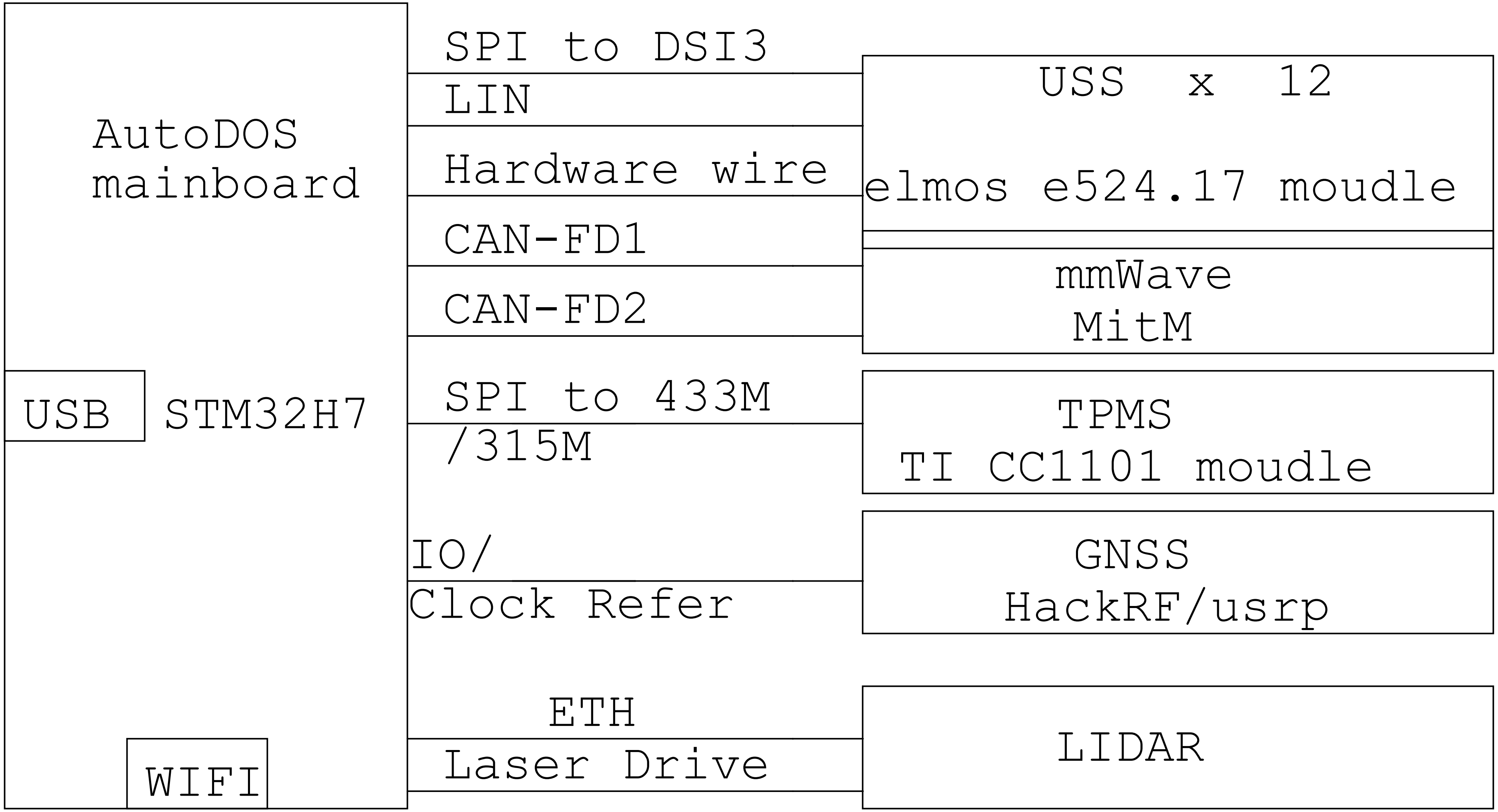

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Size
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Rev
