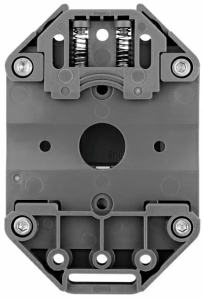
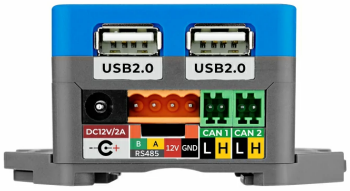
CoreMP135

SKU:K135





Description

CoreMP135 is an all-in-one **Linux** industrial controller based on the **STM32MP135DAE7**.
It integrates a single-core Arm Cortex-A7 processor running at up to 1 GHz and comes with 4 Gbit DDR3L SDRAM.
Typical applications include advanced industrial automation, smart home and multimedia devices, industrial IoT edge gateways, and robot motion-control hubs.

CoreMP135 offers a rich set of interfaces:

- 2 × Gigabit Ethernet (GbE) ports
- 1 × HD video output port
- 2 × USB2.0-A ports
- 1 × USB-C port (OTG & power) and a microSD card slot
- 2 × CAN-FD interfaces
- 1 × PWR485 port (9 ~ 24 V power input + RS485)
- 2 × Grove ports (I2C & UART)

For HMI, it features a 2.0-inch IPS capacitive touch screen and a 1 W speaker (16-bit I2S).
The low-power design adopts the AXP2101 PMU and an RTC (BM8563) with timed wake-up/sleep capability.
It supports rechargeable-battery power as well as an external DC jack (12 V @ 2 A).
A microSD card pre-loaded with Debian is included—power on and use immediately.
The bottom DIN-rail base allows wall mounting or screw fixing for various installation scenarios.

Tutorial

UiFlow2

This tutorial shows you how to control the CoreMP135 using the UiFlow2 graphical programming platform.

Features

- STM32MP135DAE7 @ Arm Cortex-A7 @ 1 GHz

- Standard Linux platform
- Multiple communication options, rich peripheral interfaces (CAN, RS485, GbE, etc.)
- 2.0-inch touch screen
- Unified power management
- Built-in speaker
- microSD slot and 4 Gbit DDR3L SDRAM
- M5BUS & PORT A/C
- DIN-rail base for easy installation
- Development Platform
  - UiFlow2

Includes

- 1 x CoreMP135
- 1 x Hex Key L-Shape 2.5 mm (For M3 Screw)
- 1 x VH3.96-4P
- 2 x Terminal Block 2.54 mm-2P (Green)
- 1 x microSD Card (pre-installed in the device)
- 1 x User Manual

Applications

- Industrial automation
- Smart home
- Industrial IoT edge gateway
- Education and development
- Robot motion-control hub

Specifications

Specification	Parameter
MCU	STM32MP135DAE7, single-core Arm Cortex-A7 @ 1 GHz
Power Management IC	AXP2101
RS485	MAX3485
CAN	2 × SIT1051T/3 (high-speed FDCAN)
USB Hub	GL852G (2 × USB2.0) + 1 × USB-C (OTG & power)
HD Video Interface	LT8618SXB, up to 24-bit color depth
DDR3L SDRAM	4 Gbit
Ethernet	RTL8211F, up to 1 Gbps, 2 × RJ45
RTC	BM8563
Screen	ILI9342C, 2.0-inch IPS LCD, 240 × 320 px
Touch Panel	FT6336U
Amplifier	NS4168, mono Class-D, I2S input 8 kHz ~ 96 kHz
Speaker	Cavity speaker 1 W @ 8 Ω
DC Power Input	12 V @ 2 A
Operating Temperature	0 ~ 40 °C
Power Supply	DC 12 V @ 2 A or USB-C 5 V @ 3 A
Product Size	81.9 x 54.0 x 39.5 mm
Product Weight	98.3 g
Package Size	122.2 x 71.5 x 61.6 mm
Gross Weight	154.7 g

Learn

M5-Bus Power

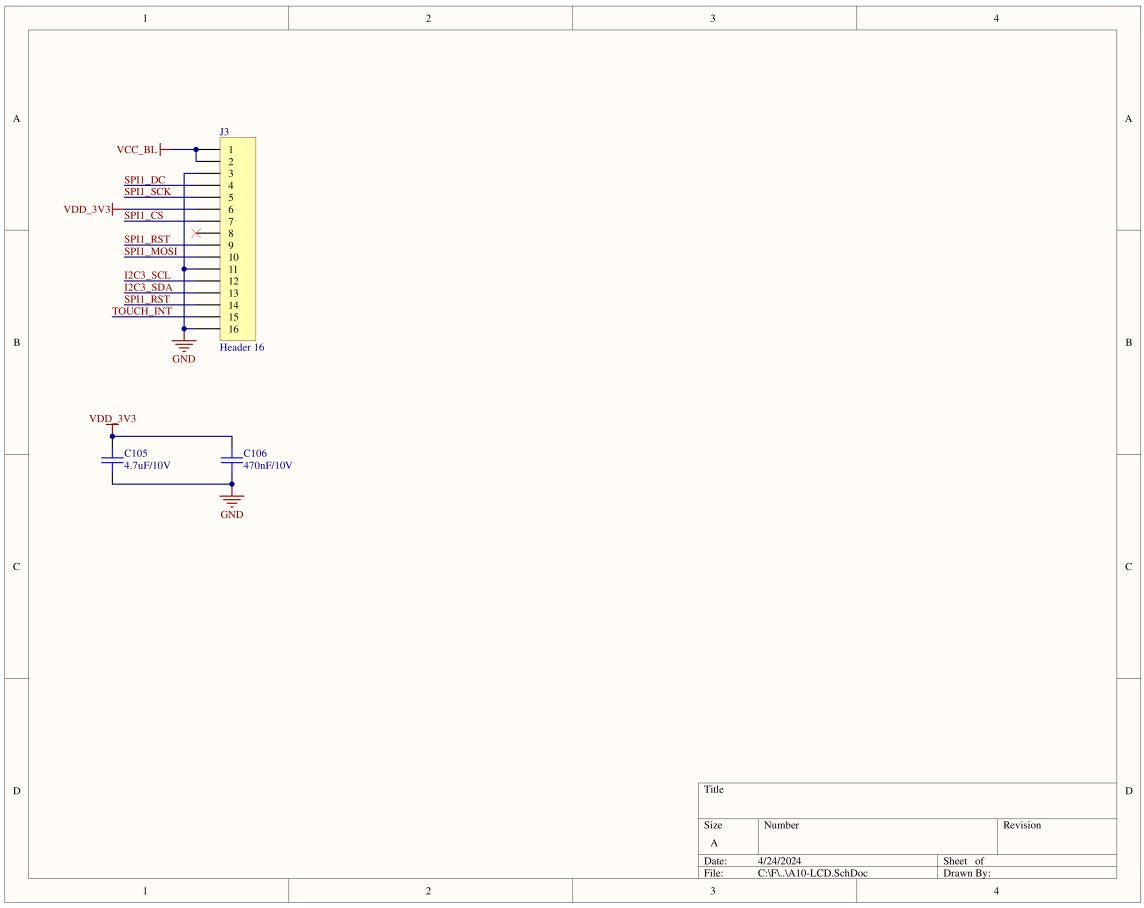
CoreMP135 M5-Bus power bus I/O control

According to the schematics, set **BUS_OUT_EN** low for 5 V input mode, or high for 5 V output mode. Use the following commands to enable 5 V output:

```
echo 131 > /sys/class/gpio/export && echo out > /sys/class/gpio/PI3/direction
echo 1 > /sys/class/gpio/PI3/value
# echo 0 > /sys/class/gpio/PI3/value
```

