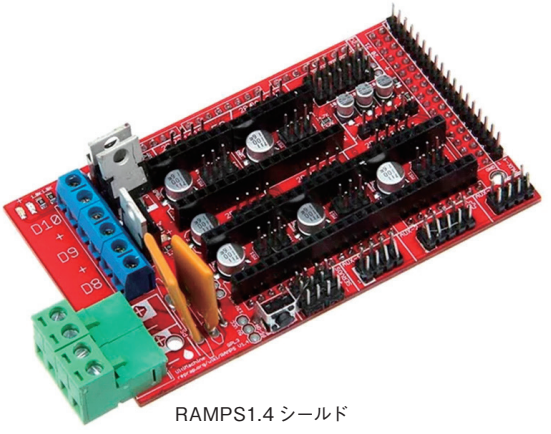
Arduino Mega 2560 Rev.3 回路図 2/2

Chapter 3

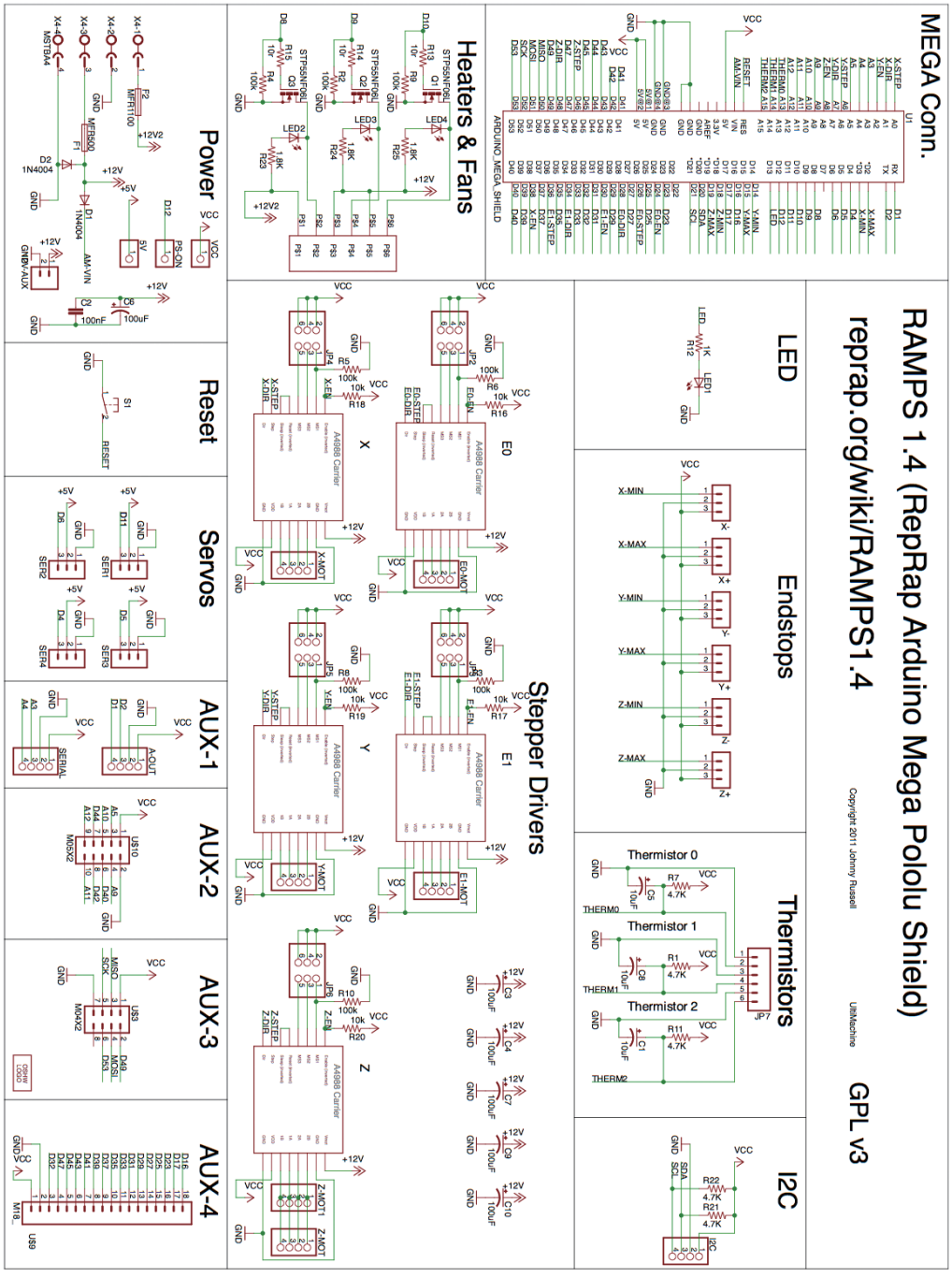
Arduino シールド (Arduino Shield)

10-3-1 RAMPS 1.4 (RepRap Arduino Mega Pololu Shield) (P-105)

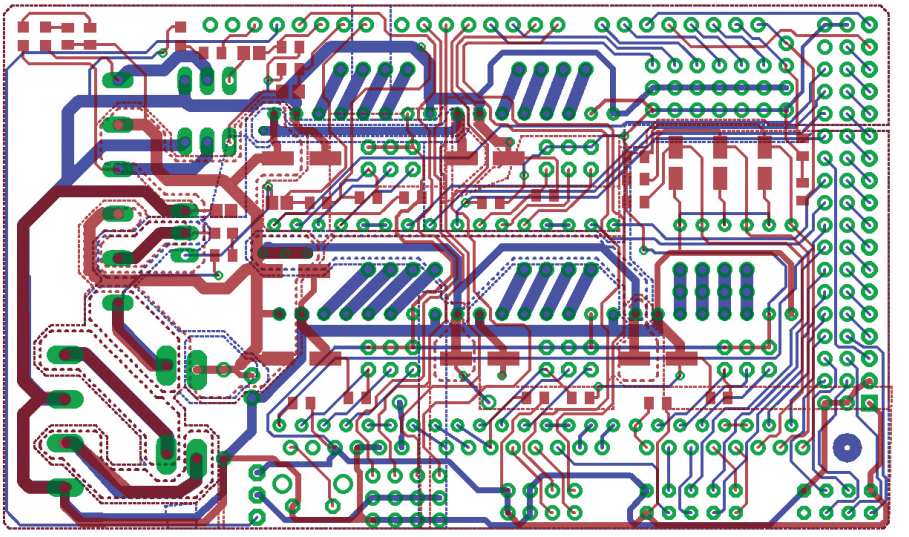


RAMPS1.4 シールド

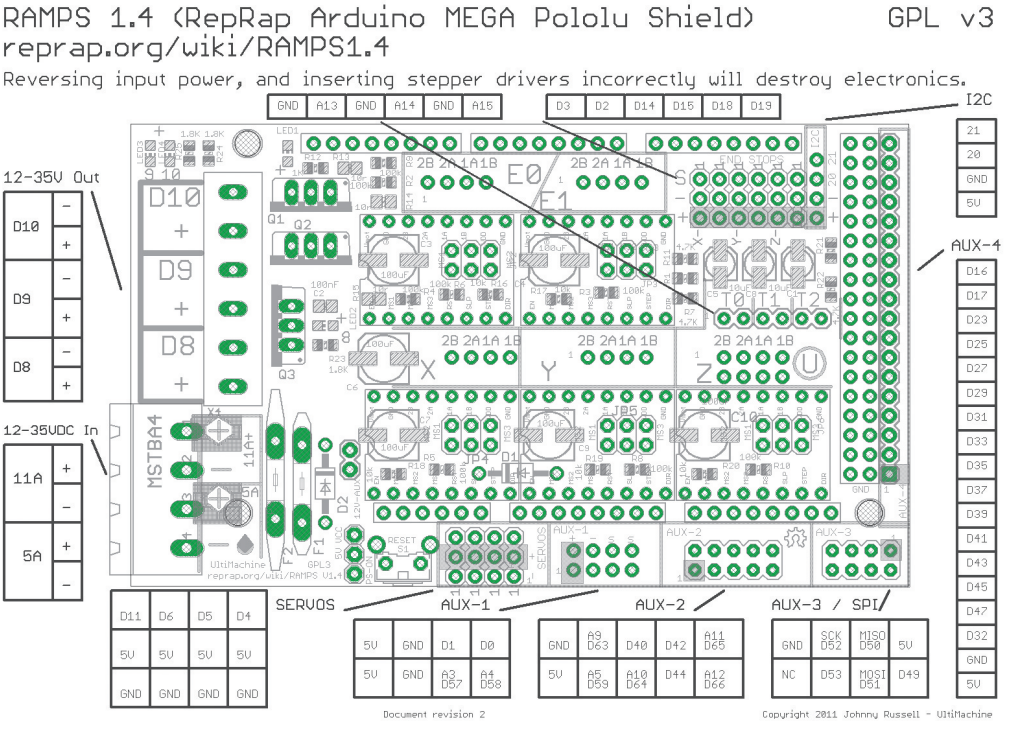
URL https://reprap.org/wiki/RAMPS_1.4


RAMPS 1.4 (RepRap Arduino Mega Pololu Shield)
reprap.org/wiki/RAMPS1.4
Copyright 2011 Johnny Russell
UltiMachine
GPL v3
MEGA Conn.
ARDUINO_MEGA_SHIELD
LED
Endstops
Thermistors
I2C
Heaters & Fans
Stepper Drivers
E0
E1
X
Y
Z
Power
Reset
Servos
AUX-1
AUX-2
AUX-3
AUX-4

RAMPS1.4 回路図

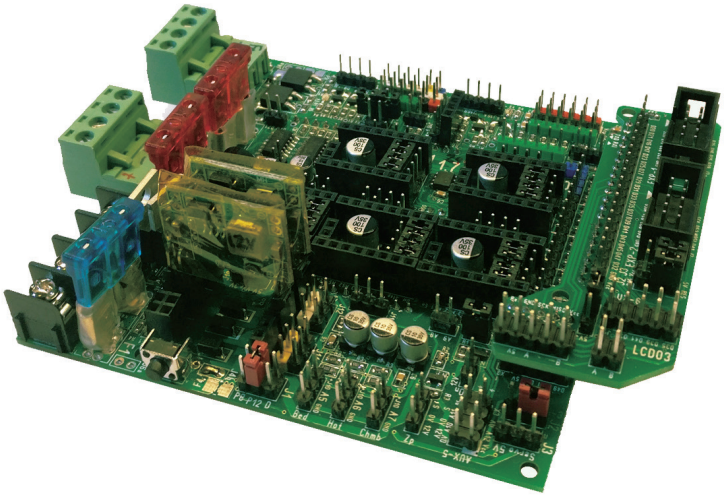


RAMPS1.4 基板パターン図



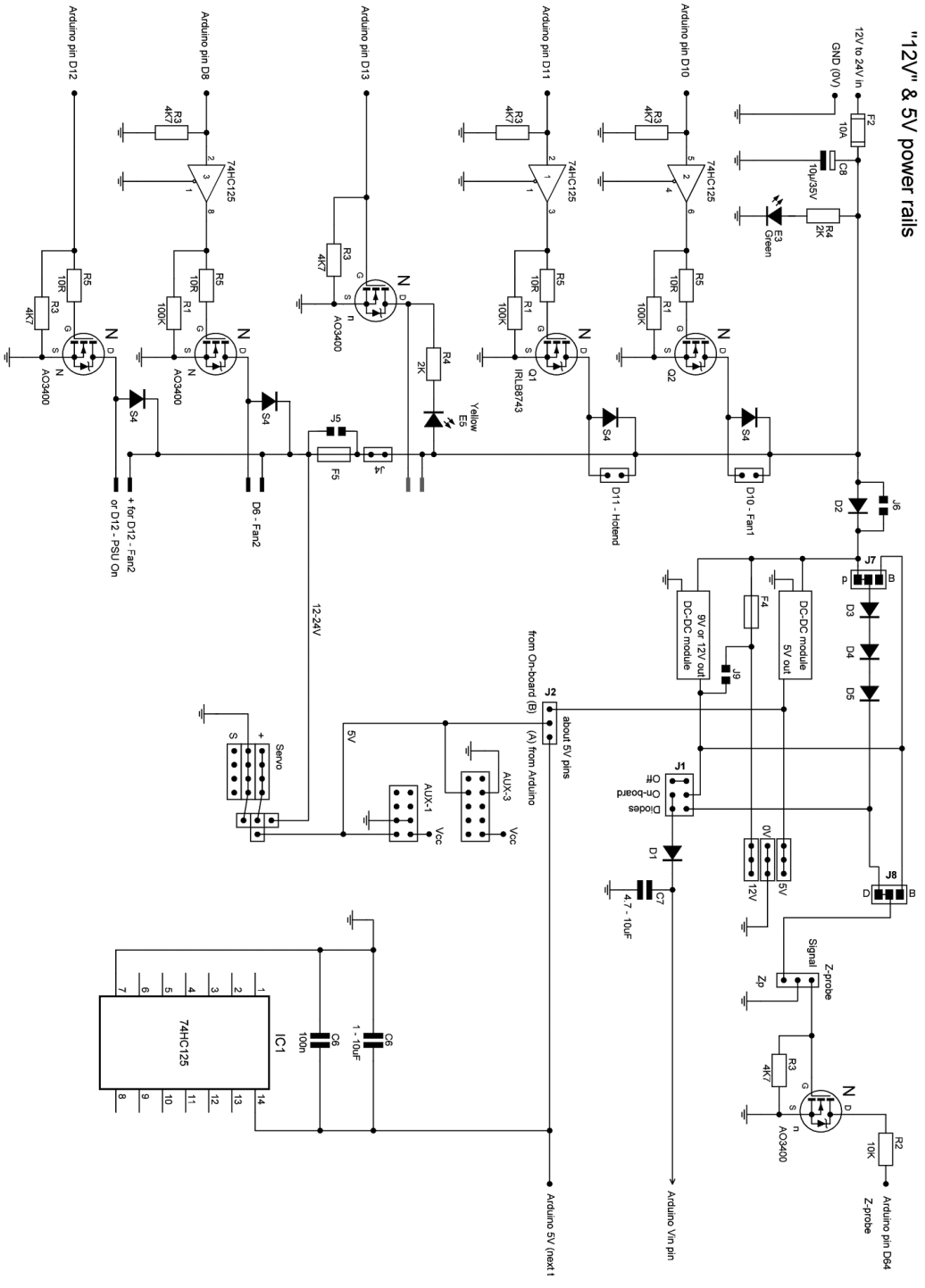
RAMPS1.4 基板配置図

10-3-2　RAMPS 1.7 (P-108)

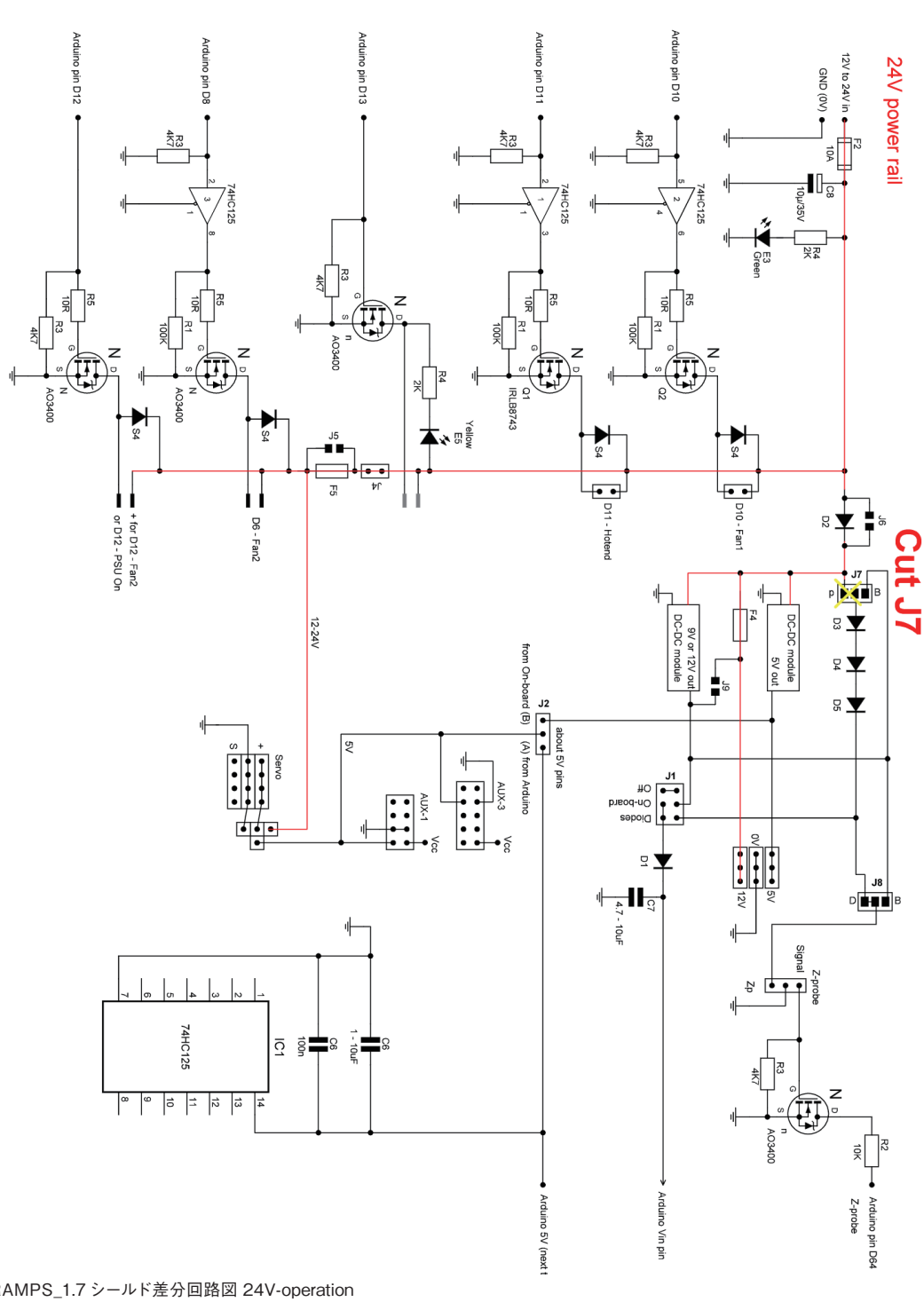


RAMPS_1.7 シールド．基盤が 1.6 より大きくなっています．

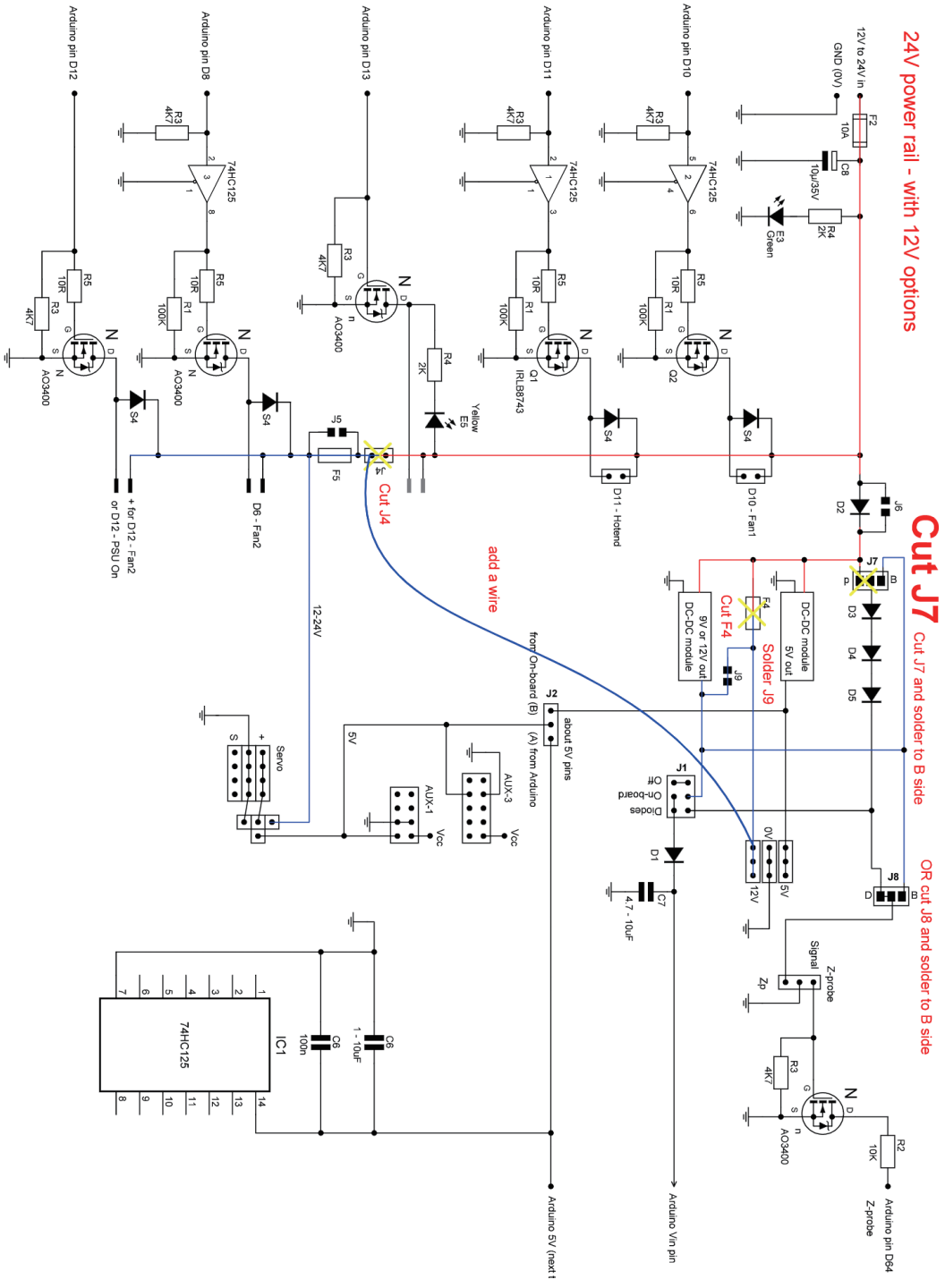
URL https://github.com/MrAlvin/RAMPS_1.7　ライセンス：GNU GPL v3.0



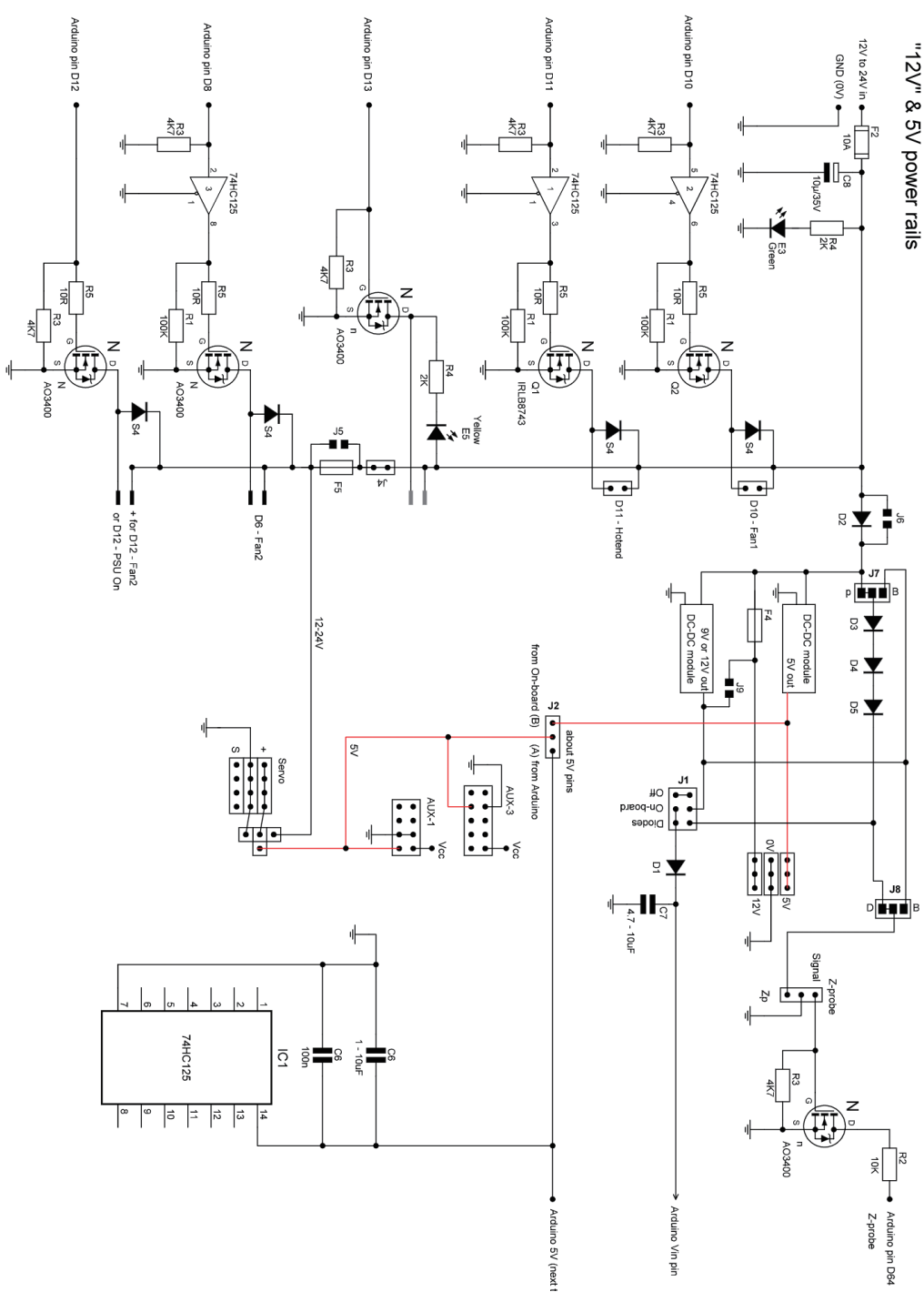
RAMPS_1.7 シールド差分回路図 12V+5V_rails



RAMPS_1.7 シールド差分回路図 24V-operation

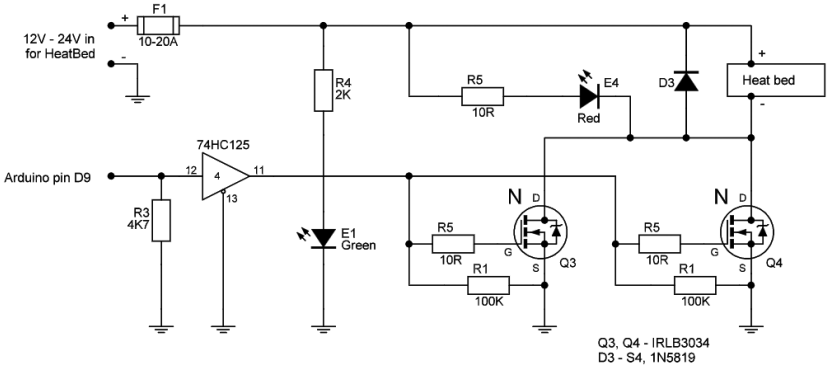


RAMPS_1.7 シールド差分回路図 24V-operation_with-12V-options



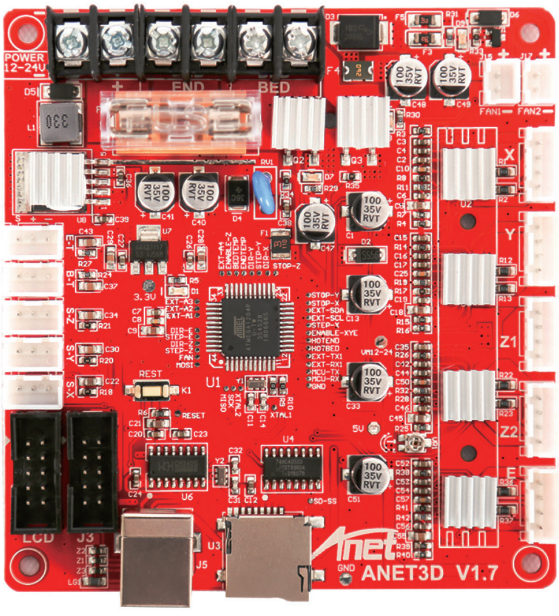
RAMPS_1.7 シールド差分回路図 5V_on-board_rail_marked

Heated bed circuit



RAMPS_1.7 シールド差分回路図 heated_bed

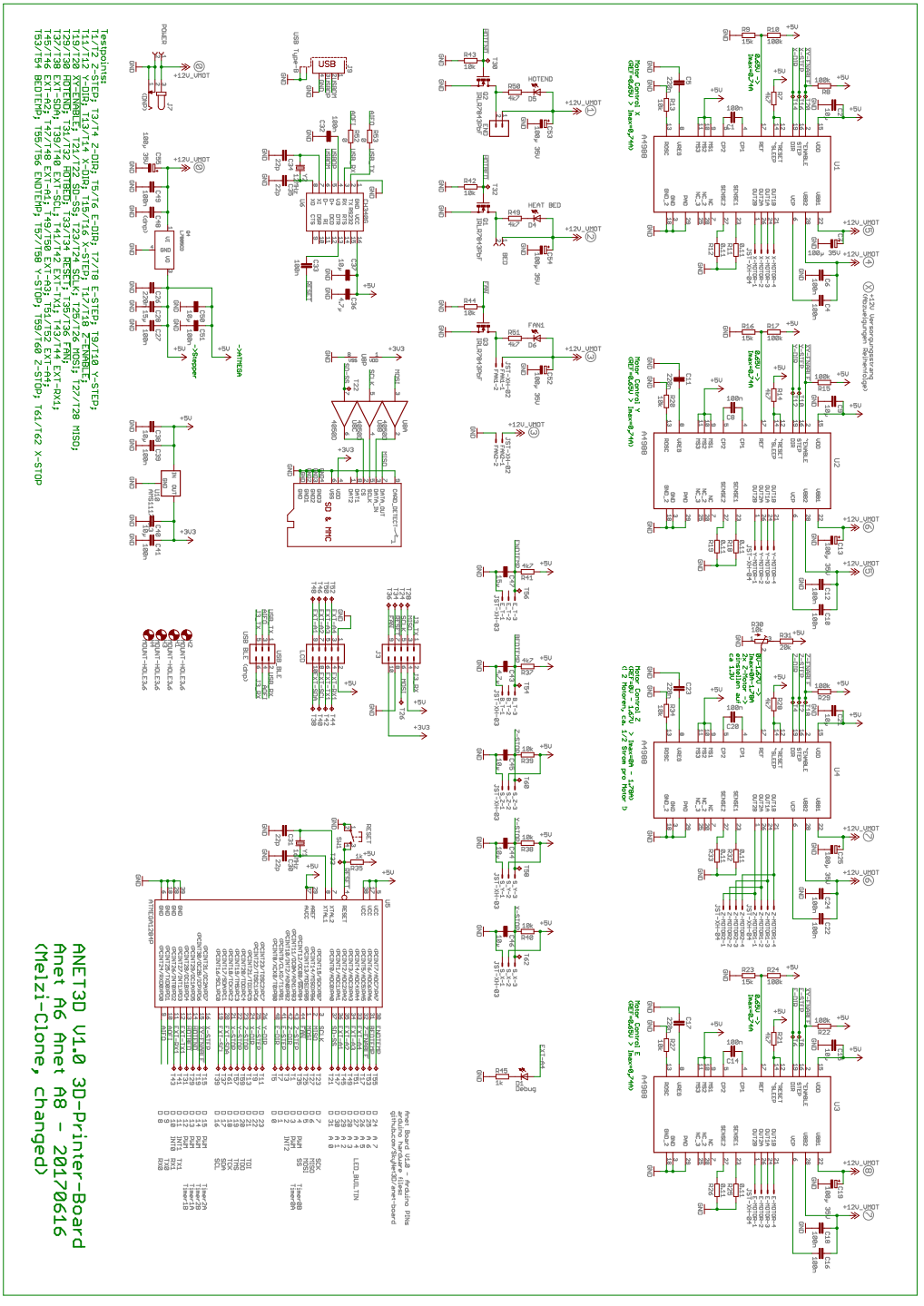
10-3-3　Anet3D V1.7 (P-110)



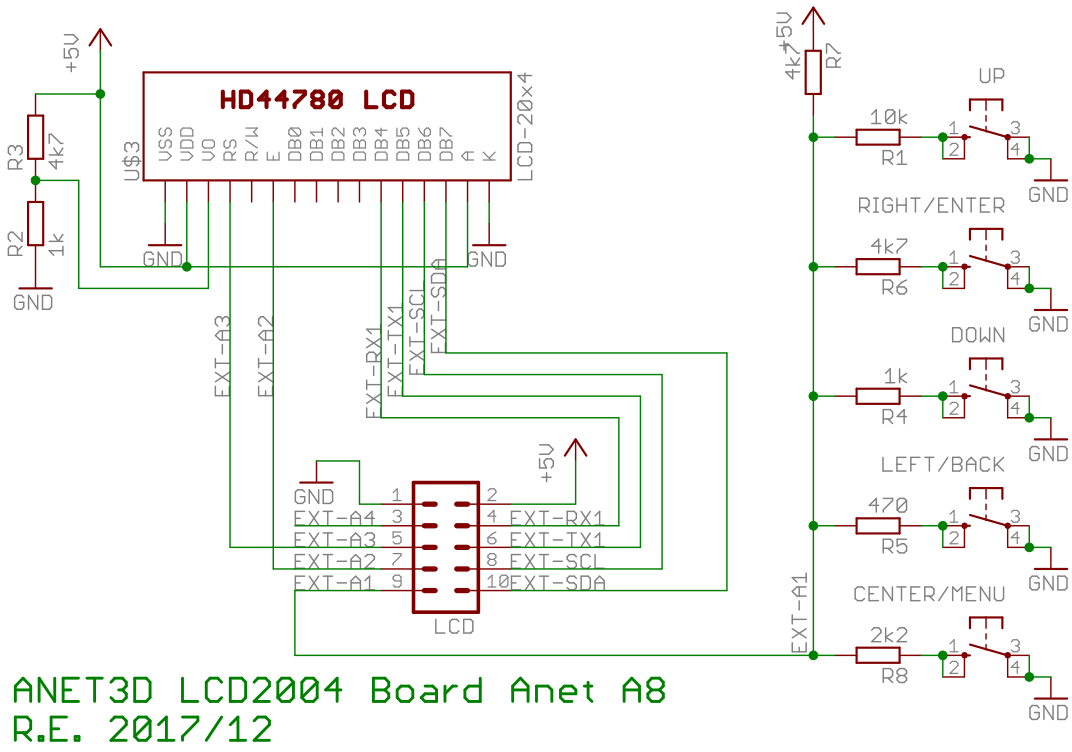
net A8/A6/A3/A2 に付属の制御基板です．V1.7 となって端子台，
電源周りが変更されました

◉Anet A8 LCD12864 to mksbase v1.3（Creative Commons - Attribution license）

URL https://www.thingiverse.com/thing:2428214



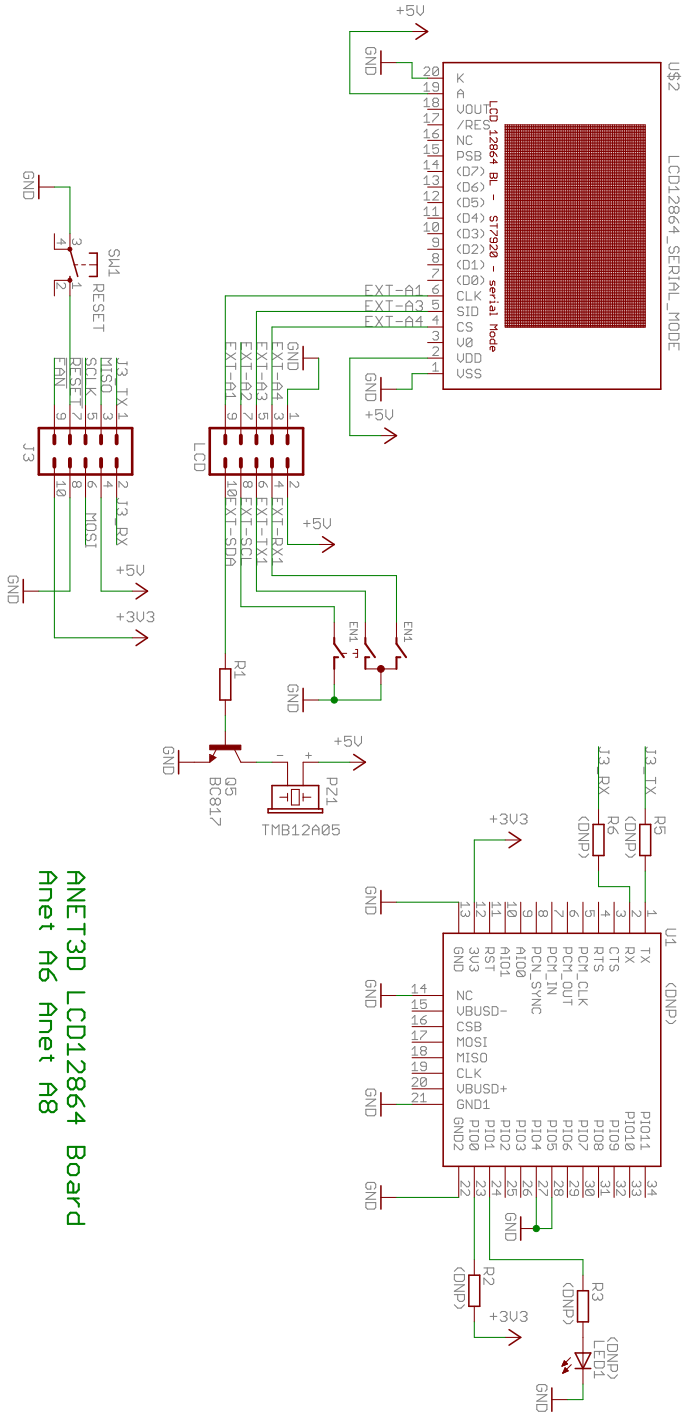
ANET3D V1.7 ボードです



ANET3D LCD2004 Board Anet A8
R.E. 2017/12

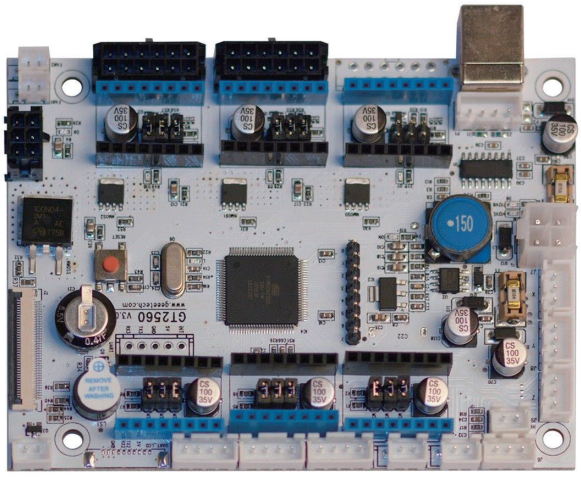
Anet A8 に付属する LCD2004 ボードです．RepRap とはコネクタの互換性がありません．

MCU	ATmega1284
USB IF	CH340
モータードライバ	A4982 × 4（実装）
電源	12V（端子）
基板サイズ	100 × 95 mm
製造メーカー	Shenzhen Anet Technology Co.,Ltd
URL	http://www.anet3d.com/



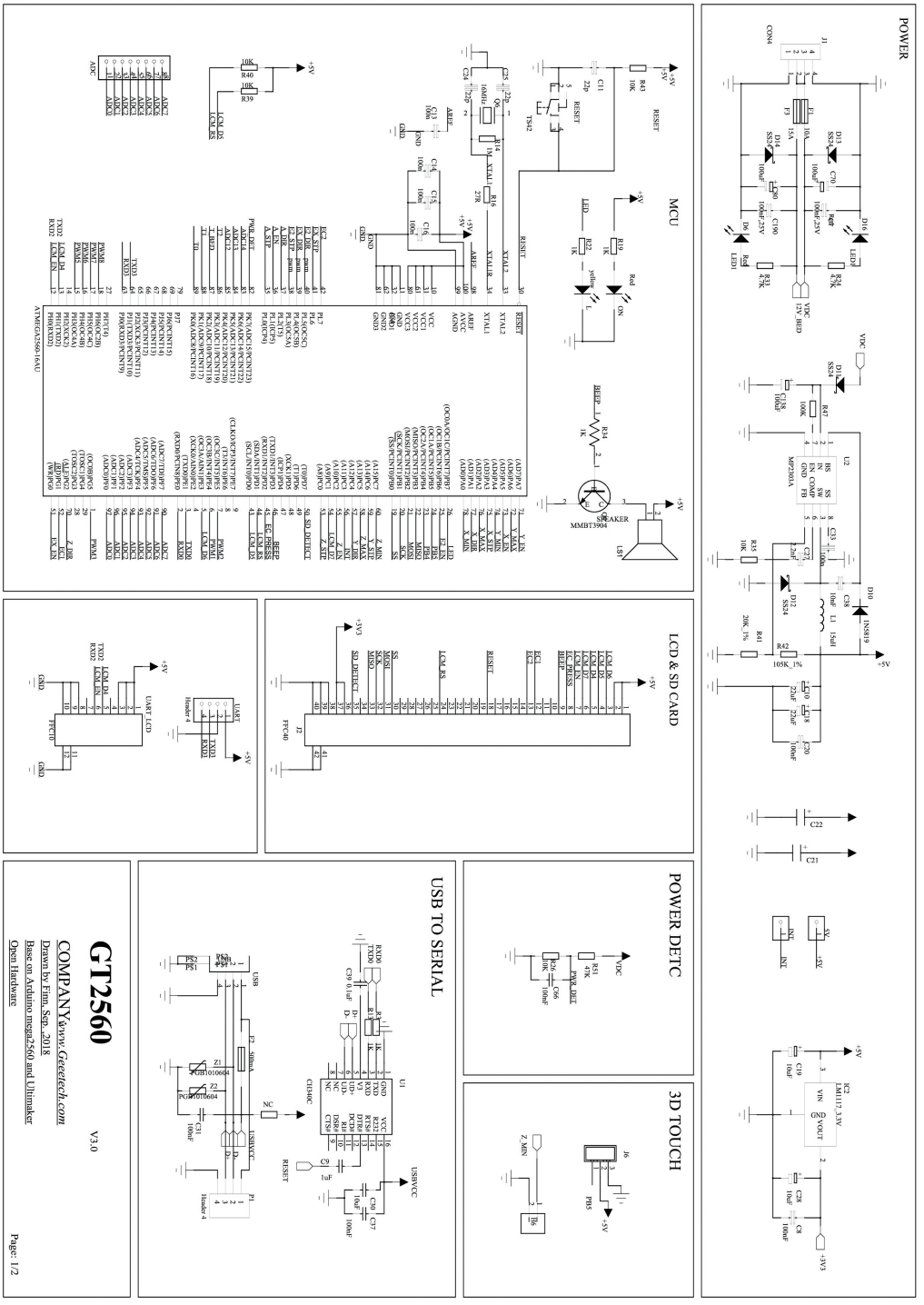
Anet A6 に付属する LCD12864 ボードです．RepRap とはコネクタの互換性がありません．

10-3-4　GEEETECH GT2560 V3.0 (P-115)

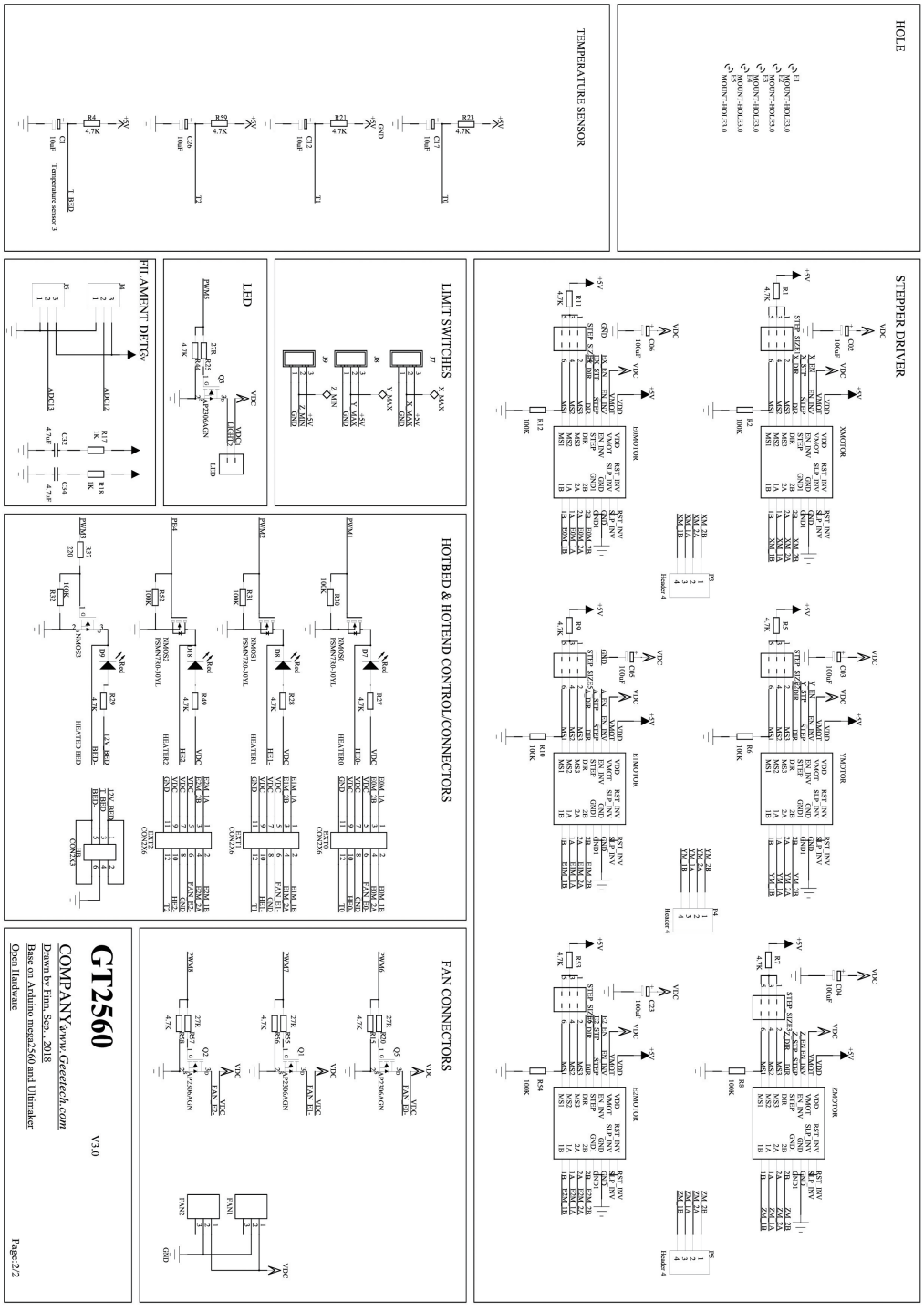


GEEETECH GT2560 V3.0

MCU	ATmega2560
USB IF	CH340
モータードライバ	ソケット×6
電源	12V / 24V（ナイロンコネクタ）
製造メーカー	geeetech
URL	https://www.geeetech.com/
GitHub	https://github.com/Geeetech3D/Diagram
wiki	http://www.geeetech.com/wiki/index.php