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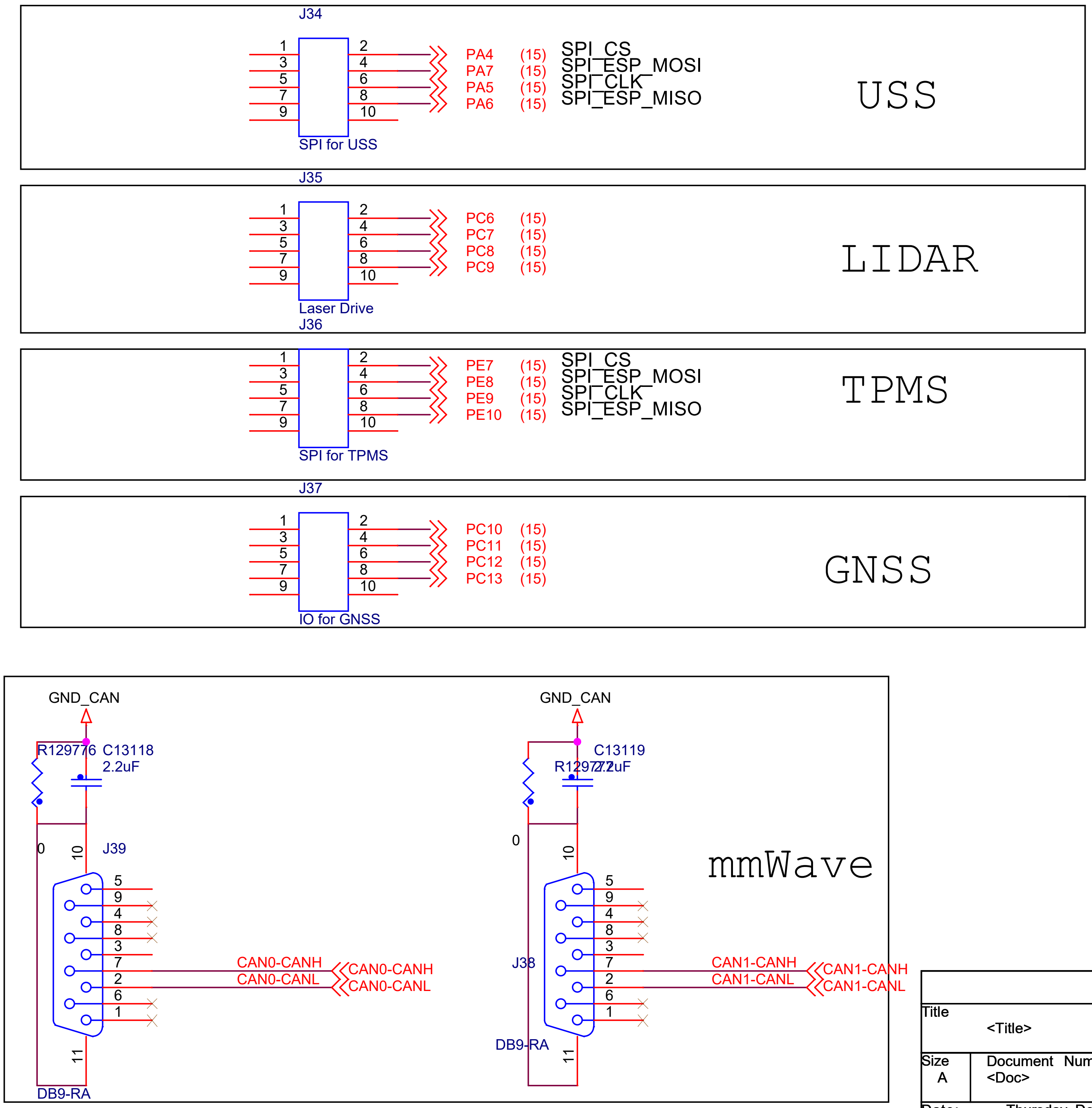
Date: Thursday, December 04, 2025
Sheet 1 of 1