Schematics

- CoreMP135 Schematics PDF
- CoreMP135 MidLayer Schematics PDF


J3
VCC_BL
SPI1_DC
SPI1_SCK
VDD_3V3
SPI1_CS
SPI1_RST
SPI1_MOSI
I2C3_SCL
I2C3_SDA
SPI1_RST
TOUCH_INT
GND
Header 16
VDD_3V3
C105
4.7uF/10V
C106
470nF/10V
GND
Title
Size
A
Number
Revision
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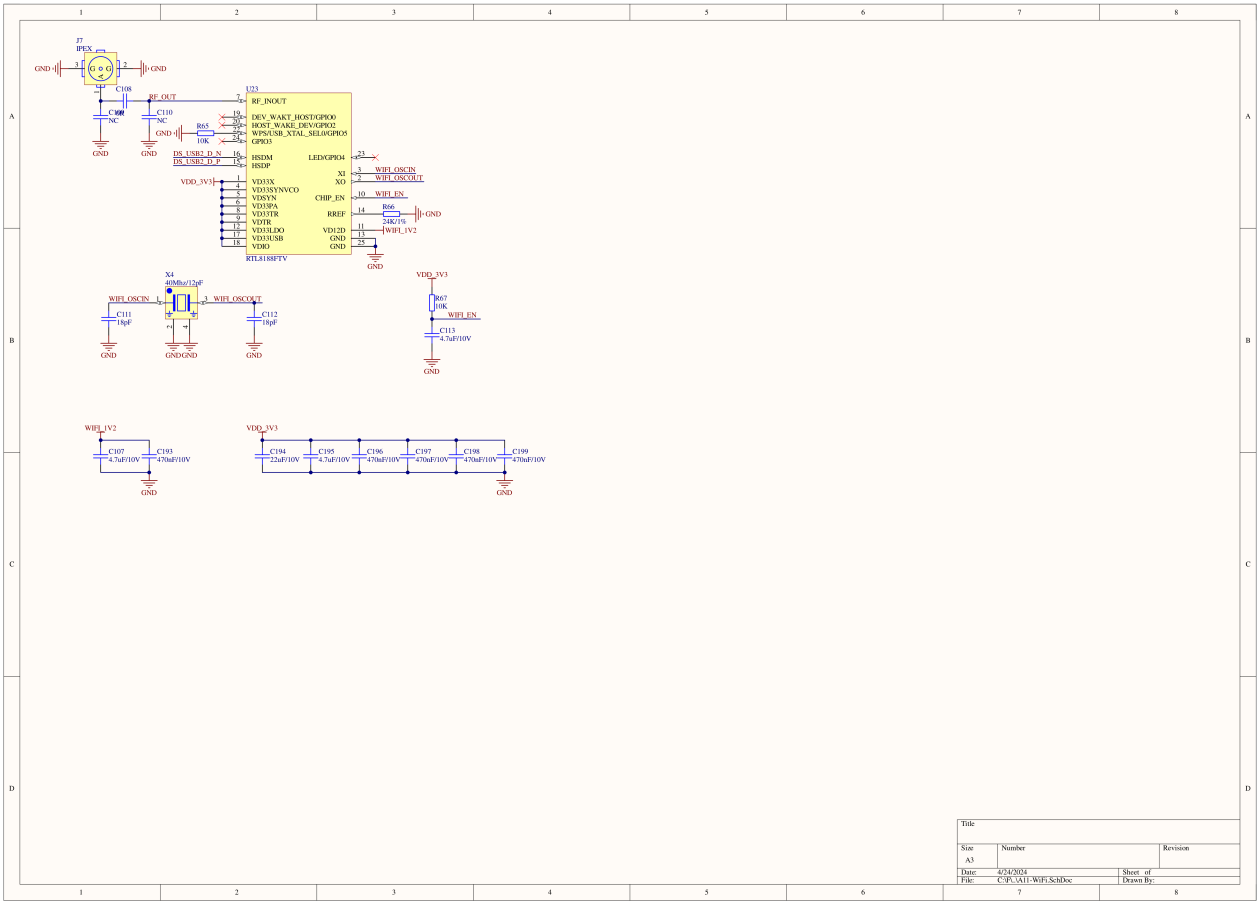
J7
IPEX
GND
C108
RF_OUT
C109
NC
C110
NC
R65
10K
U23
RF_INOUT
DEV_WAKE_HOST/GPIO0
HOST_WAKE_DEV/GPIO2
WPS/USB_XTAL_SEL0/GPIO5
GPIO3
DS_USB2_D_N
DS_USB2_D_P
HSDM
HSDP
LED/GPIO4
XI
XO
CHIP_EN
RREF
VD12D
GND
VDD_3V3
VD33X
VD33SYNVCO
VDSYN
VD33PA
VD33TR
VDTR
VD33LDO
VD33USB
VDIO
WIFI_OSCIN
WIFI_OSCOUT
WIFI_EN
R66
24K/1%
WIFI_1V2
RTL8188FTV
X4
40Mhz/12pF
C111
18pF
C112
18pF
R67
10K
C113
4.7uF/10V
C107
4.7uF/10V
C193
470nF/10V
C194
22uF/10V
C195
4.7uF/10V
C196
470nF/10V
C197
470nF/10V
C198
470nF/10V
C199
470nF/10V
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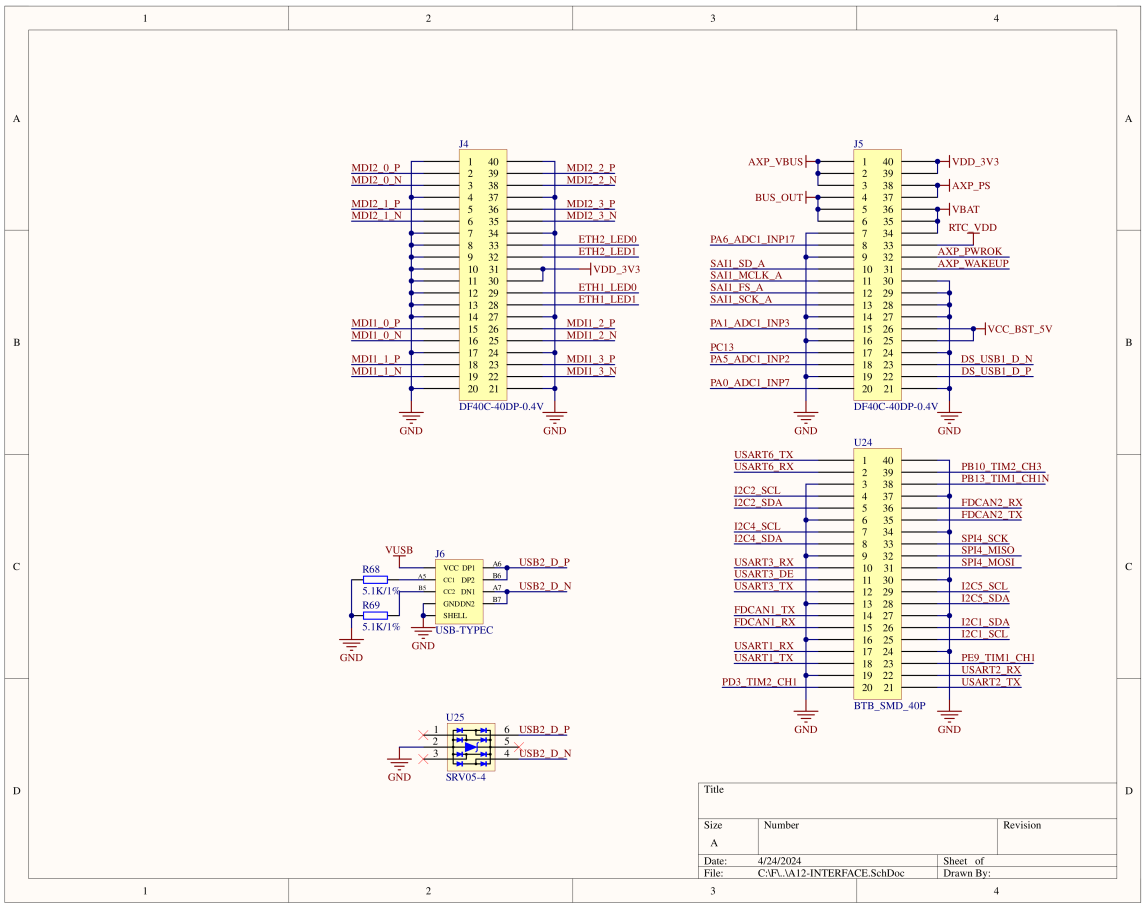
J4
MDI2_0_P
MDI2_0_N
MDI2_1_P
MDI2_1_N
MDI1_0_P
MDI1_0_N
MDI1_1_P
MDI1_1_N
MDI2_2_P
MDI2_2_N
MDI2_3_P
MDI2_3_N
ETH2_LED0
ETH2_LED1
VDD_3V3
ETH1_LED0
ETH1_LED1
MDI1_2_P
MDI1_2_N
MDI1_3_P
MDI1_3_N
DF40C-40DP-0.4V
GND
J5
AXP_VBUS
BUS_OUT
PA6_ADC1_INP17
SAI1_SD_A
SAI1_MCLK_A
SAI1_FS_A
SAI1_SCK_A
PA1_ADC1_INP3
PC13
PA5_ADC1_INP2
PA0_ADC1_INP7
VDD_3V3
AXP_PS
VBAT
RTC_VDD