GEEETECH GT2560 V3.0 回路図 _1/2

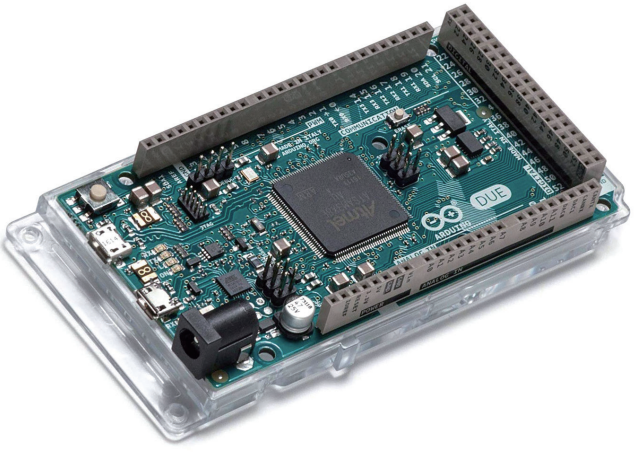


GEEETECH GT2560 V3.0 回路図 _2/2

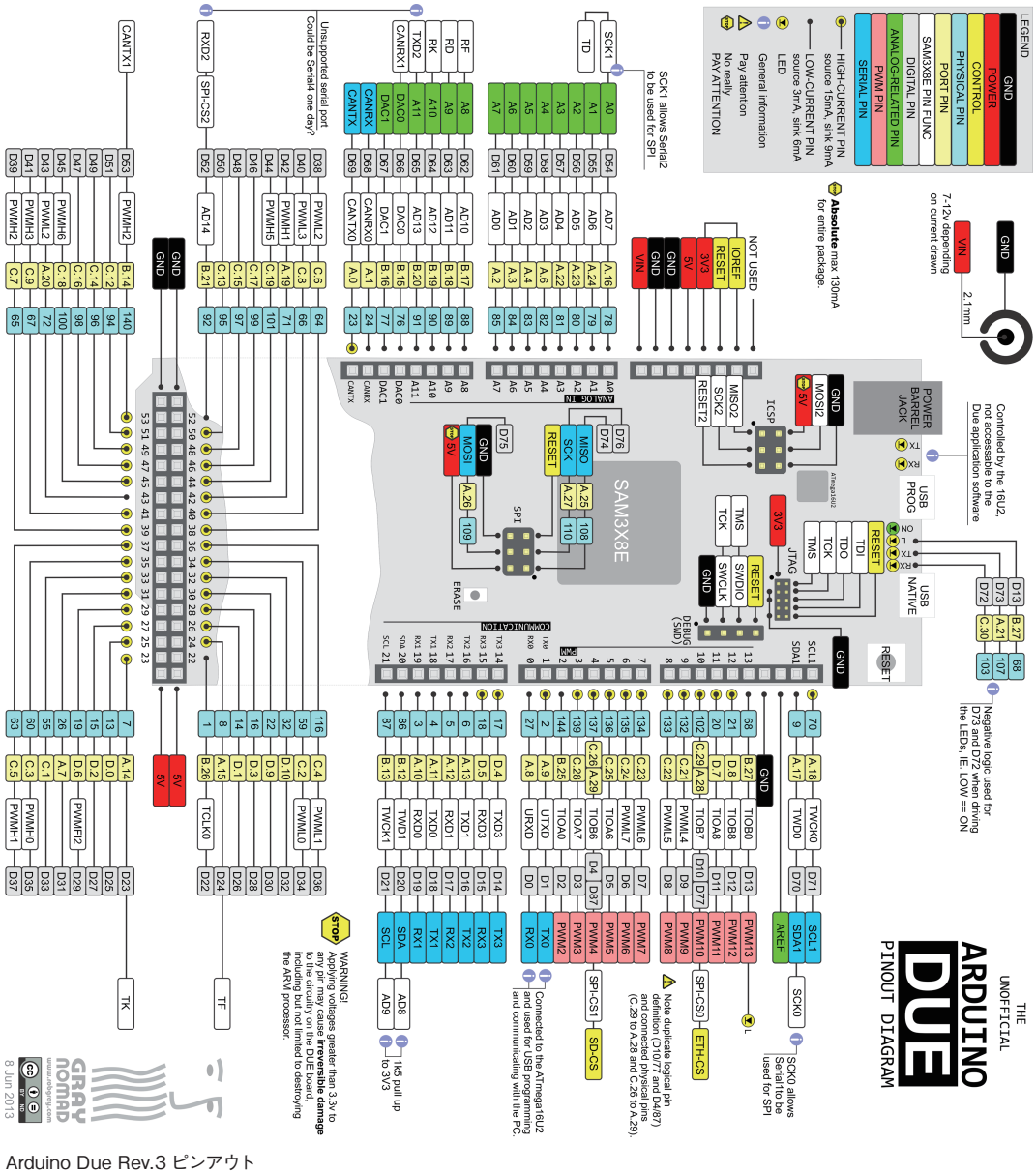
Chapter

4 Arduino Due Rev.3

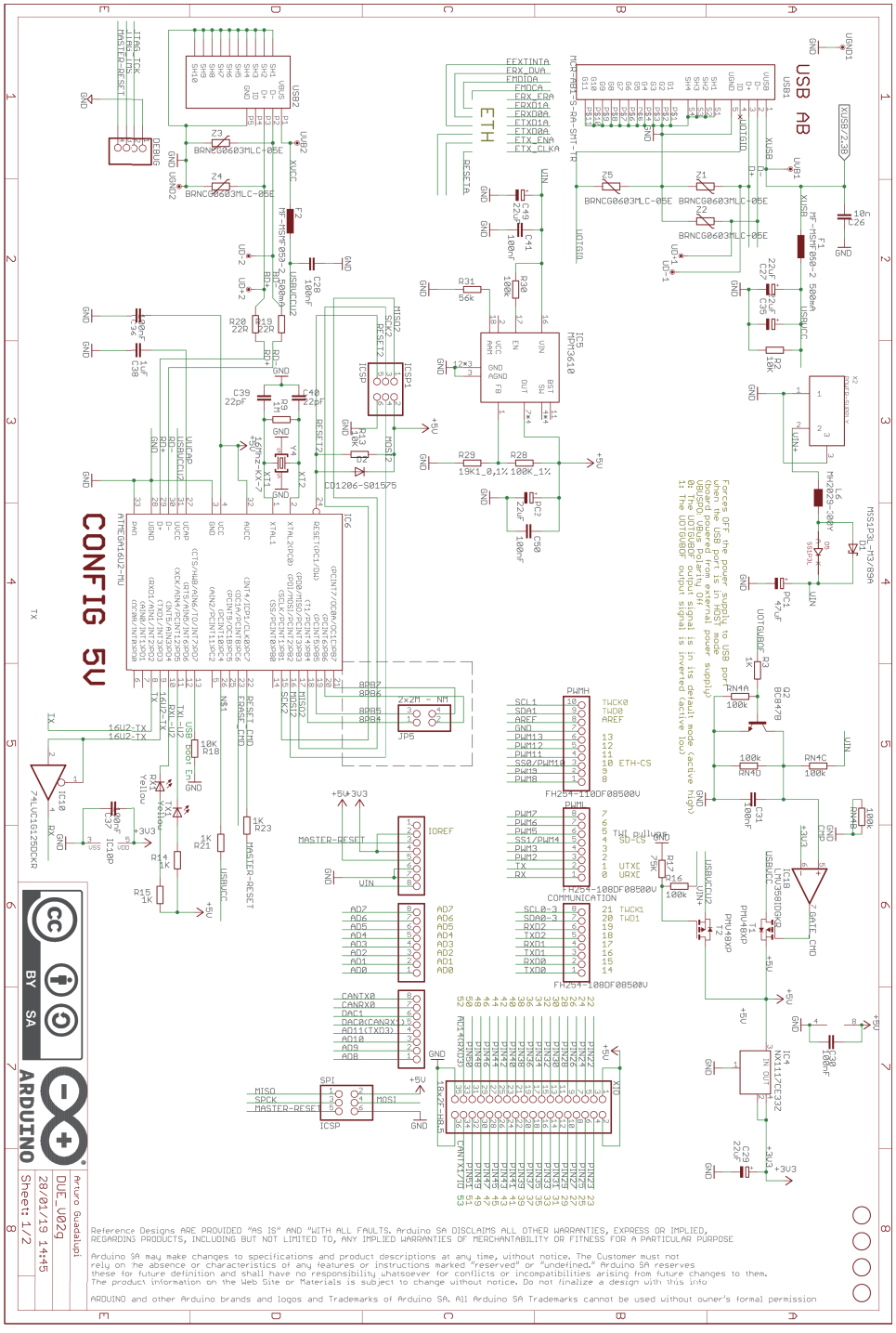
(P-121)



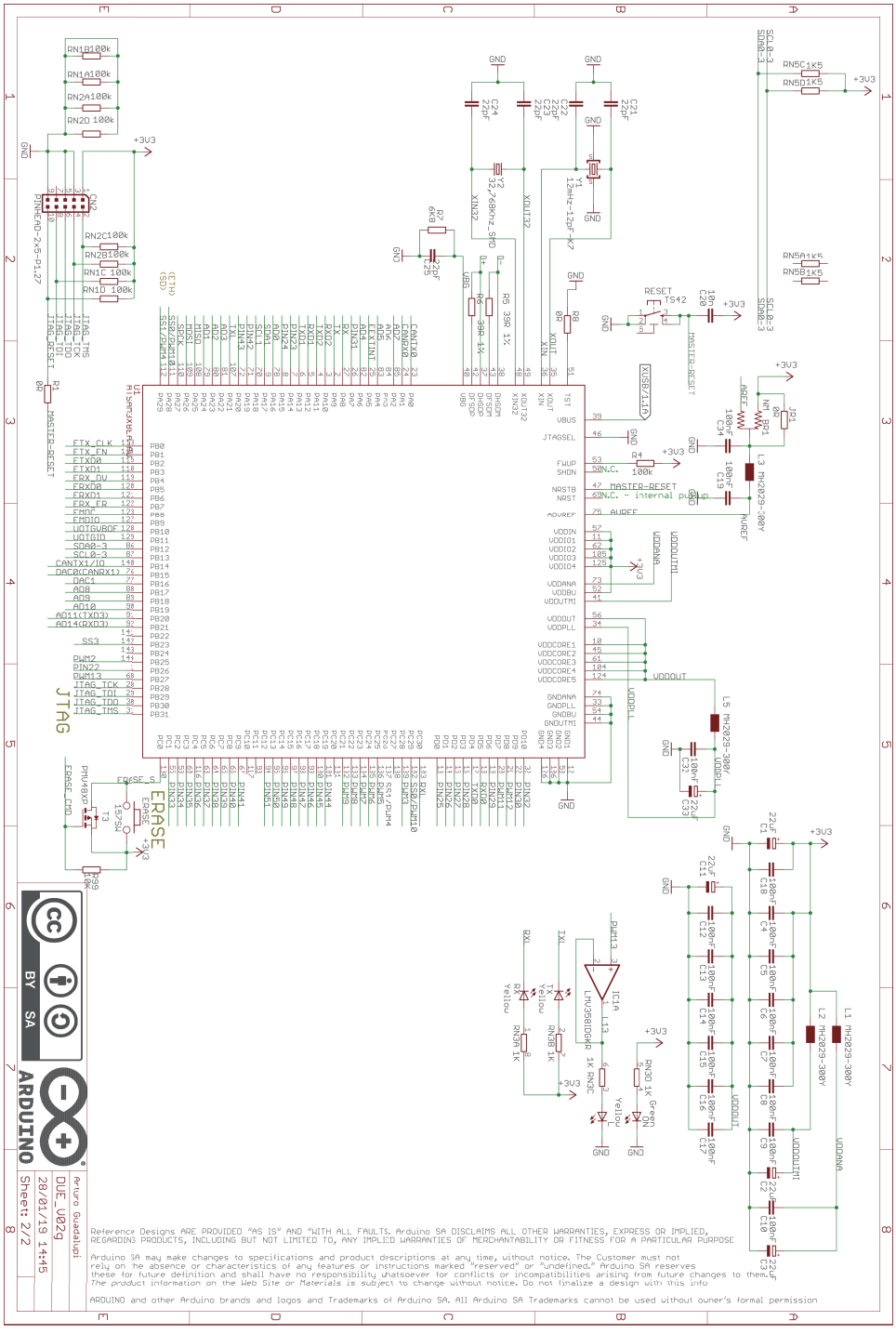
Arduino Due Rev.3　32bitARM Cortex-M3 を搭載した MCU ボードです.



Arduino Due Rev.3 ピンアウト



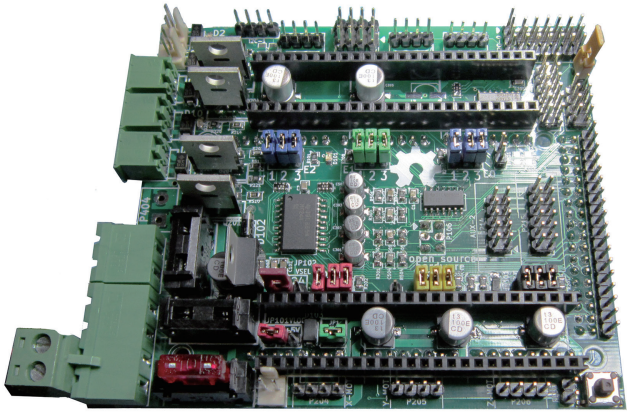
Arduino Due Rev.3 回路図 _1/2



Arduino Due Rev.3 回路図 _2/2

Chapter 5

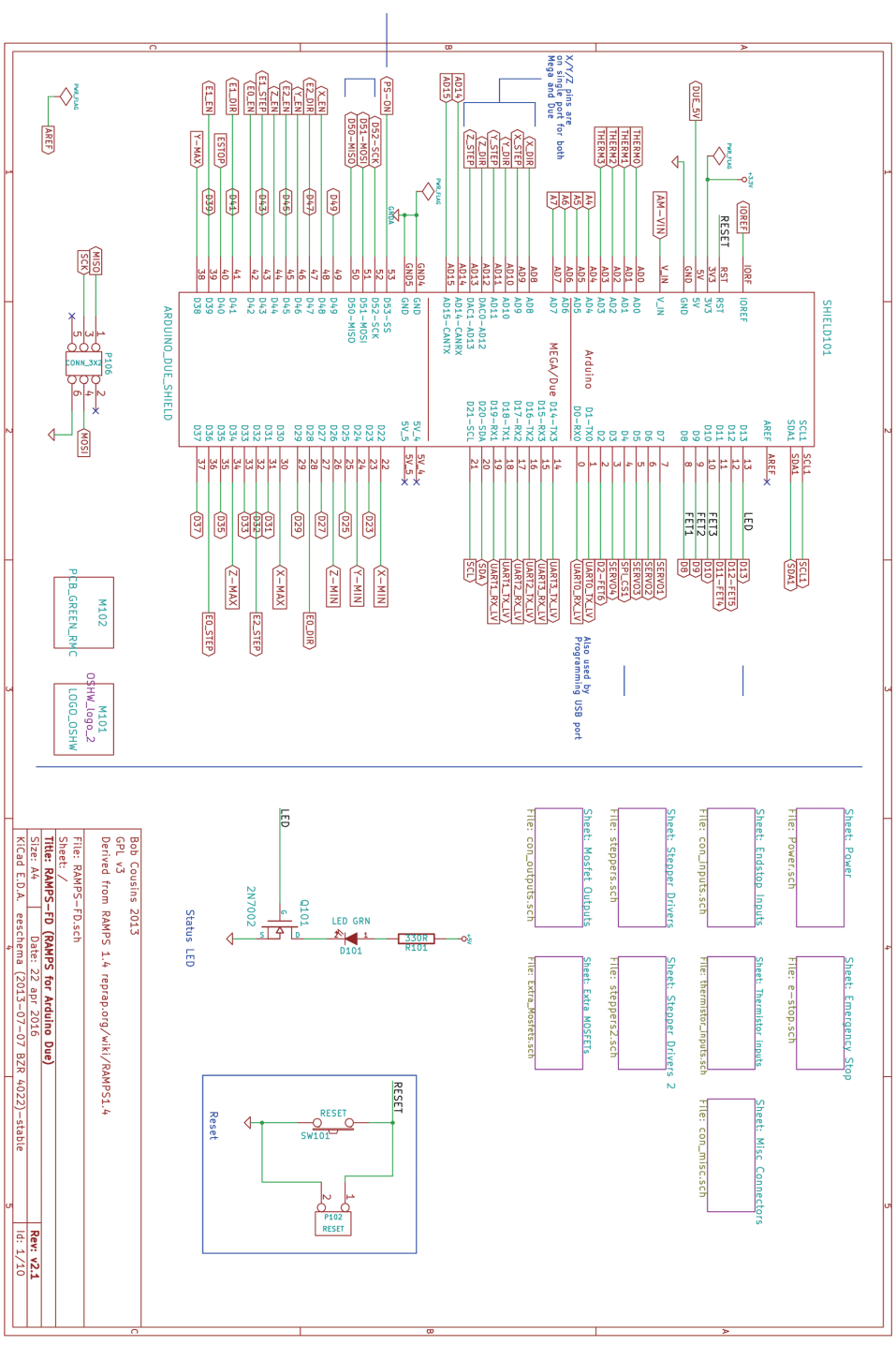
ARMコア対応シールド RAMPS-FD V2.1 (P-122)



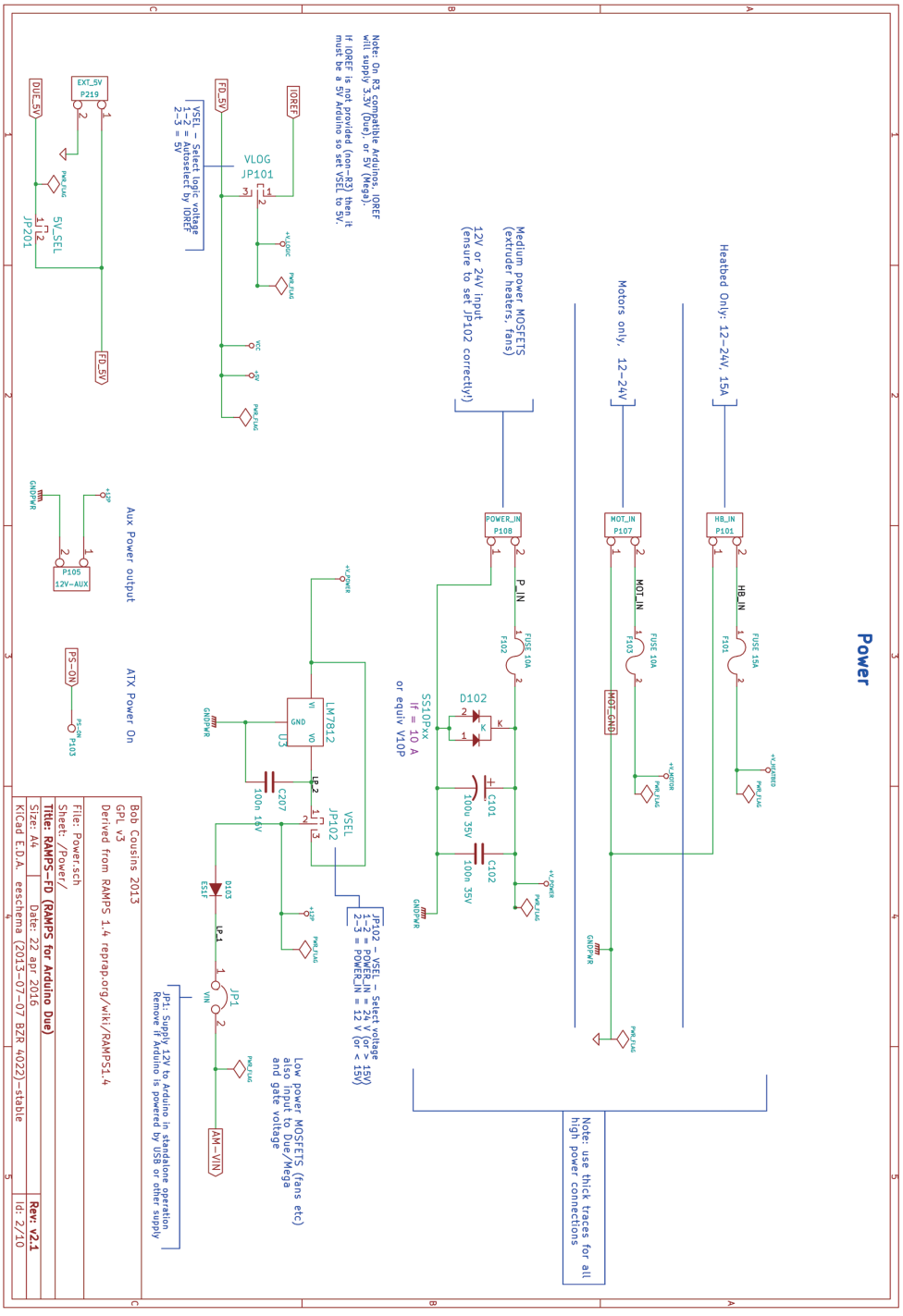
RAMPS-FD と LCD 変換コネクタ

◉GitHub：https://github.com/bobc/bobc_hardware/tree/master/RAMPS-FD

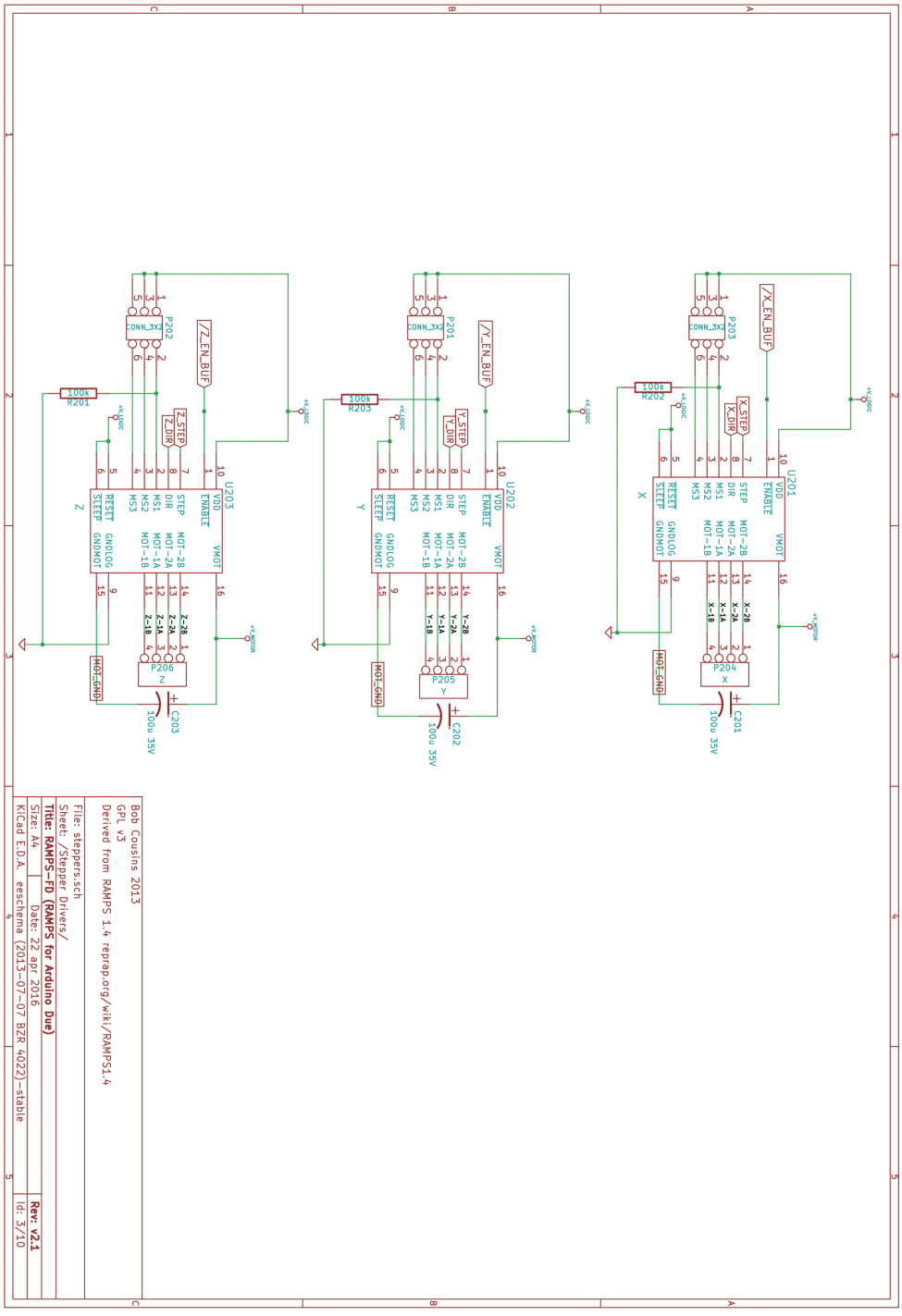
モータードライバ	ソケット×6
電源	12V-24V DC（端子）
ライセンス	GNU GPL v3.0



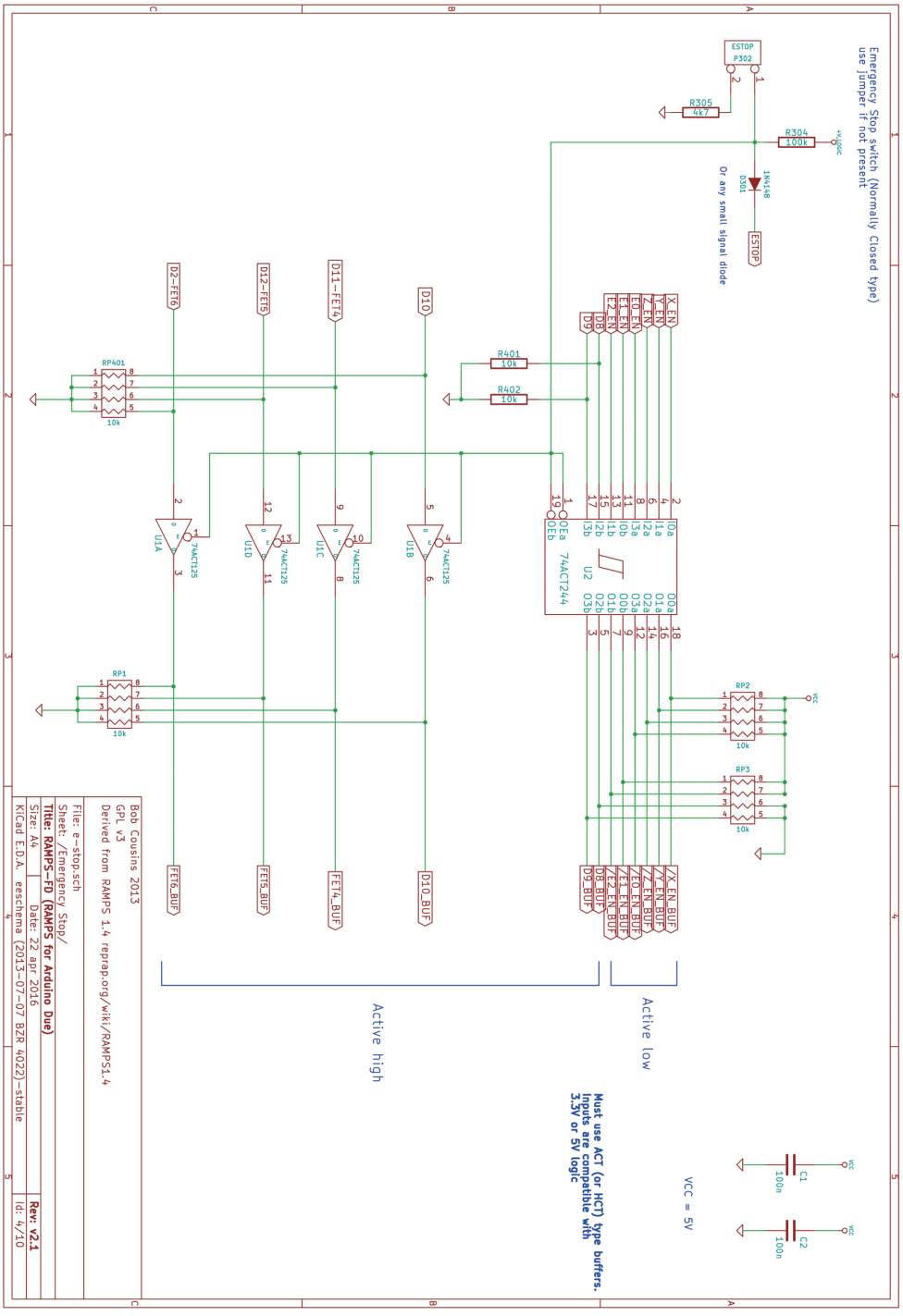
RAMPS-FD V2.1 回路図 _1/10



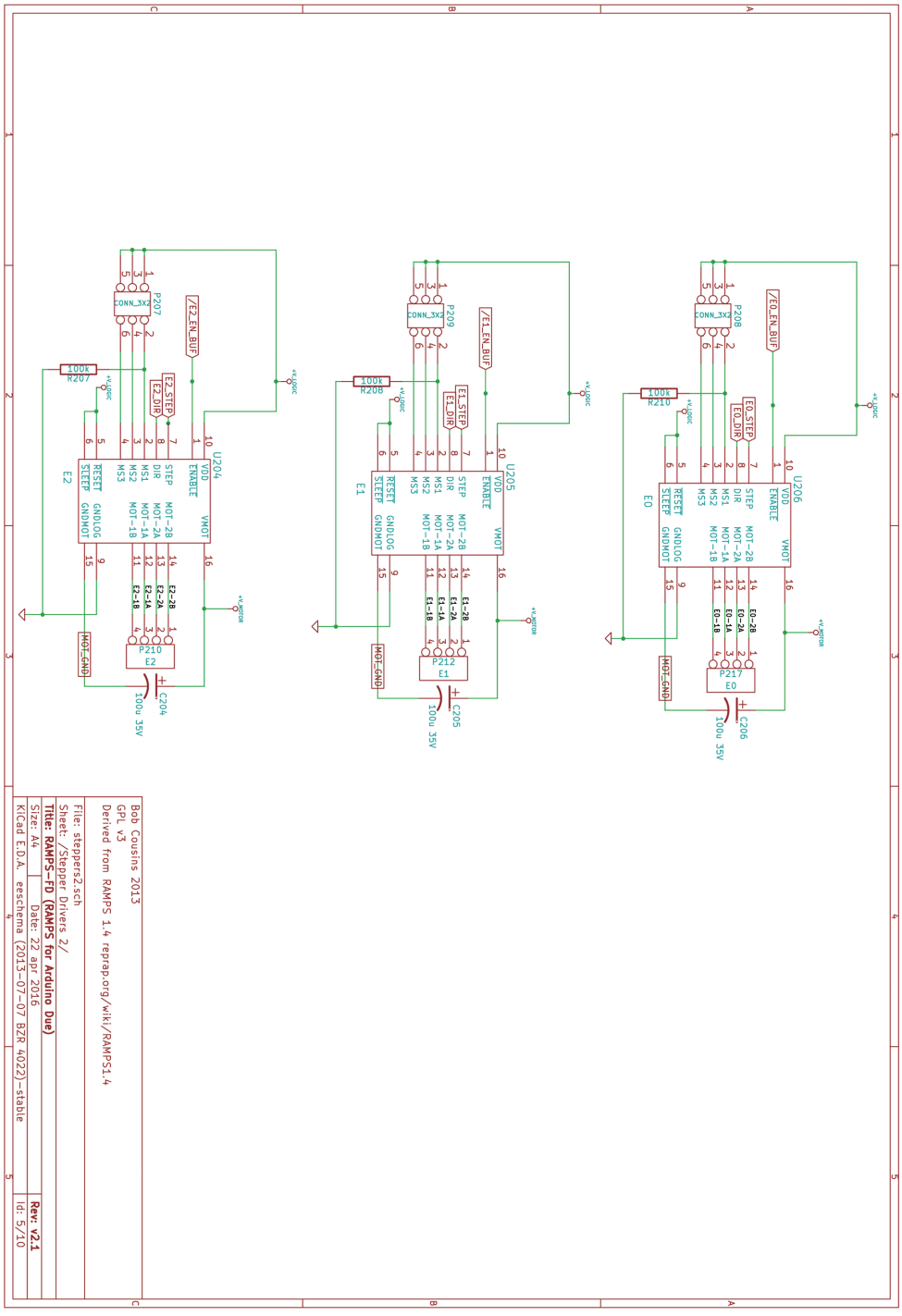
RAMPS-FD V2.1 回路図 _2/10



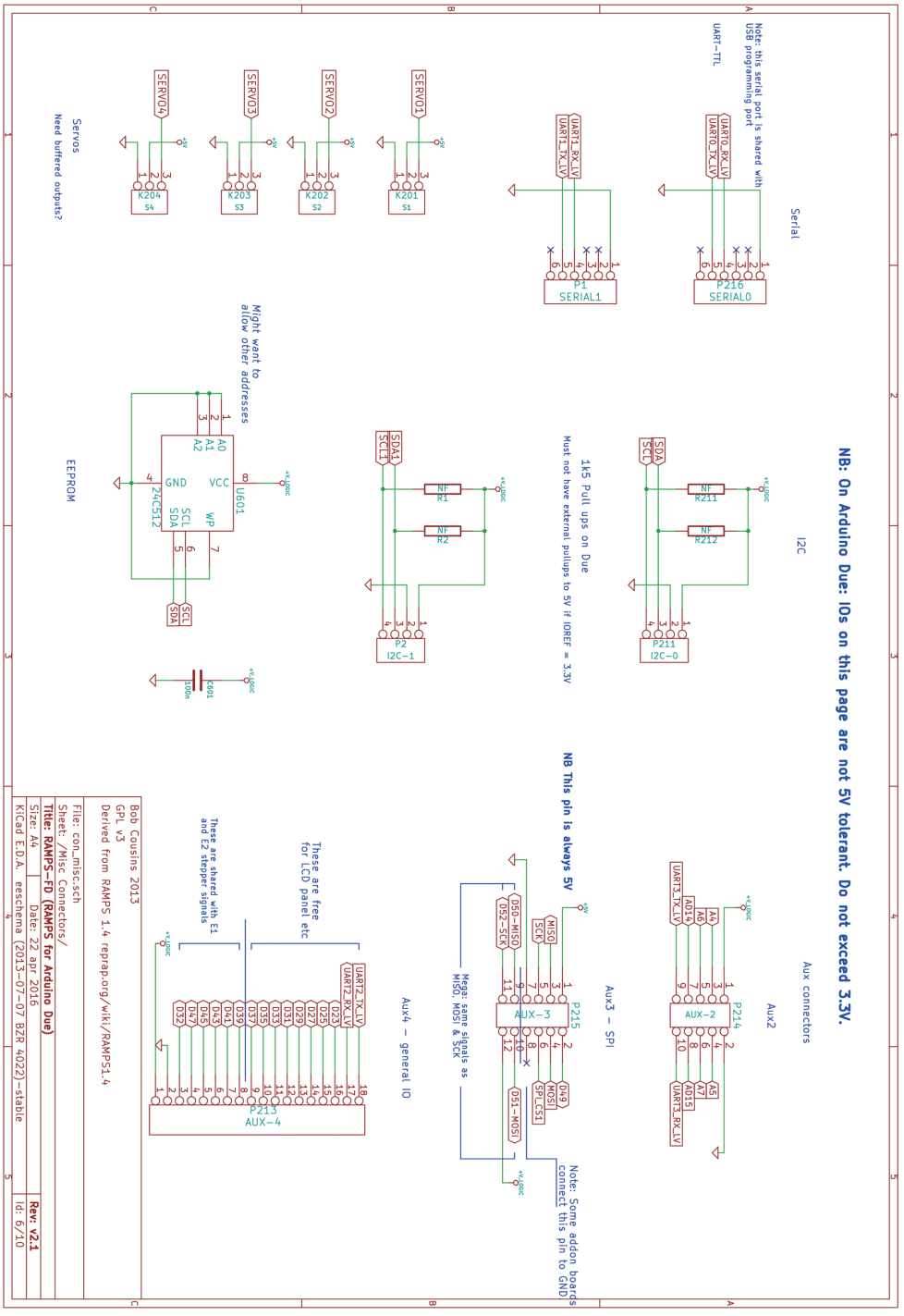
RAMPS-FD V2.1 回路図 _3/10



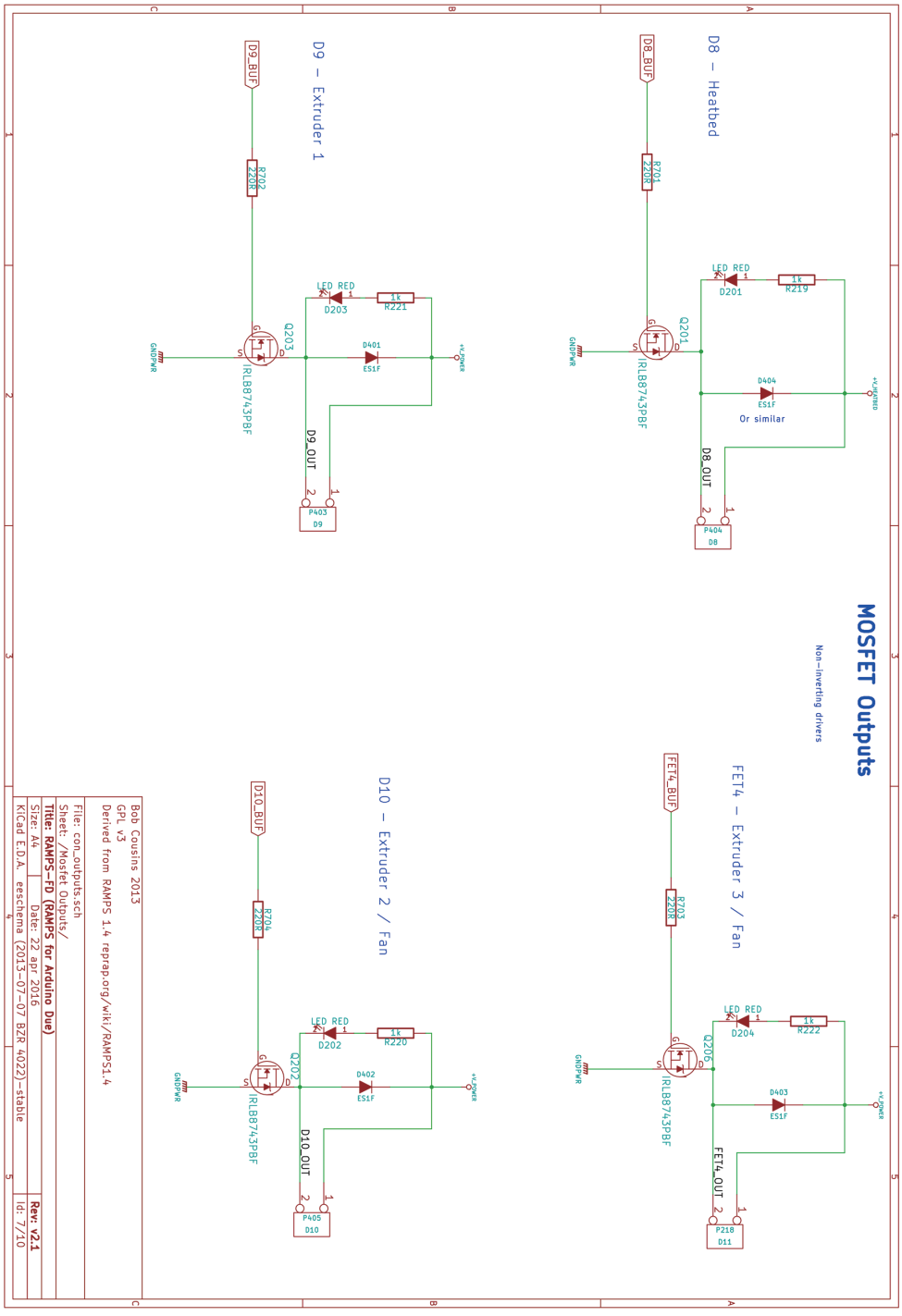
RAMPS-FD V2.1 回路図 _4/10



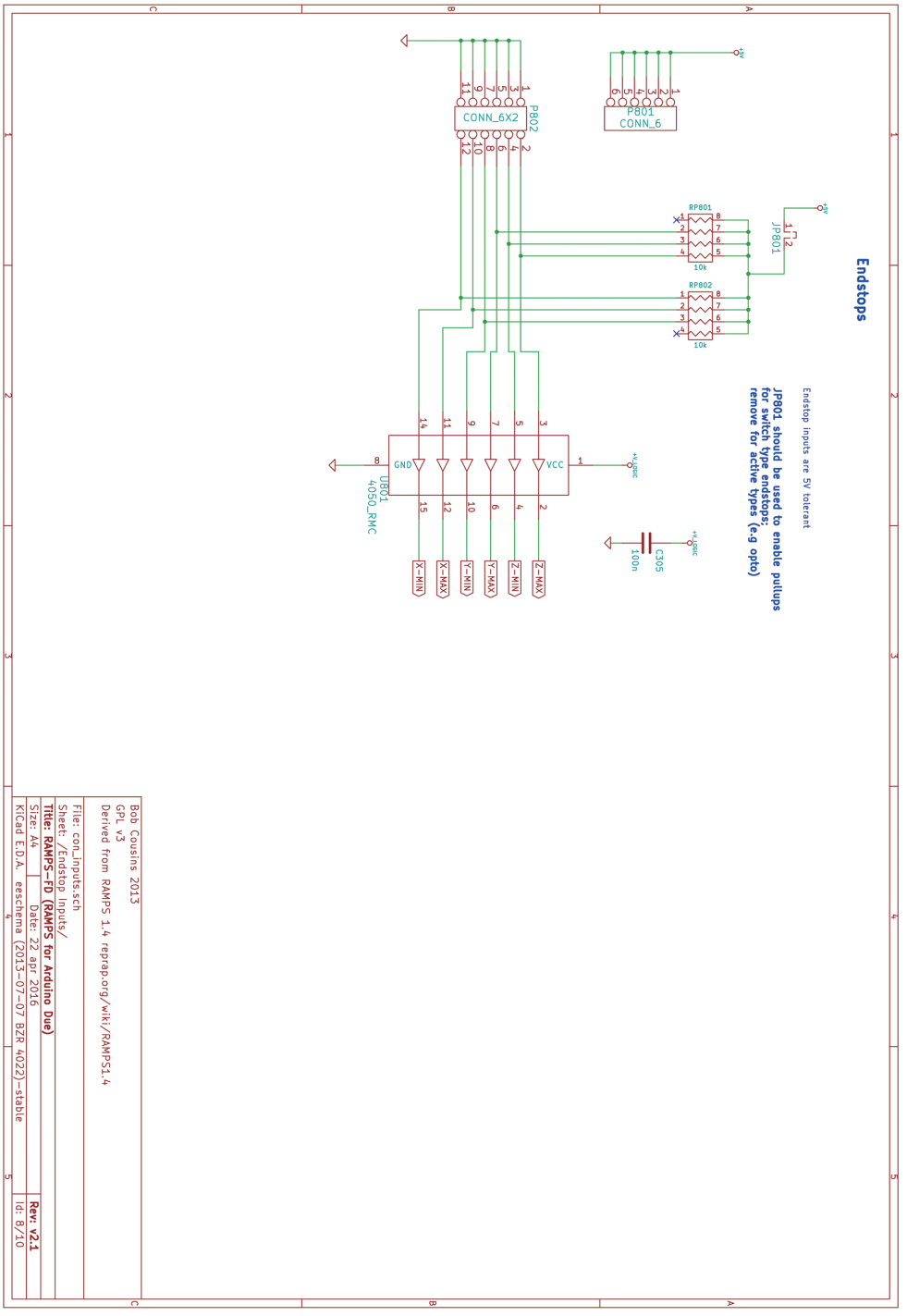
RAMPS-FD V2.1 回路図 _5/10



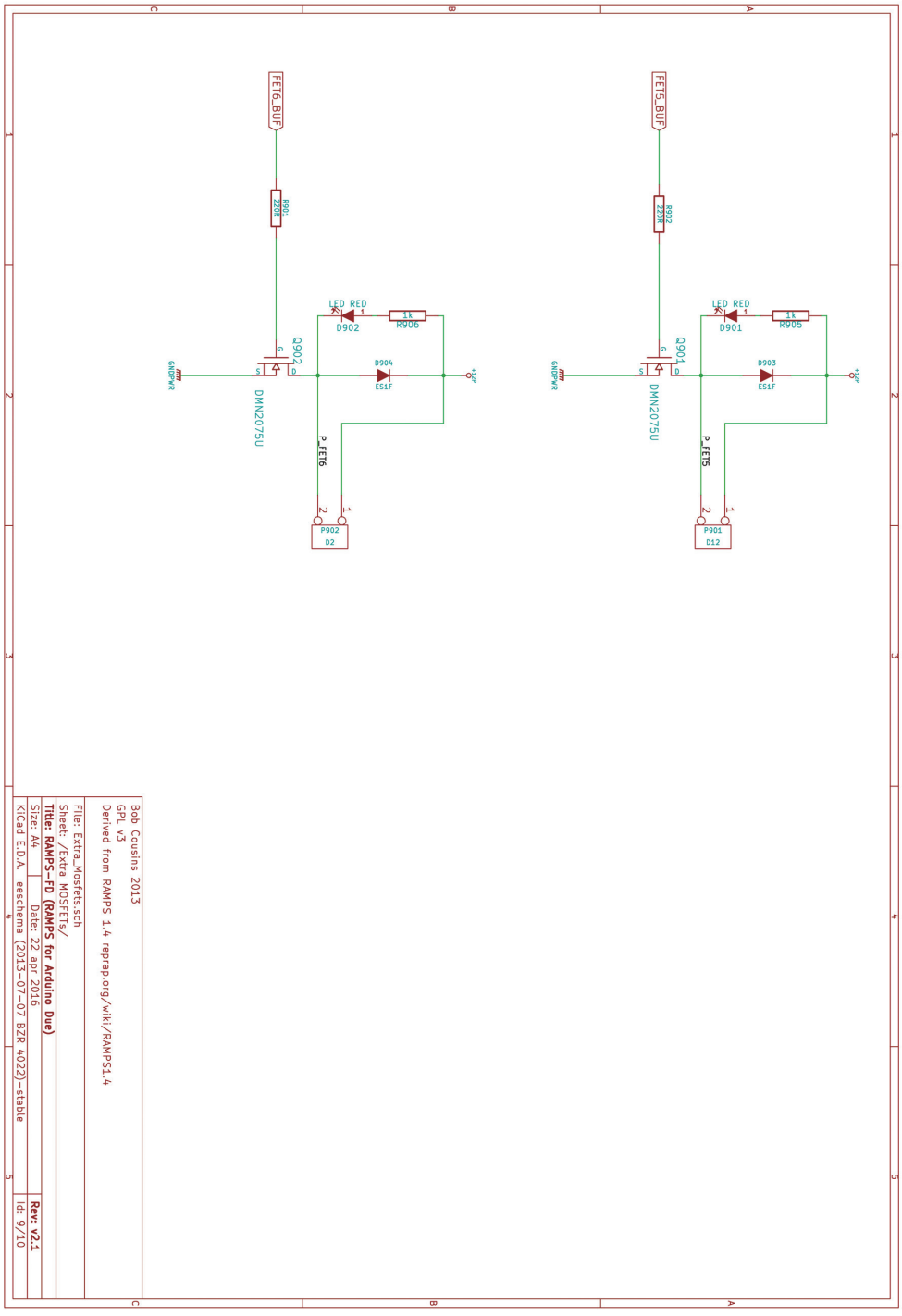
RAMPS-FD V2.1 回路図 _6/10



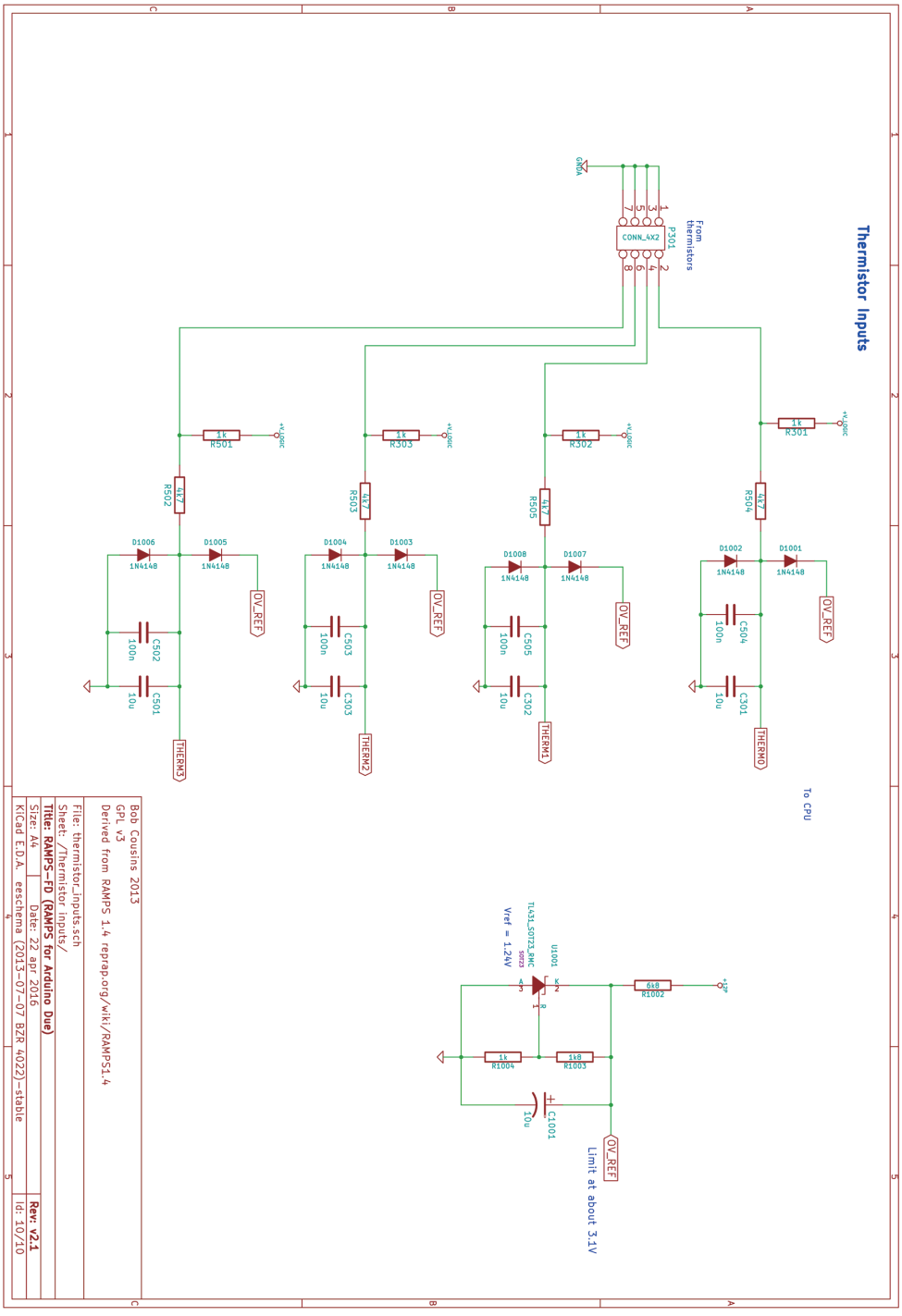
RAMPS-FD V2.1 回路図 _7/10



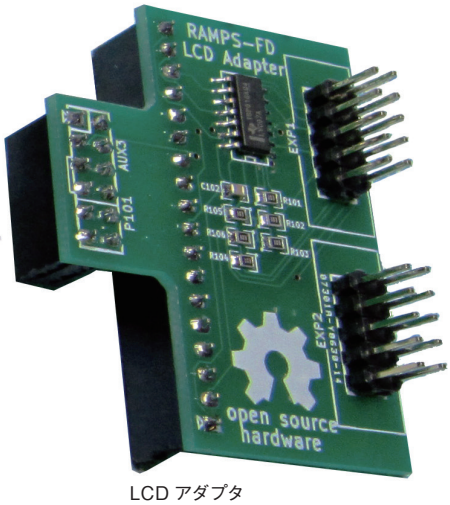
RAMPS-FD V2.1 回路図 _8/10



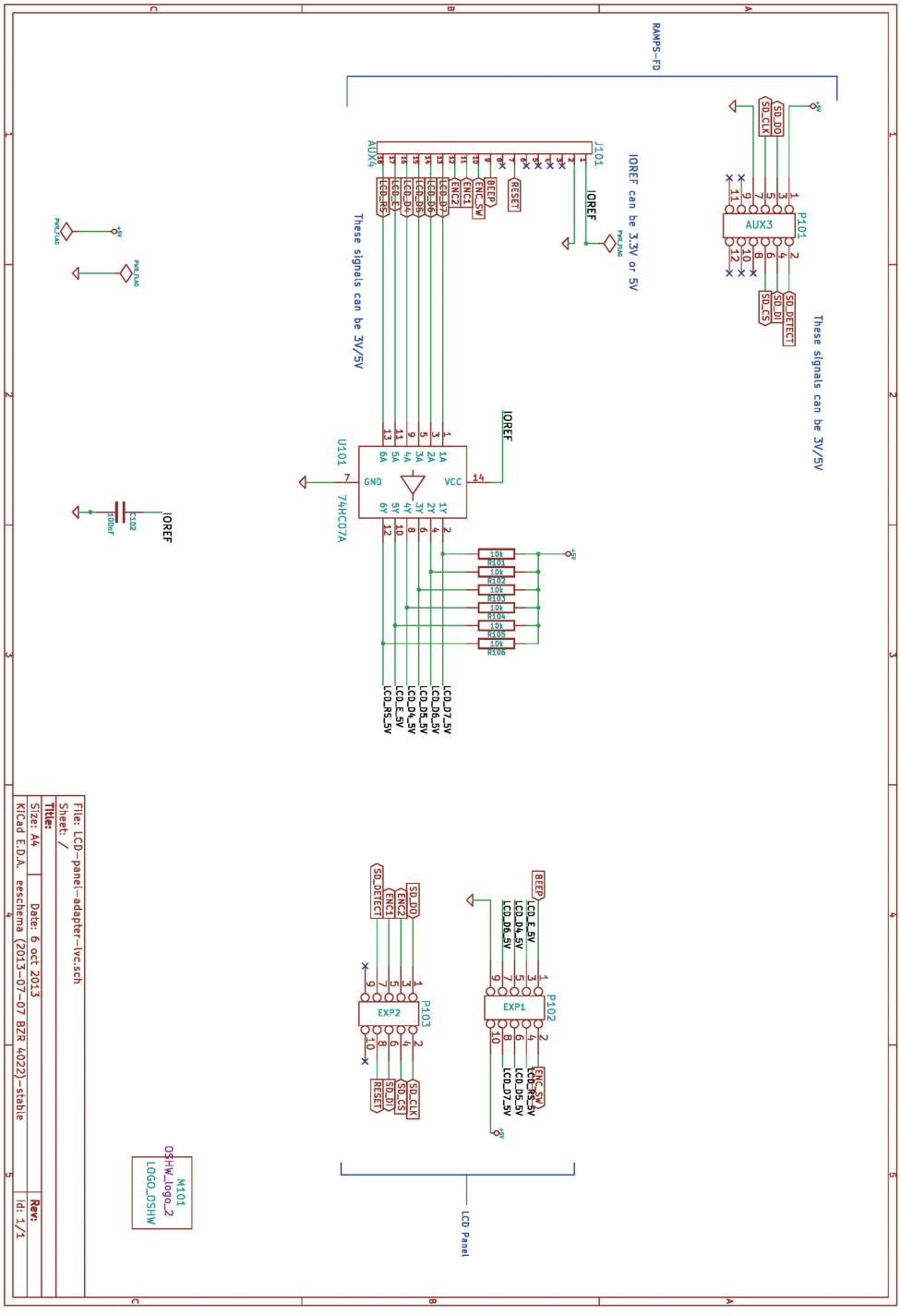
RAMPS-FD V2.1 回路図 _9/10



RAMPS-FD V2.1 回路図 _10/10


RAMPS-FD
LCD Adapter
EXP1
EXP2
AUX3
P101
C102
R105
R106
R104
R101
R102
R103
open source
hardware