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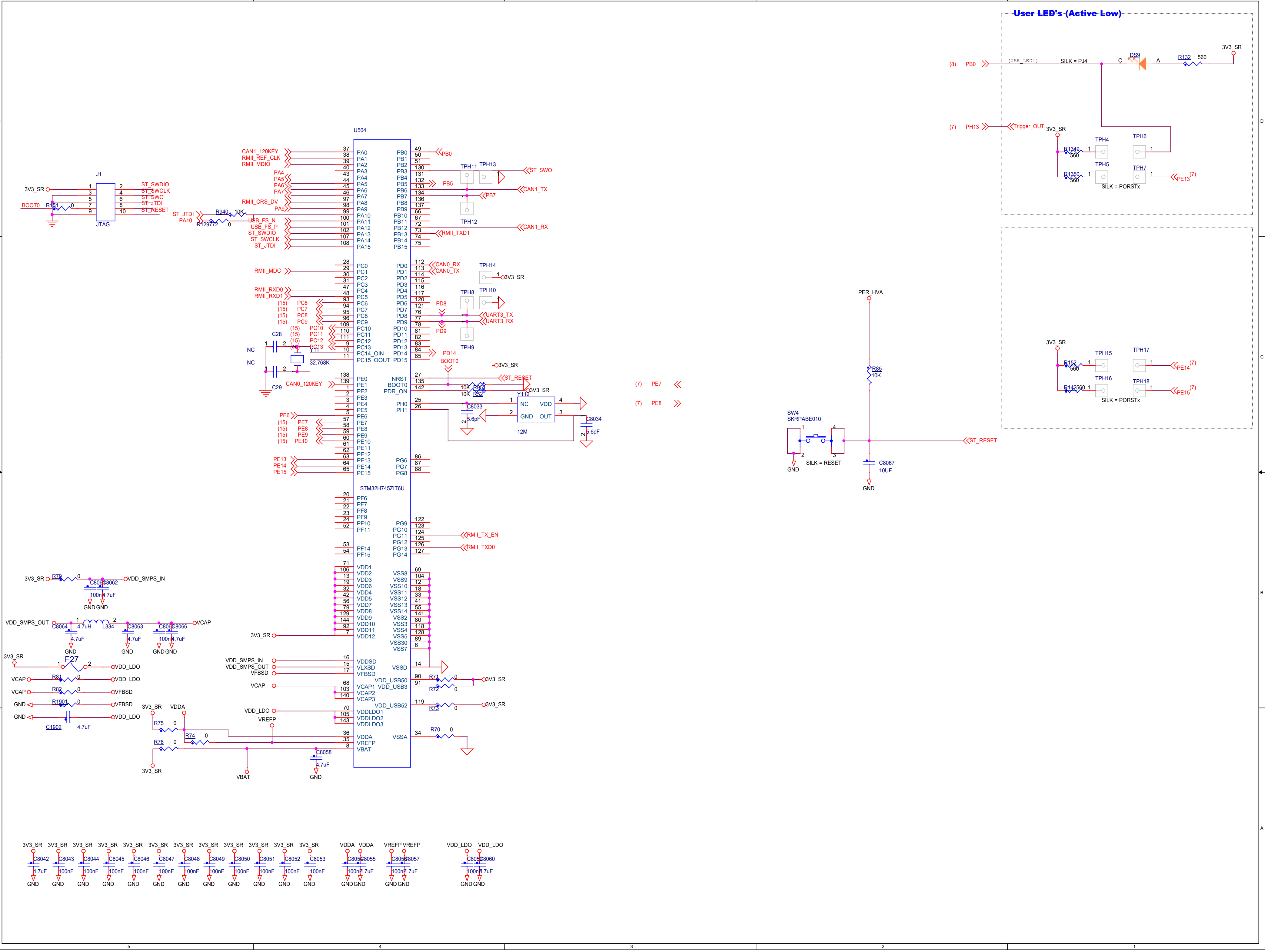
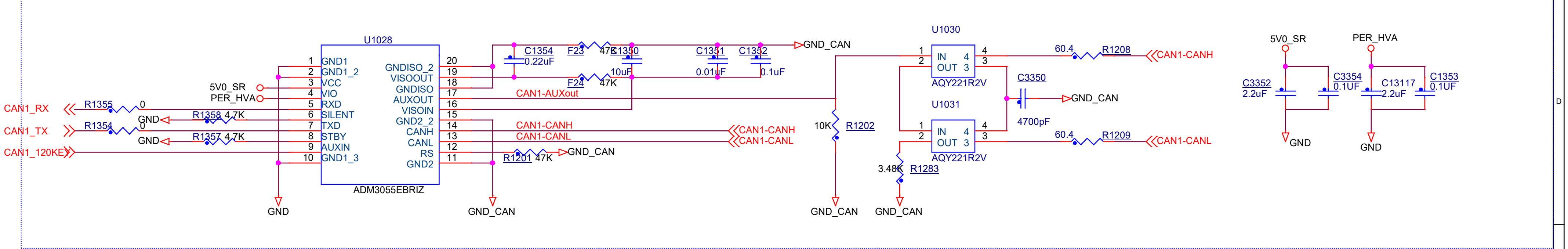
Date: Thursday, December 04, 2025