AXP_PWROK
AXP_WAKEUP
VCC_BST_5V
DS_USB1_D_N
DS_USB1_D_P
VUSB
R68
5.1K/1%
R69
5.1K/1%
J6
USB-TYPEC
USB2_D_P
USB2_D_N
U25
SRV05-4
U24
USART6_TX
USART6_RX
I2C2_SCL
I2C2_SDA
I2C4_SCL
I2C4_SDA
USART3_RX
USART3_DE
USART3_TX
FDCAN1_TX
FDCAN1_RX
USART1_RX
USART1_TX
PD3_TIM2_CH1
PB10_TIM2_CH3
PB13_TIM1_CH1N
FDCAN2_RX
FDCAN2_TX
SPI4_SCK
SPI4_MISO
SPI4_MOSI
I2C5_SCL
I2C5_SDA
I2C1_SDA
I2C1_SCL
PE9_TIM1_CH1
USART2_RX
USART2_TX
BTB_SMD_40P
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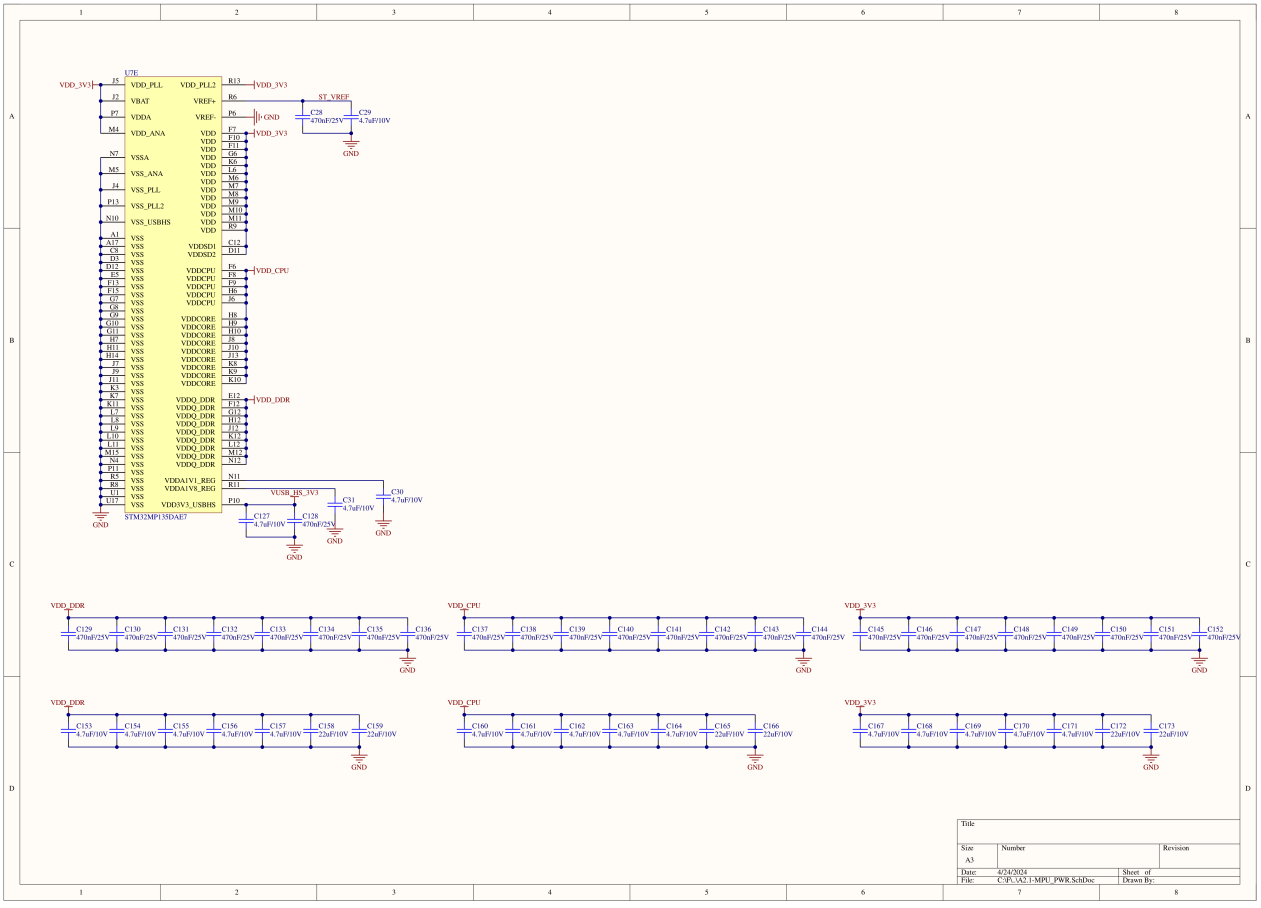
U7E
STM32MP135DAE7
VDD_3V3
VBAT
VDDA
VDD_ANA
VSSA
VSS_ANA
VSS_PLL
VSS_PLL2
VSS_USBHS
VDD_PLL
VDD_PLL2
VREF+
VREF-
VDDSD1
VDDSD2
VDDCPU
VDD_CPU
VDDQ_DDR
VDD_DDR
VDDA1V1_REG
VDDA1V8_REG
VDD3V3_USBHS
VUSB_HS_3V3
ST_VREF
C28
470nF/25V
C29
4.7uF/10V
C30
4.7uF/10V
C31
4.7uF/10V
C127
4.7uF/10V
C128
470nF/25V
GND
C129
C130
C131
C132
C133
C134
C135
C136
C137
C138
C139
C140
C141
C142
C143
C144
C145
C146
C147
C148
C149
C150
C151
C152
C153
C154
C155
C156
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C161
C162
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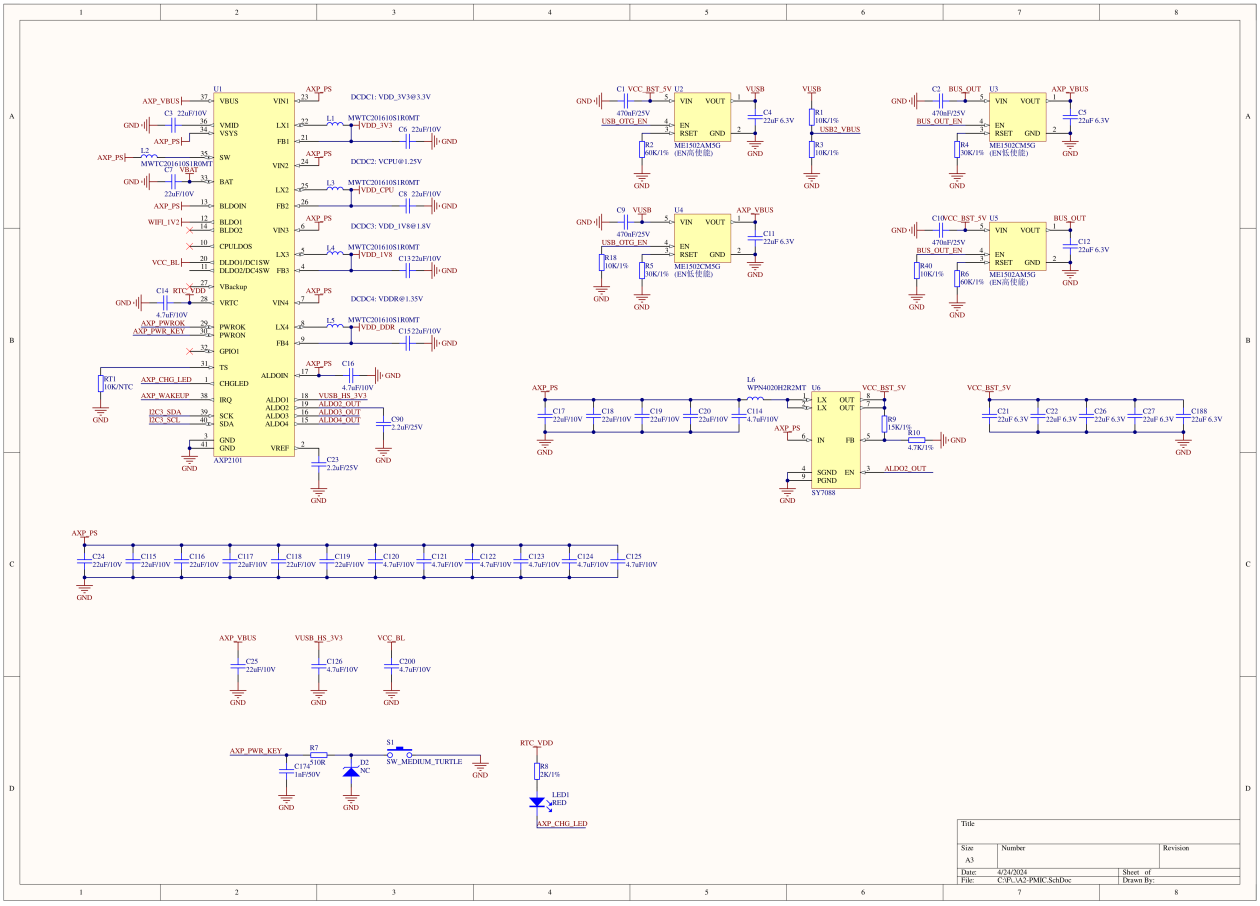
U1
AXP2101
VBUS
VMID
VSYS
SW
BAT
BLDOIN
BLDO1
BLDO2
CPULDOS
DLDO1/DC1SW
DLDO2/DC4SW
VBackup
VRTC
PWROK
PWRON
GPIO1
TS
CHGLED
IRQ
SCK
SDA
GND
VIN1
LX1
FB1
VIN2
LX2
FB2
VIN3
LX3
FB3
VIN4
LX4
FB4
ALDOIN