LCD アダプタ

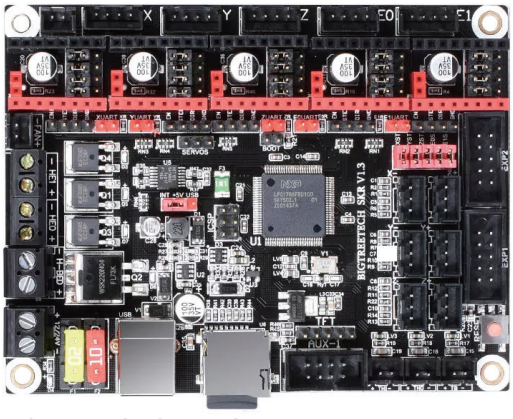

RAMPS-FD
P101
AUX3
SD_DD
SD_CLK
SD_DETECT
SD_DI
SD_CS
These signals can be 3V/5V
J101
IOREF can be 3.3V or 5V
IOREF
PWR_FLAG
AUX4
BEEP
ENC_SW
ENC1
ENC2
RESET
LCD_D7
LCD_D6
LCD_D5
LCD_D4
LCD_E
LCD_RS
These signals can be 3V/5V
U101
74HC07A
GND
VCC
1A
2A
3A
4A
5A
6A
1Y
2Y
3Y
4Y
5Y
6Y
R101
R102
R103
R104
R105
R106
10k
LCD_D7_5V
LCD_D6_5V
LCD_D5_5V
LCD_D4_5V
LCD_E_5V
LCD_RS_5V
C102
100nF
P102
EXP1
LCD_D7_5V
LCD_D6_5V
LCD_D5_5V
LCD_D4_5V
LCD_E_5V
LCD_RS_5V
P103
EXP2
M101
OSHW_logo_2
LOGO_OSHW
LCD Panel
File: LCD-panel-adapter-lvc.sch
Sheet: /
Title:
Size: A4
Date: 6 oct 2013
Rev:
KiCad E.D.A. eeschema (2013-07-07 BZR 4022)-stable
Id: 1/1

LCD アダプタ回路図

Chapter 6

ARM統合型ボード

10-6-1　BIGTREETECH SKR V1.3 (P-123)

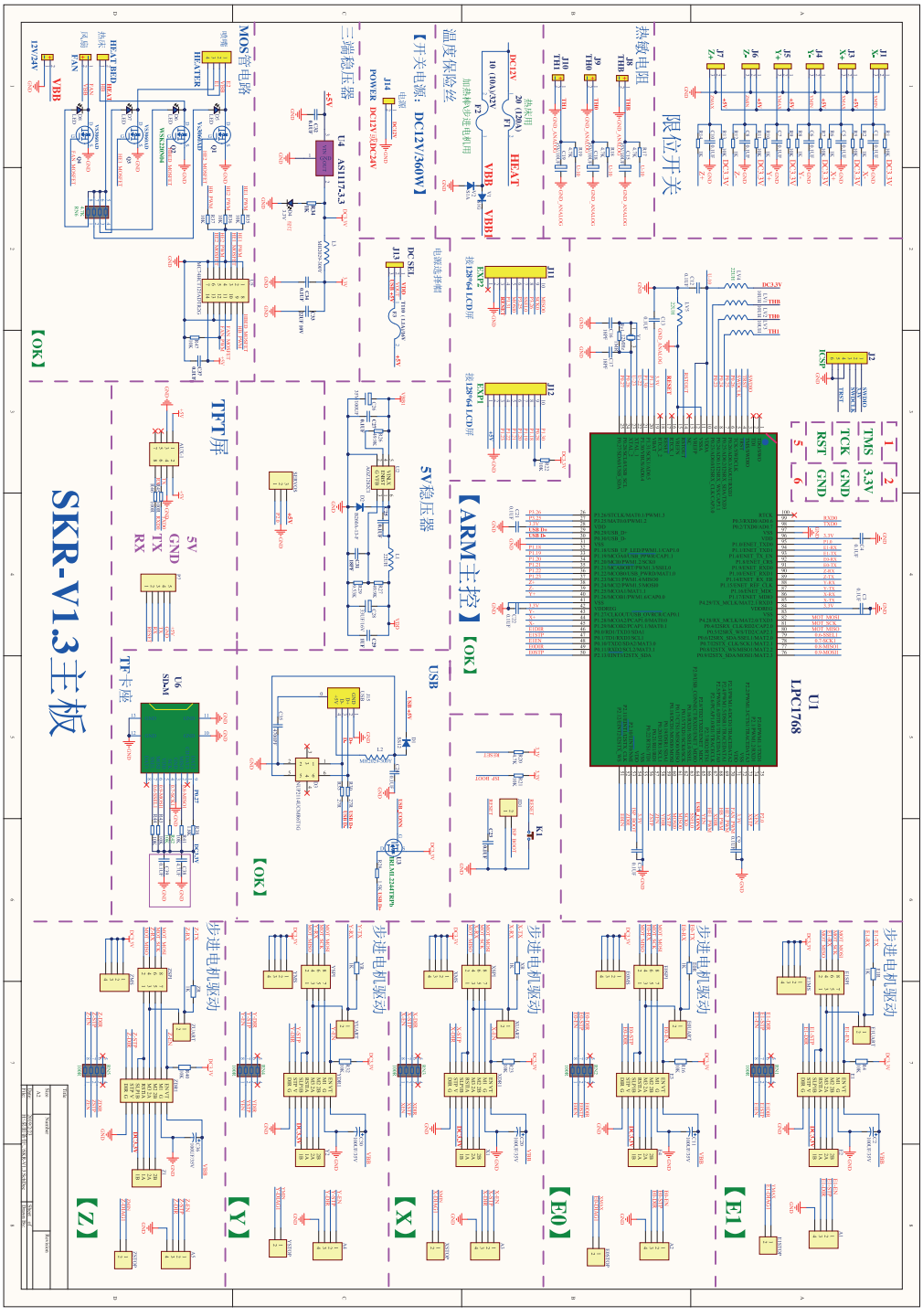


BIGTREETECH SKR V1.3

◉GitHub：BIGTREETECH-SKR-V1.3

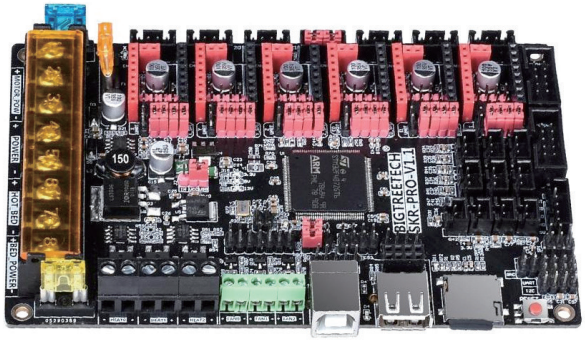
URL https://github.com/bigtreetech/BIGTREETECH-SKR-V1.3/

MCU	32bit ARM Cortex-M3 LPC1768 100MHz
モータードライバ	ソケット×5
電源入力	12V-24V DC, 5A ～ 15A（端子台）
基板サイズ	109.67mm × 84.30mm
製造メーカー	BIGTREETECH
URL	http://www.bigtree-tech.com



BIGTREETECH SKR V1.3 回路図

10-6-2　BIGTREETECH SKR Pro V1.1 (P-124)

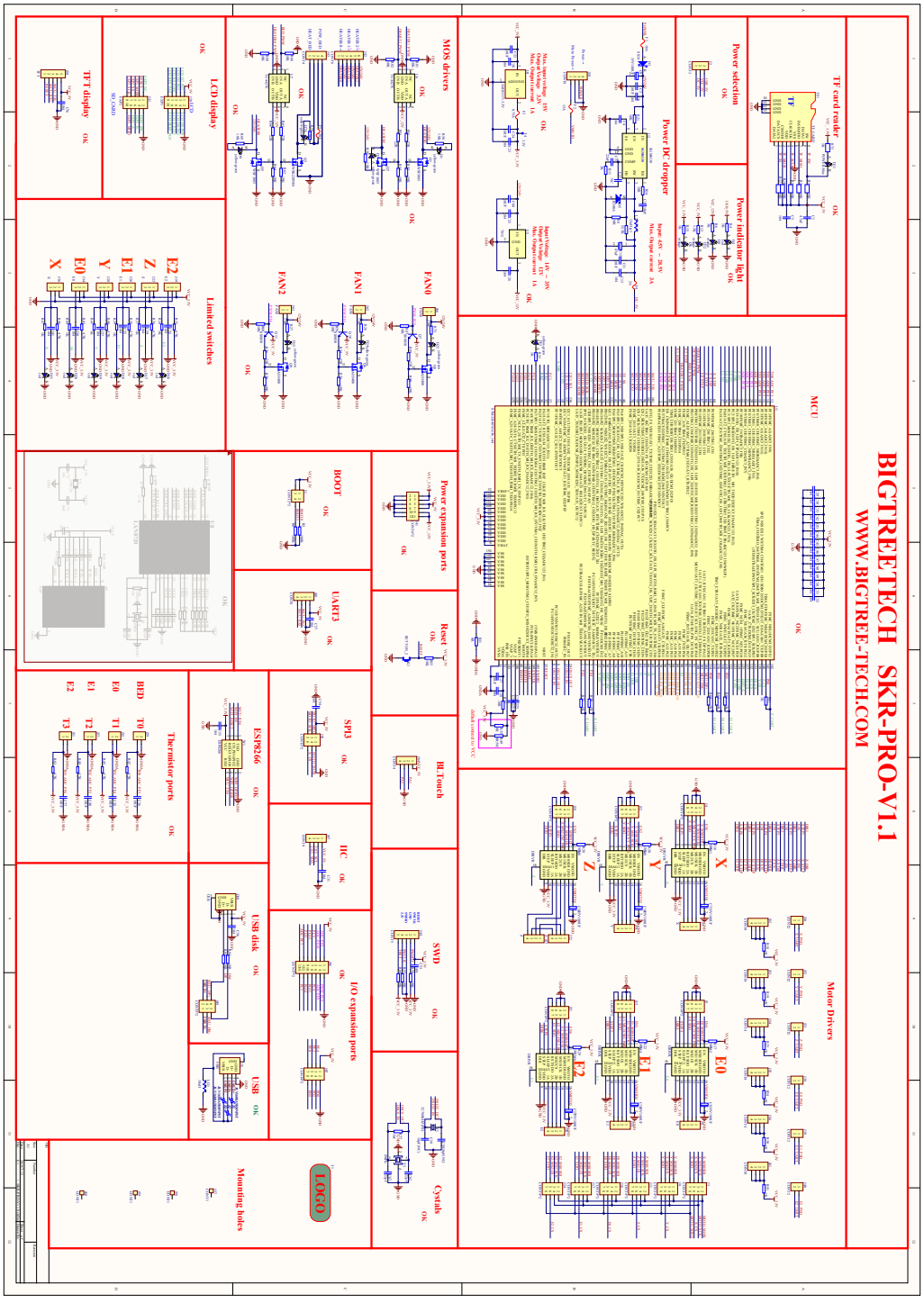


BIGTREETECH SKR PRO V1.1

◉GitHub：BIGTREETECH-SKR-PRO-V1.1

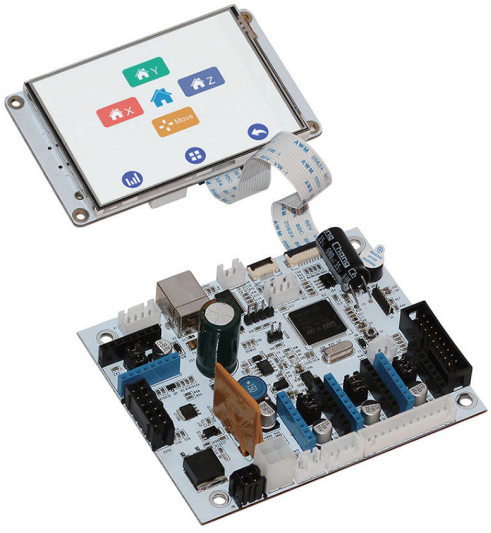
URL https://github.com/bigtreetech/BIGTREETECH-SKR-PRO-V1.1

MCU	32bit ARM Cortex-M4 STM32F407ZGT6 168MHz
モータードライバ	ソケット×6
オプション	Wi-Fiモジュール（SP8266 ESP-01S WIFI module）ESP3D用コネクタ
電源入力	12V-24V DC（端子台）
基板サイズ	147mm x 59mm
製造メーカー	BIGTREETECH
URL	http://www.bigtree-tech.com



BIGTREETECH SKR Pro V1.1 回路図

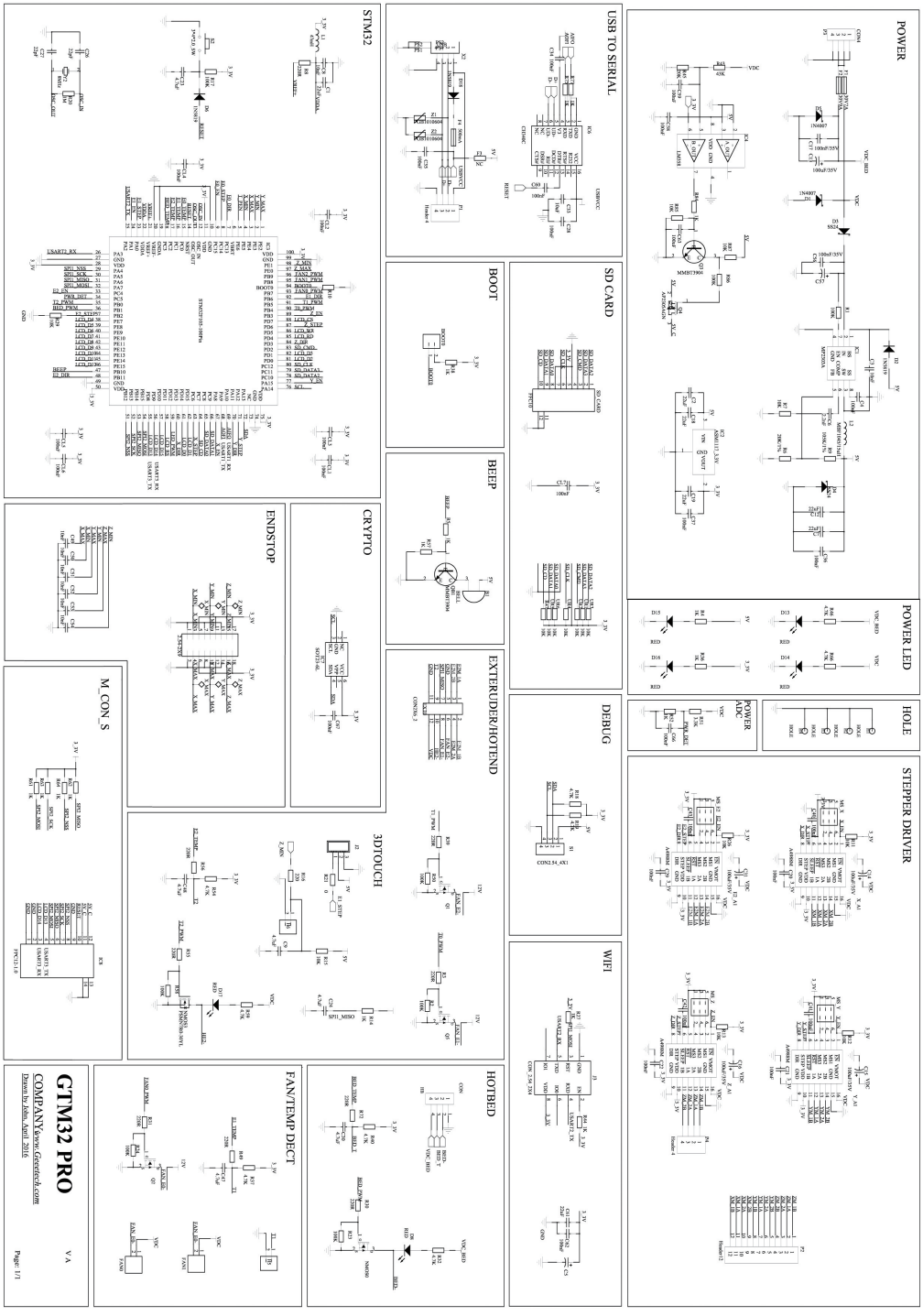
10-6-3　Geeetech GTM32 MINI S (P-125)



Geeetech GTM32 MINIS

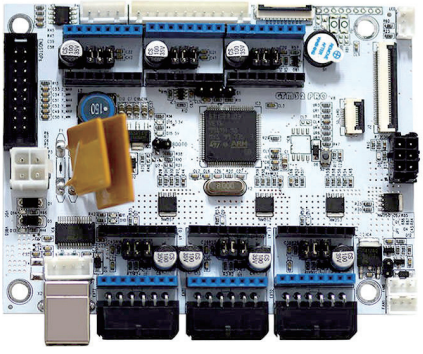
◉GitHub：https://github.com/Geeetech3D/Diagram/tree/master/3DPrinter_A30_E180
◉wiki：http://www.geeetech.com/wiki/index.php

MCU	32bit ARM Cortex-M3 STM32F103 72MHz
USB IF	FTDI FT232RL
モータードライバ	ソケット×4
オプション	Wi-Fiモジュール用コネクタ
電源入力	12V-24V DC（ナイロンコネクタ）
基板サイズ	102×84×27.5mm
製造メーカー	geeetech
URL	https://www.geeetech.com/



Geeetech GTM32 MINI S 回路図（図面のタイトルは GTM 32PRO となっていますが，MINI S で公開されている回路図です）

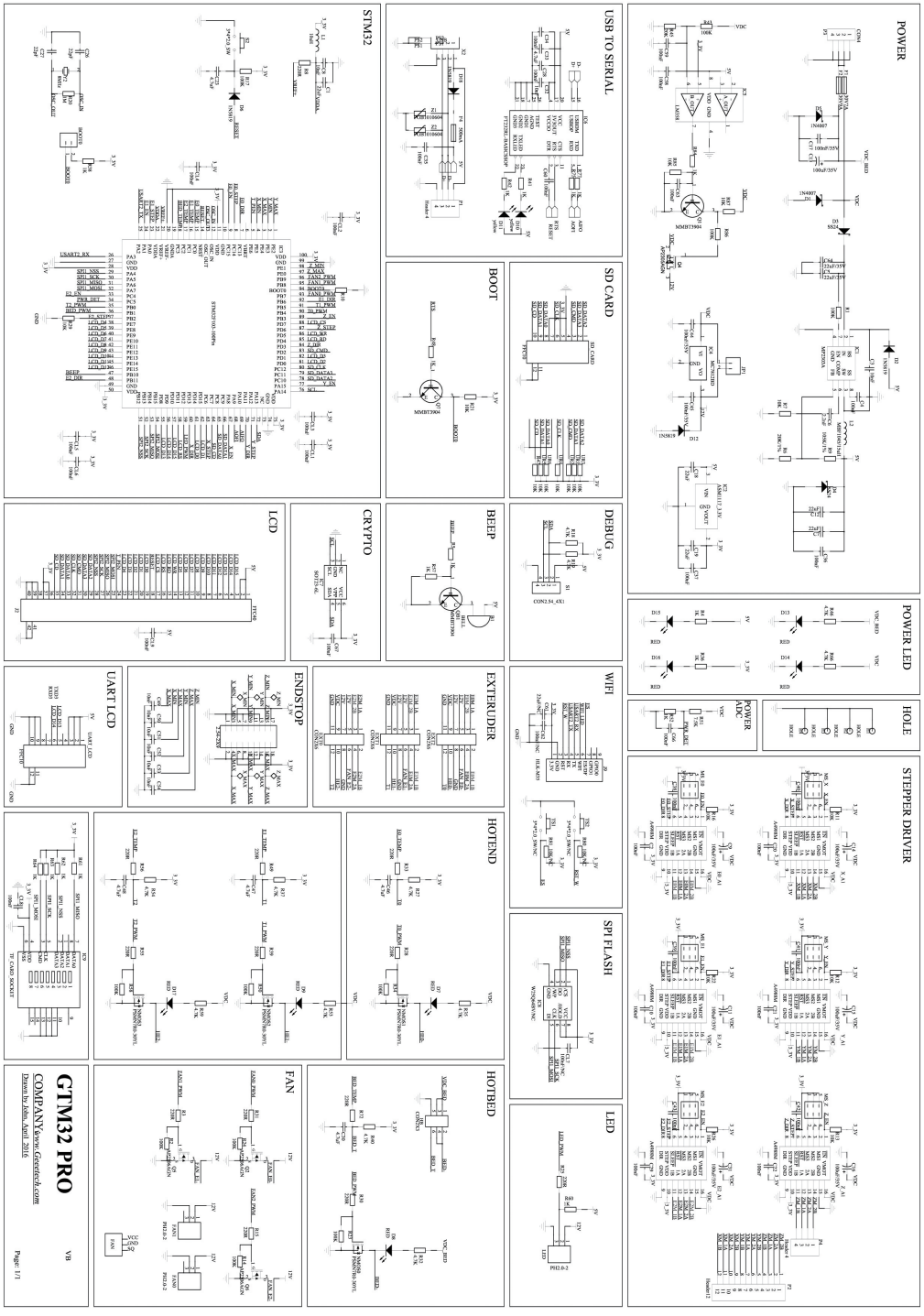
10-6-4　Geeetech GTM32 PRO vB (P-126)



Geeetech GTM32 PRO vB

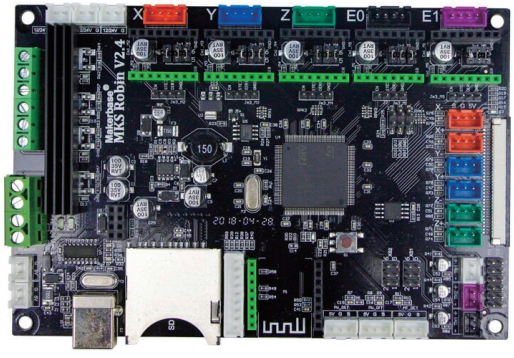
◉GitHub：https://github.com/Geeetech3D/Diagram/tree/master/Rostock301
◉wiki：http://www.geeetech.com/wiki/index.php

MCU	32bit ARM Cortex-M3 STM32F103 72MHz
USB IF	FTDI FT232RL
モータードライバ	ソケット×6
オプション	Wi-Fi モジュール用コネクタ
電源入力	12V-24V DC，5A ～ 15A（ナイロンコネクタ
基板サイズ	110 × 84
製造メーカー	geeetech
URL	https://www.geeetech.com/



Geeetech GTM32 PRO 回路図

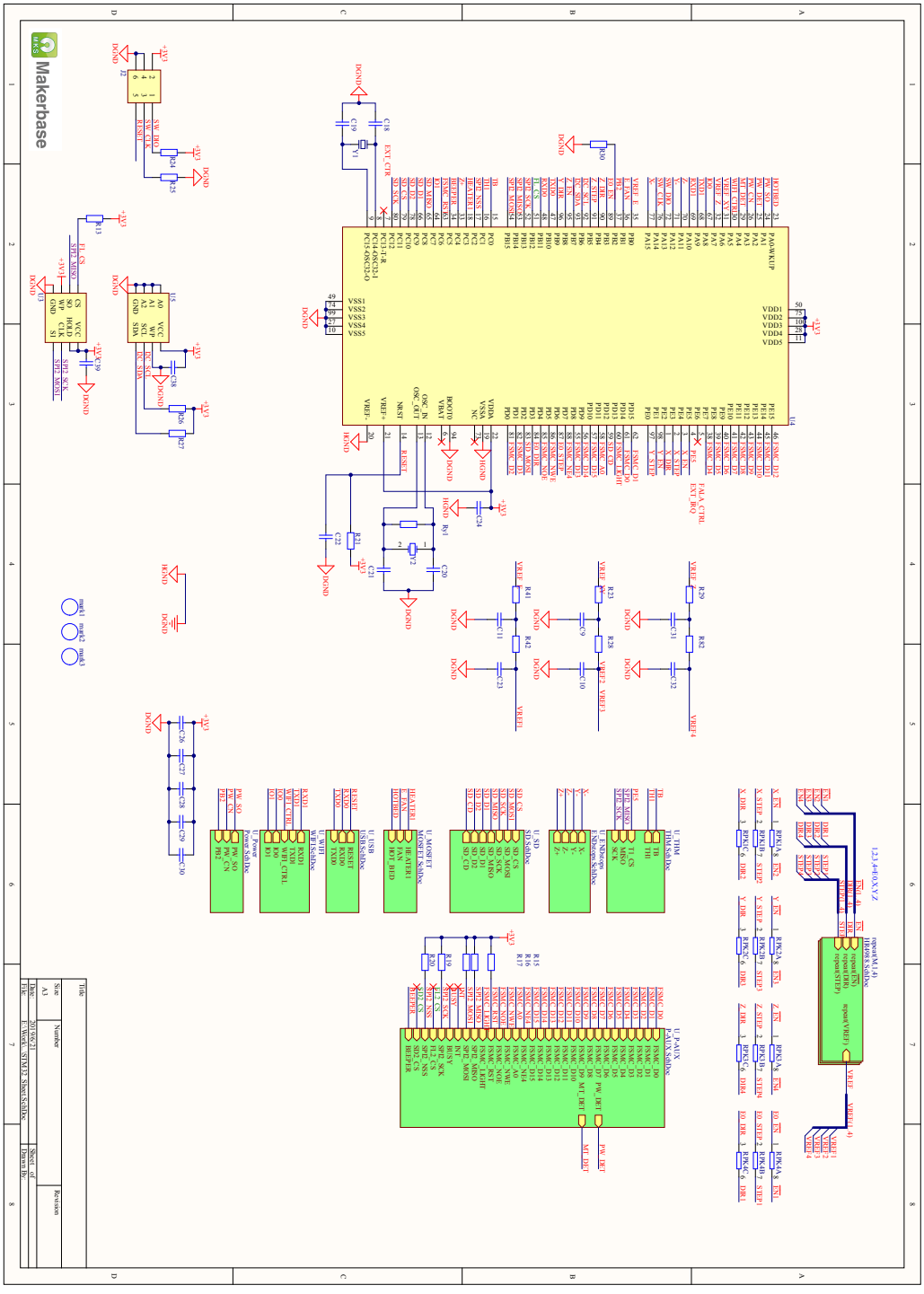
10-6-5　MKS Robin mini V2.4 (P-127)



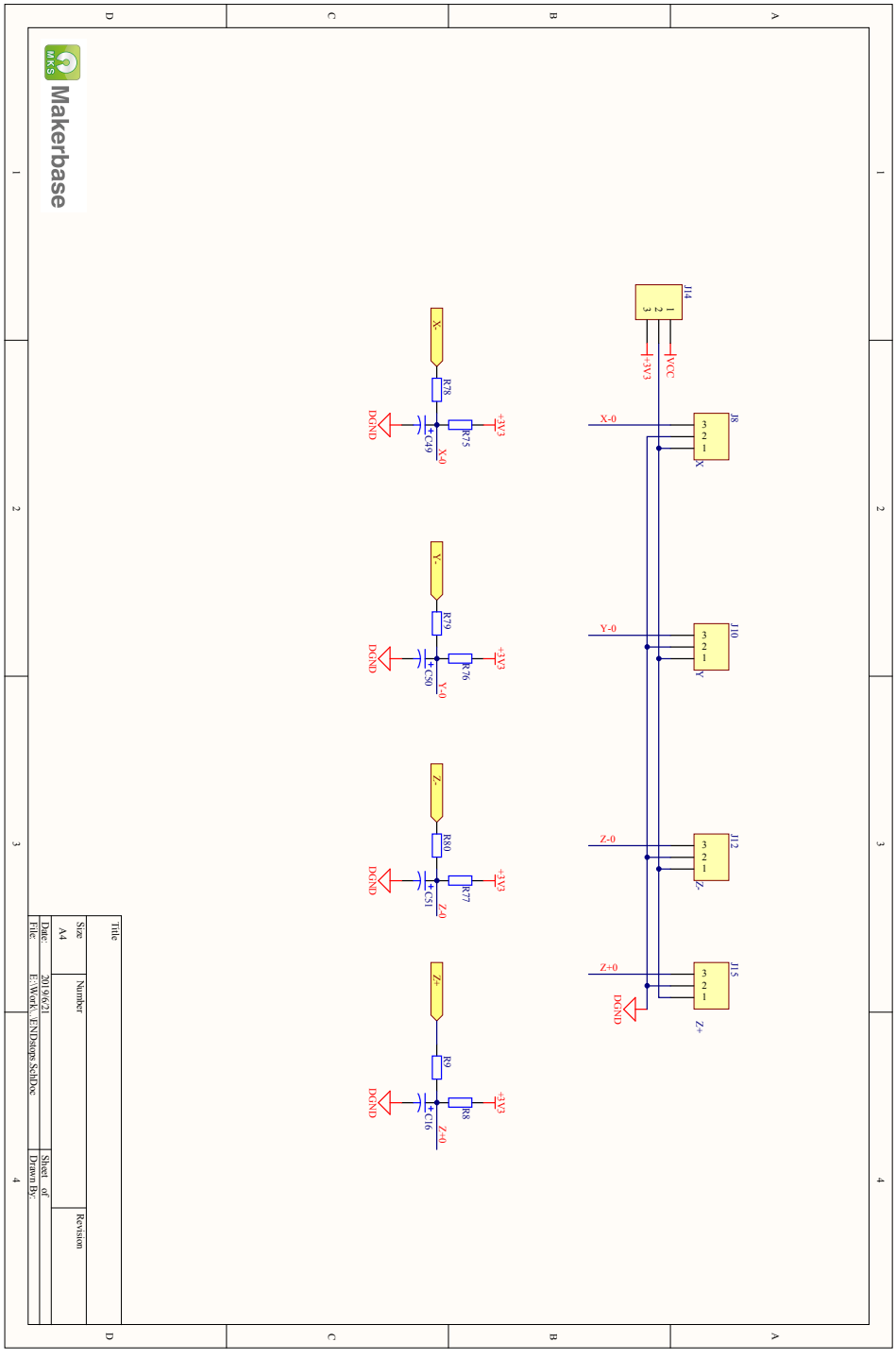
MKS Robin mini V2.4

◉GitHub：https://github.com/makerbase-mks/MKS-Robin

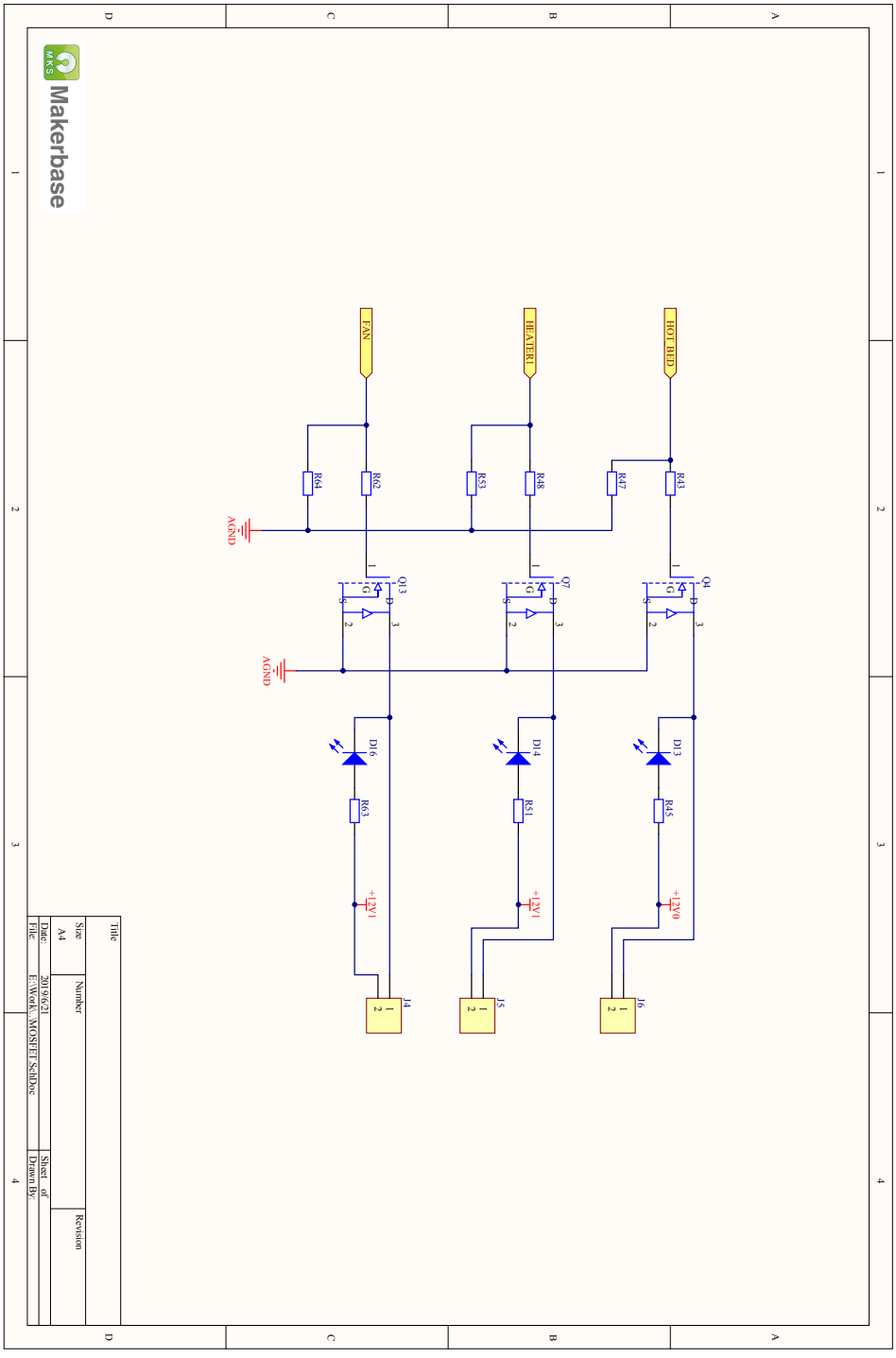
MCU	32bit ARM Cortex-M3 SMT32
ファームウェア	Marlin2.0
ドライバ	ソケット5個
USB IF	CH340
オプション	無線LANモジュール
電源	12V-24V DC, 5A ～ 15A（端子台）
基板サイズ	150×100mm
製造メーカー	MakerBase Technology
URL	https://www.makerbase.com.