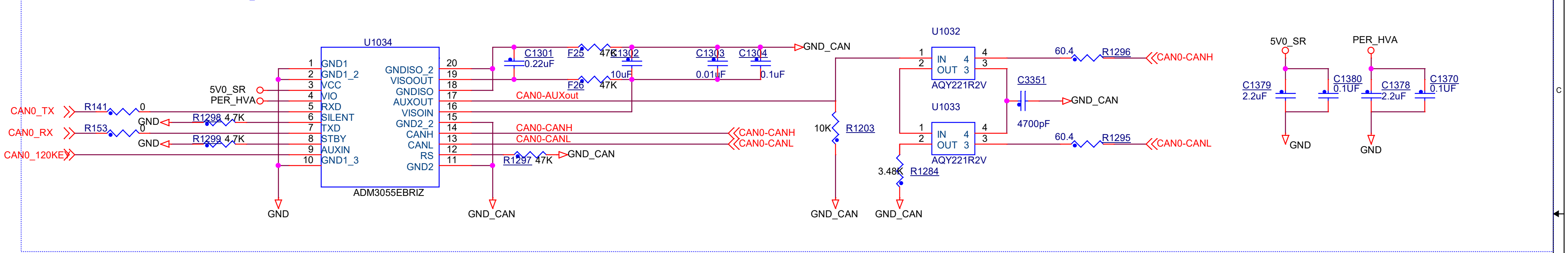
Sheet 1 of 1


User LED's (Active Low)
U504
STM32H745ZIT6U
J1
JTAG
3V3_SR
BOOT0
R151 0
ST_SWDIO
ST_SWCLK
ST_SWO
ST_JTDI
ST_RESET
ST_JTDI
PA10
R940 10K
R129772 0
CAN1_120KEY
RMII_REF_CLK
RMII_MDIO
PA4
PA5
PA6
PA7
RMII_CRS_DV
PA9
USB_FS_N
USB_FS_P
PA0 PA1 PA2 PA3 PA4 PA5 PA6 PA7 PA8 PA9 PA10 PA11 PA12 PA13 PA14 PA15
PB0 PB1 PB2 PB3 PB4 PB5 PB6 PB7 PB8 PB9 PB10 PB11 PB12 PB13 PB14 PB15
PB5
PB7
TPH11
TPH12
TPH13
CAN1_TX
CAN1_RX
RMII_TXD1
RMII_MDC
RMII_RXD0
RMII_RXD1
(15) PC6
(15) PC7
(15) PC8
(15) PC9
(15) PC10
(15) PC11
(15) PC12
PC13
PC0 PC1 PC2 PC3 PC4 PC5 PC6 PC7 PC8 PC9 PC10 PC11 PC12 PC13 PC14_OIN PC15_OOUT
PD0 PD1 PD2 PD3 PD4 PD5 PD6 PD7 PD8 PD9 PD10 PD11 PD12 PD13 PD14 PD15
CAN0_RX
CAN0_TX
TPH14
TPH8
TPH10
TPH9
PD8
PD9
UART3_TX
UART3_RX
PD14
BOOT0
C28
C29
NC
NC
Y11
32.768K
CAN0_120KEY
PE0 PE1 PE2 PE3 PE4 PE5 PE6 PE7 PE8 PE9 PE10 PE11 PE12 PE13 PE14 PE15
PE6
(15) PE7
(15) PE8
(15) PE9
(15) PE10
PE13
PE14
PE15
NRST
BOOT0
PDR_ON
PH0
PH1
R51 10K
R52 10K
Y112
NC VDD GND OUT
12M
C8033 5.6pF
C8034 5.6pF
PG6 PG7 PG8
PF6 PF7 PF8 PF9 PF10 PF11 PF14 PF15
PG9 PG10 PG11 PG12 PG13 PG14
RMII_TX_EN
RMII_TXD0
VDD1 VDD2 VDD3 VDD6 VDD4 VDD5 VDD7 VDD8 VDD9 VDD10 VDD11 VDD12
VSS8 VSS9 VSS10 VSS11 VSS12 VSS13 VSS14 VSS2 VSS3 VSS4 VSS5 VSS30 VSS7
VDDSD VLXSD VFBSD
VSSD
VCAP1 VCAP2 VCAP3
VDD_USB50 VDD_USB3 VDD_USB52
VDDLDO1 VDDLDO2 VDDLDO3
VDDA VREFP VBAT
VSSA
R71 0
R72 0
R73 0
R70 0
R79 0
VDD_SMPS_IN
C8061 C8062 100nF 4.7uF
VDD_SMPS_OUT
C8064 4.7uF
4.7uH L334
C8063 4.7uF
C8065 C8066 100nF 4.7uF
VCAP
F27
VDD_LDO
R81 0
R82 0
R1901 0
VFBSD
C1902 4.7uF
VDDA
R75 0
R74 0
R76 0
VREFP
VBAT
C8058 4.7uF
GND
C8042 4.7uF
C8043 100nF
C8044 100nF
C8045 100nF
C8046 100nF
C8047 100nF
C8048 100nF
C8049 100nF
C8050 100nF
C8051 100nF
C8052 100nF
C8053 100nF
C8054 C8055 100nF 4.7uF
C8056 C8057 100nF 4.7uF
C8059 C8060 100nF 4.7uF
(8) PB0
(USR_LED1)
SILK = PJ4
C
DS9
A
R132 560
(7) PH13
Trigger_OUT
TPH4
TPH5
TPH6
TPH7
R1349 560
R1350 560
(7) PE13
SILK = PORSTx
TPH15
TPH16
TPH17
TPH18
R152 560
R142560
(7) PE14
(7) PE15
(7) PE7
(7) PE8
PER_HVA
R85 10K
SW4
SKRPABE010
SILK = RESET
C8067 10UF
ST_RESET