ALDO1
ALDO2
ALDO3
ALDO4
VREF
AXP_PS
DCDC1: VDD_3V3@3.3V
DCDC2: VCPU@1.25V
DCDC3: VDD_1V8@1.8V
DCDC4: VDDR@1.35V
MWTC20161OS1R0MT
VDD_3V3
VDD_CPU
VDD_1V8
VDD_DDR
VUSB_HS_3V3
ALDO2_OUT
ALDO3_OUT
ALDO4_OUT
AXP_VBUS
AXP_PWROK
AXP_PWR_KEY
AXP_CHG_LED
AXP_WAKEUP
I2C3_SCL
I2C3_SDA
RTC_VDD
VCC_BL
WIFI_1V2
U2
U3
U4
U5
U6
ME1502AM5G
ME1502CM5G
VIN
VOUT
EN
RSET
GND
USB_OTG_EN
USB2_VBUS
BUS_OUT_EN
BUS_OUT
VCC_BST_5V
VUSB
SY7088
WPN4020H2R2MT
LX
IN
FB
SGND
PGND
ALDO2_OUT
S1
SW_MEDIUM_TURTLE
D2
LED1
RED
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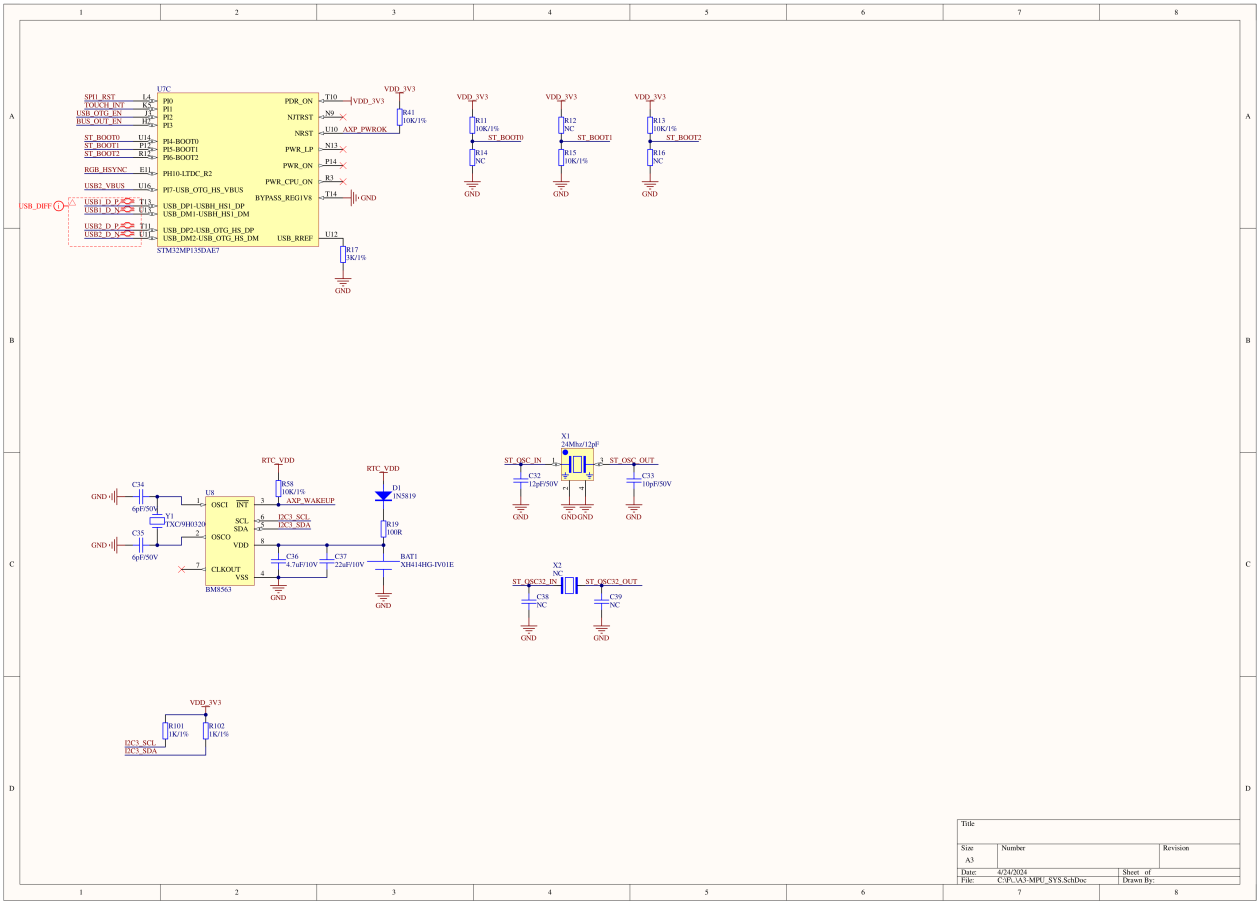
U7C
STM32MP135DAE7
P0
P1
P2
P3
P4-BOOT0
P5-BOOT1
P6-BOOT2
PH10-LTDC_R2
P7-USB_OTG_HS_VBUS
USB_DP1-USBH_HS1_DP
USB_DM1-USBH_HS1_DM
USB_DP2-USB_OTG_HS_DP
USB_DM2-USB_OTG_HS_DM
PDR_ON
NJTRST
NRST
PWR_LP
PWR_ON
PWR_CPU_ON
BYPASS_REG1V8
USB_RREF
SPI1_RST
TOUCH_INT
USB_OTG_EN
BUS_OUT_EN
ST_BOOT0
ST_BOOT1
ST_BOOT2
RGB_HSYNC
USB2_VBUS
USB_DIFF
VDD_3V3
AXP_PWROK
ST_BOOT0
ST_BOOT1
ST_BOOT2
U8
BM8563
OSCI
OSCO
CLKOUT
INT
SCL
SDA
VDD
VSS
RTC_VDD
AXP_WAKEUP
I2C3_SCL
I2C3_SDA
D1
1N5819
BAT1
X0414HG-IV01E
X1
24Mhz/12pF
X2
ST_OSC_IN
ST_OSC_OUT
ST_OSC32_IN
ST_OSC32_OUT
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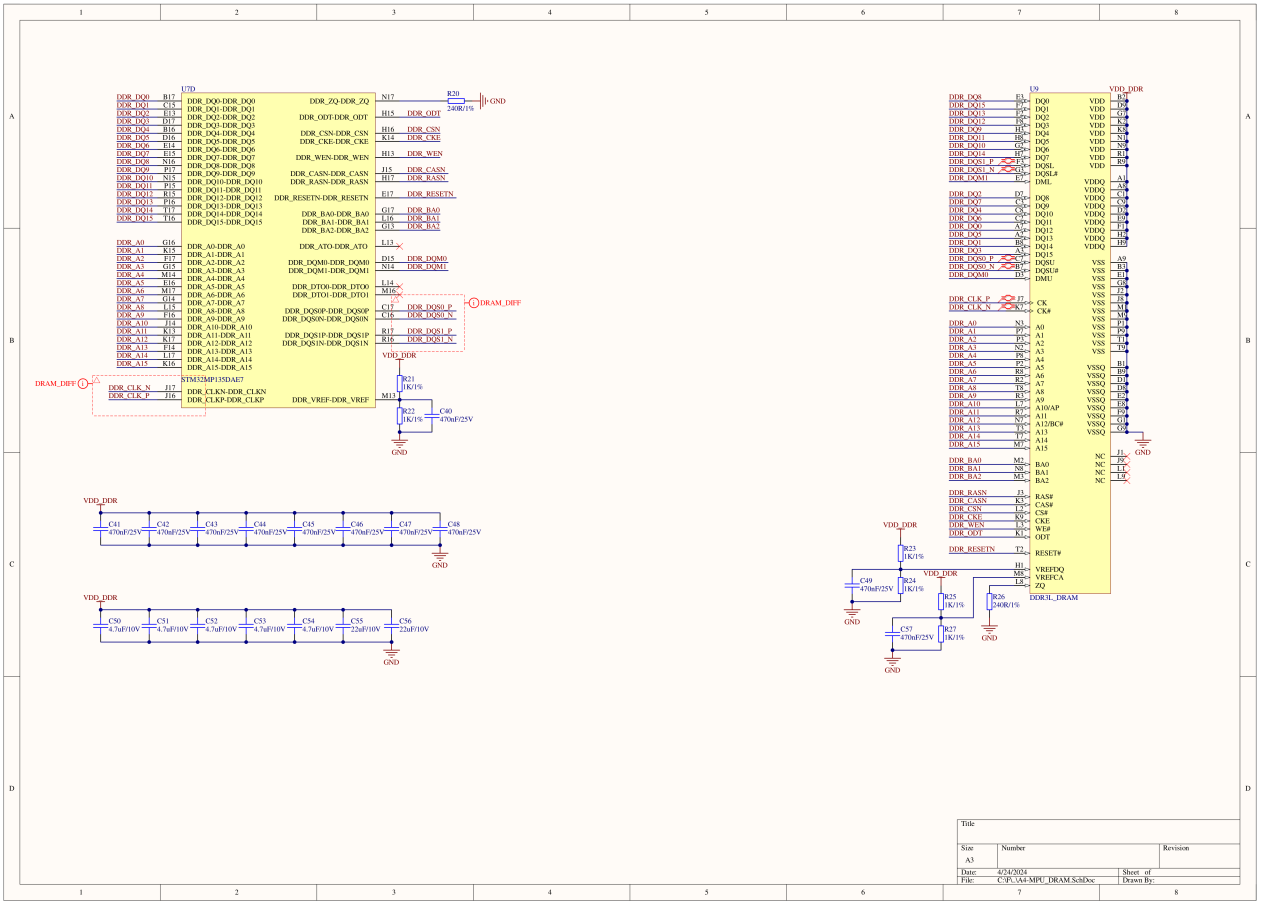
U7D
U9
VDD_DDR
DDR_DQ0-DDR_DQ0
DDR_DQ1-DDR_DQ1
DDR_DQ2-DDR_DQ2
DDR_DQ3-DDR_DQ3