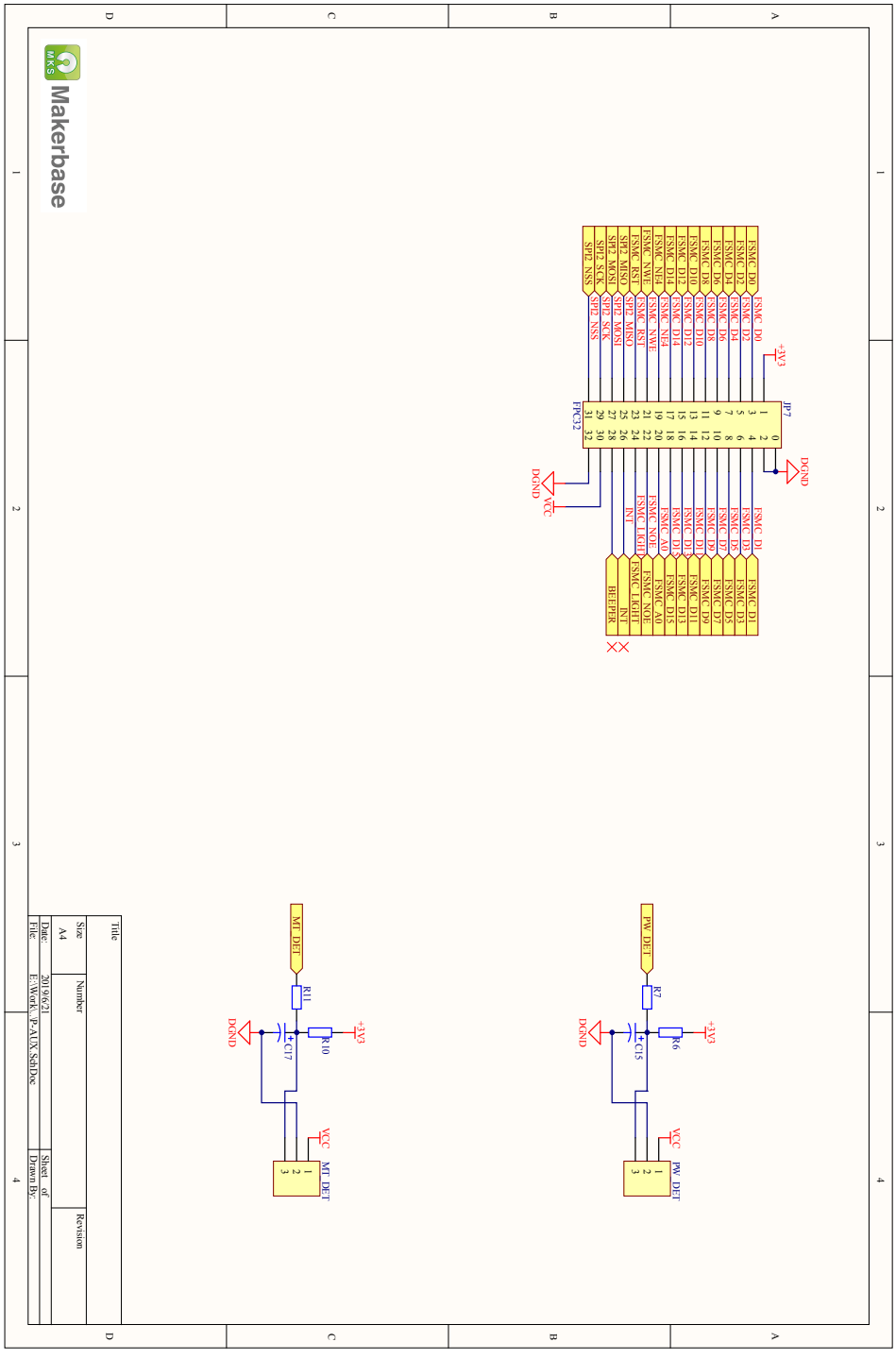
MKS Robin Mini V2.0_004 回路図 _1/10



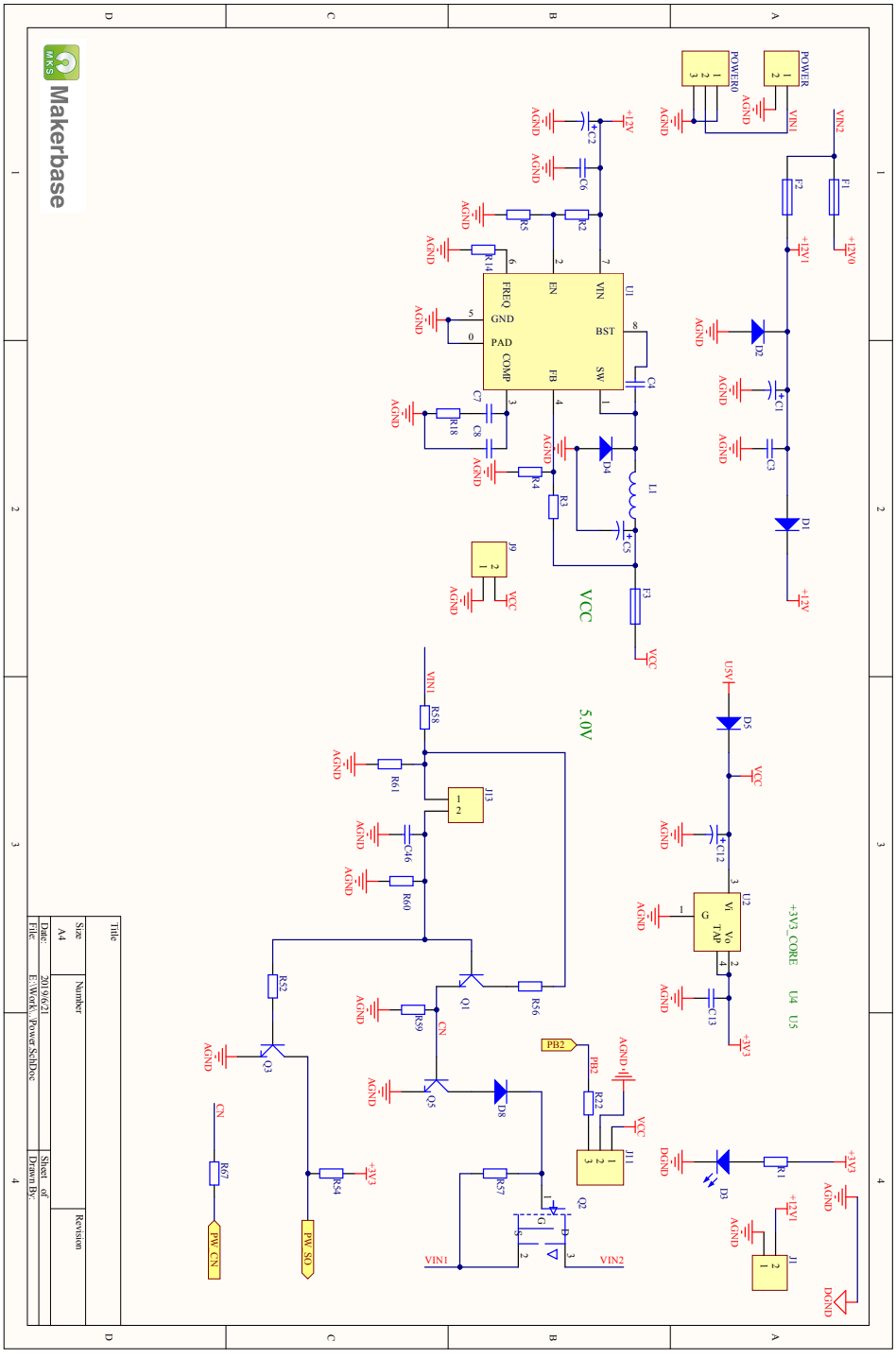
MKS Robin Mini V2.0_004 回路図 _2/10



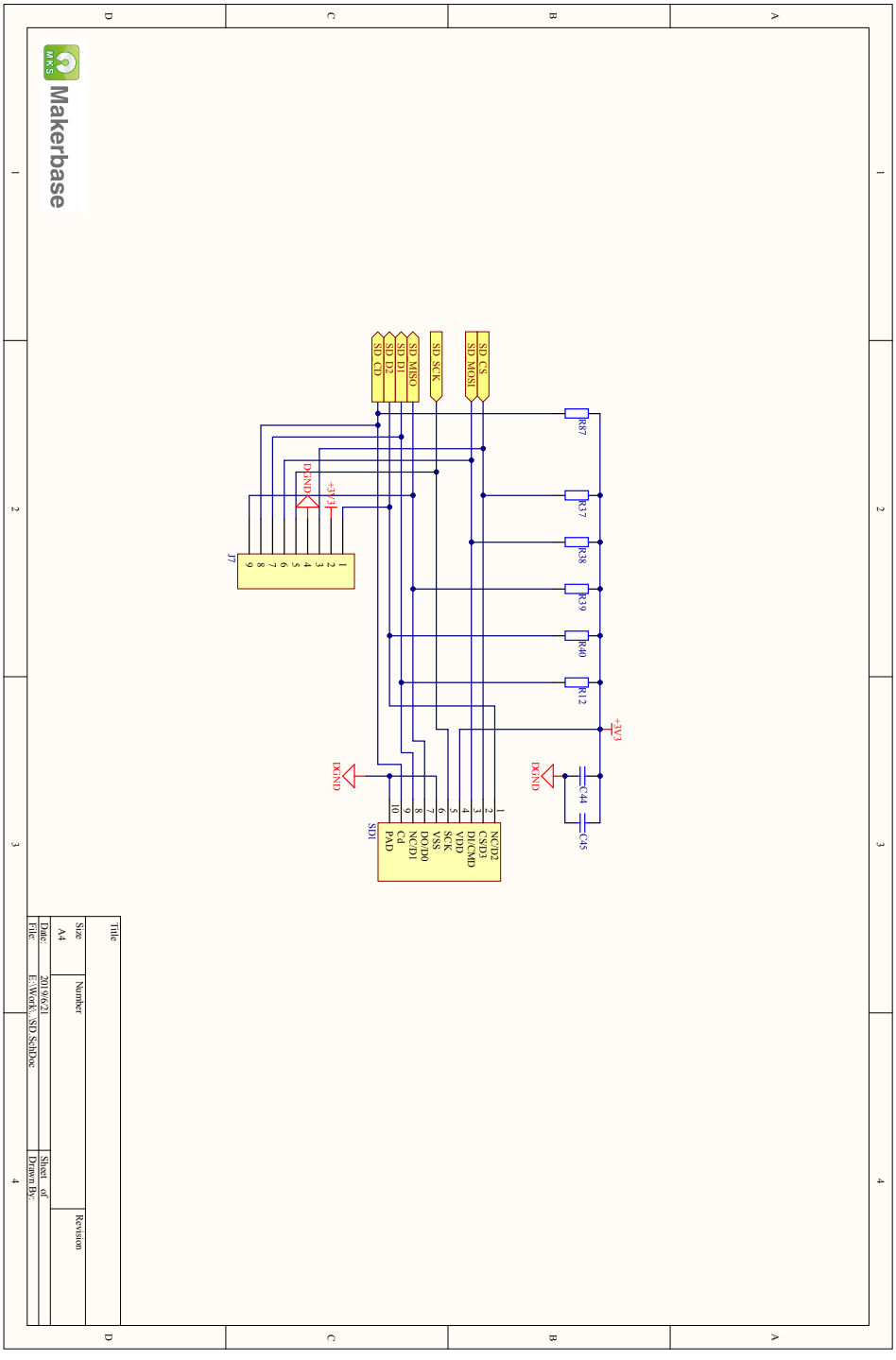
MKS Robin Mini V2.0_004 回路図 _3/10



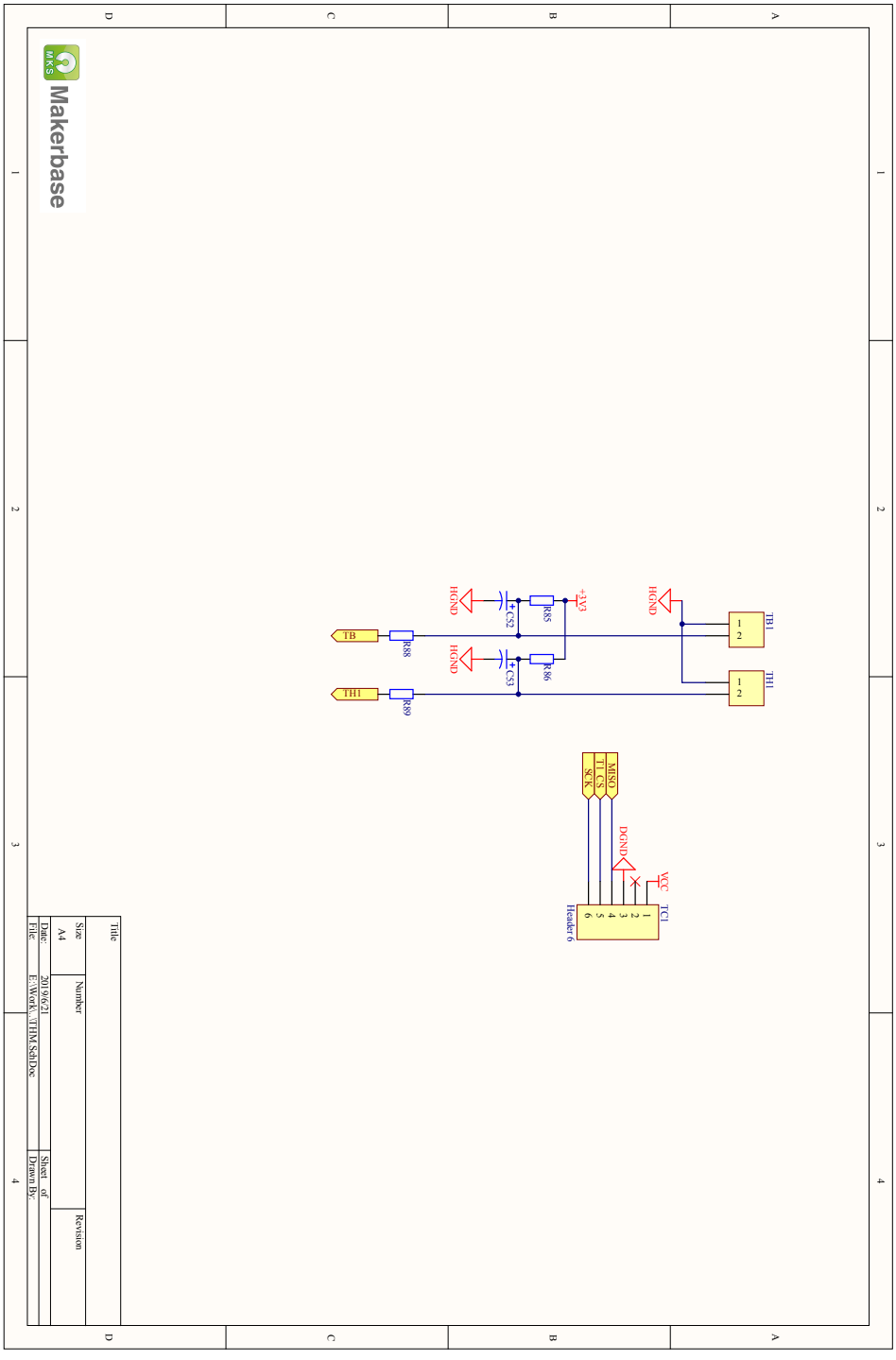
MKS Robin Mini V2.0_004 回路図 _4/10



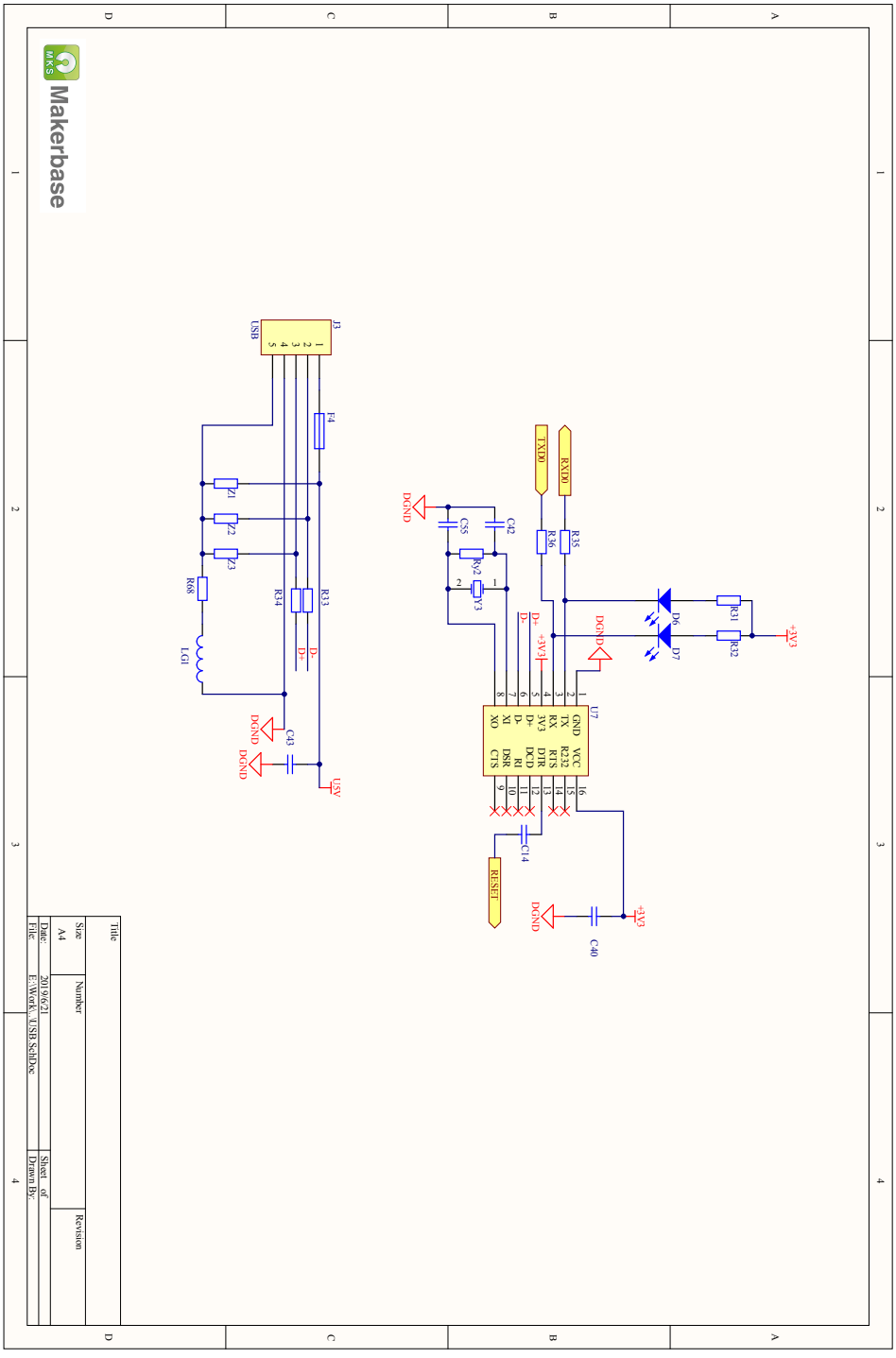
MKS Robin Mini V2.0_004 回路図 _5/10



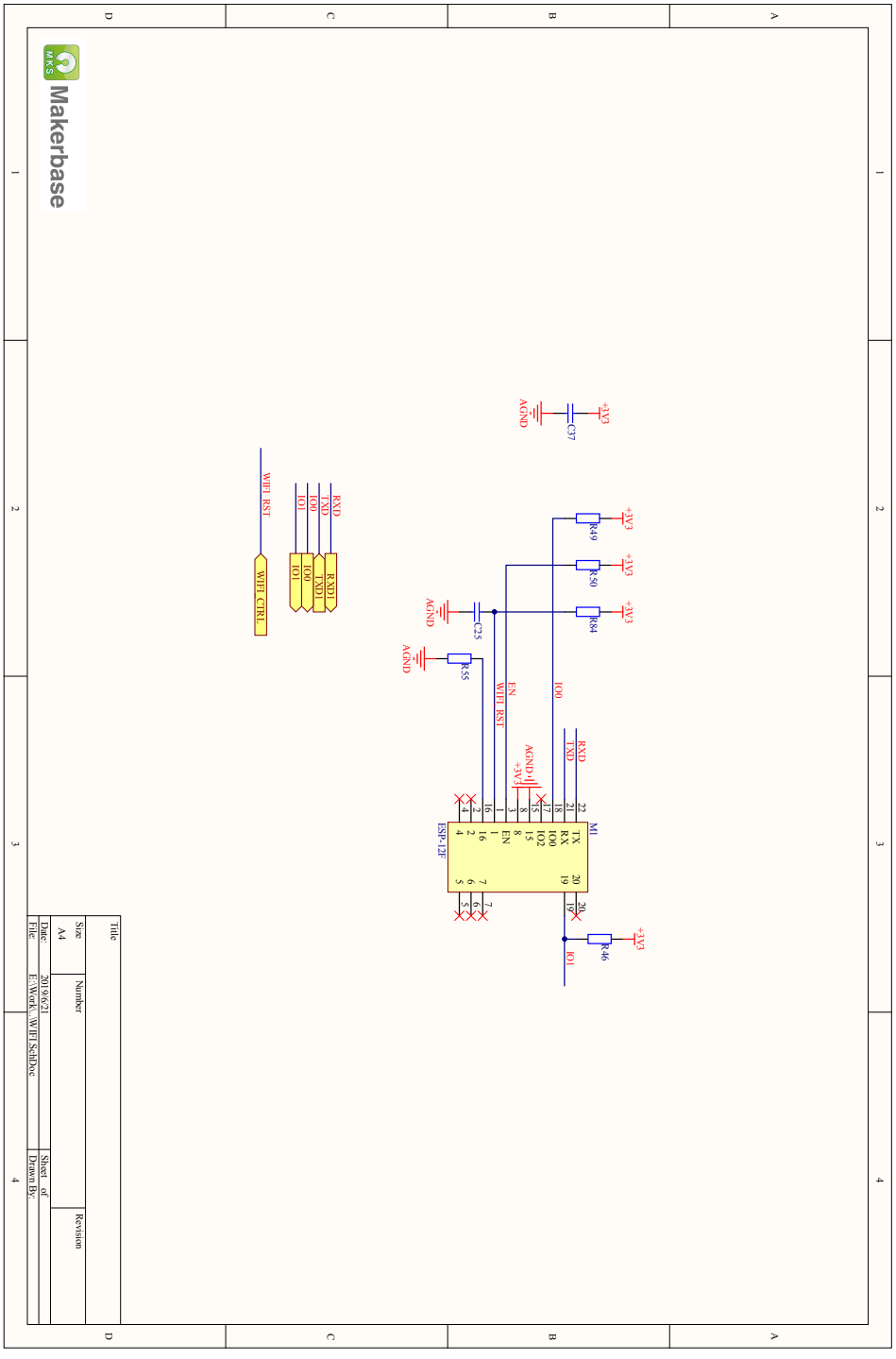
MKS Robin Mini V2.0_004 回路図 _6/10



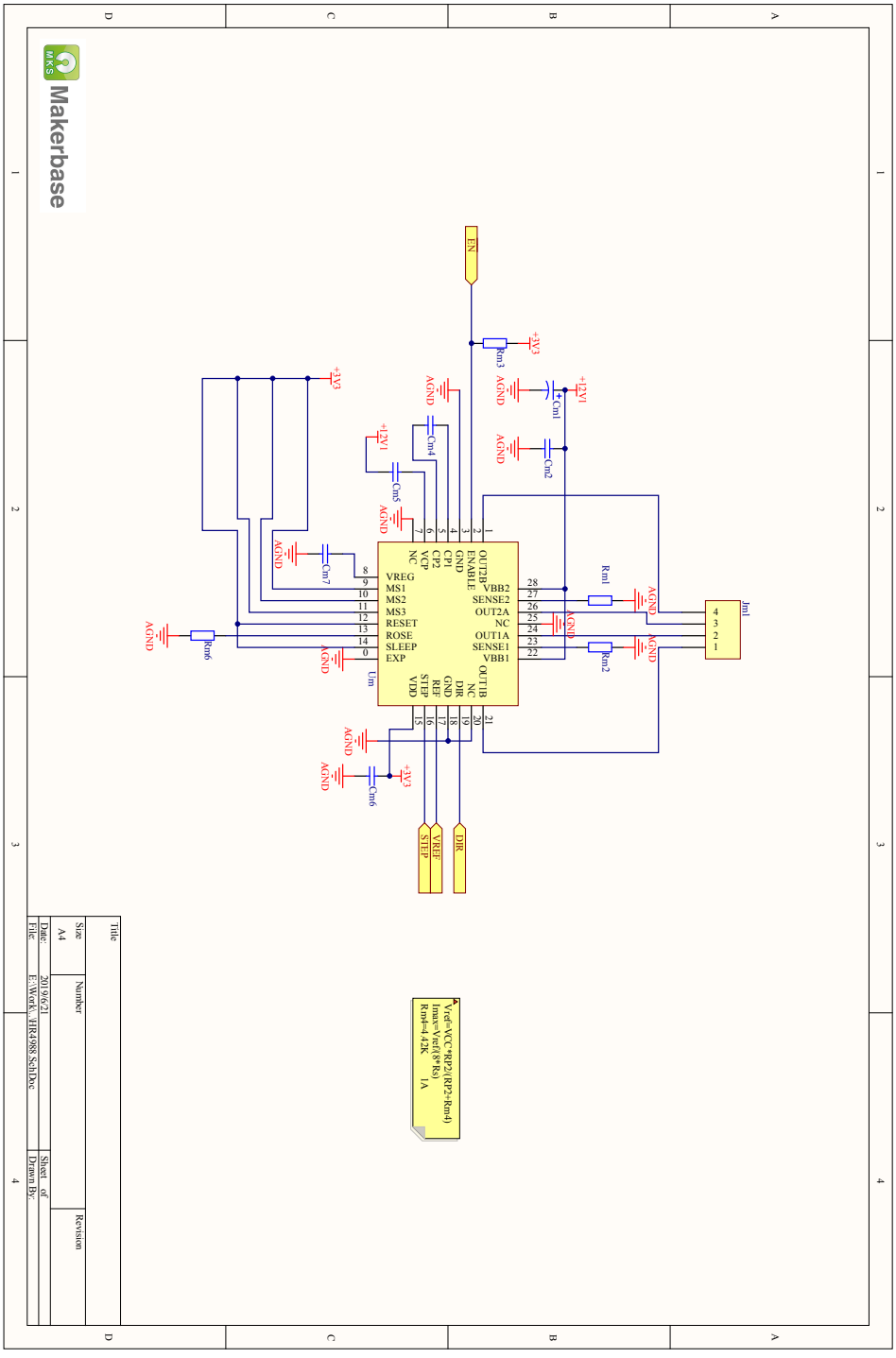
MKS Robin Mini V2.0_004 回路図 _7/10



MKS Robin Mini V2.0_004 回路図 _8/10

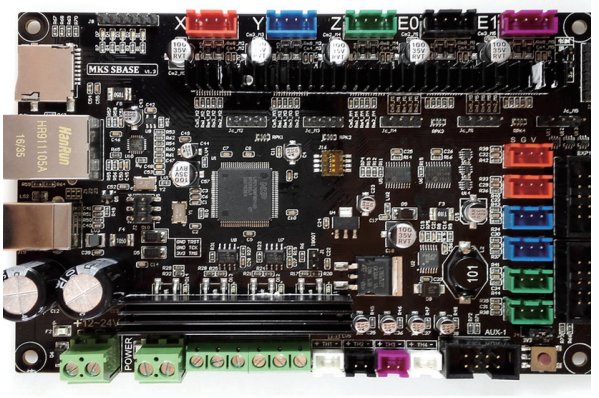


MKS Robin Mini V2.0_004 回路图 _9/10



MKS Robin Mini V2.0_004 回路図 _10/10

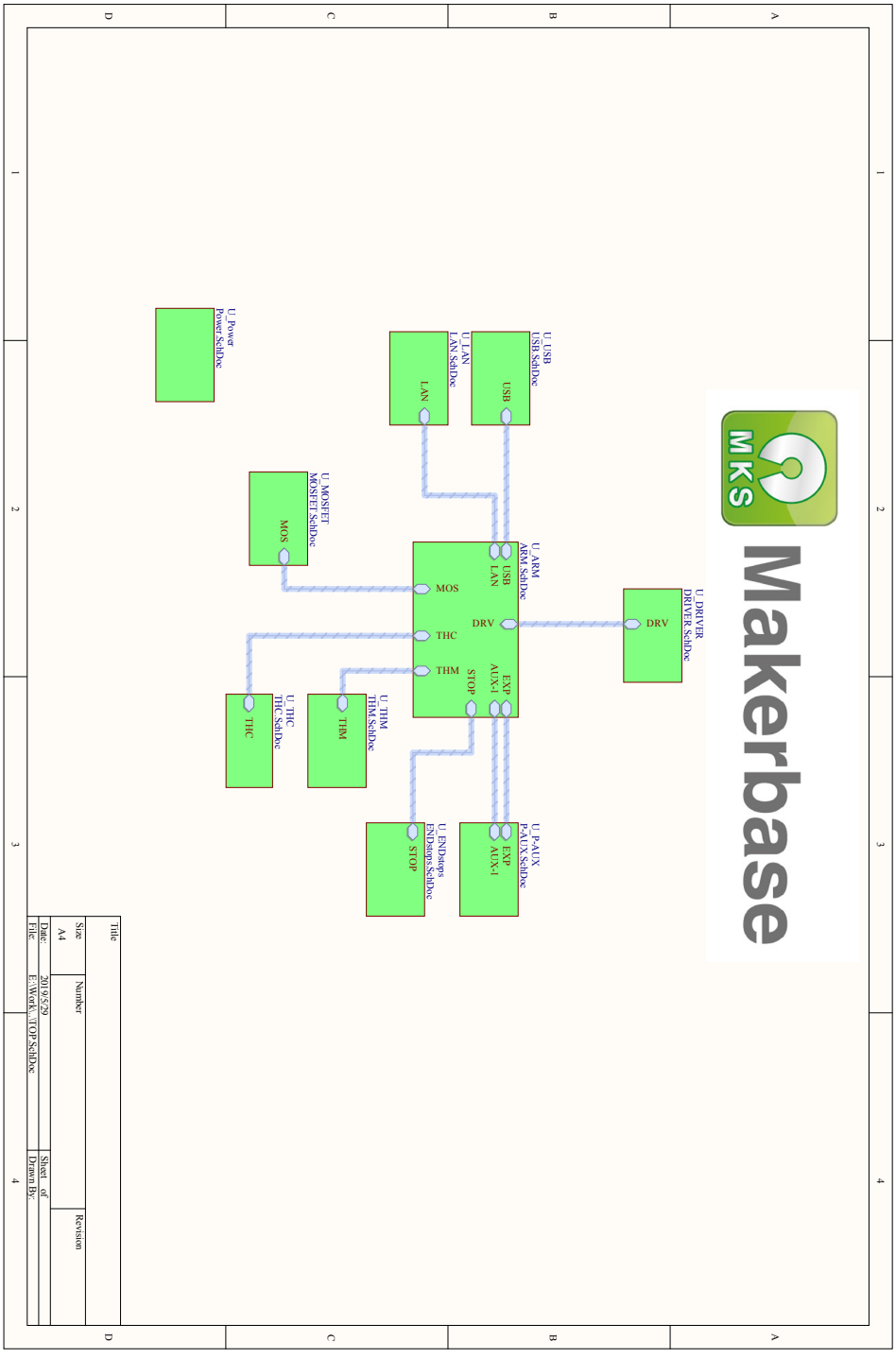
10-6-6　MKS SBASE V1.3 (P-128)



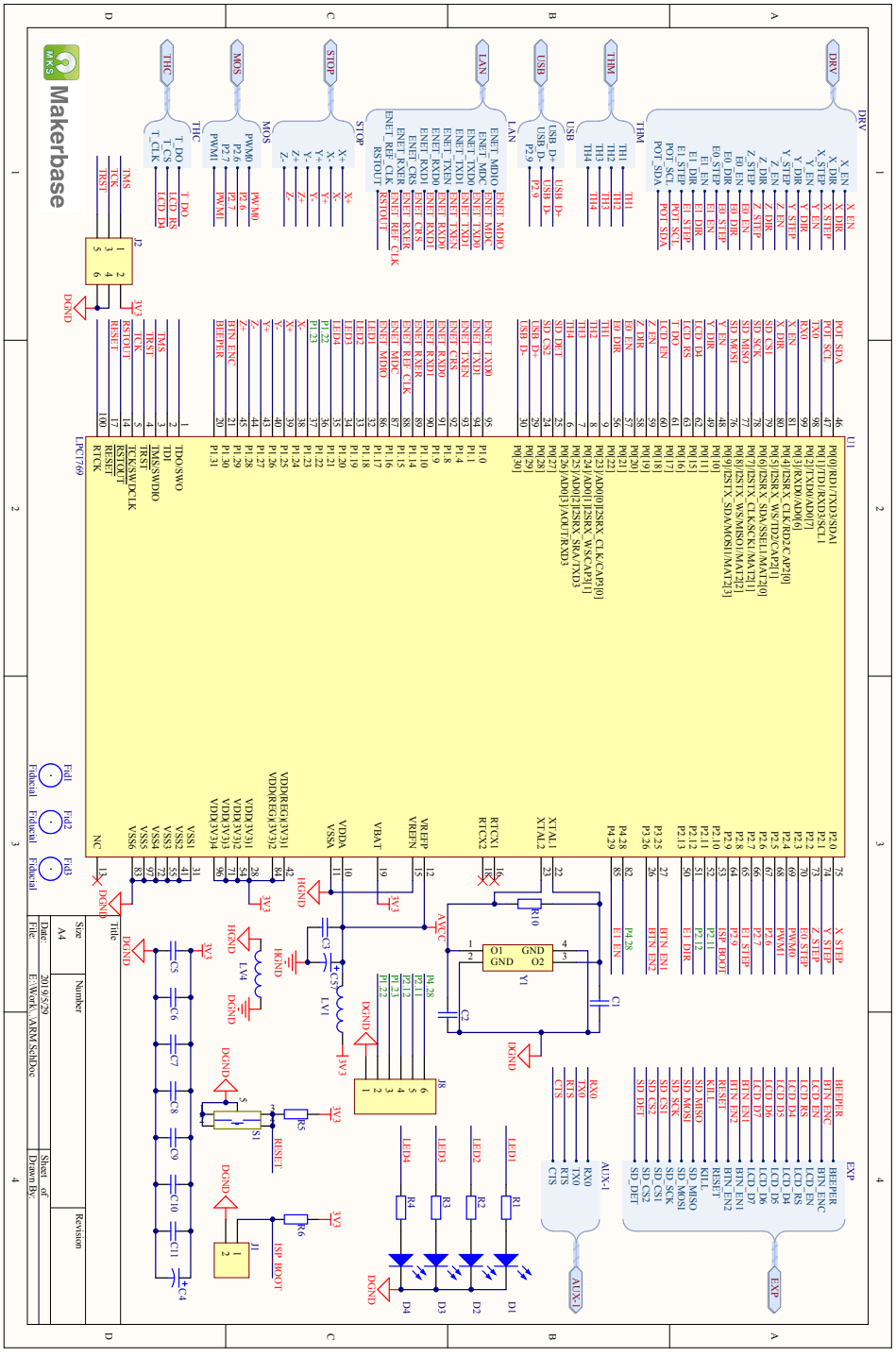
MKS SBASE V1.3

◉GitHub：https://github.com/makerbase-mks/MKS-SBASE

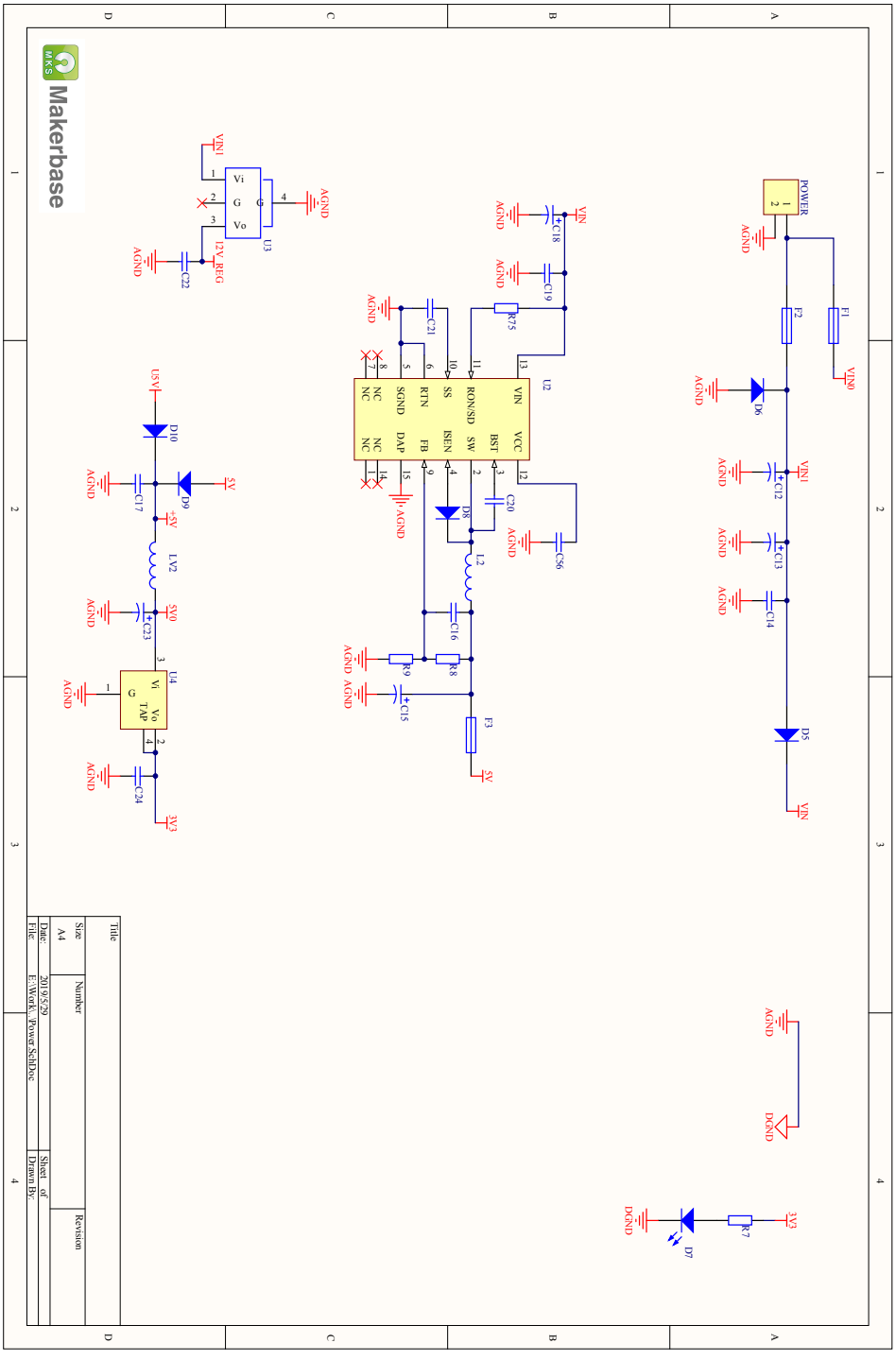
MCU	32bit ARM Cortex-M3 LPC1768 100MHz
ファームウェア	Marlin-bugfix-2.0.x
ドライバ	DRV8825×5（実装）
電源	12V-24V DC（端子台）
基板サイズ	146.5×92mm
製造メーカー	MakerBase Technology
URL	https://www.makerbase.com.cn/