CAN1 Physical Interface



CAN0 Physical Interface



12V OBD16------------------------------DB9-9
Shild OBD4------------------------------DB9-10
GND OBD5------------------------------DB9-3
DOIP_WeekUP OBD8------------------------------DB9-5

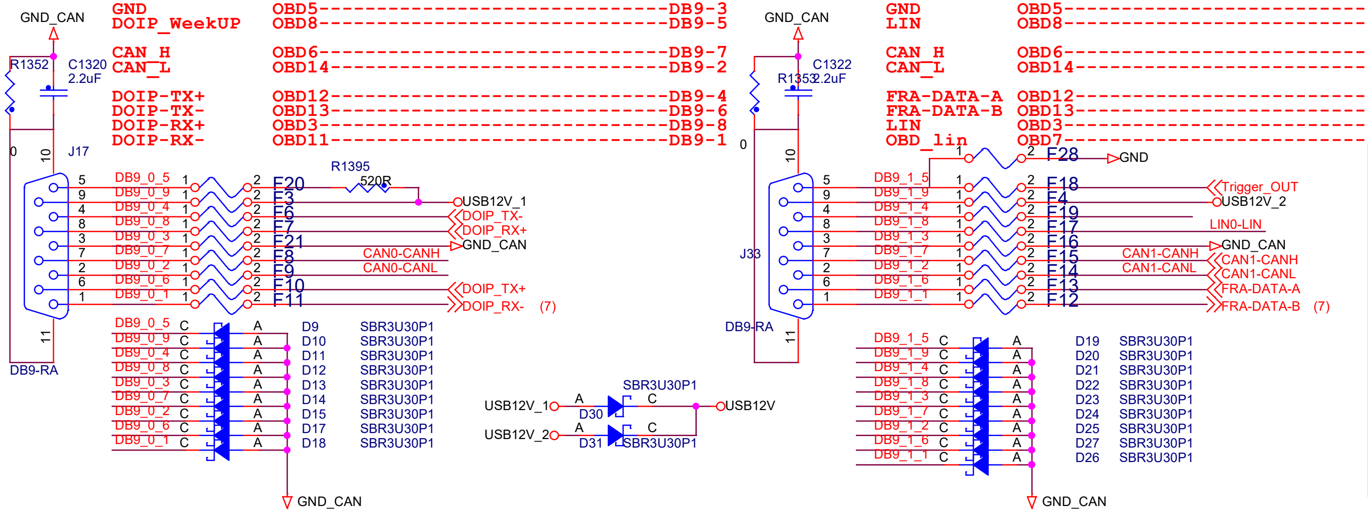
CAN_H OBD6------------------------------DB9-7
CAN_L OBD14------------------------------DB9-2

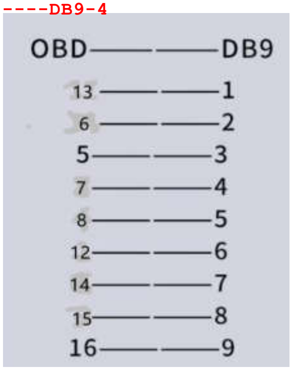
DOIP-TX+ OBD12------------------------------DB9-4
DOIP-TX- OBD13------------------------------DB9-6
DOIP-RX+ OBD3------------------------------DB9-8
DOIP-RX- OBD11------------------------------DB9-1

12V OBD4------------------------------DB9-10
Shild OBD16------------------------------DB9-9
GND OBD5------------------------------DB9-3
LIN OBD8------------------------------DB9-5

CAN_H OBD6------------------------------DB9-2
CAN_L OBD14------------------------------DB9-2

FRA-DATA-A OBD12------------------------------DB9-6
FRA-DATA-B OBD13------------------------------DB9-1
LIN OBD3------------------------------DB9-8
OBD_lin OBD7------------------------------DB9-4