DDR_DQ4-DDR_DQ4
DDR_DQ5-DDR_DQ5
DDR_DQ6-DDR_DQ6
DDR_DQ7-DDR_DQ7
DDR_DQ8-DDR_DQ8
DDR_DQ9-DDR_DQ9
DDR_DQ10-DDR_DQ10
DDR_DQ11-DDR_DQ11
DDR_DQ12-DDR_DQ12
DDR_DQ13-DDR_DQ13
DDR_DQ14-DDR_DQ14
DDR_DQ15-DDR_DQ15
DDR_A0-DDR_A0
DDR_A1-DDR_A1
DDR_A2-DDR_A2
DDR_A3-DDR_A3
DDR_A4-DDR_A4
DDR_A5-DDR_A5
DDR_A6-DDR_A6
DDR_A7-DDR_A7
DDR_A8-DDR_A8
DDR_A9-DDR_A9
DDR_A10-DDR_A10
DDR_A11-DDR_A11
DDR_A12-DDR_A12
DDR_A13-DDR_A13
DDR_A14-DDR_A14
DDR_A15-DDR_A15
DDR_CLKN-DDR_CLKN
DDR_CLKP-DDR_CLKP
DDR_ZQ-DDR_ZQ
DDR_ODT-DDR_ODT
DDR_CSN-DDR_CSN
DDR_CKE-DDR_CKE
DDR_WEN-DDR_WEN
DDR_CASN-DDR_CASN
DDR_RASN-DDR_RASN
DDR_RESETN-DDR_RESETN
DDR_BA0-DDR_BA0
DDR_BA1-DDR_BA1
DDR_BA2-DDR_BA2
DDR_ATO-DDR_ATO
DDR_DQM0-DDR_DQM0
DDR_DQM1-DDR_DQM1
DDR_DTO0-DDR_DTO0
DDR_DTO1-DDR_DTO1
DDR_DQS0P-DDR_DQS0P
DDR_DQS0N-DDR_DQS0N
DDR_DQS1P-DDR_DQS1P
DDR_DQS1N-DDR_DQS1N
DDR_VREF-DDR_VREF
XFMS32MP135DAE7
DRAM_DIFF
R20 240R/1%
R21 1K/1%
R22 1K/1%
C40 470nF/25V
C41 C42 C43 C44 C45 C46 C47 C48 470nF/25V
C50 4.7uF/10V
C51 C52 C53 C54 C55 4.7uF/10V
C56 22uF/10V
R23 1K/1%
R24 1K/1%
R25 1K/1%
R26 240R/1%
R27 1K/1%
C49 C57 470nF/25V
DDR3L_DRAM
GND
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Number
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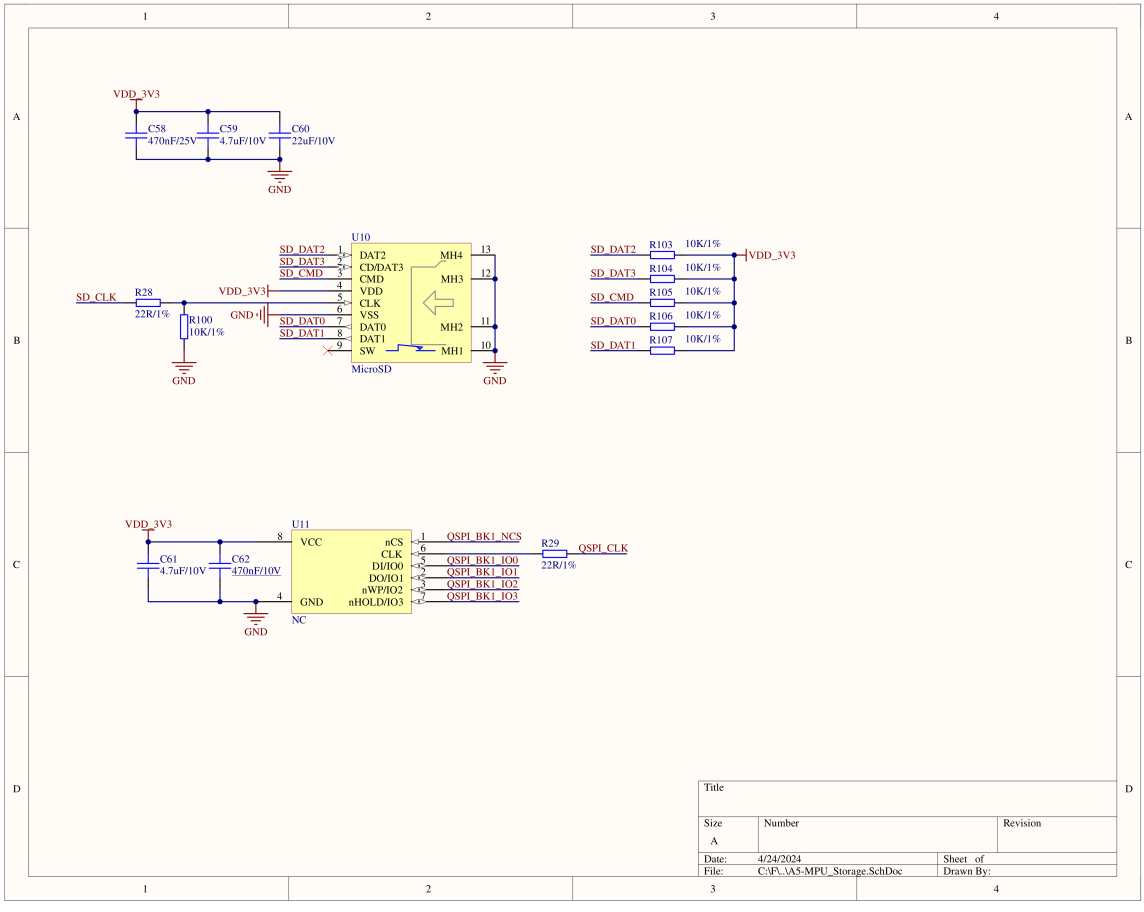
VDD_3V3
C58 470nF/25V
C59 4.7uF/10V
C60 22uF/10V
GND
U10
SD_DAT2
SD_DAT3
SD_CMD