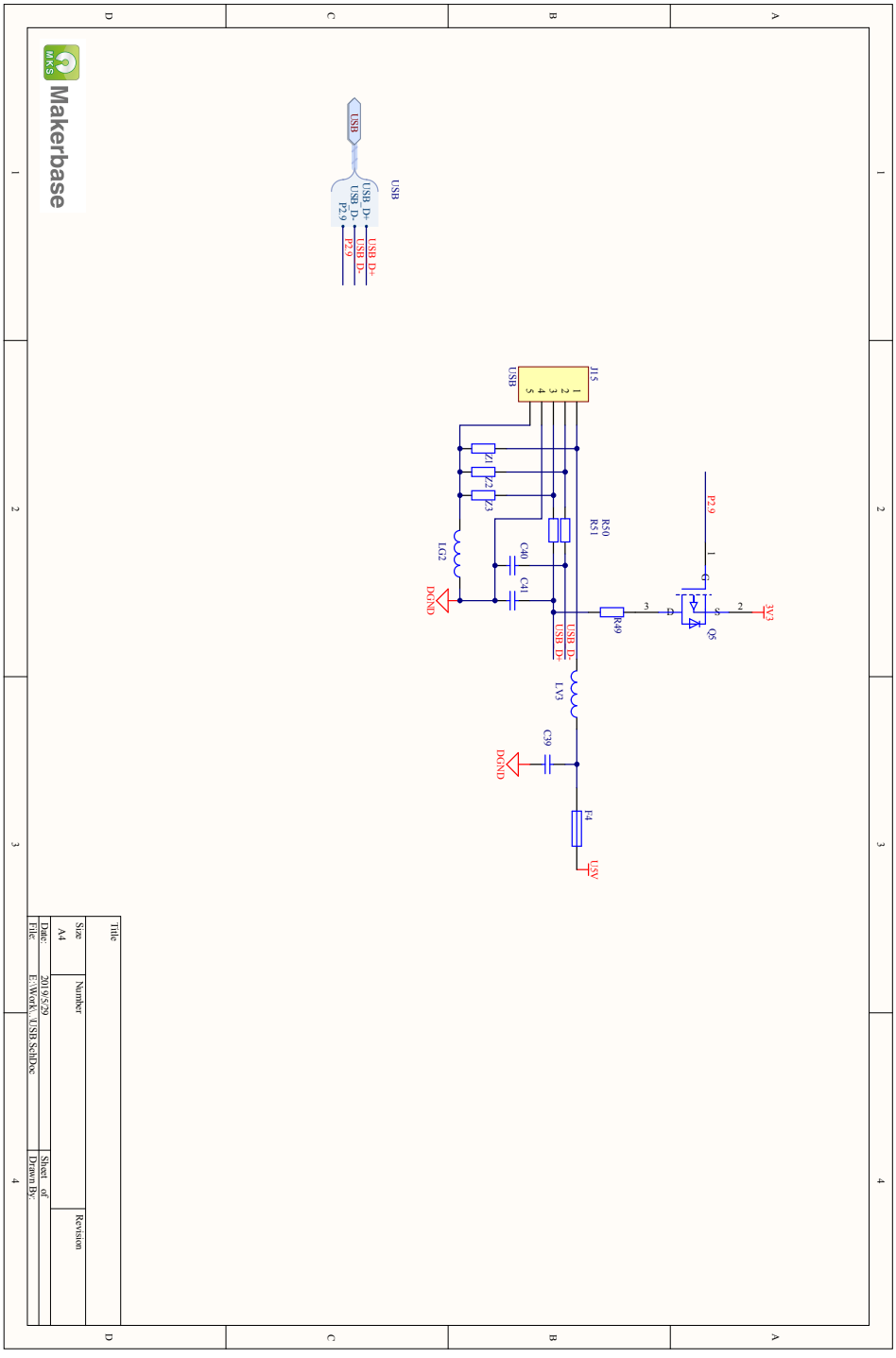
MKS SBASE V1.3 回路図 _1/17



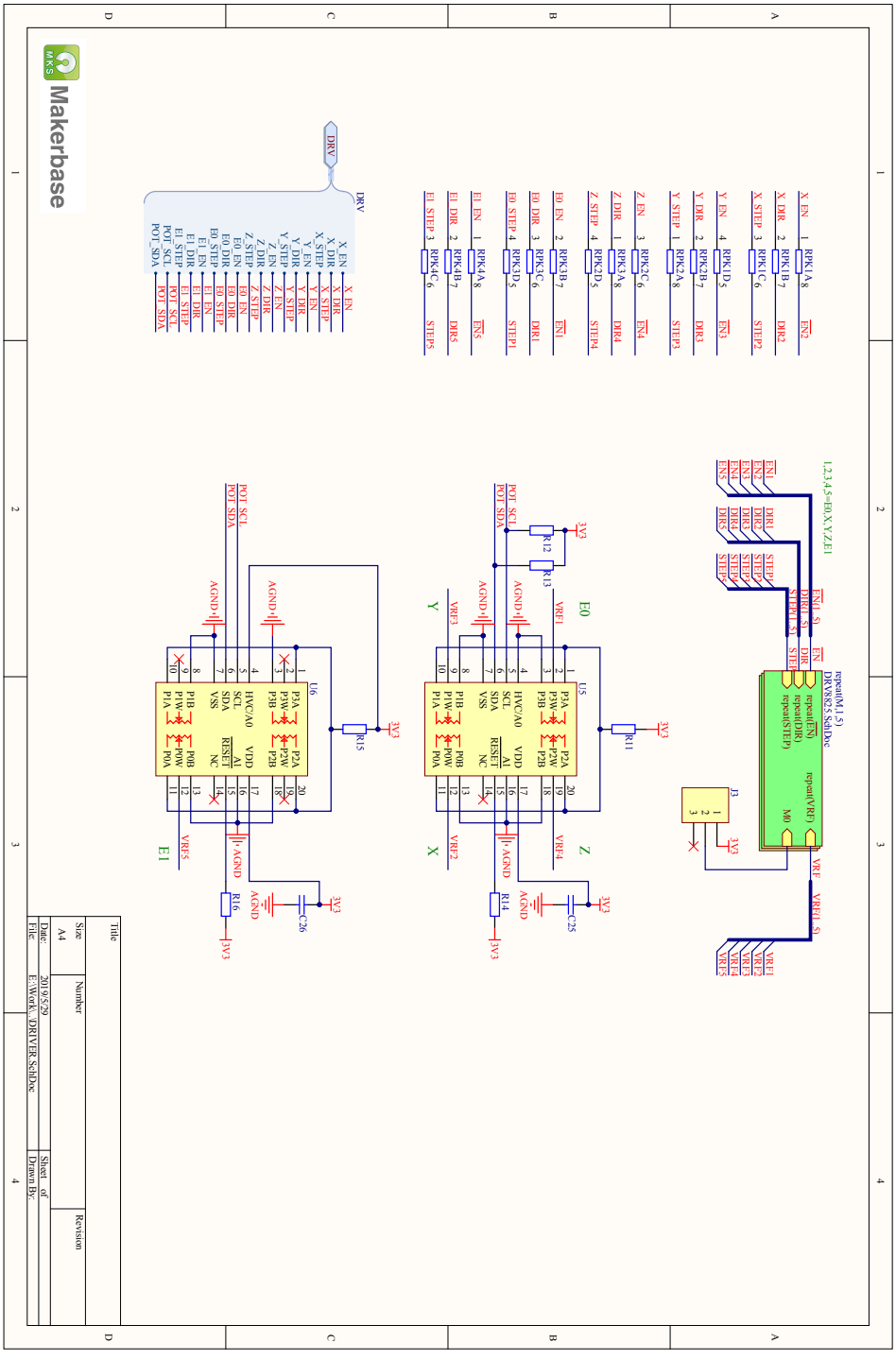
MKS SBASE V1.3 回路図 _2/17



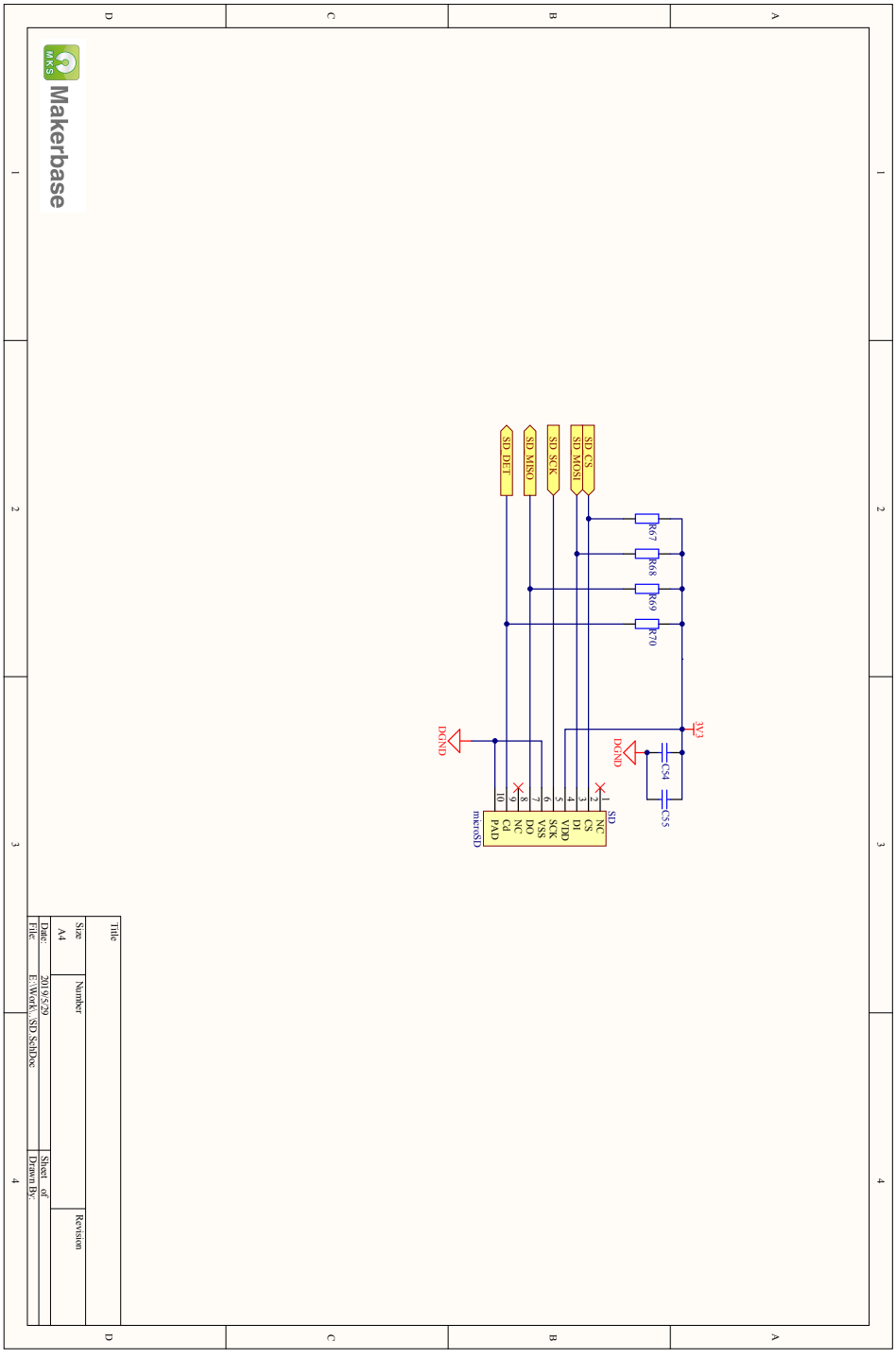
MKS SBASE V1.3 回路図 _3/17



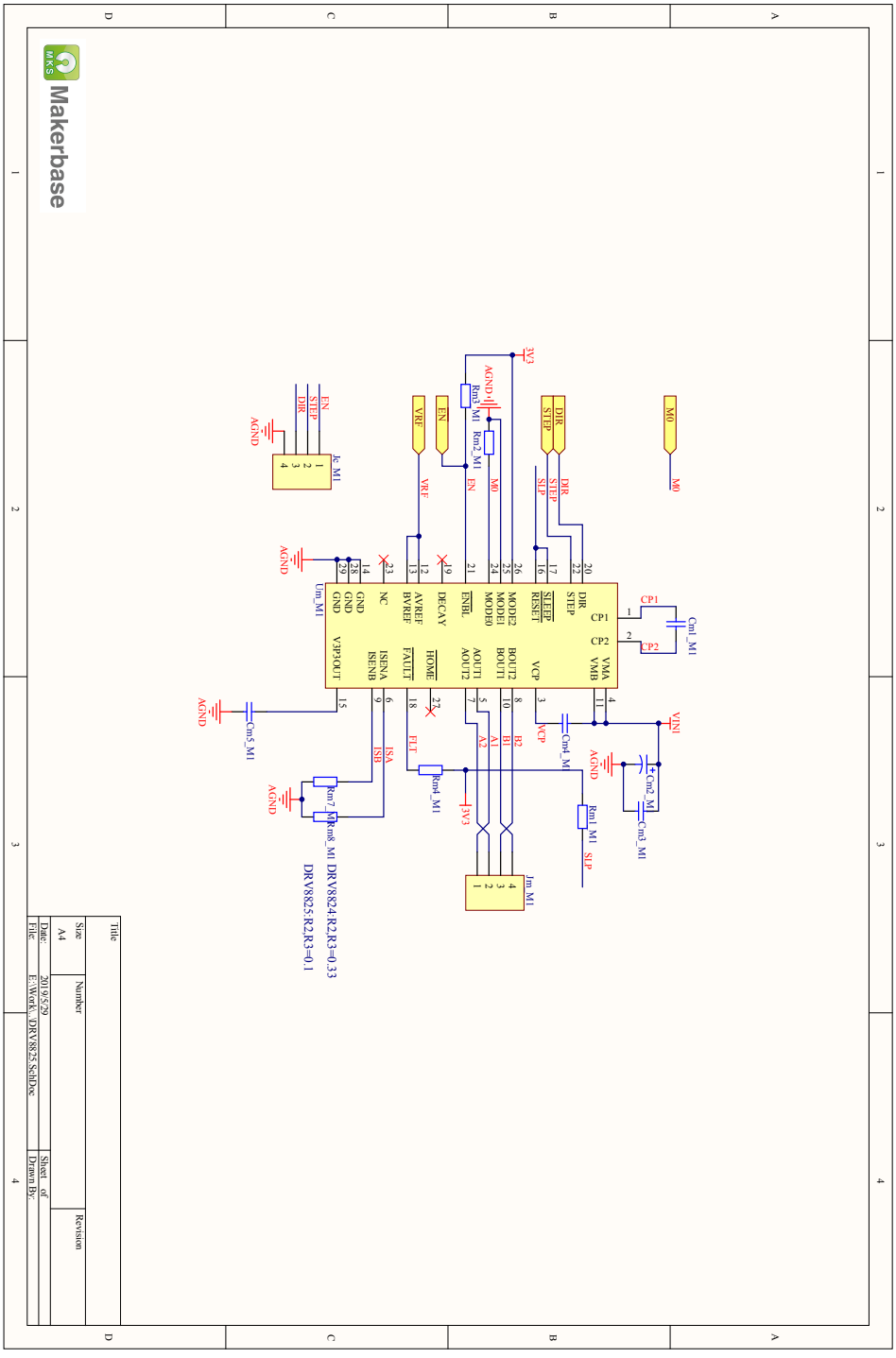
MKS SBASE V1.3 回路図 _4/17



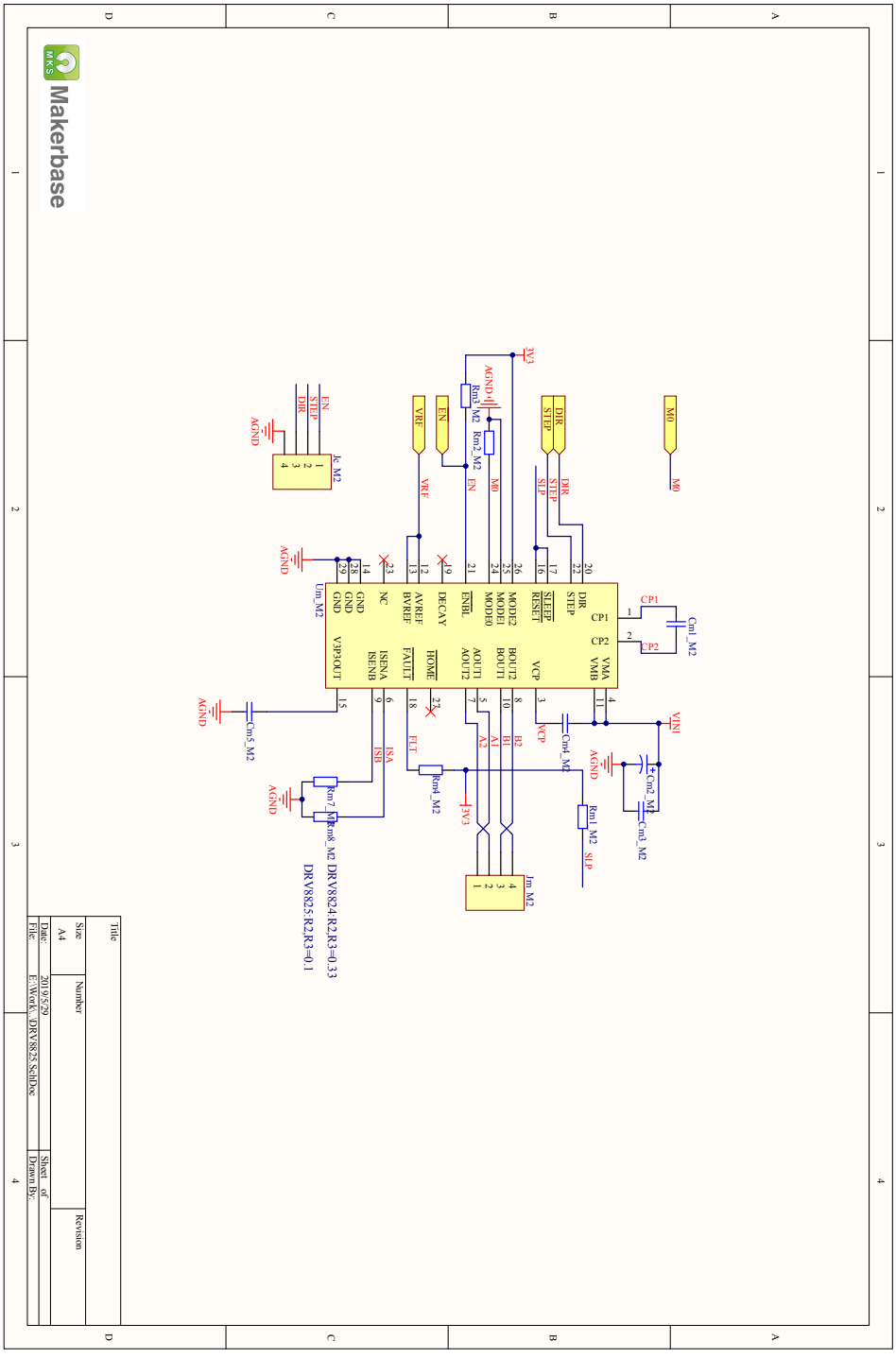
MKS SBASE V1.3 回路図 _5/17



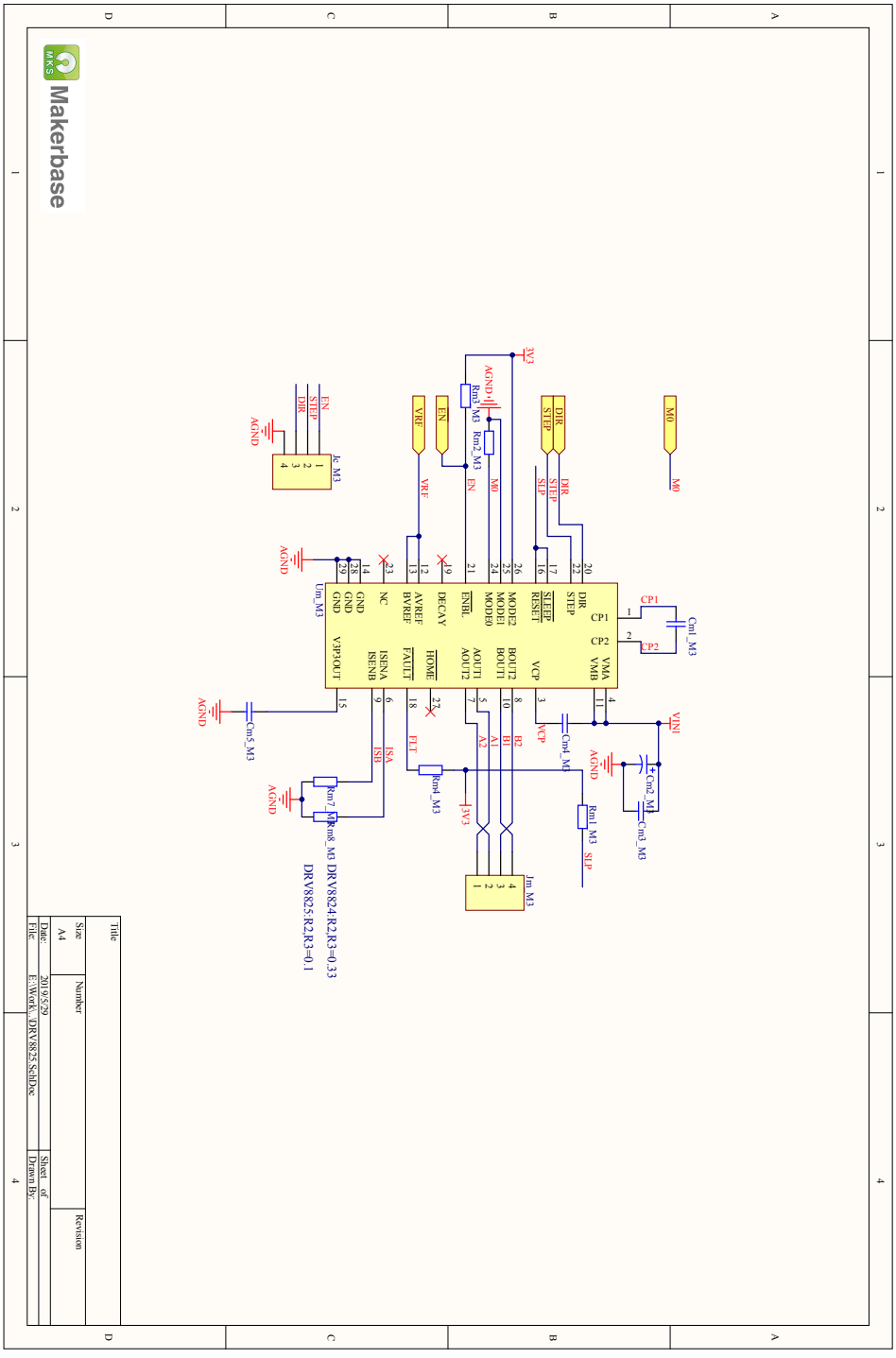
MKS SBASE V1.3 回路図 _6/17



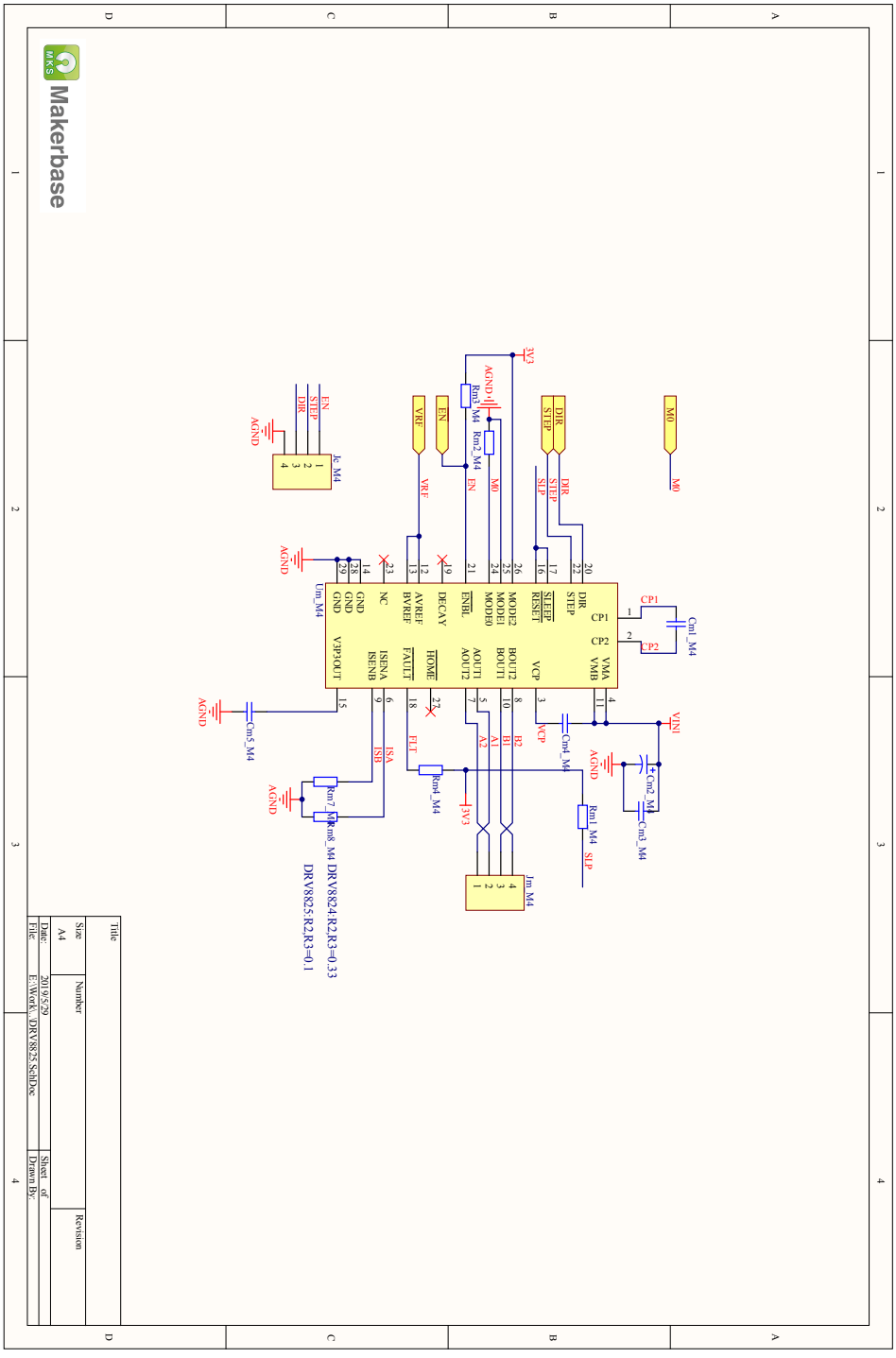
MKS SBASE V1.3 回路図 _7/17



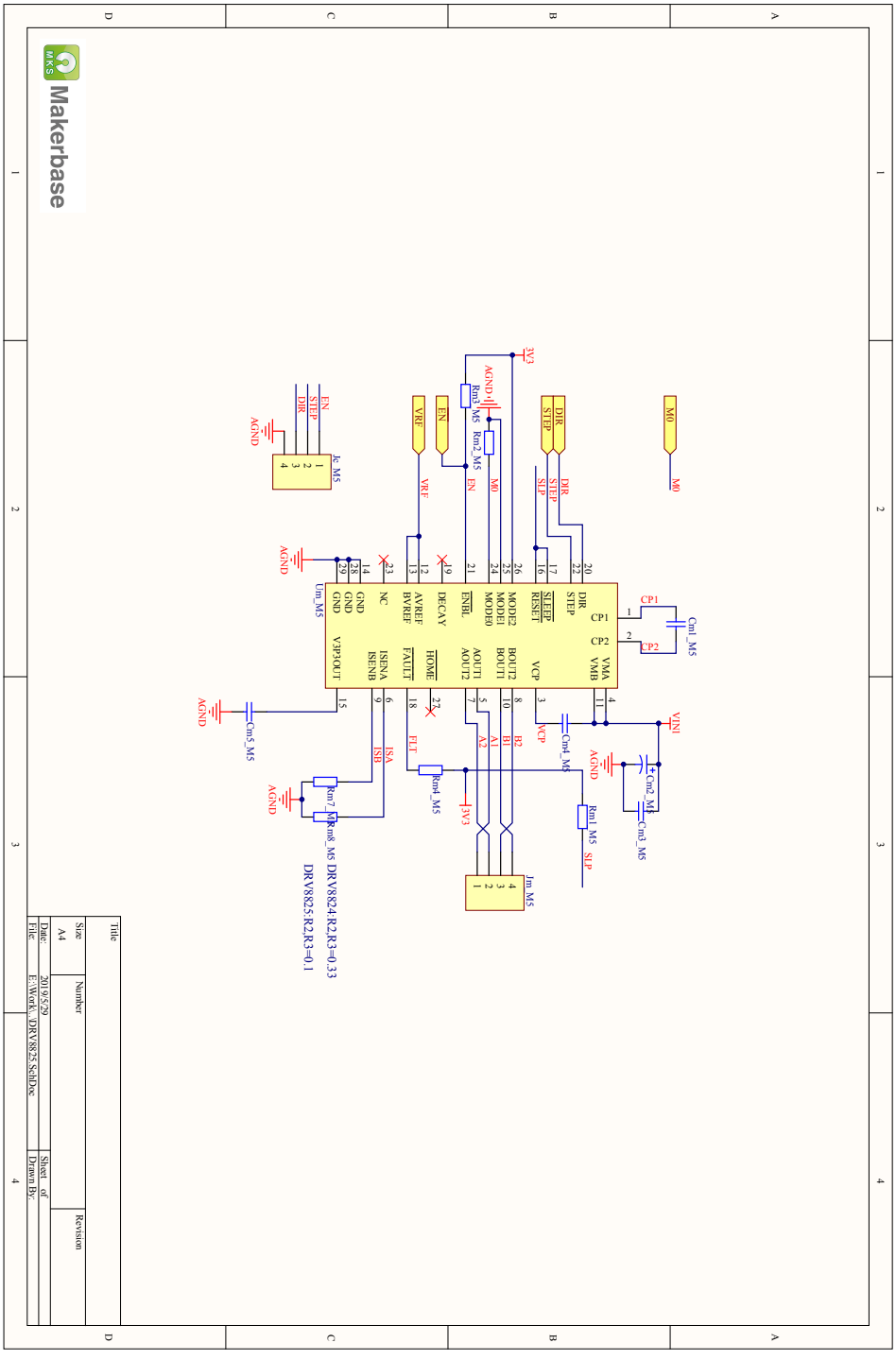
MKS SBASE V1.3 回路図 _8/17



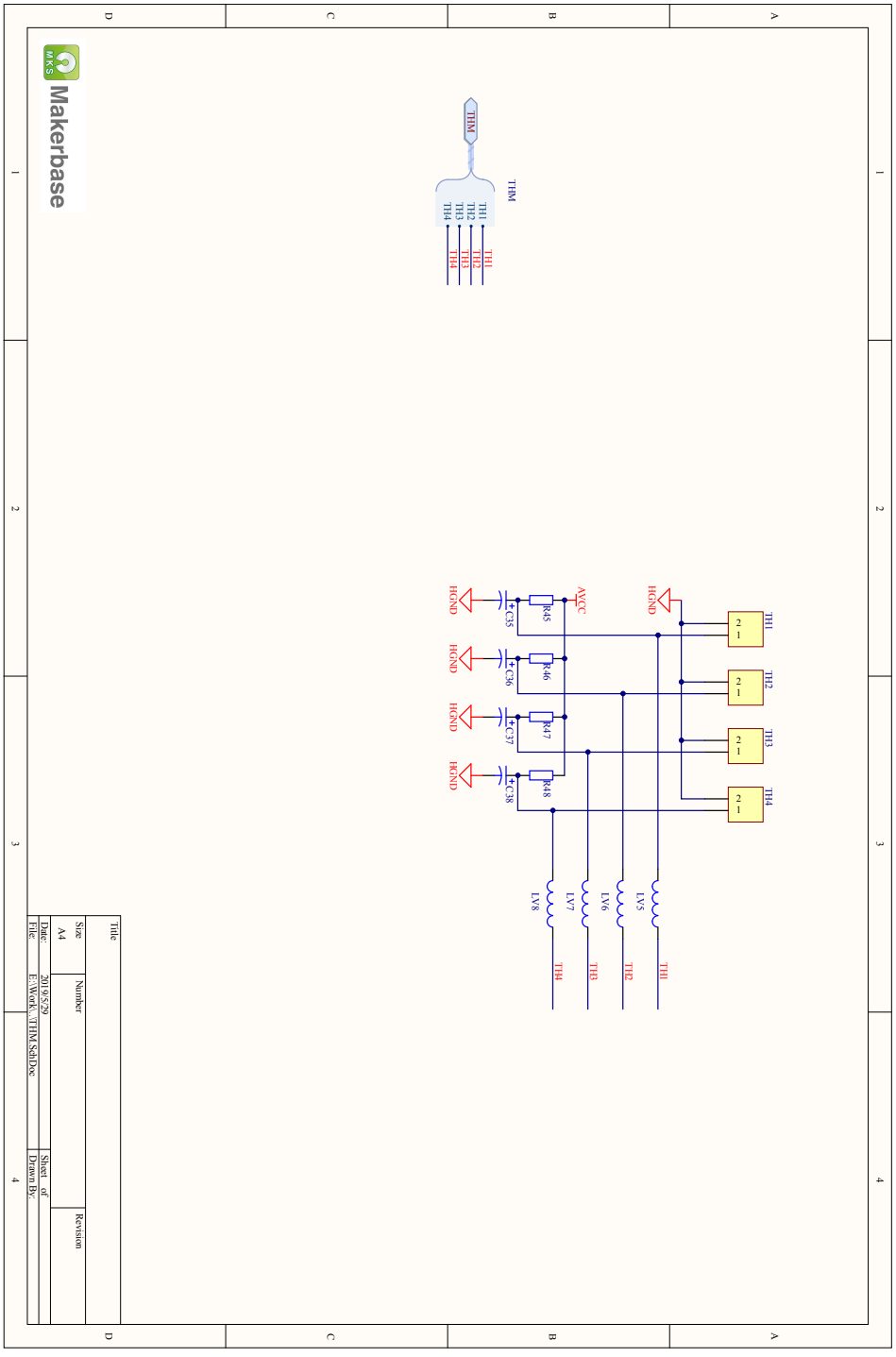
MKS SBASE V1.3 回路図 _9/17



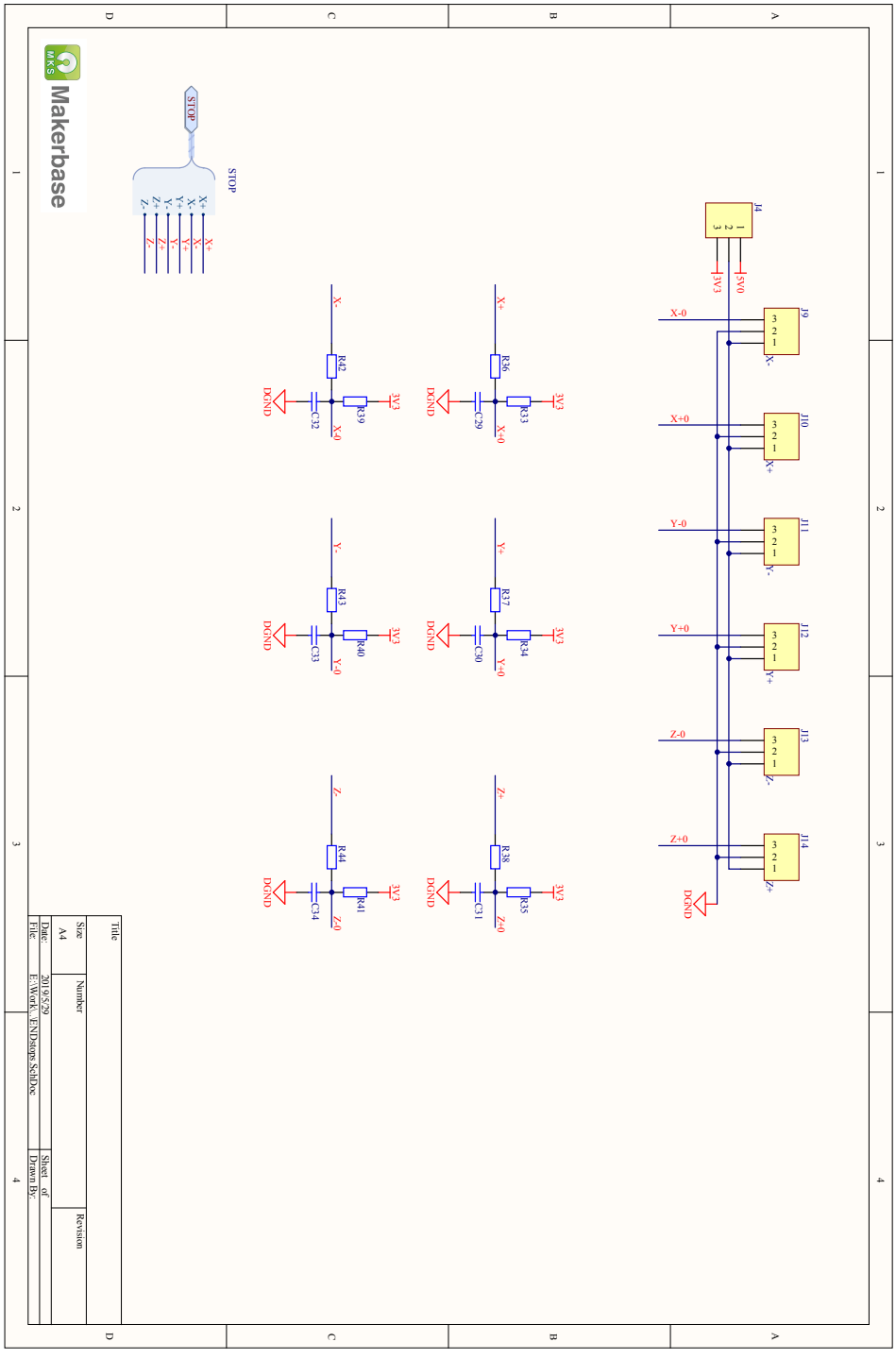
MKS SBASE V1.3 回路図 _10/17



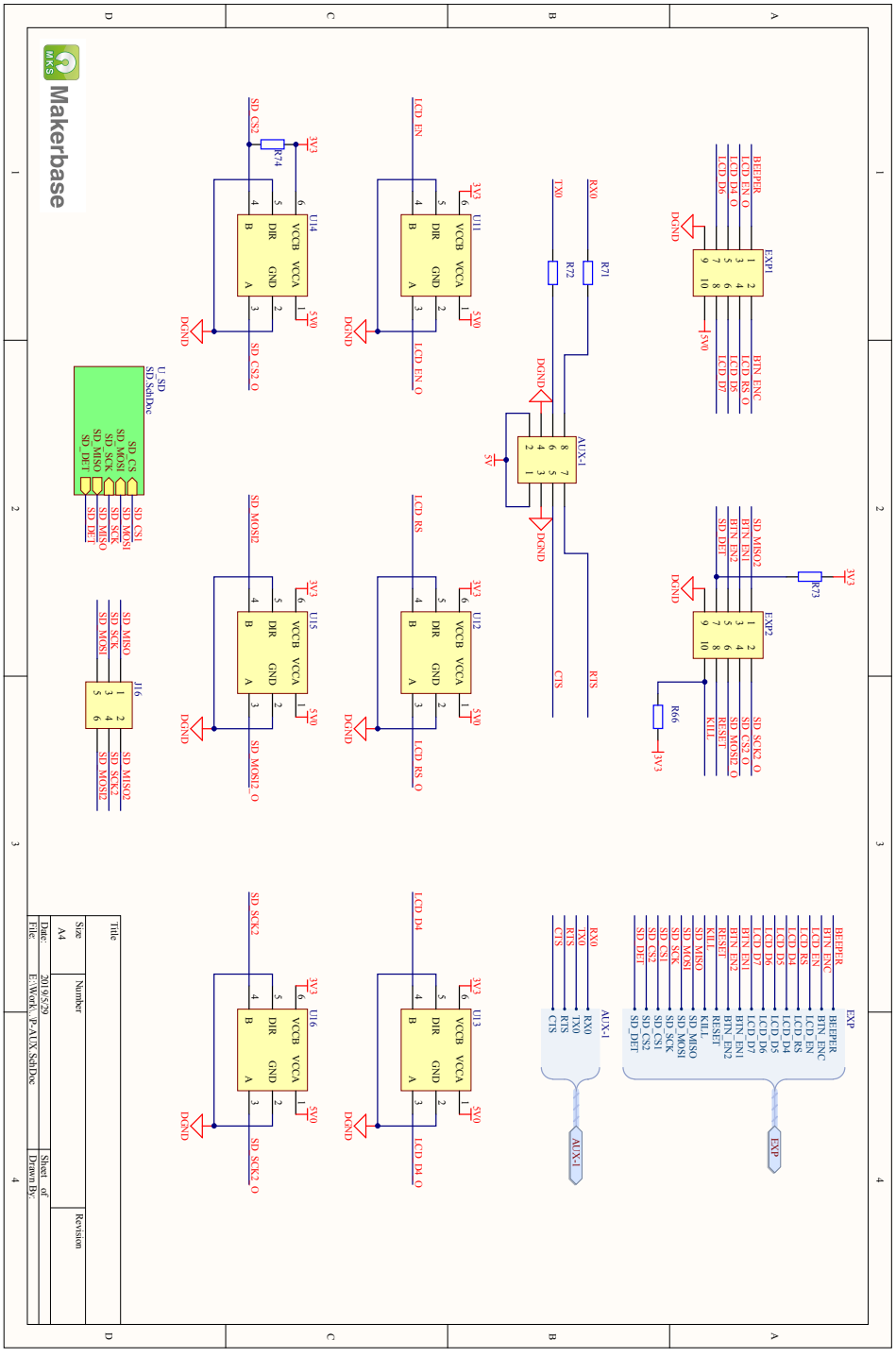
MKS SBASE V1.3 回路図 _11/17



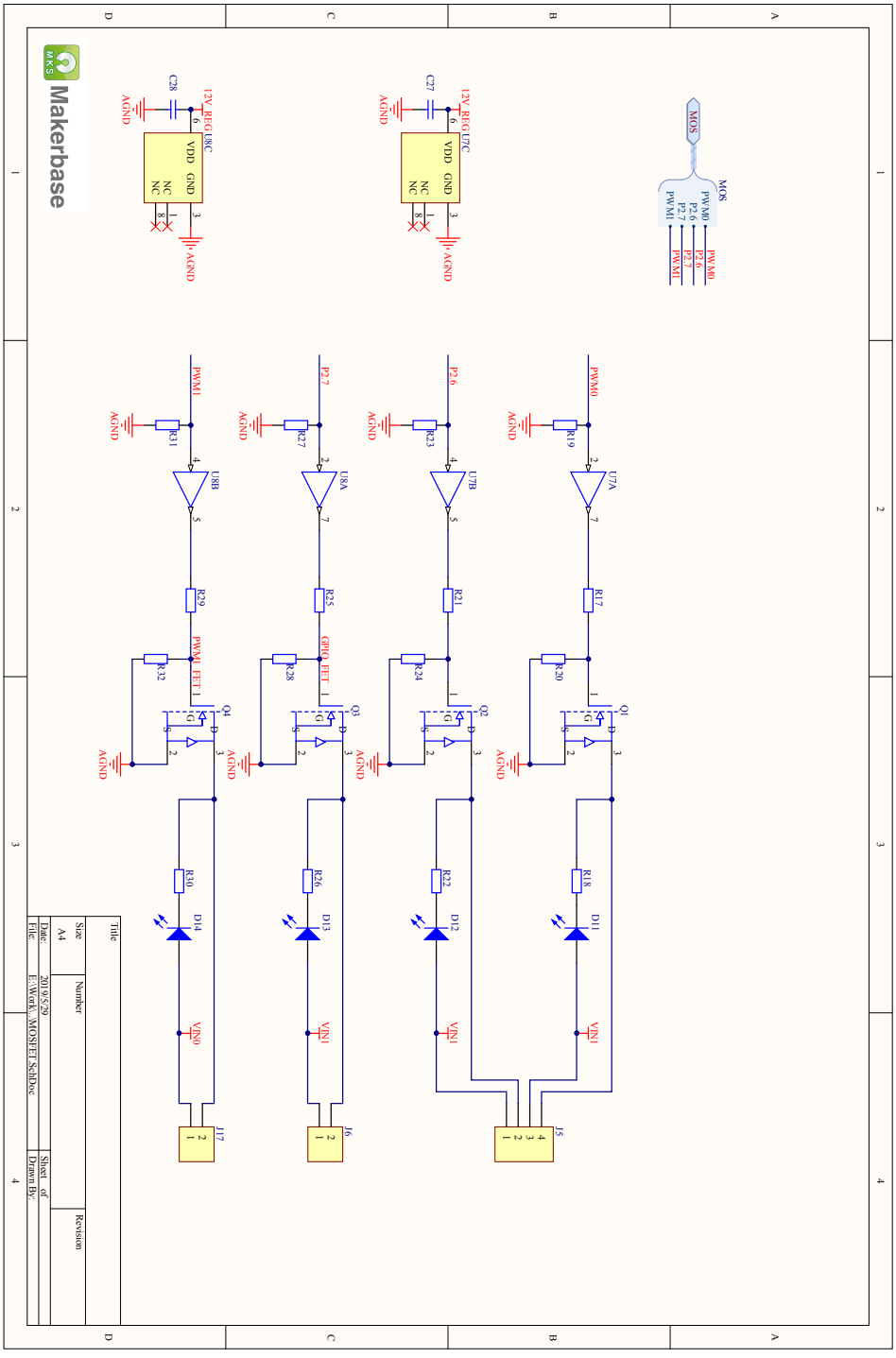
MKS SBASE V1.3 回路図 _12/17



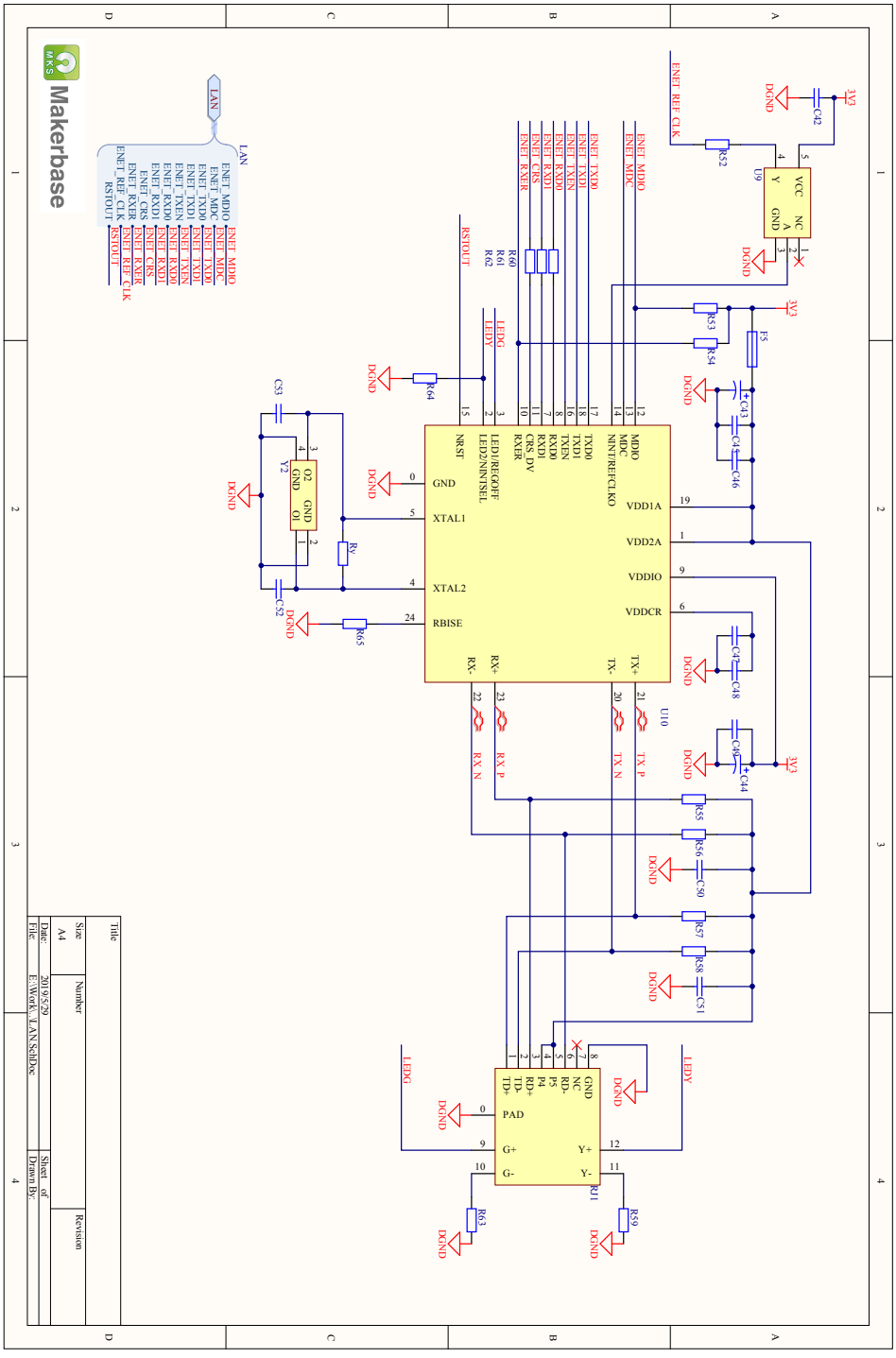
MKS SBASE V1.3 回路図 _13/17



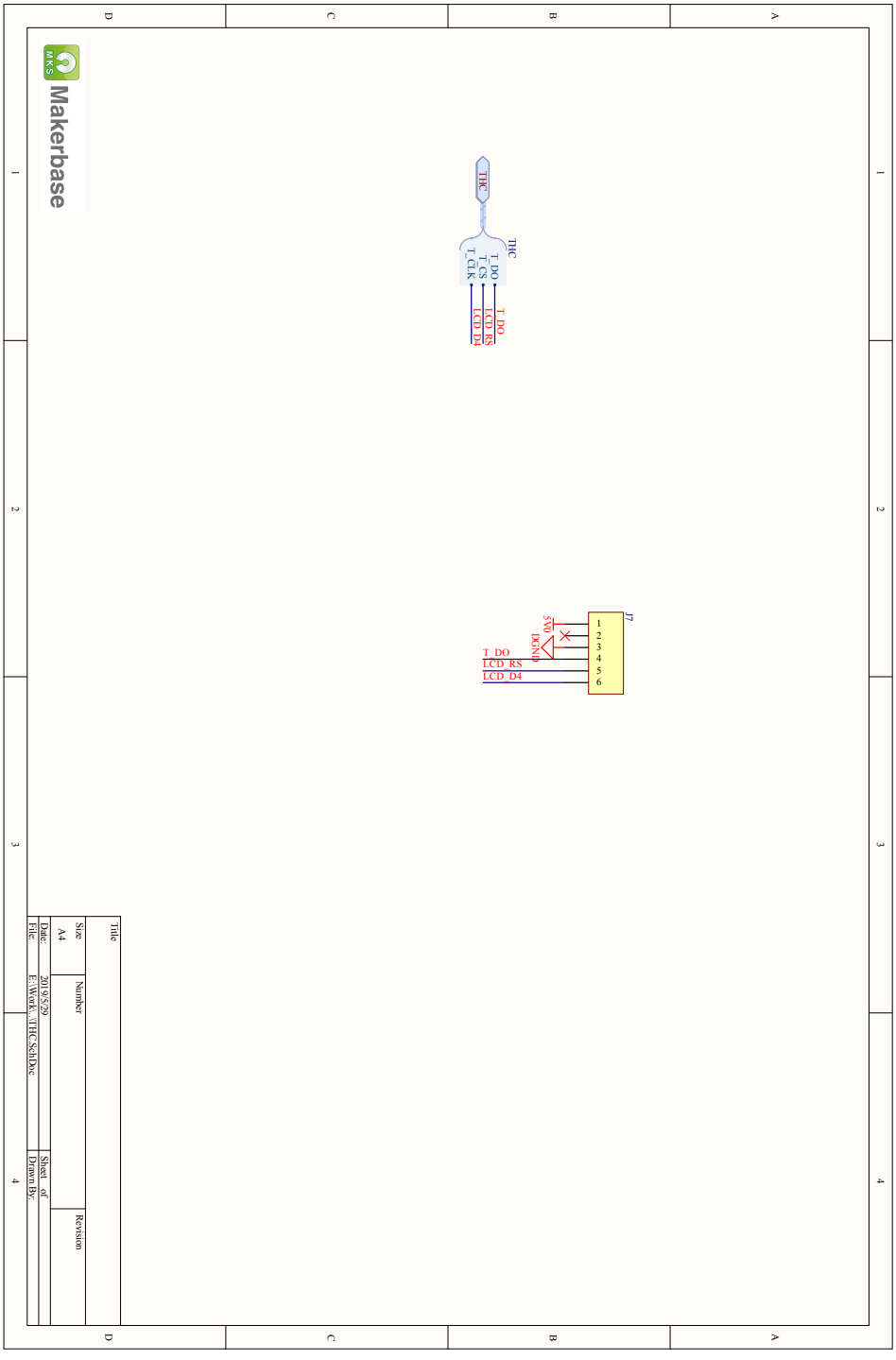
MKS SBASE V1.3 回路図 _14/17



MKS SBASE V1.3 回路図 _15/17

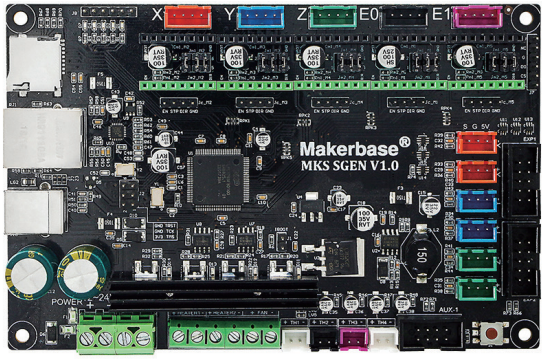


MKS SBASE V1.3 回路図 _16/17



MKS SBASE V1.3 回路図 _17/17

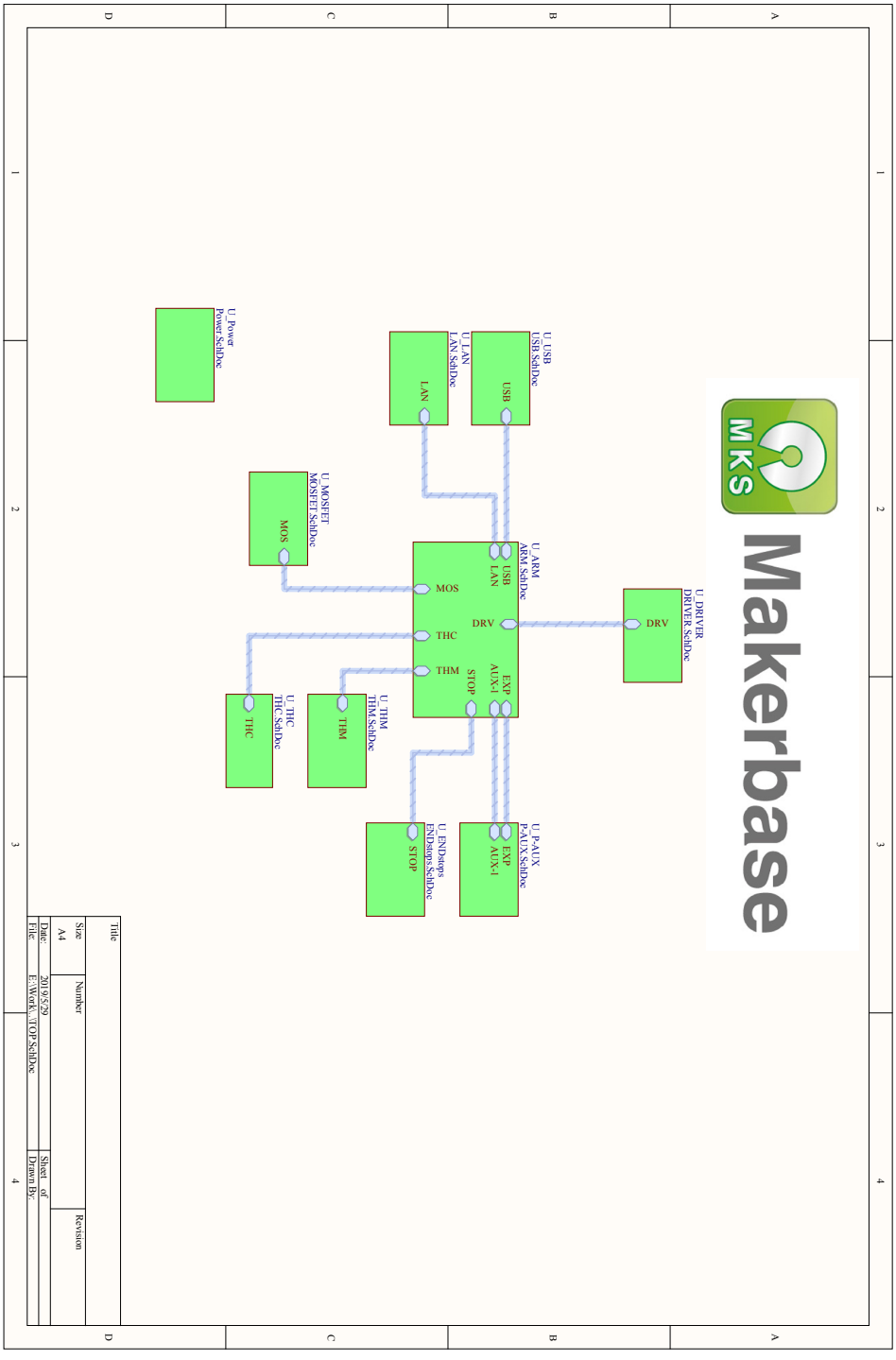
10-6-7　MKS SGEN V1.0 (P-129)



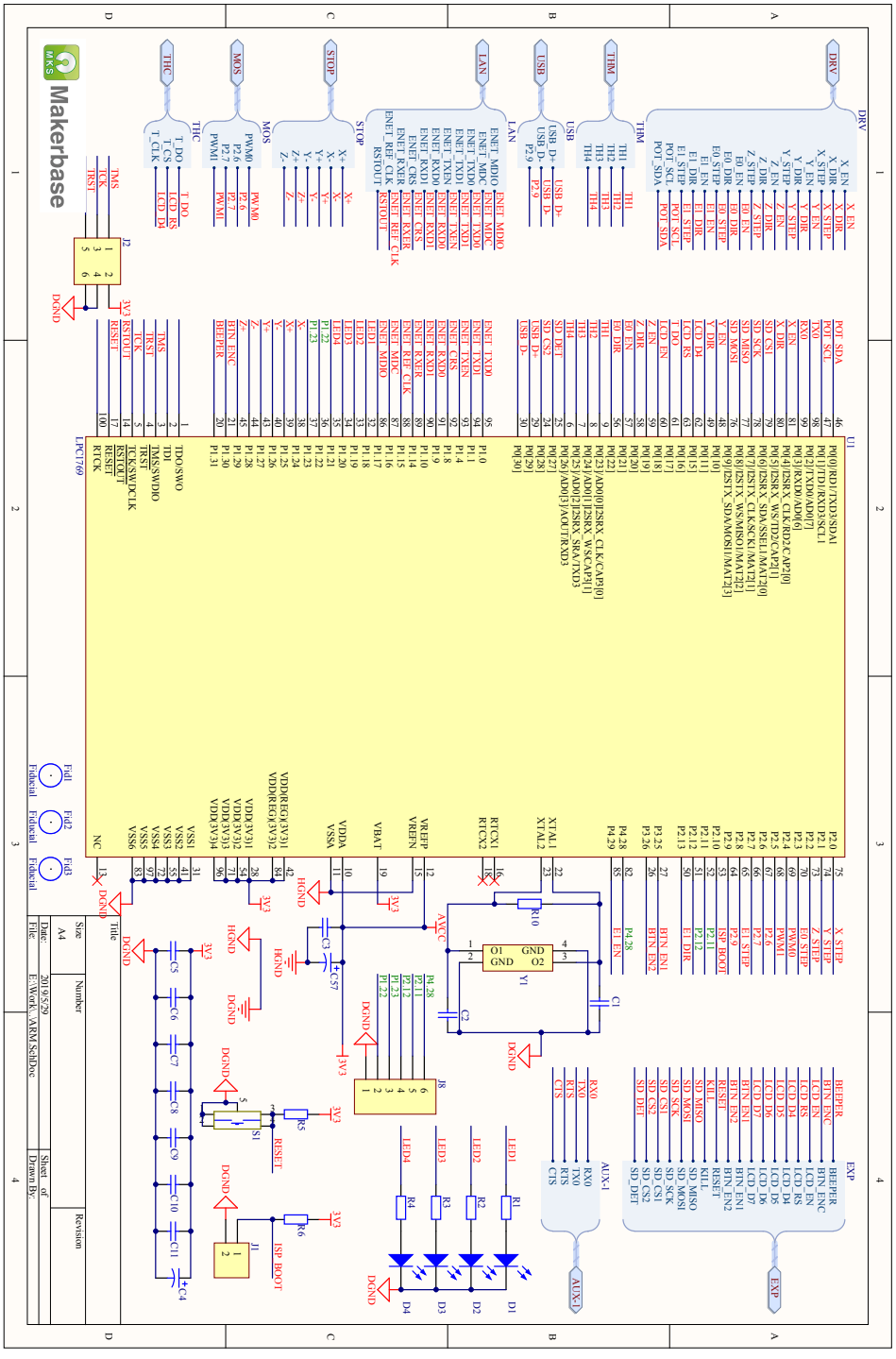
MKS SGEN V1.0

◉GitHub：https://github.com/makerbase-mks/MKS-SGen

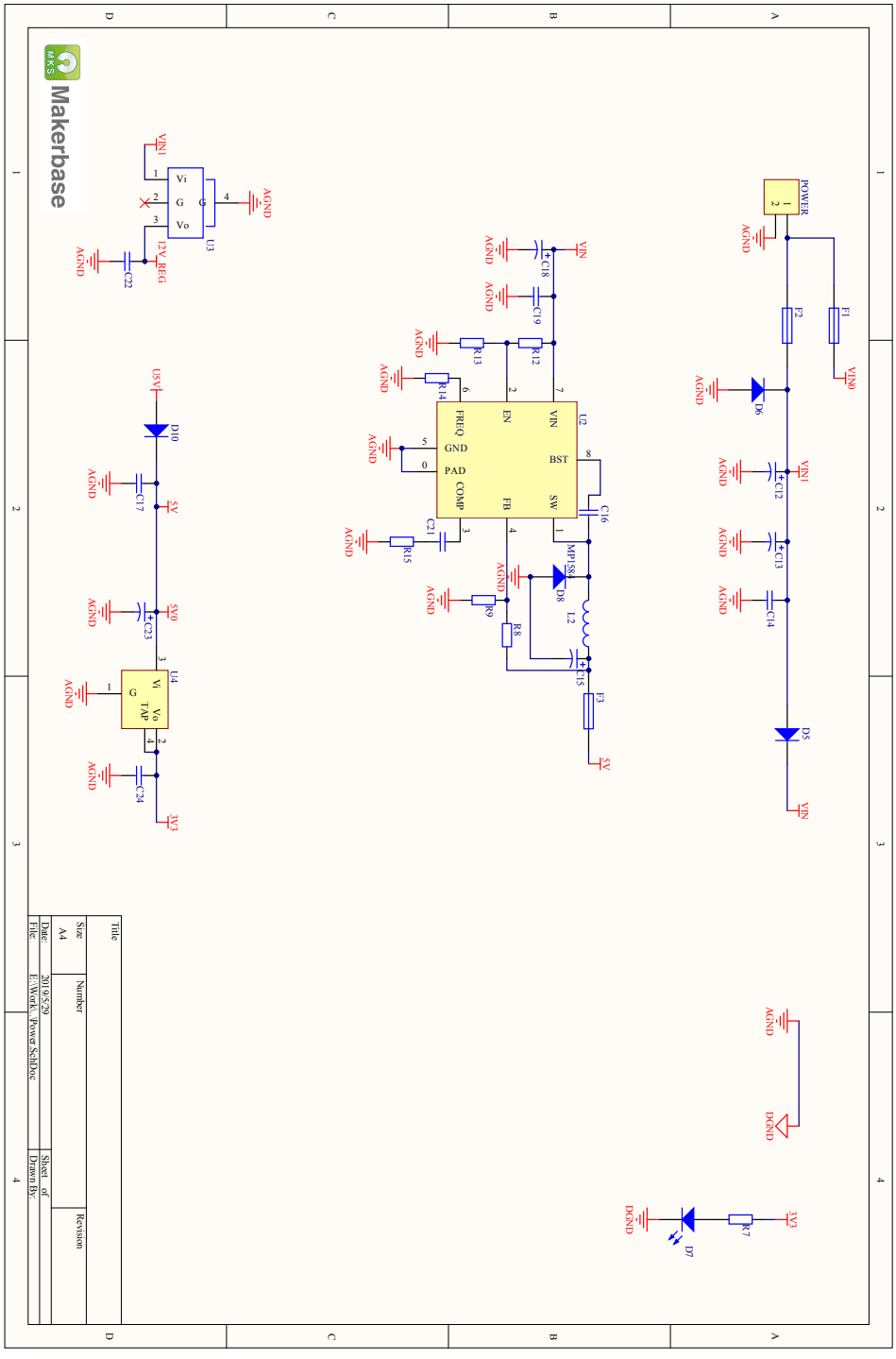
MCU	32bit Cortex-M3 LPC1769 120MHz
ファームウェア	Marlin-bugfix-2.0.x
ドライバ	ソケット×5
電源	12V-24V DC（端子台）
基板	4層
基板サイズ	146.5×95mm
製造メーカー	MakerBase Technology
URL	https://www.makerbase.com.cn/