OBD	DB9
13	1
6	2
5	3
7	4
8	5
12	6
14	7
15	8
16	9

USB (Type A Host and Type AB OTG)

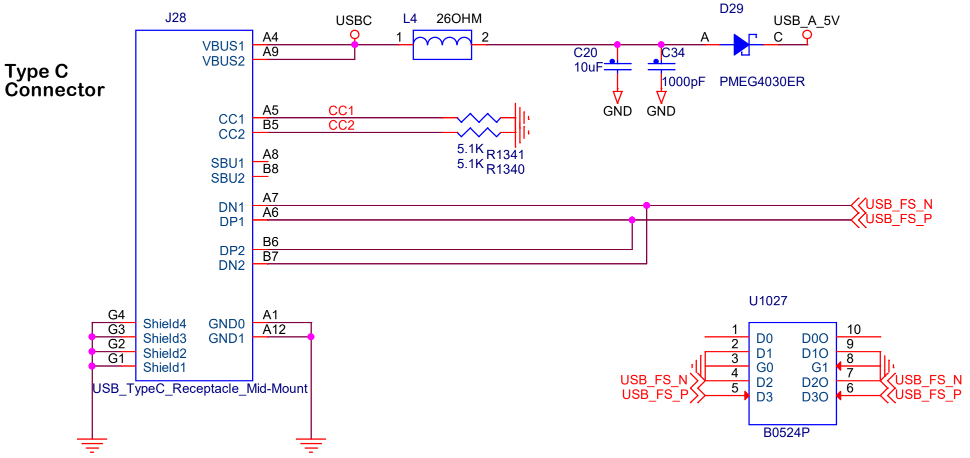
General Layout Note. Recommendation is to keep all tracks between MCU and USB PHI less than 3"

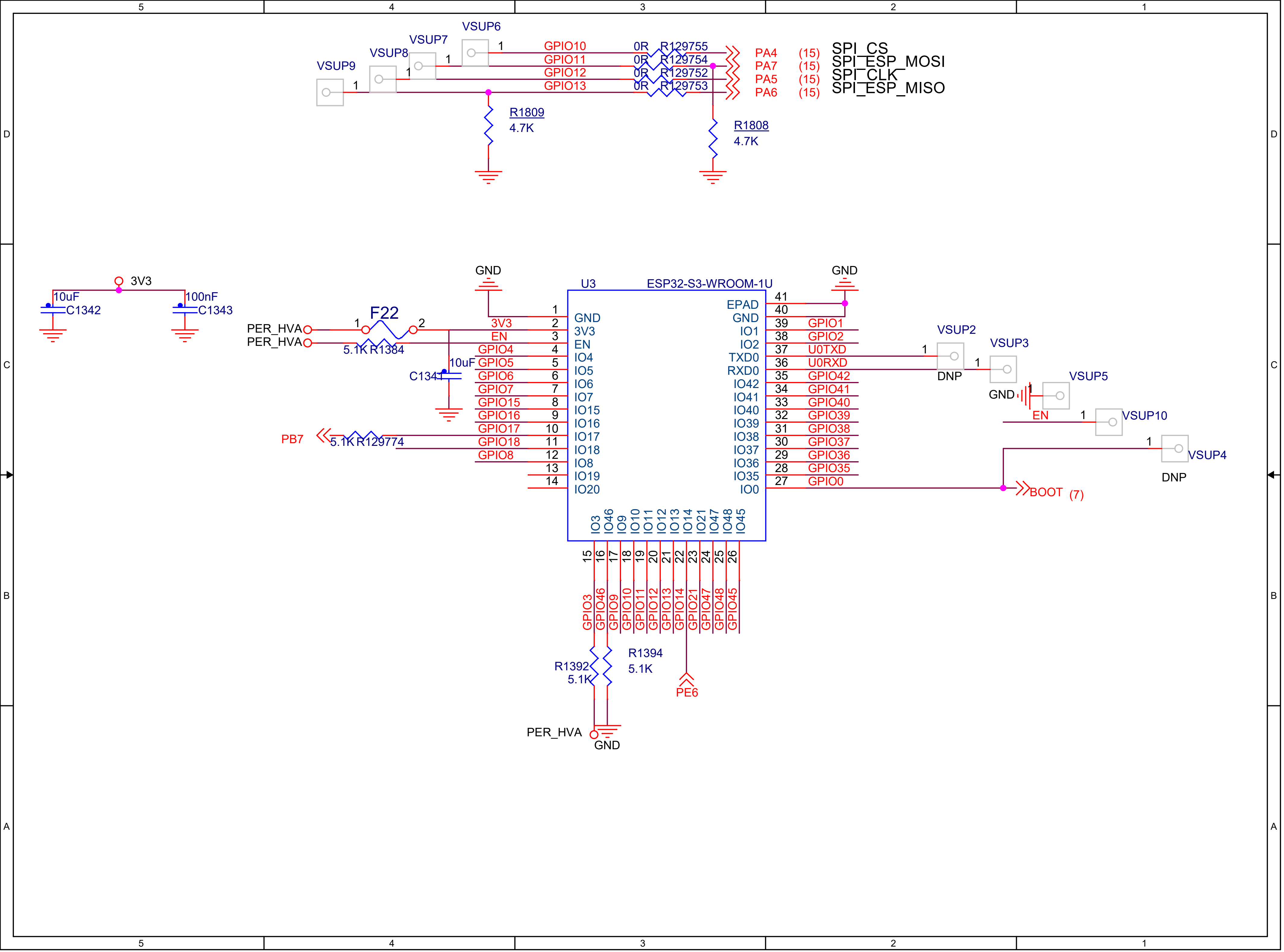
USB Signals are in power domain VDD_HV_A