SD_CLK
SD_DAT0
SD_DAT1
DAT2
CD/DAT3
CMD
VDD
CLK
VSS
DAT0
DAT1
SW
MH1
MH2
MH3
MH4
MicroSD
R28 22R/1%
R100 10K/1%
R103 R104 R105 R106 R107 10K/1%
U11
VCC
GND
nCS
CLK
DI/IO0
DO/IO1
nWP/IO2
nHOLD/IO3
QSPI_BK1_NCS
QSPI_BK1_IO0
QSPI_BK1_IO1
QSPI_BK1_IO2
QSPI_BK1_IO3
R29 22R/1%
QSPI_CLK
C61 4.7uF/10V
C62 470nF/25V
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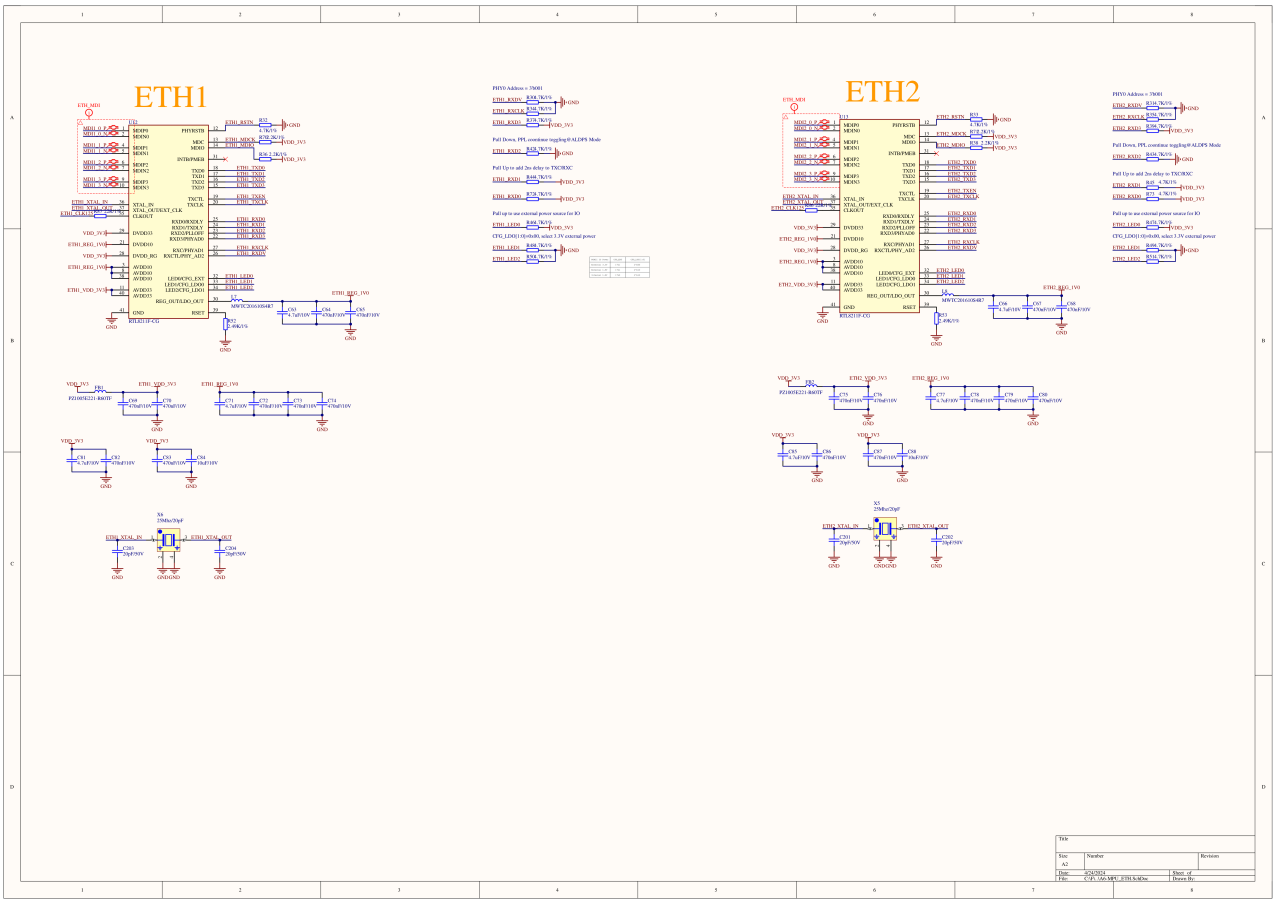
ETH1
ETH2
PHY0 Address = 19d01
Pull Down, PPL coordinate toggling@ALDPS Mode
Pull Up to add 2ns delay to TXCRXC
Pull up to use external power source for IO
CFG_LDO[1:0]=01=0.8V, select 3.3V external power
Title
Size
A2
Number
Revision
Date: 4/24/2024
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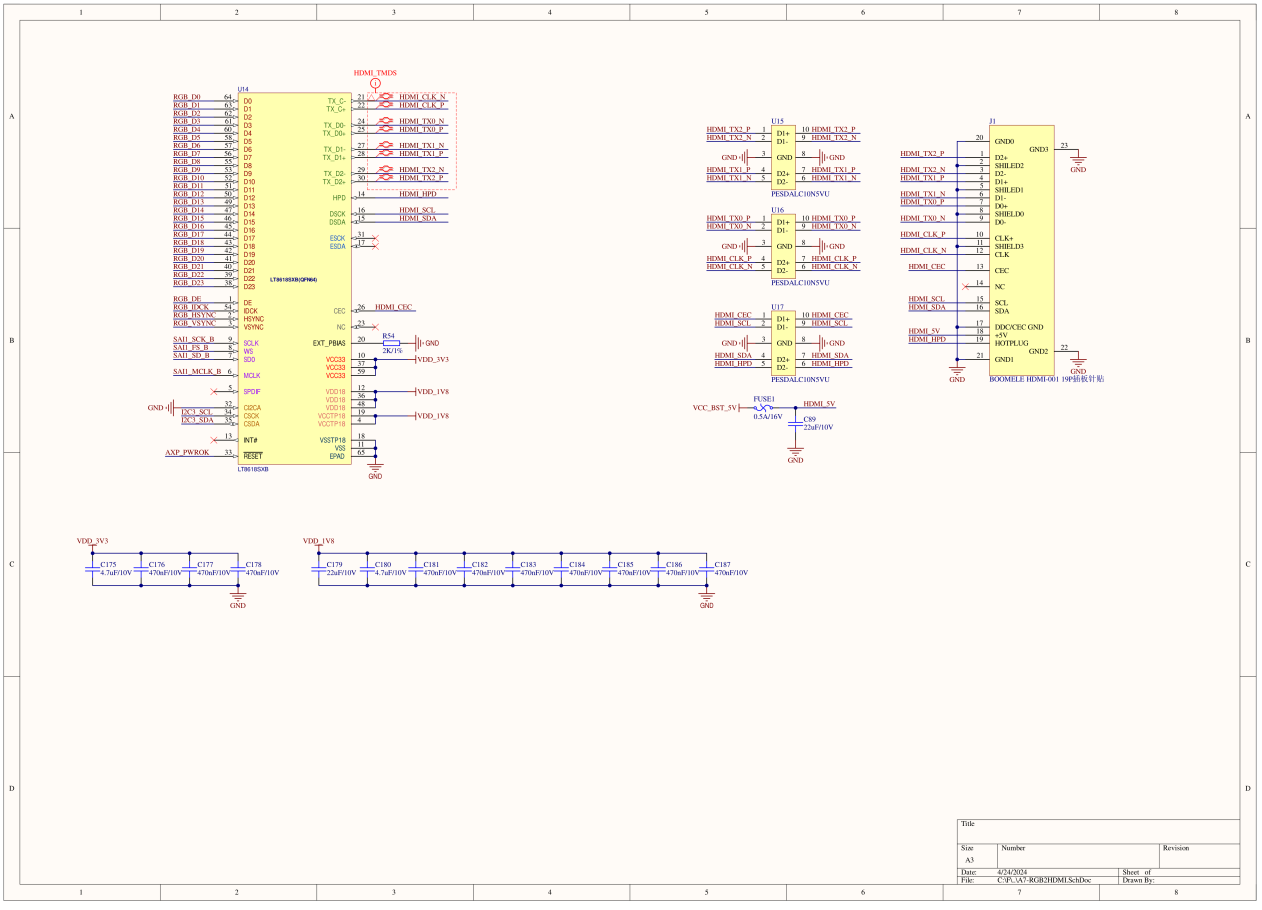
HDMI_TMDS
U14
LT8618SXB(QFN64)
U15
U16
U17
PESDALC10N5VU
J1
BOOMELE HDMI-001 19P插板针贴
FUSE1
VCC_BST_5V
HDMI_5V
VDD_3V3
VDD_1V8
Title
Size
A3
Number
Revision
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U7A
STM32MP135DAE7
U7B
STM32MP135DAE7
Title
Size
A3
Number
Revision
Date: 4/24/2024
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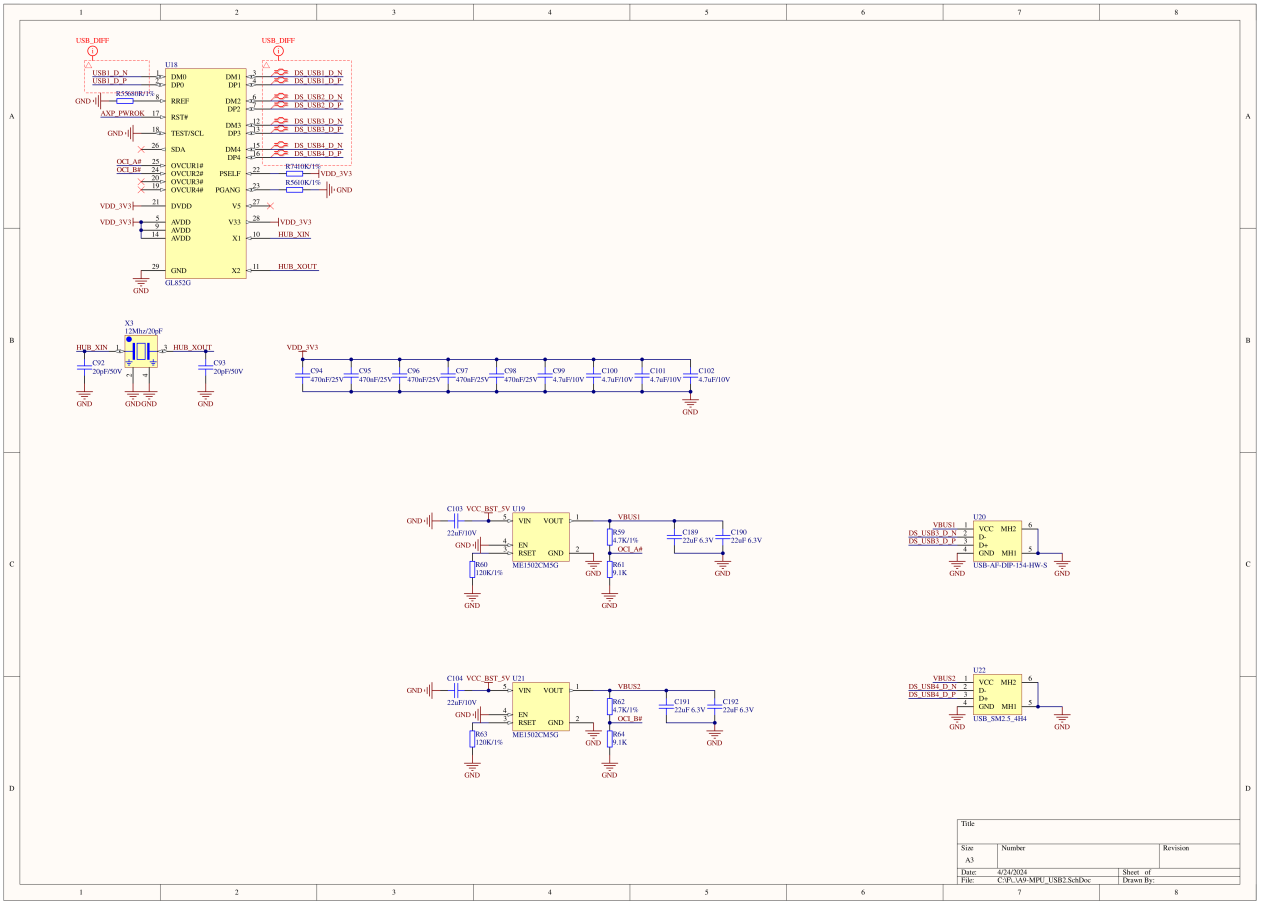
U18
GL852G
X3
12Mhz/20pF
U19
ME1502CM5G
U21
ME1502CM5G
U20
USB-AF-DIP-154-HW-S
U22
USB_SM2.5_4H4
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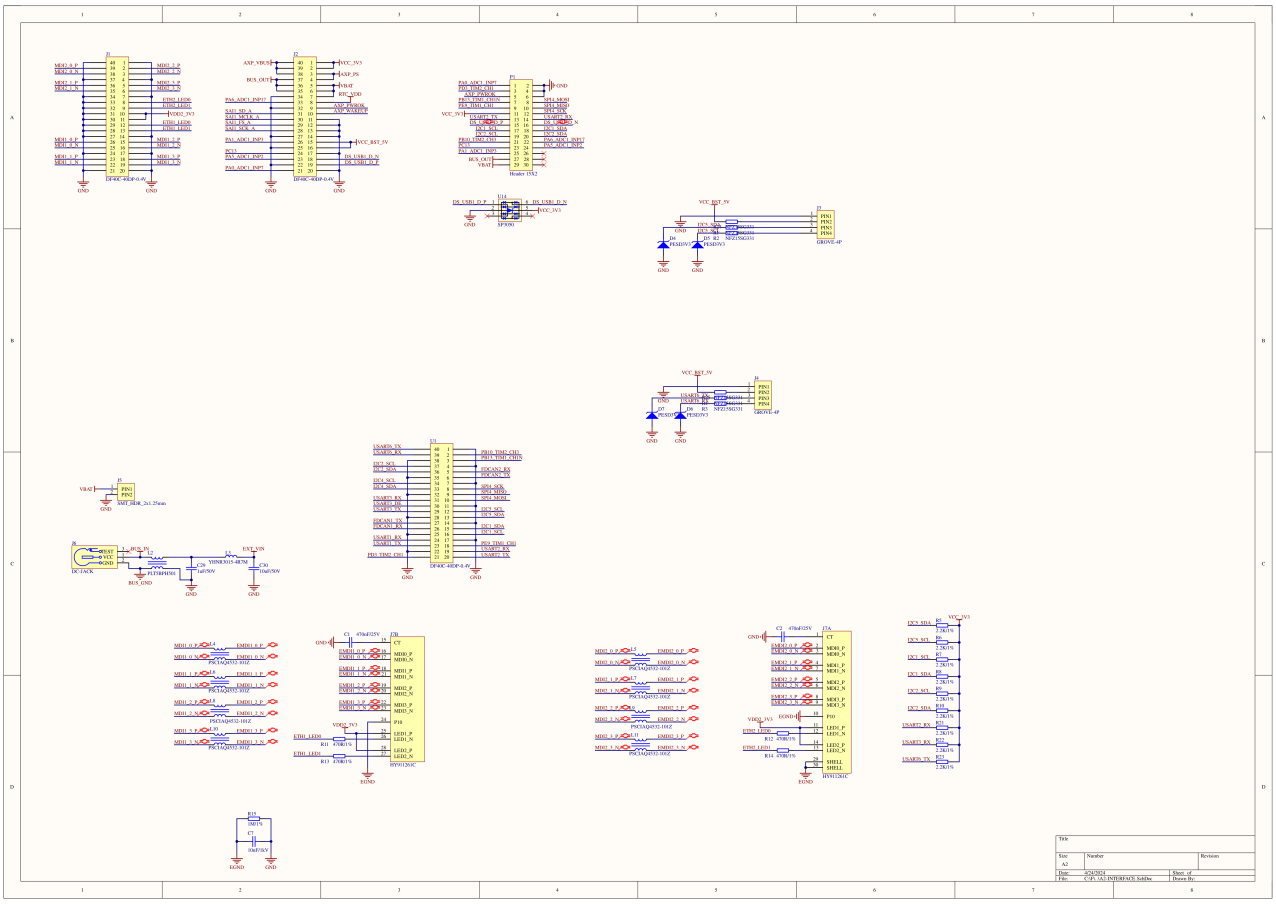