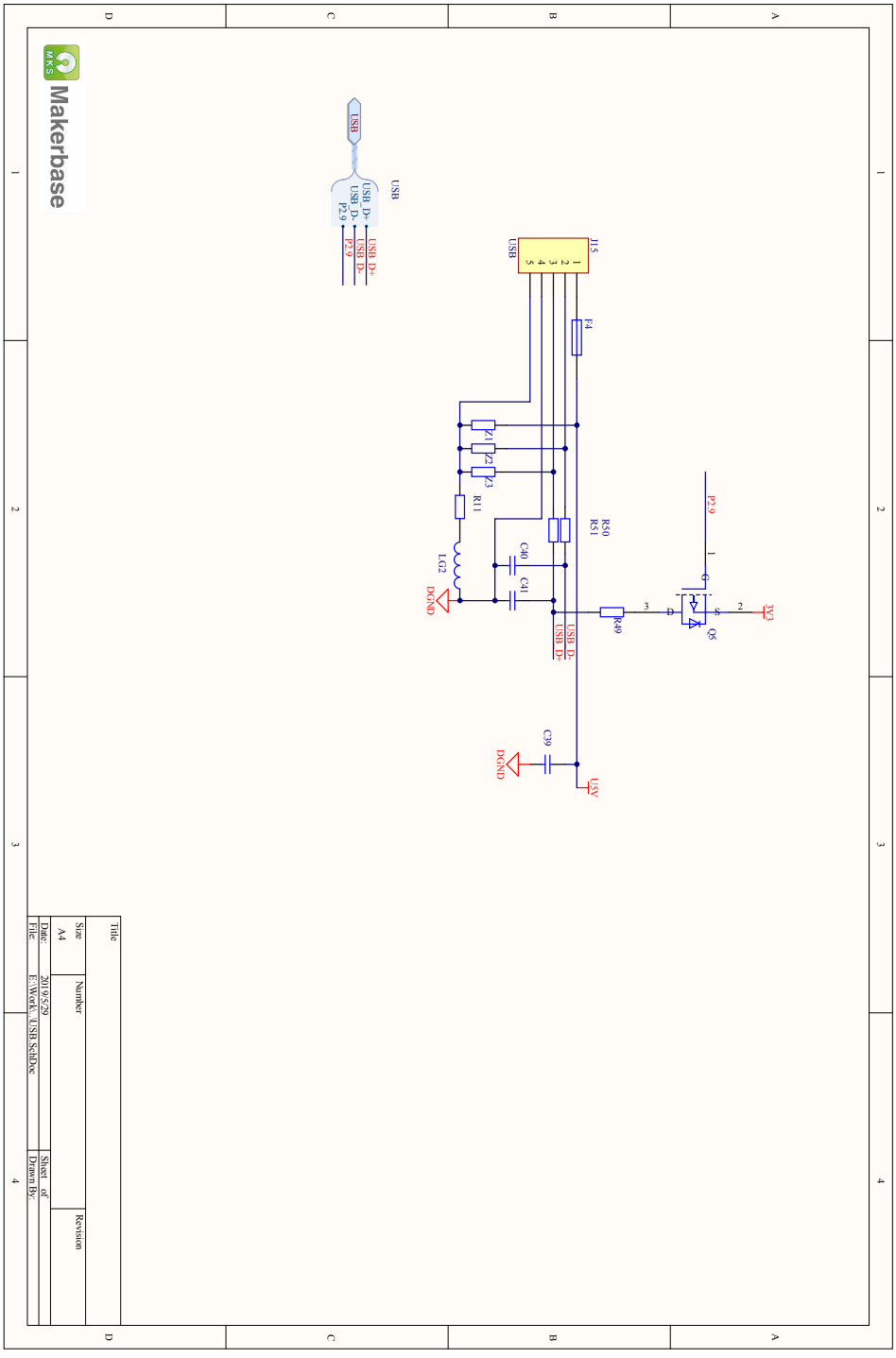
MKS SGEN V1.0 回路図 _1/17



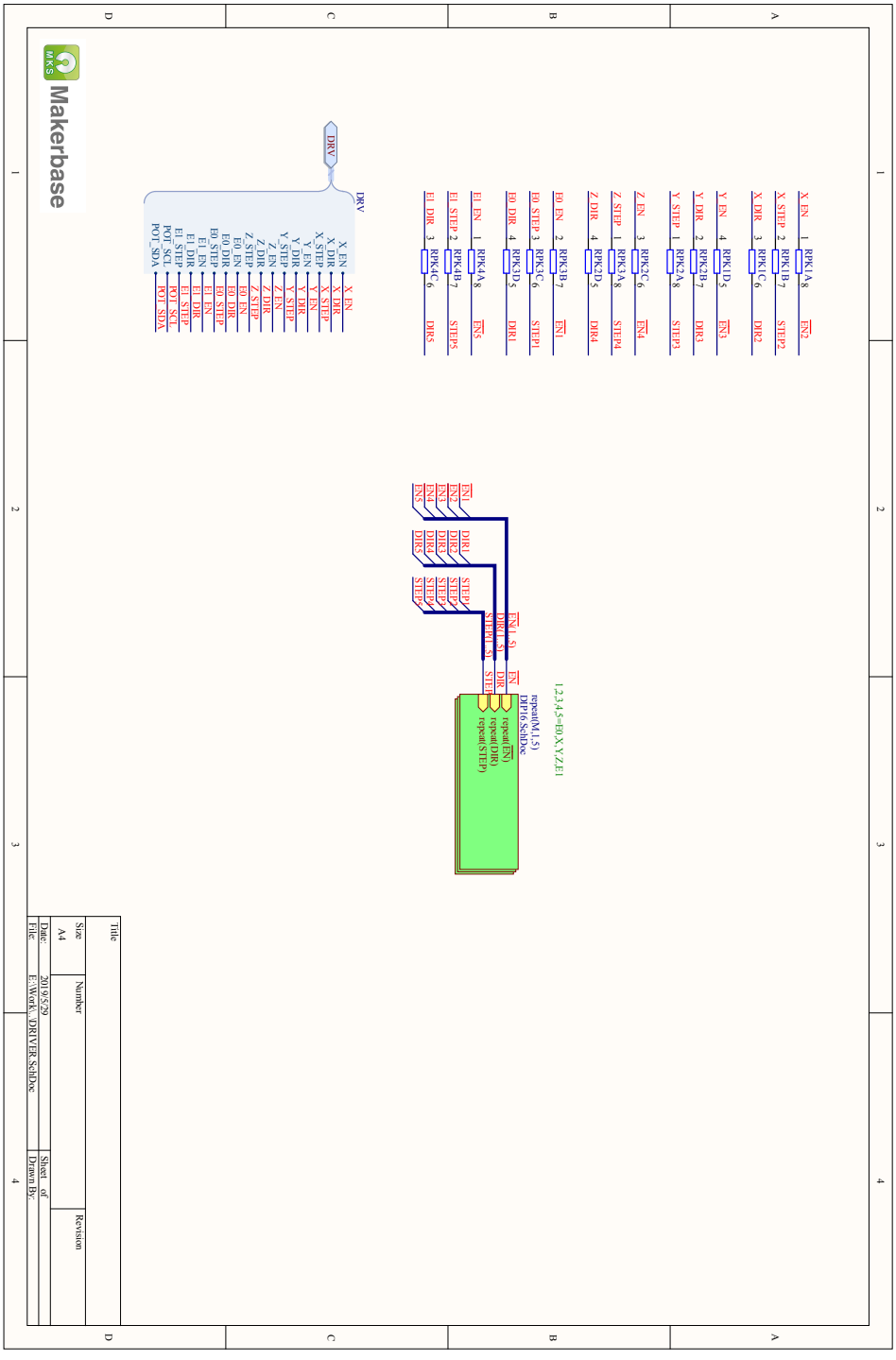
MKS SGEN V1.0 回路図 _2/17



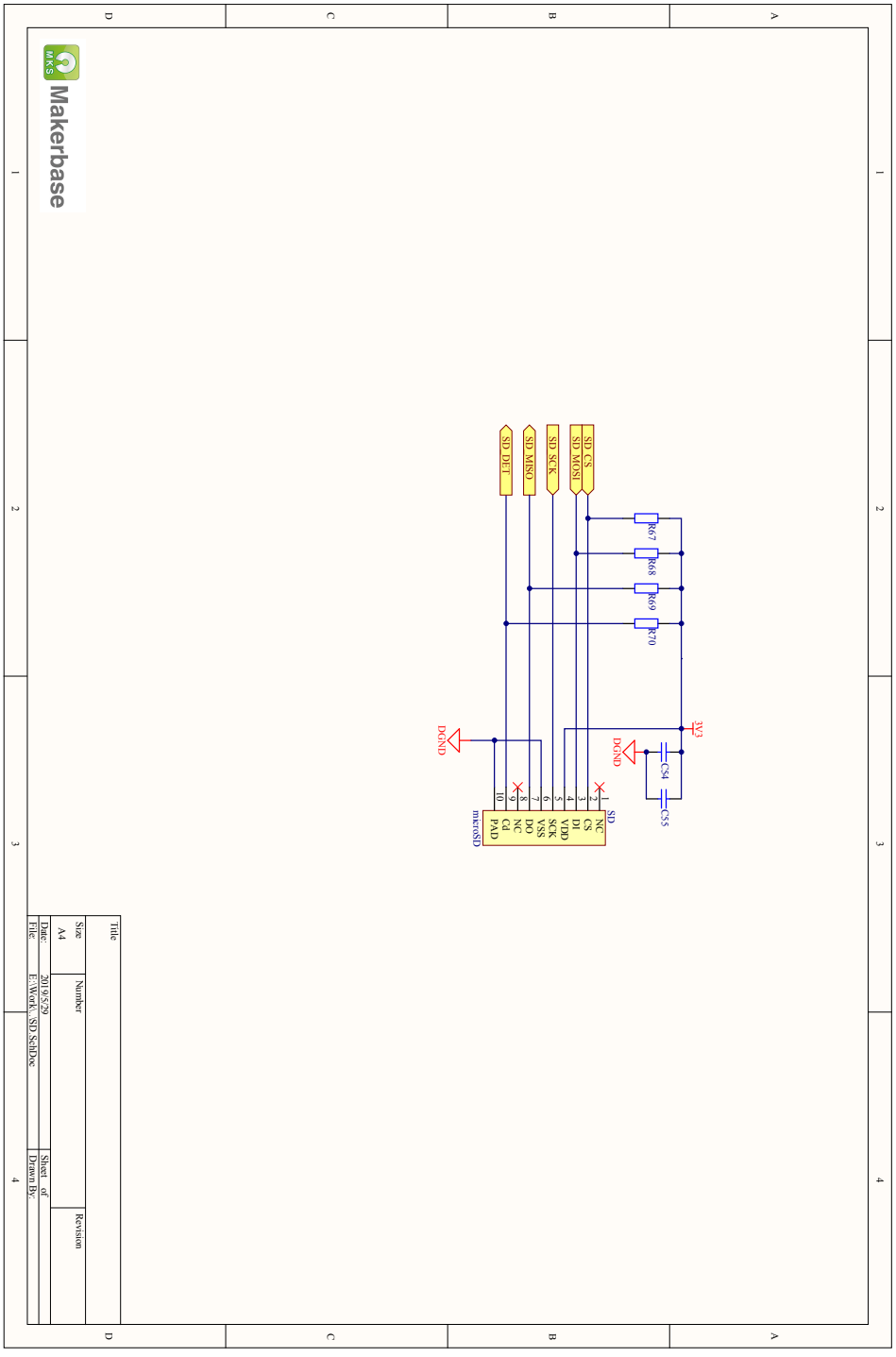
MKS SGEN V1.0 回路図 _3/17



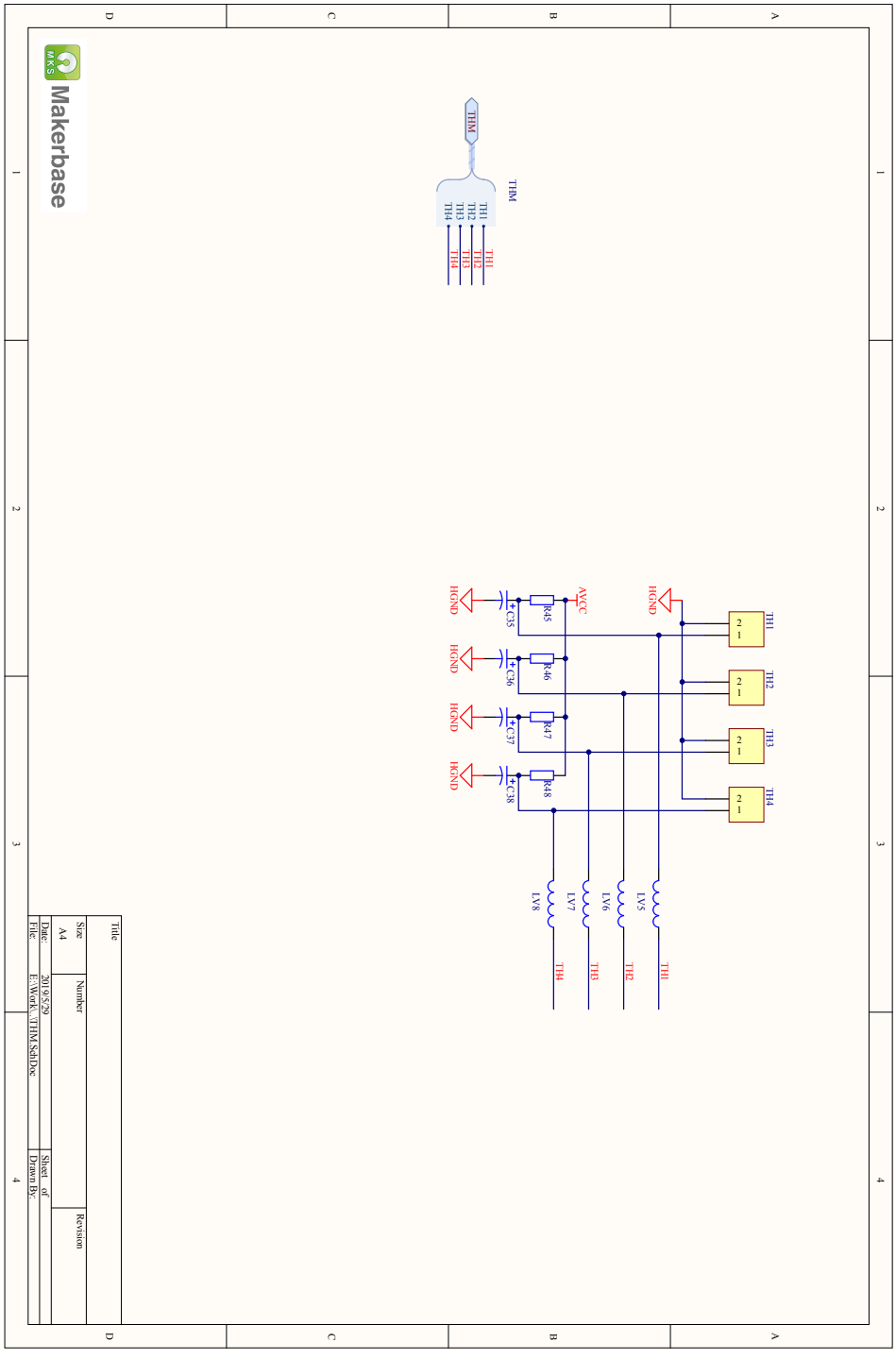
MKS SGEN V1.0 回路図 _4/17



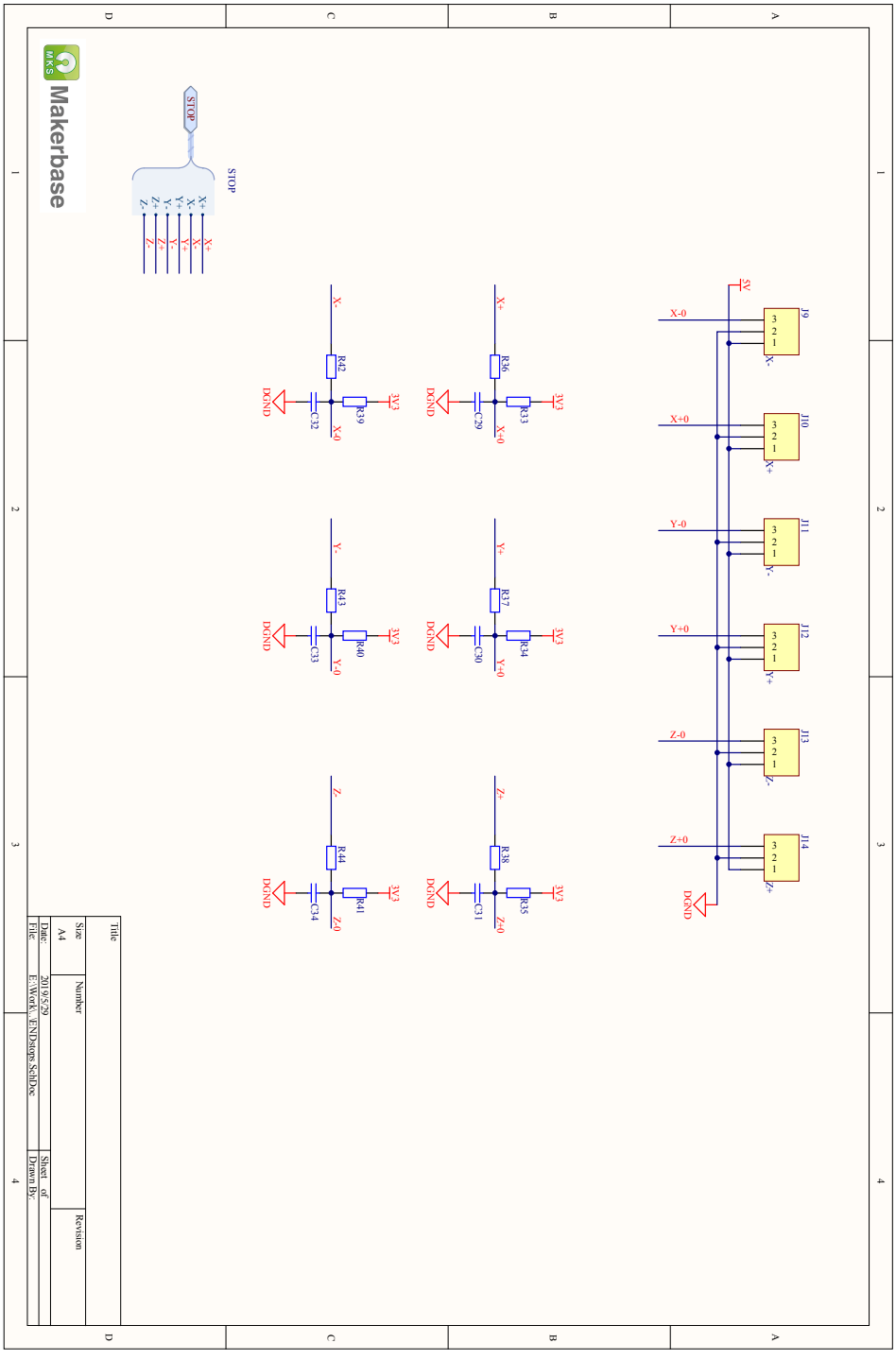
MKS SGEN V1.0 回路図 _5/17



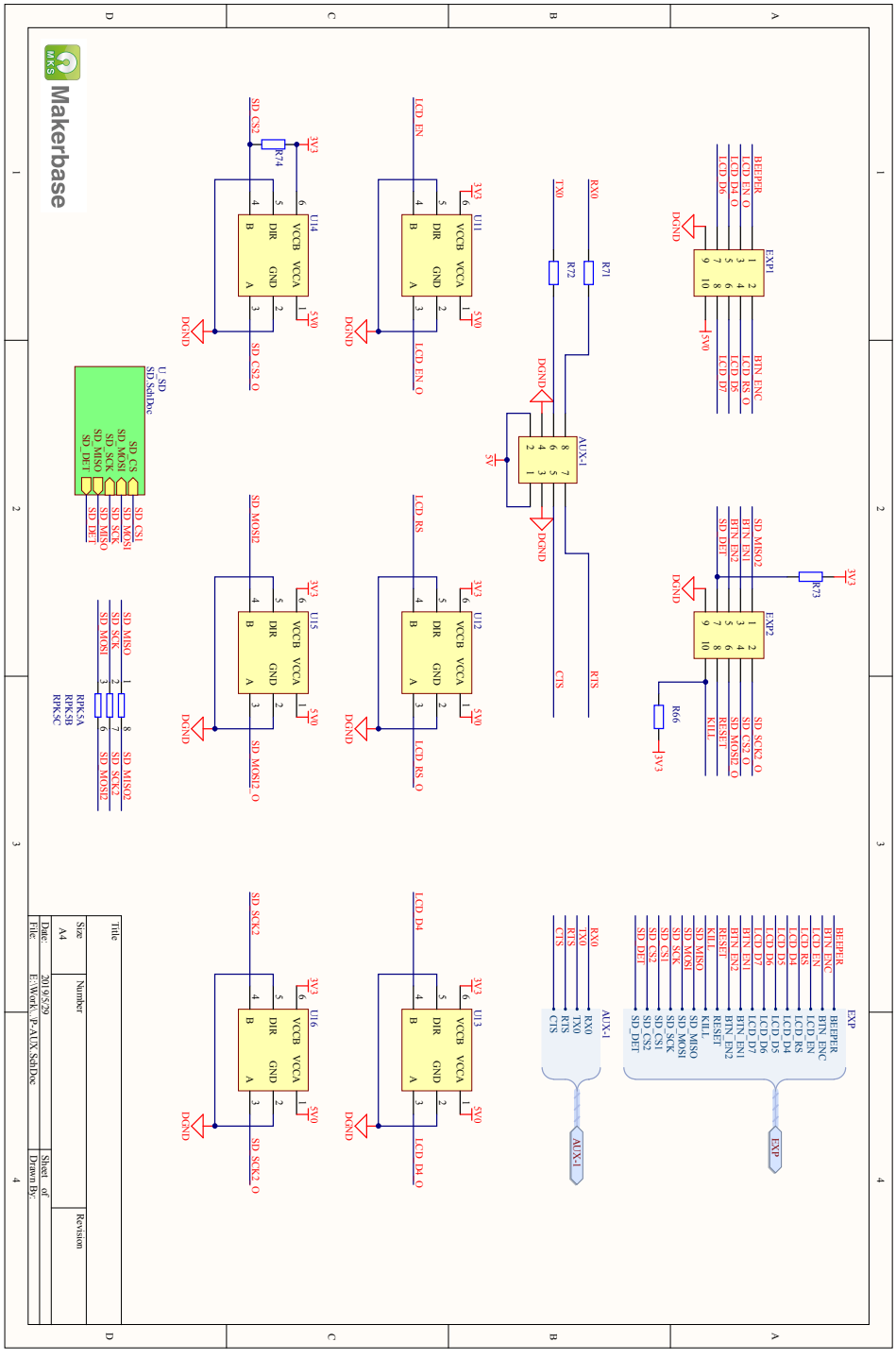
MKS SGEN V1.0 回路図 _6/17



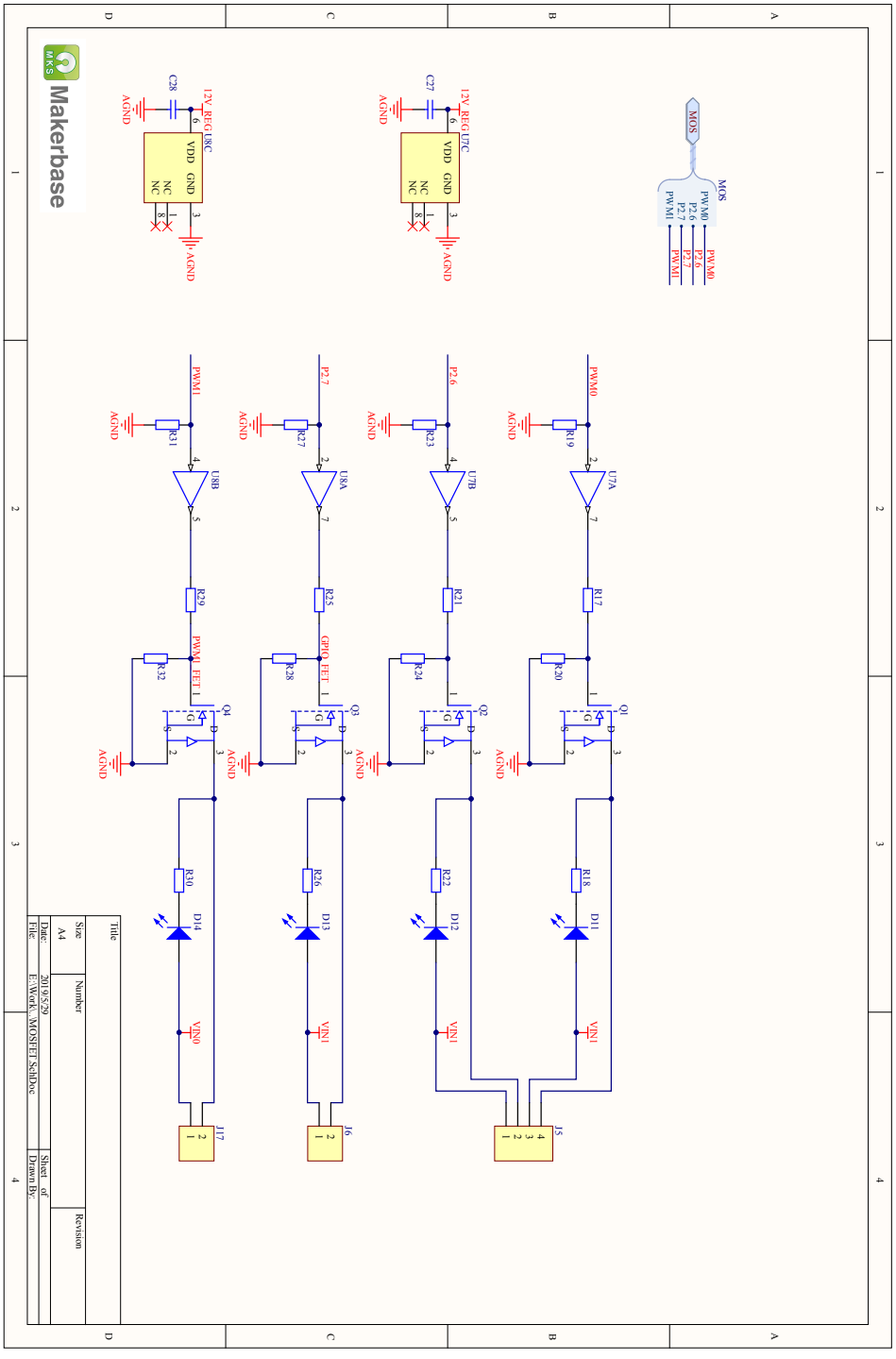
MKS SGEN V1.0 回路図 _7/17



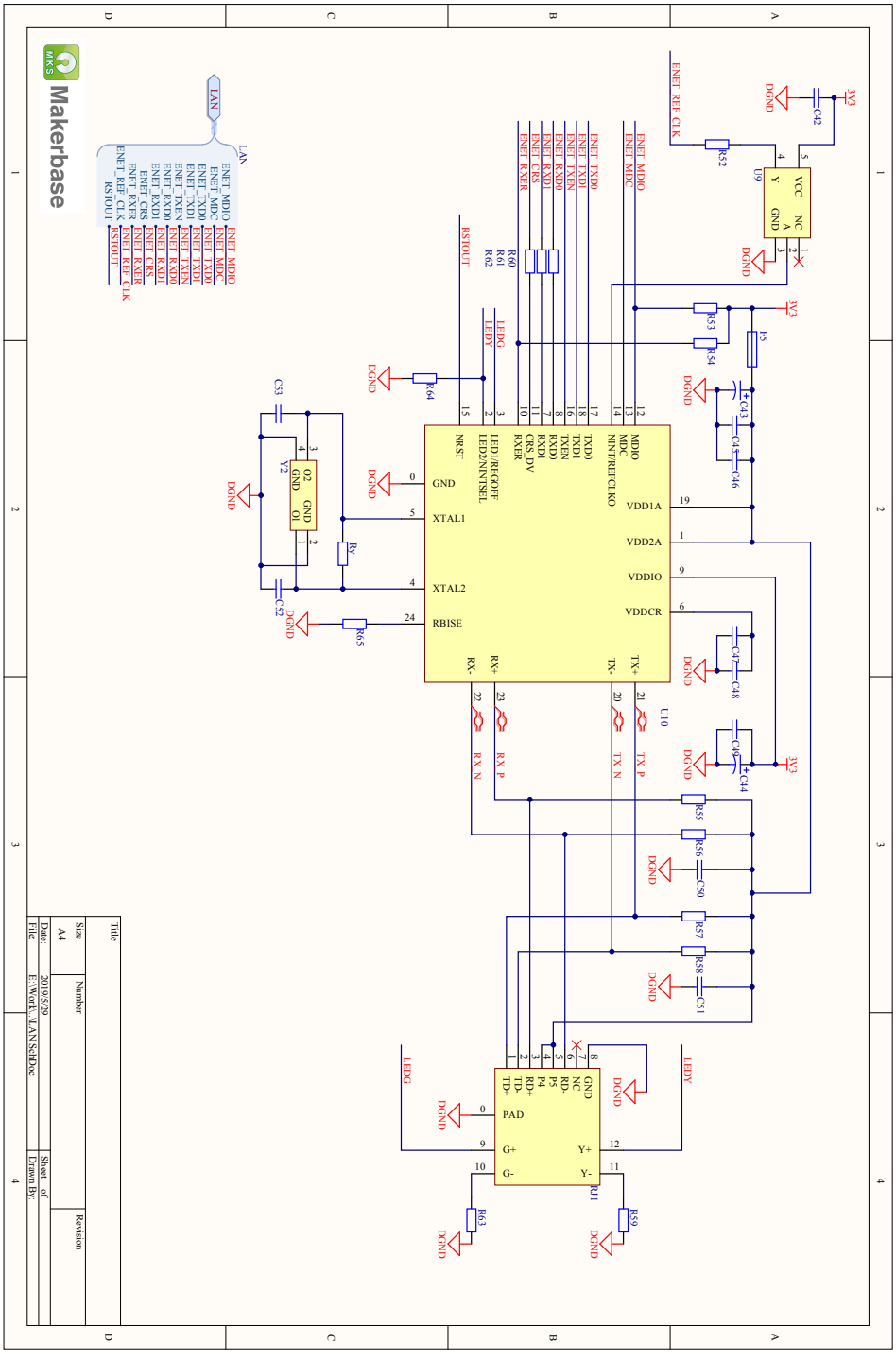
MKS SGEN V1.0 回路図 _8/17



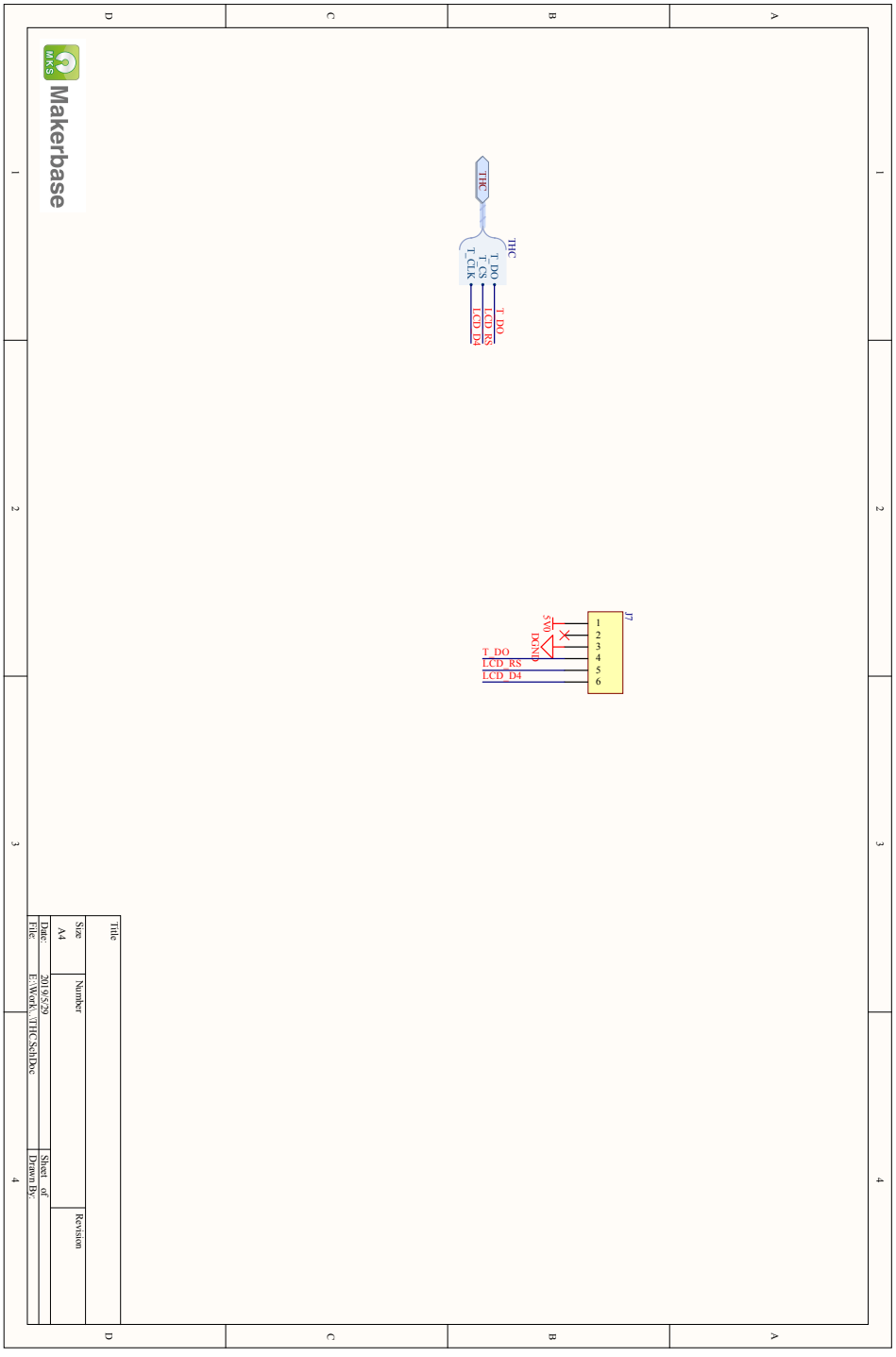
MKS SGEN V1.0 回路図 _9/17



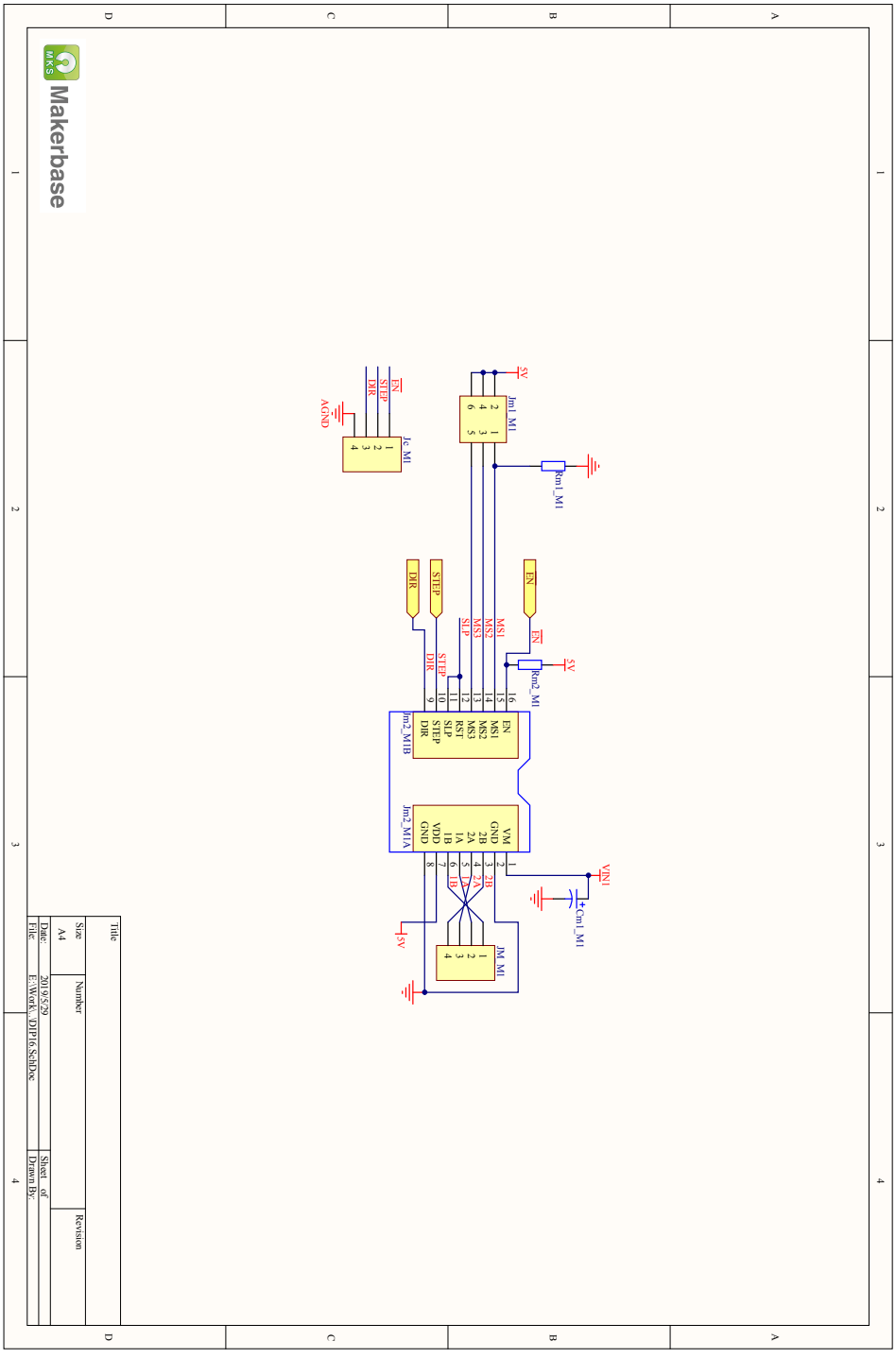
MKS SGEN V1.0 回路図 _10/17



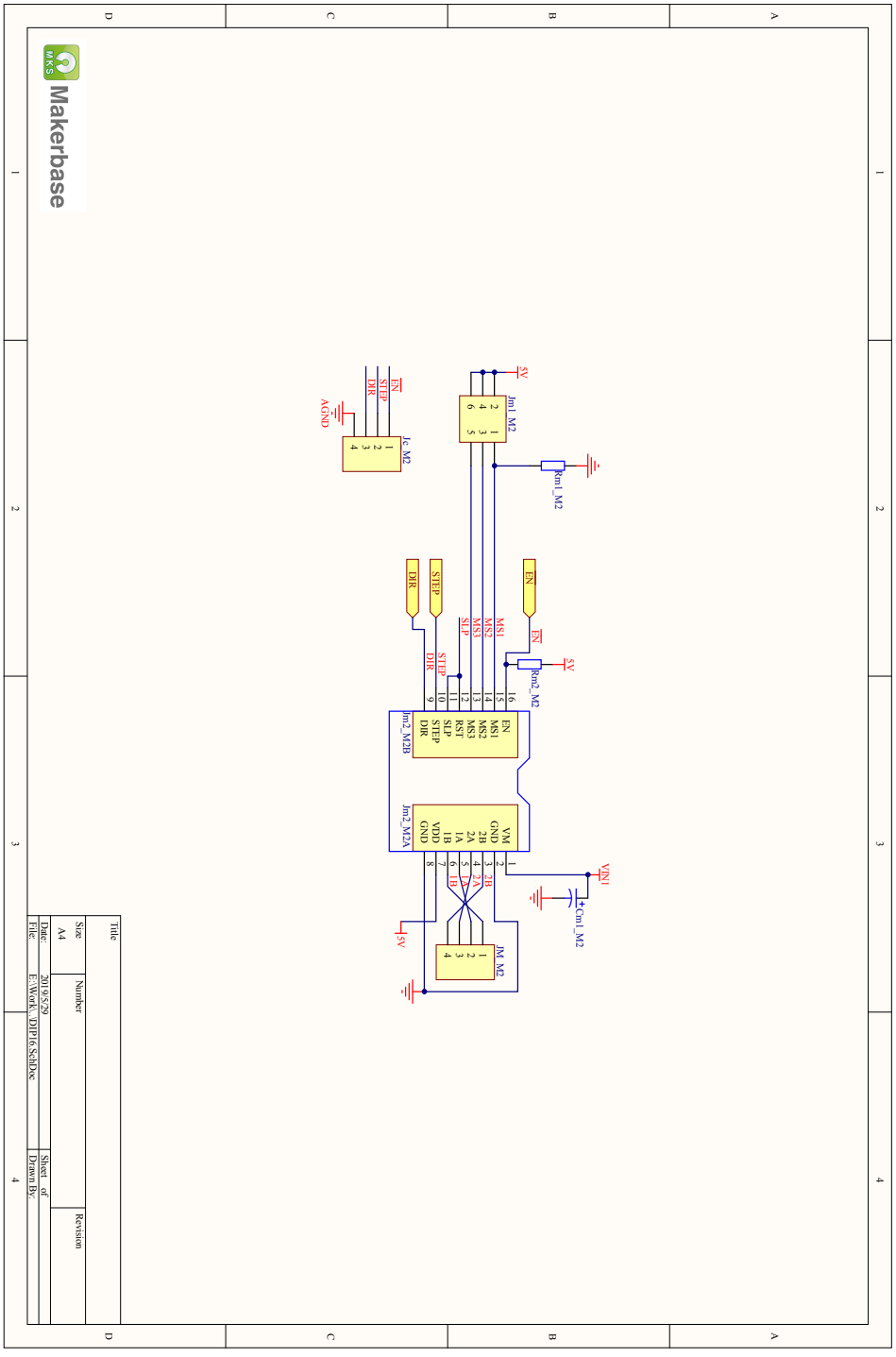
MKS SGEN V1.0 回路図 _11/17



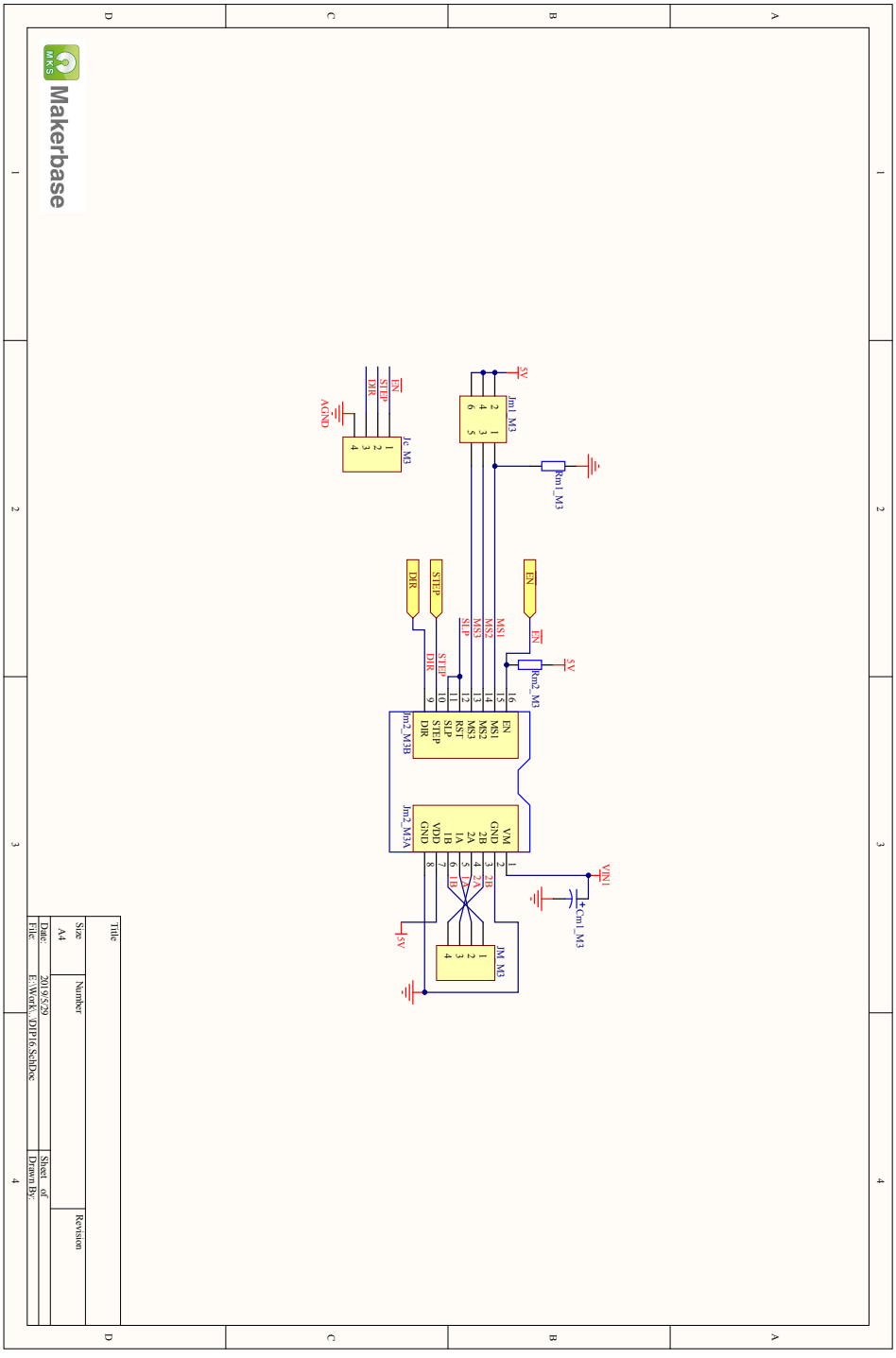
MKS SGEN V1.0 回路図 _12/17



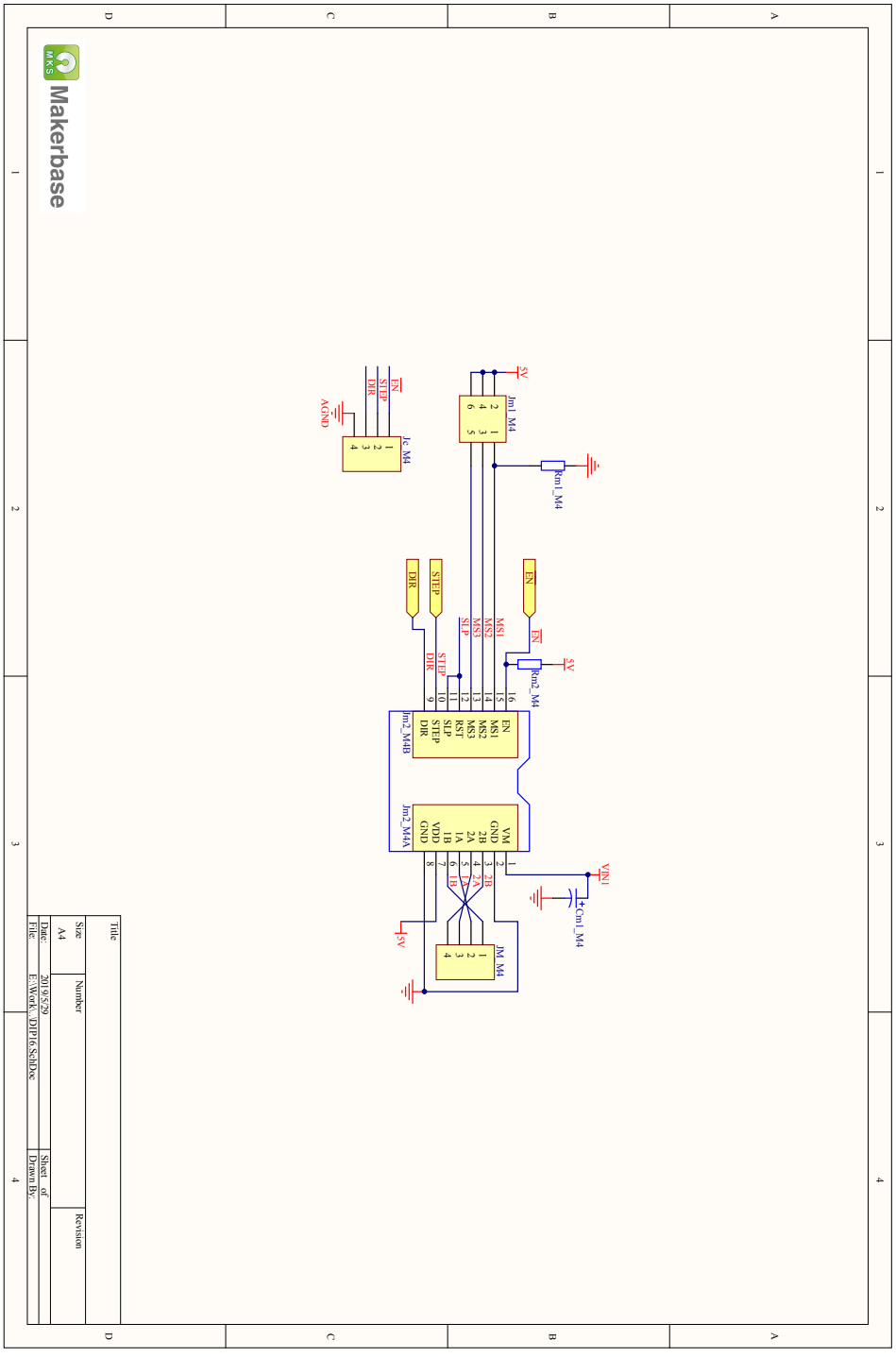
MKS SGEN V1.0 回路図 _13/17



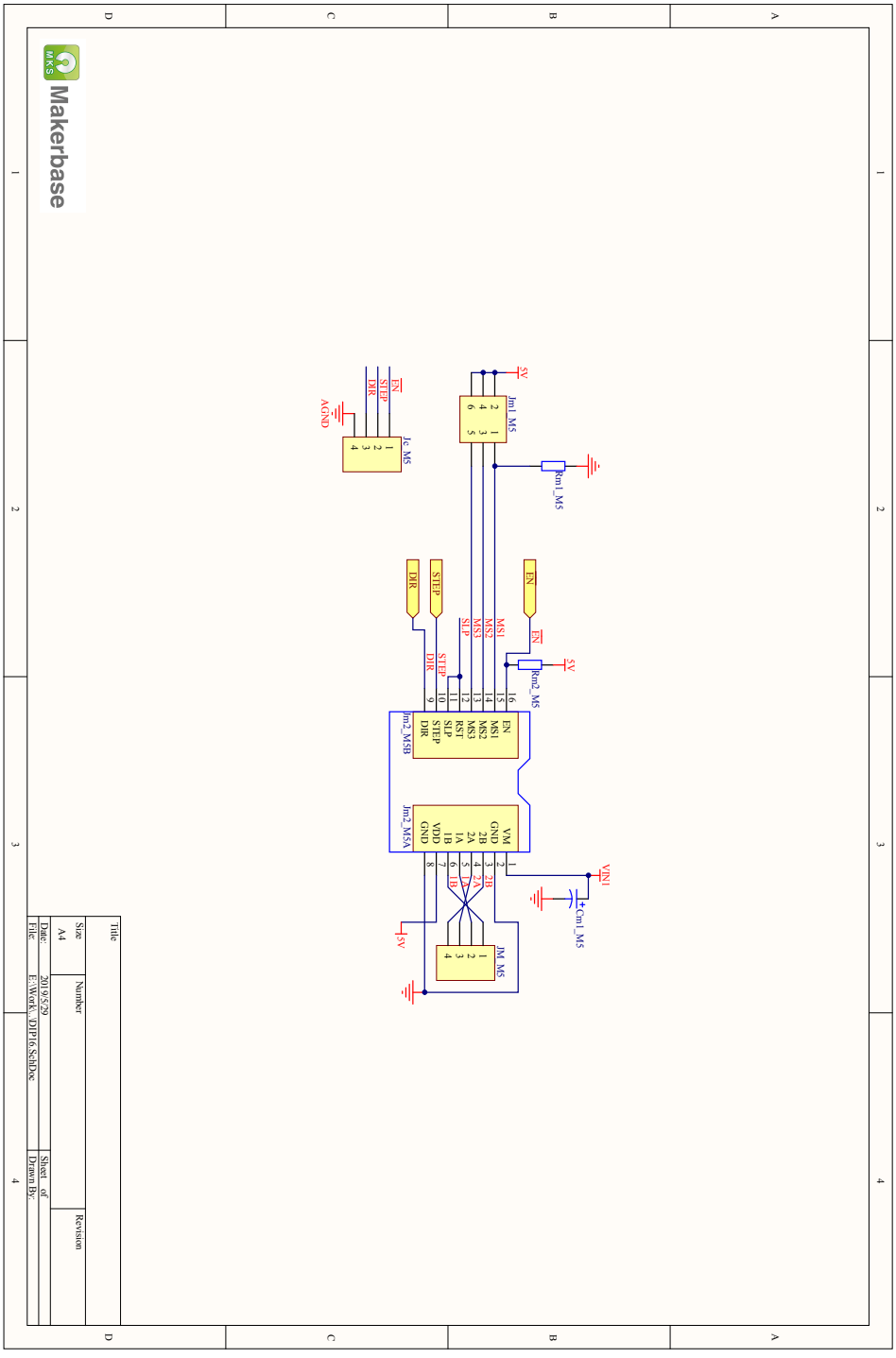
MKS SGEN V1.0 回路図 _14/17



MKS SGEN V1.0 回路図 _15/17

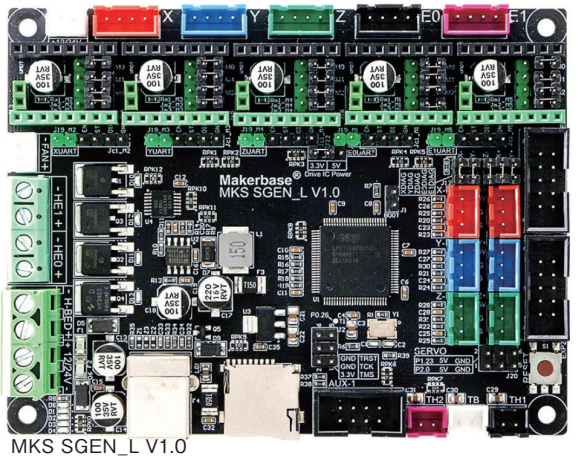


MKS SGEN V1.0 回路図 _16/17



MKS SGEN V1.0 回路図 _17/17

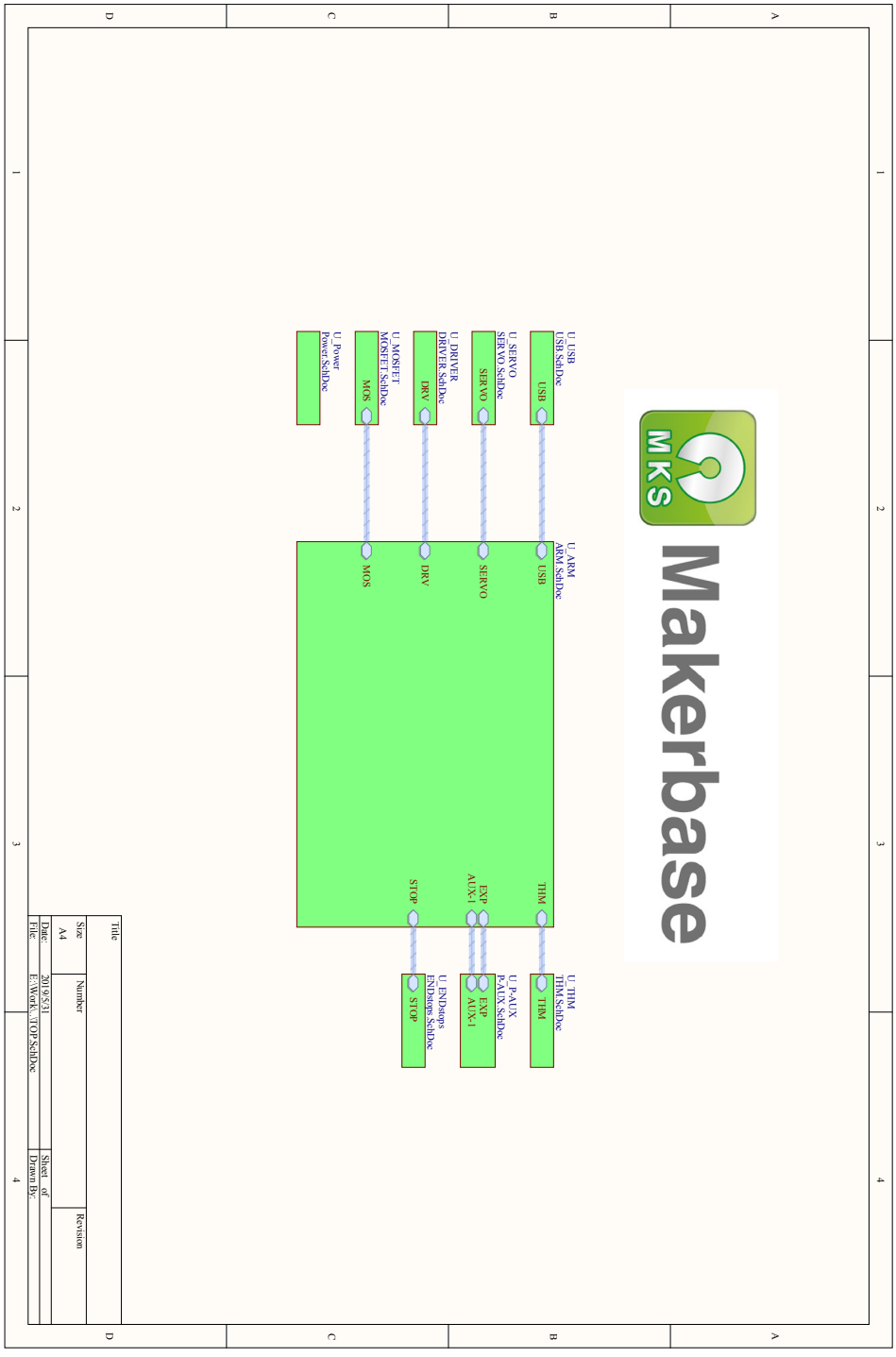
10-6-8　MKS SGEN_L V1.0 (P-130)