(Layout Note: Place Series Termination resistor (30 Ohm) close to USB IC)

211-78945 -
CON 5 USB_MICRO_AB_RECEPTACLE RA SKT SMT 0.65MM SP 122H AU
Changed to
211-75297-USB_TYPE_A
CON 4 SKT RA SMT -- AU USB A

The USB interface only supports 3.3V operation. All I/O signals must be 3.3V. If VDD_HVA is set to 5V, USB MCU pads must be left as tri-state with no pullups or series resistors to be removed



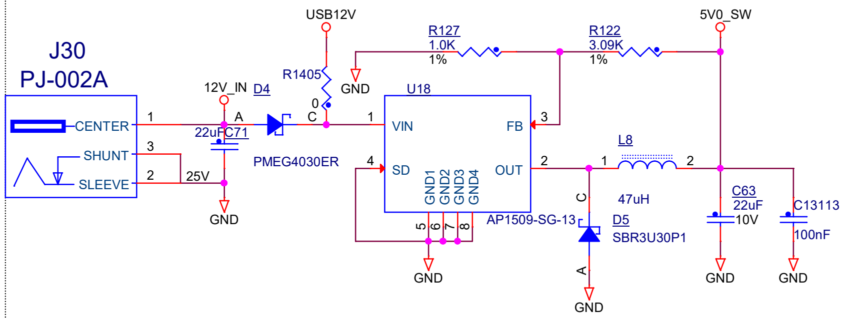

5
4
3
2
1
D
C
B
A
VSUP6
VSUP7
VSUP8
VSUP9
1
GPIO10
GPIO11
GPIO12
GPIO13
0R
R129755
R129754
R129752
R129753
PA4
PA7
PA5
PA6
(15)
SPI_CS
SPI_ESP_MOSI
SPI_CLK
SPI_ESP_MISO
R1809
4.7K
R1808
4.7K
3V3
10uF
C1342
100nF
C1343
PER_HVA
PER_HVA
F22
1
2
5.1K R1384
GND
10uF
C1341
3V3
EN
GPIO4
GPIO5
GPIO6
GPIO7
GPIO15
GPIO16
GPIO17
GPIO18
GPIO8
PB7
5.1K R129774
U3
ESP32-S3-WROOM-1U
GND
3V3
EN
IO4
IO5
IO6
IO7
IO15
IO16
IO17
IO18
IO8
IO19
IO20
EPAD
GND
IO1
IO2
TXD0
RXD0
IO42
IO41
IO40
IO39
IO38
IO37
IO36
IO35
IO0
IO3
IO46
IO9
IO10
IO11
IO12
IO13
IO14
IO21
IO47
IO48
IO45
1 2 3 4 5 6 7 8 9 10 11 12 13 14
41 40 39 38 37 36 35 34 33 32 31 30 29 28 27
15 16 17 18 19 20 21 22 23 24 25 26
GND
GPIO1
GPIO2
U0TXD
U0RXD
GPIO42
GPIO41
GPIO40
GPIO39
GPIO38
GPIO37
GPIO36
GPIO35
GPIO0
VSUP2
DNP
VSUP3
VSUP5
GND
EN
VSUP10
VSUP4
DNP
BOOT
(7)
GPIO3
GPIO46
GPIO9
GPIO10
GPIO11
GPIO12
GPIO13
GPIO14
GPIO21
GPIO47
GPIO48
GPIO45
R1392
5.1K
R1394
5.1K
PE6
PER_HVA
GND