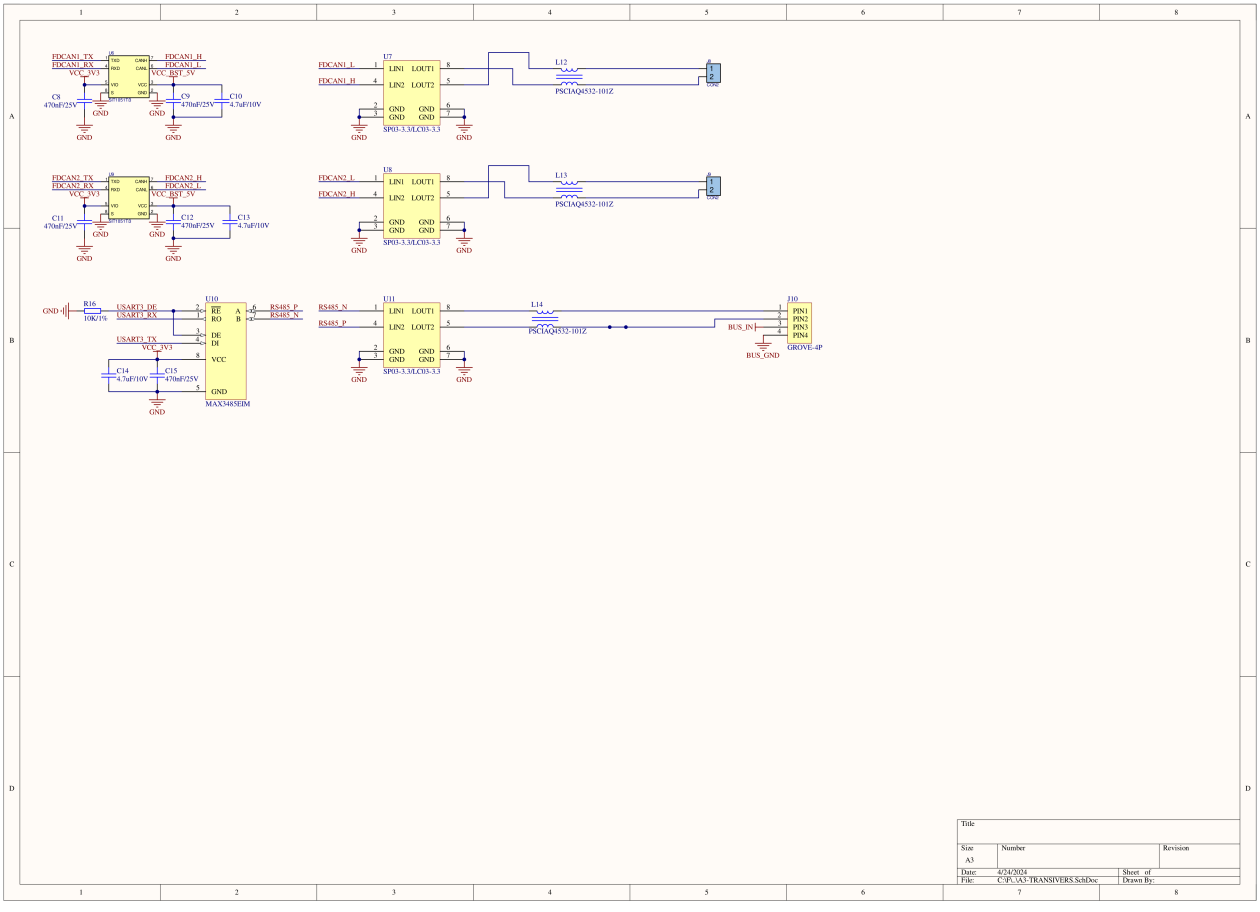

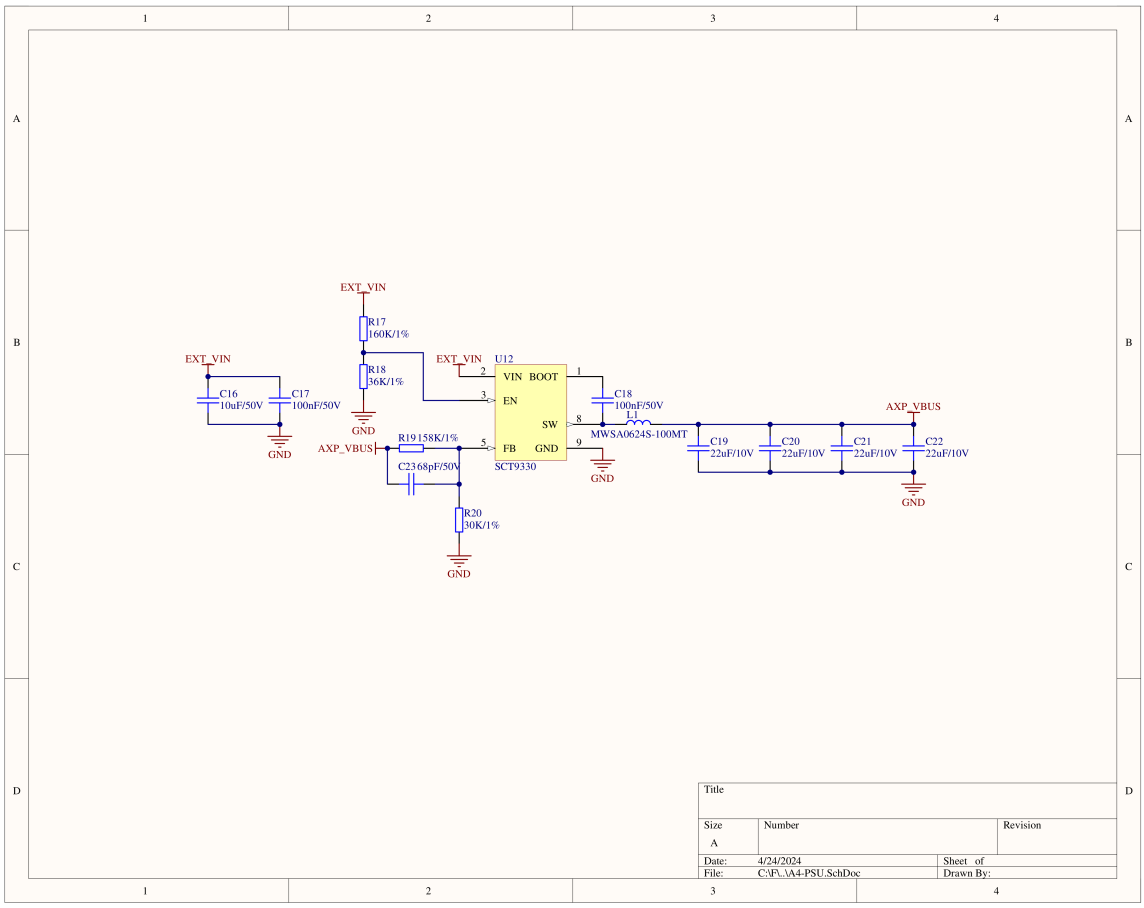
EXT_VIN
R17
160K/1%
R18
36K/1%
GND
EXT_VIN
C16
10uF/50V
C17
100nF/50V
GND
EXT_VIN
U12
VIN
BOOT
EN
SW
FB
GND
SCT9330
C18
100nF/50V
L1
MWSA0624S-100MT
AXP_VBUS
C19
22uF/10V
C20
22uF/10V
C21
22uF/10V
C22
22uF/10V
GND
AXP_VBUS
R19 158K/1%
C23 68pF/50V
R20
30K/1%
GND
GND
Title
Size
A
Number
Revision
Date: 4/24/2024
File: C:\F\..\A4-PSU.SchDoc
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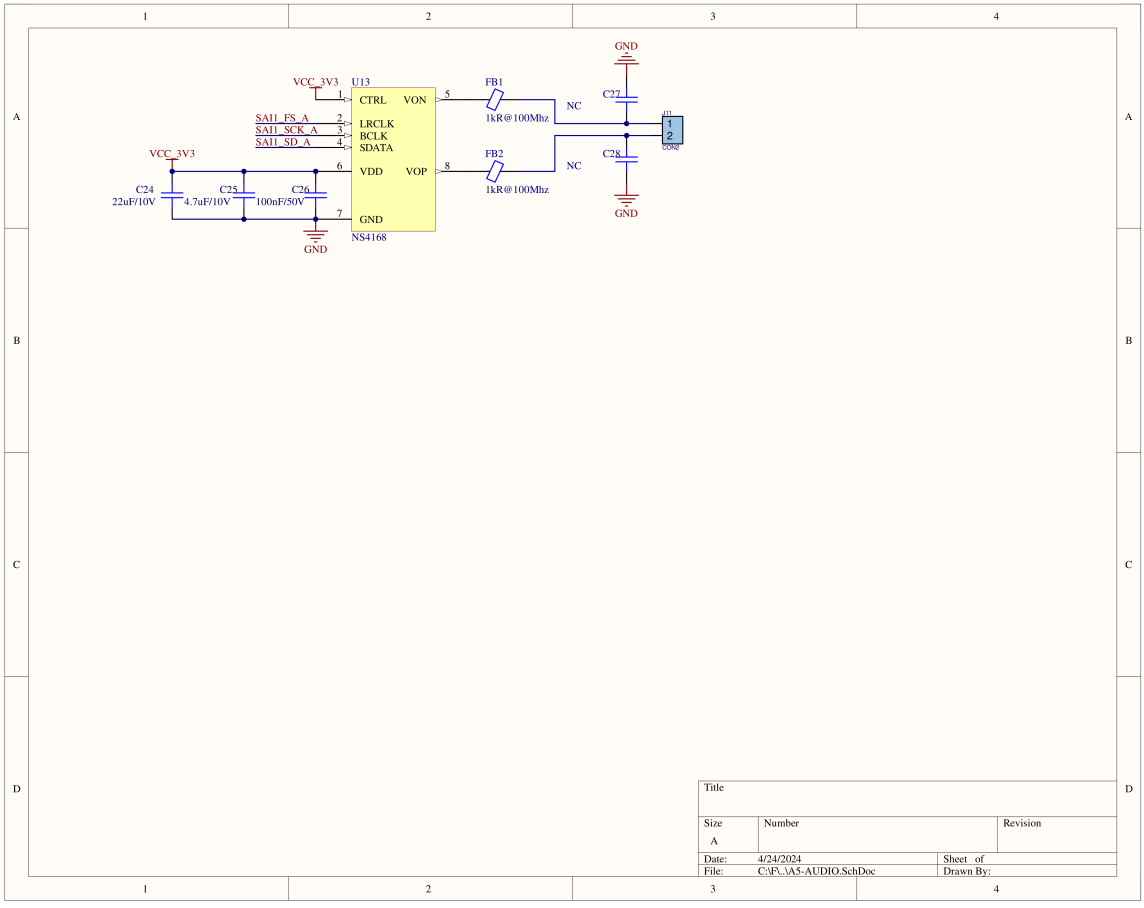
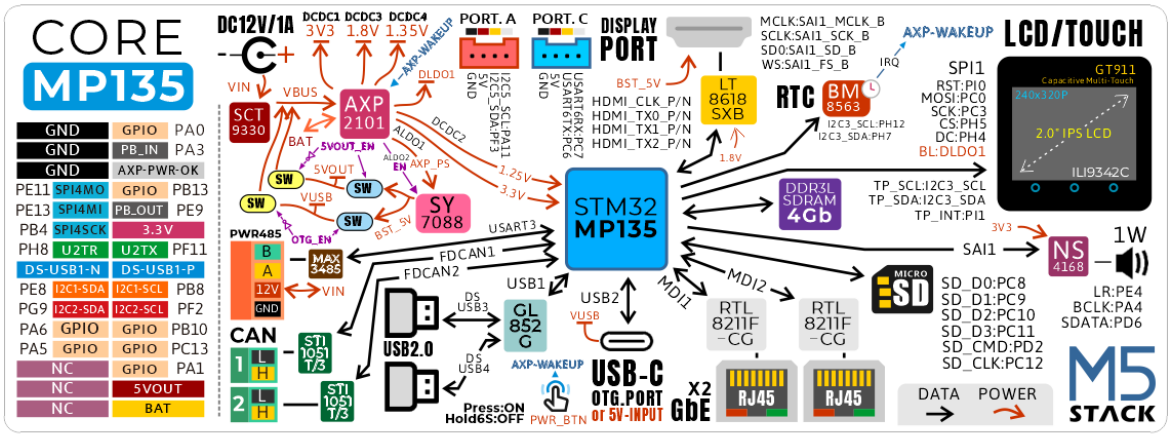
Drawn By:


VCC_3V3
U13
CTRL
VON
SAI1_FS_A
SAI1_SCK_A
SAI1_SD_A
LRCLK
BCLK
SDATA
VDD
VOP
GND
NS4168
FB1
1kR@100Mhz
FB2
1kR@100Mhz
NC
NC
C22
C28
GND
GND
VCC_3V3
C24
22uF/10V
C25
4.7uF/10V
C26
100nF/50V
GND
J11
CON2
Title
Size
A
Number
Revision
Date: 4/24/2024
File: C:\F\..\A5-AUDIO.SchDoc
Sheet of
Drawn By:

PinMap



M5-Bus

M5-Bus	STM32MP135DAE7
U2RX	PH8
U2TX	PF11
I2C1-SDA	PE8
I2C1-SCL	PB8
I2C2-SDA	PG9
I2C2-SCL	PF2

Device	Linux Node
USART2	/dev/ttySTM2
I2C1	/dev/i2c-2
I2C2	/dev/i2c-3

PORT.A

PORT.A	I2C5_SCL	I2C5_SDA
STM32MP135DAE7	PA11	PF3

Device	Linux Node
UI2C5	/dev/i2c-1

PORT.C

PORT.C	USART6RX	USART6TX
STM32MP135DAE7	PC6	PC7

Device	Linux Node
USART6	/dev/ttySTM0

RS485

MAX3485EIM	USART3RX	USART3TX	DE/RE
STM32MP135DAE7	PG4	PD8	PD12

Device	Linux Node
USART3	/dev/ttySTM3

CAN

STM32MP135DAE7	PE3	PE10	PG0	PE0
SIT1051T/3 (FDCAN1)	FDCAN1_TX	FDCAN1_RX		
SIT1051T/3 (FDCAN2)			FDCAN2_TX	FDCAN2_RX

Display

LT8618SXB	MCLK	SCLK	SD0	WS	I2C3_SDA	I2C3_SCL
STM32MP135DAE7	PF13	PF8	PA3	PG10	PH7	PH12

Device	Linux Node
I2C3	/dev/i2c-0

RTC

RTC	I2C3_SCL	I2C3_SDA
STM32MP135DAE7	PH7	PH12

Device	Linux Node
I2C3	/dev/i2c-0

Micro SD

Micro SD	SD_DAT0	SD_DAT1	SD_DAT2	SD_DAT3	SD_CMD	SD_CLK
STM32MP135DAE7	PC8	PC9	PC10	PC11	PD2	PC12

NS4168

NS4168	LRCLK	BCLK	SDATA	WS	I2C3_SDA	I2C3_SCL
STM32MP135DAE7	PE4	PA4	PD6	PG10	PH7	PH12

Device	Linux Node
I2C3	/dev/i2c-0

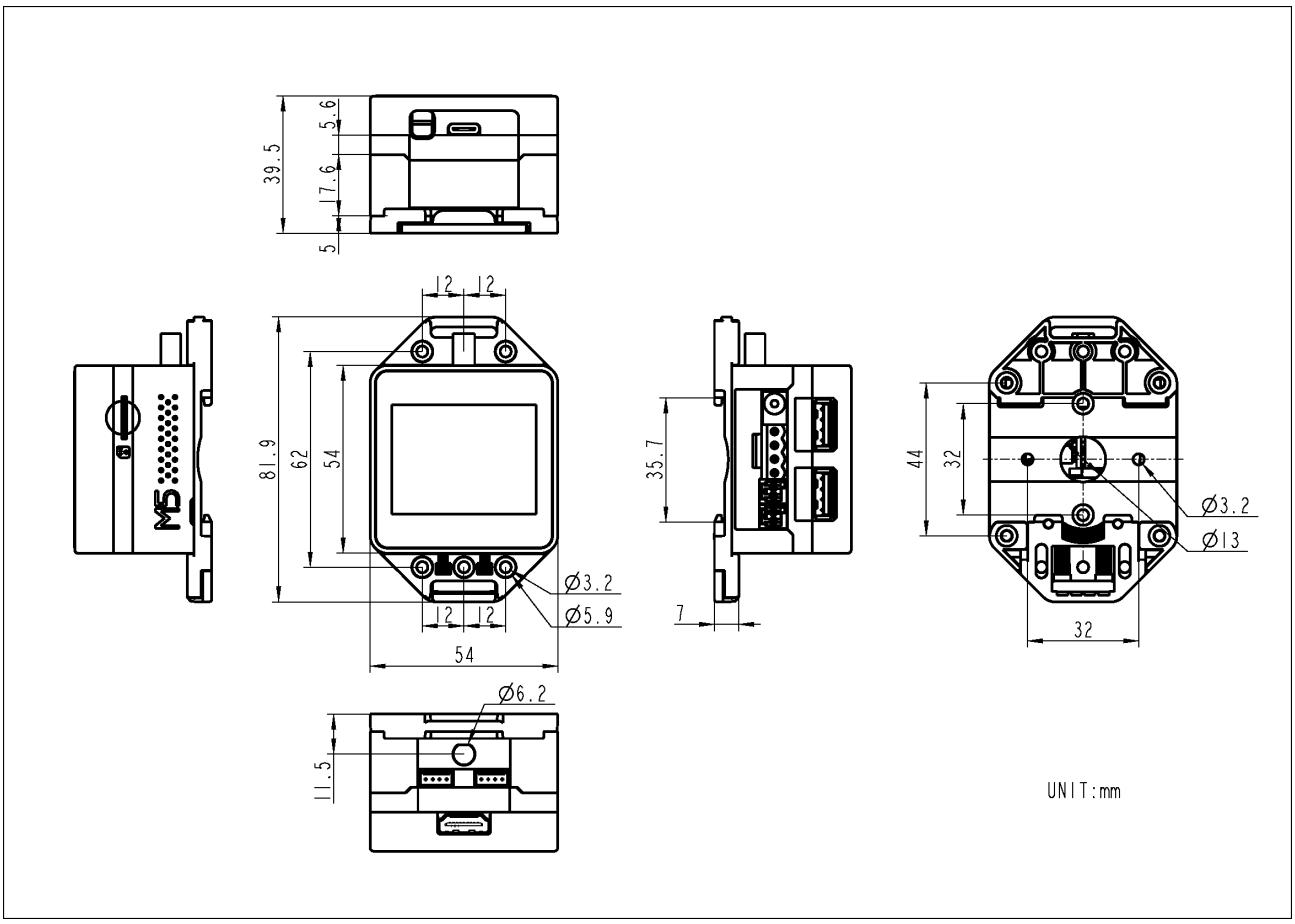
Screen & Touch

STM32MP135DAE7	ILI9342C	FT6336U
PI0	RST	
PC0	MOSI	
PC3	SCK	
PH5	CS	
PH4	DC	
PH12 (I2C3_SCL)		TP_SCL
PH7 (I2C3_SDA)		TP_SDA

AXP2101	DLDO1
ILI9342C	BL

Device	Linux Node
I2C3	/dev/i2c-0

Model Size



Datasheets

- STM32MP135DAF7
- GL852G (USB Hub Chip)
- LT8618SXB
- RTL8211F (Ethernet Chip)
- FT6336U (Touch Driver)
- NS4168 (Amplifier)
- BM8563 (RTC)
- AXP2101 (PMU)
- SIT1051T/3 (CAN Transceiver)
- ILI9342C (LCD Driver)

Softwares

Quick Start

- CoreMP135 Image Flashing & Update
- CoreMP135 Application Framework
- CoreMP135 Root Filesystem Expansion

- CoreMP135 Network Configuration
- CoreMP135 Buildroot Compilation
- CoreMP135 Device-Tree Overlay

UiFlow2

- CoreMP135 UiFlow2 Quick Start

SDK

- M5Stack Linux Libs
- CoreMP135 Buildroot

> **Buildroot**
>
> Buildroot is a simple, efficient and user-friendly embedded build system. This repository is a BR2_EXTERNAL tree dedicated to the STM32MP1 platform.

- CoreMP135 Buildroot External ST

Image

Version	Kernel	Download
M5_CoreMP135_buildroot_20240515	5.15.118	Download
M5_CoreMP135_buildroot_20240628	5.15.118	Download
M5_CoreMP135_debian12_20240515	5.15.118	Download
M5_CoreMP135_debian12_20240628	5.15.118	Download
M5_CoreMP135_debian12_20240919	5.15.118	Download

Video

- CoreMP135 Introduction

K135 CoreMP135 视频.mp4

- CoreMP135 Image Flashing

coremp135_image.mp4

- Peripheral Control on CoreMP135 Using the M5Stack Linux Application Framework

coremp135_develop.mp4

- CoreMP135 UiFlow2 Quick Start

cmp135UIFlow2quickstart.mp4