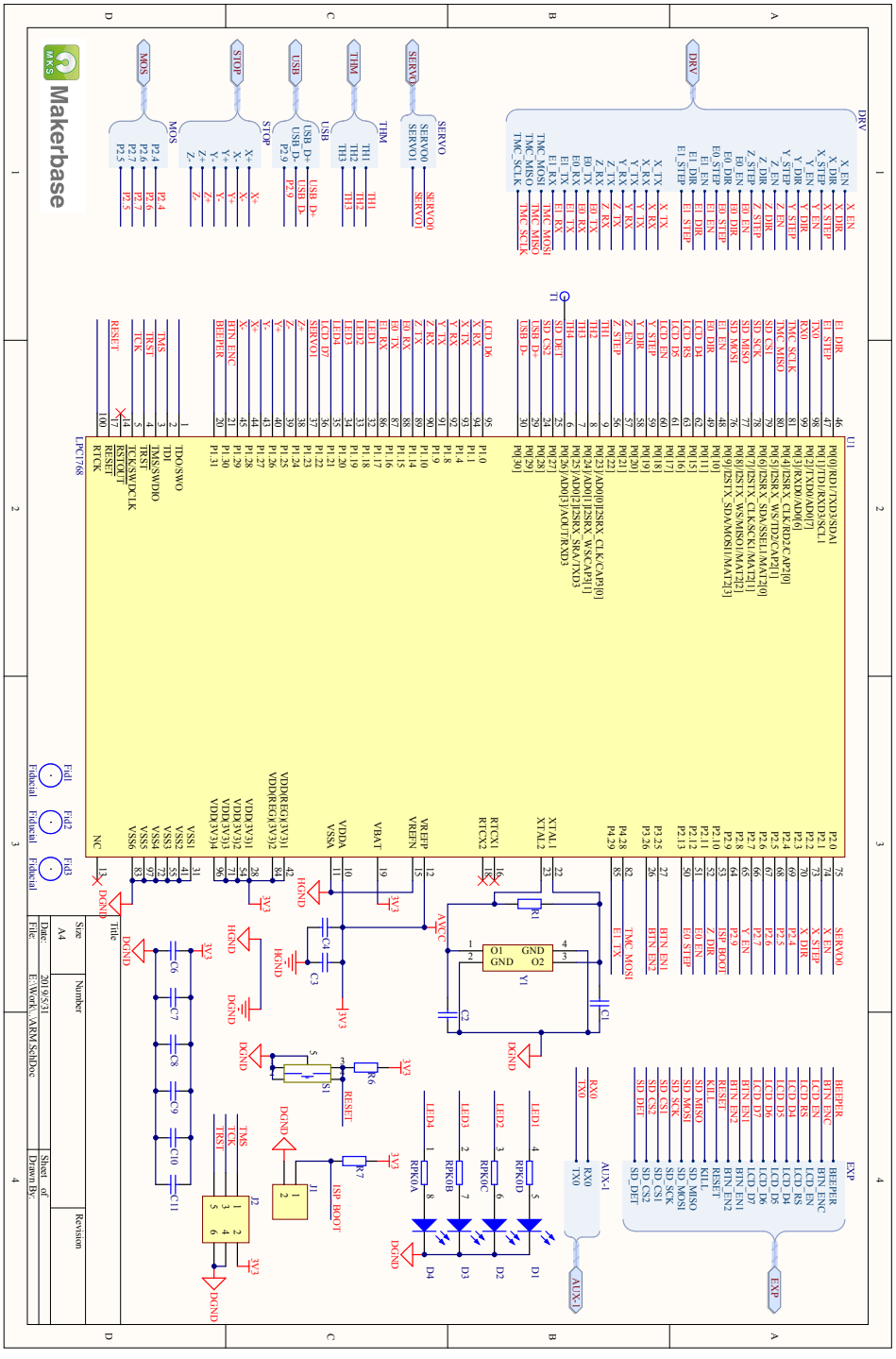
MKS SGEN_L V1.0

◉GitHub：https://github.com/makerbase-mks/SGEN_L

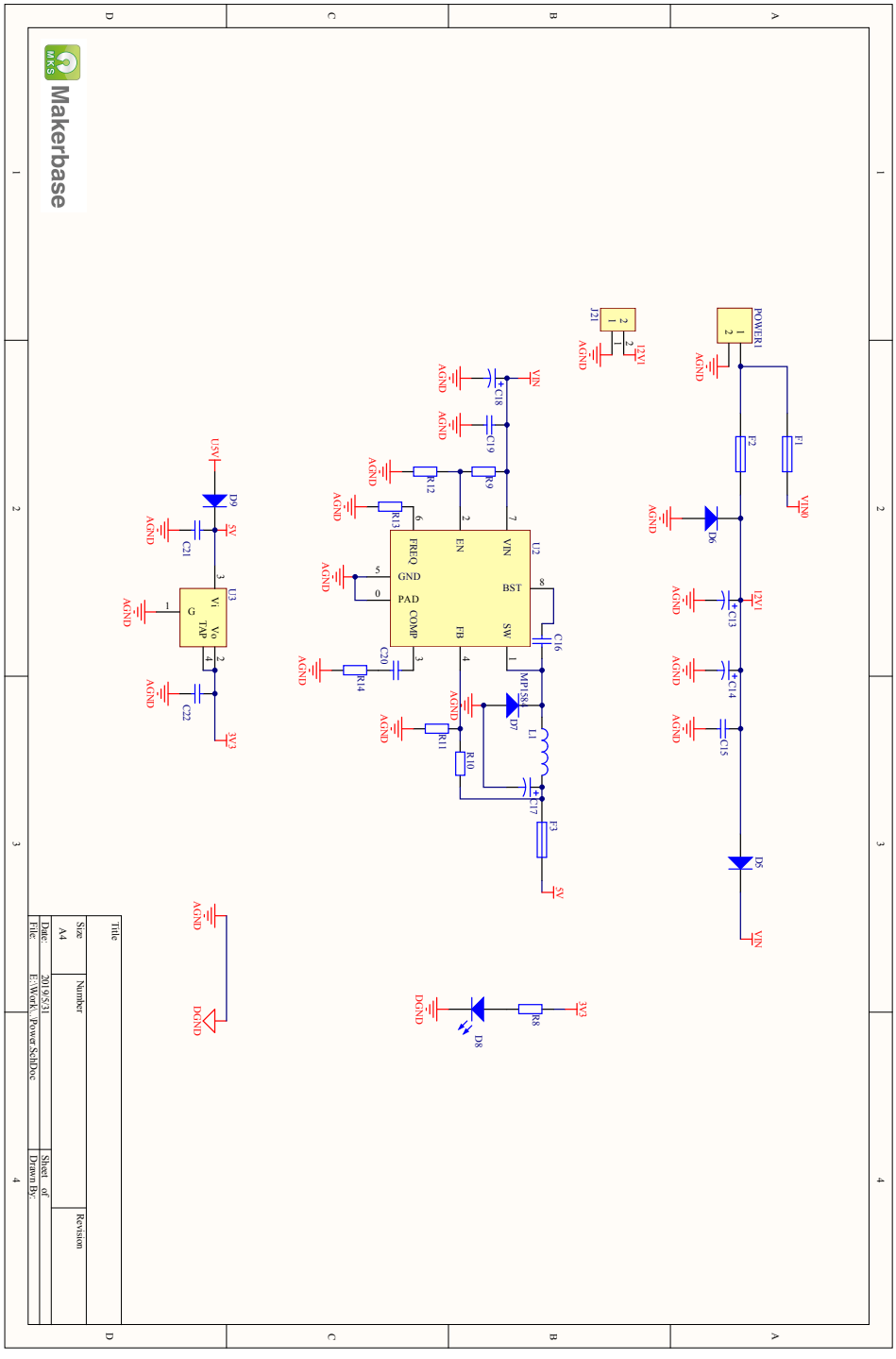
MCU	32bit Cortex-M3 LPC1768 100MHz
ファームウェア	Marlin-bugfix-2.0.x，Smoothieware
ドライバ	ソケット×5
電源	12V-24V DC（端子台）
基板	4層
基板サイズ	102×76mm
製造メーカー	MakerBase Technology
URL	https://www.makerbase.com.cn/



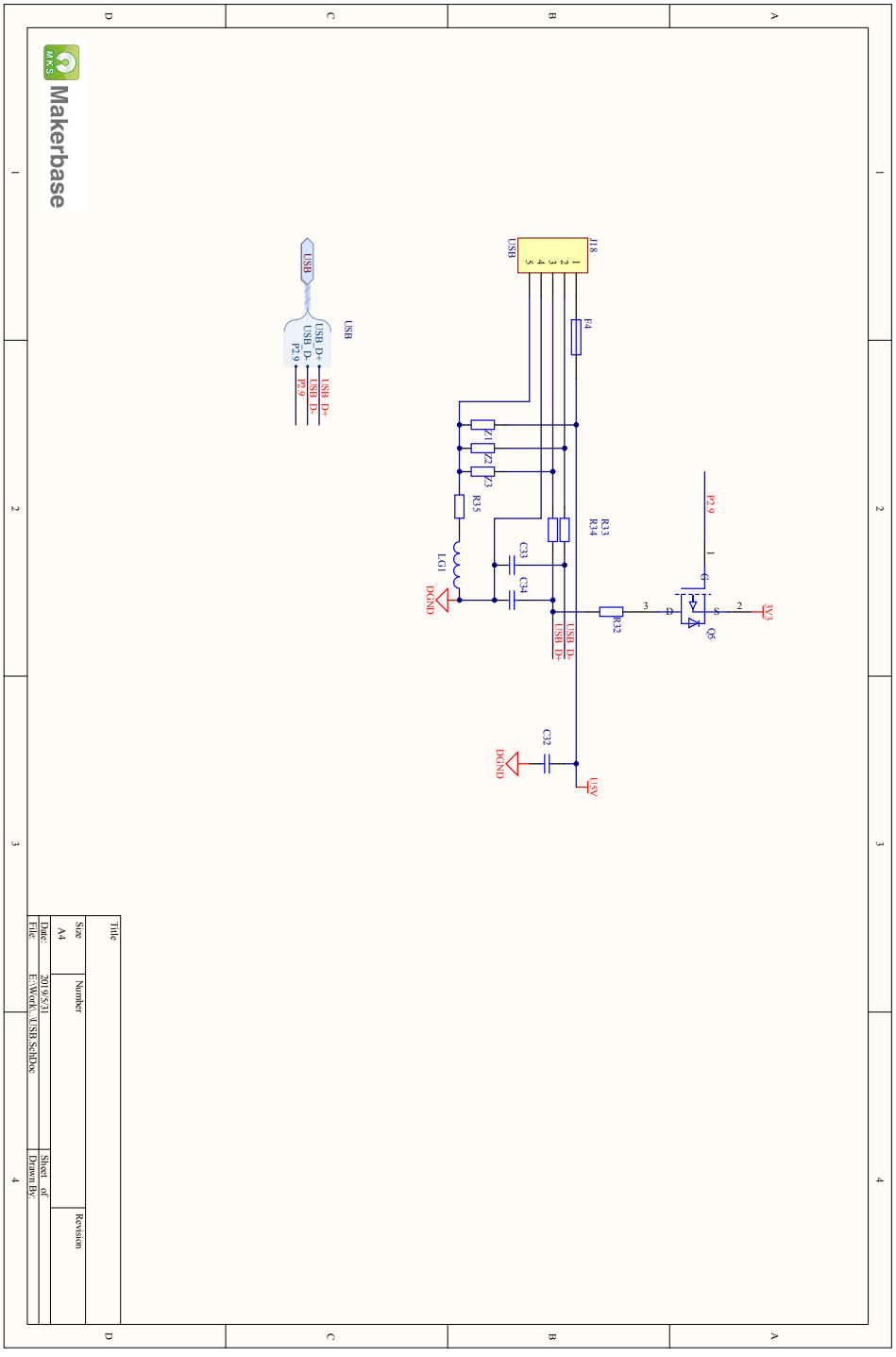
MKS SGEN_L V1.0 回路図 _1/12



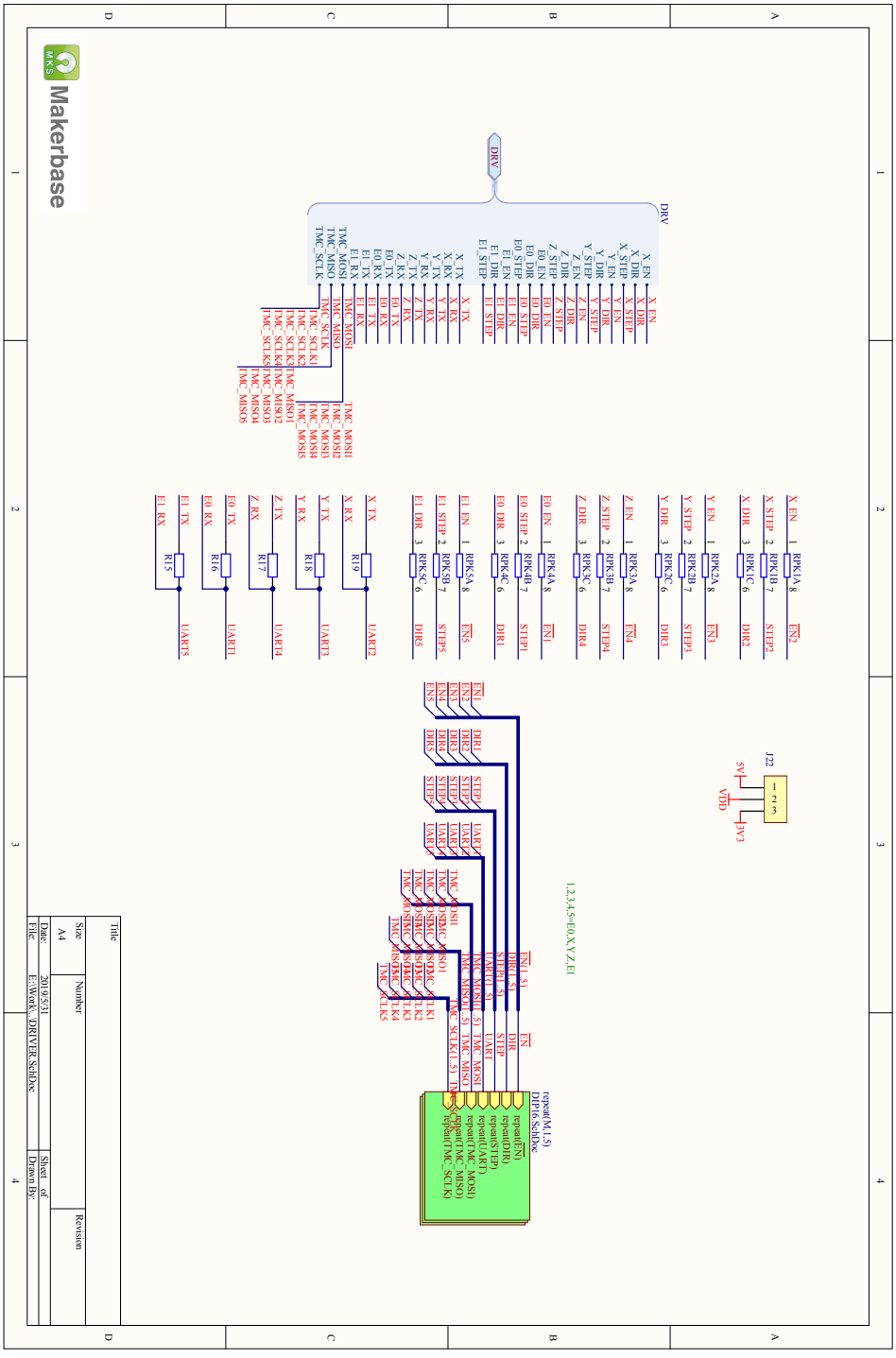
MKS SGEN_L V1.0 回路図 _2/12



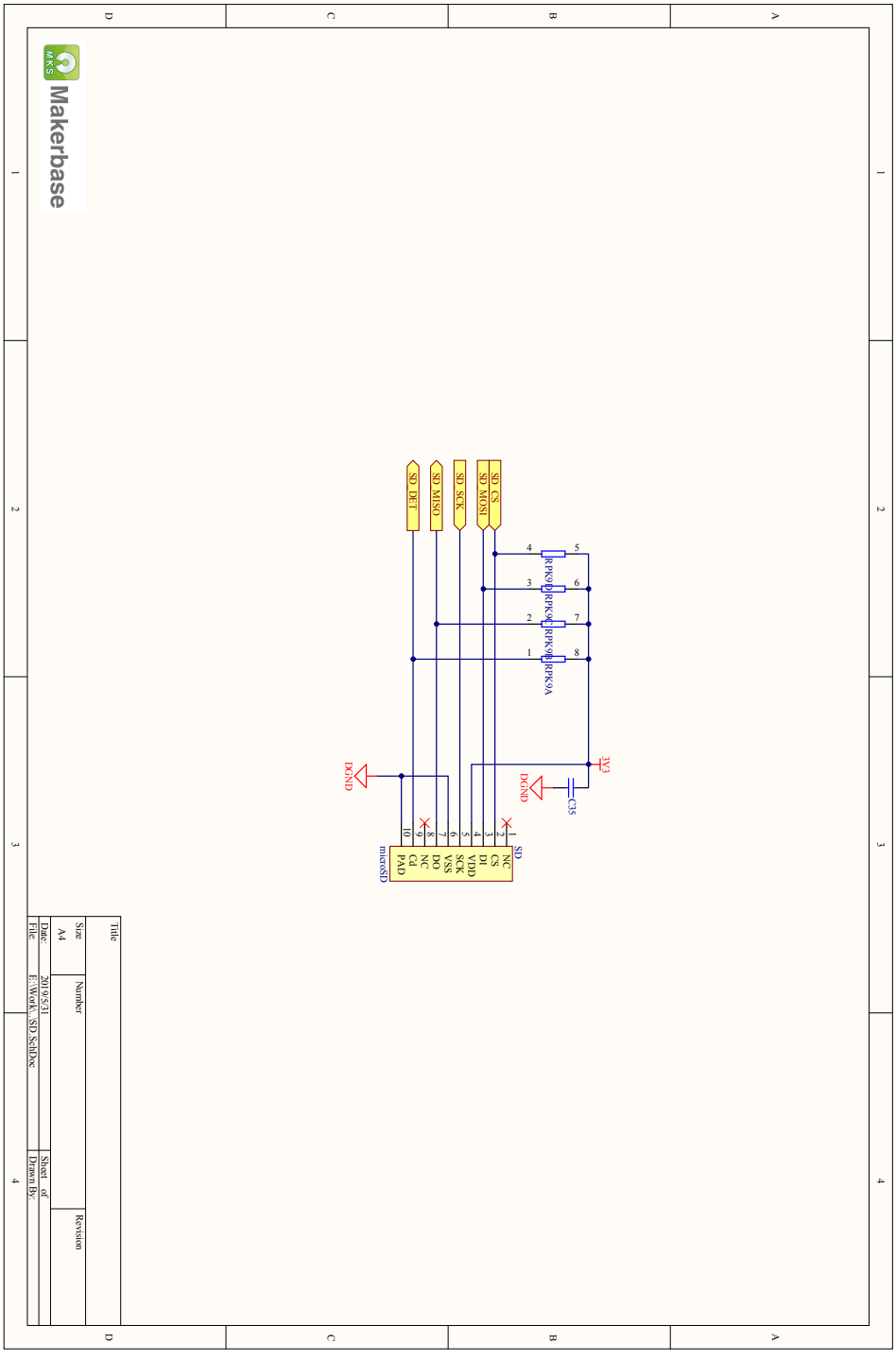
MKS SGEN_L V1.0 回路図 _3/12



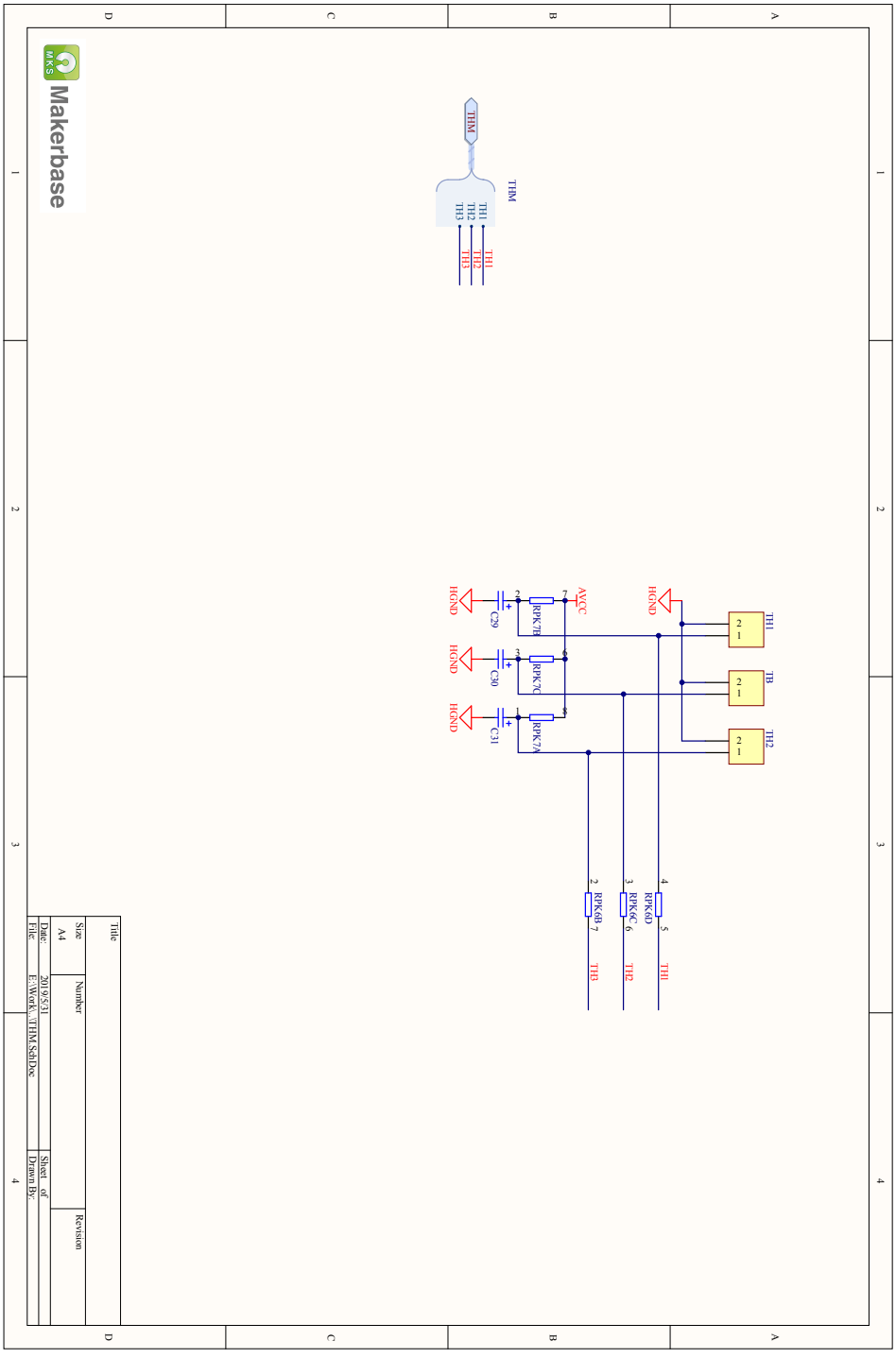
MKS SGEN_L V1.0 回路図 _4/12



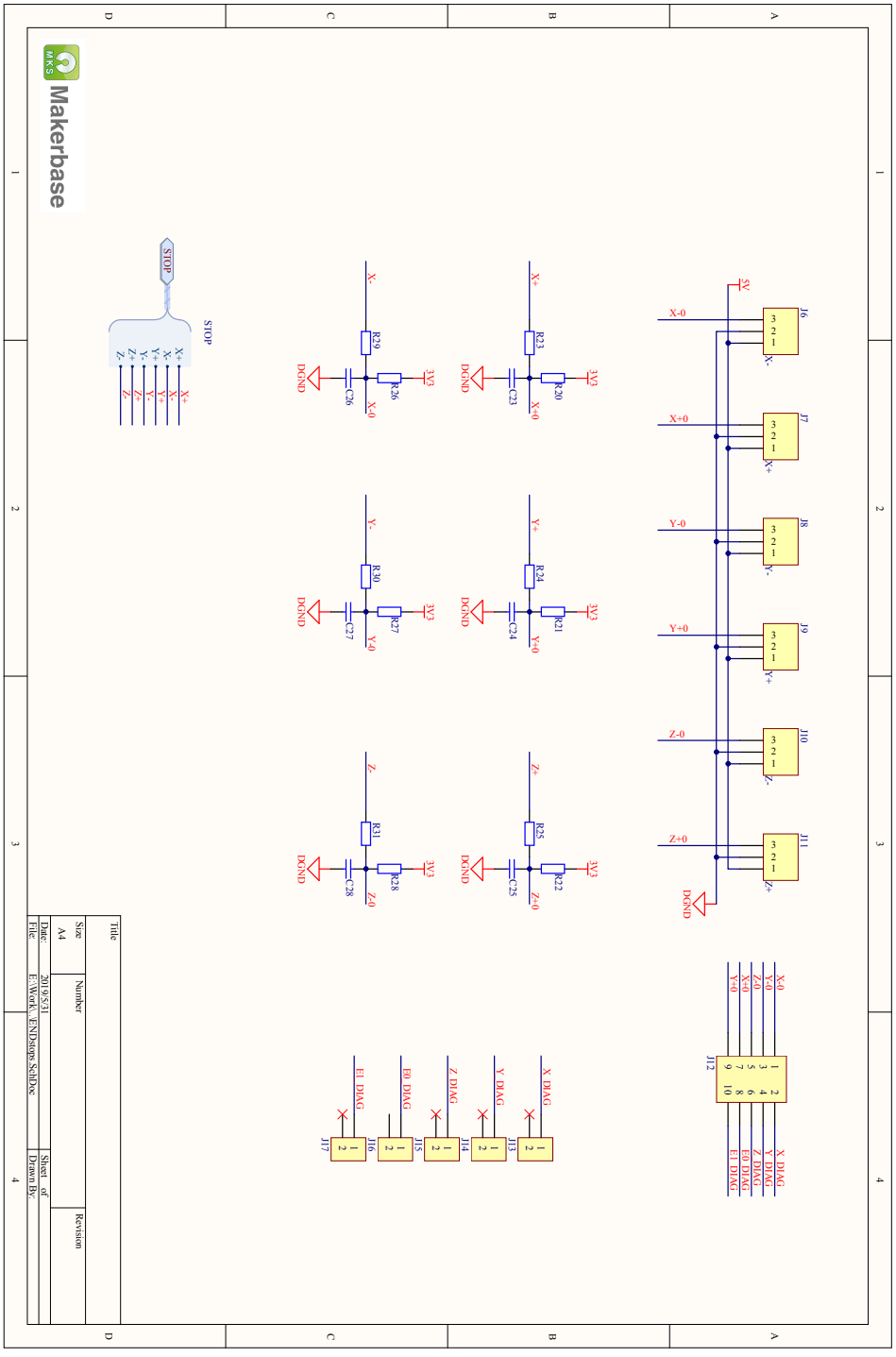
MKS SGEN_L V1.0 回路図 _5/12



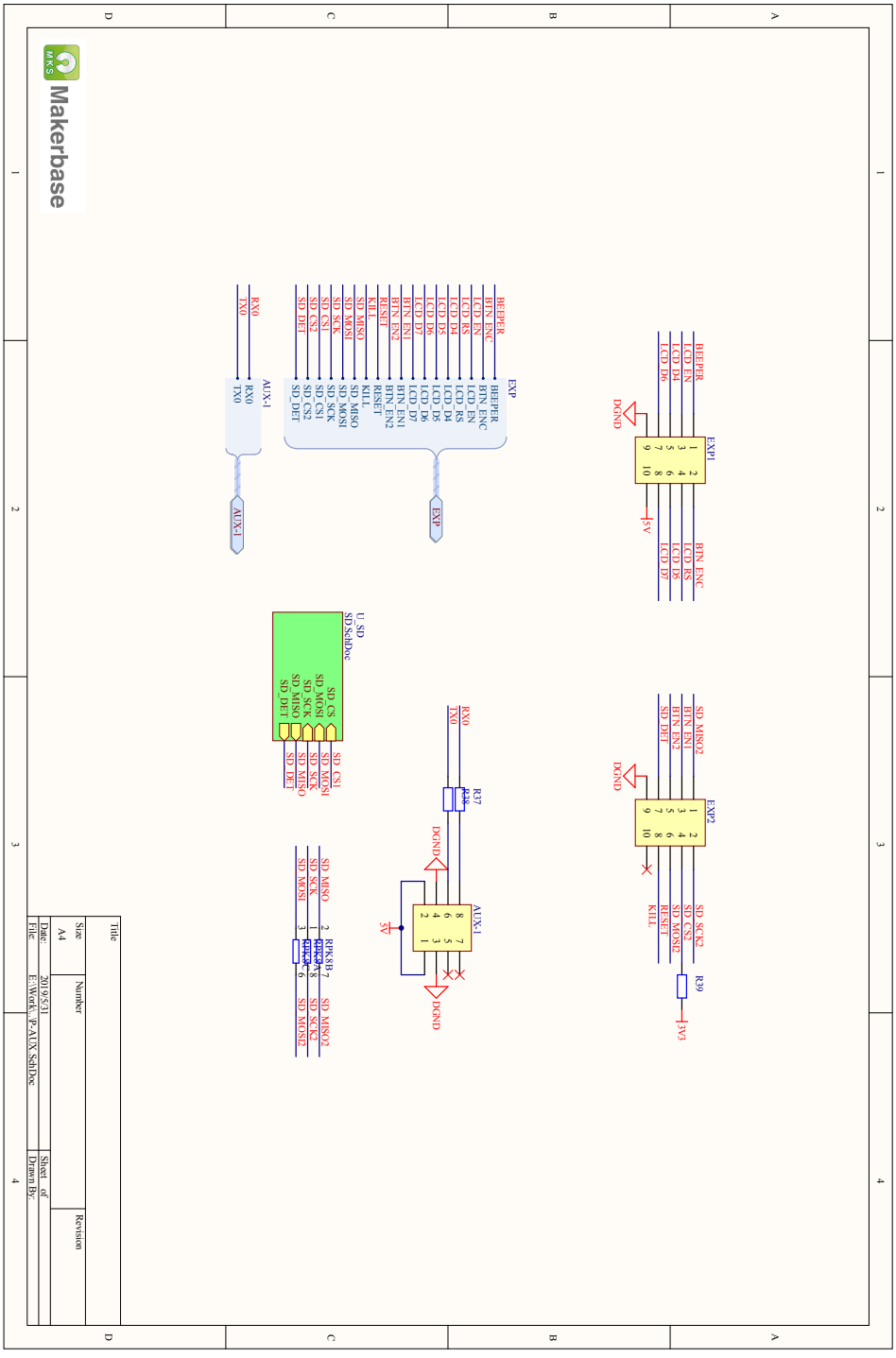
MKS SGEN_L V1.0 回路図 _6/12



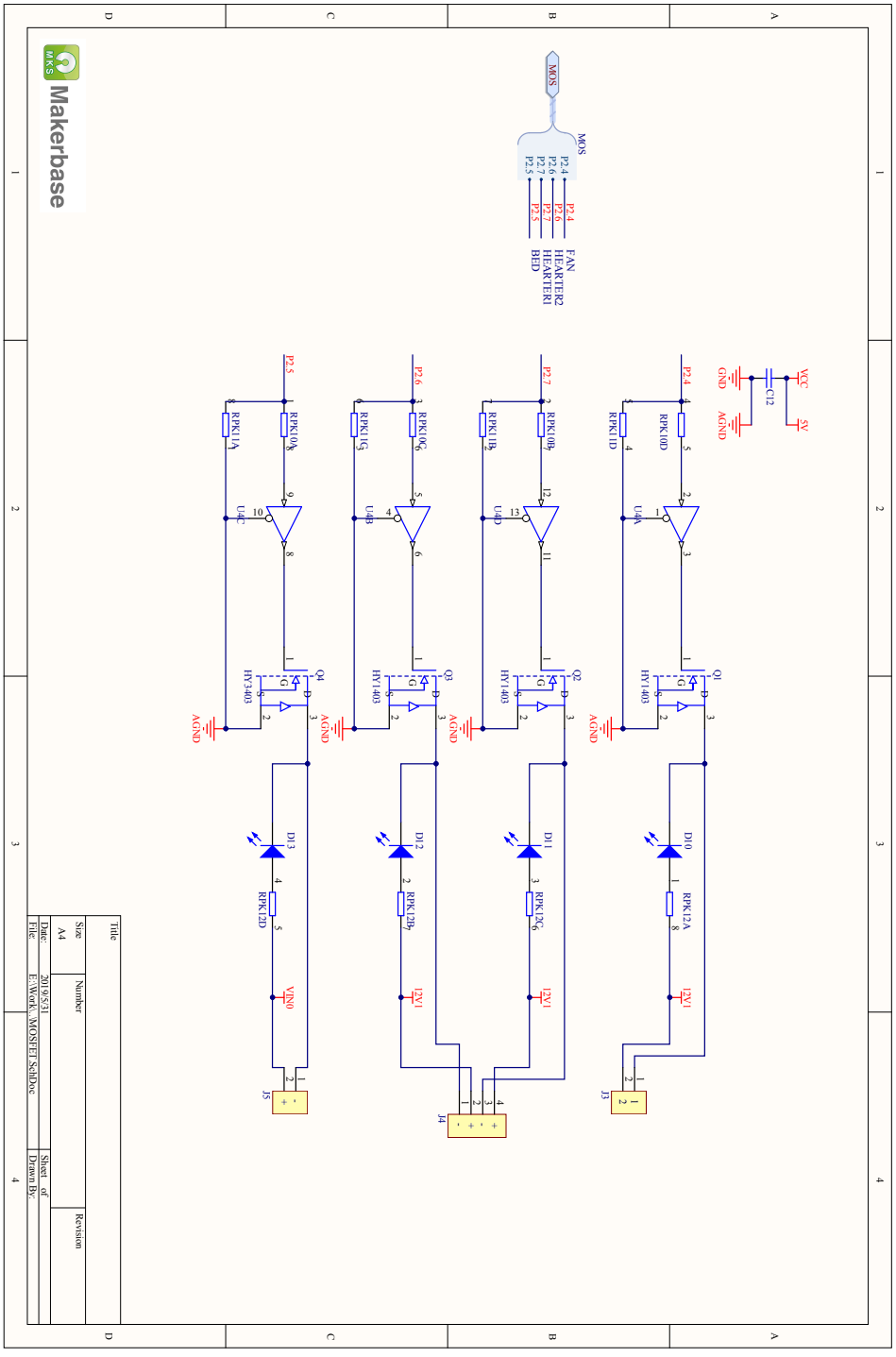
MKS SGEN_L V1.0 回路図 _7/12



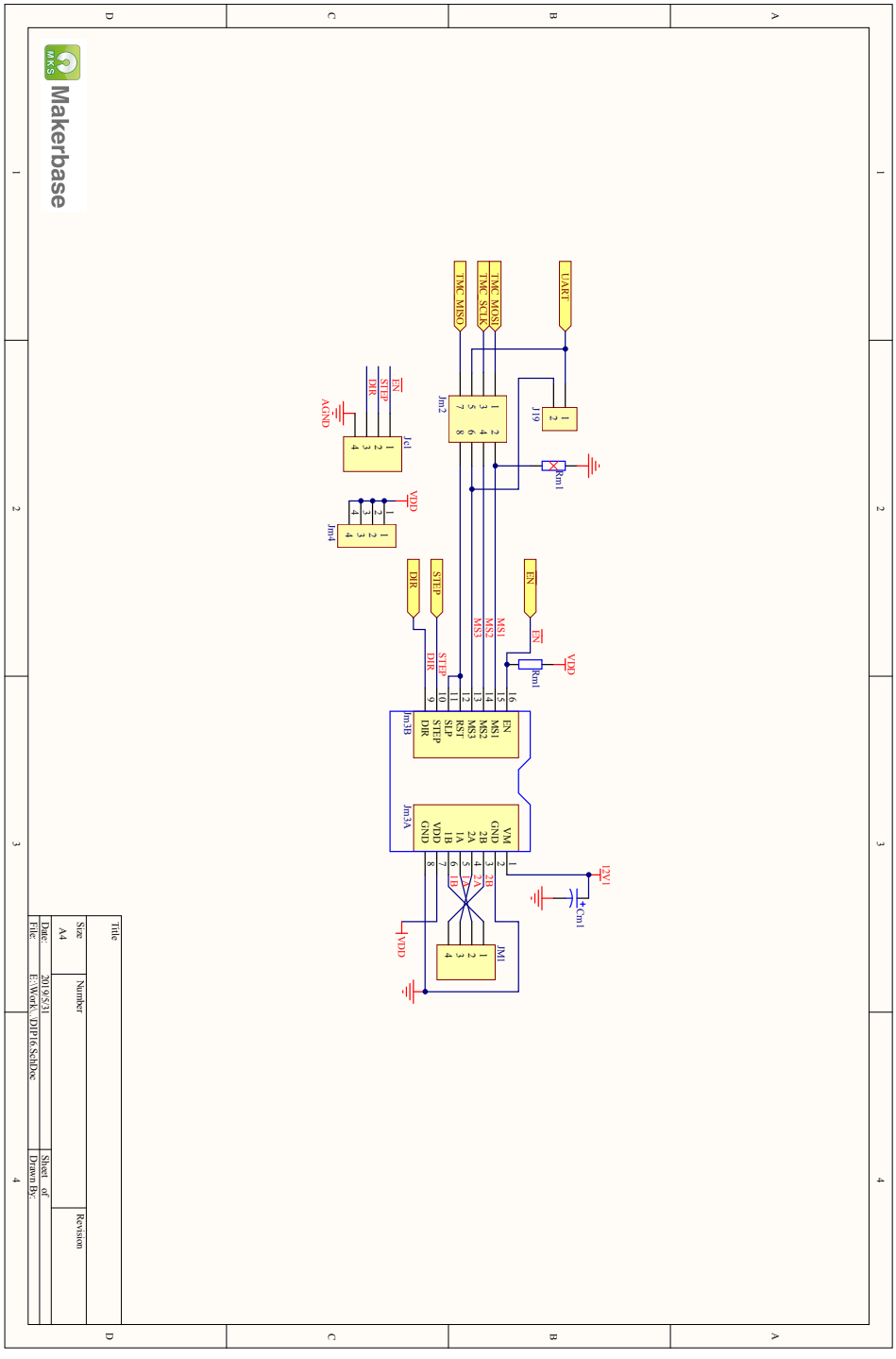
MKS SGEN_L V1.0 回路図 _8/12



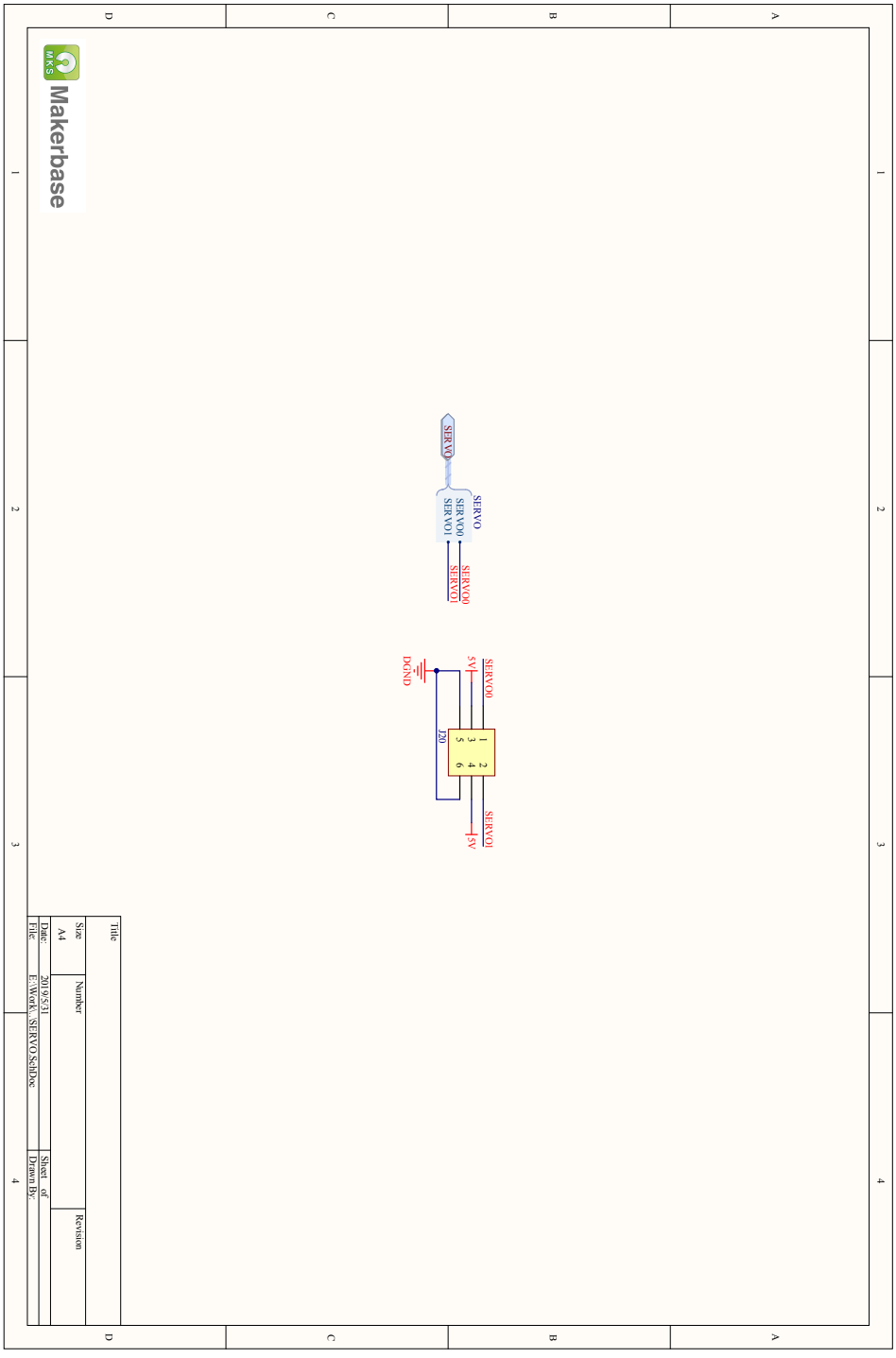
MKS SGEN_L V1.0 回路図 _9/12



MKS SGEN_L V1.0 回路図 _10/12

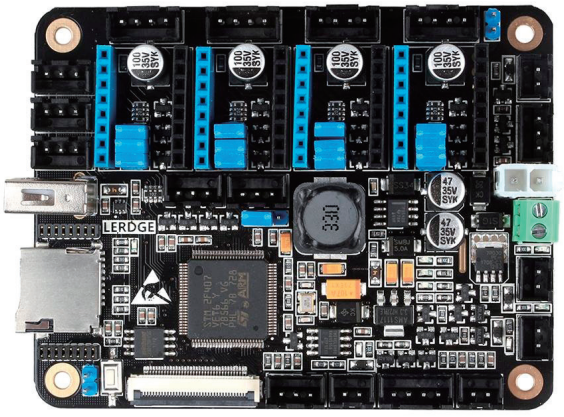


MKS SGEN_L V1.0 回路図 _11/12



MKS SGEN_L V1.0 回路図 _12/12

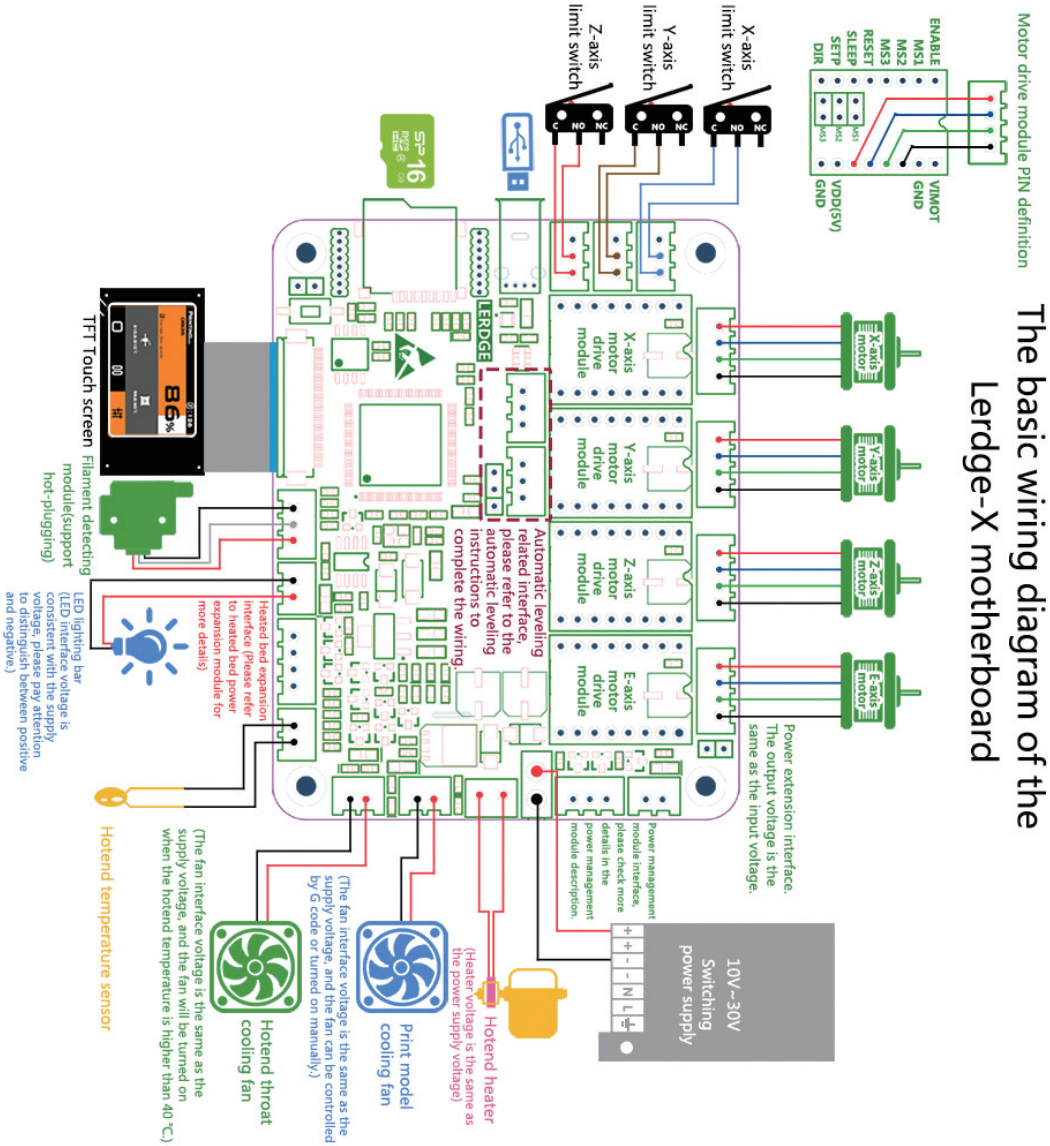
10-6-9 Lerdge-X Motherboard (P-131)