Power Input and Voltage Regulators

12V Power Supply Input

5V Switching Regulator

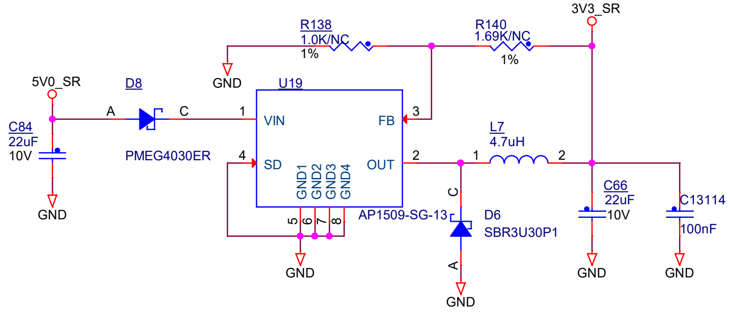
Input Voltage 12V, Output 5V at 1800mA



Layout note: follow IC datasheet recommandations for PCB layout and thermal dissipation

3.3V Switching Regulator

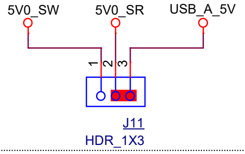
Input Voltage 5V, Output 3.3V at 1600mA

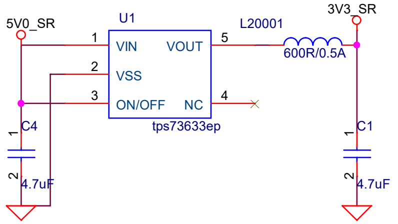


Layout note: follow IC datasheet recommandations for PCB layout and thermal dissipation

Board supply selection
Select between USB and external 12V

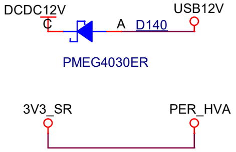
1-2 -> external 12V
2-3 -> USB/UART connector

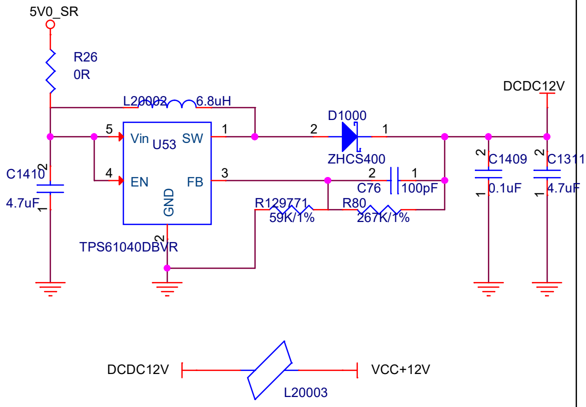




Power Control

Jumpers can be fitted to facilitate power measurements

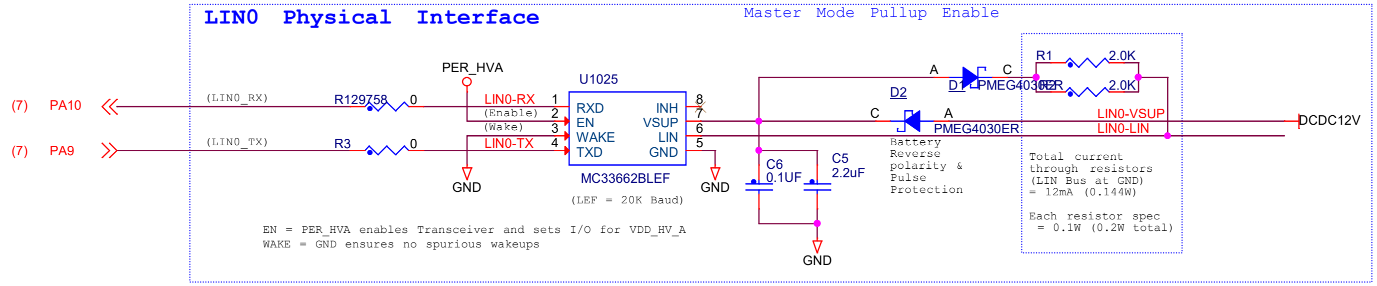




Test and reference points

GND Test Points, Top Side

LIN0 Physical Interface



LIN0 Physical Interface