Lerdge-X Motherboard

◉URL:http://www.lerdge.com/case_view.aspx?TypeId=30&Id=432&FId=t4:30:4

MCU	32-bit ARM coretx-M4 STM32F407
ドライバ	ソケット×4
オプション	パワー・マネージメント
電源	18 ～ 35V（ナイロンコネクタ）
基板サイズ	90 × 70mm
製造メーカー	Lerdge
URL	www.lerdge.com



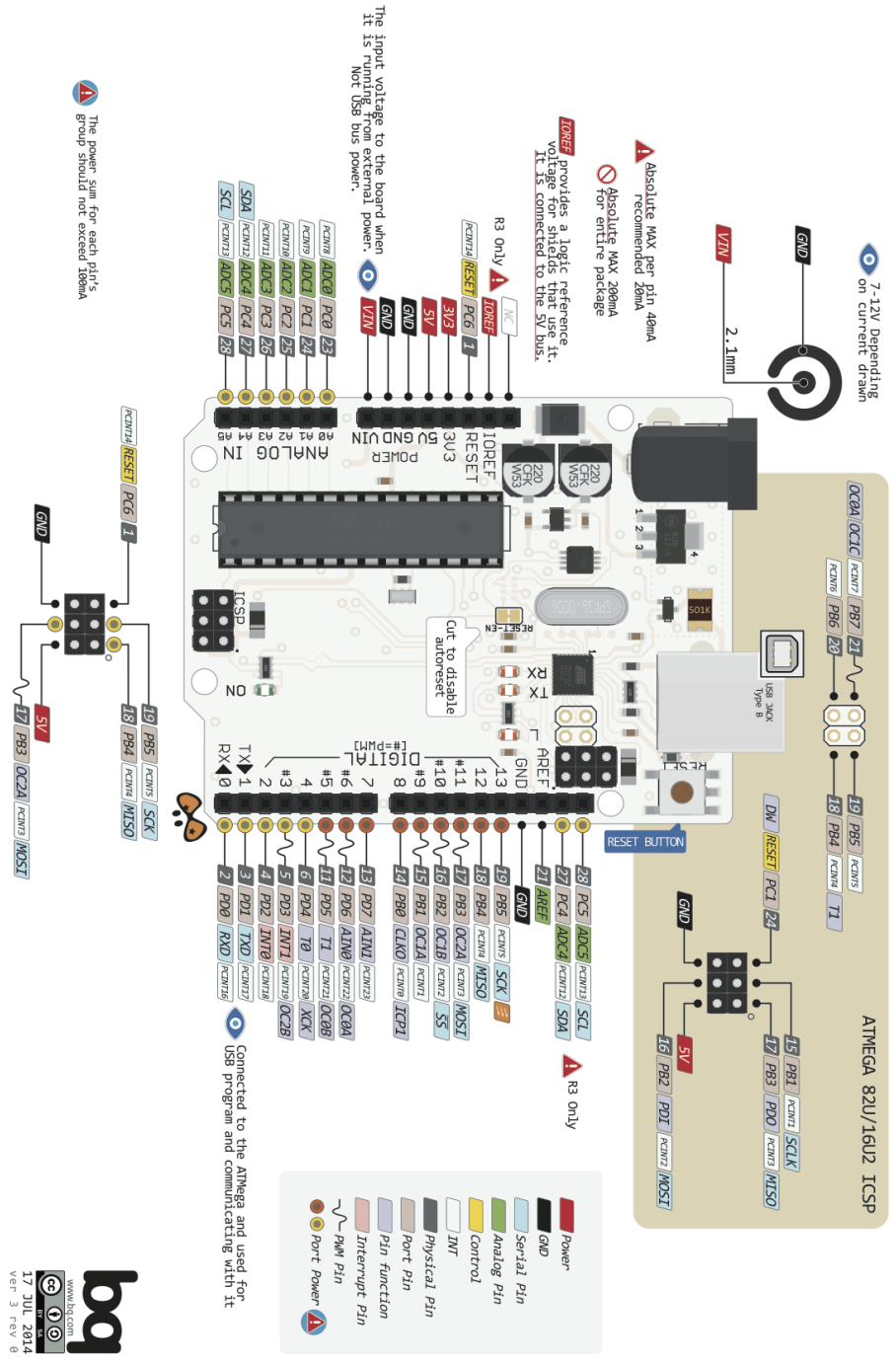
Lerdge-X 周辺結線図

Chapter 7

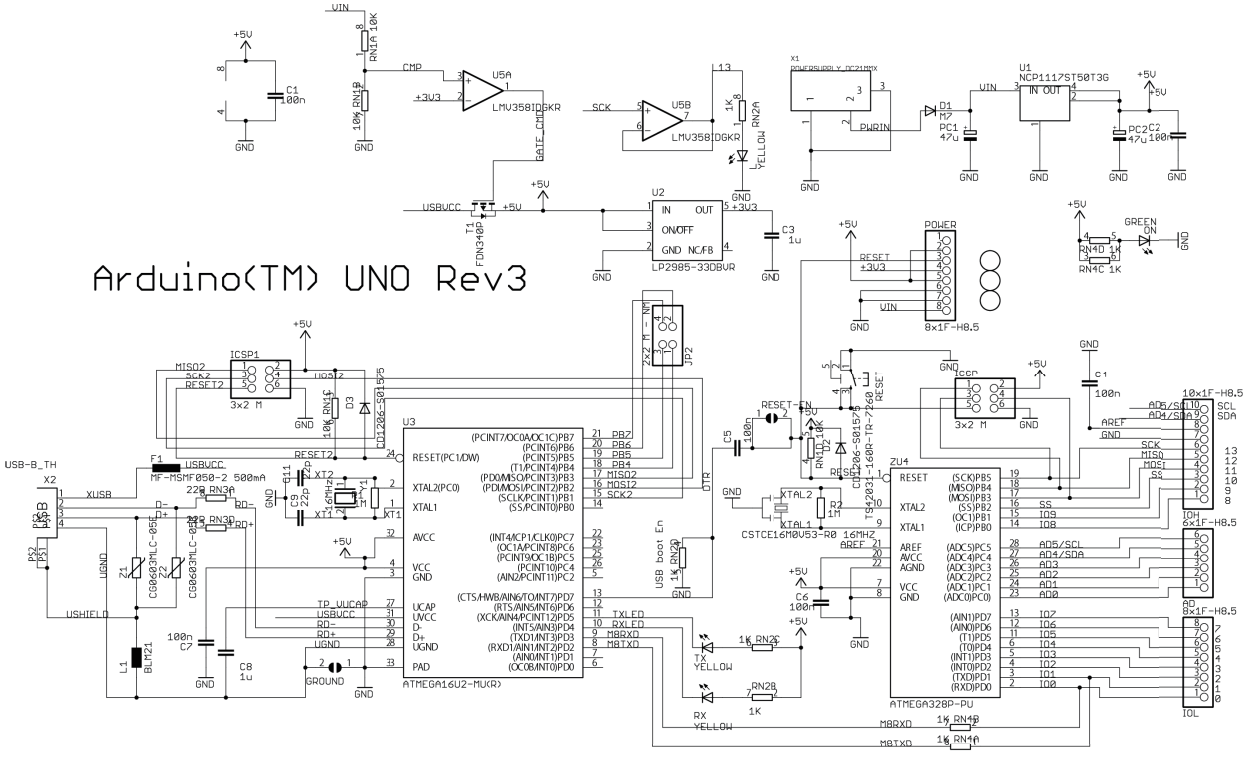
Arduino UNO Rev.3

10-7-1 Arduino UNO Rev.3

Arduino UNO Rev.3



Arduino UNO Rev.3 ピン配置図



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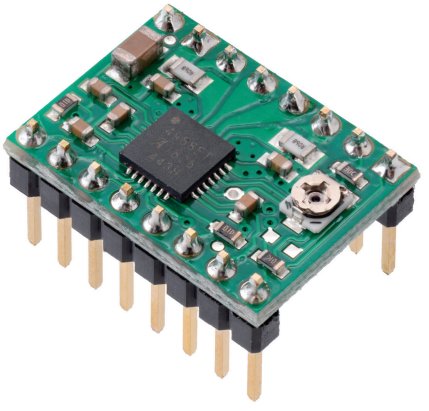
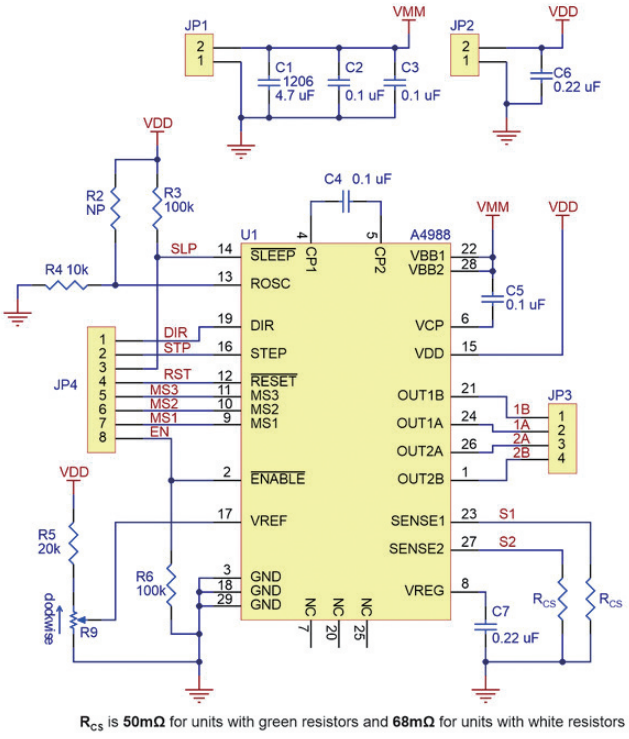
Chapter 8

RepRapステッピングモータードライバモジュール基板 (Stepper Motor Driver Carrier)

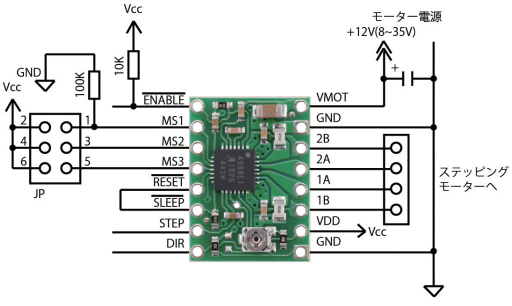
10-8-1　A4988モジュール (P-139)

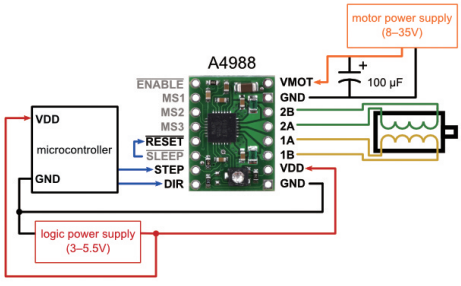


A4988 モジュール（Pololu 社製）

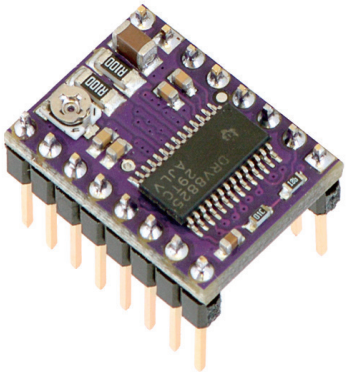


モジュール回路図（Pololu A4988）

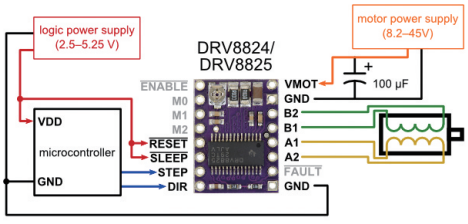


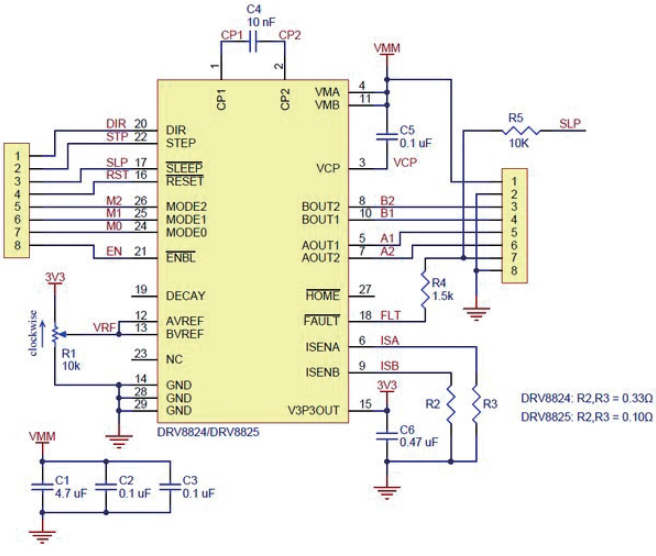


10-8-2　DRV8825モジュール（P-143）



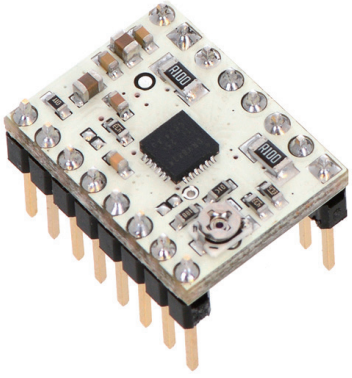
DRV8825 モジュール（Pololu 社製）



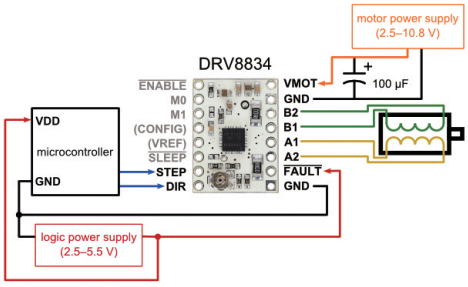


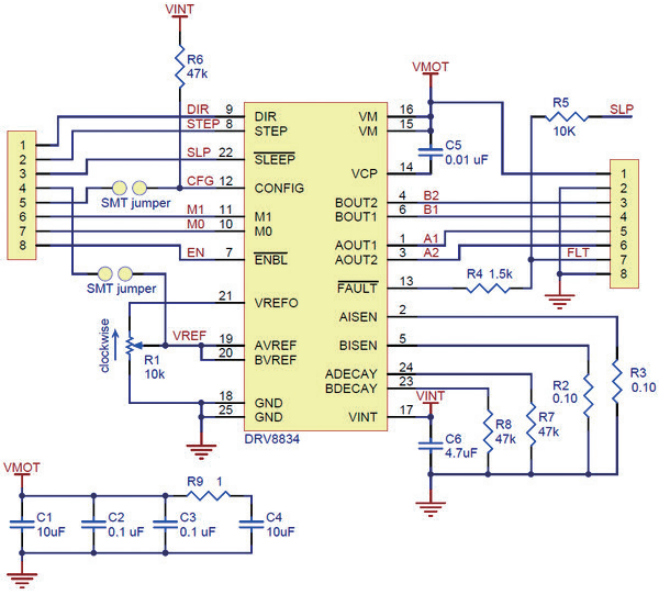
DRV8825 モジュール回路図（Pololu 社製）

10-8-3　DRV8834モジュール（P-145）



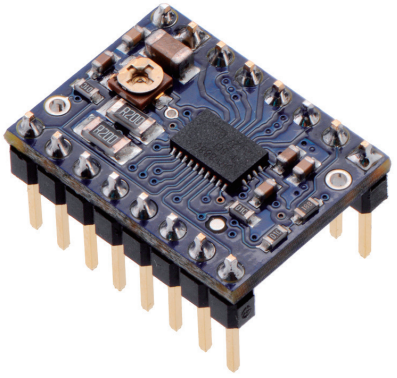
DRV8834 モジュール（Pololu 社製）



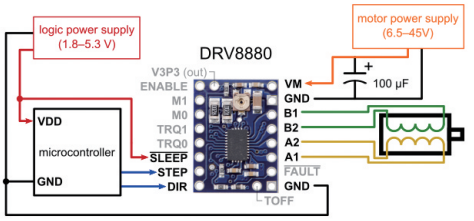


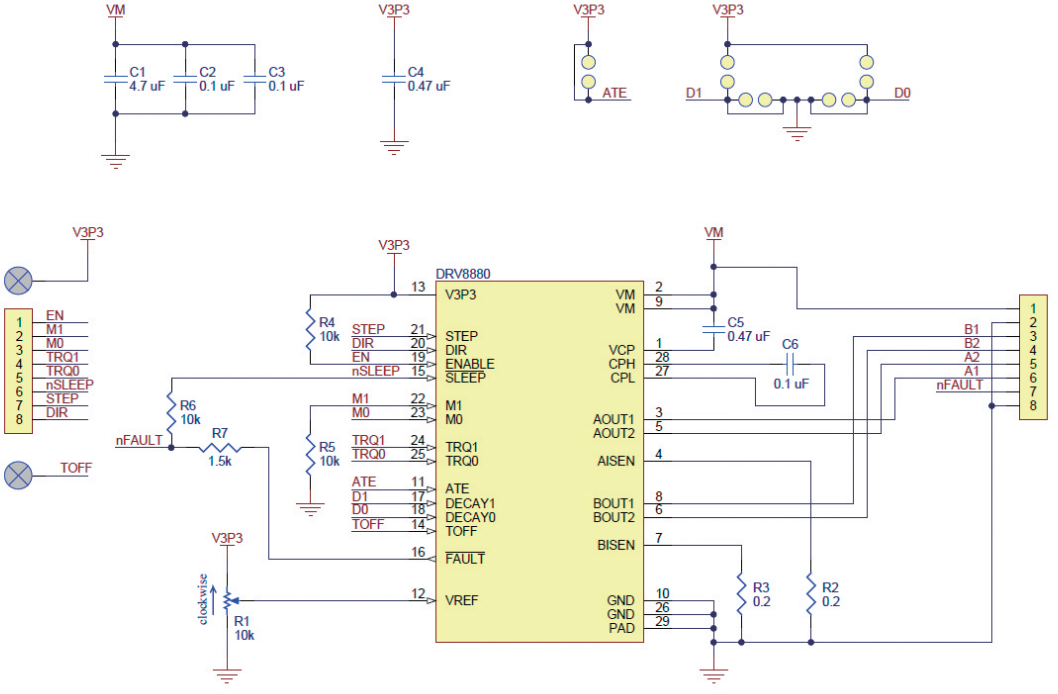
DRV8834 モジュール回路図（Pololu 社製）

10-8-4　DRV8880モジュール (P-146)



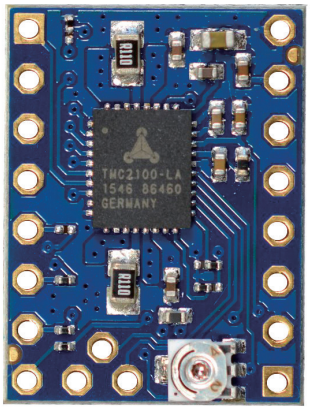
DRV8880 モジュール（Pololu 製）



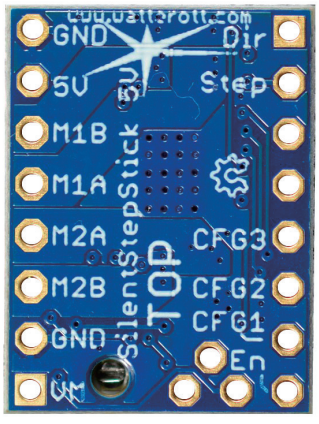


DRV8880 モジュール回路図（Pololu 社製）

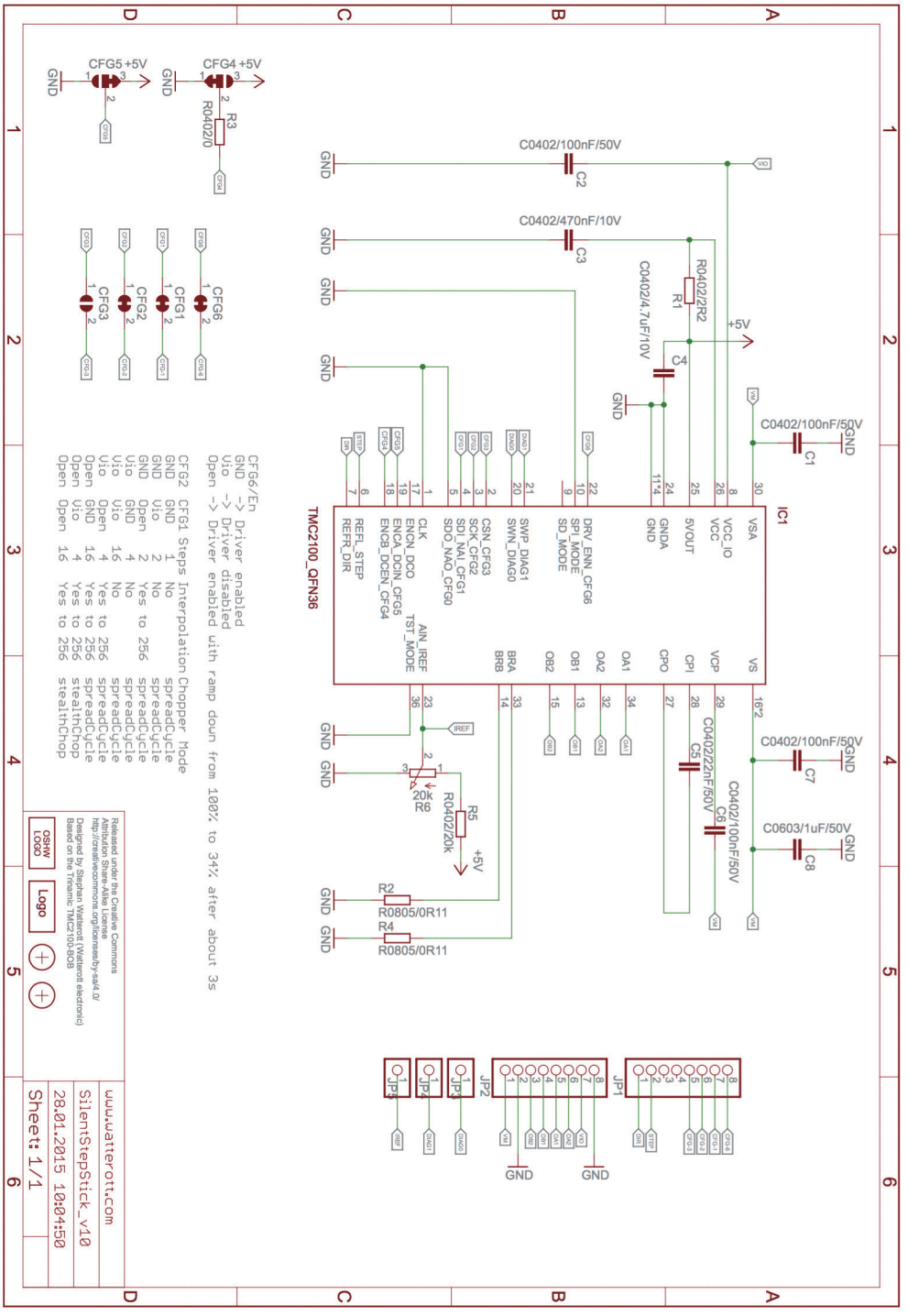
10-8-5　TMC2100モジュール（P-150）



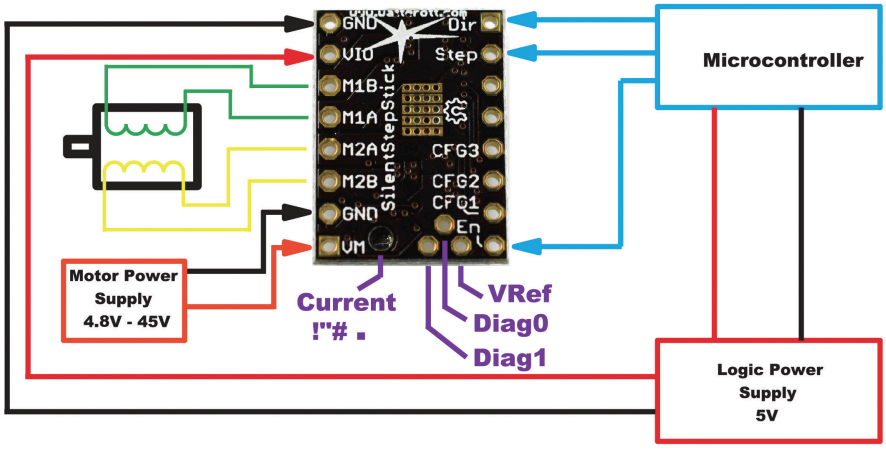
TMC2100 モジュール部品面（Watterott electronic）.
部品面が下向きに取付けられます.



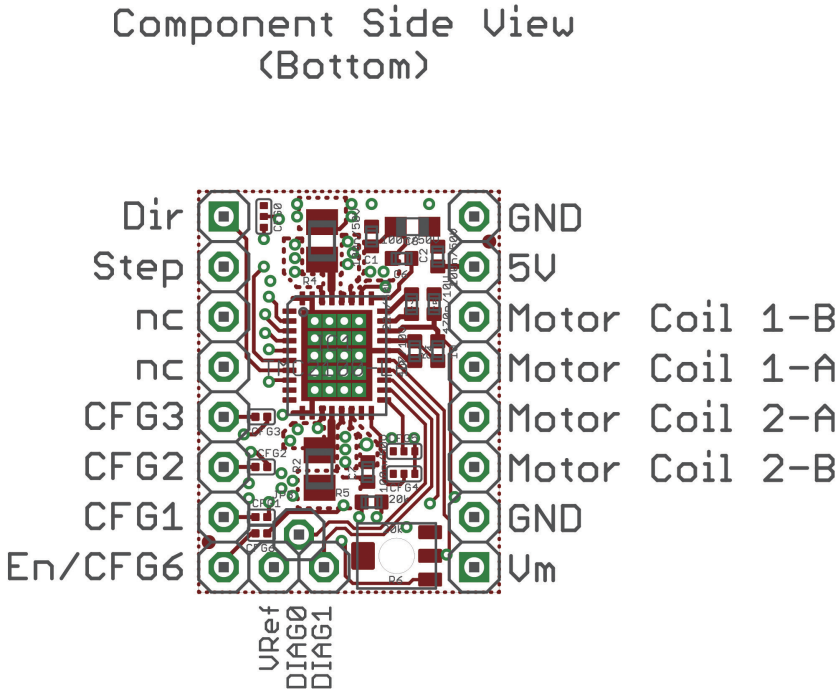
TMC2100 モジュール（Watterott electronic）.
こちらが上面になります.



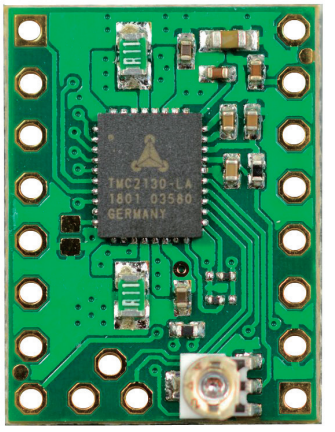
SilentStepStick-TMC2100_v13_5V モジュール回路図（Watterott electronic）



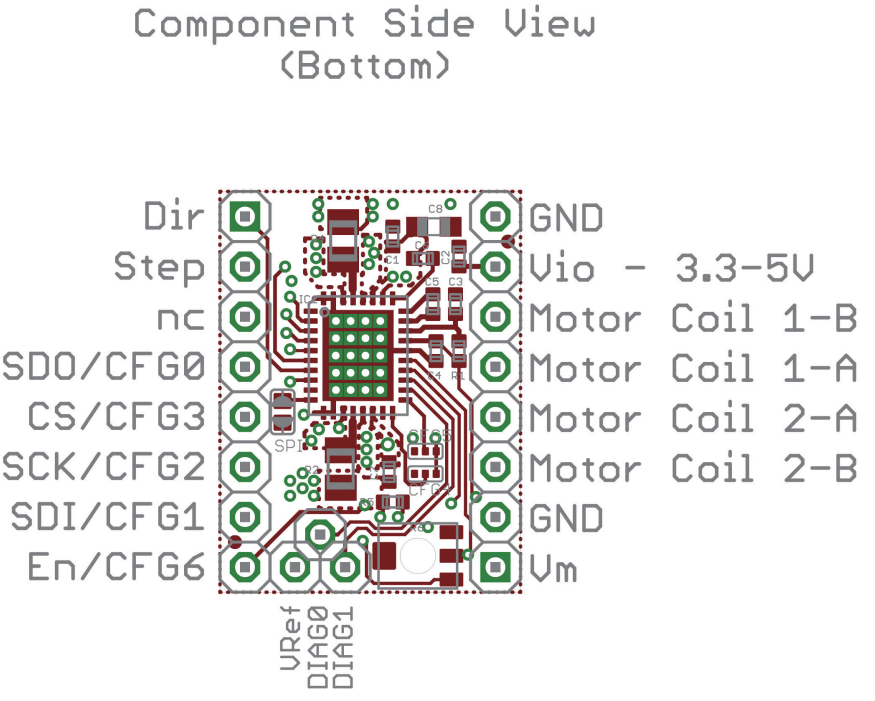
SilentStepStick-TMC2100 モジュール接続図（Watterott electronic）

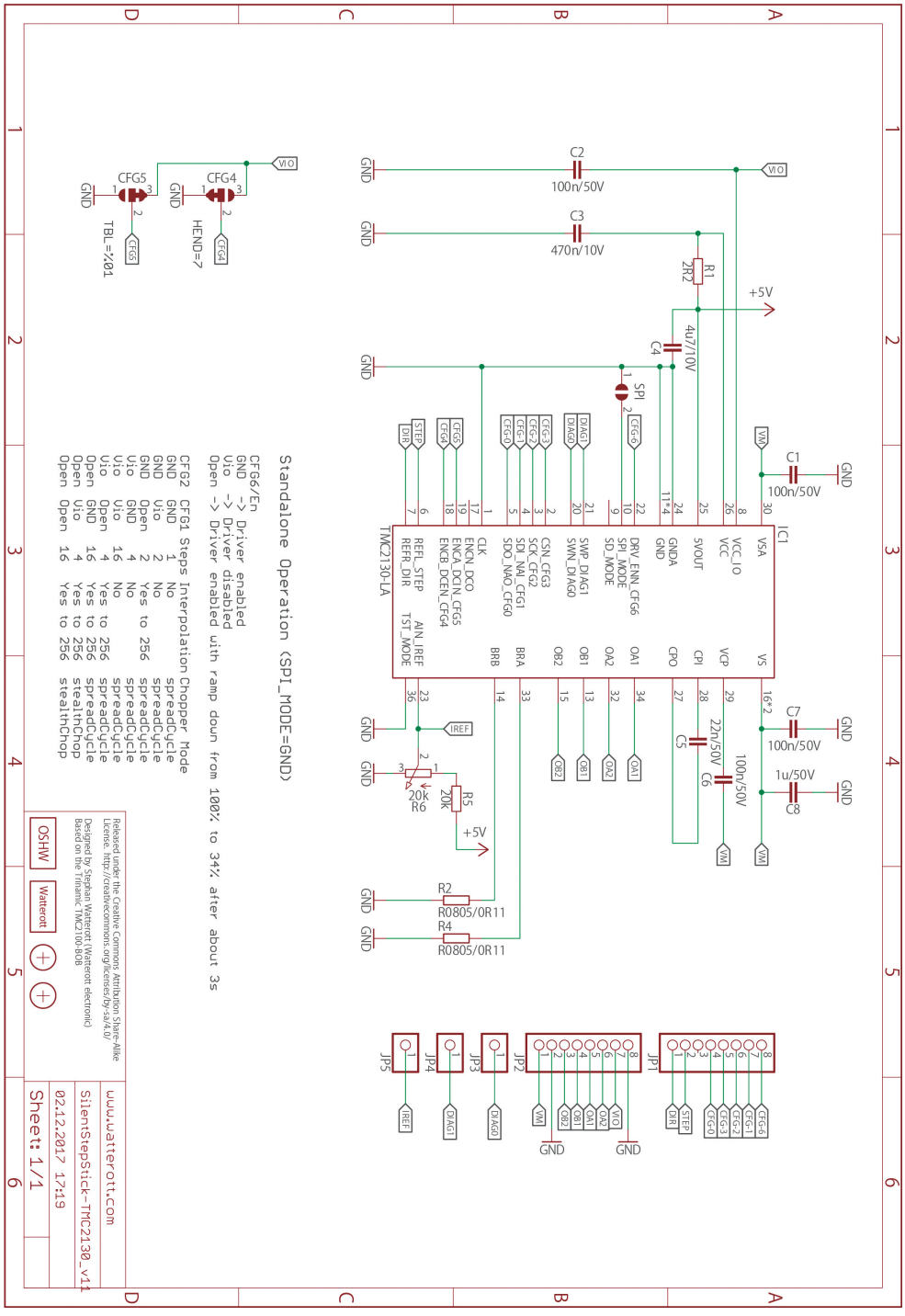


10-8-6　TMC2130モジュール (P-154)



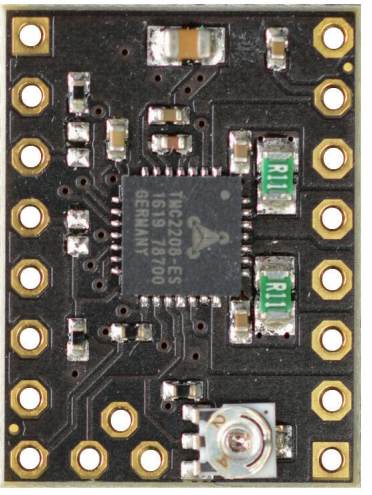
SilentStepStick TMC2130 モジュール
(Watterott electronic)
部品面が下向きに取付けられます.



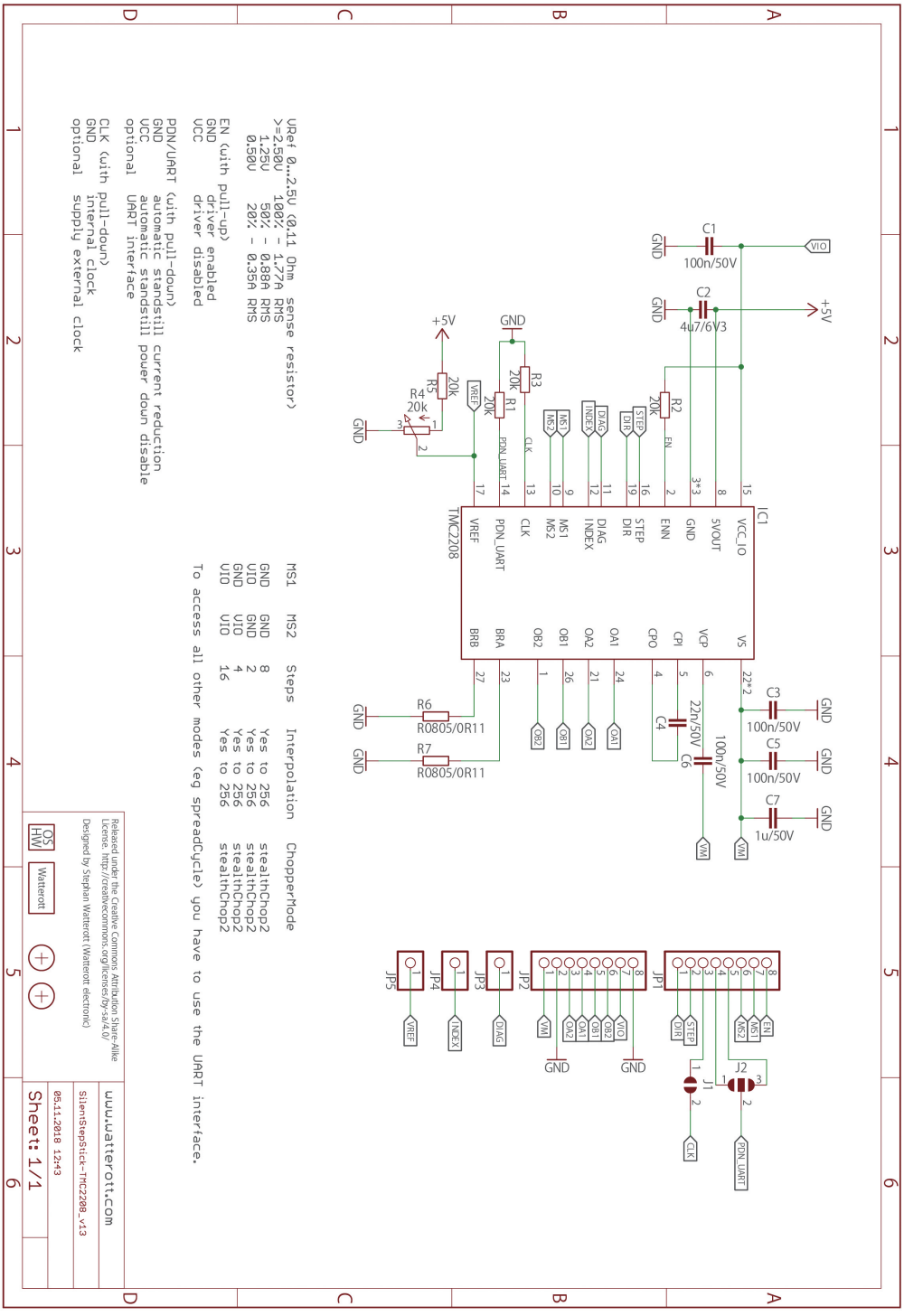


SilentStepStick-TMC2130 モジュール回路図（Watterott electronic）

10-8-7　TMC2208モジュール (P-165)



SilentStepStick TMC2208 モジュール（Watterott electronic）部品面が下向きに取付けられます


IC1
TMC2208
VCC_IO
5VOUT
GND
ENN
STEP
DIR
DIAG
INDEX
MS1
MS2
CLK
PDN_UART
VREF
BRB
BRA
OB2
OB1
OA2
OA1
CPO
CPI
VCP
3*3
EN
VS
22*2
C1 100n/50V
C2 4u7/6V3
C3 100n/50V
C5 100n/50V
C7 1u/50V
C4 22n/50V
C6 100n/50V
R1 20k
R2 20k
R3 20k
R4 20k
R5 20k
R6 R0805/0R11
R7 R0805/0R11
+5V
VIO
VM
JP1
JP2
JP3
JP4
JP5
J1
J2
URef 0...2.5V (0.11 Ohm sense resistor)
>=2.50V 100% - 1.77A RMS
1.25V 50% - 0.88A RMS
0.50V 20% - 0.35A RMS
EN (with pull-up)
GND driver enabled
VCC driver disabled
PDN/UART (with pull-down)
GND automatic standstill current reduction
VCC automatic standstill power down disable
optional UART interface
CLK (with pull-down)
GND internal clock
optional supply external clock
MS1 MS2 Steps Interpolation ChopperMode
GND GND 8 Yes to 256 stealthChop2
VIO GND 2 Yes to 256 stealthChop2
GND VIO 4 Yes to 256 stealthChop2
VIO VIO 16 Yes to 256 stealthChop2
To access all other modes (eg spreadCycle) you have to use the UART interface.
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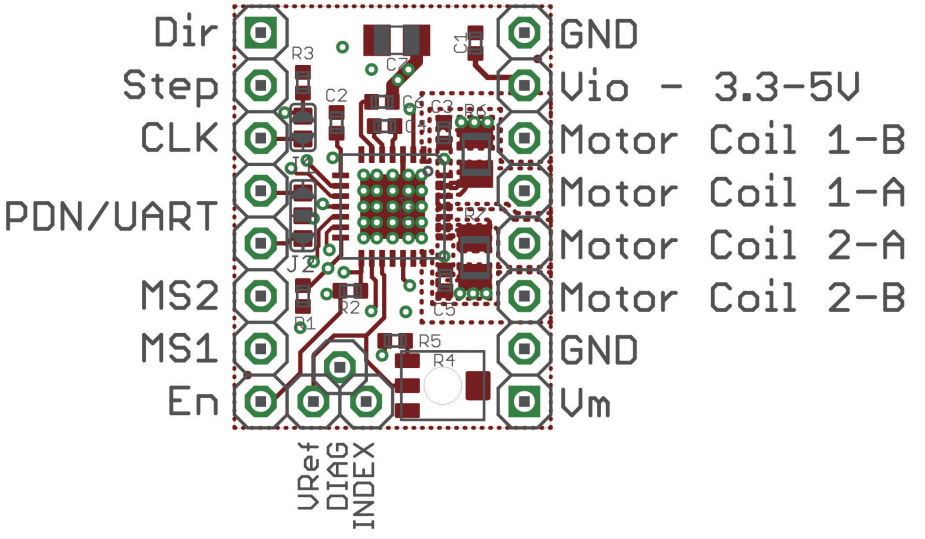
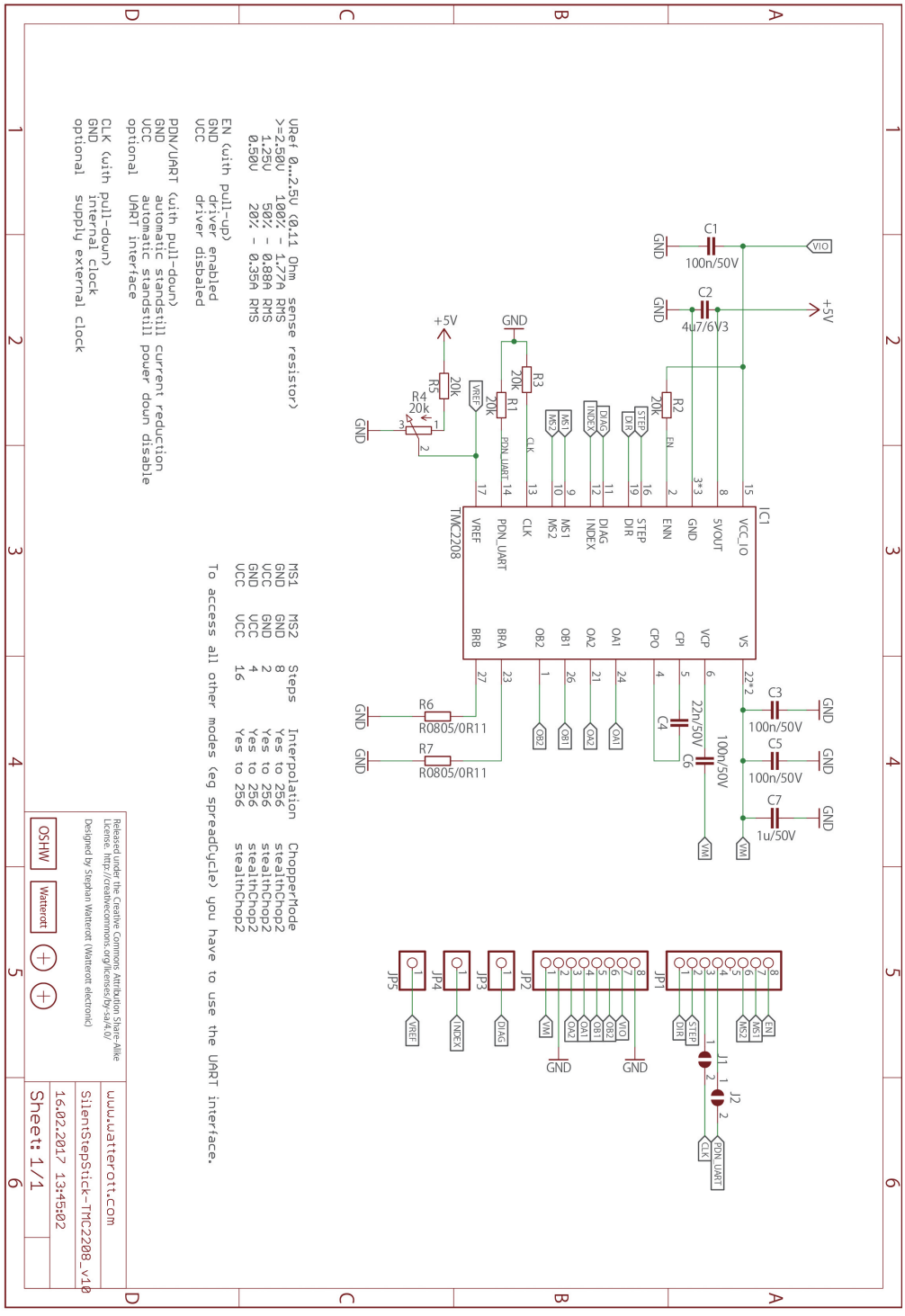
Designed by Stephan Watteroff (Watteroff electronic)
www.watteroff.com
silentStepStick-TMC2208_v13
05.11.2018 12:43
Sheet: 1/1

Component Side View
(Bottom)




IC1
TMC2208
VCC_IO
5VOUT
GND
ENN
STEP
DIR
DIAG
INDEX
MS1
MS2
CLK
PDN_UART
VREF
BRB
BRA
OB2
OB1
OA2
OA1
CPO
CPI
VCP
VS
C1 100n/50V
C2 4u7/6V3
C3 100n/50V
C4 22n/50V
C5 100n/50V
C6 100n/50V
C7 1u/50V
R1 20k
R2 20k
R3 20k
R4 20k
R5 20k
R6 R0805/0R11
R7 R0805/0R11
JP1
JP2
JP3
JP4
JP5
J1
J2
VIO
+5V
VM
GND
EN
MS2
STEP
DIR
PDN_UART
CLK
DIAG
INDEX
VREF
OB2
OB1
OA2
OA1
VREF
URef 0...2.5V (0.11 Ohm sense resistor)
>=2.50V 100% - 1.77A RMS
1.25V 50% - 0.88A RMS
0.50V 20% - 0.35A RMS
EN (with pull-up)
GND driver enabled
VCC driver disabled
PDN/UART (with pull-down)
GND automatic standstill current reduction
VCC automatic standstill power down disable
optional UART interface
CLK (with pull-down)
GND internal clock
optional supply external clock
MS1 MS2 Steps Interpolation ChopperMode
GND GND 8 Yes to 256 stealthChop2
GND GND 2 Yes to 256 stealthChop2
VCC VCC 4 Yes to 256 stealthChop2
GND VCC 16 Yes to 256 stealthChop2
VCC VCC
To access all other modes (eg spreadCycle) you have to use the UART interface.
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OSHW
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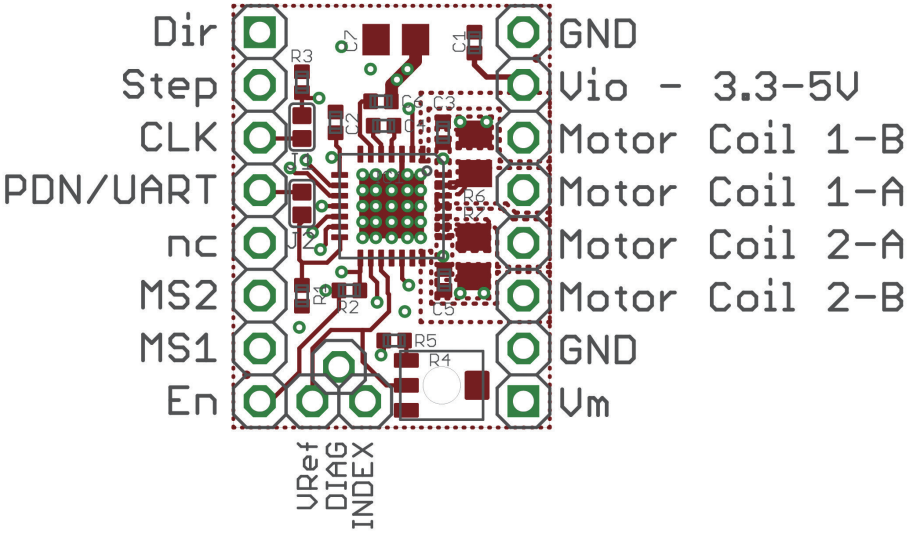
SilentStepStick-TMC2208_v10
16.02.2017 13:45:02
Sheet: 1/1

Component Side View
(Bottom)